

Article

Lifestyles Shape the Cytochrome P450 Repertoire of the Bacterial Phylum *Proteobacteria*

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Table S1. Information on proteobacterial species and their respective genera was used in the study. Species abbreviations and the P450 count of different species were also presented in the table. Species information is presented as per their class.

Betaproteobacteria

Genus	Number of species	Number of species having P450s	Species name	Species codes	P450 count
<i>Neisseria</i>	40	0	<i>Neisseria meningitidis</i> MC58 (serogroup B)	nme	0
			<i>Neisseria meningitidis</i> alpha710 (serogroup B)	nmp	0
			<i>Neisseria meningitidis</i> H44/76 (serogroup B)	nmh	0
			<i>Neisseria meningitidis</i> G2136 (serogroup B)	nmd	0
			<i>Neisseria meningitidis</i> M01-240149 (serogroup B)	nmm	0
			<i>Neisseria meningitidis</i> M01-240355 (serogroup B)	nms	0
			<i>Neisseria meningitidis</i> M04-240196 (serogroup B)	nmq	0
			<i>Neisseria meningitidis</i> NZ-05/33 (serogroup B)	nmz	0
			<i>Neisseria meningitidis</i> Z2491 (serogroup A)	nma	0
			<i>Neisseria meningitidis</i> WUE 2594 (serogroup A)	nmw	0
			<i>Neisseria meningitidis</i> 510612 (serogroup A)	nmx	0
			<i>Neisseria meningitidis</i> FAM18 (serogroup C)	nmc	0
			<i>Neisseria meningitidis</i> 053442 (serogroup C)	nmn	0
			<i>Neisseria meningitidis</i> 8013 (serogroup C)	nmt	0
			<i>Neisseria meningitidis</i> alpha14 (crl strain)	nmi	0
			<i>Neisseria gonorrhoeae</i> FA 1090	ngo	0
			<i>Neisseria gonorrhoeae</i> NCCP11945	ngk	0
			<i>Neisseria lactamica</i>	nla	0
			<i>Neisseria elongata</i>	nel	0
			<i>Neisseria weaveri</i>	nwe	0
			<i>Neisseria mucosa</i> FDAARGOS_260	nsi	0

			<i>Neisseria mucosa</i> ATCC 19696	nmj	0
			<i>Neisseria chenwenguii</i>	nei	0
			<i>Neisseria</i> sp. KEM232	nek	0
			<i>Neisseria flavescens</i>	nfv	0
			<i>Neisseria subflava</i>	nsf	0
			<i>Neisseria zalophi</i>	nzl	0
			<i>Neisseria animalis</i>	naq	0
			<i>Neisseria brasiliensis</i>	nbl	0
			<i>Neisseria zoodegmatis</i>	nzo	0
			<i>Neisseria canis</i>	nci	0
			<i>Neisseria cinerea</i>	ncz	0
			<i>Neisseria animaloris</i>	nani	0
			<i>Neisseria bacilliformis</i>	nbc	0
			<i>Neisseria wadsworthii</i>	nwd	0
			<i>Neisseria shayeganii</i>	nsg	0
			<i>Neisseria musculi</i>	nmus	0
			<i>Neisseria sicca</i>	nsc	0
			<i>Neisseria perflava</i>	npf	0
			<i>Neisseria dentiae</i>	ndn	0
<i>Snodgrassella</i>	1	0	<i>Snodgrassella alvi</i>	salv	0
<i>Kingella</i>	2	0	<i>Kingella kingae</i>	kki	0
			<i>Kingella oralis</i>	koa	0
<i>Vitreoscilla</i>	2	2	<i>Vitreoscilla filiformis</i>	vff	2
			<i>Vitreoscilla</i> sp. C1	vit	1
<i>Eikenella</i>	2	0	<i>Eikenella corrodens</i>	ecor	0
			<i>Eikenella exigua</i>	eex	0
<i>Simonsiella</i>	1	0	<i>Simonsiella muelleri</i>	smur	0
<i>Alysiella</i>	1	0	<i>Alysiella filiformis</i>	aff	0
<i>Conchiformibius</i>	1	0	<i>Conchiformibius steedae</i>	cste	0

<i>Aquella</i>	1	0	<i>Aquella oligotrophica</i>	nba	0
<i>Paralysiella</i>	1	0	<i>Paralysiella testudinis</i>	ptes	0
<i>Chromobacterium</i>	8	7	<i>Chromobacterium violaceum</i>	cvi	1
			<i>Chromobacterium vaccinii</i>	cvc	1
			<i>Chromobacterium</i> sp. ATCC 53434	chro	0
			<i>Chromobacterium phragmitis</i> IIBBL 112-1	chri	2
			<i>Chromobacterium phragmitis</i> IIBBL 274-1	chrp	1
			<i>Chromobacterium rhizoryzae</i>	crz	1
			<i>Chromobacterium paludis</i>	chrp	2
			<i>Chromobacterium haemolyticum</i>	chae	1
<i>Iodobacter</i>	2	1	<i>Iodobacter ciconiae</i>	iod	0
			<i>Iodobacter fluviatilis</i>	ifl	1
<i>Laribacter</i>	1	0	<i>Laribacter hongkongensis</i>	lhk	0
<i>Pseudogulbenkiania</i>	1	1	<i>Pseudogulbenkiania</i> sp. NH8B	pse	1
<i>Jeongeupia</i>	1	0	<i>Jeongeupia</i> sp. USM3	jeu	0
<i>Aquaspirillum</i>	1	0	<i>Aquaspirillum</i> sp. LM1	aql	0
<i>Aquitalea</i>	2	1	<i>Aquitalea magnusonii</i>	amah	1
			<i>Aquitalea</i> sp. USM4	aqs	0
<i>Deefgea</i>	1	0	<i>Deefgea</i> sp. D17	dee	0
<i>Chitinibacter</i>	2	0	<i>Chitinibacter bivalviorum</i>	chiz	0
			<i>Chitinibacter fontanus</i>	cfon	0
<i>Vogesella</i>	1	0	<i>Vogesella</i> sp. XCS3	vog	0
<i>Ralstonia</i>	14	13	<i>Ralstonia solanacearum</i> GMI1000	rso	0
			<i>Ralstonia solanacearum</i> CFBP2957	rsc	1
			<i>Ralstonia solanacearum</i> PSI07	rsl	3
			<i>Ralstonia solanacearum</i> Po82	rsn	4
			<i>Ralstonia solanacearum</i> CMR15	rsm	3
			<i>Ralstonia solanacearum</i> FQY_4	rse	1
			<i>Ralstonia solanacearum</i> UY031	rsy	2

			<i>Ralstonia pickettii</i> 12J	rpi	2
			<i>Ralstonia pickettii</i> 12D	rpf	2
			<i>Ralstonia pickettii</i> DTP0602	rpj	2
			<i>Ralstonia mannitolilytica</i>	rmn	2
			<i>Ralstonia insidiosa</i>	rin	3
			<i>Ralstonia pseudosolanacearum</i>	rpu	1
			<i>Ralstonia syzygii</i> subsp. <i>celebesensis</i>	rsg	2
<i>Cupriavidus</i>	13	13	<i>Cupriavidus necator</i> H16	reh	4
			<i>Cupriavidus necator</i> N-1	cnc	7
			<i>Cupriavidus necator</i> NH9	cuh	3
			<i>Cupriavidus pinatubonensis</i> JMP134	reu	2
			<i>Cupriavidus metallidurans</i>	rme	5
			<i>Cupriavidus taiwanensis</i>	cti	3
			<i>Cupriavidus basilensis</i>	cbw	7
			<i>Cupriavidus gilardii</i>	cgd	2
			<i>Cupriavidus</i> sp. USMAHM13	ccup	1
			<i>Cupriavidus malaysiensis</i>	cup	1
			<i>Cupriavidus</i> sp. USMAA2-4	cuu	2
			<i>Cupriavidus pauculus</i>	cpau	6
			<i>Cupriavidus oxalaticus</i>	cox	4
<i>Burkholderia</i>	90	82	<i>Burkholderia mallei</i> ATCC 23344	bma	3
			<i>Burkholderia mallei</i> SAVP1	bmv	3
			<i>Burkholderia mallei</i> NCTC 10229	bml	3
			<i>Burkholderia mallei</i> NCTC 10247	bmh	3
			<i>Burkholderia mallei</i> 23344	bmal	2
			<i>Burkholderia mallei</i> 6	bmae	1
			<i>Burkholderia mallei</i> BMQ	bmaq	2
			<i>Burkholderia mallei</i> 2000031063	bmai	3
			<i>Burkholderia mallei</i> FMH 23344	bmaf	2

			<i>Burkholderia mallei</i> NCTC 10247	bmaz	2
			<i>Burkholderia mallei</i> 2002734299	bmab	2
			<i>Burkholderia pseudomallei</i> K96243	bps	2
			<i>Burkholderia pseudomallei</i> 1710b	bpm	2
			<i>Burkholderia pseudomallei</i> 1106a	bpl	3
			<i>Burkholderia pseudomallei</i> 668	bpd	2
			<i>Burkholderia pseudomallei</i> MSHR346	bpr	0
			<i>Burkholderia pseudomallei</i> MSHR305	bpse	2
			<i>Burkholderia pseudomallei</i> MSHR511	bpsm	3
			<i>Burkholderia pseudomallei</i> MSHR146	bpsu	3
			<i>Burkholderia pseudomallei</i> MSHR520	bpsd	3
			<i>Burkholderia pseudomallei</i> 1026b	bpz	3
			<i>Burkholderia pseudomallei</i> BPC006	bpq	3
			<i>Burkholderia pseudomallei</i> NCTC 13179	bpk	3
			<i>Burkholderia pseudomallei</i> HBPUB10134a	bpsh	2
			<i>Burkholderia pseudomallei</i> NAU35A-3	bpsa	2
			<i>Burkholderia pseudomallei</i> A79A	bpso	2
			<i>Burkholderia pseudomallei</i> TSV202	but	2
			<i>Burkholderia thailandensis</i> E264	bte	4
			<i>Burkholderia thailandensis</i> 2002721723	btq	4
			<i>Burkholderia thailandensis</i> E444	btj	4
			<i>Burkholderia thailandensis</i> H0587	btz	3
			<i>Burkholderia thailandensis</i> MSMB121	btd	3
			<i>Burkholderia thailandensis</i> MSMB59	btv	3
			<i>Burkholderia thailandensis</i> E254	bthe	3
			<i>Burkholderia thailandensis</i> USAMRU Malaysia #20	bthm	3
			<i>Burkholderia thailandensis</i> 2003015869	btha	4
			<i>Burkholderia thailandensis</i> 2002721643	bthl	3
			<i>Burkholderia oklahomensis</i> E0147	bok	0

			<i>Burkholderia oklahomensis</i> C6786	boc	2
			<i>Burkholderia mayonis</i>	buu	2
			<i>Burkholderia savanna</i>	bsav	0
			<i>Burkholderia vietnamiensis</i> G4	bvi	1
			<i>Burkholderia vietnamiensis</i> LMG 10929	bve	1
			<i>Burkholderia lata</i>	bur	4
			<i>Burkholderia cenocepacia</i> AU 1054	bcn	1
			<i>Burkholderia cenocepacia</i> HI2424	bch	1
			<i>Burkholderia cenocepacia</i> MC0-3	bcm	5
			<i>Burkholderia cenocepacia</i> J2315	bcj	2
			<i>Burkholderia cenocepacia</i> DDS 22E-1	bcen	2
			<i>Burkholderia cenocepacia</i> DWS 37E-2	bcew	1
			<i>Burkholderia cenocepacia</i> H111	bceo	2
			<i>Burkholderia ambifaria</i> AMMD	bam	1
			<i>Burkholderia ambifaria</i> MC40-6	bac	1
			<i>Burkholderia multivorans</i> ATCC 17616 (Tohoku)	bmj	3
			<i>Burkholderia multivorans</i> ATCC 17616 (JGI)	bmj	4
			<i>Burkholderia multivorans</i> DDS 15A-1	bmj	5
			<i>Burkholderia multivorans</i> ATCC BAA-247	bmj	2
			<i>Burkholderia cepacia</i> GG4	bct	2
			<i>Burkholderia cepacia</i> DDS 7H-2	bced	2
			<i>Burkholderia cepacia</i> ATCC 25416	bcep	0
			<i>Burkholderia dolosa</i>	bdl	1
			<i>Burkholderia pyrrocinia</i>	bpyr	2
			<i>Burkholderia contaminans</i>	bcon	4
			<i>Burkholderia ubonensis</i>	bub	3
			<i>Burkholderia diffusa</i>	bdf	1
			<i>Burkholderia latens</i>	blat	0
			<i>Burkholderia territorii</i>	btei	2

			<i>Burkholderia seminalis</i>	bsem	1
			<i>Burkholderia pseudomultivorans</i>	bpsl	1
			<i>Burkholderia metallica</i>	bmec	0
			<i>Burkholderia stagnalis</i>	bstg	1
			<i>Burkholderia stabilis</i>	bstl	1
			<i>Burkholderia anthina</i>	bann	2
			<i>Burkholderia glumae</i> BGR1	bgl	1
			<i>Burkholderia glumae</i> LMG 2196 = ATCC 33617	bgu	1
			<i>Burkholderia</i> sp. CCGE1001	bug	3
			<i>Burkholderia</i> sp. CCGE1003	bgr	4
			<i>Burkholderia gladioli</i> BSR3	bgr	4
			<i>Burkholderia gladioli</i> ATCC 10248	bgo	3
			<i>Burkholderia</i> sp. YI23	byi	7
			<i>Burkholderia</i> sp. KJ006	buk	1
			<i>Burkholderia</i> sp. RPE67	bue	7
			<i>Burkholderia</i> sp. 2002721687	bul	3
			<i>Burkholderia</i> sp. HB1	buq	2
			<i>Burkholderia plantarii</i> PG1	bgp	2
			<i>Burkholderia plantarii</i> ATCC 43733	bpla	3
			<i>Burkholderia</i> sp. Bp5365	bud	3
			<i>Burkholderia</i> sp. PAMC 26561	bum	0
			<i>Burkholderia</i> sp. PAMC 28687	bui	0
			<i>Burkholderia</i> sp. JP2-270	burk	1
<i>Paraburkholderia</i>	24	23	<i>Paraburkholderia xenovorans</i> LB400	bxe	6
			<i>Paraburkholderia xenovorans</i> LB400	bxh	5
			<i>Paraburkholderia phymatum</i>	bph	4
			<i>Paraburkholderia atlantica</i> CCGE1002	bge	2
			<i>Paraburkholderia phenoliruptrix</i>	bpx	3
			<i>Paraburkholderia phytofirmans</i> PsJN	bpy	2

			<i>Paraburkholderia phytofirmans</i> OLGA172	buz	0
			<i>Paraburkholderia fungorum</i>	bfn	6
			<i>Paraburkholderia caribensis</i>	bcai	3
			<i>Paraburkholderia spreintiae</i>	pspw	5
			<i>Paraburkholderia</i> sp. SOS3	para	2
			<i>Paraburkholderia aromaticivorans</i>	parb	1
			<i>Paraburkholderia hospita</i>	phs	7
			<i>Paraburkholderia terrae</i>	pter	9
			<i>Paraburkholderia graminis</i>	pgp	2
			<i>Paraburkholderia caledonica</i>	pcj	4
			<i>Paraburkholderia terricola</i>	pts	3
			<i>Paraburkholderia caffeinilytica</i>	pcaf	2
			<i>Paraburkholderia megapolitana</i>	pmeg	5
			<i>Paraburkholderia tropica</i>	ptro	4
			<i>Paraburkholderia ginsengisoli</i>	pgis	2
			<i>Paraburkholderia acidiphila</i>	pacp	5
			<i>Paraburkholderia acidisoli</i>	pacs	2
			<i>Paraburkholderia edwinii</i>	pew	9
<i>Mycetohabitans</i>	1	1	<i>Mycetohabitans rhizoxinica</i>	brh	1
<i>Polynucleobacter</i>	4	0	<i>Polynucleobacter asymbioticus</i>	pnu	0
			<i>Polynucleobacter necessarius</i>	pne	0
			<i>Polynucleobacter duraquae</i>	pdq	0
			<i>Polynucleobacter paneuropaeus</i>	poh	0
<i>Pandoraea</i>	14	6	<i>Pandoraea pnomenusa</i> 3kgm	ppk	1
			<i>Pandoraea pnomenusa</i> RB38	ppno	0
			<i>Pandoraea pnomenusa</i> DSM 16536	ppnm	0
			<i>Pandoraea pnomenusa</i>	prb	0
			<i>Pandoraea pulmonicola</i>	ppul	1
			<i>Pandoraea sputorum</i>	pspu	0

			<i>Pandoraea apista</i>	papi	1
			<i>Pandoraea vervacti</i>	pve	0
			<i>Pandoraea oxalativorans</i>	pox	0
			<i>Pandoraea thiooxydans</i>	ptx	0
			<i>Pandoraea faecigallinarum</i>	pfg	0
			<i>Pandoraea norimbergensis</i>	pnr	1
			<i>Pandoraea</i> sp. XY-2	pand	1
			<i>Pandoraea fibrosis</i>	pfib	2
<i>Paucimonas</i>	1	0	<i>Paucimonas lemoignei</i>	plg	0
<i>Ephemeropterocola</i>	1	0	<i>Ephemeropterocola cinctiostellae</i>	hyf	0
<i>Lautropia</i>	1	0	<i>Lautropia mirabilis</i>	lmir	0
<i>Mycoavidus</i>	1	0	<i>Mycoavidus cysteinexigens</i>	mcys	0
<i>Caballeronia</i>	2	2	<i>Caballeronia</i> sp. SBC2	caba	2
			<i>Caballeronia insecticola</i>	buo	2
<i>Limnobacter</i>	1	1	<i>Limnobacter</i> sp. SAORIC-580	limn	1
<i>Chitinimonas</i>	1	1	<i>Chitinimonas arctica</i>	cari	1
<i>Vallotia</i>	3	0	<i>Candidatus Vallotia tarda</i>	vtr	0
			<i>Candidatus Vallotia lariciata</i>	vla	0
			<i>Candidatus Vallotia cooleyia</i>	vcv	0
<i>Bordetella</i>	23	15	<i>Bordetella pertussis</i> Tohama I	bpe	1
			<i>Bordetella pertussis</i> CS	bpc	1
			<i>Bordetella pertussis</i> 18323	bper	1
			<i>Bordetella pertussis</i> B1917	bpet	1
			<i>Bordetella pertussis</i> 137	bpeu	1
			<i>Bordetella parapertussis</i> Bpp5	bpar	1
			<i>Bordetella parapertussis</i> 12822	bpa	1
			<i>Bordetella bronchiseptica</i> 253	bbh	1
			<i>Bordetella bronchiseptica</i> RB50	bbr	1
			<i>Bordetella bronchiseptica</i> MO149	bbm	1

			<i>Bordetella bronchiseptica</i> S798	bbx	1
			<i>Bordetella petrii</i>	bpt	1
			<i>Bordetella avium</i>	bav	0
			<i>Bordetella holmesii</i> ATCC 51541	bho	0
			<i>Bordetella holmesii</i> 44057	bhm	0
			<i>Bordetella hinzii</i>	bhz	1
			<i>Bordetella trematum</i>	btrm	1
			<i>Bordetella bronchialis</i>	bbro	0
			<i>Bordetella flabilis</i>	bfz	0
			<i>Bordetella pseudohinzii</i>	bpdz	0
			<i>Bordetella</i> sp. H567	boh	0
			<i>Bordetella genomsp.</i> 13	bgm	0
			<i>Bordetella</i> sp. J329	boj	1
<i>Achromobacter</i>	10	6	<i>Achromobacter xylosoxidans</i> A8	axy	4
			<i>Achromobacter xylosoxidans</i> NH44784-1996	axo	1
			<i>Achromobacter xylosoxidans</i> NBRC 15126 = ATCC 27061	axn	1
			<i>Achromobacter xylosoxidans</i> NCTC10807	axx	0
			<i>Achromobacter denitrificans</i>	adt	0
			<i>Achromobacter insolitus</i>	ais	0
			<i>Achromobacter spanius</i>	asw	0
			<i>Achromobacter</i> sp. AONIH1	achr	3
			<i>Achromobacter</i> sp. B7	achb	1
			<i>Achromobacter deleyi</i>	ady	1
<i>Taylorella</i>	5	0	<i>Taylorella equigenitalis</i> MCE9	teq	0
			<i>Taylorella equigenitalis</i> ATCC 35865	tea	0
			<i>Taylorella equigenitalis</i> 14/56	teg	0
			<i>Taylorella asinigenitalis</i> MCE3	tas	0
			<i>Taylorella asinigenitalis</i> 14/45	tat	0
<i>Pusillimonas</i>	3	3	<i>Pusillimonas</i> sp. T7-7	put	2

			<i>Pusillimonas thiosulfatoxidans</i>	pus	1
			<i>Pusillimonas</i> sp. DMV24BSW_D	pud	2
<i>Advenella</i>	2	1	<i>Advenella kashmirensis</i>	aka	1
			<i>Advenella mimigardefordensis</i>	amim	0
<i>Castellaniella</i>	1	1	<i>Castellaniella defragrans</i>	cdn	1
<i>Basilea</i>	1	0	<i>Basilea psittacipulmonis</i>	bps	0
<i>Alcaligenes</i>	4	3	<i>Alcaligenes faecalis</i> ZD02	afa	0
			<i>Alcaligenes faecalis</i> JQ135	afq	1
			<i>Alcaligenes aquatilis</i>	aaqu	1
			<i>Alcaligenes ammonioxydans</i>	aamm	1
<i>Paenicaligenes</i>	1	0	<i>Paenicaligenes hominis</i>	phn	0
<i>Orrella</i>	2	2	<i>Orrella dioscoreae</i>	odi	1
			<i>Orrella marina</i>	boz	1
<i>Oligella</i>	2	1	<i>Oligella urethralis</i>	our	0
			<i>Oligella ureolytica</i>	oue	1
<i>Pigmentiphaga</i>	2	1	<i>Pigmentiphaga</i> sp. H8	pig	3
			<i>Pigmentiphaga aceris</i>	pacr	0
<i>Kerstesia</i>	1	0	<i>Kerstesia gyiorum</i>	kgy	0
<i>Paralcaligenes</i>	1	1	<i>Paralcaligenes</i> sp. KSB-10	park	2
<i>Rhodoferax</i>	6	3	<i>Rhodoferax ferrireducens</i>	rfr	2
			<i>Rhodoferax saidenbachensis</i>	rsb	0
			<i>Rhodoferax antarcticus</i>	rac	0
			<i>Rhodoferax koreense</i>	rhy	0
			<i>Rhodoferax sediminis</i> CHu59-6-5	rhf	3
			<i>Rhodoferax sediminis</i> Gr-4	rhg	1
<i>Polaromonas</i>	5	4	<i>Polaromonas</i> sp. JS666	pol	4
			<i>Polaromonas naphthalenivorans</i>	pna	1
			<i>Polaromonas</i> sp. SP1	pos	2
			<i>Polaromonas</i> sp. Pch-P	poo	2

			<i>Polaromonas vacuolata</i>	pvac	0
<i>Acidovorax</i>	13	6	<i>Acidovorax citrulli</i>	aav	0
			<i>Acidovorax</i> sp. JS42	ajs	2
			<i>Acidovorax ebreus</i>	dia	1
			<i>Acidovorax avenae</i>	aaa	0
			<i>Acidovorax</i> sp. KKS102	ack	1
			<i>Acidovorax</i> sp. RAC01	acra	1
			<i>Acidovorax carolinensis</i> NA2	acid	0
			<i>Acidovorax carolinensis</i> P4	acip	0
			<i>Acidovorax carolinensis</i> NA3	acin	0
			<i>Acidovorax carolinensis</i> P3	acis	0
			<i>Acidovorax</i> sp. 1608163	acio	1
			<i>Acidovorax monticola</i>	amon	0
			<i>Acidovorax antarcticus</i>	aant	1
<i>Verminephrobacter</i>	1	0	<i>Verminephrobacter eiseniae</i>	vei	0
<i>Delftia</i>	5	3	<i>Delftia acidovorans</i>	dac	1
			<i>Delftia</i> sp. Cs1-4	del	0
			<i>Delftia tsuruhatensis</i>	dts	0
			<i>Delftia</i> sp. HK171	dhk	1
			<i>Delftia lacustris</i>	dla	1
<i>Variovorax</i>	6	6	<i>Variovorax paradoxus</i> S110	vap	2
			<i>Variovorax paradoxus</i> EPS	vpe	2
			<i>Variovorax paradoxus</i> B4	vpd	3
			<i>Variovorax</i> sp. PAMC 28711	vaa	1
			<i>Variovorax boronicumulans</i>	vbo	1
			<i>Variovorax</i> sp. PMC12	vam	3
<i>Comamonas</i>	7	5	<i>Comamonas thiooxydans</i>	ctt	1
			<i>Comamonas testosteroni</i> TK102	ctes	3
			<i>Comamonas kerstersii</i>	cke	0

			<i>Comamonas serinivorans</i>	cser	3
			<i>Comamonas</i> sp. NLF-7-7	cof	1
			<i>Comamonas aquatica</i>	caqt	0
			<i>Comamonas odontotermitis</i>	codo	1
<i>Alicyclophilus</i>	2	2	<i>Alicyclophilus denitrificans</i> BC	adn	1
			<i>Alicyclophilus denitrificans</i> K601	adk	1
<i>Ramlibacter</i>	1	1	<i>Ramlibacter tataouinensis</i>	rta	2
<i>Symbiobacter</i>	1	0	<i>Candidatus Symbiobacter mobilis</i>	cbx	0
<i>Ottowia</i>	2	0	<i>Ottowia</i> sp. oral taxon 894	oto	0
			<i>Ottowia oryzae</i>	otk	0
<i>Limnohabitans</i>	2	2	<i>Limnohabitans</i> sp. 103DPR2	lim	1
			<i>Limnohabitans</i> sp. 63ED37-2	lih	2
<i>Hydrogenophaga</i>	6	5	<i>Hydrogenophaga</i> sp. RAC07	hyr	2
			<i>Hydrogenophaga</i> sp. PBC	hyb	0
			<i>Hydrogenophaga</i> sp. LPB0072	hyl	1
			<i>Hydrogenophaga</i> sp. PAMC20947	hyc	1
			<i>Hydrogenophaga pseudoflava</i>	hpse	2
			<i>Hydrogenophaga</i> sp. BPS33	hyn	3
<i>Diaphorobacter</i>	4	1	<i>Diaphorobacter polyhydroxybutyrativorans</i>	dpy	0
			<i>Diaphorobacter</i> sp. HDW4A	dih	0
			<i>Diaphorobacter aerolatus</i>	daer	0
			<i>Diaphorobacter ruginosibacter</i>	drg	2
<i>Simplicispira</i>	1	1	<i>Simplicispira suum</i>	simp	1
<i>Melaminivora</i>	3	0	<i>Pulveribacter suum</i>	melm	0
			<i>Melaminivora</i> sp. SC2-9	mela	0
			<i>Melaminivora jejuensis</i>	mje	0
<i>Serpentinomonas</i>	2	2	<i>Serpentinomonas raichei</i>	cbaa	1
			<i>Serpentinomonas mccroryi</i>	cbab	1
<i>Schlegelella</i>	2	2	<i>Schlegelella thermodepolymerans</i>	sthm	3

			<i>Schlegelella brevitalea</i>	pbh	2
<i>Kinneretia</i>	1	1	<i>Kinneretia</i> sp. DAIF2	kia	2
<i>Methylibium</i>	2	1	<i>Methylibium petroleiphilum</i>	mpt	0
			<i>Methylibium</i> sp. Pch-M	metp	1
<i>Herminiimonas</i>	1	0	<i>Herminiimonas arsenicoxydans</i>	har	0
<i>Janthinobacterium</i>	9	7	<i>Janthinobacterium</i> sp. Marseille	mms	0
			<i>Janthinobacterium agaricidamnosum</i>	jag	1
			<i>Janthinobacterium</i> sp. B9-8	jab	0
			<i>Janthinobacterium</i> sp. 1_2014MBL_MicDiv	jaz	2
			<i>Janthinobacterium</i> sp. LM6	jal	1
			<i>Janthinobacterium svalbardensis</i>	jsv	1
			<i>Janthinobacterium</i> sp. 17J80-10	jaj	3
			<i>Janthinobacterium tructae</i>	jas	1
			<i>Janthinobacterium lividum</i>	jlv	1
<i>Herbaspirillum</i>	7	5	<i>Herbaspirillum seropedicae</i> SmR1	hse	1
			<i>Herbaspirillum seropedicae</i> Z67	hsz	1
			<i>Herbaspirillum hiltneri</i>	hht	0
			<i>Herbaspirillum rubrisubalbicans</i>	hrb	1
			<i>Herbaspirillum</i> sp. meg3	hee	0
			<i>Herbaspirillum huttiense</i>	hhf	1
			<i>Herbaspirillum frisingense</i>	hfr	1
<i>Zinderia</i>	1	0	<i>Candidatus Zinderia insecticola</i>	zin	0
<i>Collimonas</i>	3	3	<i>Collimonas fungivorans</i>	cfu	1
			<i>Collimonas arenae</i>	care	1
			<i>Collimonas pratensis</i>	cpra	2
<i>Massilia</i>	10	6	<i>Massilia</i> sp. NR 4-1	mnr	0
			<i>Massilia</i> sp. WG5	masw	0
			<i>Massilia violaceinigra</i>	mass	0
			<i>Massilia armeniaca</i>	masz	2

			<i>Massilia oculi</i>	mtim	0
			<i>Massilia</i> sp. YMA4	masy	3
			<i>Massilia albidiflava</i>	mali	2
			<i>Massilia umbonata</i>	mum	6
			<i>Massilia flava</i>	mfla	2
			<i>Massilia plicata</i>	mpli	1
<i>Duganella</i>	1	1	<i>Duganella</i> sp. AF9R3	dug	2
<i>Oxalobacter</i>	1	0	<i>Oxalobacter formigenes</i>	ofa	0
<i>Undibacterium</i>	2	2	<i>Undibacterium parvum</i>	upv	2
			<i>Undibacterium piscinae</i>	upi	1
<i>Noviherbaspirillum</i>	1	1	<i>Noviherbaspirillum</i> sp. UKPF54	nok	1
<i>Glaciimonas</i>	1	1	<i>Glaciimonas</i> sp. PAMC28666	glc	1
<i>Sutterella</i>	3	0	<i>Sutterella megalosphaeroides</i>	sutt	0
			<i>Sutterella faecalis</i>	sutk	0
			<i>Sutterella wadsworthensis</i>	sws	0
<i>Leptothrix</i>	1	1	<i>Leptothrix cholodnii</i>	lch	1
<i>Thiomonas</i>	2	1	<i>Thiomonas intermedia</i>	tin	0
			<i>Thiomonas arsenitoxydans</i>	thi	1
<i>Rubrivivax</i>	2	1	<i>Rubrivivax gelatinosus</i>	rge	1
			<i>Rubrivivax benzoatilyticus</i>	rbn	0
<i>Roseateles</i>	1	0	<i>Roseateles depolymerans</i>	rdp	0
<i>Paucibacter</i>	1	0	<i>Paucibacter</i> sp. KCTC 42545	pkt	0
<i>Mitsuaria</i>	1	0	<i>Mitsuaria</i> sp. 7	miu	0
<i>Rhizobacter</i>	1	1	<i>Rhizobacter gummiphilus</i>	rgu	1
<i>Aquabacterium</i>	1	1	<i>Aquabacterium olei</i>	aon	1
<i>Sphaerotilus</i>	1	1	<i>Sphaerotilus natans</i> subsp. <i>sulfidivorans</i>	snn	2
<i>Xylophilus</i>	1	0	<i>Xylophilus rhododendri</i>	xyk	0
<i>Tepidimonas</i>	1	0	<i>Tepidimonas taiwanensis</i>	ttw	0
<i>Ideonella</i>	1	1	<i>Ideonella dechloratans</i>	idc	1

<i>unclassified Burkholderiales</i>	2	1	<i>Burkholderiales bacterium GJ-E10</i>	bbag	1
			<i>Burkholderiales bacterium YL45</i>	bbay	0
<i>Nitrosomonas</i>	7	3	<i>Nitrosomonas europaea</i>	neu	0
			<i>Nitrosomonas eutropha</i>	net	0
			<i>Nitrosomonas</i> sp. AL212	nit	1
			<i>Nitrosomonas</i> sp. Is79A3	nii	1
			<i>Nitrosomonas communis</i>	nco	1
			<i>Nitrosomonas ureae</i>	nur	0
			<i>Nitrosomonas stercoris</i>	nst	0
<i>Nitrospira</i>	2	2	<i>Nitrospira multiformis</i>	nmu	1
			<i>Nitrospira lacus</i>	nlc	1
<i>Sulfuritalea</i>	1	0	<i>Sulfuritalea hydrogenivorans</i>	shd	0
<i>Methyloversatilis</i>	1	1	<i>Methyloversatilis</i> sp. RAC08	metr	1
<i>Denitratisoma</i>	1	1	<i>Denitratisoma oestradiolicum</i>	doe	2
<i>Thiobacillus</i>	1	0	<i>Thiobacillus denitrificans</i>	tbd	0
<i>Methylobacillus</i>	1	1	<i>Methylobacillus flagellatus</i>	mfa	1
<i>Methylotenera</i>	2	0	<i>Methylotenera mobilis</i>	mmb	0
			<i>Methylotenera versatilis</i>	meh	0
<i>Methylovorus</i>	2	0	<i>Methylovorus glucosetrophus</i>	mei	0
			<i>Methylovorus</i> sp. MP688	mep	0
<i>Methylopumilus</i>	2	1	<i>Candidatus Methylopumilus turicensis</i>	mbac	1
			<i>Candidatus Methylopumilus planktonicus</i>	mbat	0
<i>Methylophilus</i>	1	1	<i>Methylophilus</i> sp. TWE2	meu	1
<i>Methyloradius</i>	1	1	<i>Methyloradius palustris</i>	mpau	1
<i>Sideroxydans</i>	1	0	<i>Sideroxydans lithotrophicus</i>	slt	0
<i>Gallionella</i>	1	0	<i>Gallionella capsiferriformans</i>	gca	0
<i>Ferriphaselus</i>	1	0	<i>Ferriphaselus amnicola</i>	fam	0
<i>Nitrotoga</i>	1	0	<i>Candidatus Nitrotoga</i> sp. AM1P	nim	0

<i>Ferrigenium</i>	1	0	<i>Ferrigenium kumadai</i>	fku	0
<i>Sulfuricella</i>	1	0	<i>Sulfuricella denitrificans</i>	sdr	0
<i>Sulfuriferula</i>	3	0	<i>Sulfuriferula</i> sp. AH1	sulf	0
			<i>Sulfuriferula plumbiphila</i>	splb	0
			<i>Sulfuriferula nivalis</i>	sniv	0
<i>Sulfurimicrobium</i>	1	0	<i>Sulfurimicrobium lacus skT11</i>	slac	0
<i>Usitatibacter</i>	2	0	<i>Usitatibacter rugosus</i>	uru	0
			<i>Usitatibacter palustris</i>	upl	0
<i>Azospira</i>	3	0	<i>Azospira oryzae</i>	dsu	0
			<i>Azospira restricta</i>	ares	0
			<i>Azospira inquinata</i>	aiq	0
<i>Rugosibacter</i>	1	0	<i>Rugosibacter aromaticivorans</i>	rbu	0
<i>Oryzomicrobium</i>	1	0	<i>Oryzomicrobium terrae</i>	otr	0
<i>Niveibacterium</i>	1	0	<i>Niveibacterium microcysteis</i>	niv	0
<i>Aromatoleum</i>	4	3	<i>Aromatoleum aromaticum</i>	eba	2
			<i>Aromatoleum bremense</i>	abre	0
			<i>Aromatoleum petrolei</i>	apet	3
			<i>Aromatoleum pumilum</i>	atw	1
unclassified <i>Rhodocyclaceae</i>	1	0	<i>Rhodocyclaceae</i> bacterium <i>Thauera</i> -like	rbh	0
<i>Dechloromonas</i>	2	0	<i>Dechloromonas aromatica</i>	dar	0
			<i>Dechloromonas</i> sp. HYN0024	dey	0
<i>Quatrionicoccus</i>	1	0	<i>Quatrionicoccus australiensis</i>	qau	0
<i>Ferribacterium</i>	1	0	<i>Ferribacterium limneticum</i>	fle	0
<i>Azoarcus</i>	7	5	<i>Azoarcus olearius</i> BH72	azo	1
			<i>Azoarcus olearius</i> DQS4	aoa	1
			<i>Azoarcus</i> sp. KH32C	aza	0
			<i>Azoarcus</i> sp. CIB	azi	1
			<i>Azoarcus communis</i>	acom	2

			<i>Azoarcus</i> sp. DN11	azd	3
			<i>Azoarcus</i> sp. DD4	azr	0
<i>Thauera</i>	5	4	<i>Thauera</i> sp. MZ1T	tmz	1
			<i>Thauera humireducens</i>	thu	0
			<i>Thauera chlorobenzoica</i>	tcl	1
			<i>Thauera</i> sp. K11	thk	2
			<i>Thauera aromatica</i>	tak	1
<i>Nitrogeniibacter</i>	1	0	<i>Nitrogeniibacter mangrovi</i>	azq	0
<i>unclassified Zoogloeaceae</i>	1	0	<i>Zoogloeaceae bacteirum</i> Par-f-2	zpa	0
<i>Fluviibacter</i>	1	0	<i>Fluviibacter phosphoraccumulans</i>	fpho	0
<i>Ferrovum</i>	1	0	<i>Ferrovum myxofaciens</i>	fmy	0
<i>Accumulibacter</i>	1	0	<i>Accumulibacter phosphatis</i>	app	0
<i>Tremblaya</i>	3	0	<i>Candidatus Tremblaya princeps</i> PCIT	tpn	0
			<i>Candidatus Tremblaya princeps</i> PCVAL	tpq	0
			<i>Candidatus Tremblaya phenacola</i>	tpj	0
<i>Kinetoplastibacterium</i>	8	0	<i>Candidatus Kinetoplastibacterium crithidii</i> (ex <i>Angomonas deanei</i> ATCC 30255)	kci	0
			<i>Candidatus Kinetoplastibacterium crithidii</i> TCC036E	kct	0
			<i>Candidatus Kinetoplastibacterium blastocrithidii</i> (ex <i>Strigomonas culicis</i>)	kbl	0
			<i>Candidatus Kinetoplastibacterium blastocrithidii</i> TCC012E	kbt	0
			<i>Candidatus Kinetoplastibacterium desouzaii</i>	kde	0
			<i>Candidatus Kinetoplastibacterium galatii</i>	kga	0
			<i>Candidatus Kinetoplastibacterium oncopeltii</i>	kon	0
			<i>Candidatus Kinetoplastibacterium sorsogonicusi</i>	kso	0
<i>Proffotella</i>	1	0	<i>Candidatus Proffotella armatura</i>	ssdc	0
<i>Nasuia</i>	1	0	<i>Candidatus Nasuia deltocephalinicola</i>	ndl	0
<i>Vidania</i>	1	0	<i>Candidatus Vidania fulgoroideae</i>	vfg	0
<i>Desulfobacillus</i>	1	0	<i>Candidatus Desulfobacillus denitrificans</i>	ddz	0

unclassified Betaproteobacteria	3	0	<i>Beta proteobacterium</i> CB	bprc	0
			<i>Betaproteobacteria bacterium</i> UKL13-2	beb	0
137			<i>Betaproteobacteria bacterium</i> GR16-43	beba	0

Deltaproteobacteria

Genus	Number of species	Number of species having P450s	Species name	Species codes	Number of p450s
<i>Geobacter</i>	7		<i>Geobacter sulfurreducens</i> PCA	gsu	0
			<i>Geobacter sulfurreducens</i> KN400	gsk	0
			<i>Geobacter metallireducens</i>	gme	0
			<i>Geobacter</i> sp. M21	gem	0
			<i>Geobacter</i> sp. M18	geb	0
			<i>Geobacter pickeringii</i>	gpi	0
			<i>Geobacter anodireducens</i>	gao	0
<i>Geotalea</i>	2		<i>Geobacter uraniireducens</i>	gur	0
			<i>Geobacter daltonii</i> FRC-32	geo	0
<i>Trichlorobacter</i>	1		<i>Trichlorobacter lovleyi</i>	glo	0
<i>Citri fermentans</i>	2		<i>Citri fermentans bemidjiense</i>	gbm	0
			<i>Citri fermentans bremense</i>	gbn	0
<i>Geoalkalibacter</i>	1		<i>Geoalkalibacter subterraneus</i>	gsb	0

<i>Geomonas</i>	3		<i>Geomonas oryzisoli</i>	ger	0
			<i>Geomonas subterranea</i>	gsub	0
			<i>Geomonas nitrogeniifigens</i>	gnt	0
<i>Syntrophotalea</i>	3		<i>Pelobacter carbinolicus</i>	pca	0
			<i>Syntrophotalea acetylenica</i>	pace	0
			<i>Syntrophotalea acetylenivorans</i>	pef	0
<i>Pelobacter</i>	1		<i>Pelobacter propionicus</i>	ppd	0
<i>Desulfuromonas</i>	3		<i>Desulfuromonas soudanensis</i>	des	0
			<i>Desulfuromonas</i> sp. DDH964	deu	0
			<i>Desulfuromonas versatilis</i>	dve	0
<i>Desulfovibrio</i>	11		<i>Desulfovibrio vulgaris</i> Hildenborough	dvu	0
			<i>Desulfovibrio vulgaris</i> DP4	dvl	0
			<i>Desulfovibrio vulgaris</i> Miyazaki F	dvm	0
			<i>Desulfovibrio vulgaris</i> RCH1	dvg	0
			<i>Desulfovibrio desulfuricans</i> ATCC 27774	dds	0
			<i>Desulfovibrio fairfieldensis</i>	dfi	0
			<i>Desulfovibrio piger</i>	dpg	0
			<i>Desulfovibrio</i> sp. G11	def	0
			<i>Candidatus Desulfovibrio trichonymphae</i>	dtr	0
			<i>Desulfovibrio ferrophilus</i>	dfl	0
			<i>Desulfovibrio sulfodismutans</i>	dsd	0
<i>Solidesulfovibrio</i>	2		<i>Solidesulfovibrio magneticus</i>	dma	0
			<i>Solidesulfovibrio carbinolicus</i>	dcb	0
<i>Megalodesulfovibrio</i>	1		<i>Megalodesulfovibrio gigas</i>	dgg	0
<i>Oleidesulfovibrio</i>	1		<i>Oleidesulfovibrio alaskensis</i>	dde	0
<i>Oceanidesulfovibrio</i>	1		<i>Oceanidesulfovibrio marinus</i>	dms	0
<i>Maridesulfovibrio</i>	2		<i>Maridesulfovibrio salexigens</i>	dsa	0
			<i>Desulfovibrio hydrothermalis</i>	dhy	0
<i>Desulfocurvibacter</i>	1	1	<i>Desulfocurvibacter africanus</i> subsp. <i>africanus</i>	daf	1

<i>Pseudodesulfovibrio</i>	6		<i>Pseudodesulfovibrio aespoensis</i>	das	0
			<i>Pseudodesulfovibrio piezophilus</i>	dpi	0
			<i>Pseudodesulfovibrio indicus</i>	dej	0
			<i>Pseudodesulfovibrio profundus</i>	pprf	0
			<i>Pseudodesulfovibrio cashew</i>	psel	0
			<i>Pseudodesulfovibrio mercurii</i>	ddn	0
<i>Lawsonia</i>	2		<i>Lawsonia intracellularis</i> PHE/MN1-00	lip	0
			<i>Lawsonia intracellularis</i> N343	lir	0
<i>Desulfolutivibrio</i>	1		<i>Desulfolutivibrio sulfoxidireducens</i>	dsx	0
<i>Paradesulfovibrio</i>	1		<i>Paradesulfovibrio bizertensis</i>	pbiz	0
<i>Desulfomicrobium</i>	2		<i>Desulfomicrobium baculatum</i>	dba	0
			<i>Desulfomicrobium orale</i>	doa	0
<i>Desulfohalobium</i>	1		<i>Desulfohalobium retbaense</i>	drt	0
<i>Desulfotalea</i>	1		<i>Desulfotalea psychrophila</i>	dps	0
<i>Desulfocapsa</i>	1		<i>Desulfocapsa sulfexigens</i>	dsf	0
<i>Desulfurivibrio</i>	1		<i>Desulfurivibrio alkaliphilus</i>	dak	0
<i>Desulfobulbus</i>	3		<i>Desulfobulbus propionicus</i>	dpr	0
			<i>Desulfobulbus oralis</i>	deo	0
			<i>Desulfobulbus oligotrophicus</i>	dog	0
<i>Desulfomarina</i>	1		<i>Desulfomarina profundi</i>	dbk	0
<i>Desulfococcus</i>	2		<i>Desulfococcus oleovorans</i>	dol	0
			<i>Desulfococcus multivorans</i>	dml	0
<i>Desulfatibacillum</i>	1		<i>Desulfatibacillum aliphaticivorans</i>	dal	0
<i>Desulforapulum</i>	1		<i>Desulforapulum autotrophicum</i>	dat	0
<i>Desulfobacula</i>	1		<i>Desulfobacula toluolica</i>	dto	0
<i>Desulfosarcina</i>	3		<i>Desulfosarcina ovata</i> subsp. <i>sediminis</i>	dov	0
			<i>Desulfosarcina widdelii</i>	dwd	0
			<i>Desulfosarcina alkanivorans</i>	dalk	0
<i>Desulfonema</i>	2		<i>Desulfonema limicola</i>	dli	0

			<i>Desulfonema magnum</i>	dmm	0
<i>Desulfoluna</i>	1		<i>Desulfoluna</i> sp. ASN36	dek	0
<i>Anaeromyxobacter</i>	4		<i>Anaeromyxobacter dehalogenans</i> 2CP-C	ade	0
			<i>Anaeromyxobacter dehalogenans</i> 2CP-1	acp	0
			<i>Anaeromyxobacter</i> sp. Fw109-5	afw	0
			<i>Anaeromyxobacter</i> sp. K	ank	0
<i>Myxococcus</i>	4	4	<i>Myxococcus xanthus</i>	mxs	7
			<i>Myxococcus stipitatus</i>	msd	11
			<i>Myxococcus hansupus</i>	mym	4
			<i>Myxococcus fulvov</i>	mfb	2
<i>Coralloccoccus</i>	3	4	<i>Coralloccoccus coralloides</i>	ccx	10
			<i>Coralloccoccus macrosporus</i> HW-1	mfu	2
			<i>Coralloccoccus macrosporus</i> DSM 14697	mmas	1
<i>Stigmatella</i>	1	1	<i>Stigmatella aurantiaca</i>	sur	17
<i>Archangium</i>	2	2	<i>Archangium gephyra</i>	age	56
			<i>Archangium violaceum</i>	avm	43
<i>Melittangium</i>	1	1	<i>Melittangium boletus</i>	mbd	28
<i>Cystobacter</i>	1	1	<i>Cystobacter fuscus</i>	cfus	42
<i>Vulgatibacter</i>	1		<i>Vulgatibacter incomptus</i>	vin	0
<i>Sorangium</i>	2	2	<i>Sorangium cellulosum</i> So ce56	scl	19
			<i>Sorangium cellulosum</i> So0157-2	scu	8
<i>Chondromyces</i>	1	1	<i>Chondromyces crocatus</i>	ccro	26
<i>Sandaracinus</i>	1	1	<i>Sandaracinus amylolyticus</i>	samy	6
<i>Labilithrix</i>	1	1	<i>Labilithrix luteola</i>	llu	5
<i>Minicystis</i>	1	1	<i>Minicystis rosea</i>	mrm	24
<i>Haliangium</i>	1	1	<i>Haliangium ochraceum</i>	hoh	17
<i>Syntrophus</i>	1		<i>Syntrophus aciditrophicus</i>	sat	0
<i>Desulfobacca</i>	1		<i>Desulfobacca acetoxidans</i>	dao	0
<i>Desulfomonile</i>	1		<i>Desulfomonile tiedjei</i>	dti	0

<i>Syntrophobacter</i>	1		<i>Syntrophobacter fumaroxidans</i>	sfu	0
<i>Desulfoglaeba</i>	1		<i>Desulfoglaeba alkanexedens</i>	dax	0
<i>Desulfarculus</i>	1		<i>Desulfarculus baarsii</i>	dbr	0
<i>Hippea</i>	1		<i>Hippea maritima</i>	hmr	0
<i>Desulfurella</i>	1		<i>Desulfurella acetivorans</i>	dav	0
<i>Bradymonas</i>	1	1	<i>Bradymonas sediminis</i>	bsed	1
<i>Persicimonas</i>	1	1	<i>Persicimonas caeni</i>	pcay	3

Epsilonproteobacteria

Genus	Number of species	Number of species having P450s	Species name	Species code	Number of p450s
<i>Helicobacter</i>	78	1	<i>Helicobacter pylori</i> 26695	hpy	0
			<i>Helicobacter pylori</i> 26695	heo	0
			<i>Helicobacter pylori</i> J99	hpi	0
			<i>Helicobacter pylori</i> HPAG1	hpa	0
			<i>Helicobacter pylori</i> Shi470	hps	0
			<i>Helicobacter pylori</i> Shi112	hhp	0
			<i>Helicobacter pylori</i> Shi169	hhq	0
			<i>Helicobacter pylori</i> Shi417	hhr	0
			<i>Helicobacter pylori</i> G27	hpg	0

			<i>Helicobacter pylori</i> P12	hpp	0
			<i>Helicobacter pylori</i> B38	hpb	0
			<i>Helicobacter pylori</i> B8	hpl	0
			<i>Helicobacter pylori</i> PeCan4	hpc	0
			<i>Helicobacter pylori</i> PeCan18	hca	0
			<i>Helicobacter pylori</i> SJM180	hpm	0
			<i>Helicobacter pylori</i> ELS37	hpe	0
			<i>Helicobacter pylori</i> 35A	hpo	0
			<i>Helicobacter pylori</i> 908	hpi	0
			<i>Helicobacter pylori</i> 2017	hpq	0
			<i>Helicobacter pylori</i> 2018	hpw	0
			<i>Helicobacter pylori</i> Cuz20	hpu	0
			<i>Helicobacter pylori</i> F16	hef	0
			<i>Helicobacter pylori</i> F30	hpf	0
			<i>Helicobacter pylori</i> F32	heq	0
			<i>Helicobacter pylori</i> F57	hex	0
			<i>Helicobacter pylori</i> Sat464	hpt	0
			<i>Helicobacter pylori</i> 52	hpz	0
			<i>Helicobacter pylori</i> v225d	hpv	0
			<i>Helicobacter pylori</i> 83	hpx	0
			<i>Helicobacter pylori</i> SNT49	hen	0
			<i>Helicobacter pylori</i> Lithuania75	hph	0
			<i>Helicobacter pylori</i> Gambia94/24	heg	0
			<i>Helicobacter pylori</i> India7	hpn	0
			<i>Helicobacter pylori</i> Puno120	hep	0
			<i>Helicobacter pylori</i> Puno135	heu	0
			<i>Helicobacter pylori</i> SouthAfrica7	hes	0
			<i>Helicobacter pylori</i> SouthAfrica20	hpys	0
			<i>Helicobacter pylori</i> HUP-B14	hcn	0

			<i>Helicobacter pylori</i> 51	hpd	0
			<i>Helicobacter pylori</i> XZ274	hey	0
			<i>Helicobacter pylori</i> Rif1	her	0
			<i>Helicobacter pylori</i> Rif2	hei	0
			<i>Helicobacter pylori</i> Aklavik117	hpya	0
			<i>Helicobacter pylori</i> Aklavik86	hpyk	0
			<i>Helicobacter pylori</i> OK113	hpyo	0
			<i>Helicobacter pylori</i> OK310	hpyl	0
			<i>Helicobacter pylori</i> oki102	hpyb	0
			<i>Helicobacter pylori</i> oki112	hpyc	0
			<i>Helicobacter pylori</i> oki128	hpyd	0
			<i>Helicobacter pylori</i> oki154	hpye	0
			<i>Helicobacter pylori</i> oki422	hpyf	0
			<i>Helicobacter pylori</i> oki673	hpyg	0
			<i>Helicobacter pylori</i> oki828	hpyh	0
			<i>Helicobacter pylori</i> oki898	hpyj	0
			<i>Helicobacter pylori</i> UM032	hpyr	0
			<i>Helicobacter pylori</i> UM037	hpyi	0
			<i>Helicobacter pylori</i> UM066	hpyu	0
			<i>Helicobacter pylori</i> UM299	hpym	0
			<i>Helicobacter pylori</i> UM298	hem	0
			<i>Helicobacter pylori</i> BM012A	heb	0
			<i>Helicobacter pylori</i> BM012S	hez	0
			<i>Helicobacter hepaticus</i>	hhe	0
			<i>Helicobacter acinonychis</i>	hac	0
			<i>Helicobacter mustelae</i>	hms	0
			<i>Helicobacter felis</i>	hfe	0
			<i>Helicobacter bizzozeronii</i>	hbi	0
			<i>Helicobacter cetorum</i> MIT 00-7128	hce	0

			<i>Helicobacter cetorum</i> MIT 99-5656	hcm	0
			<i>Helicobacter cinaedi</i> PAGU611	hcp	0
			<i>Helicobacter cinaedi</i> CCUG 18818 = ATCC BAA-847	hcb	0
			<i>Helicobacter heilmannii</i>	hhm	0
			<i>Helicobacter typhlonius</i>	hty	0
			<i>Helicobacter bilis</i>	hbl	0
			<i>Helicobacter apodemus</i>	had	0
			<i>Helicobacter enhydrae</i>	het	0
			<i>Helicobacter cholecystus</i>	hcl	0
			<i>Helicobacter winghamensis</i>	hwi	1
			<i>Helicobacter suis</i>	hsh	0
<i>Wolinella</i>	1	1	<i>Wolinella succinogenes</i>	wsu	0
<i>Sulfurimonas</i>	9	9	<i>Sulfurimonas denitrificans</i>	tdn	0
			<i>Sulfurimonas autotrophica</i>	sua	0
			<i>Sulfurimonas xiamenensis</i>	suln	0
			<i>Sulfurimonas lithotrophica</i>	sulg	0
			<i>Sulfurimonas</i> sp. CVO	sulc	0
			<i>Sulfurimonas paralvinellae</i>	spal	0
			<i>Sulfurimonas sediminis</i>	ssei	0
			<i>Candidatus Sulfurimonas baltica</i>	sbal	0
			<i>Candidatus Sulfurimonas marisnigri</i>	smas	0
<i>Sulfuricurvum</i>	2	2	<i>Sulfuricurvum kujiense</i>	sku	0
			<i>Candidatus Sulfuricurvum</i> sp. RIFRC-1	sulr	0
<i>Campylobacter</i>	78	51	<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> NCTC 11168 = ATCC 700819	cje	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> NCTC 11168-BN148	cjb	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 81-176	cjj	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 81116	cju	1

			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> ICDCCJ07001	cjn	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> IA3902	cji	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> M1	cjm	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> S3	cjs	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> PT14	cjp	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-2426	cjej	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-2538	cjeu	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-2544	cjen	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-2425	cjei	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> R14	cjer	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> MTVDSCj20	cjv	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> YH001	cjy	0
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 35925B2	cjq	0
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-1597	cjl	1
			<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-6200	cjw	1
			<i>Campylobacter jejuni</i> RM1221	cjr	1
			<i>Campylobacter jejuni</i> subsp. <i>doylei</i> 269.97	cjd	1
			<i>Campylobacter jejuni</i> 32488	cjz	1
			<i>Campylobacter jejuni</i> 4031	cjx	1
			<i>Campylobacter fetus</i> subsp. <i>fetus</i> 82-40	cff	0
			<i>Campylobacter fetus</i> subsp. <i>fetus</i> 04/554	cft	0
			<i>Campylobacter fetus</i> subsp. <i>venerealis</i> cfvi03/293	cfv	0
			<i>Campylobacter fetus</i> subsp. <i>venerealis</i> 97/608	cfx	0
			<i>Campylobacter fetus</i> subsp. <i>venerealis</i> 84-112	cfz	0
			<i>Campylobacter fetus</i> subsp. <i>testudinum</i> 03-427	camp	0
			<i>Campylobacter fetus</i> subsp. <i>testudinum</i> pet-3	cfp	0
			<i>Campylobacter curvus</i>	ccv	0
			<i>Campylobacter hominis</i>	cha	0
			<i>Campylobacter concisus</i> 13826	cco	0

			<i>Campylobacter concisus</i> ATCC 33237	ccoc	0
			<i>Campylobacter lari</i> RM2100	cla	1
			<i>Campylobacter lari</i> RM16701	clr	1
			<i>Campylobacter lari</i> RM16712	clm	1
			<i>Campylobacter lari</i> CCUG 22395	clq	0
			<i>Campylobacter lari</i> NCTC 11845	cln	1
			<i>Campylobacter lari</i> subsp. <i>concheus</i> LMG 11760	cll	1
			<i>Campylobacter coli</i> 76339	ccol	1
			<i>Campylobacter coli</i> CVM N29710	ccc	1
			<i>Campylobacter coli</i> 15-537360	ccq	1
			<i>Campylobacter coli</i> RM1875	ccf	1
			<i>Campylobacter coli</i> RM4661	ccy	1
			<i>Campylobacter coli</i> RM5611	ccoi	1
			<i>Campylobacter coli</i> FB1	ccof	1
			<i>Campylobacter coli</i> OR12	ccoo	1
			<i>Campylobacter iguaniorum</i>	caj	0
			<i>Campylobacter insulaenigrae</i>	cis	1
			<i>Campylobacter volucris</i>	cvo	1
			<i>Campylobacter peloridis</i>	cpel	1
			<i>Campylobacter</i> sp. RM16704	camr	1
			<i>Campylobacter subantarcticus</i> LMG 24374	csm	1
			<i>Campylobacter subantarcticus</i> LMG 24377	csf	1
			<i>Campylobacter gracilis</i>	cgra	0
			<i>Campylobacter ureolyticus</i>	cure	0
			<i>Campylobacter hyointestinalis</i>	chy	0
			<i>Campylobacter helveticus</i>	chv	1
			<i>Campylobacter sputorum</i>	cspf	0
			<i>Campylobacter pinnipediorum</i>	cpin	0
			<i>Campylobacter cuniculorum</i>	ccun	1

			<i>Campylobacter lanienae</i>	clx	1
			<i>Campylobacter avium</i>	cavi	1
			<i>Campylobacter hepaticus</i>	chw	1
			<i>Campylobacter</i> sp. RM12175	camz	1
			<i>Campylobacter</i> sp. RM6137	camy	1
			<i>Campylobacter ornithocola</i>	coj	1
			<i>Campylobacter upsaliensis</i>	cux	1
			<i>Campylobacter rectus</i>	crx	0
			<i>Campylobacter geocheloni</i>	cgeo	0
			<i>Campylobacter blaseri</i>	cbla	0
			<i>Campylobacter corcagiensis</i>	ccor	0
			<i>Campylobacter armoricus</i>	carm	1
			<i>Campylobacter mucosalis</i>	cmuc	0
			<i>Campylobacter showae</i>	csho	0
			<i>Candidatus Campylobacter infans</i>	cinf	0
			<i>Campylobacter novaezeelandiae</i>	cnv	1
<i>Sulfurospirillum</i>	7	7	<i>Sulfurospirillum deleyianum</i>	sdl	0
			<i>Sulfurospirillum barnesii</i>	sba	0
			<i>Sulfurospirillum multivorans</i>	smul	0
			<i>Sulfurospirillum halorespirans</i>	shal	0
			<i>Sulfurospirillum</i> sp. SL2-1	suls	0
			<i>Sulfurospirillum</i> sp. JPD-1	sulj	0
			<i>Sulfurospirillum</i> sp. ACSTCE	sult	0
<i>Aliarcobacter</i>	11	11	<i>Aliarcobacter butzleri</i> RM4018	abu	0
			<i>Aliarcobacter butzleri</i> ED-1	abt	0
			<i>Aliarcobacter butzleri</i> 7h1h	abl	0
			<i>Aliarcobacter skirrowii</i>	ask	0
			<i>Aliarcobacter trophiarum</i>	atp	0
			<i>Aliarcobacter cibarius</i>	acib	0

			<i>Aliarcobacter cryaerophilus</i>	acre	0
			<i>Aliarcobacter lanthieri</i>	alan	0
			<i>Arcobacter porcinus</i>	apoc	0
			<i>Aliarcobacter faecis</i>	afc	0
			<i>Aliarcobacter thereius</i>	athr	0
<i>Arcobacter</i>	7	7	<i>Arcobacter nitrofigilis</i>	ant	0
			<i>Arcobacter ellisii</i>	aell	0
			<i>Arcobacter aquimarinus</i>	aaqi	0
			<i>Arcobacter suis</i>	asui	0
			<i>Arcobacter cloacae</i>	aclo	0
			<i>Arcobacter venerupis</i>	avp	0
			<i>Arcobacter defluvi</i>	adz	0
<i>Poseidonibacter</i>	2	2	<i>Poseidonibacter lekithochrous</i>	alk	0
			<i>Poseidonibacter parvus</i>	alp	0
<i>Malaciobacter</i>	6	1	<i>Malaciobacter halophilus</i>	ahs	0
			<i>Malaciobacter mytili</i>	amyt	1
			<i>Malaciobacter marinus</i>	amar	0
			<i>Malaciobacter canalis</i>	acaa	0
			<i>Malaciobacter molluscorum</i>	amol	0
			<i>Malaciobacter pacificus</i>	apai	0
<i>Halarcobacter</i>	3	3	<i>Halarcobacter bivalviorum</i>	hbv	0
			<i>Halarcobacter ebronensis</i>	hebr	0
			<i>Halarcobacter anaerophilus</i>	aana	0
<i>Pseudoarcobacter</i>	1	1	<i>Pseudoarcobacter acticola</i>	paco	0
<i>unclassified Arcobacter</i>	1	1	<i>Arcobacter</i> sp. L	arc	0
<i>Hydrogenimonas</i>	1	1	<i>Hydrogenimonas</i> sp. MAG	hyo	0
<i>Nitratifractor</i>	1	1	<i>Nitratifractor salsuginis</i>	nsa	0
<i>Sulfurovum</i>	3	3	<i>Sulfurovum</i> sp. NBC37-1	sun	0

			<i>Sulfurovum lithotrophicum</i>	slh	0
			<i>Sulfurovum indicum</i>	sinu	0
<i>Nitratiruptor</i>	1	1	<i>Nitratiruptor</i> sp. SB155-2	nis	0
<i>Nautilia</i>	2	2	<i>Nautilia profundicola</i>	nam	0
			<i>Nautilia</i> sp. PV-1	nap	0
<i>Caminibacter</i>	2	2	<i>Caminibacter mediatlanticus</i>	cmed	0
			<i>Caminibacter pacificus</i>	cpaf	0

Table S2. Comparative analysis of P450 families and subfamilies in different classes of *Proteobacteria*. P450 family and subfamily data for *Alphaproteobacteria* and *Gammaproteobacteria* are retrieved from the published articles [1, 2] and used for comparative analysis.

Family	Subfamily	<i>Alphaproteobacteria</i>	<i>Betaproteobacteria</i>	<i>Gammaproteobacteria</i>	<i>Deltaproteobacteria</i>	<i>Epsilonproteobacteria</i>
CYP101	M			1		
	B	1				
	C	3				
	D	2				
	E	2				
	Q	1				
	R	1				
	F		2			
	N		2			
	P				1	
CYP1007	B				1	
	C				2	
	D				1	
	E				1	
	F				1	
	G				1	
CYP1010	A	1				
CYP1011	E				3	
	F				1	
CYP1013	A		42			
CYP1017	A	1				
CYP102	J		5	1	1	
	A	10	6			

	E		14			
	K	1				
	AC	1				
	M				6	
CYP103	A	4				
CYP1036	B	1				
	C	1				
CYP104	A	13				
CYP1043	C			1		
	A		1		1	
CYP1049	A		3	1		
CYP105	BQ			4		
	BF	3				
	CX	1				
	B		1			
	CV		4			
	CW		4			
	T		16			
	AC				1	
	EK				1	
CYP1061	B	2				
CYP1068	A	4				
CYP1069	A				6	
	B				1	
	C				2	
	D				1	
	E				1	
	F				1	
	G				1	

	H				1	
	J				2	
CYP107	DJ			3		
	E			4		
	HT			1		
	S			15		
	AN	8				
	JE	1				
	DG		12			
	DN		5			
	DQ		3			
	NN		1			
	NP		5			
	NQ		1			
	NX		1			
	AM				1	
	CJ				2	
	DL				7	
	DP				9	
	EN				2	
	HU				2	
	HV				4	
	HW				1	
	HX				3	
	HY				1	
	HZ				1	
	JA				1	
CYP1075	A	1				
CYP1076	A	1				

CYP1077	A	1	1			
CYP1078	A	7				
	C	1				
CYP108	R			1		
	A	2				
	D	6				
	G	18				
	L	1				
	P	2				
	U	1				
	V	1				
	W	1				
	X	5				
	AB		1			
	E		2			
	S		12			
	Z		1			
CYP1081	B	2				
CYP1082	A	1				
CYP1083	A	3				
	C	2				
CYP1086	B	1				
CYP1088	B	2				
CYP1089	A	1				
CYP109	AK				3	
	C				5	
	D				2	
	N				4	
	P				1	

	Q				4	
	R				7	
	S				1	
CYP1090	C	2				
CYP1091	A	3				
CYP1094	A	3				
	B	1				
CYP1097	B			1		
	A		16			
	C		1			
CYP1098	A	6				
	B		8			
	D		1			
CYP110	J		1		2	
	V				1	
	AD				1	
	AU				1	
	AV				1	
	H				3	
	R				5	
	S				1	
	T				1	
	U				2	
	W				1	
CYP1101	A	29				
CYP1104	B		1	3		
	A	4				
	C	3				
	E	3				

CYP1107	A	12			
	B	3			
	C	1			
CYP1108	A		1		
CYP111	A	1		1	
	B	1			
CYP1110	A		2		
CYP1111	A	5	2		
	B	1			
	C	1			
CYP1112	A		4		
CYP1116	B	3			
CYP1118	B	1			
CYP112	A	23		3	
CYP1135	A	1			
	B		1		
CYP1137	A	1			
CYP1138	A		3	1	
	B	2			
CYP114	A	22		4	
CYP1141	A	1			
CYP1142	A			1	
CYP1145	A	1			
CYP115	A	1		3	
CYP1155	B	1			
	A		1		
CYP1157	C			1	
	D		5		
CYP116	B	1	58	2	

	F		1			
CYP1164	A			1		
CYP1165	A			1		
	B			1		
CYP117	A	22		3		
	C		4			
	B				1	
	D				1	
	E				4	
CYP1170	A	7				
CYP1171	A	1				
CYP1172	A			1		
CYP1173	A	1				
CYP1174	A	2				
CYP1175	A	1				
CYP1176	B		1			
CYP1179	A			1		
	B		4			
CYP1180	A		1			
CYP1181	A	1				
CYP1182	A	1				
CYP1183	A		1			
CYP1186	A	2				
CYP1187	A	1				
CYP1199	A		1	2		
	C		1			
CYP120	F				1	
	G				5	
	H				1	

CYP1200	B			1		
	A		1			
CYP1201	A			1		
	B			1		
CYP1202	A			1		
	B		1			
CYP1204	A	2				
CYP1206	B	1				
CYP1220	A		13			
	C				1	
CYP1221	B	2				
CYP1224	J				3	
CYP1225	A		2	1		
CYP1229	A	1		1		
	B	2				
	C	1				
CYP1232	F		1			
CYP1234	A			5		
	B			1		
CYP1236	A	1				
CYP1246	A	2	1			
CYP1247	A			9		
CYP1248	B				2	
CYP125	U		1			
	E				2	
	N				1	
CYP125	P	1				
CYP1250	A	1				
CYP1258	A	1				

	B		1			
CYP126	C			4	1	
	B				2	
CYP1261	B			1		
CYP1263	B		1			
	C				1	
CYP127	A	18				
	C	1				
CYP1275	B	1				
CYP1278	A			1		
CYP1281	A	1				
CYP1284	B				7	
CYP1286	A				2	
	B				1	
CYP1291	B	3				
	C	2				
CYP1295	B		1			
CYP1298	A				1	
CYP1302	A	2				
CYP1311	A	2		1		
CYP1312	A	1				
CYP1315	B				1	
CYP1318	A		1			
CYP1319	A		3			
CYP1326	B	2				
CYP1329	A				2	
	C				1	
CYP133	B		10	22		
	C		14			

	D			1		
	E		4			
	F	1				
	J		1			
CYP1330	A	1				
CYP1335	A				2	
CYP1337	A	1				
CYP134	B			2		
CYP1347	B				6	
	C				1	
	E				1	
CYP1349	A	1				
CYP1350	A	1				
CYP1352	B				1	
CYP1355	B		4			
CYP136	F			2		
CYP1366	A				1	
CYP1371	B	1				
CYP1373	B				2	
	C				2	
	D				1	
CYP1376	B	1				
	C	1				
CYP1384	A	1				
CYP1387	A				1	
	B				1	
CYP1396	A	1				
CYP1405	B	1				
CYP1406	B	2				

	C	1				
CYP1413	A			3		
	B			1		
CYP1414	A			2		
	B			1		
CYP1415	A			3		
CYP1448	B				1	
CYP1460	C	1				
CYP1464	A		4	2		
CYP1465	A			4		
CYP1466	A			1		
CYP1467	A			1		
CYP1468	A			1		
CYP1469	A			2		
CYP147	D	16				
	A				1	
	L				1	
CYP1470	A			3		
CYP1471	A			1		
CYP1472	A			1		
CYP1473	A			1		
CYP1474	A			3		
	B			2		
	C			2		
CYP1475	A			1		
CYP1476	A			1		
CYP1477	A			1		
CYP1478	A			1		
CYP1479	A			1		

CYP1480	A			1		
CYP1481	A		1	2		
CYP1482	A			1		
CYP1483	A			1		
CYP1484	A		1			
CYP1485	A		6			
CYP1486	A		3			
	B				2	
CYP1487	A		2			
CYP1488	A		36			
CYP1489	A				2	
CYP1490	A				1	
CYP1491	A				1	
CYP1492	A				3	
CYP1493	A				1	
CYP1494	A				1	
CYP1495	A				1	
CYP1496	A				1	
	B				1	
CYP1497	A				1	
CYP1498	A				1	
CYP1499	A				1	
CYP1500	A				1	
CYP1501	A				1	
CYP1502	A				1	
CYP1503	A				1	
CYP1504	A				1	
CYP1506	A				5	
CYP151	A		1	2		

	C	2				
CYP1515	A	2				
CYP152	G			3		
	R			2		
	W			2		
	X			1		
	Y			1		
	B	4	3			
	C	3				
	E	2	1		2	
	P	1				
	AA	1				
	AB	2				
	AR		3			
	S		2			
	Z				1	
CYP153	A	44	5	16		
	C	2				
	D	14				
	E			3		
CYP155	J	3				
	K	1				
	H				1	
CYP159	B			4		
	A				1	
CYP1591	A	1				
CYP1597	A	1				
CYP163	K			1		
CYP167	B				11	

	A				1	
	C				1	
	D				1	
	E				2	
CYP168	A			18		
	B			1		
	C			1		
CYP1686	A		1			
CYP169	A		1	13		
CYP172	B			1		
	A					52
CYP173	A	45				
	B	8				
	C	3				
	G	1				
	H	1				
	J	2				
CYP1732	A	3				
CYP1733	A	1				
	B	1				
CYP1734	A	1				
CYP1735	A	1				
CYP1736	A	1				
CYP1737	A	2				
CYP1738	A	1				
CYP1739	A	2				
CYP1740	A	1				
CYP1741	A	1				
CYP1742	A	1				

CYP1743	A	1				
CYP1744	A	1				
CYP1745	A	1				
CYP1746	A	1				
CYP1747	A	1				
CYP1748	A	1				
CYP1749	A	1				
	B	1				
CYP1750	A	1				
CYP1751	A	1				
CYP1752	A	4				
CYP1753	A	1				
CYP1754	A	1				
CYP1755	A	1				
CYP177	E			2		
CYP1779	A			1		
CYP180	D	1				
CYP183	AG		1			
	AH				2	
	BE				1	
CYP1833	B				1	
CYP186	K	7				
CYP191	B	1				
CYP192	A	3				
CYP193	A	17				
CYP194	A	10				
	C		2			
CYP195	A	18	29			
	D	1				

	E	2				
	C		1			
CYP196	A	34				
	B	2				
	C	1				
CYP1962	A		1			
CYP197	R	2				
	AA				2	
	AB				2	
	F				4	
	G				1	
	H				1	
	J				1	
	K				1	
CYP198	A			3		
CYP1982	B		3			
CYP199	A	11	2			
	B	1				
	J	1				
	K	1				
	L	1				
	M	1				
	H		1			
	V		2			
CYP200	A	5				
	B	2				
	C	1				
CYP201	A	25				
	B	3				

	C	3				
	E		1			
CYP202	A	46				
	B	24				
CYP203	A	12	6			
	B	1				
CYP204	A	2				
CYP206	A	9				
	B	1				
	C	3				
	D	6				
CYP209	A				1	
CYP210	A				1	
	B				1	
CYP212	A		34			
	B		6			
	E		1			
CYP2140	A	1				
CYP2159	A		1			
CYP219	A	2				
CYP220	A		2			
CYP221	A			2		
CYP223	A	2				
	E	1				
CYP224	A	1				
CYP2242	A			1		
CYP225	A	7	1			
CYP226	A		18	5		
	C	1				

	D	1				
CYP229	A			7		
	D		1	7		
	E			4		
	B		4			
	F		39			
	G		1			
	L		4			
	M		4			
	N		1			
	P		1			
	H				1	
CYP2308	A		1			
CYP2334	A	2				
CYP234	A			1		
CYP2353	A		1			
	B		2			
CYP236	A			3		
CYP238	A			1		
CYP240	A		15			
CYP242	A				4	
	B				1	
	C				1	
CYP251	V				2	
CYP2528	A				1	
CYP253	D				5	
	G				6	
	H				2	
	J				1	

	K				1	
	L				1	
	M				1	
	S				1	
CYP259	A				1	
CYP260	A				1	
	B				1	
CYP261	D		1	1		
	A				1	
CYP262	B				2	
	A				1	
	C				1	
	D				1	
	F				1	
CYP2624	B				1	
CYP263	A				3	
CYP264	A				6	
	B				1	
	C				1	
	D				14	
	E				2	
	F				1	
	G				1	
	H				1	
	J				3	
	K				3	
	L				1	
CYP265	A				1	
CYP266	A		1		1	

	B				1	
CYP267	C		1			
	A				4	
CYP2724	A					1
CYP2730	A		1			
CYP2733	B		1			
CYP2742	A		1			
CYP2743	A		1			
CYP278	A	1				
	C	1				
CYP286	C	1				
CYP288	B	2				
CYP289	A	33	14	6		
	D			1		
	E		1			
	F		1			
CYP290	A	5				
	B	1				
CYP51	B			2	2	
292	564	873	603	277	333	53

Table S3. P450 identified and annotated in this study is presented as per their class. A header follows each P450 sequence consisting of protein ID, database, P450 name, species name, species code, and an abbreviation for the class, such as BP for *Betaproteobacteria*, DP for *Deltaproteobacteria*, and EP for *Epsilonproteobacteria*.

Betaproteobacteria

>VITFI_CDS3214|KEGG|CYP1098B3|[Vitreoscilla filiformis]vff|BP

MSRFCPYYPRPVSDKTPAWRMFFSKRRSWLDGLYERSYHMKMGVHFPVVDLYMVNDPAL
VREVMNADRFPKHEMLGEALRPLLGDSIFTTNGEVWQRQRDLMDPSFEAARVKLVFGRM
RDAAQAMVERLRQVPEGAVYDLEVEMTHVAADIILRTILSKSLDSEGARLIFDAFARYQD
MAPRLMLPAFFGLRWLRPWWQIRRSRAAEDIRKLIVQLIRPRYDAYQTALASGNTEGVE
TGGDILATLLRVRNAETGQGFTFDELVDQVAMLFLAGHETSASALSWSLHLLANAPDVQE
RLHQESLDKLGAVGTDPSGLKDLELSRNVFRESLRLFPVVGFLVRASETGCPLGDKTVKP
GGSMISPWLIQRHRQFWARPDEFDPDRYTHTEDTTPMTTRESLRKAYLPFGMGPRVCIG
AAFALQEATLILSTLARHFRFEPVPGHRPEPVGRLLTLRAENGIPLKVFARDR

>VITFI_CDS3233|KEGG|CYP203A11|[Vitreoscilla filiformis]vff|BP

MFSFDPYSPAVDADPFPPYQRLRDEFPCFWSPEAQMWVLSRYSDIVTALNDWQTYSSASGNLMTELPGRAGATLGSSDPPRHDRLRALVQHAFMKR
NLLALETPIREVARDVFGTLKGVSEFDFKEVSSKFTVKVLMAALGLPMGDEALVPEQEVDRNAVLMVQSDARTRTKGPEHIAAYNWMQDYAAKVIA
LRRAEPRDDLISHFAQAEIDGDKLDEREVLLTTTTLIMAGVESMGGFMMFAHNLATFADARRAVVANPALLPDAIEESLRFNTSAQRFRRRLMKD
VSLHGQTMKQGDVFCLAYGSGNRDERQFPNPEVYDITRKPRGHLGFGGGVHACLGTAIARMAVKIAFEEFHRVVPDYRRVADQLAWMPSSTFRSPL
VLLLKAQ

>ADP71_22770|KEGG|CYP151A16|[Vitreoscilla sp.]vit|BP

MDNSLIVEVPFLNFADPSFSIRSDAVKQAQDVSWYAKTPYGLAILRYDEVNALVRDQRLR
QGSYAWPKHCNATGAFADWWTRMLLSKEGPNHSRLRRLANPAFSPKLVRLMQPVFFQLAN
DLINQFIDQKCEFGVDFAAAPYATQVICLLGIPLSEAKRLAELAVDMGVALGVTYERDQ
NLVNGATDEMFEYCYEAVRRLKEEGLGDNFLSMLVKANENQADLSDEELFDMMLVLAIFGG
IDTTRNQLSLAMDTFVQNPAQWQILGEQPDLAANAVEEIMRFRPTVTWVTREALEDFEFQ

GVFIKQGTTVHLISQAADNDPRAFGDVAFDITQKRKAHFGFGAGAHHCIGHFIARGDMKE
ALALLAQRLHNVQYAAEPSYMPDSGNTGLNHLHIRFDAVKG

>CV_2656|KEGG|CYP212A1|[Chromobacterium violaceum]cvi|BP
MKTTPQSSPCPFHAVGRPPTPPRSSAGRWPPGPESGLTGWGLLKLMSRDLMGTLAGWQREFGDLVHVRTWPEHQVIVSDPQLARELLVNQADALQRW
ERALTVYRRVHGHSVLI AEGQVWREKRQALQPDFTRKSVQAFSPSIVEAARRAFEQWPARRAAWPIESELT SVTMEVILRMMFSSGVGSEAQQAE
AVHTLMVASTEELWRPASLPDWVPWQRKRRRARLLMNGLIERHLQARLAMPQDAWPEDLLSRLRLHLQPPQSWPLQAVRDECKTAFLAGHETVAT
SLTWWAWCMASHPEIQERAREEALAALS GGGQADPAALQYVSQTLL ETMRLYPVPLLSRRALKPVT LGDWTFPAKTVMVPMQLMQHDERWFPE
PRSYRPERFGPDAARPQQGAYLPFGGGPRVCLGQHLAMAEMALVAAQLLLRYRLSAPEGAEPPRPVFHVSQRPSQPLTLGIARI

>BKX93_03785|KEGG|CYP212A8|[Chromobacterium vaccinii]cvc|BP
MKTTPQSSPCPFHAGGHPPASPKPSSGSWPPGPEAGLTGWGLLTQLSRDLMGTLAGWQREFGDLVHVRTWPEHQVIVSDPHLARELLVNQADSLRRW
ERALS VYGRVHGHSVLI AEGEAWREKRQALQPDFTRKSVQAFSPSIEAAARRAFEQWPDRRDAWPIESELT SVTMEVILRMMFSSGVGSEAREAE
AVHTLMVASTEELWRPASLPDWVPWQRKRRRARLLMNGLIERHLQARLRLPADAWPEDLLSRLRLHLQPPKSWPLQAVRDECKTAFLAGHETVAA
SLSWWAWCMASHPDIQEKARAEALAAWPGEESADADLSALQYVSQTLL ETMRLHPAVPLLSRRRAVKPVT LGDWTFPAKTVMVPMQLMQHDERWF
PEPLSYRPERFDPAARPQQGAYLPFGGGPRVCLGQHLAVAEMTLVAAQLLLRYRLSAPAGMAPRAVFHVSQRPSAPLALDIARI

>DK842_20225|KEGG|CYP212A20|[Chromobacterium phragmitis]chri|BP

MKTTSSSSCPFRPGQPASQPNPQAGAWPPGPKPGLMGWRLLSRMSRDLMGTLADWQREFG
DLVHVRTWPEHQIIVCHPQWARELLVSQADALQRWERALFVYGRVHGHSVLI AEGEAWHQ
KRQALQPDFTRKSVQAFSPSII DAGKQAFKWPERRDDAWPIERELTSLTMEVILRMMFSS
GVGEEAQQAE DAVHTLMVASTDELWRPFSLPDWMPWQRKRRRARLVMGELIERHLQARLA
VPPDAWPEDLLSRLRLHLHLEQPEEWPLQAVRDECKTAFLAGHETIAASLGWWSWSMASHP
DIQQRAREEAI AAWPGDEHGEMDLSALQFVSQTLL ESMRLYPVPLLSRRRAIKPVAIGD
WTFPARTVMVPMQLMQHDERWFPEPRRYRPERFAPEAGRPQLGSYLPFGGGPRVCLGQH
LAMAEMTLVAAQLLRRFRLSIPAGAQP RPVPVFHVSQRPKPLTLAIARL

>DK842_05860|KEGG|CYP261D1|[Chromobacterium phragmitis]chri|BP

MFATRGPARGYMDGLICGRTDRTREFFRFFIVWKEVLTEKDAWSETEAVAHRLSTRSETKAIVLLDQMQRNNMKRFNDLPAPPSLPFLGNAHQLDKK
GLHLTLEKWAREYRQEPFRFQLGPLKFIVLSRPEDVRCVLKERPTQFRMRREMSKIFDEVGFSSVFTKEGEAWRRQRRMMQPAFTKHTLVFPVQI
ARKALQLRDLRQKSNGEPLAIRHDFRRFTVDVGCLLVFGVDLNNLADDDNHVLHTFHNVVHTMNKRLRSLVPYWRLVKMPVDRRFDGSIQELRDMV
TGIAHDVRRARMKRGEDLGEHCILHTMLAASEGDDATLTDELAFANMMILVLGSEGSTAAMLSWICFYLSQDEVLQQRLREELCDFDLETVDYDAIE
SLPLTEAVIEETFIRIRSTVPALVLEALEDTEVVELHVDRGTRVFALTRVNGIMDTARDMVFDPRRWLNEDGSLASLKDARQTQFPFGYGPRVCPGA
PLSNIELKLAIAMLVKHFKLEIVDGEAVEEVFMASAVPDNFRVKAIPLPKRPRESGSLVFGREEEREDARSPA

>DK843_03200|KEGG|CYP212A20|[Chromobacterium phragmitis]chrB|BP
MKTTSSSCPFRPGQPASQPNPQAGAWPPGPKPGLMGWRLLSRMSRDLMGTLADWQREFGDLVHVRTWPEHQIIVCHPQWARELLVSQADALQWE
RALFVYGRVHGHSVLIAEGEAWHQKRQALQPDFTRKSVQAFSPSIIIDAGKQAFKWPERRDDAWPIERELTSLTMEVILRMMFSSGVGEEAQQAEDA
VHTLMVASTDELWRPFSLPDWMPWQRKRRLRRLVMGELIERHLQACLAVPPDAWPEDLLSRLRLHLEQPEEWPLQAVRDECKTAFLAGHETIAAS
LGWWSWSMASHPDIQQRAREEEAIAAWPGDEHGEMDLSALQFVSQTLLESMLYPVAVPLLSRRAIKPVAIGDWTFFPARTVFMVPMQLMQHDERWFP
EPRRYRPERFAPEAGRPOQGSYLPFGGGPRVCLGQHLAMAEMTLVAAQLLRRFRLSIPAGAQPFRPVFHVSRQRPDKPLALAIARL

>D1345_00555|KEGG|CYP2353B2|[Chromobacterium rhizoryzae]crz|BP
MSAWPLDPLAAVVHAHPYPYRDLAQRQPLYFDAGLGLWVAAGHAAVQAALASATCRVRPVEQPAPSQLDGGLARTFCLWARMSEAPRHPALKAA
LNRALATVAGAEAGGLAESLARDWLAREPLNGLLDRMAQGLPVLTLAGLLGLPMEDAPGLVAEAAAGLARALAADADAEALESGERALEALQARVA
KALPRSGLLAVLRREWMEEEEALTANVIGLLFQSLDAGAGLFAAAVWHQAQGRPLAAGAAADWAWLALHDPVLHNTRRFVARDWHHGGQTVPAGA
SLLVVLAAAALDPAGPGEGLMFGAGRHACPGQALALEIARGGLAALAAMRPDWKTLTAAARFRRLPNARVRIYDEEGSAE

>FYK34_06710|KEGG|CYP212A21|[Chromobacterium paludis]chrM|BP
MKTPTSSCPLHADTKASTTANPGTSAWPPGPKAGLTGLRLVARMSRDLPGALAEWQSEFGDLVHVRTWPEHQVAVVSEPRLVRELLVSQAGALVRW
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AAHALMVASNAEFYQPFSLPDWMPWQRGRQARQVLERLIEDHLQTRLRLAREAWPEDLLSRLRLHLLQPPQAWPLQAVRDECKTTFLAGHETVAA
TLTWWAWCMASHPEAQAAARAEARQFAPEQAMGQAGAPWRYLVQTLQETLRLHPAAPILISRRALQPVTLGDWRLPAGTMYLVPVLLMHHDARWFP
QPRSRFRPERFAPEAARPLGAYLPFGSGPRVCLGQHLAMSEMTLIAAQLLRRYELSVPEGQAAPEPAFYITRRPREPLRLRIRRR

>FYK34_16325|KEGG|CYP2353A8|[Chromobacterium paludis]chrM|BP
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AASLAAQEDERAQRRLARDLARGFLAGAAPD GARLDALVDFLPAATLASLLGWPERSLLGWPERSLGLSGQVAAWCRAVAADAGAAEREAGEAACL

ALHAELAALADAGWLLARWRQEFGEFGEDALRANLLGVLFQSRDAGAGLLAAGISWRCEGPWDWRAAAEWRRRLRADPVLHHTRRFVAEDATLAGQP
LKAGDQVLVLLAAAARDPAGPGESMDFGRGRHGCPGERLALAIARGALAALEEIGPDWRALGGGLVFRGPPNVRMRRFGAGDGR

>CH06BL_01070|KEGG|CYP2353B5|[Chromobacterium haemolyticum] chae|BP

MSAWPLDPLAAVVHAHPYPYRDLAQRRPLYFDAGLGLWVAAGHAAAQAVLASAACRVRP
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LAREPLSGLLDRMAQGLPVLTLAGLLGLEVEDEPALVAEVAALAQALAADADAETLARG
EQALAAALQVRVAEALPRSDGLLAE LRREWTVEEAALTANVIGLLFQSLDAGAGLFAAAVW
HQAQGRPLAAGAAADWAWLALHDPVLHNTRRFVARDWHHGGQTVPAGASLLVVLAAAALD
PAGPGEGLMFGAGRHACPGQALALEIARGGLAALAAMRPDWKTLTAAARFRRLPNARVRI
YDEEGSAE

>C1H71_18930|KEGG|CYP107NX1|[Iodobacter fluviatilis] ifl|BP

MITTKPLSFYDPAFYQNPYASFQRLMEKGEIHYVKFPPSGVCGWLVTGYDAAMKTLTHPNI
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IALIAQRLLLEPLQRAGECDLIADFASQLPLLVSEVIGLSDKHRIQFKPVWCKVVQPVGP
NDVGRAAYIGLLTELQSYIDTVIVESRGGDSDR LIVQLIAAYDGKKISRDELTSVLFQLL
VAGQEPMTNQIGNAMLALLQHPEQLKQIREDSTRIDRAMTELLRYDGAFALSTWRFFTET
TQWLGATVFAGDSVIVGLNAAHDSAQFGCPHKLDFAREPNKPLSFGYDHHYCPASALAR
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>NH8B_0727|KEGG|CYP289A13|[Pseudogulbenkiania sp.] pse|BP

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ALEFDGYIRAQLDARRAAGDQAPDDVTRRLGETLQGRTLSDAEIVCIVRNWTVGELSTI

SSCVGILTQYLAERAELQQRLRQQPELLPAAIDEILRIHAPLIANRRIATR DVEIGGCQL
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ALLSQTERIGTVAGKTPVRASYPASGYASLPLWIERAAGPAPQA

>DLM_1347|KEGG|CYP1200A5|[Aquitalea magnusonii]amah|BP
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LRKVVAKDFSAAGVATLRDVTVIQATHARLDALSSQTGVIDLLDLVLECI PAEVDCHLLGI
PLADRSYYRPLTHTVQIADPRDVPPELLRQFWLVYDY
LMDLVTGRRTTAPHGLIRRFVAARHESVPLNDEELVGILLGILIGGDQNILTVLCKV
VYTLAAPALWQSLRAQPATLPAMVEELLRLIPLGTTS
TFPRIASEGVHGSFGFIPAGSVVYADVFAANRDPVFAADPLRIDPQRNASKHLQFGYGM
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>RCFBP_20388|KEGG|CYP1179B1|[Ralstonia solanacearum]rsc|BP

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GRIASILAPRIEALKGRTEFDFVEALAHVPVPAEILAAMLGLDEIDIVDFLRWSDAIADFM
QDFVISPVPNRQIARATAEQ LLEMKAALREAI VRRRQPKEDLLTDLACATGDDGSTITE
EELMLQLIHLIFGGHKIPQFVLANTLHLLFKNPQYMLHGEEATFDKVS KLVD ESMRVESP
IQFITRHAVDDFELNGQRIKKGDSIYLM LGSANRDPEVYSDPDTFQPYAPKRKGIHYGTG
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>RPSI07_mp0406|KEGG|CYP1464A2|[Ralstonia solanacearum]rsl|BP
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VPLLGHVHRI SQDALGELRKA EAACGPMFWTYFGARLPVLQILDEEGLAILQNKYTDNSF
LREQMPVITGAAMNAFDGPRHRNARHASSAAFSP TGLTRAQVGQFVVESIEQRLKRWTRE
SKLAI F PETKDIALEVVFRI LGIKTHELAQWRRQYEEFFLGMIPLKINLPGFPAWRCKRKA
RGWLEARVAQIVATARADDDHDSL VGAMIFGRDDNGNGMSEVELVHNILGLGFAGSETTA
SVMAWSALMLAQHPDVWRQLCRQVAGMDSVPSTQEELVRQAPLAE AIFRETMRLYPPAPF
EMRKVHTEFEMMGHKIPAGVMVGVSLLHVS RNPERYPDPDSWKPERWLGVDRALTPVETC
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DMTGR

>RPSI07_mp0607|KEGG|CYP133B5|[*Ralstonia solanacearum*]rsl|BP

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TAHQLIDGFEQKQSADLVAEFAFPLPVRIICRMLDVIDDAPALGVAASKLAKVFD PAMP
SADELVKTSAAEYELAQYFTKVIARRAQPGTDLISMLLRVEEDGQKLTHDEIVSNVILL
FIAGHETTSNMIGNALIALHRNPRQLDLLKRDPSRMPNAVLECLRYDGSVQVTIRAAMED
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>RPSI07_mp1116|KEGG|CYP229F11|[*Ralstonia solanacearum*]rsl|BP

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YMALPDATALGPALADAMHLRIPLATMTHALLGDDADAAACQORDIATYLAALSPGAPPAA
IHHAQTAVARLSERVAAAPLAHADE TIVANLAGLLAQTHDACAGLLGNAIVTLARQPGL
AAHLRSHPHAIDPFLYEVLRLDAPVQNTRRFVSRD T T LCGESLRAGDRILVLLAAANVDT
AANPDPLRFDLARVRRRVWTFGAGAHRCPAESLAVAVARETVQHLLSLPGIARWLAGAGE
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>RSPO_c02265|KEGG|CYP1179B1|[*Ralstonia solanacearum*]rsn|BP

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APIHGRLRTFMSRTFDRGYIERVRGRIASILAPRIEALKGRTEFDFVEALAHVP AEILAAMLGLDEIDIVDFLRWSDAIADFMQDFVISPVPNRQ
IAQATAEQ LLEMKAALREAI AVRRLPKEDLLTDLACATGDDGSTITEEELMLQLIHLIFGGHKIPQFVLANTLHLLFKNPQYMLHGEEATFDKVS
KLVDESMRVESPIQFITRHA VDDFELNGQTIKKGDSIYLM LGSANRDPEVYSDPDTFQPYAPKRKGIHYGTGPHVCIG AALAGVTIAEILCSFLQA
TRSVEALYDLDP EWTRNDTFHGVARMPVKA EYR

>RSPO_m00920|KEGG|CYP229F10|[Ralstonia solanacearum]rsn|BP
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PAGVFFGRLVRQIDGPDHGARRAAVLTALGRLDVSSVSAHAHRLAKMALPDATALGPALADAMHLRIPLATLAHALLGDDADAAACRQDIAAYLAA
LSPEAPAAAIHRADTAVARLSERFATAPLAAHADEALVANLAGLLAQTHDACAGLLGNAVVALARRPGLAGHLRTHPHAIDPFLYEVLRLDAPVFN
TRRFVSRDITLTCGESLRAGDRILVLLAAANVDASANPDPLRFDLARAPRRVWTFGAGAHRCPEGALAVAIARETVRHLLNLPGIDRWLAGVAMVRY
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>RSPO_m01039|KEGG|CYP133B5|[Ralstonia solanacearum]rsn|BP
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YFTKVI EARRAQSGTDLISMLLRVEEDGHKLTHDEIVSNVILLFMAGHETTSNMIGNALIALHRNPQQDLLRRDPSRMPNAVLECLRYDGSVQVT
IRAAMEDVEVEGEVVPRTTVFLMLGAANRDPDQFTEPDRLDIGRQDGRQLQTFGAGIHHCLGYRLALIELETALSALFTRLPLRLTNLDQLGWNQ
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>RSPO_m01214|KEGG|CYP1464A2|[Ralstonia solanacearum]rsn|BP
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FLREQMPVITGEAMNAFDGPRHRNARHASSAAFSPTGLTRAQVGQFVVDTIEQRLKRWTR
ESKLAI F PETKEIALEVVFRILGIETHELAQWRHQYEEFFLGMIPLKIDLPGFPAWRCK
ARRWLEARVARIVATARANGDHDLSLVGAMIFGRDDNGNGMSEVELVHNILGLGFAGSETT
ASVMAWSALMLSQHPEIWRQLCQQVAGLHSMPLTHEELVSQVPLAEAI FRETMRLYPPAP
FEMRKVHTEFDMMGHRVPAGAMVGVSLHVS RNPERYPDPDNWRPERWLGIDRALTPVET
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LDLTGR

>CMR15_20043|KEGG|CYP212A14|[Ralstonia solanacearum]rsm|BP
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QTRLAQPHVWPDDLTRLLQLHQEEASAWPLHAVRDECMTAFLAGHETTAAALTWWAWCMACNPAAQTARKEVQAVLQGRTPDADMLASLPYLT
QTIKETLRLYPAAVPLISRATRISALGPWQFPARTMFLVPVQLMHHDPRWFPQPLSFRPERFAQDAPEIPRGAYAPFGAGPRVCLGQHLAMSEMT
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>CMR15_mp10680|KEGG|CYP133B5|[Ralstonia solanacearum]rsm|BP

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IDAF AQKPSADLVAEFAFPLPVRIICQMMDL DIDDAMALGVGVSKLAKVFD PAPMSADEL
VETSAAYEELAQYFTKVIARRAQPGTDLISMLMRAEENGETLTHDEIVSNVILLFIAGH
ETTSNMIGNSLIALHRNPQQLDLLKRDP SRMPNAVMECLRYDGSVQVTIRAAMEDVEVEG
EVLPRGTTVFLMLGAANRDPAQFTDPDQLDIGRQQGRLQTFGAGIHHCLGYRLALIELEA
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>CMR15_mp10892|KEGG|CYP1179B1|[Ralstonia solanacearum]rsm|BP

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LAPRIEALKGREEFDFVETLAHPVPAEILAAMLGLDEIEIVDFLRWSDAIADFMQDFVIS
PVPNRVIAQATAKQLLEMKAALREAI AVRRRQP KEDLLTDLACAAGDGGDAITEEELMLQ
LIHILIFGGHKIPQFVLANTLHLLFKNPQYLVHGEEATFDKISKIVDESMRVESPIQFITR
HAVDDFMLHGERIKKQSIYLM LGSANRDAEVFGDPDTFQPDAPKRKGIHYGTGPHVCIG
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>F504_4509|KEGG|CYP133B5|[Ralstonia solanacearum]rse|BP

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IDDFEQKPSADLVAEFAFPLPVRIICQMMDL DIDDAMALGVGVSKLAKVFD PAPMSADAL
VETSAAYEELAQYFTKVIARRAQPGTDLISMLMRAEENGETLTHDEIVSNVILLFIAGH
ETTSNMIGNALIALHRNPQQLDLLKREPSRMPNAVLECLRYDGSVQVTIRAALEDVEVEG
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>RSUY_15200|KEGG|CYP1179B1|[Ralstonia solanacearum]rsy|BP

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GRIASILAPRIEALKGRTEFDFVEALAHVPVPAEILAAMLGLDEIDIVDFLRWSDAIADFM
QDFVISPVNRQIARATAAQ LLEMKAALREAIAVRRRQPKEDLLTDLACATGDDGSTITE
EELMLQLIHLIFGGHKIPQFVLANTLHLLFKNPQYMLHGEEATFDKVS KLVD ESMRVESP
IQFITRHAVDDFELNGQTIKKGDSIYLMLGSANRDPEVYSDPDTFQPYAPKRKGIHYGTG
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>RSUY_42850|KEGG|CYP229F10|[Ralstonia solanacearum]rsy|BP

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KMALPDATAALDPALADAMHLRIPLETLAHALLGDDADAAACRQDIAAYLAALSPDAPAGA
IHRADTAVACL SARFATAPLAAHADEALVANLAGLLVQTHDACAGLLGNVVALARRPGL
AGHLHTRPHAI DPFLYEVLRLDAPVQNTRRFVSRDTALCGESLRAGDRILVLLAAANVDA
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>Rpic_4258|KEGG|CYP102E4|[Ralstonia pickettii]rpi|BP

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AFSQRAMKGYFDVMLDVANALADKWARQGP DADIPVADDMTRLTLDTISLAGFGYRFDSF
NTPELHPFLAAMVGVLSEAMGKLTRLPLKDRFMREHHRFEHDVAAMHQLVDEVIRARRQ
AKDGGIGASDLLGLMLNARDPLSDQPLDDTNIRFQVITFLIAGHETTSGLLTFALYMLLR
HPAVLAQAYAEVDRVLPGDTV PQYAHLAQLDVIERVLKETLRLWPTAPSGVAPYEDTRI
GGRYAIRKDQRVVTVLLALHRDPAVWDRPEAFDIDRFLPENEAKLHPHAYKPFNGERAC
IGRQFALTEAKLALAVILQRFALSDPYDYGFHIKETLTLKPDGFRLRARLRHARERLSVA
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IADALPQRGTLVVVAATYNGRAPDSARTLEARLDAADALTRQATGLRYAVLGCNSQWPA
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VELQDTATVRDITALHAATRCPFTRGQLAVWLEGDDAAERFDQDIQAPHVSVLDDLIRLP
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TSLLCFGCRHPEHDFLYRDTLRAWEDAGLVRVFPAYSCVAEHPHRFVQHALWDAREAVWA
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>Rpic_4262|KEGG|CYP229F16|[Ralstonia pickettii]rpi|BP
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ARTALPDAASLDAALDADAHFRVPLATMAQTLLGDHADAPACQADIAAYLAALGPGASAG
VVAQADAAVGRLLQQRFADSPFAGGDDSDADIANLAALLAQTYDACAGLLGNCIVALSRH
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>Rpic12D_4368|KEGG|CYP102E4|[Ralstonia pickettii]rpf|BP
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VWDRPEAFDIDRFLPENEAKLHPHAYKPFNGERACIGRQFALTEAKLALAVILQRFALSDPYDYGFHIKETLTLKPDGFRRLRARLRHARERLSVA
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DALTRQATGLRYAVLGCNSQWPAFQAFPKRVEAMLAAAGAHAIVPRGEADGNAGFDDAVIDAWTRSLWSALGARQTHADGPSVRVDYVAPDALRAA
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TSLLCFGCRHPEHDFLYRDTLRAWEDAGLVRVFPAYSCVAEHPHRFVQHALWDAREAVWAAFDAGATLYVCGDGRAMAPAVRDTLIRMHQARYGSD
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>Rpic12D_4372|KEGG|CYP229F16|[*Ralstonia pickettii*]rpf|BP
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QQRFADSPFAGGDDSDADIANLAALLAQTYDACAGLLGN CIVALS RHAGLTARLRAQPLAIEPFVREVLRRDAPVQNTRRFVAHDIALLGQPLRA
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>N234_33520|KEGG|CYP229F9|[*Ralstonia pickettii*]rpj|BP
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AAQWLGAWLADTTPGDGPLPALHQAHAAGIDAQVAANTIGLLVQACEATAALAGNTLLRLGRGASDLALQAVVARVAQDDPPVQNTRRFLAADA
QLCGHAVKAGDAVLVLLAAASCSGLAGGARPWTFGHGRHACPGERLAQALAAATVAALLER GADPAALAQAFRYRPSLNARMPHFL

>N234_37805|KEGG|CYP108S1|[*Ralstonia pickettii*]rpj|BP
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NIVKALVHVDGDEHKGLRALTQSWFMPNSILK LDERIRGLARQIVDKLQQSDGNTIDFAKDIALHYPLHVIMDILGVPPEDEPRMLLLTQELFGGE
DPELKRAKQEASANDGALAKNLM AVVADFRDYFENVTAERRV NPNRNDVATLLANAVVNGEPISEVSRLGYVI IATAGHDTTSSSSAVAMWALSQY
PELLPRLQADSSLI PQFIDEAVRIASPV RHFMRTATADTEIRGRTIRKGDWLM L CYGSANRDEEVFDRPFDFS IDRKPNRH LAFGFGAHVCLGQHL
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>TK49_21945|KEGG|CYP102E4|[*Ralstonia mannitolilytica*]rmn|BP
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RAGAGDGLFTAHHDEPNWGKAHRILLPAFSQRAMKGYFDMLEVANALADKWARQGPEADIAVADDMTRLTLDTISLAGFGYRFDSFNTPELHPFL
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>BTH_II0026|KEGG|CYP1488A2|[Burkholderia thailandensis]bte|BP

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>BTH_II0434|KEGG|CYP212A12|[Burkholderia thailandensis]bte|BP

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>BTH_II0725|KEGG|CYP116B128|[Burkholderia thailandensis]bte|BP

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LEL

>BTH_II2347|KEGG|CYP1013A3|[Burkholderia thailandensis]bte|BP

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>BTQ_3316|KEGG|CYP1488A2|[Burkholderia thailandensis]btq|BP

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>BTQ_3727|KEGG|CYP212A12|[Burkholderia thailandensis]btq|BP

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>BTQ_4014|KEGG|CYP116B128|[Burkholderia thailandensis]btq|BP

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LEL

>BTQ_5633|KEGG|CYP1013A3|[Burkholderia thailandensis]btq|BP

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>BTJ_4293|KEGG|CYP1013A3|[Burkholderia thailandensis]btj|BP

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>BTJ_4348|KEGG|CYP1488A2|[Burkholderia thailandensis]btj|BP

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>BTJ_4761|KEGG|CYP212A12|[Burkholderia thailandensis]btj|BP

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>BTJ_5045|KEGG|CYP116B128|[Burkholderia thailandensis]btj|BP

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LEL

>BTL_3516|KEGG|CYP116B128|[Burkholderia thailandensis]btz|BP

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LEL

>BTL_5148|KEGG|CYP1488A2|[Burkholderia thailandensis]btz|BP

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>BTL_5546|KEGG|CYP212A12|[Burkholderia thailandensis]btz|BP

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>BTI_4127|KEGG|CYP116B103|[Burkholderia thailandensis]btd|BP

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>BTI_4272|KEGG|CYP1486A1|[Burkholderia thailandensis]btd|BP

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>BTI_4729|KEGG|CYP1488A2|[Burkholderia thailandensis]btd|BP

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>BTHA_4656|KEGG|CYP212A12|[Burkholderia thailandensis]btv|BP

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>BTHA_5068|KEGG|CYP1488A2|[Burkholderia thailandensis]btv|BP

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>BTHA_5121|KEGG|CYP1013A3|[Burkholderia thailandensis]btv|BP

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>BTN_4756|KEGG|CYP1013A3|[Burkholderia thailandensis]bthe|BP

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>BTN_5218|KEGG|CYP212A12|[Burkholderia thailandensis]bthe|BP

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>BTRA_5023|KEGG|CYP1013A3|[Burkholderia thailandensis]bthm|BP

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>BTRA_5488|KEGG|CYP212A12|[Burkholderia thailandensis]bthm|BP

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>DR62_5346|KEGG|CYP212A12|[Burkholderia thailandensis]btha|BP

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>DR62_5680|KEGG|CYP116B128|[Burkholderia thailandensis]btha|BP

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>DR62_4913|KEGG|CYP1488A2|[Burkholderia thailandensis]btha|BP

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>DR62_07990|KEGG|CYP1013A3|[Burkholderia thailandensis]btha|BP

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>BG87_5559|KEGG|CYP212A12|[Burkholderia thailandensis]bth1|BP

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>BG90_1030|KEGG|CYP266A2|[Burkholderia oklahomensis]boc|BP

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>BG90_4037|KEGG|CYP1013A3|[Burkholderia oklahomensis]boc|BP

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>Bphy_5447|KEGG|CYP133C2|[Paraburkholderia phymatum]bph|BP

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>Bphy_6307|KEGG|CYP107DQ1|[Paraburkholderia phymatum]bph|BP

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>Bphy_7766|KEGG|CYP108S3|[Paraburkholderia phymatum]bph|BP

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>BC1002_1423|KEGG|CYP195A3|[Paraburkholderia atlantica]bge|BP

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>BC1002_6864|KEGG|CYP108S5|[Paraburkholderia atlantica]bge|BP

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>BUPH_02254|KEGG|CYP195A3|[Paraburkholderia phenoliruptrix]bpx|BP

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>BUPH_00139|KEGG|CYP1485A2|[Paraburkholderia phenoliruptrix]bpx|BP

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>BUPH_08319|KEGG|CYP108S4|[Paraburkholderia phenoliruptrix]bpx|BP

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>Bphyt_1856|KEGG|CYP195A3|[Paraburkholderia phytofirmans]bpy|BP

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>Bphyt_2741|KEGG|CYP1258B1|[Paraburkholderia phytofirmans]bpy|BP

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>OI25_3427|KEGG|CYP195A3|[Paraburkholderia fungorum]bfn|BP

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>OI25_5996|KEGG|CYP1155A1|[Paraburkholderia fungorum]bfn|BP

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>K788_0007982|KEGG|CYP195A6|[Paraburkholderia caribensis]bcai|BP

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>K788_0004290|KEGG|CYP1049A4|[Paraburkholderia caribensis]bcai|BP

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>BTO02_24655|KEGG|CYP1220A18|[Paraburkholderia sp.]para|BP

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>BTO02_25280|KEGG|CYP1220A19|[Paraburkholderia sp.]para|BP

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>CJU94_29980|KEGG|CYP1220A16|[Paraburkholderia aromaticivorans]parb|BP

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>C2L64_08965|KEGG|CYP195A6|[Paraburkholderia hospita]phs|BP

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>C2L64_25710|KEGG|CYP133C2|[Paraburkholderia hospita]phs|BP

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>C2L64_30050|KEGG|CYP105T10|[Paraburkholderia hospita]phs|BP

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>C2L64_30060|KEGG|CYP105T9|[Paraburkholderia hospita]phs|BP

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>C2L64_30120|KEGG|CYP105CV2|[Paraburkholderia hospita]phs|BP

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>C2L64_30215|KEGG|CYP105T2|[Paraburkholderia hospita]phs|BP

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>C2L64_49995|KEGG|CYP1049A4|[Paraburkholderia hospita]phs|BP

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>C2L65_08430|KEGG|CYP195A6|[Paraburkholderia terrae]pter|BP

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>C2L65_22700|KEGG|CYP133C2|[Paraburkholderia terrae]pter|BP

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>C2L65_33045|KEGG|CYP105T7|[Paraburkholderia terrae]pter|BP

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>C2L65_33140|KEGG|CYP105CV1|[Paraburkholderia terrae]pter|BP

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>C2L65_33200|KEGG|CYP105T8|[Paraburkholderia terrae]pter|BP

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>C2L65_33210|KEGG|CYP105T11|[Paraburkholderia terrae]pter|BP

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>C2L65_38220|KEGG|CYP1049A4|[Paraburkholderia terrae]pter|BP

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>CUJ87_03085|KEGG|CYP1220A2|[Paraburkholderia caledonica]pcj|BP

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>CUJ87_07550|KEGG|CYP195A3|[Paraburkholderia caledonica]pcj|BP

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>CUJ87_11010|KEGG|CYP133C8|[Paraburkholderia caledonica]pcj|BP

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>CUJ87_32005|KEGG|CYP1097A18|[Paraburkholderia caledonica]pcj|BP

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>CUJ90_07885|KEGG|CYP195A3|[Paraburkholderia terricola]pts|BP
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>CUJ90_19250|KEGG|CYP1220A16|[Paraburkholderia terricola]pts|BP

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>CUJ90_31030|KEGG|CYP1485A6|[Paraburkholderia terricola]pts|BP

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>DSC91_002542|KEGG|CYP105B78|[Paraburkholderia caffeinilytica]pcaf|BP

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>DSC91_007111|KEGG|CYP195A3|[Paraburkholderia caffeinilytica]pcaf|BP

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>BB3721|KEGG|CYP240A1|[Bordetella bronchiseptica]bbr|BP

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>BN115_3393|KEGG|CYP240A1|[Bordetella bronchiseptica]bbm|BP

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>BBS798_3501|KEGG|CYP240A1|[Bordetella bronchiseptica]bbx|BP

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>Bpet1785|KEGG|CYP240A4|[Bordetella petrii]bpt|BP

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>ACR54_04430|KEGG|CYP199H1|[Bordetella hinzii]bhz|BP

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>SAMEA390648700219|KEGG|CYP212A17|[Bordetella trematum]btrm|BP

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>CBF45_10850|KEGG|CYP1232F2|[Bordetella sp.]boj|BP

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>AXYL_01591|KEGG|CYP240A3|[Achromobacter xylosoxidans]axy|BP

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>AXYL_03286|KEGG|CYP116B81|[Achromobacter xylosoxidans]axy|BP

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VLEL

>AXYL_03542|KEGG|CYP1110A2|[Achromobacter xylosoxidans]axy|BP

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>AXYL_04967|KEGG|CYP108S2|[Achromobacter xylosoxidans]axy|BP

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>NH44784_004871|KEGG|CYP240A2|[Achromobacter xylosoxidans]axo|BP

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>AX27061_1499|KEGG|CYP240A2|[Achromobacter xylosoxidans]axn|BP

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>C2U31_19705|KEGG|CYP1199C1|[Achromobacter sp.]achr|BP

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>C2U31_30205|KEGG|CYP1110A3|[Achromobacter sp.]achr|BP

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>C2U31_20070|KEGG|CYP2308A1|[Achromobacter sp.]achr|BP

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>DVB37_24515|KEGG|CYP116B73|[Achromobacter sp.]achb|BP

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>HLG70_25295|KEGG|CYP116B298|[Achromobacter deleyi]ady|BP

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LEL

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>PT7_2686|KEGG|CYP1183A1|[Pusillimonas sp.]put|BP

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>CKA81_16930|KEGG|CYP1157D3|[Pusillimonas thiosulfatoxidans]pus|BP

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>G9Q38_04420|KEGG|CYP199V2|[Pusillimonas sp.]pud|BP

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>TKWG_13525|KEGG|CYP116B8|[Advenella kashmirensis]aka|BP

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>BN940_07996|KEGG|CYP289A15|[Castellaniella defragrans]cdn|BP

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>D3M96_05490|KEGG|CYP1319A1|[Alcaligenes aquatilis]aaqu|BP

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>FE795_04400|KEGG|CYP1319A1|CYP1319A1|[Alcaligenes ammonioxydans]aamm|BP

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>I6G29_02045|KEGG|CYP289A28|[Oligella ureolytica]oue|BP

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>EGT29_25055|KEGG|CYP116B100|[Pigmentiphaga sp.]pig|BP

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>LSG25_13615|KEGG|CYP116B301|[Paralcaligenes sp.]park|BP

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>LSG25_18200|KEGG|CYP107DG11|[Paralcaligenes sp.]park|BP

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>Rfer_0298|KEGG|CYP203A5|[Rhodoferax ferrireducens]rfr|BP

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>EXZ61_03070|KEGG|CYP212B5|[Rhodofera sediminis]rhg|BP

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>Bpro_2807|KEGG|CYP1180A1|[Polaromonas sp.]pol|BP

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>DT070_17790|KEGG|CYP229M1|[Polaromonas sp.]pos|BP

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>DT070_20855|KEGG|CYP195A26|[Polaromonas sp.]pos|BP

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>Dtpsy_2579|KEGG|CYP289A19|[Acidovorax ebreus]dia|BP

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>0987_16625|KEGG|CYP1098B6|[Comamonas testosterone]ctes|BP

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>0987_22120|KEGG|CYP226A26|[Comamonas testosterone]ctes|BP

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>0987_26720|KEGG|CYP116B146|[Comamonas testosterone]ctes|BP

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>CCO03_00415|KEGG|CYP108S8|[Comamonas serinivorans]cser|BP

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>FOZ74_03160|KEGG|CYP289F1|[Comamonas sp.]cof|BP

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>LAD35_12920|KEGG|CYP1982B1|[Comamonas odontotermitis]codo|BP

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>Alide2_1311|KEGG|CYP289A19|[Alicyclophilus denitrificans]adk|BP

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>L63ED372_01421|KEGG|CYP195A31|[Limnohabitans sp.]lih|BP

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>L63ED372_01617|KEGG|CYP225A10|[Limnohabitans sp.]lih|BP

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>E5678_02035|KEGG|CYP195A29|[Hydrogenophaga sp.]hyc|BP

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>F9K07_04220|KEGG|CYP105T5|[Hydrogenophaga sp.]hyn|BP

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>F9K07_04270|KEGG|CYP105T6|[Hydrogenophaga sp.]hyn|BP

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>F9K07_19630|KEGG|CYP195A30|[Hydrogenophaga sp.]hyn|BP

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>SRAA_1070|KEGG|CYP203A12|[Serpentinomonas raichei]cbaa|BP

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>CPter91_0565|KEGG|CYP1199A10|[Collimonas pratensis]cpra|BP

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>CPter91_5329|KEGG|CYP107DG6|[Collimonas pratensis]cpra|BP

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>C9I28_12805|KEGG|CYP1097A16|[Massilia armeniaca]masz|BP

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>DPH57_02135|KEGG|CYP1355B1|[Massilia sp.]masy|BP

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>DPH57_08810|KEGG|CYP1097A16|[Massilia sp.]masy|BP

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>FCL38_05710|KEGG|CYP226A25|[Massilia umbonata]mum|BP

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>EJG51_012640|KEGG|CYP229M3|[Undibacterium piscinae]upi|BP

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PGTLERIKADRSLVPKLIDETIRYEPLATFKVREVAKDVEFYGVKIPKGSFVQCLVVSAN
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>CEW83_02430|KEGG|CYP226A24|[Azoarcus communis]acom|BP

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VIWD

>CDA09_09135|KEGG|CYP108Z1|[Azoarcus sp.]azd|BP

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>CDA09_13845|KEGG|CYP226A23|[Azoarcus sp.]azd|BP

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VIWD

>CDA09_13895|KEGG|CYP226A21|[Azoarcus sp.]azd|BP

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>Tmz1t_0929|KEGG|CYP1157D1|[Thauera sp.]tmz|BP

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>Tchl_0232|KEGG|CYP116B253|[Thauera chlorobenzoica]tcl|BP

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>CCZ27_08860|KEGG|CYP226A23|[Thauera sp.]thk|BP

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VIWD

>CCZ27_08910|KEGG|CYP226A21|[Thauera sp.]thk|BP

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VIWD

>Tharo_0243|KEGG|CYP116B253|[Thauera aromatica]tak|BP

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>AI055061.1|NCBI|CYP1013A3|[Burkholderia mallei 23344]bmal|BP
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Deltaproteobacteria

>Desaf_1336|KEGG|CYP152E2|[Desulfocurvibacter africanus subsp. Africanus]|daf|DP

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>MXAN_0683|KEGG|CYP197F1|[Myxococcus xanthus]|mxa|DP

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HVADAVDAVMRHTDSPLRPPIWVPTPTNLRRLRALGRLNTLLATLVRRYREQPESRTDLL
ALLLSAPVPLSENQLRDELATMIMSGHETTADALVWAWYLLAQHPEAEARLVAELETVLG
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HRDARYFDAPESFRPDRWLSEDAQRMHRYVYFPFGGGPRFCIGSALAMMETVLIITACVAR
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>MXAN_1743|KEGG|CYP1506A3|[Myxococcus xanthus]|mxa|DP

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DPLAQPWTPAWQAAQVEPLRAAILESVEALLQQPSIDLTPTLRKLTFDAFCVATVGEKLP
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LGQGPLTLERLKDAPWGEAVAYEALRILPAVRI FLRRT PPT PTRLAEVTLPPGTTLMISN
QHLHRDP SHWTAPET FAPERWLDGGAARNPHGSDHFFFPGRGPRACVAGDFAIVYLRTAL
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>MXAN_2304|KEGG|**CYP253H2**|[Myxococcus xanthus]|mxa|DP

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AGFTRTMVDAADLAATMEARADTGAAFNVAEDFTRLTLRIASSTLFGADVSSATHDIAT
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QMMMEAHHDDDTGERMSDSQLRDEVLTLLLAGHETTASALAWTIMLLSQHPGVRRDMESEL
ARELGGRNP THE DLPRLELTHRVVDESLRLYPPAWALSRIATKEDLVGGFRI PKGAHLI
APWVTHRHP SIW D N P E G F D P D R F L P E R E Q A R P R F A W F P F G G G P R Q C I G N Q F A L M E L V L V L
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>MXAN_3943|KEGG|**CYP209A1**|[Myxococcus xanthus]|mxa|DP

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LLVLDGKRHRDRKLI MP T F L G E R M H A Y G S V I R D I V N A A L D R W P V G K P F A V H E E T Q Q I M L
EVILRVI FGLEDARTIAQFRHHVHQVLKLAFLFPNGEGKPAAE GFARAVGKAFPSLDVF
ASLKAIDDI IYQEIQDRRSQDI SGRQDVLSLMMQSHYDDGSVMT PQELRDELMTLLMAGH
ETSATIAAWCVYHL CRHPDAMGKLREE IAAHTVDGVL PLAKINELKFLDAVVKETMRITP
VFSLVARVLKEPQTIGGTTY PANVVLSPNIYGT HHRADLWGD PKVFRPERFLEERVNPFH
YFPFGG G I R K C I G T S F A Y Y E M K I F V S E T V R R M R F D T R P G Y H A K V V R R S N T L A P S Q G V P I I
VESRLPS

>MXAN_4127|KEGG|**CYP147A2**|[Myxococcus xanthus]|mxa|DP

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GTIEQRKAKRDRTKAELGQYLAALADAHLRQPGDLLSGFLT DNGPDGRMSREEVLSTAA
LLL VAGHETT V N L I A N G M L T L L R H P G V F E R L R R E P E L S I P L V E E L L R Y E P P V Q F L P D R V T
LADIDIAGTTI PQGSPVLMLAAGSRDPERFDDPDRFMPDRPNNSHLGFGSGIHYCFGAP

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>MXAN_4919|KEGG|**CYP1069C1**|[Myxococcus xanthus]|mxa|DP

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AEKEPFIRTLVDALIHFRHERQADLFLRFHPLSCSIIAEILGIPSSDIHRFRWSDEL
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ELVSLLMQVHFAGHETTAGLIVGAVELLLHEHPEQLRALRDDPGLIAGAVEEAVRMISPVH
AMFRTALEAVEIGGVPIPKGAHIRIVYASANRDEARFHEPERFDIRREPEVKKHLAFGQGL
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L

>MXAN_7298|KEGG|CYP1069A3|[Myxococcus xanthus]|mxa|DP

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QEDVWIKIRWSSDWQQLVFEYVAPELQVEMAKGVIEFQOYCIRLIEDRKNPQEDLTSYL
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FLEESSRYDSVSHAMIRTAKEDELGGVKIPQGSRLLLLFAAGSRDESLCPHSSKLDVDR
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HLKVEWTPT

>MYSTI_02578|KEGG|**CYP1506A2**|[Myxococcus stipitatus]|msd|DP

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LMRVPLDFERLKGGSWGEAVAFEALRILPAVRVFLRRSPLAPTQLVGVTLPPGMTLMI SN
QHLHRDP SHWVQPEVFDPERWLNNGGAARNPLGSGHFFPFGRGPRACVAGDFAMVYLRTAL
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>MYSTI_03599|KEGG|**CYP253L1**|[Myxococcus stipitatus]|msd|DP

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ALIDGMLKSWEERTRAAQPLDIAEEMGILSLHMTTRALYSEVPDAPTTAAVRRMMHTFNA
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RDTGEAMTEKELRDEFMNLFSGNEGPGAALAWGWHLLSLHPEIADRLASESAAVLGGRAP
TLEDLPRRLRYATQVFEESLRLYPTAWKLVRVAGAADTLGTYPVAPGTVFMAISYIIHRHP
EFWSSPEVFDPPDRFAPGGPARHKFAYLPFGGGQHICIANNLMLMFGALVLMVVSQRFRLR
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>MYSTI_04048|KEGG|CYP1501A1|[Myxococcus stipitatus]|msd|DP

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FSEELAKSVERWKEMGARGESFDMYTEGARLMFGVMWRTCFFEEQPEIAYFDRIMDAIDVF
GRRVSPLSVLLYNLMPRMDPRHERVYTSVKLINGWIYERIGKRRGRGTEDGDITLLSMLV
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>MYSTI_04343|KEGG|CYP1491A1|[Myxococcus stipitatus]|msd|DP

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VLGGELPTSATLPELHYTRATVEETLRLYPPSWQFARRAREADEVGGFKVPPGMLMLISP
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>MYSTI_04792|KEGG|CYP1497A1|[Myxococcus stipitatus]|msd|DP

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ELDVTRLSALPYLDAVLKESLRNRSLSPICGGRVLKAPMRLREYELPACTVLIINSPLYLLH
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>MYSTI_04794|KEGG|CYP120F1|[Myxococcus stipitatus]|msd|DP

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ATARRHLERWVQQGRSLYDGLKGLTFDTASQLLFGTPEGADTGRLGKLFATYTAGMQGL
HPVVPLRVPFTPFGRFAARSEMLKEVTRIIQEREKSTGSDALARLLESRKEQGEGPSAD
ALAEQAFFLLFAGHESTSSLTTWACLELSRHPDLLDSAREEAQSLGEGPLTMERVERLPP
LEQVLLETERLHPPFSGSFRQVVKSFENGFHVPEGCRVYFYSINGTHGDPATFPEPERFT
PGRFTPEAACARHELGLVGFAGPRSCLMGFARLQAKVVLALLLRDYEWSLQPKQSLD
PVYLPFLPKDHLRVSFRRRSAQETRHRETA

>MYSTI_04805|KEGG|CYP1503A1|[Myxococcus stipitatus]|msd|DP

MSQTPEISIFSPFLANPFPIYQQLREQAPVFWRSRELGAWLISRYADVKMLLTDERATPD
QKAWAGYPELKTSAQPTHEHVQWALDATALLLLCHGAQHARMRRFANTPFQSAGCGRIARVTE
QVVHEVLDGFSGRKEIDLLADFSAPIRIKVMGRLFGAGFTPEEEEFVLTGTNLALGFLEP
SLAPEAITRNEGALRGFRALVENVIRRGKEAGAEDSILGDLLQPNREGDRLSDEEVLSLV
FSFLLAGTEANGSLITMGVLLLLLEHSGQLAHLQREPDRYPDAIREILRYSFTKFLPRYL
KEDISLHGNVMKQGQIALLLFQSAFRDPETFENPDVFDVMRKRSHHELLAFGAGPHRCVGE
RMAEIEAVIALREFFKRFKATLRGSEADWVKHMLVAVPRSVVPPVLLS

>MYSTI_04813|KEGG|CYP1495A1|[Myxococcus stipitatus]|msd|DP

MEPDFNPAHPAFRADPHRWLGLRERDPVHFSRPLNAWVLTRYDDVRRRAATDVTHFSNDT
LSVLVKGKHAGAMPRTTEHRIGTNLGMADGAVHTRLRTAIAPYFTPGAIHRLETGLQHIV
DGLLRRASGGELDLVAGLGRPLAVEAVASGLFGIPEGDREPLSGWAAATTRISDPLLTR
EERENFLELTRFADYLDGLVVQRRQPGDDLLSRIADLDRSGLTHPEVLATCMSIVGGG
IDTVSMGISRGILALLDHPEQMELLRENPDLLPGATEEILRFCAVAVFVARVVRVDLELR
EKTAAAGDVVLYSPAAACRDPVAVSEPDRLDLRREVERGHNLAFGHGAHYCIGAALARLE
LRVAFRGVLSRLPRLELKVPRSMITYGRNLMSMGIESLPVVFPPQNIPLP

>MYSTI_04828|KEGG|CYP125N1|[Myxococcus stipitatus]|msd|DP

MHKTELADLSPITYGRAIPHETFEHLRREAPVYFHQEPDGGTGFWAITRHEDIITISRD
PATYSSYRGGTSEDYSQEDLSLIRFMMLNMDPPQHVKYRRLVSSGFTPVAITYLEPRIR

AVTKEILDKVVHEREFDVTSIAAELPLQVIAELVGIPREERHQLFAWSNRLIDYDDSGR
ARSFDDAKMAAMEMWQYANQLAARNQGREGKDLVSVLMNAEVDGEKLNAAEFDAFFLLLI
VAGNETTRNLI SGGMLALMEHPEELARLRANPALLPTAVEEMLRWVSPVVCFRRTVTRDT
VLRGQQLREGDKVVLFPYPSANRDESVFENPGRFDI SRFPNEHIAFGIGQHYCLGTSLARL
EIRVMFEELLKRLDGLELAGPVERRRSKLVNAIRAMPVRRPPSSRPREGARENQEGTACE
PSMRG

>MYSTI_06075|KEGG|CYP1352B1|[Myxococcus stipitatus]|msd|DP

MSKSAPPTFISRFEPHNVENPYPLYARMREEAPVHFSPEMHLWVSRHDDVKAVVLNPQD
FLSANSFRNPVPPAPEVVAVLEQGYQPVPALVDDDDPPNHTRMRVIVTKALAPHRLSAMEA
RVRSITTELLDAFAADGHADLVKLGYPPLPARVIGAIMGLPDSDLERMKRWTEDLALLSA
GNVPVARQVECAHGLVSIQKYLAGYIAERRKTPGDDLI SALIEARYEDSPPLSDVELISL
LSLLHFAGHETTTNLLGNLLVWVLQEPERLKELEDPTRI PRAIEETLRRLDSPIQGMMRT
TARAVTLNGVEIPANARVLVLFASANRDETI FHAPDHGDP RRDPVGKHLGFGMGIHYCIG
APLARLEVKLAMEMLLKRLPNLRLAPGNAFSYVPNFLHRGPHRLLVEWDP

>MYSTI_07239|KEGG|CYP229H1|[Myxococcus stipitatus]|msd|DP

MSPSNPVVAATHPDYPFYADLVARRPFYRDDTLGLWVASSARAVGAVLSSPACRVRPLP
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EEVPLRELVFRLPVQAVGALLGLEPGGLPEVASWTGALVRGMAPGADAEQVREGALAAER
LMAV FHARLAHSEDGPLTLLSREL GASSTAPGALSREQADAESSAVIVSNAIGLLVQTHD
ATAGLLGNALRASLADPAVYAQVSSRPEWLPRLLEVLRFDPVQNTRRFLSEDAVIDGR
ALRAGDTVLVLAANRDPVHHAPHRFDLHREPSELATFGEGRHACPGAALARAVSLGA
LEVLFATDLVSHRAAFSATGFQPSVNGRVPLLPRLHLHSREHTT

>A176_002600|KEGG|CYP109S1|[Myxococcus hansupus]|mym|DP

MSNALWGVRLVEFEPFSSVHWEDPYPVYRALREHSPVHWAPKAKLFCVSRHADVDFVLR
RPEQFSSRAMTAVMFENKRPELGDVPSLLRLVVRGRVDVQKFFQGPDAI INSDPPRHGA
LRGMVSRCFPTPTIASWEPRIRELVNECLAPLRAGQPFDDVVSGLAVPLPVVIVTEMLGVE
PEWRADFKRWAAGFITIYATGAGRDRTPMREFFDVLTEFRAYMRTLVEKRRQAPTEDLISV
LVDPAQKEVLDEEELFSFIHTLLGGNETTTNLI GNAVAALLDHPEQLALVQGAPEKI PG
LVEETLRWESPVQFTLRSAVEDVDVGGVRLPAGSNMALLLGAANRDERAFKSPDTFDVTR
TPSPHRAFGFGIHHCGLGAGLARLEARVALEELVPLLPGVRRADARREYVDSLMMRGLARL
PLVPR

>A176_004746|CYP253H1|[Myxococcus hansupus]|mym|DP

MSTHSAGESTAAPLPPSPVGTPLLGHMRVLRSDPLTFLQAQVRQYGDVVRIHVGPASLVV
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AGFARTMVDAASDLASELEARADAGTAFDVAEDCMRLTLRIASSTLFGKDVSGAWHDIAD
AMGRVQVFTYKRLTQALPIPRRLPLPTHRRFERDTHMLDRVVRGIIETRRRDTGAHHDLL
QMMLEQQDADTGERMSDTQLRDEVLTMLLAGHETTANALSWTLMLLSQHPSVRRDLEAEL
AQVLGGRKPTDEDLPRALTRRVVDEVLRLYPPAWSLSRVAIEDDVIGGFRI PKGTYLLL
SPWVTHRHRPRVWDNPEGFDPDRFLPEHEQERPRFAWFPFGGGPRQCIGNQFALMELVVLV
ATLLQRVRLNLTTPGQIIRPAPAITLRPRSGVWVTAARAP

>A176_006320|KEGG|CYP197F1|[Myxococcus hansupus]|mym|DP

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VNGDGNFVKLAGVGGQRHRGGFPEAMMNSEGEDWLRKRRLVQPAFHRKHVAACGDTVVS
LTEQMLQTWRPGDARDVHAEVSALALGIVSRFLFHTPIDDEARHVADAVDAVMRHTDSPL
RPPMWVPTPTNLRLRRALDRLDTLLTLLRRYREHPESRTDLLALLLSSPVPLSEAQLRD
ELATMILSGHETTADALVWAWYLLAQHPEAEARLREELDTVLGGRLPGAEDLPRLSFTEA
VVKEAMRLYSPAWITSREALRDCELGGFHVPA GTTLAVSQWVTHRDPYFDAPDAFRPER
WLSEDATRRHKYVYFPFGGGPRFCIGAALAMMETVLITACVARRYRLELAPGCVVRPRPA
LALQPLGVRLI PHPRAARGLESEARHAARA

>A176_007236|KEGG|CYP1069A2|[Myxococcus hansupus]|mym|DP

MSVPKQEETGAPAPASSGRCPHLGAQYNPFAGPHVENPHPFDDQLRKEEPVAFSPMLNMW
LISRYDDIAQVLRDPARFSNRDMLVSGTHAHLTEEARAILAQGYPTAHVLLGMDPPEHTR
LRRLMNQCFTPQRVASLAPLVQRMATELVERFDKTGQADLVTQLAYPMPVHVILGAVGVP
QEDFWRIKGWSTDWQRILFEYVPPEKQVDMAGKFLEFQQYCIRLIEDRRRNPRDDLASHM
LAVEDNGEALSLHELIMAIIGGSMLAAGHESTTALLANAWKLALQHGLWQRLRDHRELVPR
FLEESSRYDSVSHAMIRTATEDVVVGGVKIPGGSRLLLLYAAASRDEALCPHANKLDLDR
EKVPQHLTYGRGTHFCLGAPLARLQFHVATNLLLDRLPDPRLVAGQDFGTTQNLVLRQMK
HLKVEWTPH

>MFUL124B02_14085|KEGG|CYP1506A6|[Myxococcus fulvus]|mfb|DP

MPNLLSRGLFNLFFGGRRAPLASLPGPTPGLLGNLGDFLGTQPWDVCARYAREYGPVTVA
WLGPSPALILNDADVIHEVMQTRRLEFEKGNIGEQIRHSTDDTFFIAEQGDDWARKHAM
DPLAQPWTPAWHAAQVEPLRRALLESVEACFAHPSVDLTPTLRKMTFDAFCVATVGEKLP
ASSYDDFMLLAAGADARIQAKLPLRFVSAPKGFEEAKERFYGAFARRIHEARQARSSTAV
DLMSWTLREMPRLDDQVHAHLLGGFFFGGVFSSSTTLVGAFHQLNKYPATLERLALESDA
LAQGPLSLSRVVAEAPWGEAVAYEALRLLPAVRVFMRRSPLTPSRLAGVTLPSTTLMVS
NQHLHRDP SHWAS PETFDPERWLNNGGAARDPLGSGHFFPFGRGPRACVAGDFAMVYLRTA
LATLSARARILVDSTEPFEEGFFFGVVRPQGVTKITPRERSTLHPASPEAPLPPAVESA

>MFUL124B02_42165|KEGG|CYP1069A4|[Myxococcus fulvus]|mfb|DP

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LRRLMNRGFTAQRIAGMEPFIEKMARELIGRFKDGHADLVEQLAYPLPAHVILGVMGVP
QEDVWKIKKWSADWQSLTFEHVPAEKQAEMARGVLEFQRYCVNLIERRKAPREDLTSYL
VEVEADGEALSVHELVAIGASFLSAGHESTTALMANTWKLALAHGLWGRLREDPELIPK
FIEEGSRFDSVQHAMI RTALE DVEVGGIQLPKGARLLLLLYAAGSRDESLCPHANKLDVDR
EKPPQHLTYGRGIHFCLGAPLARLQTQITTRLLVEAVGNPRLVNPQDYGTWQSIVLRQMR
HLKVEWDVTP

>COCOR_00795|KEGG|CYP197J1|[Coralloccoccus coralloides]|ccx|DP

MHAAPSDSAVLPRLPAGLPWVGQGLEYSRKDPLGFFFLRYADRGAVVRTRFVGTDIYLLNT
SEAIEHVLVKNFRNYPKDAFQKRALEAVVGHGLFTSHGDFWMRRRRMMQPAFHKNLLTAH
GSVAVKAASTWMSRREGASF DAYPEMMALTLDVVAETLFGANLSAQARELGAMEAVML
HAQHLLFDTPISLPAWVPTLGQRRFRAGLRALHAVDDVVERRRRQGGPGEDLLGLMLEAQ
AEDGEHLTDAQLRDECLTLMIAGHETTATALALS LYLRLARHPDAQAALRRELATVLLGRE
PTVADLPSLPYCEQVVKESLRLYPPAWGMSRVAEQDDRMDGVLVPAGTVVAWSQWALHRD
ASHFPEPEAFRPERWADGLERRIPRFAYCFFGGPRLCIGAGSALMVIRLVLATVLRQRIH
FEAEPGPAPEVLPAITLRPKNGIPLVARRVSRQE

>COCOR_02122|KEGG|CYP264K|[Coralloccoccus coralloides]|ccx|DP

MQTYDLFAPTTETERHALYARMRAESGLCRIAPFGAYAAARYEDVRTIQKDAQRFSSSEAL
ATTAEPWLGPNPVAQSLVTRDPPRHTQLRALINRAFGPTGMARLEAQVRQEAQTLAEAA

VSQREVDLVDAFSFVLP RNI IGRMLGLEPSTFTEFKRWSVNMGLITSAPVPAQHAGIRDTV
KEMEDYLGGVITARRRQPGEDMVS DLLRAEVEGQRLTDAEVL SFLFLLLPAGMETTAQLI
GNAAILLARHPEQLEQARADRAHI PRFIEEVL RCEPPAQFAFRVATS DVELSGTPI PAGES
LVMGLVASANRDERIFEQPDVFAPGREKASQHL SFGHGIHFCLGAQLARMEARLALALV
PRIRALRLRAPDIEWLPGLTIHGPR TLPVELLPA

>COCOR_02428|KEGG|CYP253D2|[Corallocooccus coralloides]|ccx|DP

MHAGHVGVLP LRPMTTATAAVTRRAPGHRGHL LMGILPDVRRD LLGCMSTLHRQYGDVVG
YRLGPQRAHLIAHPDGVKHVLQDHVKNYTKDH LTYRMVRWLTGNLLVSTGDFWLRQRRL
AQPAFHRQRIAGMAAGMVRRT EAMLRWE PAAASGTPLSISEEMKRLTLTIVGEALFGTS
VEDQTERVGVAFTEL GKQIAERFRTFRMLPPVLP TPYDRAFRARASLQETVRGIIATR
ERGDDSGDLLSMLMLARDEDTGEGMTDEQLGAEVMTMLLAGHETTATALS WTWGLLSKYP
EAEARLHAELDAVLGGRAPTVEDMPRLTYTKQVLEETMRLYPSVPIFSRTVDEDDVIGGF
HIPKGTSVNLCPYVTQRHPDFWEEPDAFRPERFAPEAAAKRHRFAYFPFSGGPRMCIGSG
FTMMEAQLIVATVAQRYRLREAPGFTLEPNANLTLWPKGELPMYLERRS

>COCOR_02429|KEGG|CYP253D1|[Corallocooccus coralloides]|ccx|DP

MTTAAATATVTRQPPGPRGHLLMGILPDVRRDILGCLGTLHREYGDVVRYRLGPMRSHLV
AHPDAVKHVLQDHVKNYTKDH LTYRMGRWITGNLLTSTGDFWLRQRRLAQPAFHRQRIA
GMAAGMVRQTQGLLQRWETAANGTPVGINEEMRLTLAIVGEALFGTSVEAQAGQVGAA
FTELSQQIAERFRTFRMLPPVLPTRYDRAFRDARATLLRTVRGII TTRRERGGDDTG DLLS
MLMLARDEDTGEGMTDEQLGAEVMTMLLAGHETTATSLSWVWGLLSKHPEVEARLHAELD
AVLGGHAPTVEDVPRLTYTKQVVEEAMRLY PAAVIFSRVQEDDVIGGFRI PKGTSVDVS
PYVTQRHPDFWEEPEAFRPERFAPEAAAKRHRFAYFPFSGGPRQCIGNSFAMMEAQLVLA
TVAQRYRLREAPGFTLDPD SHLTLRPKGALPMYLERRS

>COCOR_02734|KEGG|CYP1506A1|[Corallocooccus coralloides]|ccx|DP

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WMGPNPGLVLNDPALIAEVYESPRRMEFEKGNISEQIRPSTTDDTAFTAELRGDWVQKRA
LEPSAQPWAEALADLVGPMQAAISEFVDALLKQERIDFAPALRRLTFDAFSVAQVGEKL
PDQVFEDFM LLARAADARIQAKLPLKFVKPPKDFEAVKARFYGHFVDRIREARKRQDPGA
VDLMSRYLRETPGIDDQVLAHMLGGTYFGGAFSSSVTLVGAHFHQLNKYPGADARLAAEAA
SLVADGPLTFQKVESAKWAEAVAYEALRILPAVRVMTRTPPKDAQLAGVTL PAGSMIMIS
NQHLHRDPAHWDPDPTFKPERWLDGGTTRDPLGSGHFFPFGRGPRACV GADFAMVFLKTA
LTTIASRVKVLQDSTEPFEEGFFFGVVLPKGVTGKLVARTAQASLKAKVG

>COCOR_03933|KEGG|CYP264D1|[Corallocooccus coralloides]|ccx|DP

MSERFNLLSPEVKANPYPTYARMRREAPVCQVEPGGMWAVSRHEDVLRVLKDPQRFSSQG
FRVATNPPWLGGNPFSESMLTMDPPQHGRRLRVLVQKAFGAGAMARLEPRVRDLRQAVAE
LPRGVPVDLMPPYALRIPAAVISSELLGLDPARATRLKQWADLITGGVTTVRPEEEDRKQR
ARDAVAELRQYFGEVLDARAHAPGTDLVSELOQARVDGEALSKDELI AFMALLLVGGIET
VVHLLGASLVVLRHPEIWAQLRSDRSRIPAFIDEVLRYEPPAQAAPRLTTEAVELGGVS
LPKGAPVLVLLGSAAHDEAHFPDGRFNLSRPGPQNL PFGHGVHFCLGAQLARMEGRLAL
EAMLD AFRHLQAGPEPMTWHRTLVVRGPATLPLVLHPH

>COCOR_04510|KEGG|CYP1069A1|[Corallocooccus coralloides]|ccx|DP

MSTAVEAVKVDGQSEAIHIDAHASKAAGAMKCPHLGAQYNPFAGPHVEDPHPFYAQLRQD
APVSYNPM LGMWLVSRYEDICHVLKDPTRYSSADLGNMGSVLAPATLAVLAEGYPLADSL
INSDPPAHLRLRKL LGRGFSQA RIAAQEAPIRAVSEELIQAFARKGHADLVTEFAYPLPV
RVILGMAGVPQEDMADIKRWCDDFFRMI FTRVPAEEQPPLARSWVTFQHYVARLIRDRTD
EPRDDLISYLVTTDADGEALTLPELIIA IAGSMLAAGHETTTALLAQCWKQALLQPGLWQ
KLREDRSLVPHLIEETLRFDSVAHGMI RTT MEDVELAGVALPKGSRLLLLYASGSRDAAL
LADGDHFDISRHHPTHLGFGRG I HFCIGAPLARLEAL IATNLLLDQLPDLKLEENPDFGH
TQSLTIRTIQH LRVNWTPTGT

>COCOR_04899|KEGG|CYP1335A1|[Corallocooccus coralloides]|ccx|DP

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TPSLSRLPDAALQLPVFVLGSL LGFPEDTLEASVRD VDAYVRSVAGPPAGSEGAARLNER
VAACFQSAARTAFTARLMEGHGAEDLRLPNTVGLLTQAYEATAGLLGATLRAFARMPELR
EQLSRGGCTMDDVVQEAARHDSPVQNTRRFTHAAALVAGQALEAGETVVVVVLA AANRDPL
ENPQPDAFLPRRTGRQTFTFGLGLHACPGPSLATTMATAAAERVLASGLDLSPLSGPVTW
RASTNTRVLGGLLE

>COCOR_05111|KEGG|CYP264D6|[Corallocooccus coralloides]|ccx|DP

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LGRYEHVRGVL RDKRFSVQDVP GQLRRRSELLKTRKLI PNQPANLDGLIANSENWFAFLE
APDHTRLRNLVSSAFQKRSVERMREQIRQC AVELLEPVRKQGHMDLMKDFACILPQNVIA
HLLGLPKEDFPQCVAWAEVIGRIFDPLVSLEEYARLNEDSISFMAYLKELVAKRRVEPKD
DLISALIEARDGQDRLSEAELISII IIFGAGEETVVSLIGNGSLALIRHPEHLEYLRTH

PEVLPSAVEEMLRYDAPLQMTSRTALEDVELGGKIIRKGDQVYVALGSANRDPDQFTEPD
SINLLRERNRHMFSADGHYCVGAPLARIEAQEAYRVLFDLTLGDFEVAIDELSYRDHTVL
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>COCOR_06417|KEGG|CYP264D6|[Corallocooccus coralloides]|ccx|DP

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LSPEREVDVDAFAMPLPASVIGELFALDPTMTARYKRWSVDLSSVSGTTEKDTHRHESEI
KATVREMEDYLSNVVAERRRHQPDDMVSDLVKTRVDGEALSDAEVMSFLFLLVVAGLETT
VQLVSHSVRMLMEQPHLMARLRENPSQVGRFVVEEVLRYEPSVHGLVRVTTKETQVAGVVI
PEGARVALMVGSACRDGERFKDPDTFNMDREGVNNMPFGHGIHFCLGAPLARLEARVGL
VLLSRFTRFTSTGPKWNTSLTVRGPLSLPLIPHA

>LILAB_05370|KEGG|CYP197F1|[Corallocooccus macrosporus HW-1]|mfu|DP

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LTETMLQTWQAGEARDVHADVSTLALDIVSRFLFHTPIGDEARHVAAAVDAVMRHTDSPL
RPPIWVPTPTNLRLRRALGRNLTLATLVRRYREQPESRTDLLALLSSPEPLSEHQLRD
ELATMIMSGHETTADALVWAWYLLARHPEAEGKLVAELETELGGRLPGAEDLPRRLRYTEA
VVKEAMRLYSPAWMTSREALRDCELGGFHVPAAGTLLAVSQWVTHRDARYFDAPESFRPER
WLSEDAQRMHRYAYFPFGGGPRFCIGATLAMLETVLITACVARRFRLELAPGCVVRPRPA
LALQPLGVRLIPRHRAHGARESEARHAASP

>LILAB_09935|KEGG|CYP1069A3|[Corallocooccus macrosporus HW-1]|mfu|DP

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LRRLMNRGFTAQRINGMAPFIREMASTLVDRFAKEGQADLVTQLAWPLPVHVILGVMGVP
QEDVWRIKRWSSDWQQLVFEYVEPERQVEMAKGVIEFQQYCIRLIEDRKKNPREDLTSYL
VAVENDGEALSMHELVMVAVGASMLSAGHESTTALMANAWKVALQHGLWQRLRDHRELVPK
FLEESSRYDSVSHAMIRTAKEDELVSGVKIPAGARLLLLFAAGSRDEALCPHANTLDLDR
EKVPQHLTYGRGTHFCLGAPLARLQFEITTNILLDRLPDPKLVPGQDFGTWQSLVLRQMK
HLKVEWTPT

>MYMAC_007011|KEGG|CYP1069A3|[Corallocooccus macrosporus DSM 14697]|mmas|DP

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LRRLMNRGFTAQRINGMAPFIREMASTLVDRFAKEGQADLVTQLAWPLPVHVILGVMGVP
QEDVWRIKRWSSDWQQLVFEYVEPERQVEMAKGVIEFQQYCIRLIEDRKNPREDLTSYL
VAVENDGEALSMHELVMVAVGASMLSAGHESTTALMANAWKVALQHGLWQRLRDHRELVPK
FLEESSRYDSVSHAMIRTAKEDVELSGVKIPAGARLLLLFAAGSRDESLCPHANTLDLDR
EKVPQHLTYGRGTHFCLGAPLARLQFEITTNVLLDRLPDPKLVPGQDFGTWQSLVLRQMK
HLKVEWTPT

>STaur_0027|KEGG|CYP1494A1|[Stigmatella aurantiaca]|sur|DP

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SRRTRRWRPGQHLRLREEMEALTLEVILRALLGLEDPQLRLASRHARTMVQWSASPLSA
LLMVPALRRDLGPLTPWKGYHRDLSTLAALVMDQAARRRRARDASGRDLLSRLMQEGAG
LSDEELKDLVLMLLFAGYETTATSLCWAFAEALLSHPGERTWVERELAEVTGGGPLEAGHL
EHLVRLDSAIKEVLRRLYPVVPILGMARRAVRPFELQGVTFPAGTKLVPTSZYLAQRADVY
PDPHFRAARFLDSKDPASWLPFGGGLRRCVGLPFALHELKAVLAHVLSQTRLRLTRTS
PAHASLEGITVGPGRGTPVAVESVRA

>STaur_0257|KEGG|CYP107CJ10|[Stigmatella aurantiaca]|sur|DP

MALHEPLPDPVPLTGCOPYKANPYFLYKRMREAGPVHRVLFPSGVRAWLVTGYEAARSALN
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LRPRFQALADALVDGLPEHGADLVTGFAARFPFQVLAEFIQLPPELAGRFDRDWGKVVQ
PVGPTDPGRPLYEARLHGLQSYIAGVVAHKREHREDDLLSRLVVAHERSELSQEELGSMI
FQLLVAGQEPVTNQITITALIALFRHPSQLARLRGNPDLLPRAVEELLRYDSAFELTTWRF
FDRSDHLHGTRVPAGDSVIVSLCAANRDRRFPDPDTLDFDRSPNPHLAFGHGHIHFPCGA
ALARTELQIALGTLLSRLPGLHLSIRDEAIAWIPAVLGRGTNHLVPGYGRRL

>STaur_0258|KEGG|CYP107EN2|[Stigmatella aurantiaca]|sur|DP

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LTGYAEIKQFLADPRFSSLKATAPDTRVTPPLRPGNLLTMDPPDHTRIRRVAKAFTM
RRVEQLRDRIRDVVDKQLDLLVAQGPPADLVASLAVPLPVVMISELFGIPYADREQFRRY

ADV FVATTAYDAVEIDRSRTALEQYFQELLEQRRSCPTDDL VSTLLEAMDTERLTPLETA
RTGIGILMAGHETSLSMISNSCFLLLSHRALYAQLVAEPLLLPTAVEELLRYIPLRSTGS
FPRRATEDVELGGVLRKGETVIFQRASADRDERVFTCPEKIDLTRRPNPHLGFHGAHH
CLGASLARCELSLAIEGLIRRFPNLRLAVPDGEVWPWKPLIARCPAHLEVTW

>STaur_0406|KEGG|CYP1069E1|[Stigmatella aurantiaca]|sur|DP

MREPERDERGPLFIQCAVREGGAGGCVGKPPFLQNTLES PYHLGMPKTQPPVRVSPALST
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HSASYSSASMLTSASQLTPEARAILGPGPILHDSPLNTDPPAHTRLRRLQLRGFLPARIA
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VSLGSLIGAGHEATTAQLGLILLNLLRKP ERWQALCENPALIPRAVEECIRLEAASHG
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>STaur_0533|KEGG|CYP1489A1|[Stigmatella aurantiaca]|sur|DP

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AIAEAIVWEARAGETIDVTGEMKRLTLRIVLLCLFSTDVSSRADEI IENLDVLQRYSVH
LLWSMMPLPEFIPTRKNREYQKARGTLD SIIYGI IAEERRKSGNHDRKDLLAMYMSAVDEE
TGEGMSDEQLRHELMNLF LAGHDTTANGLAFTFYLLSKHPEALKRVDEERDAVLGNGRMV
TNEDLPQLNYARWSFEEALRIY PPTFAMSRTSVRELKHNDYVI PAGESNI FVCQWALHRNP
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>STaur_0821|KEGG|CYP1011E2|[Stigmatella aurantiaca]|sur|DP

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VQEMVDQLIARVRDTGKMEIVGELACPLAVTMIASMLGVPEEAHASVTRWADGLSRVLD
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KDFTLHGKTI PAGDLIYFSLGSANRDP SQFPDPKFDITRKENRHLAFSGGIHYCLGAAL
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>STaur_1562|KEGG|CYP107DP2|[Stigmatella aurantiaca]|sur|DP

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ITAI AEQLLD SVQQDRVDLLDAFAFPLPITVIAELLGVPVEDQDRFREWT TTTFLT PPKD
GDVAPLRRMAQEFQAYLQEF LARRAEPRDDLASAMIAAEEQGDRLSPVELMSMVFLLLV
AGHETT VNLIGNGIWALLKHPEQLERLRAAPALLDSAVEEMLRYCGPVKHSTSRFTLEDT
EFHGQH IPAGEMV VAGLVSANHDAEVFP EPERFDIARQPNRHIAFGSGIHFCLGAPLALL
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>STAUR_1628|KEGG|CYP264A2|[Stigmatella aurantiaca]|sur|DP

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LTAISDATRYITEVIEARRHSPAEDLVSDLVRAEVDGQSLTTREIVDFLILLIAGLETT
VHLLANSLFLAERPEESERLRADPTLIPRFIEEMLRYDSPVQSLVRIVTSDVTVAGVTI
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>STAUR_1874|KEGG|CYP264A3|[Stigmatella aurantiaca]|sur|DP

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LLSRKSTDFIASFALPLPALVLSDLLGLEASDYRLFKNWSDDFACILPKVPSEDALRLRN
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LLANGLILLAHQPELLAQLRADRTLIPSFVEELLRYDPPTQGVLR TTTLEEVEISGVSLPK
GAGVLALTGSAGRDERQYPEPDRFLLHREQSSIAFGKDSL TCLGAPLARMQARIGLEALL
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>STAUR_2030|KEGG|CYP120H1|[Stigmatella aurantiaca]|sur|DP

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YLPQMEKSHLAAIARWEKAGRMVCIEDFGRVTLRVANQLFLGDDTEDGAEDLPQWMKHWL
EGFYSPVIRFPLGTFSRALAARHKLI SHVERAIHSRREKTTDALGLLTGFKDS DGVALT
TDQLASEMLVLVAAGFH TTTTSM LTYVMFALAEHPDVLK KARQEQRDLGIQGSVTLEQIHR

MSYLNVAEMAEIERLYAPVPPFGFRRVVEPF EFHGYRIPAGWQVAWSVEGAQKDPRNYADPL
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>STAU_3582|KEGG|CYP1498A1|[Stigmatella aurantiaca]|sur|DP

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EALAGMCSEIIGGANAPTGDTLGNALLACLSPHEELEKARHTPALWKTAVPELLRYDGP
LFW SRLATEDVVLGGKRIRAGQMVYASLAGANRDPDVFPEPDQLDFSRPNAHKHVSFSFG
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>STAU_5213|KEGG|CYP1486B1|[Stigmatella aurantiaca]|sur|DP

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ATAGYFDAATPIFEKAI DRWVEQGHVSFKDAIRSLLEVEVSTRIFLGVDSGAREFERALID
YWEGPLSLRSALLSSKWRRSIRGHRVLCCEMLRSRIAERRATGGDDLFSRLCAKTQESEG
ILDDDGLVRLVIGVMAAAFATTSSGLASMA YLLAIHPEWQEKMR EEALAVSKGRVSYEDS
KQLEVTSRVWKETMRLYPIAPY CARRALHDVNLGQFRI PAGTFVMGLI SVVMQDSALWSN
PQRFDPDRFTEERAEDKSKASFLPFGTGAHTCTGMHLANAEAKSFWHAMLTRCRFTLER
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>STAU_5214|KEGG|CYP126B2|[Stigmatella aurantiaca]|sur|DP

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DDPRHQDFKDVMT PAMGRQALATLEGKLRPYAAELVSSLLARGNCFATEVGATVGAHAI
SOLLGIPSQDWPLFAEWT SLLMGFDDREAGRPTERSQKIHMDIFRYGCQLLA KRAGPSD
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SNPFSFDIRKPNPHLAFGYGSHTCFGDHLGRLEMRVVLEALLDRVEQIELTGQVAVAGS
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>STAUR_5220|KEGG|CYP110U2|[Stigmatella aurantiaca]|sur|DP

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SSPALIFFPGLRHRFGGIGPYANWQRADARLTRLIHDLIARRRASPPGSKVDVLSLLLLTA
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EPTSVMKLPYLEAVCNETLRIYPPVADLYRKLRLVPLRIGSTMVPAGTGVAVFTTIIHARE
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>STAUR_5324|KEGG|CYP167B5|[Stigmatella aurantiaca]|sur|DP

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PEIQAIIVDEILDGVEAKGTVNVVAEADLI PARVIGSMLKIPKGREVQFQRFTDAMIKNF
VPGLVCAREVEAMRPDIAGGLELIRETVEDRRRHQPCEEDILTTLIRTEERGDSLNAQELL
SLVAALIVGGFETT VHLSFTVYNLLQRPEVLAQVKAPELSRVNVEEVLRFDNFGKMGL
ARYALEDVELGGVTIKKGQLVLMNSALRDEGTFSSADVFDVRRHTNASIAFGHGVHYC
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>STAUR_6876|KEGG|CYP1387B1|[Stigmatella aurantiaca]|sur|DP

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LTPEHQMECAHMVVKLQRYIADLLAERLDQKRTDAMTQLATQLLTLEKLSIEELAGMVS
TVVAGNATLTSMVGLTTRVFLQQPNLWQRLREQPERISQAIIDEALRLESPFWGLRRVTTE
PVEVGGVKLPAGARVLVAFISANRDVERFPQSEVFDLDRPNASQHMSFGKGVHVCVGSGL
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>STAUR_7270|KEGG|CYP264J1|[Stigmatella aurantiaca]|sur|DP

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ATIVEMKAHMQR AIDERRQOPTDDLLGLIVRGKSDSEPLSNSQMMALCFNLLTGGETTS
FFFSNAVRVLAERP DVYAQLRADRTLLPQFIEEVRLRYDGPVRGLPRIVTSDVELSGVRIE
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>AA314_00027|KEGG|CYP109R1|[Archangium gephyra]|age|DP

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AGNETTTNLLGNSLLALIRHPEQYEWLRNNPSREACA AVEETLRYD SPVVGLMRRATQD
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>AA314_00028|KEGG|CYP107HX1|[Archangium gephyra]|age|DP

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ERIVSELLDAAEKKPAVDLLAD FALPLPLTVI SEMMGVPEEDRLTFHRQMGLLDNLTTP
AGFLLQTPNAFNMRRFFRKLIRLRQTEPRD DLTALVQAEEQGDRLNEDELI SMIFLLLL
AGHETT VNLI GNGLLALLQHPEQLQKLRHPELIGSAVEELLRYGNPVDQPSPRYAREEI
QLEGHV I PKGATVMCLLASANRDES VFENADTL DITRKNRHVAFGMGVHYCLGAPLARL
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>AA314_00098|KEGG|CYP197G1|[Archangium gephyra]|age|DP

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ISHDMMRLTFEIVSKTLFDADTGEQASQVGKAFTS IMQAINKEYPLYSVLP AWVPVKRWG
ASRRAVEALNRITSTIIQERRGTGTD RDLLSMLLLARDEDGTRMTDEQVGAQTLSLLFA
GHETTANLLSWTWLLLSRNPDIRLKLQQEVDTVLEGRAPT VGDLPRLKYTESVVKETLRI
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>AA314_00303|KEGG|CYP107DL4|[Archangium gephyra]|age|DP

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TTVNLLGNGVVALLNHPHQHARFLADPAGMSKGMVEETLRYWGPVDYLPSTPRIATESFAL
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>AA314_00471|KEGG|**CYP253G2**|[Archangium gephyra]|age|DP

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GSMVDATRQMLARWRARPSPEPLDVAEEMHLLTLGIVGRALFSTDVSGNASRVGQALT
ALAETNRRILSLGLYAPDFLPTARNRAFRQALGTLDSVIFDI IARRRAGETQGDDLLATL
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>AA314_00680|KEGG|**CYP1347C1**|[Archangium gephyra]|age|DP

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VANTSLLLLAAGHLTTTDDQLSNGLYELLTRPEQLALLRREPSLLKPAIEEMMRFPAPPV
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>AA314_01068|KEGG|**CYP1069C1**|[Archangium gephyra]|age|DP

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AMFRTALEAVELGGVSI PKGAHIRIVYASANRDEARFHEPERFDPRRPDVKKHLAFGQGL
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>AA314_01308|KEGG|**CYP253G1**|[Archangium gephyra]|age|DP

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DTVAELLPAWERAADGGTPLPVFQELMRLTLTVVVRALFGVDVAPHTTTMGKAFTTAEV
TNERIISPLPYLPWLYRLPTRSNRAFRQAVDTLDGMVRGLIAQRRRAAGTQAEDLLGMLMA
ASDADTGDTFNDAQLRDEVMTLLLGHETTATSLAWTFHLLARHPEVEATLHAEVDAALG
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>AA314_01700|KEGG|**CYP197K1**|[Archangium gephyra]|age|DP

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>AA314_01792|KEGG|**CYP264D2**|[Archangium gephyra]|age|DP

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VHLMGLCVLALMEHPEVMERLRADRSVLPNFVEEVLRTGAPGHGLLRLTTEEVELGGVRL
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>AA314_02215|KEGG|CYP109D3|[Archangium gephyra]|age|DP

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>AA314_02385|KEGG|CYP110R1|[Archangium gephyra]|age|DP

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>AA314_02449|KEGG|CYP1284B1|[Archangium gephyra]|age|DP

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>AA314_02454|KEGG|CYP107DP4|[Archangium gephyra]|age|DP

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>AA314_02467|KEGG|CYP1011E|[Archangium gephyra]|age|DP

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>AA314_09024|KEGG|CYP1007C2|[Archangium gephyra]|age|DP

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>AA314_09346|KEGG|**CYP264C1**|[Archangium gephyra]|age|DP

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>AA314_09827|KEGG|**CYP242B1**|[Archangium gephyra]|age|DP

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>JQX13_10145|KEGG|CYP253D4|[Archangium violaceum]|avm|DP

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>JQX13_12475|KEGG|CYP110R5|[Archangium violaceum]|avm|DP

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>JQX13_13845|KEGG|CYP110AV1|[Archangium violaceum]|avm|DP

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>JQX13_15660|KEGG|CYP197F4|[Archangium violaceum]|avm|DP

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>JQX13_15775|KEGG|CYP107DL9|[Archangium violaceum]|avm|DP

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>JQX13_16055|KEGG|CYP2528A2|[Archangium violaceum]|avm|DP

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>JQX13_18665|KEGG|CYP1284B6|[Archangium violaceum]|avm|DP

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>JQX13_18675|KEGG|CYP1284B7|[Archangium violaceum]|avm|DP

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FRHLAAQAASPTVDPATRAATFKHIAETIKARQEKREDDLI SHLLDANLNGRNP
DFHEMLGYSILLFLGGLDVTVNALCFGVRHLARDQELQAKLRADPSLIPGAIEELLRLYGIV
CMPRHVARDEVYQGVQFKKGDVLLLLPAANYDEAAFANPEQFILGRKEQHQTFTNTGPHR
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>JQX13_18835|KEGG|CYP253G6|[Archangium violaceum]|avm|DP

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DTITETLQWEPAVASGRPLPVFQEMMKLTLTVAVRSLFGVDVGEHTRAVGDAFTTALS
SVTNERIISPLPYLPWLYRLPSRDNRAFREAVDTLDSIVRGIISQRRVKGPGAGADEDLLGM
LMAASDADTGDTFDDAQLRDEVMTLLLAGHETTATALAWTFHLLQNPVEATLHAEVDA
ALGGRVPTLADLPKLRVYVGCVFEEAMRLYPPVWAI PRVPLEDDVVDGYRIPKGDIVILVP
YVTHRHPDFWPEPERFDPTRFLPENSKDRPRWAYLPFGGGQRQCIGNNFAMMEAQFVLAL
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>JQX13_19770|KEGG|CYP1263C1|[Archangium violaceum]|avm|DP

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EELAPASLPGGLTDFAFRLSVHGVGELLGMPEAHLPRVADWMSDFVRCLAPASSPEQVER
GRVAAGQLLGLFREWLFARHALPAESLLSTLARELGRRSGGLDVGEAVAANGIGLMSQAY
EAGAGLFGNTRLRVLAAPPEWRERVVANSGLLDVLRVLRYPPIQNTRRFVVRDDVVAG
GRMRAGDVILVVLAAANRDP RVHPSPERFDPFRRPERETRSFGAGVHACPGEALALALAKA

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>JQX13_21720|KEGG|CYP264D12|[Archangium violaceum]|avm|DP

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LPLGSPVDMVPALPVPFVFLGNLLGLDASLHSQLKHWADQLTSVTAIRPDETERQEPV
RRAVADVCRYFGEVVEHRRREPGEDELVSDDLRLARVEGEALTDDEIMAFLLMLLGGLETT
VQLLGLCVLALMEHPDVMARVRADRSIIPRFVVEVLRTGAPGHGLLRVTTEEVELGGVRL
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>JQX13_22375|KEGG|CYP1496B2|[Archangium violaceum]|avm|DP

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ASLVERTLEKVRROGELDVVADFAEPIAINAIAELFALPEADRPRFMRWSKDLLKPTSSA
VRTDEVNSVRRTSHDMVTYLRDLVEKRRRAAPGDDLISQFIAGEEGLNLQAGEAVIQSFQ
MIGAGFVTSTNQLTNTVLALLKHPEQLRELRGDPGLIRGAIEESLRHEPAILSINRLCVQ
DTEVGGTRIPQGRFVHAMTAAANRDPEVFPDPDRFDITRAPNRHVTFGVGAHYCPGASLV
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>JQX13_22385|KEGG|CYP264A9|[Archangium violaceum]|avm|DP

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ELAЕКGEADVFVSRFAMPLPAFVIGELLGLDVSLHHRFKDWSDDIASVTPEPRDPEHARRT
LIAISDATRYISEVIEARRRSPADDLVSELIRAEVEGQSLTDREIIDFLVLLLIAGLETT
VHLLANSLLFLAERPDRARLRAEPALVPGFIEEMLRYDTPVQALVRIVTSDVTLSGVKI
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>JQX13_24835|KEGG|CYP107DP9|[Archangium violaceum]|avm|DP

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PRIREICSELLEGLMAHGSGGDFLKLFAFPLPVIVIAELLGIPPEDRDRFREWTQTFAP
PSKDSQEKAREAYQRFFKYLGELEFQRRQPRDDLISALLAVQEQGDRLSSEELTSMVFL
LLVGGYETTGHLLGNLLALLQHPDQLQRLREDRSLIPSAVEEMLRYCGPFELSILRFAK
EDLELHGQRIQAHEAIRVNYLAADRDAEQFSEPDREFDVGRTPNKHVGFHGHIFCLGAPL
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>JQX13_25725|KEGG|CYP102M17|[Archangium violaceum]|avm|DP

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LSLMLQGVDPVSGQQLDDQNIQNQVVTFLIAGHETTSGLLSFTLYQLLQHPDVLARATAE
VDRVLGRDLSKRPTVEVLSKLTLYLDQVLRSLRLWPTAPAFGLYAREDTVGGAWPVRKG
EPIMVLTPLMLHRDPEVWTEPERFDPERFSPEAVAARPPNAWKPFNGQQRACIGRPFAMQE
ALLVLGMQLLQRFQLIDHTRYQLHIKETLTLKPEGFRMRVRARGDADRPVVELRPAVA
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VDERLAAAGAQRLLARGEADARADFFGDFDGWYQGVWPRLGESFGVETAEANQAPRYEVE
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ENAPEQVERVARRFKLSPDETTLIRRTREEPGTLPFDRPVTVRALLGRYVELSAPATRA
LQLLAKYTACPPEKKRLLALAGEGGAPEVYRTQVLEKRLSVIDLLEEFQACELPFGVFL
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AVLREPHAPFRPPEDPSVPVIMVGAGTGLAPFRGFIQERARLAERGTRLGRALLFFGCDH
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>JQX13_28490|KEGG|CYP264D14|[Archangium violaceum]|avm|DP

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ELTLGRPVDFVESFALRVPAAVIGELLGLDASLHPRFKRWADDINNTSSTPPDAHEWHAQ
IRGTYAEMEQLKEVIAERRRAPREDMISDLLAARIEGEALTDALLGFLFLLLIAGLET
TVHLLGHAALVLAERPDPVAVRADRSLIPRFIEEVLRYEPVAQTLLRLTTAETELGGVR
LPAGSHVMLLLGSACRDEAQFPNSEFDDLREGSQSMPFGHGHIFCLGAPLARMPEARLAL
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>JQX13_28950|KEGG|CYP267A4|[Archangium violaceum]|avm|DP

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IQALVEELLDAARGKERMEVISELANPLPVIVIGEMGLPREDRYRLKKWSDKSLASLIGT
GRPTLAEVEGALGAILFEDYFRPLLARRRTQPGNDLLSALVQAEQGNLMSEQEVLSTC
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AVDLEFGGHTFRKGRVILMIAANRDPAHFPEPDRLDVRREQLRHQGFQGMGPHYCVGAA
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>JQX13_30100|KEGG|CYP264D13|[Archangium violaceum]|avm|DP

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LPVGRSVNFVDAFSI WVPIAVLGEMLS L P QSLHPRIKHWA E VYGEFTS I GENDTERQKTI
LETVAETR FHFNFQVLEDRRRTPRDDLVS ELLRTHVNGEELS YTDLMGFLFLL L IGALETA
VHLLSSCALMLQE QPELMARLRAAPT L I PRFIDEMLRHSGPAHGLFRLNTDEVELGGVRI
PRGARM L L L IASANRDEAAI PDPDRFDMDRPGPQNL PFGHGIHFCLGAQLARMEVRVALE
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>JQX13_31565|KEGG|**CYP1248B6**|[Archangium violaceum]|avm|DP

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IAAMEPAIRATADSLIDGFIRDGQADLIQQFAYALPGFIICDLLGVPRSDMEQLKRWSDD
KTALMSATAPIEQLVQCAHGFIAMERYFKEQLHERRRHPREDLLTLLLPQSLGGTAPMSE
QEAVCNAMDLFAAGHETTTGLIGNMWLLFNAPDQLEALREDPSLLPNALEEMLRMEAPI
RGFFRTVMADSTLGGVMLPKGARAFILYASGNRDETQFTEPDRFDIRRADAKKHLAFGKG
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>JQX13_32710|KEGG|**CYP1043A11**|[Archangium violaceum]|avm|DP

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VRVLEERAMHRATLVRLRDLMMPIWAEFYELVFNERCPREARDLIVDNADDVVTALKGL
SLRHMDRRLRLTRYLKARLEAGAVAHELPSCLSLEQKAFYLGQVYFNTAVVQMSEAMAHL
VMFLAQHQEVQTRLADNLDDDRYLDRIITESLRLYPLFGIAHRITSSDIRVDDKTTLPKG
SVLCFNYQAYHHEGFEDPLRFDPDRWLKHSTKESNYMPFGAAANRPCPAQAIALVTMRV
ARETIRRFRAFSSASHTRPLPNRGPCVLEPRKENPDPRAREELLASMSAREPWEEVGRSV
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>JQX13_34720|KEGG|**CYP242A7**|[Archangium violaceum]|avm|DP

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WSRDLLPIFTASSMEQLLQSQKSVLEMTDYMRPIVEEHRREPRQDLISVFLAEEAAGNIR
DVEEIAANCVLLL FAGHETTANLICNGLSALFDFPDQLELLRAKPELMQSAVEEMLRFSG
IGGTITRVAGTDLELGGKKIAPRQLV FVSLASANHDPEVFPEPSRFDITRKTNKHVTFGY
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>JQX13_34870|KEGG|**CYP1329C1**|[Archangium violaceum]|avm|DP

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TLEAQARWTDGQEIDVGQEMLRRLTMRIVGKTLGLEVLEADDFGAALTTCLEYSNHLVA
NIVPVPLWLPTRKRNRELKKALAFIRGMLMEKLSRRRHAGCPATQDFASMLMGVRGEDGQG
LSDEQLRDNLIFIF SAGYETSANTLAWTWYLLSKHPEVYERLRKEVDEVLQGRAPTYEDL
ASLPYVHQVVKEVMRIYPVAYFFGREARRDVEIDGYQVPKGTFAAVCPYTLHRNPEYFPD
PERFDPDRFAPEQESKLPKYAYL PFGAGVHACLGVHFFMIEAPLLLATLVQRVHIDVLPG
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>JQX13_36270|KEGG|**CYP264K4**|[Archangium violaceum]|avm|DP

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AITAEPWLGPNPVAQALISKDPPNHARLRALVNRAFGPAGMARLEAQVWKVSEELAEAA
VRRREVELVDAFTFVLPDIIGYLLGLDPSTFSNFKRWSLAMGLITSATTPEQHEEIRFV
VREMKGYLTEVIEARRRQPGEDMVS DLLRAEVDGRKLTDEEILSFLFLLLPAGMETTSQL

LGNAI IYLARHPEHLARAREDKTHIPRFVEEVLRYESPVQLSFRMATQDVELSGTKIPAG
SFVLGLVGSANRDERVFEQPDRFLPGRDKGTQHLTFGYGIHFCLGAQLARMEARLGLEAL
VSRVGAIRLRSPEVQWLPGYTIHGPA TLPLVELIPA

>JQX13_36820|KEGG|CYP264E1|[Archangium violaceum]|avm|DP

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VRHQEVDFIADFALPLPTRVLNLF FGLEPAMALRLKGWADDLVSIPASQPSQRMEQIRH
SLAEMERCFNALIELRRADPGEDLVSELIRTEALTHEELLSFLFGLVPAGVETTVYLLAN
TMLVLSEHPRELERVRENPTLIPRLIEEVLRYEPPGQSSRLRTTEDVVLSGVTIPRGSVV
VALIGAAMRDEGRFPQADRFIIDRENQQLAFGHGPHFCLGAMLARMEARLGMEALFSRI
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>JQX13_38215|KEGG|CYP152E5|[Archangium violaceum]|avm|DP

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SIREWERKGRLLVLLDEVQQLLCRVVCEWTGVPLPEAEVIQRTRELTALIDGSGGVGPRHW
RARLMRMRSEAWLGR LVSRRVAGRHAAP EGSALRTVAEYRGPDGKRLGPRLAAVELLNVL
RPTVAVARFVVFEALALHEHPESRAWLLEEEEDDDAYEHFVQEVRRYYPFFPFAARVRRD
FTWKGYHFPRGRRLVLLDLYGTNHDVRLWERPHEFRPERFRTWDGSPFSFI PQGGGDHHTG
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>JQX13_38560|KEGG|CYP1224J3|[Archangium violaceum]|avm|DP

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ASLEQWPVGKPFPLPRMMSLTIEILLRSVFGIEGKEELALFARRFRLVDSIASPLYLI
PALSGVDV FQKVPWLRASKMKREVDEAIYALIAHRAQPADPRRQDMLSLLLESRDEAGQ
PLTDRELRDALFTVIVAGYETTAIGMCF TVERLLSTPEALARVHEELERVVGDTELQAEH
LGQLEYLDAVIKETLRLRPV VPLVSRRTKVPFELSTYTLPPETMLVPGIALTHLREDIYP
EPDSFQPERFLGKKPDYAWL PFGGGSRRCLGMALSLFEMKVVLATMLRRAKLRLASKRP
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>JQX13_39850|KEGG|CYP1224J2|[Archangium violaceum]|avm|DP

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VTHASLERWPMARPFPLLDVMTLTLLEMLLRNVFGLETPEEIAAFSRDFSSLV DSTNSPL
RMLPSLIGMDLFTLLPWARASRLKRRVDAAIYALVARRRAEPRRPERTDVLGLLLESTHE
DGKPMSDQELRDALLTLIVAGYETTAIGLSFTTVERLLAEPRTLTRMHEELERVVG DDELG
PEHIGQLEYLDATIKEALRVRPLVPLISRQLKGPLELTHYTLPAAGVTVLPAIVLTHFRED
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>JQX13_41630|KEGG|CYP109N4|[Archangium violaceum]|avm|DP

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TREL LDAMLTRQEFDLMDLAVPLPIIVIAEMLGIEPERRLDFKRWSNAISQSVTLTVGG
LDLEWIATGIREIHAYLEAAIERRRQEPGN DLISALVESNEQQGGFLSSMDVIGFVRLLL
FAGNETTTNLIGNGT LALLNHPAEMERLAEDASLIPNAVEEMLRYDTPAQVIFRITTADT
E IAGTPIPKDSRIMLLLGAANRDPKFPDPDTFDITRDTQGHVAFGHGVHFCIGGPLARL
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>JQX13_41680|KEGG|CYP1347B6|[Archangium violaceum]|avm|DP

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TVHRIMRELLEQLASRHEMDLVKDLAYPLPALAIAELLGVPPEDRDRFWVWSEHLALYSS
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NACLILFAGHTTTTDDQLSNGVYDLLTHPDQFQMLREDMGLLRS AVEEMLRYTTSVPAITR
IASEDIQMHGKTIRKGMVFLVMAAANRDP SVFPDPERFDITRDSYHQKHISFGFGAHC
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>JQX13_41805|KEGG|CYP109R10|[Archangium violaceum]|avm|DP

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GLVAEMTAHDEFDLMDGLGSPVPTIIAEMLGVEPSRRRDFKRWSDSLVE SGAEIIRDGK
ASDKNIRLQEMLAYMTEIAEKRRREPRGDLISMLVQGGEGAEPLTPKEVNSFAILL LAA
GNETTTNLIGNALVALIRNPEAYEWLRRDPTIAACAAVCEETLRYDSPVLGLTRRTTQEV

ELSGGKLPADSTLVVMVASANHDPRKFPNPDRDFDPQRDITGLFSFGHGIHFCLGAPLSRL
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>JQX13_45100|KEGG|CYP167B11|[Archangium violaceum]|avm|DP

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AIERLRPEIQAIIVDEILDGVAAGRLDVVNEFAERI PARVIGSMLKIPKGREELFQDFTN
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NKQELLSLVAALIVGGFETT VH LIAFCVYNLLQRPEVLAQVKTEPELLKNFVEEVLRFDN
FGKLGISRYALEDVELGGVRIKKGQMLLIMLNSALRDESTFDKADVFDIRRNNTNASIAFG
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>JQX13_47220|KEGG|CYP1833B1|[Archangium violaceum]|avm|DP

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AISLLRHGMELSR L RDPALLETAVEELFRYDGPVQATGRVCTEDVELGGVRIARGQALVLL
LGSANRDPEAFSQPEALVLD R QPNPHLAFGWGIHACVGGLLAKAVVRLALCSLIEHAPGL
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>JQX13_47720|KEGG|CYP109N5|[Archangium violaceum]|avm|DP

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EITVELIDDMLRKDEL DL MEDLAAPLPVTVIAEMLGVEPERRREFKRWSDDAISSSNLSL
ADTDPSRLEVGVRALHEYMRQAIEERRRS PRGD L I SALVEAGGKEDFVTSNDLVAFCRLL
LIAGNETTTNLIGNGMVALLRNPAEWEKLVADPSLVPNAVEEILRYDSPVQGIFRETTQE
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> JQX13_49065|KEGG|CYP117E4|[Archangium violaceum]|avm|DP

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EGNALGSDSLIQNLRLLALAGHETSASVMAWLGIVLAQRPDLWEKLRDESMAAPGLPRSP
DELKRHPFAEALFREVLRMYPPVAFTAREATEDLVLHGRRVPRGTMITVPIGTYGYDPAL
FSEPEYFDPSRWMGRRVPPSAIETAAFGGGPHFCLGYHLAWMEVVQFAAAFARELTRGV
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>JQX13_51560|KEGG|CYP1286A2|[Archangium violaceum]|avm|DP

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>JQX13_51845|KEGG|CYP242A6|[Archangium violaceum]|avm|DP

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>JQX13_52240|KEGG|CYP1329A2|[Archangium violaceum]|avm|DP

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>MEBOL_000247|KEGG|CYP253D|[Melittangium boletus]|mbd|DP

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GGRLPTAEDVPRVLVYTRRVLDDETMRLYPPVYILSRKVVSDDTICGYRVLGGSMMLDVSPYV
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>MEBOL_000316|KEGG|CYP107DL5|[Melittangium boletus]|mbd|DP

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>MEBOL_000406|KEGG|CYP117E2|[Melittangium boletus]|mbd|DP

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>MEBOL_000745|KEGG|CYP264J2|[Melittangium boletus]|mbd|DP

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>MEBOL_000961|KEGG|CYP262F1|[Melittangium boletus]|mbd|DP

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>MEBOL_001720|KEGG|CYP167B10|[Melittangium boletus]|mbd|DP

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>MEBOL_001721|KEGG|CYP251V1|[Melittangium boletus]|mbd|DP

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PAGVEVLVSPIMSHRNPRIYPEPMRFDPRWLPERARELPRYALLPFGDGKHKCIGDMFA
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>MEBOL_001915|KEGG|CYP1284B2|[Melittangium boletus]|mbd|DP

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>MEBOL_002117|KEGG|CYP1492A3|[Melittangium boletus]||mbd|DP

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>MEBOL_002190|KEGG|CYP107DP7|[Melittangium boletus]||mbd|DP

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>MEBOL_002509|KEGG|CYP102M15|[Melittangium boletus]||mbd|DP

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>MEBOL_003675|KEGG|CYP109R9|[Melittangium boletus]|mbd|DP

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>MEBOL_003803|KEGG|CYP110R3|[Melittangium boletus]|mbd|DP

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>MEBOL_003931|KEGG|CYP253G4|[Melittangium boletus]|mbd|DP

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>MEBOL_003979|KEGG|CYP253S1|[Melittangium boletus]|mbd|DP

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EELNHQVLSVLPLPASLPLPGHRRRLRAIQVLDIVFGIIDARHRGAHASEDLLAMLMQA
RDADTGEGMSDRQLRDEVMTLVLAGHETTANALTWTFHLLLEQHPEAEARLAEVTRLLGE
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>MEBOL_004399|KEGG|CYP109AK1|[Melittangium boletus]|mbd|DP

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LVAGNETTTNLLGNVRRALLSHPDQRDLIREPALIPNAVEEMLRYDSAAQALFRKTTQE
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>MEBOL_004662|KEGG|CYP107DL4|[Melittangium boletus]|mbd|DP

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>MEBOL_004948|KEGG|CYP1506A5|[Melittangium boletus]|mbd|DP

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>MEBOL_005233|KEGG|CYP264D7|[Melittangium boletus]|mbd|DP

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>MEBOL_005971|KEGG|CYP242C1|[Melittangium boletus]|mbd|DP

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>MEBOL_006681|KEGG|CYP107DP8|[Melittangium boletus]|mbd|DP

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>MEBOL_007050|KEGG|CYP1347B4|[Melittangium boletus]|mbd|DP

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>MEBOL_007148|KEGG|CYP120G3|[Melittangium boletus]|mbd|DP

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>MEBOL_007173|KEGG|CYP107DP5|[Melittangium boletus]|mbd|DP

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>MEBOL_007319|KEGG|CYP197AA1|[Melittangium boletus]|mbd|DP

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VMAEHARRQLATWRDGEVRDNDMMRLTLGIVIKSLFDLELDGKAEAVGPSLARVMEHF
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GQHMSDPQIRDEVMTLMLAGHETTSINLAFCFHLLARHPEAEASLHRELDVLLGGREPTL
EDLPALPFTDSVVKEALRLYPATLGREALEDEIGGWSIAKGSVMMNPNPTVHRDARL
YEDPLAFRQQRWVDGLEKRLPRFAWPFPGGGPRLCIGMGFALMEARLVLATLAQRFRFER
APEDDVELLPSITLRLPKHGKVRVTR

>MEBOL_007543|KEGG|CYP167B6|[Melittangium boletus]|mbd|DP

MSPDSTQSHPPTVSFSPDAPGFAANPFPVLEELRKAAPLSYWKEGRAWLVTRYEEALAML
RDSKRFSTNRAHWEFASVSGIAAIIPELAELNNAGLFALSGADHARLRKLVSPALTPRAI
ERLRPEVQAIVDEILDEVSGQDTVNVVSDIADRIPPRVIGSMLKIPKGRETLFNRFTEAA
VKSFLPGLLRPEDVPALRADVQEGIALVRETIERRRNPLPDDILTTLIQTEEQDRLST
AELLSLVSSLIVGGFETTHLIGFTTYNLLKRPELLAQVLVEPDLIKGVIEEVLRFDNFG
KMGLARYALEDVEVGGVTIKKGQMILLMLNSALRDEAAFSQADVFDARRNTNSSIAFGYG
VHFCLGANLARLELQVVMNRILERFPTMSLVKEPSFGPHPVIRKMESLEVQLRSR

>MEBOL_007929|KEGG|CYP1284B4|[Melittangium boletus]|mbd|DP

MHAFSGQKLDKI PAHVPELVYEDNARDPRMLEDPHGRMRS LILEAPPIFFTPYNGGHW
FVTRKQAIVDITMNEPVYSNKISGEHSGEHKDSQPGLNLLPI SEDPPRHTAYRTPLNQPL
SAKSLAGLES AIRVMANELIDKVLAAAGRCDFLS DIAEPLPVTFLFKLAGMPTNRLAEFRH
LAVQAASATVDPATRAETFKQIAGIMAESIQRQEKREEDLLSRLLDKIDGRNPTFQEM
LGYSMLLFLGGLD TVVNMAMSGVVRHLARDQELQAKLRADPSLLPGAIEELLRLYGIASVP
RRVTRD TVCHGVQFKQGD TMLLLLPAANYDDAAFNPPEQFMLGRTEQHMSFN SGP HRCVG
LNLARLELKV FYQEWLKRVPPFR LDPQAPPRFMGGFTLAVTSLPLVWE

>MEBOL_007972|KEGG|CYP109R3|[Melittangium boletus]|mbd|DP

MDLLSRFDFFSPDVMRNPYPYFAELRDKAPLHYDAKLKAHVLSRYEDVAFVLKNHALFSS
TKIRIAGKLQEERASVKELGVSNSLVSM DPPVHTRLRGLVSR SFTPKQINAMEPRVRELS
RELVAEMTSRSEFDFMDALASPLPVTIIAEMLGIDPVRRRDFKRWS DNLIQSNNATLQSG
ETPEEVIRSAKEMLAYMTEVAEARRREPRGD LISLLVQEIDGVAALTPPEVNSFTTLLLI
AGNETTTNLLGNALTALIRNPGEYEA FRRDPS PAACSAICEETLRYDSPVIGLFRRTTQE
VEMSGGKLPADTSVMVLLASANHDPRKFPEPERFDPTRDTHGLMSFGHGIHFCLGAPLSR
LEAPVALRELMERAPRLGFS PRQPQDIDYGGSF FLRGPKSLWLQKN

>CYFUS_000165|KEGG|CYP110R3|[Cystobacter fuscus]|cfus|DP

M TTPQLPSGPRITPVQTFRFLRDTTRFFLDCRARYGDPFTAPLPVGNVVVTGDPEGIRDI
FSADPALFEPLGQLPLAPAVGDN SLLL MAGQRHKRERKLLMPPFHGERMRAYGQLMREIT
LRSVETLRPGGPFRAQELTQSISLEVIIRAVFGIEEPARMRRYREVLVGYMESYTPLMM
AVPLRRSFGGVPWARFQRYVTELDQLLTEELSTRRGHEVGHTDILSLLLAARDEEGQPM
TDAELKDELRTLLIAGHETTAIGMAWALHHLHRAPGTMQRLLLEELAPLGPEPEPEALVKL
PYLTAVCDEALRIHP IVPVGRRTVAPFTLRGRELPPGTGVMAAICLAHVDPVLYPEPDS
FRPERFLERKYS PF EYLPFGGGARRCIGAAFAQYEMRTVLGSLLAHRFSLANDT PERPV

RRNITIGPARGVEMVYEGPRRGALA

>CYFUS_000318|KEGG|**CYP264D9**|[Cystobacter fuscus]|cfus|DP

MSGRINLLAPEVRANPYAVYAE LRRHAPVCQVDPGGYWVITRHDDVVA AFKNPQLFSSTG
VRMATKPEWLGHNPFADSMIGQDPPRHTRLRNLVNRAFGPPALARLEGRVRHYAEAIVAR
IPEGREVDVDAFTLPLPASVIGELIGLEPSLHSHCKRWADDLTSISANPQDEKRREEIR
AAVRETEAEMARVLALRRSEPREDLVSELLQARVDGQSLSDAELMSFMFLLLVAGLETTI
HLLGHCVRVLMERPDLARLRADRSLLPRFIEEVLRYEPPVQAFGRLLTAEAEELSGVRI P
AGAKVMLLIGSANHDDARFPDGRFDMDREGVNNLPFGHGIHFCLGAPLARLEARIGLEV
LLSRFERFTPAGPLEWNHSFTVRGPRVLPVIAHGSA

>CYFUS_000663|KEGG|**CYP167E3**|[Cystobacter fuscus]|cfus|DP

MLQKTPTPDHGPDFVLDMEDPAFVHNPYPTYAWLREKAPAYRWKARGDAIVFSRHKDVRA
LVLDRRFSNDYRMWEFARKEEWPAEHA EYKSIMDNGLFGLADADHLRVRKLVSPAFTPRA
AERMRDEIQKAVDDIIAEQVKGERVDLTTITEPLPMRVVSDMLKIPEDLRGEFRAFGLAS
IRSSVLF TKSEELFALIAPMPRWIRMLREVI AERRANLLENDLLSTLITASDEGQKLTEE
EMISLVHALIVAGSDTTVHAANWALYSLLRHPDQFALLRDEPSLIRNTIEETLRYDLFGK
GGLPKFAREEMEFAGTKLRKGMVMPFI PAALHDPEVFP EPERFDIRRDVSQTI AFSAGQ
HFCLGAALARQELDLVVGTLVRRFPHMRLS QEPEFVPHPI MRALTRLEV TLS

>CYFUS_000749|KEGG|**CYP253G4**|[Cystobacter fuscus]|cfus|DP

MNNSAPLPPMPPGHWLWGHLPERESDPLGLYLGRALLGDVVRFRMGPIIYVEQLTHPDHV
KYVLADAPARYTKGPI FHKTRPLVGNGLVTAEGDFWKRQRRLAQPSFHRERLAGLAGVMT
ETAAEVLAQWEPRVRAGEPVVFPPEMMRLTLLVVVRALFGVDVAEHTRELGESFTTAEV
TNERIISPLPYKPWLYRIPTAKNLAFQ RAMVPLNRIVEGIIAQRRARGPADESQDLLGML
MAARDADTGDTFDDVQLRDEVM TLLLAGHETTATSLAWAFHLL EKNPEQEALLHEEVDRV
LDGRIPTLEDVPKLRYTSCVFEEALRLYPPIWAI PRVAEEEDVVSGYRIPKGD LVLLVPY
VTHRHPDFWPDPERFEPT RFLPENSKQRPRWAYLPFGGGQRQCIGNNFAMMEAQFILAMV
AQRFRLRGTGAPVTAEAHVTLRPHGTM PMHATRREKQPQLQSA

>CYFUS_001301|KEGG|**CYP253D3**|[Cystobacter fuscus]|cfus|DP

MTDTS AAPRAPAPRIPTGPRGLPLIGVVREARKDILGWFLRTAAEHGPVAQYRFG LGRSY
LVSHPDGIKHVLQDNVKNYTKDHSYAMVRRVVG DGLLTSQGD TWMKQRRLAQPAFHRRAR
ISAMADQMVRATVELSEQWAEAQRTGEPRLGAVDMMSLTLRIVGEALLGADV RADTEAVG
RAFTVISEQTVERFRSLRFIPVLP TAYDRAFRDANRSLRQVVTRVIAERRAHTEDRGDL

LSMFMLARDEETGERMDDTHLQDEVLTMLLAGHETTANALSWTWALLAQNPDAERTLHAE
LDAVLGGRPPTVEDIPRLVYTRRVLDLTLRLYPPAYALSRKVVEDDVICGYQVRSGSSVD
MSAYMTHRLPEFWPDPERFDPDRFTPEKVAARPRYAYFPFLGGPRQCIGNNFALMEGTLI
LATLAQHHRPRLVEGYTPRPEPVITLRPSGHLPVIRITPR

>CYFUS_001363|KEGG|**CYP264A6**|[Cystobacter fuscus]|cfus|DP

MTTQRVNIIAPEFRADPHPRYAELRRNAPVTQVEPAGFWAISRYEDVAFVIKPNQLFSSQ
GFKAAWQPEWVGYNPLANSMLVLDGVDGPHARMRTLVSRAFNASAI SRLEVRI RQLANRLVD
ELA EKGEADAVSSFAMPLPAFVIGELLGLDVS LHHRFKDWSDDITSVTPVPHNPEHAQRT
LTAITDATRYISEII EARRRSPADDLVSDLIHAEVEGQSLTDREIVDFLVLLLIAGLETT
VHLLAHSLLFLAERPEEQARLRAQPALVPGFVEEMLRYEAPVQALLRVATSDVTL SGVKI
PQGDVVLALLASANRDERHYTEPDRFDVHRGQPGLSFGYGIHYCIGAQLARMEARCGLEA
LLSRFSGFTRTSTELSWGQAITVRGPQHLLPLRFIPA

>CYFUS_001619|KEGG|**CYP107DL6**|[Cystobacter fuscus]|cfus|DP

MATNPVNEQTTKAAASGPTPQATCPMKALREAPRCALLDKESPEFLAHAYATYADLRTO
APVVRTSFAHNFADAVLPGGTKRPESGSHPAKERLRFVTRYDEVVEALLDERLSSDFRTSL
TPEQRANLQYMPEEVRPIAYSLLMLDPPDHTRLRKLQVNFARTMEMLRPRIQRIADTL
LDQVERAAAERGEREGERRMDLLHAFAYPMPITVIVSDMLGIPEDRSRVHGWAE SLLGAD
RRDAAMDELRRSSLREFARYLDGLFERKRREPAEDMISQMVHAQDEGDKLNHQEMVSMVF
ILFFAGHVTTVNLI GSGVVAL LTHPEQLERFLADPTNLSKGAVEETLRYWGPVDYMSTPR
IIKEEMELAGTHLPQGEKLSVGLASANRDPQHFPNPDVFDITRPNHRNLAFGKGIHICL
GAPLARLEGQIAFETLFRRYPRMRLEVPFESLRWNTGSGLRGFRVPRF

>CYFUS_001993|KEGG|**CYP1492A2**|[Cystobacter fuscus]|cfus|DP

MNPALAI DTPRPLKEYAPSTLELLKAI RREGFLGWMNTWRQHGDLLRIRMGSSQLVLT
HPDHVRHVNVTRRESYDKGESYDVLRELLLGNGIVTATGEDWRWQRRLMAPFFT PRGVEK
FYPIFLSDTQQ LIERWRSQ LQSGR PVEMLD EMMRVTASVILHSVFSTESDEALLRIKNS
IETMVSHISETGMRPVQPQWVPTPGNLRFRRAHKLVTAYIRELIARRRAI PTEQWPDDL
LTKMMTIRDEETGRLMAEQLLIDNGLTMFAAGHETTARTLSFLWYALSQNPEVERRLHVE
LDSVLGDAPPTLNDLKKLPYTLQVVKEVLRLYPAAPMYARDAVADDEL DGVRI PAGTRMI
VFSYGTHRHPAFWDEPERFDPDRWLPEREAARHAHAYHPFAAGPRICLGNNFSLLETHVM
AAMLARRFKLRLKPGHVPRIDMFGTLGSSNGLPMLIEAR

>CYFUS_001994|KEGG|**CYP1284B4**|[Cystobacter fuscus]|cfus|DP

MNAFNGQKLDKI PAHVPELVYEYDIAGDPRVLEDPHARMRSLILEAPPIFFSPFNGGHW
FVTRKKAIVDITMNPEVYSSKNPGEHGKEATGGLSLLPI SVDPPQHTLYRTPLNQPLSAK
SVAGLETAIRAMTNELIDKVLAAAGRCDFLPDIAEPLPVTFLFLKLAGMPTNRLAEFRELAL
QAASATVEPATRAETFKRIAGILAEETIEARQEKRDDLI SRLLDANLDGRNPTFQEMMGY
SILLFLGGLD TVVNALCFGVRHLARDQELQAKLRADPSLLPGAIEELLRLYGIASIPRHV
TRD TVCHGVQFKQGDALLLLPAANYDDTAFPNPEQFILGRTEQHMTFNTGPHRCVGLNL
ARLEMKVYFQEWLKRVPPFRLLDPQAPPRFSGGFALALTS LPLSWA

>CYFUS_002491|KEGG|CYP264D7|[Cystobacter fuscus]|cfus|DP

MSGRINLLAPEIRANPYPAYAELRRNAPVSQVDPGGLWAVSRQEDVMHVFKNPQLFSSQG
FRQAYRPPWISNYPLADSALVMDPPRHTQLRALINRAFGTQVVTRIEPRVREFAQRIVQA
LPDGQEVNFVEHFSVLMPMYVIGELLGLSPEVQPRLLSWVEWLGQFTGVGPADTARQEAV
RATVNEARGHFEQVLTERRRNP GDDLISDLLRARVEGESLSDTDLLGFMFLLLVGGMETT
IHLLSHSALRLQLQPELMRQLREQPSLLPRFIDEVLRHETPAHGVMRLTSEETELGGVRL
PKGTRLLMLMGSANRDEA QHPDPRDFDMNRTQSNLPFGHGIHFCIGSQLARLEARLSLEA
LLSRFTHLTAGTQSIQWNSSLVVRGPTRLSLIPHEN

>CYFUS_002676|KEGG|CYP105EK1|[Cystobacter fuscus]|cfus|DP

MTDSYPLPKDWQHPLDPPPEYKRLRKEAPVCPVRTWDGNTPWLITRYEDVLAALGDPRLS
LDSSLPGFPHTSPASAARQSRPLPFPFLPEAEYRAQRAMLVPEFAPRRMEALRPRIQQTV
DEVLDAMLAGPRPADLISAFALPVSMRVICDLLGVSREDADRLHVISRTIGSRASSREVA
EKALDELDTYFRRLVEENLREPTDTLVGRVVAEHVQPGRLSVPDATAMFHALFYAGHGPS
GYMVGMGVLAALLHPDQLDRFRALET PDALSAAVQELLRYVTVSHMGRQRAATEDVTIGG
QLIRAGEGVLAQPD SANRDET VFPEDRLDVHREPYRNFAFGHGIHLCTGRTLAIIELEV
TFHTLFRRI PNRLAAPPLEQIRFKK DENLIGAHHELPVTW

>CYFUS_003078|KEGG|CYP120G3|[Cystobacter fuscus]|cfus|DP

MTAQADPHAPSPENLPLPPGRTGLPLLGETLDFLRSSRAFTEQRRNQYGPVFRSHVLGSP
AAFLTGPDAIQWIFAGEGKYLKNRWT PGVRRLLGANSLSLLEGEEHLERRLLAPHFSYA
TMRGFVPAIESLATRHFERWAALPGDFTLWPAMRELAF EIALSLIFGQDTVDPFLMRHF
QAWTAGL FVPLAVNLPWTKFGRALAAKKAMITYLDQLVAERQKRTEQPPDLLGSLLRHRD
GEEPLPRETIVEELQ LLLFAGHDTTVTATSNLMLLLAQHPDVLQKGREAVADMEGPLTLD
GLRAMPYL VQLIHEGMRLIPPIGGAFRVTT RDVAFKGFRI PKGWMVPVSIRTAHAGDHP
LPERFDPERFGSENNEQRKPGTFIPFGGGPRICLQGHFAMVEMSVMLALLLKH YTWELVP

GQDLSYLLVFPFQPRSGIQLRLRRRS

>CYFUS_003193|KEGG|**CYP251V1**|[Cystobacter fuscus]|cfus|DP

MDTVTPLPTATAPEVPGGLPLLGHALRLLRLPIAYLQSLREFGDIVQLRIGSSPVYVVT
PEFIHQVLVTHADSFERGRVFDKATAAIGKGLIVSNGTFHRQQRKLLQPGFHRPRIHGYM
EIIHRQAEAQIAGWSPGARISLREEMHRLTLNAVTRTLFGANTEERIAAEIGDYIDAANS
WVGLHTVLPGRFFERLMPVNRFAFERKKARFDEIINTFIESRRADGRDQGDLLSALLASQ
DDETGKMSDEQLRMEIAGLVFVAGSETTATALTWLFHEVGRHPEVEARIHAEVDAVLGGR
PVTTEDLPRQYIQSVISETLRRYPPIAWLLMRRATRDVELAGTLLPAGAEVIVSPMMVHR
NPQLYPEPLRFDPRWLPERARELPRHAFLPFGDGKHKCIGDYFARTEMVIAVATIAARW
RLVVPVPGHRVWEVPRSVLRPNQVLMTAVPRSAAPVPEENH

> CYFUS_003263|KEGG|**CYP117E2**|[Cystobacter fuscus]|cfus|DP

MQMOTLSNMLERLPMKETHRLGIPILPGGLPLVGHAPFNLGDTLTLFLRAAEAKVGPIFWM
RSFGSEMQLVCMGEPGFELLKNRVTSSEFIREQAPEFIGDALLSQD GARHRNLRTPMMSGP
FTPRGLSSSGAATLSAEVIEASVASLPASRPFSLITETQKFALDIIFRVMGIDRSEIQEF
NTNYREFTLGAFPLKLDLPYSPRWRARRGRAWLDARFSSLIAAARGRPMPGTL SAMLAA
RDTEGQPLKEDDLISNLRLALAGHETTASTMAWLGLVLAQRPDLEKLRREEATAAPGLP
RSPEELKRHPFAEALFREVIRLYPPVSSSTAREATEDLTLHGKLVKGTMITVPLGTYGYD
PANFPEPEKFDPSRWMGRRI PPSIETAPFGGGPHFCLGYHLAWVEVVQFATAFARELSR
RGRVQPQLAPGVAPPKLRYL PFGQPPKKALIEFVPPV

>CYFUS_003343|KEGG|**CYP1284B2**|[Cystobacter fuscus]|cfus|DP

MSAFSGKKLDKIPAHVPELVY EYDNARDPRLLEDPHARMRSLILEAPPIFFTPYNGGNW
VVTRKKAIVDITMNPEVYSNAFLVSGHQSEEHAGEHKEAQQGLMLLPVAADPPRHTAYRA
PLNQPLSAKSVAGLETAIRDMTNELIDKVLAAAGRCDFLSDIAEPLPVTLMKLAGMPTDR
LAEFRHLATQATSATVTPADREVTFKRIAGILAETIKARQEKREEDLISHLLDANINGRN
PTFQEMLGYSIALFLGGLETVVNALSFGVRHLARDQELQAKLRADPSLLPGAIEELLRLY
GIAS TVRQVMRDEVCHGVQFKKGDTVSLLLPAANYDDAAFDPDPEQFILGRKEQHQT FNTG
PHRCVGLNLARLEMKV FYQEWLKRVPFRLDPEKKPRFVGGFNLAIASLPLVW

>CYFUS_003436|KEGG|**CYP102J22**|[Cystobacter fuscus]|cfus|DP

MTPSLLPIQP RPWPLVGNLTDLDAEQSILSIMELARLHGPIFRLVFFGQSLIVVGSQEL
VNELCDETRFGKLVHSSLRELRAIGGDGLFTAHTTEPNWGAHRILMPAFGPLGVRDMFA

PMLDVAEQMLLRWERFGAGAVLDVDPQMTLRLTLDTLALCAFDIRFNSFYQDALHPFVGAM
VDGLHEAGVRADRPEVLNRLLLPSARRYAEDIRLMHAVADQIITERRRDPDAGQKNDLLG
RMLSARDPVTGETLSDENIRYQMVTFIAGHETTSGLLSFALYLLLKNPRVLHAARARVD
EVLGGDTPRLEHLPSLRYVEQILMETLRLWPTAPAFAVRAYEDTVIGGRYAITPQDAVMI
FPPILHRDPKVVWGPDVEAFRPERFDREAEARLPPNAWKPFNGQRACIGRPFALQEALLV
LSMILRRFDLIEDDPSYTLKIKETLTLKPEGFRIRARRRDLAALKSRSPVPGAPRGTAP
EPTPALARTEGPRTPLLVLYGSNTGSAQAFQQRIGSDAPSHGYSVRVAPMDEHAGRLPTQ
GAVIVLTASYEGQPPDNARQFVAALEAAPAGAFAGVKYTVFGCGNRQWARTYQAVPLQVD
ALLEQAGATRLKPRGEADASEDFFGAFDAWYATLWPALAATFGQEAAGTSEAPRLQVEVV
RDNRSTLLRQEDLGAGQLVENRELVNLASPHARSKRHLEILLPEGMTYRAGDYLAVLPRN
PGVSVERALRRFGFAQDSQIVHKEGARLTALPTGYPIAVSELLTSYVELGQPATRAQVE
TLAKATRCPPPEKQPLEALAQAELYRREVLDKRVSVLDLLERFPACELSFAAFLEMLPPLK
ARQYSIASSPLWNEHRCALTVAVVDAPAYSGQGRYLGVTSNYLAALAPPTRVSVAVRPSH
PRFHPPTDPQEPLVMICAGTGLAPFRGFLQERALQAREGRRVGPALLFFGCDHPDADFLY
REELEAWQRAGIVDVRPAFTYAPEGEVTFVQHRVWKDRADVAGFFQRGATVYVCGDGRRM
APAVRETLVRIYEEATQVPREEAEQWALRMEREQGRFVADVFA

>CYFUS_003477|KEGG|CYP262B4|[Cystobacter fuscus]|cfus|DP

MSETTSQTSSDRSLPPRVSSLPVGLPRLIANPLSFMEQAQREHGDI FSMDLGFTQVIG
LCHPRYVHHVLEHAHKYSKGGPMWDSMRTFMGNALPMSEGAFWKRQRRMIQPSFHHQRV
SLMTDTMVEAIDECLLEWDLAALLEGKPFDVSVALSRTMTVLVRTLFGSGLDKDDAEKVA
QAFSFILEYFIAGMVTHSLPEWMPVPGRQRYRESIKMIDEIMRRLIERGREQASGEDNLL
SLLLQAVDGESEGERMTNEQLRDEALGFFIAGYDTTAAGMTWVLHALTQHPEVTDKVRVEL
DAVVGTRRPGFADLMRMPYTRNVLQEALRIHSPSVWLPRLSVVEDEIDGYRIPPGVMMVI
FTRLIHRHPGIWDDPLTFDPDRFTPERSEGRHKLAWLPFGSGQRQCIAKEFSLLEGMLIM
ARIVSRYELSSVPGRLPQERVSTNLRTKDGMWLNLRPRLPQAQVPRIQLSGTA

>CYFUS_003785|KEGG|CYP109AK1|[Cystobacter fuscus]|cfus|DP

MQASDYNPLSSTVQADPYPYAALREHSPYIFNEQLGWYIVSRYEDVVAITKNPAVFSSA
RAIVQPEKLDAAEKVAPISVRSFRRGILIGEDPPTHTKTRNLVTRAFTPKRIAEMEPRIR
QIARELISQLPRSGEFDLIKDLAEPLPMIVIAEMLGVEPERRHDFKRWSDDAIAISFALV
KGAELSGLEHSSREMADYMARALEARRQQPREDLIQALLDNGVREGLLSVDDASAFCRLL
LVAGNETTTNLLGNGMRALLGHPDQLERLTREPSLIPNAVEEMLRFDSAAQALFRKTTQE
VEVSGVRI PAGASVLLLFGSANRDPKRFQDPDHFVTRNVAGQVAFGHGIIHFCLGAPLAR
LEAKVALEELLTPDRQLSLVPGQRLLENVAHFTLRGLKSLRLRTEPARSARASA

>CYFUS_003950|KEGG|CYP1335A2|[Cystobacter fuscus]|cfus|DP

MTPPTDPYQAVTHPDPYPYASLCARGGLQRIAGFEPWIAADAATVRAVLTSEACRVRPQ
AEPVPSHLLGSPAGALFGRLVRMNDGAPSAAVKQALASALPTVMRAVDAESRRWSARLFS
EPRLSLLPEKALQLPVFVLGCLLGFPEEFLAESVREVDAYVRSVTQPGARTEGALGAVRL
VERVTACLQAKPRAPELLGAFSSRMREEGGALEALVPNAVGLLTQAYEATAGLLGAALLA
FARMPALREQLARGECSIDDVVREARHESPIQNTRRFIHACATVANQELEAGATVVVVVL
AAANRDPRVNPQPDVFLPRRPERQTFTFGLGAHACPGRELAVTMVSAEVERVLASGLELT
PLSKSITWRASTNARILGGLQ

>CYFUS_004102|KEGG|CYP167B9|[Cystobacter fuscus]|cfus|DP

MSAQQTNPSENREPEVQFNPYAPGYDVNPHPALEKLRVAPIFYWEQGRCWVVSRYEDGLT
VLRDDKRFSPNRDDWEFASVLGSDALIPEMEELNKNGLFALGERNHARVRLVSPAFTPR
ATERLRPEIQAIIVDEILDSMAAKGRNLNMVHEFSEIRIPARVIGSMLKIPKGNEELFLDFTN
AVAKSVFAGALAPEELAPLRRQIREGIVLVTTETIEDRRRNPNQENDILTTLIQTEEQGDKL
NKQELLALVSSLIVGGFETTIVHLFSFCVYNLLQHPEVFAELRTRPELTKNLVEEVLRFDN
FVKMGPARYALEDMELGGMPIKKGQMLVVLVGSALRDERAFDKADVFDVQRNASAGIAFG
HGAHYCLGANLARLMGQIAMGTLVRRFPPELRLVKQPSFGPHSLMRKMEVLEVDLGSPSA

>CYFUS_004514|KEGG|CYP102M6|[Cystobacter fuscus]|cfus|DP

MSKPSLSTTIPOPRSRPLVGNVPDVGFTPLQNMMKLAREFGPIFRLSFPGENFLRVISS
YELVADACDETRFEKMLGQVLLQLRDLGGDGLFTADAREPNWGAHRLMLPAFSPAAMRN
YHDGMYDVADQMLTRWARFGPDTTIDVSDNMTRLTLDTIALCGFDFRNSFYQREMHFV
ESMVRALAEAGDRTRRVPLQTQLMLRTQRQYQSDLQYMYEVVRELIVRRRALPPEEAPKD
LLGLMLEAKDPLTGEKLDNRSQMTFLIAGHETTSGLLSFAVYFLLHYPEVLQKAYE
EVDRVLGSEAPRFEQISQLQYIDQILRETLRLWPTAPAFTLHAKADNTLLAGRYPVGVKD
TLMVLIPLHRDPTVWKNPERFDPERFAPEVRDSIPTHAWKPFNGMRACIGRAFALQEA
TLVLGTMLQRFHISTPEPYTLRIRETLTLKPDGLKLRVRARKPVSRAAARRAPTAPVA
SSSQPTEKTSSTHGTPLLLLYGSNSGASEAFARRIASDGLARGYTAKVAPLDEYAGKLPKE
GAVVIVTASYNGQPPDNARAFHTWLSNVPAGALQGVRYAVFGCGNRDWGETYQAVPKFID
ERLSAAGARSLLSRGEADARADFFGDFDYWYAPFWTRVGEGLGVASSEVDAGPRYTVEVV
PPVSAELVKQNKLELATLVDNRELVDMTSPFGRSKRHLVFKLPQGVTYAAGDYLAVALPEN
HPELVERAARRFGVSPDATVILGSARGDQGSLLPTGRPVLVRELLGRHVELSAPATRKDL
ERLAEKNPCPPHAMHLVALARDAERYKKEILDKRVSVLELLEQYTSCILSLGDFLELLPA
MRVRQYSVSSSPLADPTECTLTVAVVDAEAWSGQGRFRGTCSYLARLRPGEQVAVAVRT
PNVPFHPPASNATPIVLVAAGTGLAPFRGFLQERALRHARGEAAAGPALFFFCDHPEVDF
LYREELAQWEREGVVKVLPAFFRQPDGDVTFVQHRLWKEREQVKALLDQGALLFICGDGR
LMAAARETLARIQEQKVGCSSEALAWLAAMEKQGRACDVFA

>CYFUS_004527|KEGG|CYP167B8|[Cystobacter fuscus]|cfus|DP

MSHEQTKSETKSCFPNPNAPGFDVNPYPMFKELRTQTPISYWDQGHGWIVTRYEDVIAAL
RDNKRFSTNSADWEFASTMGTAALIPERDELNRANLFSLPDADHTRVRRLLVSPAFTPRAV
EWLRPDIQAIIVDELLDAAEAKGTINVVSDIADPIPARVMSSMLKIPKGREVLVQRFTEAS
IKSLLPSLIPPEELVTVREAIAREGIVLIRETIEERRRNPRENDILTTLIQTEEQGDKLST
PELLSLVASLIVGGFETTIVHLIGFTLSNILRRPELFAQLKAEPELVKNVLEEVLRHDNFG
KLGTRYAREDLELGGVKIKKGQRLFLMTNSAMHDEAAFPHPETFDVRRNNTTTIAFGNG
MHFCLGVHLARLEGRIAVDTLLKRFPMKLVKPPFTFGSHPVLRKMETLEVQLRARS

>CYFUS_005195|KEGG|CYP107HV5|[Cystobacter fuscus]|cfus|DP

MPTITPPDFSSQQFKANPFPFYARLRQEAPVYHFTSLTKEPTWLVTTRYEDVSQVLKHASL
SKDVFGAAGAERRAQMPWLLKIFEPVSNMLSKDPDPDHTRLRSLVHKAFTPRLIEQLRSR
VQALSDRLLDEAARKGSMDLVSEYALIVPVTTIAEMLGVPPSDYRKFFQHWSNRLISNTSL
WDVILSVPSVVMFTRYLRQLIARRRSSLGDDLLSALIQAEEAGDKLNADELVSMVFLLLV
AGHETTUNLISGGTLALLQHPEQLERLRKEPGLIAPAVEELLRYASPVEVSTERFTKEDI
TVGGVTIPRGHLVFAAIGSANRDERQFKDPDTLDLGREPNRHLSFGMGIHYCLGAPLARL
EGQIALQTLVNRFPKLRRLATSAQSLKWRGTGVLMRGPQRLPVVLS

>CYFUS_005203|KEGG|CYP1347B4|[Cystobacter fuscus]|cfus|DP

MQSTVALVGMDRNPVSPQNLNNPIPLYHELREHEPVHWSEPLQAWVVTRHEDVMACFRDP
RLSAERWKFFEYQIQGLEPETIREFMETTRDQMAMRVGPEHTRVRRQASAGFTPMKLEEM
RACIHHTMAELLEGVRRERHGMNLAQEISYPLPTRVIAELLGVPAEDRDRFRWSDTLAEF
AAPAAGASMLGAARRANQAMMEMKAYFLPLIEQRRAHPTPDALGMMVQAEVGHMTAGEL
VANAILLMFAGHTTTTDDQLSNCVHDLTHPEQLQVLREEPERVRAAVEESVRFHPAVPFI
FRVAVADVVELRGRLIHAGDVVFLGMAAANRDPRAFPEPDRFDITRDHTQHRHLSFGFGTH
HCMGAGLARRELETGITLLEHLPLRLDETRPARLKCHSLNFRGFDVLPVRW

>CYFUS_005279|KEGG|CYP107HX5|[Cystobacter fuscus]|cfus|DP

MVEAVRVNLQREFESPEARANPIPVYAKLRKLGVLHSTALYEGGFVLPVRYEEVSVLKD
PRFANDRRNVPGGTSMDRWWMPAILRLLVSSMVLKDPDPDHRRLRNLVQKAFTPIMVENLN
GRVEQITEELLDAAVRKPVDLMEEFALPLPLTVISEMLGVPEPDRINFRKLIKVLDP
SVSPIAFIRNYPHMLRLNRFLRRLVNLRRREQPGNDLVLTALVQAEEGDRLSEDELI SMIF

LLLFAGHETTUNLIGNVLAALVRHPDQLQKLREQPDLIDSAIEEMLRFTNPVGVAPRFA
KEDVEIAGVRI PKGS AVTLLIASANLDETAFPNADKLDITRSPNRHVSFGYGIHYCLGAP
LARLEARVAIPALLQRFPRLAVPAEKLWRPNIGLRGLEALPLSVSPASSAAERSAA

>CYFUS_005395|KEGG|CYP264A5|[Cystobacter fuscus]|cfus|DP

MTQINLMSPEVLTNPYPYAE LRRLSPVCQVEPHGMWAVSRYEDVLFVLKNPSLFSSSGF
TVAWQPAWVGYNPMANSMITRDPPQHTRLRALLLRAFGPATIARLEPRVRATAERLASGL
VDGADFIQTLALVPAYVISEILGLDHQLLPYFKQWSDDIVAITPSPASPEAAERIRGTI
AKLTEYVGKVI EERRRAPADDTVSDLLRAEVEGQRLTDVEIKDFLILLIAGLESTTNLL
GNSLLFLADHPEMMAHLRAEPLIPSFIEEMLRYDGVAPGVPRLAASDVTLAGVTIPQGS
MVFPLMSSANRDERKFPDPDRFDLHRGSQGGLAFGQGAHFCLGAMLARMEVRIVLETVLA
RFQRVERLLGNIQYQCALTTRGPVALPLRYIPVGG

>CYFUS_005459|KEGG|CYP1011E3|[Cystobacter fuscus]|cfus|DP

MESVARPSVDVKELSTPRSSIKFNMFDPAFHADPYVYARLREEEPVHRTIMGAWI ITR
YADV KVLRLDNNFGVFDIPTRIERKSPFLERKKIGELRTLASAMRRWMLCDPPDHTRLR
SLVNRSFTPTAVESLRPRIQETVDQLIARVRSSGRMDIVNDLACPLAVTMIASMLGVPEE
AHSSVTRWADGLSRVLDPLRSLEQYAEMNNVAQEF LAYFRELFAERRRNPKNDLISSLIA
VTDQGDRLTEDEMLSVCM LMFIA GEKTTVNLLGNGMRALLLHRSEFERLRQDPTLIRGAI
DEILRYDSPVQLNTRVPKKDVVLHGQTI PAGDLVYFSLGAANRDPAQFEQPDFTDITRRE
NRHLAFSGGIHYCLGAALALIEGQIAIGTLVREFPDMALVPGETEWMKEIIFRGPQTLPV
TFTP

>CYFUS_006003|KEGG|CYP109R5|[Cystobacter fuscus]|cfus|DP

MDLLSRFDLNPVEMRNYPYFAEMREKAPLHYDAKLQAHVLTRYEDVSYILKNPALFSS
ADVRVAGKHQKERSQESGLEGVDSLLTTDPPVHTRLRGKVSRSFTPKQISAMEPRVRELS
RELVAEMTASNEFEFMGLASPLPVTIIAEMLGVDTSRRRDFKRWSDAIANSNGNASFTGK
TPEDVVRNAKEMLAYMTEVAEARREPRGDLSLLVQENEGQEALTPPEVNSFAILLLLA
GNETTTNLLGNALTALIRHPEAYEWLRRDPTQAACA AVEETLRYDSPVITVVRRTTQEV
ELSGGKVPANTTLFAVVSANRDPKFPDPDRFDPRRDTTGLMSFGHGIHFCLGAPLARL
EAPVALQELMARAPRLGFSRQPEHIDYGATFALRGPRVLWLQKN

>CYFUS_006004|KEGG|CYP109R3|[Cystobacter fuscus]|cfus|DP

MDLLSRFDFFNPEVMRNPYPYFAEMREKAPIYYDAKLQAHVLSRYEDVSFVLKNHALFSS
TKIRVAGKRQEERASVEELGSVSNLVTTDPPVHTRMRGLVSRAFTPKQISALEPRVRELS
RTLIAEMTASPEFDFMEGLASPLPVTIIAEMLGVDTSRRHDFKRWSDILIHSSRAALQSG
KVSEQVERSAREMLTYMKEVAEARRREPRGDLISLLVQETDGVAALTPPEVNSFTVLLLI
AGNETTTNLLGNALNALIRHPEAYEWLRRDPSAACAABAEETLRYDSPVIGLVRRTTQE
VEVSGGKLPEDSTVMVLLASANHDPKFPDPERFDPRRDTNGLMSFGHGIHFCLGAPLTR
LEAPVALRELMERAPRLGFAPRQPEALDYGGSLFLRGPRSLWLQKN

>CYFUS_006005|KEGG|CYP109R5|[Cystobacter fuscus]|cfus|DP

MDLLSRFDFFNPEVMRNPYPYFAEMREKAPLFYDAKLQSTLVSRYEDVSYILKNPALFSS
AQIRIAGKLQTERNQDAGLEGVDSLTTDPPVHTRLRGRVNRAFTPKQISALEPRVRELS
QECISEMTAHNEFEFMSGLASPLPVTIIAEMLGVDTSRRRDFKRWSDALVNSSNASITGK
TPEEVIRSAKEMLAYMTEVAEARRREPRGDLISLLVQESEGEALTPAEVNSFAILLLLA
GNETTTNLLGNALTTLIRHPEAYEWLRRDPSAACAABIEETLRYDSPVLTLSRRTTQEV
ELSGGKVPADTTLMVLVSSANHDPKFPDPRDFPRRDTAGLMSFGHGIHFCLGAPLARV
EAPVALQELMARTPRLGFSPRQPENIDYGASFFLHGPRSLWLQKN

>CYFUS_006176|KEGG|CYP242A4|[Cystobacter fuscus]|cfus|DP

MTTTTAASLPSYDLFTPEMMANPMPTLHRIENPLVWSPQLNAYVLTRYADILAALKDR
RLASSNMANWMDLLTPEQQQELLPVRQSIQLWMGHTNEQDHLRFQLLLKRYFTPGTVDAL
RPRVRQLTEELLDAEPRGGMDVVEELAYPLPANVIAEMLGMPTRDREKLQAWSRDITAL
FQRSDIHQLRRSQRSVLEMQDYLRPLLEERRRAPSEDLISVLLAASKEGTLSEEEIVSNC
VLLLFAGHETTANLIANGLVLLFEHPDQFEALKARPELMATAVEEMMRCDGPASVISRVS
IEPVEVCGRSFPAGQTFYLALGAGNRDPEVFPDPRFDITRKNRHLGFGMGAFYCLGAA
LARMEADECFRILLRRFPNVRPAYQQPDWQVSPPLGHNLSLQVKF

>CYFUS_006207|KEGG|CYP1387A1|[Cystobacter fuscus]|cfus|DP

MSSPSSPRPEANASGCPFSARSFNPFAPPQHENMQALFAQARREQPVFFSEAMNAWVVT
RHEDICAAVEDTQRFSKLDSDQIFEALLPEPRAYLADAGYRKMPMIYDDPPEHSRSRQIV
ARLFSKENLAALEPLVRSITEELVDGFAQDRQVELVSRLAYPLPIRVIFAWMGLPLELMD
DFKKWSRHLTLMLSLQARTLELQNECVRGVTDMQRCVAELISERVAHPREDGLTVLAQSL
REGTTLDAADLAAMVLLISAGHETTSSLMGMAVRVLLLEQPERWRQLREEPHTLPRVVEE
VLRVETPMAILARHTATQAEELGGVTIPAGARVLLVVLVSGNRDERRFPEPEGFDPKRPQLG

QHLLAFGRGIHVCVGAGLARLEARVMLEVLARRLPGLRIVEPPRLVPGPVRHQEQLLLAWD

>CYFUS_006425|KEGG|**CYP107DL4**||[*Cystobacter fuscus*]|cfus|DP

MKPMDESQKQTVVEGVSPAGTCPFKHLMEAPAPSGGSVVLDRENPEFLTAYATYARLRE
QAPVVRTLARGVMDTRKVDSTRAGSTADLASSEERLLVTRYDEAVAALLDGSLSDFRTG
MTPRQIEGLAHMPEEARPLADSLISRDPDHTLRKLVQPSFTARAMETLRPRVQRITDA
LLDKAEREAAGRQAAADRQMDLLEAFAYPMPITVISDLLGIPEEDRERINHLAELLMNT
DRFDASLAATRRDQTRRFNAYLEELFERKRREPAEDMISQMVHTQEEDGDRLGHEEMISM
VHVLFFAGHLTTVNLIINGVVALFSDQDQARMVADPSLAKGMVEETLRYWGPVDYIGTA
RTAIADTQVGGVSIPOETELSIGLGSANRDPDRFPDPVDYDITRPEAHRNIAFGKGIHVC
LGAPLARLEGQIAFETLFRYPKLRRLAVPAEQKWKWAGVGSVGLRGFARIPVLF

>CYFUS_007441|KEGG|**CYP183BE1**||[*Cystobacter fuscus*]|cfus|DP

MRVPTAPARWPLLGHSWPLLSRPRDFLLSLEKVGSLVRVYIGQMPMVVITDPELTRQVLH
DSATFDKGGSLYEKLSLSELTGNLLTSQSEPHKRQRLVQPAFKSSIKDYSSVMAGVVEV
ALRDWEDDAVDMKAAAYHIVSRIAARSMFSAEMADASIARIAEALSIYLNGLFVRTVGP
GVLFERLPTPGNLRKQALEVLHQEISRIISEYIASGVEREDVLSILLREKDEGDGAGLS
PQEVHDQVTTLLLAGIETSAATLCWCLYLLSHHPDVTQRLQAELDGVLGGRAAQWDDIPE
LKQTRRIVMEALRLYPPGWLFTRVTRMDTVLGAYPLPRGTGIAYSPYLLHRSPSSFEQPD
RFDPRWLPERSNRLSMNSFVFPFGGVRRICIGEMLVTEVMLTLATIASHWEARCVREGP
IEPAPAHVSLIPKQLRMRVTRRKR

>CYFUS_007462|KEGG|**CYP109AK2**||[*Cystobacter fuscus*]|cfus|DP

MQASDYNPMLPAVQADPYPYATLRENAPVYFNEQLGWYIVSRYEDVIAITKNPAVFSSA
RAVVRPEQLDAAEKVAPTAVRAFRRGILLSEDPMPHTKTRSVVTRAFTPKRVAEMEPRIR
QLARELISQLPRSGEFDLIKDLAEPLPIIVIAEMMGAEPKLRHEFKRWSDNAVATFYALA
RGAELSGIERTSQEMHDYMSQALEARRQQPREDLMQALLDNGVREGLLSVDEAIAFCRLL
LVAGNETTTNLLGNGMHALLSHPDQLERLTREPALIPNAVEEMLRYDSAAQVFRKVTQD
VEVSGTRIPSGANVLLLFGSANRDPKRFQDPDRFDVTRNVAGHVALGHGIIHFCLGAPLAR
LEARVLEELLTPDRQLSLVPGQHLNENPNFNVRGLKSLRVRTEPAPGTRASA

>CYFUS_008532|KEGG|CYP167B6|[Cystobacter fuscus]|cfus|DP

MSLEATKQSSPAVLFPQAPGYDANPYPMLDELRTKTPLVYWEQGRGWLLSRYEDAIEVL
RDARRFSPNRDEWEFASVLGSAAMIPELVELSKTGLFALSGADHARVRKLVSPALTPRAI
ERLRPEVQALIDEVLDEAAVKGTINVVSDISDRIPARVIGSMLKIPKGRETLFQRFTEAS
IKNFLPGLLRPEEVEALRADIREGIALVRETIEDRRKNPLPDDILTTLIQTEEQGDRST
SELLSLVAALIVGGFETTIVHLIGFTTYNVLQRPELRAQLKTEPDLLKNVIEEVLRFDFNG
KIGVARYALEDVELSGQTIKKGQMVLIIMNSALRDEAAFPKADTFDVRRTNASIAFGHG
VHYCLGANLARLEVQLAVGTLRLRRYPDMQLVRPPTFAPHPVIRRMETLEVQLRAQ

>CYFUS_008546|KEGG|CYP107DL5|[Cystobacter fuscus]|cfus|DP

MAPNPLDEQQQTPAQPPREAPFGGPVVDKESLEFMTRAHAVYAELRDKGPIVRVPSGR
GIVDRAQAERASPGASSPEQYFVTRYDEAVSILMEEKLSSDVLKAMPPEQRARMDAAMPE
ELRPVRSILVLDPPDHTRLRKLQPNFTARAMEALKPRIQRIVEDLLDKAEREAATRGE
VSPDRRLDLVESFAYPLSITVISDMLGIPVEERETVYPWAERLLRAKGPEGMMDGETRAG
LTAFAANYLESFARKRQAPAEDMISQMVQVQEDGDILSPQELLSMVFILFFAGHLTTVNL
IGNGVVALLSHPEQHARFLEDPAACVKGMVEETLRYWGPVDFIGGPRIALEDLVGGTRV
PRGAKVAVGLASANRDRRFTNPDAFDISRPDAHRHIAFGKGIHVCIGAPLARLEAELAF
EALFRRWPELRLAQAPAGQLELSMGAALRGFKRIPVVF

>CYFUS_008576|KEGG|CYP264J2|[Cystobacter fuscus]|cfus|DP

MQPTPDVMALAHRLNPYPLYAELRRDHPVCRVEPGGLVAVSRYKDVEYVLKHPELFSSHG
FRFAWQPAWVDNPLAQSLAASDGKEHARLRSLSRAFTPVAINRLEEKVRANAARLADG
LLARGEVDFMEEFATPLPARTISDLLGIDPTLERHYKRWTEVLVSIAPVPENDEHVTRTR
DTIAEMKRYVQIIDARRSQPGDDVMGLIVQGGPDGQRLGDQEIIGLAFTLLAAGLETTS
FFFahalPLLAERPdvFERLRADRELLPKFIEEMLRYDGPVRGLPRIVTTDVELSGVRIE
RGTCVPLPIASANRDEARFPHADRFDLREQPGIPFGAGSHFCLGAFLARLEARAGLDAL
LDRFSGFSLIPEGVVWNRSIVTSGPLKMPVRFPLPA

>CYFUS_008681|KEGG|CYP1069J1|[Cystobacter fuscus]|cfus|DP

MCAMISSQLGLEFTPLEPHFLENPFPHYARLRREAPITFAPAFQFWLVSRYADVMTVFKD
PRHYSSRDTLRPPVALPREVMAILEPAGYTSDYPLLGDPPAHTRRLRALVGKAFNQARVN

ALEPRIRQLVGEHLDTLRDGEPRaelISQLISPLAMSVMTellGLPASDRERIKQWCDD
KLFFVPIPLEQHLRAARGVADFRRYLRELVEDRRESPRDDLISLLEARTEGDRPLDTDE
LVALACVLVfAGHETSTNLLATALHLLRHfGAWDELrKNTYLVRNAVEETLRYDSPVVG
MMRTTTRPVQLGGTALPEGARLFLLFASANRDESvFEQGERFDIHRASAVRHfLGFHGfIH
YCVGASLGRLEAQLTLELLLQRLPGLRLAPGEAVTYLPNLVHRVPRQLLVEWDT

>CYFUS_008687|KEGG|CYP107HU2|[Cystobacter fuscus]|cfus|DP

MAERDVNAAQGPAPQPLPTEVVTLTLDPHISPETYARLRQQGRVARVSFTLGANAAPAG
EKSAELIEFLGHEHLFVTRYEDVIAALLDDRISSDPRTALTEEQKKKLPNVPDELRLAR
SLLSVDPPDHSRLRKLIPQPSFTPRAMESLRSRIQRIAE DLVDGAERAAAERGESRPERRM
DLIAEFAYPLPVKVISDMLGIPeEDREMVKGWENLVKNNAGRGFRDAESLAKVREFTDY
LRRLFVAKRKNPADDMISQLLRIEEDGDKLNEDETLSTVFILYLAGHVTTVNLIGNGIFA
LLSHPEQLARLkanPSLVKGLVEETLRYWGPIDFISRRIAKEELDLAGTHFPKGEPMMLG
LASANRDPARFAHPEVFDITRPDADKHIAFGKGIHICIGAPLARMEGQIAFETLIRLPE
LRLAVASEELHWSNSLLRGFAQLPVLF

>CYFUS_008947|KEGG|CYP107DP5|[Cystobacter fuscus]|cfus|DP

MSTSTLTSELWAPQTRTNPLPFYARIRQeAPVVRMIDPYFQTPVWIVTRYKEAVELLRDN
RFTKDQDKLPENSPSRMRIDSLAAINQHMLSADPPDHTRLRTIVSKAFTPRRVEELRPR
VTAIAQRLLEAWPQGSMDLLDSFAFPLPVTVIAEMLGVPaedQDQFREWTNIIINPPVN
GDVGPLQKAGMQFLQYFQQLMARRRAEPRDDLALMTAEEQGDRLSPTELVSMLFLLL
AGHETTvnLMGNGVWALLKHPEQLERLRANPALIDSAVEEMLRYRGPVETTTTYRWALQDT
ELYGQVIPAGEAVLASLMAADHDPAQFPEPERFDITREPnrHIAFGFGIHfCLGAPLARL
EATVALNLLLERMpRLRLAVDERELRWREGILVNGLQRLPVAf

>CYFUS_009336|KEGG|CYP102M7|[Cystobacter fuscus]|cfus|DP

MNKPSHSSTIPQPHVRPLVGNVPDVGfETPMQNLMKLARELGPIFRLSFPGGRTSLILSS
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YHDDMLDVADQMfTRWERFGPDAVLDPDNMTRLTLDTIALCGFGYRFNSFYQKEMHPFV
ESMVRALAEAGNRARRVPLQTQLMLRTQRQFQADIGYMHEVTRELIASRRALPPEEAPRD
LLSLMLDARDPLTGEGLDEENIRNQMVTFLIAGHETTSGLLSFATYFLLRHPEVLEKAQA
EVDRLVLDGEMPRFEQVSQLHYIDQILRESLRLWPTAPAFSVHPKAEETLIAGTYPIRRDN
TAVVLTTMLHRDPTVWKDPERFDPRFAPEVRDSIPPHAWKPFNGQRSCIGRAFALQEA
TLVLAMMLQRfHLVEPAPYELHVRETTLTKPEGLKLRVRVRKPVSRPLASRPTPGAAAPA
PKQEGVASHGTPLLLLLYGSNSGASEAFARRIASDGLARGYSAKVAPLDDYTGKLPKEGAV
VLVTASYNQPPDNARAFHTWISNVPEGSLLGVRYAVFGCGNRDWAATYQAI PKHFDERL

SAAGAEALVARGEADARGDFFGDFEHWYAPFWEKVGAAALGVSSRAVSSEPLYTVEVVPSS
STELVKQNKLELATLVDNRELVDMTSPLGRSKRHLAFKLPEGVTYAAGDYLAVLPENHPD
LVERAARRFGVRTDAAVVLHSTRGAMASSLPTDKPVSQVQELLGRHVLSAPATRKDLERL
AEKNPCPPHAMHLAALAQAERYKKEILDKRVSVDLLEQYTSCLLTFGDFLELLPAMRV
RQYSVSSSPRADPTVCTLTAVVDAEAWSGQGRFHGTCSYLARLRPGEQVAVAVRTPNA
PFHPPASNATPLIMVGAGTGLAPFRGFIQERALRHARGEAAAGPALFFFGCDHPEVDFLYR
EELAAWEREGVVKVLPAFFRQPEGDVMFVQHRLWKEREQVKALLDQGALFFICGDGRRMA
PAVRETLAKIHQETVGCSEAEATAWLEGMEKQGRLVADVFA

>sce0122|KEGG|**CYP109C1**||[Sorangium cellulosum So ce56]||scl|DP

MNLFPDEMRRDPYPLYDQLRTGSPVFHVAPLDLWVFDYDGVKRALTDHEAFSSAVAPPT
GKAPDWIVFSDPPRHKTLSIVLRAFTPRSIAGLEPRIRELSRDLLDPWIERGEMDLAAD
YAGPLPTMVAEMLGVPPEDRARLLRFSEVIVNLSHAISGEEAARAVSEHAVVKEEMKV
YLAGLIEARRRAPAEDLLTRLVEAEVDGERLTEGDILNFFQFLLAAGTETATNLIDNAIL
CFLESPAELFRLRAPELLPSAIEEVLRRHSPLQMVFRETRRAVEVHGQVI PAGKLVLPV
IGSANRDPHQFHDPRGFDIGRDPNPHVAFGHGHIHFCIGAALARLEARIALPDLLCRLKGL
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>sce0200|KEGG|**CYP261A1**||[Sorangium cellulosum So ce56]||scl|DP

METARA EVAPSAGMRDLSTLPGPRRLPLLGNNLEIRPSQFHLTLEGWNRKYGDLYTFWLG
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FTAGQLRESHGTLSTITRRLRERWRASAARGAPVDARRDLARYTVDVTTAVAFGLDMNLI
ERGTDPLSDQLETVFASLNRRVFAFPFYWRHVKLPADRALDQALSEVRTRMLDILRTTRA
ELDRDPARAAAPRSLLEALLVARDADDPKARLSEQEV LGNVLTLLLAGEDTTADTMWML
HFMALRPDVQARMRAEVD AELGDADLPESPEHAQRLRYLGAVAQETLRLKSAAPILFMEA
CADTVVGSRLRAAGTRMILLTRQIALKEEHFHDAASFMPERWLT PRPAGAGKHD PRAALA
FGSGPRVCPGRALSMVESAMVGAMVARDFDVSLVDPARPVKELLGFTMKPEGLFVRFPPR
HR

>sce0675|KEGG|**CYP267A1**||[Sorangium cellulosum So ce56]||scl|DP

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ITRYDQVAAGFRDPRLSAKRSSAFVTKLPDEVRQRLEPLRRNLASWALLLDPPEHTRIRS
LINKAFVPRLVEGLRSRVETLVNELLDAVAPAGRMDVLRDLGDLPLLVIGEVLGVP AED
RHRLKGSNALSGLGAGRPTLEIAGGALSVAELEDYFRGVIAARRQSPGNDLLSQLIL
AEEQGMILGEQELLSTCCMLLFGGHETTKNLIGNLLALLLHRSEREALRATPSLIGPAV
EELLRYDSPVQWMSRVALDDIELDGVRI PKGDRAFLVLGAANRDP AQFPDPDKLDFRRTD

IRHISLGLGVHYCAGSALARVEAQAAISTFLRRFPDAELSPGPLTWRMNPGRGVTALPI
ELGPQSSAS

>sce1588|KEGG|CYP260A1|[Sorangium cellulosum So ce56]||scl|DP

MDFPLANLFFVPSDATAFGRRLRAAAQQAPIVFDTAFGMPILLRKSHITTAYRDTATFS
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RVDLLEDFAMELPRRVIGELFGFPAEKLHETDERVRAMLRLGLVRMHDPAAVAESQRAYGE
TLGLITEVVERESRDTSDTLLEGEILRTLKAEHMDTIEASRQIVLSLILGGYETTSWLVAN
TIHALLAHPDTLARVRQDPSLLPAAIEEGMRWCPSFVGLRMVERDVLDDQALSAGTVV
CLAGIAGNYDETAYPSPEVYDIDRKPLPAANVFGGGAHFCVGAPLARMEARVGLQALLAR
FPGLRAVPEERPSFMYGAKDSVAHGPKLPVLLH

>sce2191|KEGG|CYP262A1|[Sorangium cellulosum So ce56]||scl|DP

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GGMWKPIGRLLGNGLVTTAGGDEWLRNRRRMQPLFSSRQLAGLVDRMFDVVEGDLPRLEER
ARAGAVVDMDKEMMQLTQRVILATMFGVSIPTREADSLGEVLLVAIQALNARMFLYFMPD
RLLPGERALRDAIARIIDEAILRLVRRRRSKEERDDLLSLLLRARDESGSGMDDRQLRDE
LVTMFIAGNETTAITMTWLFYLLDRNPGIERKLRAEIEEVGDRRPTAADLSRMEYTKMV
IQEAMRMYPPSWLVPRTVKEDDQICGYVPAGATVILSQYVMHHDPAFWEAPAEFDPERF
TPERSASRPRYSYMPFGGGPRQCIGNLFSIMEAQIVIAVLLRRLRMLVPGHPVSPQAVA
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>sce3065|KEGG|CYP110H1|[Sorangium cellulosum So ce56]||scl|DP

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PLQRELGGGLGPYARFRRRVGEALDQALFRAQIERARAAPGDDILSLMVSARYDDGSRMSDQA
IFDELRTLLFAGHETTALALAWALDHVHRHPGVLARLRDEIDALGPEPDPERLAALPYLD
AVCKEALRVYPIVTEsprllaQPFRLGEHELLPGTGVAPCILLVHHHPPELYPEPSRFRPE
RFLERKFSPEYLPFGGGHRRICIGAAFAMFEMKIVLGVALSAWEFRLLDERPPRPVRRNL
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>sce4633|KEGG|CYP109D1|[Sorangium cellulosum So ce56]||scl|DP

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PWIGRLAASLLEATGDGSPDLMGAYAMPLPMMVIATLLGIPAERYVQFRSWSESVMSYSG
IPAEERASRGKAMVDFFAAELEARRRAPSGDLISALVEAEIDGARLDTPEAVGFCVGLLV
AGNDTTTTNLIGNMAHLLSERPELYRRAQQDRSLVGPIIEETLRHSSPVQRLLRVTTRPVD
VSGVMI PAGHLVDVVFGAANRDPVFEEDAFRLDRPPAEHLAFGQGTHFCIGAALARME
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>sce4635|KEGG|CYP259A1|[Sorangium cellulosum So ce56]|scl|DP

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IPGRLPGMPAYRSDRARAWIDDLRLKLLALARGGGAAGSLVEMLSNARDDEGEPLSDQGI
VDNLRAIVLAGHETSASILAWIVIVLSRRSEVWSALCDEHAAAPDAPVPM SAREADRLPV
ANAI FREVLRMYTPVWFIFRTVTETITLSGRRI PRNTPLALSPAQFGYDPSLFPDPDRFD
LSRWRDRSIPPGPLELAAFGGGPHFCLGYNVACVEALQLQFILVRALRRAGLVP HLEGAS
PKHVYFPTGHPTAATRVAFRRC

>sce4806|KEGG|CYP260B1|[Sorangium cellulosum So ce56]|scl|DP

MLPRKNLFSFTSKDPSAFGIHLAAAAREHSVYFDEGLGVPVVLRGADVAVLRDSETFST
RTYDTGIMKGALVTLGGEAHRMRRLFNAVLSPRVISRYEEATVTPVARRVVERLVRKER
AELFDDFAISMPMGVTSALFGLPEERIAENDALIRKMIRSVVMPQDPVVVAEGRSAHAM
EAQLREIAEREVAHPSDTLLGEIARAIVAEGGGVEACEGVVLTLLILGSYETT SWMLANL
LVALLAHPDAMNQLRQQPSLLPQAIEESTRWCSAAGIVRFVEREATIGGETLAAGTILY
LSLIARHYDEEIIYPRPETFDIHRRPVGMNFGGGLHYCVGAPLARMEARVGV SLLLERFP
ALRADPTVQPTFSTAPRGAAAFGPDQIPALLV

>sce4885|KEGG|CYP263A1|[Sorangium cellulosum So ce56]|scl|DP

MSATLERQPPGPGPLASRLRYLANFRTGDMRHYEDLFARHGDVVRLRAPGAEDFVMAFHPN
DIAHVLRTNARNYPKGKRYHELAPVLGWGLVNSEGELWRRQRRHVQPQFNHANTLKFVPI
IVEHMEAVLRRWDAQPGEFERDINDMDMVTFGIAGEAFFGAALHAHTDTVREAFKYALS
IALKRMYSLVNPPLSWPLPSHLRFRRAMDRVHAVIDGIIIDGYQRGAGGEDNVLVRLMNSV
DPETGAKMDRAQLRDEIKTILMVGHETSSVTASWALYQLARHPEVCARLTDEIDRVLGGR
SPTARDIESMPYLTMVFNECLRLLPSVPFILRSPLEDDVIGGYKVAAGSTVAIVPWVTHR
HPEFWSDPLEFKPERFANHRRSADDKLAFIPFGAGQRICLGEFMGQLEGKIMVAMALQRY
RLRLVPGFDPRCRGFI SLQPVNGMRMILKRREPSSAVRAAPAGREEPAGAE PVVTEPVAA
AMSAHGCPYSARA

>sce5528|KEGG|CYP117B1|[Sorangium cellulosum So ce56]||scl|DP

MTTALPASFADLPLLQGRNPLARRIETRHGFPILPGRFPVVGHMPAIAVDELGLLREGQR
RFGSLFFWAPGVDAWQLIYASNEAFSLFKSKAVDSSYLTEGGVGHVLFQTLMAHDGASHR
RLRTAMNGPFPSPKGLDAAEVGAIIVATSVERKVRSWLGRRDVQLLRETRELALEVMFKITG
VEDDELPEWRHYEDLMLVILSLPFDVPGSPRRRGLRARAWLDERIGRILAGVRARGDAK
GLLPALLTARDEQGEPLSEQDLVGNLRLLLLGHETSASVMAWCVAHLAESPAVWRALRE
EASSAPDLPRSPADLRRFPFAEAVFREARLHPPVPHDARRAVADFELDGRAVPAGTHVA
IPLVLLSRDPELYPDPDSYRPERWLGRKEALSPLAIAQFGGGAHFCLGYHLAWMEIVQFL
VALGRELPASGPRQLQGGFPASRYLPVLRPSGGTRVRFDG

>sce5624|KEGG|CYP266A1|[Sorangium cellulosum So ce56]||scl|DP

METQVAATQPEINIIAPENLRWPYPMFRLLLLLEEPVFYDKNTGSWVVSRYEDVNALLRDA
RMSADRYVALADTVPEQKEMNSYIVKSLSMFMLNVENPTHFRLRNLTNRSFTPKSIAAM
RPSAHAVVNELLDVAVQPRGHMDVVADLAYPMPKIFICGILGMPVEDMGLIKQLSDDVSVY
IGSAGKAAGCIPPAYHAIVEFSKLFRLPVEARRKEPKDDLISSMVTTRVDGDSLSDDEVI
ANCILFLVAGFETVTNLIACGTLALLEHPDQLELLKRDSRLMEGAIDEMLRYPVNRTA
RLCVEDIPLRGKVIKKGQIVVLMGAGNRDPSEYPDPDRFDIARENRSRPLSFGGGHHFC
IGSHLARMERGEVALGALLQRMPNLRRLATQEVWRGNSRFRGLRALPVSF

>sce6323|KEGG|CYP264A1|[Sorangium cellulosum So ce56]||scl|DP

MSERVDIMTPAFRADPYTPYAAMRREAPVCQVDPGGMWAVSRYADVATVLRSPERFSSQG
FRAAWQPAWVGHNPASSILAMDGPDHARLRGLVSRAGAPAIARIEQRARDLCERLAGR
LDGEVDFIAAAAAPLPAFVISELLGLDHALEPHFKRWMDLLSVTPEPASAEHAARVRAT
IAELDRYMADVIAARRRSPSDDLSELARAGELLGDREIIDLLVSIILGGGLETTTHFLGS
SMLLLAERPAELERLRASPQLIPRFIEEMRYDGPTQSVPRLTTSVALAGVTIPAGSLV
LALVGSANRDEVRFDPDRFDLHRGQPSLTFGHGAHFCLGAALARMEAKVALEVLVPRIG
EVTRAPGEIPYNRTLTVRGPVSLPLRFRPA

>sce6424|KEGG|CYP110J1|[Sorangium cellulosum So ce56]||scl|DP

MGNLPPGPKSLSLVDTIRAGFISSEPVFRRYAAEYGPFRRLRSPNGILTITGDPEAIRAV
YTADPDEFDVGVLTEPVFGTSSVVVTAGARHRRDRLLAPPFSAGAMRGYGDIAEIS
LDVASRWRPGRSFSMLAATQAIALDVIVRVVFGVRGEARVGRVTRAVLGLIESLSPSFM
IPALRRDFAGFGPYARHKRAARALDALLFEEIRARRAEGDASQDILGLMMSARHDDGAGM
SDVEIADQLRALLFAGHETTAMSLGWAMYWLHREPAVLARLLDELDTLGPAPADALASL

PYLEAVCLEALRLHPPVVDVARVVKRPFRLKGYTIPAGEAIAASPLLLHGREDLYSPER
FRPSRFLDRKFTPFEFIAFGGGARRCLGAAFAMYEMKVALGTILGRYRLRLESQAPIHHV
RRGLTMGPSGDVAMILEGERERARAEGRPAAVQGSPAEPALRPAAPQPAGRCPMGFS

>sce6630|KEGG|**CYP266B1P**||[Sorangium cellulosum So ce56]||scl|DP

MGQAPATCTAASPVAAPSSRGVAGRARSTGAYRSCPSPAATDWTGHGHDRRRGGSGVRRN
CHLEPDRFDITRQQSRHLTFGSGAHYCPGASLIRMEVEESVRALLSLPRWELAEETLSYA
GSNLQDRGPSSLRVRFPAACSGRARPIGRRAAGR

>sce7867|KEGG|**CYP125E1**||[Sorangium cellulosum So ce56]||scl|DP

MTPQTVDILDPDLYLAGAPHDRFELLRREAPVHWHPEPAGRGFWAITRHADVARI SRDPA
AFCSGRGLFIEDLPPGDMDRNDPDMIMMDPPRHARFRALVSKGFTPRVIQRLESHVRELV
TRLIDDACERGGCDFASDIAGKLPLSVILEVIGVPREDQEQLDWTTRFFGASDPAYGVT
PEELNAVLHNMNAYAHQLAEQRRKEPKDDMLSLLMAAEVDGEKLSYTEFGGFFNLLLTAG
HDTTKNLI SNGLALLEHPDQRRRLDDPSSLPTAIEEMLRFTPPVYYYFRSAVRDIELH
GQRIAAGDKVVLWYVSANRDET VFSDPHRFDVGRTPNEHLSFGIGPHVCLGLVLARLEAR
VAFEELLRRLPDLELAGPAVRLRSNWSGVKSMFVRCARPAR

>sce8224|KEGG|**CYP265A1**||[Sorangium cellulosum So ce56]||scl|DP

MSTPHTLQPDLLMEEGGDVVRRQAEACWYAETSMGKAVLRYREVHDLLRDARFRNMGTDV
LTRQGVTEGLVRRMYEGFLLSTEGA AHARLRGLLKKGFTPDAVDALRPRMRERMHALLDE
IGDRTEFDVFTAVAERFPGQVII ELLGLPVSFEDPDFRRWCSDLGYIVGLEVKKHLPRLE
AAFEGLRGYIEPTIAARRAEPRGDLISTLAAAEQNGDRFSEEELVCQIVALLFGGLDTTR
RTIGKAFLVMLEHPDQRRLLQERPDLAEPAEEILRYAPGTRVAVRVATCDLELHGVP
IR AGEMVIAATGAANRDPVFEAPETFDITRRGAAPLSLGAGPHHCLGAYLARAELQEAVPI
LTRRLTEAALASPVVVRTAREGSPGPRVIPLRCRVRPR

>sce8551|KEGG|**CYP264B1**||[Sorangium cellulosum So ce56]||scl|DP

MTRLNLFAPENVRENPYPFYAALRRESPVCQVDPNGMWVTRYDDIVA AFKNTQVFSSAGL
RMATEPPYLRRQNPLSGSMILADPPRHGQLRSISSRAFTANMVSTLEHHMRSMAVRLTDD
LVHRRVVEFISEFASRAQVSVLAKLIGFDPGLEGHFKRWATDLVIVGVIPPEDHARIAEV
RRTIDEMEYMLGLLASRRRHLENDLVSELLRSRRDDDGITDQDLVSLLSLLLVAGLETS
TSLMTHMVLILAQRPMWMDRLRAEPALIPH FIEEVMRFEAPVHATMRLTVTETELGGTRL
PAHAVVALLISSGLRDEARFQEPDRFNPERGDQANLAFGHGAHFCLGVFLARVQARIVLE
ELLRRCHRIVLRTDRLEWQAALNTRSPVALPIEVI PVSTTAARESPPVQGIW

>sce8913|KEGG|CYP109C2|[Sorangium cellulosum So ce56]|scl|DP

MNLFSEEMRRNPYPAYDQLRSRTPVLHYPPSDSWLIFDHDGKRALHDHDAFSSVVSPPG
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YAVPLPLLVIAEMLGAPAADQPHFKRWSDAILDLSHTVSGSEEAARALDAFTAVTAEMQA
YLRGLVEQRRAPEDDLLTRLVEAEVDGERLNEDEILGFFQLLL VAGHETTTNLIGNAML
CFLENPDELARLRAAPELLPSAIEEVLRYRSPVQAMFRVTRRDVPMHGQVI PAGKAVLAM
IGSANRDSQQFRDPDRFDIARDPNPHIAFGHGIHFCIGAPLSRLEARVALADLVARLGGL
ERASDAPWEPRAIHVHGPARLPPIRFAPGPRGGAPG

>SCE1572_00630|KEGG|CYP109C3|[Sorangium cellulosum So0157-2]|scu|DP

MNLFPEMRRDPYPLYEQMRSSPALHIAPFDLWMI FDYDGVKRALTDHDAFSSAVTPPT
GKAPEWIVFSDPPRHTKLRGIVQRAFTPRSIAGLEPRIRELSRELLDQRIEHGTMDLAVD
YAGPLPTMVIAEMIGIPAEDRARFMRWSEAI VNLSTLSGGEEAARVSEHA AVKEEMKA
YVADLLEARRGAPEDDLLTRLVEAEVDGERLNEDELLNFFQFLLAAGTETTTNLIDNAIL
CLLESPSELARVRAAPDLVPSAIEEVLRYRSPLOMVFRETRRAVEVHGQAI PAGKLVLPV
IGSANRDSRQFRDPGRFDVARDPNPHVGFHGIHFCIGASLARLEARIALPDLLTRLRGL
ALASDEPWEPKALIVHGPARLPVCFEPGRRAGAGAAGAHAASP

>SCE1572_04555|KEGG|CYP267A2|[Sorangium cellulosum So0157-2]|scu|DP

MNSPDAPKPDATPVATPAADADLDPFRLQSPETFANPYPVYAKLREQAPVYFSAAYNGWL
ITRYDQVAAGFRDPRLSAKRSGAFVTKLPEDVRQRLEPLRRNLASWALLLDPPEHTRIRS
LINKAFVPRLVEGLRSRVEALVNELLDAVAPTGRIDVLRDLGDALPLL VIGEVLGVPTQD
RHRLKGWSNALGGFLGSGRPTLEIAGGALSAVAEMEDYFRGVIAARRQNP GSDLLSQLLV
AEEQGMILGEQELLSTCCMLLFGGHETT KNLIGNLLALLLHPAEREALRESPALIGPAV
EELLRYDSPVQWMSRVALDDIELDGVRIAKGDRAFLVLGAANRDPSQFPDPDRDLDFRRTD
IRHISFGLGVHYCAGAALARVEAQAAISTFLRRFPDAALSSAPLTYRQSPGIRSLTAMPV
ELGAQSSAS

>SCE1572_16700|KEGG|CYP110AD1|[Sorangium cellulosum So0157-2]|scu|DP

MTTLPKGPSNNILVNIQGMLDPIGYTLRMRERYGDPMSCPKMNGKPVLATGSVEGLRSVF
AVPPENLDQMLGESFTA AVGESSFLSLSGARHAAMRKLMPFFHGQRMRLYKQICDLTL
QCSQDFKPLQLVAQDLMHKISLQTI IHLVFGVTTPAEAARLEELLEELRKSFSFGLTIT

LIIPWLRREFRFGFGPWARRQRATRDLRSFLDREVARRRAEPAERTDILSLLLEARQEDGT
ALDDQQIFEQLHTLLFAGHSTTAGALSWVLYFLGHAPAALRRLQDELTA LGADPEPEALA
KAPYLEAVCNETLRLRPPSPGVGRKLNAPMQIAGYELPAGAGVFAQIIWAHNPVAVFPEP
AVFRPERFLERTYSPFEFLPFGGGNRRRCIGAAFALYEMKLILGTLRLRRYSFELVSKKPVR
VGLQGLPGSPVRVIVR

>SCE1572_18480|KEGG|**CYP110H2**||[Sorangium cellulosum So0157-2]||scu|DP

MAPDAAAAPRRRPHRWIDPGEAPRATGIELLPRCAMSQ LPRGPQGRLTTYQFLTRPIEL
LSRCAATYGDVFNVPYNGDVVMAGSPASVQDVMTAPPDALVTYATKSIAPLVGEHSLLM
LSGERHRRERKLLTPPFHGDRMRAYAAAMADVAARRFAEAAARAPRAVAQDITQAI SLDVI
LRAVFGVEEPSRMSAFARAVVAMTDALTPALTFLPVLQRELGG LGPYARFRRRVDHLEAL
FREQIERARAAPGDDILSLLVAARYDDGSSMSDQAI FDELRTLLFAGHETTALALAWALD
HAHRHPAVLARLRDEIDALGPEPDPERLAALPYLDAVCKEALRLHP IIVTEAPRMAAQ PFR
LGEHTLPPGTGVAPCILLVHHRAELYPEPSRFRPERFLERKYS PFYEYLPFGGGNRRRCIGA
AFAMFEMKIVLGVALS AWEFRLLDERPPRPVRRNLT LGPAGGVPLALRARGRAALRTAA

>SCE1572_24990|KEGG|**CYP167A1**||[Sorangium cellulosum So0157-2]||scu|DP

MTQEQANQSETKPAFDKPFAPGYAEDPFP AIERLREATPIFYWDEGRSWVLTRYHDVSA
VFRDERFAVSREEWESSAEYSSTIPELSDMKKYGLFGLPPEDHARVRKLVNPSFTSRAID
LLRAEIQRTVDQLLDARSGQEEFDVVRDYAEGIPMRAISALLKVPAECDEKFRRFSGATA
RALGVGLVPQVDEETKTLVASVTEGLALLHGVLDERRRNPLENDVLTMLLQAEADGSRLS
TKELVALVGAI IAAGTDTTIYLIAFAVLNLLRSPEALELVKAEPGLMRNALDEVLRFDNI
LRIGTVRFARQDLEYCGASIKKGEMVFLLI PSALRDGTVFSRPDVFVRRDTSASLAYGR
GPHVCPGVSLARLEAEIAVGTILRRFPDMK LKETPVFGYHPAFRNIESLNVILRPSKAG

>SCE1572_32890|KEGG|**CYP105AC39**||[Sorangium cellulosum So0157-2]||scu|DP

MIMTESVHTVGLLPTAREPGCFDPPNELRQAREHGPI SRYPFPGGYEGWLITGYDLVRS
VLADSRFSSRKELMRHPLIDLGMKIP PAPPGEFLLMDEPEHGRYRKL LTGKFTVRRMQL
LTERVEQVTTEHL DAMEKAGPPVDLVTAF AKPIPTIMICDLLGVPYETRDSFQEHVDAIF
SGVSKQDQVAGYVATQOYIAQLVA AKRANPTDDVLSDLTDTDLTDEELMGVGLLLLAAGI
DTTANMLALGTFALLSNPAQWATLRARPEIADLAVEELLRYLSVAKTFQRTALEDVELGG
QTIKAGTTVILSYNTANRDPERFDNPHALDIRRQAIGHLAFGHGHIHVCLGQQLARIEMRV
ALPALVQRFP TLRDLVA AEDVDLRPETADIFGVNSLPVTWNA

>SCE1572_38035|KEGG|**CYP110J2**||[Sorangium cellulosum So0157-2]||scu|DP

MGSLPPGPKSFSLVDYIRSGFISSEPVFKRYAAQHGPTRFRVKS PNGMLTITADPEAIRAI
YTADPDTFGVWAAELVEPVFGTTSVVVTTGARHRRDRKLLGPPFGAGAMRGYGEAIADIS
LGEASRWRPGRSFSMLAATQAIALDVIIVRVVFGVRGEERVGRVTREAVLALIDSLSPSFFV
LPALRREFGGFGPYARNRRAARALEALLVEEVQRRRAAGDASQDILGLMMSARHDDGGGM
SDVEIADQLRALLFAGHETTAMSLGWAMYWLHREPAVLARLLAEIDALGSPAPDALASL
PYLEAVCLEALRIHPPVVDVGRVAKRPFQLGRYTI PAGESVAASPLLLHGREDLYPSPER
FRPSRFLERRFSPFEYIAFGGGARRCLGAAFAMYEMKVVLGTILGRYRLRLESQAPIQHV
RRGLTMGPSGGMAMILEGERERPRAAGGGAAAEGSQAEPALQGVASGPAARCPMGFS

>SCE1572_50855|KEGG|CYP109C4|[Sorangium cellulosum So0157-2]||scu|DP

MNLFSDEMRRNPYPLYDQLRSGSPVLHYPPSDTWMIFDYDGVKRALHDPEAFSSVVSPPG
NRTSEWLLFMDPPRHAKLRALLQRAFTPKAVAALPRVRELSRGLLDRAIERGEMDLVED
YTVPLPLLVISEMLGAPIEDQPRFKRWSVDVLDLSTTVAGTEEGARAAIAFTAVSAEMQA
YLRGLIAERRAAPRDDLLTRLVDAEVDGERLGEDEILGFFQLLLLVAGHETTNNLIGNAVL
CILEDRAALARVRAEPALLPAAIEEVLRYRSPVQAMFRVTKRDVPMHGQVI PAGKPALVM
IGSANRDPQQFRDPHRFDIARDPNPHVAFGHGLHFCLGAPLSRLEARIALSDLVTRLADL
RLASDAPWEPRAIHVLPTRLPPIRFAPGPRLDRSET

>CMC5_001820|KEGG|CYP102M3|[Chondromyces crocatus]||ccro|DP

MSDLPAQSVPQPPVRPLLGNAPDIDTDSPVMSMVQLSERLGPIYKLAFFGRSMLVLGNH
ALAAEAGDEARFGKYVGGVLNELRALGGDGLFTADSNEENWGKAHRVLMFAPGPAAMRNY
FDDMVEIADQMLVKWERFGPETDIDVADNMTRLTLDTIALCGFNRYRFNSFYQREMHPFVA
SMVRALLEAGYRAKRLPLQNQLMFLSRRQFEADNAFMHGLTDELIEKRRKLDQREAPRDL
LGLMLNAKDPLTGEGLDDKNIRYQLVTFVLVAGHETTSGLLSFALHLLLDNPEVLEKAQAE
VDRVLGDEAPRHEHLAQLVYVDQILRETLRLHPTAPIFAVHAREETTLGGRYPIHPEQAL
MVLPSVHRDPAIWKHPERFMPERFAPGVRQEIPHRAWMPFGNGQRSCIGRAFSLQEATL
VLAMLLQRFEITRPRRYRLVIKETLTMKPEGLVLRARARKPAVRGLAARPAAPRAEPREDT
KTKVRAPAHGTPLLLLLFGSNSGASEAFARRIASDGSARGYATHVAPLDDHAGKLPREGAV
AIIITASYNGQPPDNARQFCTWLDGLPEGALSGVRYAVFGCGNRDWAATYQNVPRRVDEQL
ARAGATVLLPRGEGDARADFFGDFEQWYAPFWGTLGEALGVAPQEIDMSPLYEVEAVPSG
SAELLAQNQLALATVIANRELVDLSSPFGRSKHHIEFTLPEGASYAAGDYLA VLPENHPD
LVERAARRFGVRTDAAVVLRSTRGAMAASLPLGKPVSIQELLGRHVLSAPATRKDLERL
AEKNPCPPHRAHLAALVGDLDRYKAEILDKRVSVLDLLETYPSCIVSFAEFLEMLPAMRV
RQYSISSSPRLDPTRCTLTIVSVLSAPAYSGNGQFHGTCSYLARLRPGDRIPVAVRTPNV

PFHPPASNETPVVMICAGTGLAPFRGFLQERADRYAHGEAVGEAVLYFGCDHPDVDFIYR
DELMQWERDGIQVVRPAFFRKPDPGEVTFVQHRVWQERERIRDLYEQGAIFFLCGDGQORMA
PAVRATLVIRIQEAVGCTEEDATAWLTSMEREGRYVPDVFA

>CMC5_008210|KEGG|**CYP110R2**|[Chondromyces crocatus]|ccro|DP

MVALPPGPPLAPLHTLFLAGLDTPRFFKSCVSRYGDPFTVTLPAGKVVVTGHPDGIREIFT
AEPSTFGALTQIPLLPVLGKSSMLLLEGGQAHKRERRLLMPPFHGDRMRAYGTLMRDITLR
LAATLPSHGAFAMQLTQAISLEVI IQAVFGVKQPERVKAFQDTIASYFSSYTVPLMFVP
PLRRSFHGVSPWDRFQQTAHRFDILLDEEIAARRRSSVEHEDILSLLLSARDEEGTPMTD
EEIKDELRTMLIAGHETTAITMAWALYHVHRLPAVKARLLDELDALGPDPSPDALARASY
LGAVCDEALRLDPVVILVPRRLKAPMTLRGVALPAGIGVMGAIVLAHHDPTIFSEPDQFK
PERFLDRKYSPEEYLPFGGGARRCLGAAFALYEMKIALGSLLLHAHRFSLDEQGPVKAVRR
NVTFGPKTGVRLRHDGVRPRPASANPGLKGAGEGAAA

>CMC5_010050|KEGG|**CYP107HV2**|[Chondromyces crocatus]|ccro|DP

MRIHVPDLCSAQHKSNPYPVYARLRAEAPVMRIVFGDKKPAWLLTRYDDVAAALKDPRLA
KNAYRTLTPEEQAKAMPWTPGFLRPLTTSMLDQPPDHTLRLTLVHKAFTPRAVESLRER
IEVLTAEIARARARGSIDLLEELAVPLPITVICEMLGVPEADRARFRAMSNRLIGIVTP
TDMLLAMPSPMWMMLMRYLRGLVESRRRSSGGNDMLAALIDAEEAGDRLGEEELLSMVMLLLL
AGHETTIVNLIASGMLSLFDDHEALERLRSEPSLIKPAVEELLRHTSPVDLATERYTTEEV
AFSGHVI PKGQRVFAVLGSANHDEQMFAQPERLQLDRDPNRHLAFSGSIHYCVGAPLARL
EAQIAFTAILKELPGLRLAVPRASLRWKPATILRGLDQLPVHCTPAPTCSI PRAKPTAAA
TAPLG

>CMC5_013000|KEGG|**CYP264H1**|[Chondromyces crocatus]|ccro|DP

MNQQIDLDFMDQNTRRNPYPVYAE LRRNRPVQVKGGIWVAARHADVMRIAKDVTSFSSSG
FRVILSPPTIGPNPVAESILALDPPNHTQLRALVSRAFTPRNIGRLEGRVTDIANEIGDR
LRDMGEADLVAELAGPLPARI IAEILGLDPALHREFKRWGEHLAVITPATVDPLASAIRS
SIGEMERYFKEVIAARRRNPREDIVTDLTRAEVDGVKLSDPQIIISFLFLLSSGGFETTVN
LIAHAMMILSARPQDHDRLRAEPHMI PAFVEEVRLRYEPPLQGLPRVCSADVVI GGQFIPA

GSLVVGLIGSANRDESLYHDPDQFDMREQH GALAFGHGIHFCLGAALARLEGRLSLEAL
LSRFRRLQQLPGEITYTCAISLRGPIAVPMRFIPG

>CMC5_016940|KEGG|CYP183AH2|[Chondromyces crocatus]|ccro|DP

MDATSEIGIAPGGLPFLGHALQMLRRPLDFVASLRGQGDVVKIRVGAEWAYLVRHPDLVR
QVLTDIFTFDKGGALFDKAKQIVGNGLSTCPASDHLRQRLLQPAFSRERLENYAATMSE
VTREMVDAWQPGDIVDVHKAMGKLALS IATQTLVSTSAVSASQETLKDSIQVLLDGIYWR
MIAPFELLQKIPTRHNREFALAQQRMGAVVDQMAEEYRKSGVDRGDLLSALLAARDTDGT
TGMTNAEIRDQVLTFLFLAGVESNGAAMAWAFYLLGRHPEVERQLHAEVDEVLGGRVPSFA
DIPKLAVTHRIVQETLRLYPPIWMVSRRTTAAVKLGSCAIPAGAGILFSAYAMHHPDLF
DEPERFDPDRWLPERARSLPREAMLPFSSGKRKCIGEAFSVIEATIAVATVARRFRLRSV
RAGTIKGI PRVTLIPGPLPMRVEGRKPKTMA

>CMC5_016950|KEGG|CYP183AH1|[Chondromyces crocatus]|ccro|DP

MDTSSEIGVAPGGLPLLGHALQMLRHPLDFLTSLRGTGDVVKIRLGPWAYLVRHPDLVK
QVLADAYTFDKGGIVFDKARNILGNGLATCPAGDHLRQRLLQPAFSRERLINYAVCMRD
AARTRVESWHDGQVVEVDREMGSLALTVA TRTLFSMDSVAESPEEQASIQTILSGIYRR
VITPFEVVL RVPTRKNREFDQAMARMYSVIHQITEDYRTAGIDRGDLLSALLAARDEDGT
TGLTNREIRDQILALFLAGIETTAAAMTWSFHLMGHHPEVEARLHAEVD TLLGDKPPGFE
DVPKLTTHAHRVITEALRLYPPLWLLTRRTTAEVKLGNHLLQPGTAILFSSYAMHRDATYF
EHPERFDPDRWLPERAKAVPRGAMIPFSAGKRKCLGDTFGMTEATIALATVARRWRLRPV
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>CMC5_019510|KEGG|CYP101P1|[Chondromyces crocatus]|ccro|DP

MNNELESERGVPAHV PVDLVVDLDFHFPAGMEDDLHLAWRKVQVSGPDIFWTPRNGGHV
ATRAEDIVVIQTDHERFSHRDVS IPTARPKGAPTALPVELDPPQH GAYRGLISP AFSIRA
VGAMEAKIREVTVALVEAIAPRGECEFVGDFAKELPVVVFLLDLDLPRADRETL LPWAED
LIRPKSAETAGLAYQNLARYVAGWVAQRTERPGNDLISHIAGSRVHGRPITQDEAIRLCM
LVLVGGLDTVASMLGFVARFMAQHPVHRRQLAEDPTLLPQAVEELIRRHGLVNTTRTITH
DFVFKGVQLKEGERILVPNHLAGLDERTVEAPLTVDFLRPKPAPHA AFGNGPHRCPGSTL
ARTELRI FLEEWLKRIP EFGIKPGTKPVFASGAVNTVHELHLGWT PARG

>CMC5_023260|KEGG|CYP264G1|[Chondromyces crocatus]|ccro|DP

MSEVHLNLLSPEVAVDPFPFYAALRRDSPVCRVEPGGFVAVSRYEDAAAVVADPVRFSR
GVAPAMPDPWLQLEFNAGAHSMVVQDPPEHTRLRSMVNRAFGPALLAATEGPLRALAERL
ADGLGGGDEVDFVSAFATPLVASVIGGVLGLDPTRHAQFKRWSVDLGSAGPVSQGPHEDE
LVR SAYREMRHCDEVIEARRREPGSDLMSALLQIRAGEQALTDRELHSFFHLLFIAGLE
TTVHLIAKSVMR FADHPEEMARLRAEPAMI PRYLEEMLRYDPSVHFIFRQAPAEATLAGG
TIPAGSFILVMLASANRDEARFPKADVFDMDRDTRGHLAFGHGPHTCLGLALARMEARIA
LETLLTRFQRFERRPGPPEWMHTIIVRGLARLPVRAIPA

>CMC5_023750|KEGG|**CYP263A3**[[Chondromyces crocatus]]|ccro|DP

MTEMREEKRPPGGPLTSLRYLANFRTGNMRHYEALFARYGDVVRLRAPGAEDFVLAHP
RDIGHILRTSSRNYPKGKRYHELVPVLGWGLVNSEGDLWRRQRRLVQPQFNHAGTLGFVP
LIIAHT EALLRRWDAR PDEFERDINDDMMDVTFGIAGEAFFGAALHAHTDTVRTAFKFAL
SMALKRMYSLVNLPLSWPLPSHARFHHAMGQVHAVIDEIIDGYQAGDGS PDNVLVRMKA
VDPETGEAMDRAQLRDEIKTILMVGHETSSVTATWALYLLSQHREACERLTTEEIDRVLSG
RTPTVEDLDAMPYLGVMVFNECLRLMPSVPPFILRSPLEDDVGGYRVEAGSTVAIVPWVTH
RHPAFWNAPEKFMPEFAESRKSAAEKLAFIPFGAGQRICLGEFMGQLEGKIMVTMLLQR
YRFQLIPGFDPRCRGFISLQPLNGMRMICRRREQTRSASVRRGGDGVRESVARPSRACPF
SAGS

>CMC5_027320|KEGG|**CYP109Q2**[[Chondromyces crocatus]]|ccro|DP

METRVFAELDVTSPEFIRHPYPSYARARRASPLCRIQPNQFLGVSRYHDVVRVLHDSKRF
SNSGYTASRPAQRQDLDIMPPMLVELDPPRHGKVRALIVRALS PRTVAEFEPRLRKITDE
LMA SLHGSEFEFELLSALAIPLPMIVIAELLGVGSERRDDFRRWADD FAGAQAIGAALETE
KLQRSTQEFYHYFGERMEERRREPRGDLLSQLVHAEVDGERLSAEELLSVVTALLIGNE
TTTSLVANTIVTLTDHPEQLAEVQENLALI PALVEEALRFEP PAHCIFRQATT DVELEGA
VI PRGTVVLP LLASANRDESQFPDPDRFDIHRDTKGHLAFGLDIHFCLGAALARMEGRVM
LEALLSRTKNLKRAERDVAVT PSSFIRAPQKLV LRAQVD

>CMC5_027330|KEGG|**CYP109Q3**[[Chondromyces crocatus]]|ccro|DP

MSTGSADS AELDVTT PDFIRHPY PGYARARRTASLCRILPNQFLGVSRYHDVVRVLHDSK
RFSNSGYTASRATQQQLNDIMPPNLVELDPPRHGKLRGLIVRALS PRSVAEFEPWLRKIA
DGLLES LHGASEFELLSTLAIPLPMIVIVEMLGVGTERRDEFRRWVDDFAAAHAIGSTLK
REQLQRSTQAFCHYFSAQLEERRREPREDLLSQLVHAEVDGERVTAEELLSVVTALLIGG
NETTSLIANALVTLTDHPDQLAEVQENPALIPAFIEEV LRFESPAHIVFRQTTT DVELD
GVTIPRGAMVLPMLASANRDERQFPDPDRFDIHRDTKGHVAFGLDIHF CPGSALARLEAR
VMLDALLSRANKLRRPEREVAWAPSFFLRTPQKLVLCQAIA

>CMC5_027340|KEGG|CYP109Q4|[Chondromyces crocatus]|ccro|DP

MFAELDVTSPEFIRHPY PGYARVRRSSPLCRIQPNQFLGVSRYHDVVRVLHDSKRFSNSA
YTTSRPAQRQGLDTMPPMLLEMDPPRHGKVRALLVHAFSPRIVAEFEPEPLRQLTDELMAT
LHGAQEFELLSTLAVPLPILVIAELLGIGSERRDDFRWSDDFADALSIGATVETEQLQR
STQEFYHYFGERMEERRREPRGDLLSLLVHAEVDGERLSARELLSAVTSLLVGGNETTTS
LVANALVTLTDHPEQLAEVQENLALIPALIEEV LRFEP AHCLFRQTTTRDVEVAEMV I PG
DTIVLPLLASANRDASHFPDPERFDIHRDTRGHLAFGLNIHFCLGAALARMEARVMLEAL
LSRTKNLKRAEREVAWSSSFLIRSPRRLVLR AQIG

>CMC5_027350|KEGG|CYP109Q1|[Chondromyces crocatus]|ccro|DP

MIADFNITSPEVARNPYALFTEMRRASPVCR LQPIQLLSVGRYHDVVRVLHDSKRFSNSG
YNASVPKEMQENSTMPPIVQVDPPRHGQLRALVTKAFTPRTVAQLEPRIRELSRELIDG
LRGQSTFELTSAITIPLPMIVIAELLGVGPERRGDFKRWSDDFVSTLALVEPGNRERVRR
STEEFYGYFGQVLEERRKEPRDDLISRLLLADVDGSRLTPEEVLSFANTLLIGGNETTTS
LIGNAMVALTDNPDQLAEVQENPALIPALIEEV LRFESPAQCIFRQTTTDDVDLDGVTIPR
GAVVLPLLASANHDES RFPDPDRFDIHRDTKGQIAFGIDIHF CIGAALARLEARV LLEEM
LGRMKNIQRAEKDVAWTPSFFIRSPQSLPLRARID

>CMC5_030120|KEGG|CYP1011F1|[Chondromyces crocatus]|ccro|DP

MSQRLHFDPLSSEFLADPYSLYARMRAEDPVHCNAMGSWLLTRHDDVAVLRDHRFGVHS
MAANLRSKGRFLGPGQKLDALADTVGQWLMFDNPP EHTRLRRLVSRSF TGTGSVELLRAQV

EERVAACLDAAEREGELDVIHDLAVPLAVGTISSILGVPKDRARVLAWTEGLSHIVDPL
RSLEEYLAMEQVAEEFMEYFRALFRERRRNPEDDLVSALVAKEKDKGVTEVELLSMCTNL
FTAGYKTTVNFIGNVLLLRNPAQCALLREAPEAVPRAMEELLRYDSPVQLITRLACEE
VSLRGRTIPAGSMVFLALGGANRDPEQFANPDRDLTRTEVRHVAFAPGMHHCGLGAMLAQ
LEGQVAILGLVQRFEDLALRTEGVAMESDVI FRGPRSLPVSFDARTQALRRGRGG

>CMC5_034440|KEGG|CYP210B1|[Chondromyces crocatus]|ccro|DP

MALPPGPRTPALVTTYHWIRRPQPFLTECRDTFGPAFTIRLPNLPPVAIFANPDDVKDIF
TGDSDTMLAGRFNLSLRAFLGDHSLMLDGREHLRQRLLLLPPFHGERMTAYGRIMIDAA
HDAIDRFPPFRSPFAVHGYMQEITLHVILRAVFGLEEGPRLDALAEAVTNLLEIAVWPPLL
LPAMQRDLGPWSPWGRFLHYKRQTHGMLLDQIRRRRAEQATRPEGLEGDDVLTLLLQARD
EEGQPLTDEELRDELMTLLVAGHETTATGLAWALHWILTTPGIEARLRRELADGHFTPER
IARLELLDAVVRETLRLQPVLPFVGRILDKPVVGGWDL PAGVGAVCSIYLAHKRPEVYT
EPDRFNPDRFLGTFKFSPEYEFFPFGGIRRCIGMAFALHEMCMVLATVLRARTILRPAHDRA
IRAVRRNITLTPSDGCSVVLKRRRAPRSTAAHAA

>CMC5_036230|KEGG|CYP147L1|[Chondromyces crocatus]|ccro|DP

MPRNDLFQQATRPAHRADPYPLYAELRQKPVWLQDDGSYVVSTYREVSALLYDPRVSADP
MKRSDLPIIYTDPRMPRDQPSFIQLDEPKHGAMRRLTMKHFGPPRSAGRVSGMGARIGQI
VDRLLDAHRDARQLDVVQDLSYPLPVMVICDLLGVPLDDEPLFREWSEVLTSSLDPDAL
QNDPAFLERIGSAAVGIRTYMTNLLQGHRRTPNDSMLSFAVNDPEAREHITDGEFLSIAI
LMLIAGHETTUNLISNATLTLRHPDQLARLRDDPTLMPGAIEEFLRYEPPVQYRERTTL
TDISIAGTTIPKGASVNLVLAANRDPLRFSEPDQFLLEREDNQHLSFGTGVHYCFGAPL
ARVEAQIALNELLRRLDNPELTADPPPYRFNPALRGPSHLVVAFDGMRA

>CMC5_041820|KEGG|CYP107HW1|[Chondromyces crocatus]|ccro|DP

MSSPTIAEVMATPAFQLDPYPLYARLRDEQPLYRSPHGVAYLSRHADIEKALRDPRLSND
RDRIIRAMQAQKNDTQLMTRLMRKLGRVMTNSDPYHARLRKLVGKAFNAGRIRDFRPQV
QALTDLLDAAQARGKGMDLIAALAYPLTSTVICALIGLPRDDQARFLAWFRQLEDPIGA
GLSIGETEALVDTLYGALRALIHLREREPGDDFLSALVHAEEGGERLDEDELLSACFVLI
GSGYETTMNLIANSVFTLLRHPDQLCALQEKPELLPQAIEEVLRYESPSLQVIRVVAEPV
PIADGTLEEGEMVSLLLGAANRDPLRFPDAERFDITRTDSRHVSLGSGIHFCLGAPLARL
EAAVAVGTVLRFPPLRFEDSTPAWRPNPALRGLAHLNVAWS

>CMC5_048430|KEGG|CYP107HU1|[Chondromyces crocatus]|ccro|DP

METRASQEQPRALRAVTEDEVSRRAQGGESIPVLNVGDPEFLGGAYEAYEALREKGPVVR

VAIPVSTGSDEEENPEGRTAFQEIYGKEVFFLSRYAEVFEALRDERFSSCPHALKSAEEL
AEEPVVAEELKPLRDSLLTTDAPDHTRLRKLKLVQPSFTAQAMEALRPRIVQLAQGLLDQAE
AAAAARGEKAGERRMDLVEAFAYPLPVTVISELLGIPEADRDRVRHWTEDLLINRGSRGL
DKAALGKLQEFSTYLRLALFVERRDRPAEDLISRMVHAKKEEGDALSEDELLSMVFLIYVAG
HVTTVNLIIGNGVFALLTHPEQLERFKASPSLSRGVVEETLRFWGPVDTVSGRIAKEDVEI
AGTVIPKGSRVMCGLAAASHDPAFDHPEAFDITRPDAGRHVAFGRGIHLCLGAPLARLE
GQIAFEVLFDRLFPSLRLSRPAEEMSWGHKVLRGFDEIPVLF

>CMC5_053220|KEGG|CYP1007F1|[Chondromyces crocatus]|ccro|DP

MANPSRDTALHALPGLRPLPLLGGRPHLVRFLRDPLTTVRALHHEYGDVAVLCAEKPAMV
CLFGGQNNRQVLTDAKLFVNYSKSLVETAPDSPLTRLTTSPLSLNGEMHKRRRRLMMPAF
SKGRVEAYRDQMVEVTERYLARRPSGQIVDIASEMTELTMCIALQCLFGLDVSNEAEDLG
RLGLQFLEGLTSLGVMALPFEIPGLPYRRFMQRCAQLEARISALIQKRSSGEETQDLLS
ILLRTHDEDGGALTDSELLSESTGLFIAGHDTTANTLSWTLFLLSQHPEIYAALVDQLTS
VLGGEAPTVEQLSQLPLLDVAVIKESMRLLPAPLLFLRNSSEKAKLDGCTLPDPTTVILS
PIISHHAPEIFPEPRRFRPDRWSTLRSPYDYL PFGAGPRTCIGASFAALELRIALAILL
QRRRFTLSPDAVVSHHMRSILMGPRKGLRMVWTRQDGHFARPGGVRGTIHDLDVLS

>CMC5_054910|KEGG|CYP1224J1|[Chondromyces crocatus]|ccro|DP

MKSSLPPGPRLPGFIQTSLYMSRPLHFLKRWSQQHGDTFTVHMTGSGDFVFITSPEDIRR
VFTASIDVIYAGESNSLVRPFVGDSSVVVLDGEAHIRSRRLQLLPPFQNERMQTYATIMRD
VADASLDRWPVGRPFPLLSKMTEIAMELMLRNIFGLEDPREIATFLERFTSVLDEATSPM
RVMAFAGLDLYKLLPFLHVSKLKRQLDDSIYELIARRRAAPRDPTRQDVLTLLILESKHE
DGQAMTDRELRLDALVTLIAAGYETSAIGMTFAVERLLAEPWALAKVHEELDRVLGQETIV
AEHLPALLEYLDAAIKESLRLRPLVPLISRRTKAPFELSRLTLPAETMLIPALVLTHLRED
LYPDPERFDPARFLGTPDPYAWLPFGGGARRCLGMAFAMYEMRMVLATVLRASLELAS
NRPVRMVRNHRIMLAPSDGAPVVLKARRPKPQTKNSAAA

>CMC5_054920|KEGG|CYP1286B1|[Chondromyces crocatus]|ccro|DP

MLPSGPTLPGRVQLFWWMFDPTSFMERCTREHGDTFTTRFTSYPPSVYVTDPEVIKQVFV
ASAEDLSAGQANTGLMGFLFGERSVLSLDGAQHLSRRLVLPFFHNERLGRYGRMLREIT
DQHIDRWPIGKSFVSKAMHELTFDVILRLLFGVHERAFYEPFSKLVAELVRQTTSPLFH

GLFAMLPPEWVMSMLTRGPTKVALGPLGERDLSLFMPGGAILQAKREIGALIHAEISLRR
ASSQRGDDVLSMLLDARDENEGMSDDELHDQLITLFIAGHDTTANALSWAVHHLLQHRE
VRGKLDDELSGVKGEAGWLEVAELAYLDAFIKETMRLTPVAPVILRILQRPLRFGQYD
LPAGSYVCPCVYLTHRRADLWPEPERFLPERFIGRRVSPYEFFPFGGGARRCLGAGFSMY
EMKVILARLVARAALRPVGGGEVRPERRGIFLAPSSGVPVVLEGRREA

>CMC5_063310|KEGG|**CYP107AM2**||[Chondromyces crocatus]||ccro|DP

MNTDRDEQVREYPFRAPGPLEPAEEWAPLRKGCVAHVRLPSGDQAVLLTRYDDVRQVLS
DPRFTHNLSAEGAARTTANEAGGVFERQEASMLTDADRHQRWRRMIMKSFTVKHISAMQQ
RIEAMADQLIDDMVKQGPPLDLASALGFPLPVWVICELGIPGVDRDKLAYWSNTMLSVT
QYGGQEI DAAQAEFKAYLTAHIVAKRANPGDDLSELLAAGDEGQGLSDMELLLTAQGLL
VAGHETTSNMIGKVMAMLLSDRRRWEQLLADPSLVRTAVEEVLRFDANAGFGLPRFITED
IEVAGQTLPRGTTVICAMASANRDERTFAEAEEMNLARSPNAHLTFGAGPHSCLGQTLAR
TELQTVLRVLLRRLPTLALAVPTEALSRRAGLLVGGLEQVLVRW

>CMC5_067690|KEGG|**CYP1496A1**||[Chondromyces crocatus]||ccro|DP

MDRRSSFVETSTSFSDPYPTLRRLHDERPVYYHEPINAWFLVKYEHCEAVVRDPRFSSV
RARELLHTLLPALRGTEGLDALVAQFSRLLWFVDPPTQRLRSMVNRGFSASAIERMREK
IRTVVQRALSRI GDGGEVDVVGDFADPIAIDVLCALFGLPEADSDVLRAWTSDLGKVAGA
SWADGTGGTDAKDASSAFAAYLKDLIADRIAHPGEDMVSRLFEGAGSAPEDI EGVIDQCY
QVIGASYLPTCNQIGNAVLTLQHPGELQRLRTPPELFRSAVEEILRFEPSTLTNRIAS
EDIELGGERILRGQLVFPVLAGANRDPVFPPEPERFDIGRRGARHLTF SVGPHYCAGGAL
VRMQLEEALQALLTFDTWELAGACDFRSGGLQDRGLATLPVRF SRRPRS PRAAHGALESD
LALLEV

>CMC5_068540|KEGG|**CYP125E2**||[Chondromyces crocatus]||ccro|DP

MELADIRIADPDLYLTGVPHDRFERLRREAPVFWHEEEGGTGFWAITRHADAIQVISDAK
RFSSARGGIWLEDYPPDDLRSNRDGLITLDPPTQTRYRGLVSKGFVPRMQAIEPHAREI
VTAMIDRVEERGSDFVSELAGDLPLRIILQLLGIPLDRAQVAAWAYQFLLAADKPKEE
VEALVRDLVGYAARLAEERRASPRDDMLSVLMEGELDGEKLSSEFGLFFSLLLSAGTVT
THQLIAQGMILTLLERPETQRRLEEDPSLIPSAVEEMLRFVPSVGYMRRTATCDTEIQGQR
IAEGDKVVAVLVSANRDEEVFPDAQTFDVTRSPNEHLSFGRGPHFCLGATLARLEARVAF
EEILRRLPGMQLAGPVQMRMSNWLMLTHLPVRWSPSLRARP

>CMC5_069130|KEGG|CYP167B1|[Chondromyces crocatus]|ccro|DP

MLDHTINHGQQPLKFCPFSTEYSANPYPTLERLRREGSPLMFWEEGRCWVSRHADVFGLL
RDPFRFTTDRRTWEFAKPSEVEARCPPEYAEMSKHSLFSLDQAAHARVRKLVSPSFTPRAIE
RLRPAIQHIVDEVLDAAGKEILDVTRDFAEQIPIRAIGAMLNVPPERQAAFHRYADAMI
RQLFPMLIRPEEVDGNFASIREGIAMIDDILEERRQEPREGDLMSSLLQAEEQGDRLSRR
ELQALVSSLIVGGSETTVHLIGFMVLNLLRRPALMEQAKDEPELVKSILEEVLRFDNFTR
LGLTRYARQDMDFNGSHIRKQMMILLNLSALRDPFAFPLPDEFDPHREAVTSIAFGNGA
HFCLGASLARLEGQVAVSTLLRRFPDMHLVGTPIFGPHVIRKLDLSKVALHASAR

>CMC5_069160|KEGG|CYP167B2|[Chondromyces crocatus]|ccro|DP

MLEQNRENAPQKVDFDPFTNDYAKDPYPTLERLRANSPLLYWEEGRCWVASRYATVVVLL
RDPFRFTTDRSVWEHAGHGQAAALCPEFVEMNRNGLFSLDQVAHARVRKLVSPSFTPRAIE
RLRPAVQGIVDEVLDAAGKDVLDVTRDFADQIPVRVIGALLNIPADRQAQFHHFADAVV
RQLMPMLIKPSEIEENFAAIREGIAMIEGVIEERRQHPIEGDILTSLIQAEEQGDRLSKG
ELVSLVSGLVVGGSETTVHLIGFMVLNLLQRPELLAEAKANPELIKGVLEEVLRFDNFGR
LGITRYAKEDIELDGARIKKGQMVILMLNSAMRDAAAI PMPDTFDPHRDVTSLAFNGA
HFCLGASLARLEGQIAVGTLLSRFPDLRQEKGA VFGPHPLIRKLDLSLQVRLRPAVS

>DB32_001278|KEGG|CYP110T1|[Sandaracinus amylolyticus]|samy|DP

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TASPDHFGAWAVGTT SVVLGPRSLIVSEGETHKRDRKLLT PAFHGARMRAYGDAMRTLAR
RRFETAMQPGATVTMQDVTTDITMDVILRTVFGVGEA AFDEGRALMGEIVRGMSPLLFF
SKASHTPLFPWRRFVRIRERFRAWLDARIAEARARGDEGDDVLAMMLAARYDDGSAMSD
DDVAAQLVTL LLFAGHETTAIALAWAMHWLGRHPDALALVRAEIASVGIDADPEVIAKLPY
LSAVCDETLRLHP IVTENLRMLRKPLALGGYTI PPGIGVAAAIGAIHADPAIYPEPDAFR
PERFLDRKYGA FEHL PFGGGHRR CIGAAFAEYEMRLALAVLVDGWDVELVHRHERPVRRS
VTLGPAHGVPVKVIGRRAGLRAAA

>DB32_004988|KEGG|CYP253M1|[Sandaracinus amylolyticus]|samy|DP

MDARPYESMPTLP GGLPLLGHWP EIIHDVFGFLERAAERADVVRVRFVHERAVITHDPAM
IQHVLQOSPRLYAKSRNYAGMKKVVGEGLLTSEGDFWKRQRKLAQPAFHAKLRGITRTM
ASATEDMLARWRTWEDGRPF DLHEEMMRVTLRIAGLSLFGADLDGESREIGAALGVILPW
VNGIIQEPFRPPLWIPTRENALREALATLDRLVYRIVEERRRS DPEHQRDDLLSMLMAA
TDDEGGGGMSDRQLRDEILTAVLAGHETTANALAWTGMLLARHPEIGARVEREASAVLGD
RTPSVDDL SKLELC DRVVSE SMRLYPPAWEFEREALVDDVAAGWRIPKGTVVMIAPWTLH

RSPRFWDEPARFDPDRFLPERSAGRPRYAYLPFGDGPRVCIGKAFAMMESKLLLAMMARE
VRFELEPGAHVREPEPSVTLLRARGGVPMRFRRTAPAPFVDQTTSA

>DB32_006288|KEGG|**CYP51B3**||[Sandaracinus amylolyticus]||samy|DP

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VFNREMVAMFGPEAHEAVFRAPDAVLSPTTEAYKIMTPVFGKDVVYDATPEKMAEQLKMLL
PALKDRRMRTYGEAVVHETAASTREWGTSGVVDFVEFCRVLTNFTSSRCLLGKEFREGMS
EEFARVYHDLEGGVTPLAYIDPHLPVPAFRKRDKARVRMVEMITGIVRDRRAHQRTGEDF
LQTLMESNYADGRPLSEHEITGLLLAGIFAGHHTSSVTTAWTLLELLQNPTQLQRCVEEV
DRVFGGGRPVSHAALRELTTIENAVKEALRLHPPLFMLVVRVVKQDFTYKQFFIPKGTWIV
VSPTVSHRIPTVFRDPDAFDPDRYLPGREEDKKDFAYIAFGGGRHKCLGNAFAILQIKAI
LALLLGQFEFGLCGDAIAPSFQGLVIGPKEPCRVYRRAQPSVTMEMGTELAAAADAI
AHELNGAKEVPQAVQAAAAAGCPAAHVAATPSTSAGSSLRVKVDRLCQGHAVCATEA
PEVFAVSPKDHKVMLKVARPPAELHDKVRKAAQYCPNHVIRIEETD

>DB32_006357|KEGG|**CYP117D1**||[Sandaracinus amylolyticus]||samy|DP

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VHEWIDRGVITTLASTRELVLALILRMLGVPERDLDVWRRDYEDHMLLALGVPLDLPGTP
RRRGLTAKARLDERIGALVREARAGSDTTVLAQLSRAKDEHGEPLADAELLDNLRLLLILA
GHETTATVIAWLIAYLAESPSSLERLQSEATDVPRAPGDLRAFRFAEALFREVLRQLQPPV
ARDARRAVVDLEIAGRVPAGSIVAI SIELLSRSPRTYEDPDSFVPERWMGKTAPPTALE
LVQFGAGPHFCLGYHVAVLEVVQTSVILARALRARGARLALDGRFPRVRHLPLRHPDASS
RVRFVRG

>DB32_008533|KEGG|**CYP152Z1**||[Sandaracinus amylolyticus]||samy|DP

MGSIPRDP AIDGSLALLREGYLFLPRRFRERLDTDVLELRMLGLRFIALRGRDAAALFYDP
TRFVRRGAVPMAVQRTLLGERGVQTL DGD MHAKRKKMFMSLMSRERIDALMGEMWKQWYA
ALDRWQQREEIVLLEEAQDVMCRAACAWAGVPLEEREVRLRAEDFGAMVHSFATIGPRHF
AGRIARARTERWMGGVIQRIRRGELRPSPTQASYVVASHVDANDRPLDEHEASVELMNVL
RPIVAIGTYVAFIGHALHAHPDHRAMLRA PVDETTTRAERVEAFVQEVRRFY PFTPFLGAR
VRESFEWRGYLFPKGRRVLLDVFGTDHRRLLFDDPDAFRPDRFLGWAGGPYDFIPQGGGR

YEGGHRCAGEWLTIEAMKVALTFLTRAVELRFAPQDAHIDLSRIPTLPRSGMILTDVRAV
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>DB32_008796|KEGG|CYP253J1|[Sandaracinus amylolyticus]|samy|DP

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PAREGTPIDVAAEMMRLTLRIAGETLLSTDPSDRANAVSTALTTVLHEANTRINTLWSPP
AHWPTPRNRAYAAATRELDRIVLEIIEQRRRGREHRDILLQMLLEARDPETGAAMDDKQL
RDEVMTMFLAGHETTANALAWTFVLLSRYPAVARALHEEACDVLGDRPATEADLPKLDLA
RRVLNESMRLYPPVWIIIGRSPAEPVEIGGYDIPAKTIVFTSQWVTHRHRPRFWDDPEGFDP
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>AKJ09_00712|KEGG|CYP1373B2|[Labilithrix luteola]|llu|DP

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FHARQRKLIAPAFAHKRVASYADTMAERARSFASGVRSEVLDVSDAMMRLTLEIVGKTL
FDAEVSDDADEIGEAVTTAMECAIGQLESFLPLPPIVSPSNVRIRKAVARLDAIIRLI
RARRDQGGDRGDLLSMLLAAQDEEDGTAMNDRQVRDEAMTLFLAGHETTANALAWTLYLLA
KNPEARAKVEAEVDTLGRAPSYEDLVRLPYTLAVLKEAMRLYPPAYILARRAVEDVSLGG
HLVRRNTIVLVNVLGLHRRPDLFPEPERFVPERFLGDEEKLPKRCAYMPFGAGPRVCIGN
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>AKJ09_02861|KEGG|CYP210A2|[Labilithrix luteola]|llu|DP

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TQVILRTVFGVAAGPQFEELADLLAKTLDAAWPGLLFPFMQKDLGPLSPWGRWRRLRDR
ASSILHEEIRQARSNHEARNVDLMMVAARDESGRALSDDDEIHDELITLLVAGHETTATA
LTWALRWIVPNRELTRLQDEIAGADDDPAKIDARLELLDATVKETLRLQPVIPVGRVLQ
EPMRVLGWDLPTGTWLAPAIALIHQRASLYPNPRRFDPDFRVGARPPWEPWLPFGGGLRR
CIGAFAIYEMKMVLAVALSRVSMRLVKNEVRTVRRSITLAPDEGLPIVALERRPRKARL
RAA

>AKJ09_06094|KEGG|CYP1007B1|[Labilithrix luteola]|llu|DP

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EHDRYHMCALPGALYPSDEVLAEEAAAADKRWRATPERLQPIRRTLTGLFHVNGAEHRRHR
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EQGVRLARMFQEWLVTKFSPAMLLRFDAGPTVFRRWLDLTRDIDQCTLDIVRAKVARSKS
QRDVAPDMLSSLIAARDEDGSALDEDELVGHAGVIFAAGHETSTNALAWTLLLLSQHPDI
ATDLVDELRGVLRGEAPTVEQLGSLPLLDVAVVKESSLRILPPVPIHPRLVAKDSELEGHSL
PAGTELFLSIYHMHDPDVFPQRFDPQSRWSKIKPTVYEYNPFSAGPRMCIGASFATME
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LVDFS

>AKJ09_06238|KEGG|**CYP1007G1**|[Labilithrix luteola]|llu|DP

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RSALDGYAEEIVTLTRSLVGAWPRGEVVS LDGLCRELSLCIAVQCFYGV DVKRGASV LGQ
TMAEFVRLVTSPANILFPFDLPGTPYRRGVQIGEDLASRMLALVESKRQSGGQRRDAMGL
LLDARDEHGNGLTADIEVALAVELFIAGSETSSMALTWCLLLLDQHPRVLEALAAELSDV
LGERDPSPADLPKLRLLLDRVVKETLRVLPAAPIFLRSATRDTMLGGKAI PKGANLVVSP
LATHHDASLYPDPDRFLPDRWKEIEPSTYAYFPFGAGPRMCAGALFASQSVRLMLAMILQ
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>AKJ09_10261|KEGG|**CYP1366A1**|[Labilithrix luteola]|llu|DP

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>A7982_00879|KEGG|**CYP51B2**|[Minicystis rosea]|mrm|DP

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>A7982_00887|KEGG|CYP263A2|[Minicystis rosea]|mrm|DP

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>A7982_01273|KEGG|CYP183AH3|[Minicystis rosea]|mrm|DP

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>A7982_01903|KEGG|CYP1493A1|[Minicystis rosea]|mrm|DP

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>A7982_01917|KEGG|CYP1500A1|[Minicystis rosea]|mrm|DP

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>A7982_04960|KEGG|CYP120G2|[Minicystis rosea]|mrm|DP

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>A7982_06089|KEGG|CYP1448B1|[Minicystis rosea]|mrm|DP

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>A7982_10186|KEGG|CYP159A21|[Minicystis rosea]|mrm|DP

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>A7982_11494|KEGG|CYP1069H1|[Minicystis rosea]|mrm|DP

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>A7982_11629|KEGG|CYP110S1|[Minicystis rosea]|mrm|DP

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>A7982_13464|KEGG|CYP1007E1|[Minicystis rosea]|mrm|DP

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AWS

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QLTYTNRVFRERLRLCPPIWVNPRDIEEEDIDGFYIPPGTTVTPVITYVIQRHPEFWEQP
HVFDPPDRFTPERSEGRDRIYAWAPFGYGRRSCIGQEMAMMEGVFILAGILQHLQIEPIPR
EAKIALLGTLRPNKNGVHLRLRPRHGGV

>Hoch_0813 | KEGG | CYP1490A1 | [Haliangium ochraceum] | hoh | DP

MASVAGLPPAAPLARSQAQLARDPLAFLTEGRERYGDIYRLGLGGMHVLLHHPRAHHV
FREHYKNYKGGALWEALRDYLGNGLLVTEGDLWLRQRLLQPLFKRTNIDMRMSSMYEI
VTRVLDSWGEECAQTGSLDLVSACARLSMGVSTGSMFGSALTHEALTHALMEEVRVVDSM
VWNMLTRRIPQRLRPGYARYRKAMDHIHSALDGLIDHYQRSEDGDDGLLAMFSYIEDSAT
GARMSRELMRDETLDLLLGGAYETTAQALAWTFYCIHQHAEVERRLRAEIGAVLGARRPEL
EDLKQLPYVVRVIREALRVYPPGAWITRTRTREDDEIDGHHIAAGTTVAVVITYAIHHHPAI
WEQPERFEPERFLPEADAARERCAWIPFGSGPRVCMGDMDFAMLELALAVILALQRYDIQR
VTSGPIAPRLRRTTLTPAEPLVRLHHRPGDA

>Hoch_0814 | KEGG | CYP1504A1 | [Haliangium ochraceum] | hoh | DP

MKHAHPRLSPFEHTRQLLASPFQWLVDSTRTGDIARLGIGHQSVLLSSHPEHADHVFR
RHARRYARAGRFWDALPGIFGRGLLMTADETWLRHRRLQRFFRRDHLLSIAEPLLATIE
DAVARHLGTVRGRVLDVHPVLEAIVLECMITLVFGTRLSADRAQVRSQITWLTRRVPO
ALLYSTLPASLARVVRNRYAENLLAFRRRIAAMAADCRRPSVSDMLSELVWAASPGGA
VLPDAEIEDEIINVFIAGLDTSVLGVTWAVALTATHPAEGEGISSEGRALGAHRRLRPEH
IDALTRSLVWFQEGLRLYPPIWFSRPLALADDEFGGCELAAGSTVIRMTHVLRHRPQFWA
ESERFLPERFEPGRCPARHRAAWVPYGLGPHVCIGRHLAAILSQAIITILFARYRLELSG
RMPRPLLRASLAPQGGVPVRI SPI

>Hoch_1303 | KEGG | CYP1489A2 | [Haliangium ochraceum] | hoh | DP

MLNDPLKLMTRAFEQHGRISYLPGINSYMISDPEFMRLILLDGENKFIKSPEVMSKIQVA

VGNGLSTLNGGEWKRRMSNSAFKPRNIAAFEPiFHEHLGEVMHQWEQRLGQRFDIAQE
MKRLTLRIVLKGLLSLDVTDRADMLIEHLQDYAVYILWSLFLPENVPTRRRNRQYAE
SKRVMDEEiYRIIEQRRRDGEAAGKGDLLATYMHAVDDAGSGMGNTQLRHELMNLFLLGGH
DTTANSIAFTLYLLSRNPGCRERLERELDEVLLGGRLPTVEDIPKLYLECVYNESLRLYP
PSSAMSRRITLEPIEYEGYEIPAGADLLLSQWAMHRDPTLWENPDVDFDPDRFTPERSANRH
KFAFVFPFAGPRICIGAKLARMEASMILAALLQKYRFESPPGYKLLKLSRLFVNAVPGVF
LRLQKREVSEKM

>Hoch_2132|KEGG|CYP167C1|[Haliangium ochraceum]|hoh|DP

MTTTPTSSEFPASPETFDDLMSSEAFVRAPAETYAYLRDRAPAYYWPRHQAWMMTRYDDV
DALLRDRPFSTDRRKWRYAHTLPHASSPELAALFENDLFTMHADDHRRVRKLVAPAFSPR
SIARLEDEVRLVNSLLDDAKIDQRETFDVSQELAEPLPIRVISTMLDIPAEKDEDFRVW
GTSVIRLALPYLPREVLMEAAEKATAGVSMVRAIIAERRQNPGEDILSKLISAQEEGERL
SEDELMSLVAGLLVAGSETTVHLITFATYQFLTHEDSRRRLQDDPSLLGNALEESLRHDN
FGKSGVTRYALEDELHKGKTIKGDVILNLSALLDERVWPDAERFDVTRDPVSNITFG
RGAHFCLGAHLARLEGRVAMQTLLERFPEMQLAGPPSFDYAHPFIRRIDKLEVRLRA

>Hoch_2513|KEGG|CYP107HY1|[Haliangium ochraceum]|hoh|DP

MSTEQPIAPAPDSHTAPPTHDPATPAALFADAFFHHHPYRLARLREAAPVCAITMPDGA
RAWLITRYDEALQVLKDAVNTNEPPGGMHGAMHSGTLERLMSPNMIFMDKADHRRRLRGL
LAKAFTPRFAEGLRPAVQQLADELDDAVAARGRMEFISDFAFPLPITVIADMLGLPQEDH
QRLRDWSAVLFDISGAHDGADREQQANEFAGYVKELIAHKRREPADDLISKLVQAEQDGE
RLDEQELRAMIVLLIFAGHETTNNLLGNLLALFRQPEQLEALKRDPSPVNAVEEMLRF
CGPATMLAPRYAREDMQIGGVTIAKDELILLSVAGADRDPAAFSDPESIDLRRPTPQHLLA
FGQGMHICIGAPLARMEAQVAFTTLLKRFPELRLTVPVDEVVWRGNFALRGVEALPLAF

>Hoch_2966|KEGG|CYP1486B2|[Haliangium ochraceum]|hoh|DP

MAATSKSQPSPEVAPFITQRVGDVARPLVGMPTTMDLSHLPGEEGPVATVRNTLWIRSG
VDHLLAQHERFGPVYRTGFAGYRVVCAADPDMVLSIARDNQSWSTSLAWLTFQGDISKI
NRAQLDSPLFLDFEPHRNARKVLQPAFGHSATSDYFDAALSLYAAAERWVARGQVSFKD
AIRSLMVEVSTRIFLGEDDAAPEFERALIEYWEGPLALVRDPRFSRKWRRSIRGHRRICE
LLRARIASRRASGGDDLFSRLCMTGTSDGLVDDDDGLVRLVIGVMSAAFATTSSGLSSMV
YLLAEHPAWQQRMRREELLALDSPRMTYADSQSLDVCMRVWKETMRLYPIAPYCARRALHD
VDLGSYRIPAGTFVFLGISAVLRDSALWTQPERFDPDRFTEERAEDKRHKAFLPFQIGV
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>Hoch_2967|KEGG|CYP126B3|[Haliangium ochraceum]|hoh|DP

MSVDSTNRPPASETAHSSPTAGALPAVLEGFDLSDQPRFADGFPYEVFARLRREAPVLFH
PPGQTKDGEFVWLSRHADICEAAAAPAFSSQGGGGRPHGGTHIDDARPELPGVLINMMD
DPRHADLKDVLSPAVGRQALVALEGALRPYVNELVDGLLARGEAEFAADVGAAVGARAI S
LLLGIPREDWPLFATWTSALMGFDDRETAEPSERSQKIHMDFGYGARLLVARRAAPQED
LGSLLANAQLRRDSERPLTELERQTAFCLMVLGTESTRNMIAGGVLALAQHPAQWQALR
DERSLLPSAIDEILRWTTPTPYNRRTATRDVTLGDAHIRAGDKVTLWWT SANRDES VFKD
PMAFDVRRDPNPHLAFGYGTHCCFGDQLGKLEMRLVLDAMLERVAPLELSGPVVWAASNK
HTVVM DMPVAVRAR

>Hoch_2973|KEGG|CYP110U1|[Haliangium ochraceum]|hoh|DP

MPETVDPSSAQTAGDLGRGPSSAFLTTLRYSIDPVSLYRTLARDYGDGHTVHMPMLLGDV
VGAISPQSAQDILTADAASFDIFSPESLAMVFRPRSVMMLSGQEHARERKLLMPPFS PRQ
VLANYAGTMQETALAYAAEVADGRPFVMOELAQRVLLRVVVRDVFVGTEDAELDELELRI
RELFEASSPALIFFPPLRHRFGVGPYATWERADRRLRLIHDLIARRRAEPRGDRVDVL
SLMLSARYPDGSAPSDEVLHDELMALFFAGHAATATSIAWVFYWAHRHPEVLHKLRLDELA
ALPWADEAPARYTEL PYLDAVCNETLRIYPPVADLYRKL RVPLRVGGRTVPAGTGVAVLVT
CIHARPELFPPEPLRFRPERFAERRYS PF EFLPYGAGARRCLGASF AHQALQVVVATILRR
WELALVRREQKAVRQGVGVGPKHGVP MRVRS LVPERSAAQPAGGRP

>Hoch_3012|KEGG|CYP262D1|[Haliangium ochraceum]|hoh|DP

MNATTTQQPSAEKRFPKIEKGLPLVGTLPQLLSSGTQLVERVSRKHGQITVLKAGPTQVY
LITHPDHVKHVLQHSERGFSKGPMDPLRRVFGDGIGTSEGSEWLRSRMAQPLFSTKNI
DSLVGSMSEIVARHVARLAPLVGSGESVDMNVEMMRMVQDVLVATLFGVDVPAQQMTTIA
DAIQRILSSSQLELLLGMVLP HRLLQPMDLLVRRRPRQVLDEVI FDLIAQARASDS DSANF
LSWFLRARDIDTGKGLDDQQLRNELIS IYVAGLETTMCSLLWLWYHLDQNPEIDGKMRAE
VDAVMGASSITA AKLEQLSYTKMVIQESMRRLPTIWMMPRYSREDNVIDGYKIPADSLIF
LSPYATHRDPKFWERPEAFYPEHFTPERVAARPRYAYYPFGGGPHQCIGKYLAMTDQLLI
VAMMVQRFRPRLLLGSTVDPRPSLFLRPRHAMRMTLERR

>Hoch_4349|KEGG|CYP155H1|[Haliangium ochraceum]|hoh|DP

MSDASAAERPLQGRCPIDHDSATQOKTARAVELPEVPLDCDAEGVWHVRAFELVRELLRS
ADTKQAGFNAESFAEQQIINAPILFLDGNHHVQRKQTARFFT PRTVSEKHRSMMESFA
DQLMREFRARKRIELSSVSMKMAVQVAAVIGLTD SLLPGLSGRLEAFFDDHEPPETLSP
PRRMLAHARSNARTFAFFYLDVKPAIRARRKRPQDDVISHLERQYS DVEILSECLTYGA

AGMVTTREFISVATWHLLEQPALLEQYLGDESARQRLLEILRLEPVVTHLRRRATADI
EIAADGRRYTIPGALIDLHIGAANLDSAATGPCPLSVQPERELQVPRVGAEVLSFGDGA
HRCPGAYIAIQETDIFLQRLRLRPLGRFAQKPSVSWHPLVTGYELRNFWLELEG

>Hoch_4741|KEGG|CYP1069B2|[Haliangium ochraceum]|hoh|DP

MSHDPTPSLDFDPFSGAQLDDPVPFLNQARATTPVFFSPPLGTWVTRYDHVVEILRDPA
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GPEIERFAHQLIIDFTGDQCELVAFAHPLPTLVIAVSVLGVPRQDLGAFRRWSDEWVLL
AQRGDMARLVQAAGEVVAQRYVADLVAQRRRAPQDDLISAIVEAAAELEEAPTEAELVS
LLMTVMFAGHETTTSLIVNTVKQLGLHPVERDRALADRGLIPAAISESLRLDPPVPSMYR
TATEAVEIGGVALPAGAHIQLNFAAANRDPARFDEPERFDLERAEPERHLSFGRGIHYCV
GAALALLEGRIAAALYDRLPGLELVPEQRIRIRPSATVRIPEVRLARWRAEV

>Hoch_5488|KEGG|CYP110H3|[Haliangium ochraceum]|hoh|DP

MSTLPPGPGSKLRPTYRLLTKPRTAIPAWSARYGDPFTLKSALTGHVVVTGNPEGNRAIFS
ADPDTFDTFAANALEPFVQYSMLLLSSEVHRRHRKLLMPPFHGERMRAYAAMAEVARR
KLREAGAGPVRAIEVAQEISIDVIVRAIFGIHDDRAAELCDAVRRAMGALHPALAFMPF
LQRRFGGIGPYARMRYLDYSDSLVAEQMKRARTQPGDDILSLMLAARDDEGQPMSEVEI
LDELRTLTVFAGHETTALLLAWGIDFIHRHPAVLKRLLAEIDQVDDSADDAERYAQLPYL
DAVCKETLRLQPPVLEVLRLTRVPFELCGYTVPPGMGVAASVQLTHSRPDLYPEPEAFRP
ERFLERKFSPEFYFPFGGNRRRCIGAAFSSFEAKVVLATLLANWQVRLLDPEPPVPVRAS
VVITPKGGVPIELTSRQRPN

>Hoch_5532|KEGG|CYP107HV4|[Haliangium ochraceum]|hoh|DP

MIDIPDITRPRHKNPYPLYARLRAEAPAVRVIFGDKRPAWLITRHADVSAALKDPRLSK
NPFVTLSAEEQRKQLPWI PAFARPLSKNMLDQDPDHGRLRRLVHKVFTPRMVAELRTRI
EAITGDLLGAARARGRFDLLEDFAMPLPITVICEMLGVPEHERRRFRILSNRMVSIPTPS
EMLRGLPAVWLLVRYLRGLIARRRREGGEDMLAVLVRAEEDGDRLDEDELLAMTLLLLVA
GHETTMNLIASGTLALLDAPEEFARLAGEPTLMSAVEELLRFTSPVDVATERYASTELO
VGGQVI PRGERVFAVLGSANRDGVSFDPDALMLDRSPNRHVAFGHGPHYCLGGPLARLE
GEIAFAAICNELRGLALDVPRDSLRLWKRSPVLRGLRSLPVRCDGAPAYSLPRAA

>Hoch_6014|KEGG|CYP1220C1|[Haliangium ochraceum]|hoh|DP

MHRLPGPRRLPLVGNLHQIELSRLHLILEDWARRYGSAYRIGLRPNLVLSDPPELIRAV

LRDRPEGFRNRRTLETVLSEMGISGVFSAEGAAWRPQRRLATAALSRSHIQGFFPTLRLG
GERLLRRWQRAADQGAIVNILTDFQRFVAVDMTSLSFGRDVNTIEDGGGGVHELLETVPF
VLARRLNARVPIWRWLPDADRALDDALVELRAWLGAI IAEARSELANPDGVTKNFLEA
MLHARDEDGAADFDEAALFGNALTMLLAGEDTTASSLAWAVHELSDDAEVVARLRAELDGE
ISSAVPKTLREVARLPYALAVAEETLRLRPAAPVLLMESNRDAVLGEDIAVPAGTRVLLL
TRLAAI SEAYVPEPQRFLPARWLDREASELLRRGVHLPFGSGPRLCPGRNLAFIEMQMM
LAVLYRNFEVERIGPRSAVAENYGFTMTPHRLRVLRRRAHAPAPHAAAAPRMEQR

>DN745_16145|KEGG|CYP197AB1|[Bradymonas sediminis]|bsed|DP

MKLRSLIREKVAQKLDPSAGVARPPGGALETLKTHLSFAGDPIGSLRKLTDKHGPTAVF
RLGPYTNLYFTNPEDIEEVLLRKNDAFHKDTMLHELDAVLGQGLLTAEGDYWRGQRKLIS
PTLRRKHIESYAEVMVSHTKDMMADWKTGEVRDFHADIMGVTLRIVVKTLFNLELEADYH
EVGEQLEAALDYFFERNNTMWRFMPEPLPTPMRAKNKRAIEGLDRLIYELIESRRRQARA
DTRAGVDEGNLLYRLLIAVDDEGNKMDNRQVRDEALTFLLAGHETTALAVTYAWHLMAA
HPDAAARLREEVDAVL DGRAPTAEDAKKLPYTRALLNETLRLYPPAWI IGREAI EDVQIG
DWTVPRGAQVLT PQALVHRDPRWFDAPDTFRPERWLGLEKTLPRFAFFPFGGGPRVCIG
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>FRD00_08280|KEGG|CYP110AU1|[Persicimonas caeni]|pcay|DP

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MIDGWRVGEEMPMRETAQSVALGLIDRLVFGLDGEANHDRHDALHRCFDEILSHPHFNIA
LIGQFGERLAGSPAQQQLQESLAEMDRLVREEIAERRATGRRGDDIMSLMMDAEYEDGES
LSDDELRLDELVTLLATGHETTATSLAWAVHWVSHPPVLERLRAELATLGPDASPSQIAE
LDYLQSVVLETLRINPVVPI IARELQEPVQIAGYELPAGVTVAPVIYLLHRREDLYDEPG
QFRPSRFLERDYKHNEFMPFGGGVRRCLGMHLALYELQILLARIATRVELRLCDEEEVRP
VRRMVTIAPSGGVRFEVERVGA

>FRD00_16705|KEGG|CYP197AB2|[Persicimonas caeni]|pcay|DP

MFGLKDGLNLDVDRFKSGESAPARPPGPRGWQNLKVLVDFATDQIGCFRRITRRYGSASFF
KLGTFDAYLFTDPEAIEEVLLTKSSSEKDALTHELDVLLGKGLLTSEGQMWRHQRRLIS
PNLRRKQIAHYADVMMVERTRQMLDDWEDGQVRPLHRDAMEVTLRIVVDTLNFNLEMSDIH
RVGQALDTAMEGFHEQAHTLWRFVPEPLPTPMRAKFEKALEEFDALIYKLIDQRRQDATE
GDDLLYRLIAAVDDEGNQMTDQQLRDEVITLFLAGHETTALAIMYAWYLMSDHPWMDKV
HAEVDEVLGERVATADDVSELPYTEAVIQETMRLYPPAWTIGREAI EDVEIAGWTVTKGA
QVLLPQSLVHRDRRWFNDPDLFRPERWLDGLEDRIPRFAYFPFGGGPRICIGNYFAMMEA

ILVVATMAQQVRLLENVSRQALRTQPSVTQRPATAIEMKVRRR

Epsilonproteobacteria

>A0Z60_06705|KEGG|CYP172A|[Helicobacter winghamensis]hwi|EP
MGVCPFHPKPYKTKASTFATFLFKRRSWLDGLYERSYKMMMGRVKMPGFDLYVVNDPKEV
RHVMVDDVKNFPKSQLLHELLEPLLGMISIFTTNDKMWKKQRELLRPSFEMTRISKVFNL
RDATDDMMRKLASCQNGAVIEVDAIMTFVTADVIFRTIMSSKLDEAKGKLVLEAFGTVQE
ETTKTALRTMFCFPKWLSRLLGENKRLKAASVIRKVLSDIIAPRYHNAQSDLGKYEDILS
SLLQVVDAETHQRFTFEEILDQVSMFLAGHETTASLTWTLYILSIAPNEQEKAYKEII
RVAGDGVFEIEHIKEMHYVASIFKEALRLYPPVGGFFARETREDRKMMDKLVKKGSGVVVA
PWLIHRHERFWKNPHEFDPTRHESKSNIKKDTYMPFGMGERICIGQGFAMQESVLILANI
IRKYKLELEENFVPDIVGRLTIRSANGMRIKFIKRNQ

>Cj1411c|KEGG|CYP172A1|[Campylobacter jejuni subsp. jejuni NCTC 11168 = ATCC 700819]cje|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNL
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDCKRAKAGDVIRQVLSDIKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMFLAGHETTASLTWTLYLLSLYPKEQEKAYEIEITQV
LQGGVIEISHLRQFKYLTNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAAILILANILKTY
KLELEEGFVPDVVGRLTVRSANGMRIKFSKRKL

>BN148_1411c|KEGG|CYP172A1|[Campylobacter jejuni subsp. jejuni NCTC 11168-BN148]cjb|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNL
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGKKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDCRAKAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTWTLYLLSLYPKEQEKAYEEITQV
LQGGVIEISHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVPDVVGRRLTVRSANGMRIKFSKRKL

>CJJ81176_1410|KEGG|CYP172A|[Campylobacter jejuni subsp. jejuni 81-176]cjj|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNL
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLNEEKGKKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTWTLYLLSLYPKEQEKAYEEITQV
LQGGAIEISHLRQFKYLINIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVPDVVGRRLTVRSANGMRIKFSKREL

>C8J_1325|KEGG|CYP172A|[Campylobacter jejuni subsp. jejuni 81116]cju|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNL
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGKKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYILGDRKRAKAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTWTLYLLSLYPKEQEKAYEEITQV
LQGGAIEISHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEDFVPDVVGRRLTVRSANGMRIKFSKREL

>ICDCCJ07001_1342|KEGG|CYP172A|[Campylobacter jejuni subsp. jejuni ICDCCJ07001]cjn|EP

MQTGYVKMPNFDLYVINDTKEVKRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWK
KQRELLRPSFEMTRINKVFNLMSEAVADMMDRFSKYPNHAIIEVDEAMTFITADVIFRTI
MSSKLDEEKGGKILNAFVTFQE QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQVLS
DIIKPRYDMADNAEFEDILGSLLLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLW
TLYLLSLYPKEQEKAYEEITQVLQGGAEIISHLRQFKYL TNIFKESLRLYPPVGGFFARE
KKDTQVRDKLIKKDSGVVIAPWLIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERI
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>CJSA_1342|KEGG|CYP172A|[Campylobacter jejuni subsp. jejuni IA3902]cji|EP

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KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQVLS DIIKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLW TLYLLSLYPKEQEKAYEEITQV
LQGGAEIISHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKDSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVDPDVGRLTVRSANGMRIKFSKRKL

>CJM1_1368|KEGG|CYP172A|[Campylobacter jejuni subsp. jejuni M1]cjm|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEGKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRTKAGDVIRQVLS DIIKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLW TLYLLSLYPKEQEKAYEEITQV
LQGGAEIISHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKDSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVDPDVGRLTVRSANGMRIKFSKRKL

>CJS3_1506|KEGG|CYP172A1|[Campylobacter jejuni subsp. jejuni S3]cjs|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGKKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDCRKRAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTWTLYLLSLYPKEQEKAYEEITQV
LQGGVIEISHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVDPDVGRLTVRSANGMRIKFSKRKL

>A911_06865|KEGG|CYP172A|[Campylobacter jejuni subsp. jejuni PT14]cjp|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGKKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTWTLYLLSLYPKEQEKAYEEITQV
LQGAIEISHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVDPDVGRLTVRSANGMRIKFSKRKL

>N564_01408|KEGG|CYP172A1|[Campylobacter jejuni subsp. jejuni 00-2426]cjej|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGKKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDCRKRAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTWTLYLLSLYPKEQEKAYEEITQV

LQGGVIEISHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVDPDVGRLTVRSANGMRIKFSKRKL

>N565_01448|KEGG|CYP172A1|[Campylobacter jejuni subsp. jejuni 00-2538]cjeu|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNL
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWSYVLGDCKRAKAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASSLTWTLYLLSLYPKEQEKAYEEITQV
LQGGVIEISHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVDPDVGRLTVRSANGMRIKFSKRKL

>N755_01445|KEGG|CYP172A1|[Campylobacter jejuni subsp. jejuni 00-2544]cjen|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNL
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWSYVLGDCKRAKAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASSLTWTLYLLSLYPKEQEKAYEEITQV
LQGGVIEISHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVDPDVGRLTVRSANGMRIKFSKRKL

>N135_01500|KEGG|CYP172A1|[Campylobacter jejuni subsp. jejuni 00-2425]cjei|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNL
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGGKILNAFVTFQE

QSVHTAMRRMFRFPKWLSYVLGDCRAKAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTTWTLYLLSLYPKEQEKAYEEITQV
LQGGVIEI SHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVDPDVGRLTVRSANGMRIKFSKRKL

>H730_08010|KEGG|CYP172A1|[Campylobacter jejuni subsp. jejuni R14]cjer|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNL
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDCRAKAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTTWTLYLLSLYPKEQEKAYEEITQV
LQGGVIEI SHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVDPDVGRLTVRSANGMRIKFSKRKL

>MTVDSCj20_1387|KEGG|CYP172A|[Campylobacter jejuni subsp. jejuni MTVDSCj20]cjv|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNL
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEGKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRTKAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTTWTLYLLSLYPKEQEKAYEEITQV
LQGGVIEI SHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVDPDVGRLTVRSANGMRIKFSKRKL

>PJ17_07425|KEGG|CYP172A|[Campylobacter jejuni subsp. jejuni 00-1597]cj1|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV

KRMMVDKVFREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFGKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEGKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTTWTLYLLSLYPKEQEKAYEEITQV
LQGGVVEI SHLRQFKYL TNIFKESLRLYPPVGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVPDVVGRRLTVRSANGMRIKFSKRKL

>PJ18_07210|KEGG|CYP172A|[Campylobacter jejuni subsp. jejuni 00-6200]cjw|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFSKYPNHAIIEVDEAMTFITADVIFRTIMSSKLDEEKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQVLSDI IKLRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTTWTLYLLSLYPKEQEKAYEEITQV
LQGGAI EISHLRQFKYL TNIFKESLRLYPPVGFFAREAKKDTQVRDKLIKKDSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVPDVVGRRLTVRSANGMRIKFSKREL

>cjr:CJE1598|KEGG|CYP172A1|[Campylobacter jejuni RM1221]cjr|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDCKRAKAGDVIRQVLSDI IKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTTWTLYLLSLYPKEQEKAYEEITQV
LQGGVIEI SHLRQFKYL TNIFKESLRLYPPVGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANILKTY
KLELEEGFVPDVVGRRLTVRSANGMRIKFSKRKL

>JJD26997_1744|KEGG|CYP172A|[Campylobacter jejuni subsp. doylei 269.97]cjd|EP

MSECPFFPKPHKNKASTLLTFLLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFSKYPNHAIIEVDEAMTFITADVIFRTIMSSKLDEEKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQVLSNIIKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTTWTLYLLSLYPKEQEKAYEEITQI
LQGGAIIEISHLRQFKYL TNIFKESLRLYPPVGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGAMQEAILILANILKTY
KLELEEGFVPDVVGRLTVRSANGMRIKFSKREL

>M635_02730|KEGG|CYP172A|[Campylobacter jejuni 32488]cjz|EP

MSECPFFPKPYKNKASTLLTFLLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDCKRAKAGDVIRQVLSDIKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTTWTLYLLSLYPKEQEKAYEEITQV
LQGGVIEISHLRQFKYL TNIFKESLRLYPPVGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGAMQEAILILANILKTY
KLELEEGFVPDVVGRLTVRSANGMRIKFSKRKL

>BN867_13910|KEGG|CYP172A|[Campylobacter jejuni 4031]cjx|EP

MSECPFFPKPYKNKASTLLTFLLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRINKVFNLM
SEAVADMMDRFSKYPNHAVIEVDEAMTFITADVIFRTIMSSKLDEEGKGGKILNAFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRTKAGDVIRQVLSDIKPRYDMADNAEFEDILGSL
LLVVDADTNKRFSFEEILDQVAMLFLAGHETTASLTTWTLYLLSLYPKEQEKAYEEITQV
LQGGAIIEISHLRQFKYL TNIFKESLRLYPPVGFFAREAKKDTQVRDKLIKKGSGVVIAPW
LIHRHEEFWTNPHGFNPSRFEGEYKKDAYLPFGVGERICIGQGAMQEAILILANILKTY
KLELEEGFVPDVVGRLTVRSANGMRIKFSKRKL

>CLA_0322|KEGG|CYP172A|[Campylobacter lari RM2100]cla|EP

MGQCPFHPKPYKNKASTLTTFFLLKRRSWLDGLYERSYKMMMGRVKMPGFDLYVVNDPKEV
RRIMVDEVREYPKSQLLHELLEPLLGISIFTTNDRVWEKQRELLRPSFEMTRISKVFNLM
SEAASDMMARFAKYEDKAIVEVDEAMTFVTADVIFRTIMSSKLDEQKGKLVLDADFVTVQE
ETVKTAMRRMFRFPTWLSNLLGERKRLKAGGVIRKVLSDI IKPRYDNATNDQGKYEDILS
SLLMVVDADTNERFSFNEILDQVAMLFLAGHETTASSLTWTLYILSISPNEQQKAYEEIM
QVAGDEEFKIEHIRAMKYLTNVFKESLRLYPPVGGFFAREARNDNKMRDKLIKKGSGVVVA
PWLIHRHDSFWENPHEFDPSRHEDKSKIKKDTYMPFGMGERVCIGQGFAMQETVLILANI
LRTYKLELEENFIPDIVGRLTIRSANGMNIRFIKRQK

>UPTC16701_0323|KEGG|CYP172A|[Campylobacter lari RM16701]clr|EP

MGQCPFHPKPYKNKASTLTTFFLLKRRSWLDGLYERSYKMMMGRVKMPGFDLYVVNDPKEV
RRIMVDEVREYPKSQLLHELLEPLLGISIFTTNDRVWEKQRELLRPSFEMTRISKVFNLM
SEAASDMMARFAKYEDKAIVEVDEAMTFVTADVIFRTIMSSKLDEQKGKLVLDADFVTVQE
ETVKTAMRRMFRFPTWLSNLLGERKRLKAGTTIRKVLSDI IKPRYDNAINDQGKYEDILS
SLLMVVDADTNERFSFNEILDQVAMLFLAGHETTASSLTWTLYILSISPNEQQKAYEEIM
QVAGDEEFKIEHIRAMKYVTNVFKESLRLYPPVGGFFAREARNDNKMRDKLIKKGSGVVVA
PWLIHRHDSFWENPHEFDPSRHEDKSKIKKDTYMPFGMGERVCIGQGFAMQEAVLILANI
LRTYKLELEENFVPDIVGRLTIRSANGMNIRFIKRQK

>UPTC16712_0326|KEGG|CYP172A|[Campylobacter lari RM16712]clm|EP

MGQCPFHPKPYKNKASTLTTFFLLKRRSWLDGLYERSYKMMMGRVKMPGFDLYVVNDPKEV
RRIMVDEVREYPKSQLLHELLEPLLGISIFTTNDRVWEKQRELLRPSFEMTRISKVFNLM
SEAASDMMARFAKYEDKAIIEVDEAMTFVTADVIFRTIMSSKLDEQKGKLVLDADFVTVQE
ETVKTAMRRMFRFPTWLSNLLGERKRLKAGGVIRKVLSDI IKPRYDNALNDQGKYEDILS
SLLMVVDVDTNERFSFNEILDQVAMLFLAGHETTASSLTWTLYILSISPNEQQKAYEEIM
QVTGDGEFKIEHIRAMKYLTNVFKESLRLYPPVGGFFAREARNESKMRDKLIKKGSGVVVA
PWLIHRHDSFWKNPHEFDPSRHEDKSKIKKDTYMPFGMGERVCIGQGFAMQEAVLILANI
LRTYKLELEENFVPDIVGRLTIRSANGMNIRFIKRQK

>UPTC3659_0339|KEGG|CYP172A|[Campylobacter lari NCTC 11845]cln|EP

MGQCPFHFKPKYKNKASTLTTFFLLKRRSWLDGLYERSYKMMMGRVKMPGFDLYVVNDPKEV
RRIMVDEVREYPKSQLLHELLEPLLGISIFTTNDRVWEKQRELLRPSFEMTRISKVFNLM
SEAASDMMARFAKYEDKAIIEVDEAMTFVTADVIFRTIMSSKLDEQKGKLVLDAFVTVQE
ETVKTAMRRMFRFPTWLSNLLGERKRLKAGGVIRKVLSDIIKPRYDNTTNDQGGYEDILS
SLLMVVDADTNERFSFNEILDQVAMLFLAGHETTASSLTWTLYILSISPDEQQKAYEEIM
QVAGDEEFKIEHIRAMKYLTNVFKESLRLYPPVGGFFAREARNDNKMRDKLIKKGSGVVVA
PWLIHRHDSFWENPHEFDPSRHEDKSKIKKDTYMPFGMGERVCIGQGFAMQEAVLILANI
LRTYKLELEENFVDPDIVGRLTIRSANGMNIRFIKRQK

>CONCH_0330|KEGG|CYP172A|[Campylobacter lari subsp. concheus LMG 11760]c11|EP

MGQCPFHFKPKYKNKASTLTTFFLLKRRSWLDGLYERSYKMMMGRVKMPGFDLYVVNDPKEV
RRIMVDEVREYPKSQLLHELLEPLLGISIFTTNDRVWEKQRELLRPSFEMTRISKVFNLM
SEAASDMMARFAKYEDKAIIEVDEAMTFVTADVIFRTIMSSKLDEQKGKLVLDAFVTVQE
ETVKTAMRRMFRFPTWLSNLLGERKRLKAGGVIRKVLSDIIKPRYDNATNDQGGYEDILS
SLLMVVDADTNERFSFNEILDQVAMLFLAGHETTASSLTWTLYILSISPNEQQKAYEEIM
QVAGNEEFKIEHIRAMKYLTNVFKESLRLYPPVGGFFAREARNESKMRDKLIKKGSGVVVA
PWLIHRHDSFWENPHEFDPSRHEDKSKIKKDTYMPFGMGERVCIGQGFAMQEAVLILANI
LRTYKLELEENFVDPDIVGRLTIRSANGMNIRFIKRQK

>BN865_07260|KEGG|CYP172A|[Campylobacter coli 76339]ccol|EP

MSQCPFFPKPKYKNKASTLLTFFLLKRRSWLDGLYERSYKMQTYGVKMPNFDLYVINDTKEV
KRMMVDEVKEFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRISKVFNLM
SEAVEDMMKRFEKYPNGSIIIEVDEAMTFITADVIFRTIMSSKLDEEQGKKILDVFTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQVLSDIIKPRYDAVSSGKAQSFEDIL
GSLLLVVDQTNQRFSEILDQVAMLFLAGHETTASSLTWTLYLLSLYPDEQEKEYKEI
IQVLQGENIQISHLRQFKYLTNIFKESLRLYPPVGGFFAREAKKDTKIRDKMVKKGSGVVV
APWLIHRHESFWNNPHEFKPSRFESEYKKDAYLPFGAGERICIGQGFAMQEAILILASIL

RKYKLELEEGFVPDVVGRRLTVRSANGMNIKFTKRES

>G157_01790|KEGG|CYP172A|[Campylobacter coli CVM N29710]ccc|EP

MSQCPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMVDEVKEFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRISKVFNLM
SEAVSDMMKRFEKYPNASIIIEVDEAMTFITADVIFRTIMSSKLDEEQGKKILDVFTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQALSDIIKPRYDAVSSGKAENFEDIL
GSLLLVVDAQTNQRFSEIEILDQVAMFLAGHETTASLTWTLYLLSLYPDEQEKAYKEI
IQVLQGENIQISHLKQFRYLTHIFKESLRLYPPVGGFFAREAKKDTKVRDKMIKKSGVVI
APWLIHRHEGFWANPHEFKPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANIL
KKYKLELEEGFVPDVVGRRLTIRSANGMIRIKFSKREP

>N149_1372|KEGG|CYP172A|[Campylobacter coli 15-537360]ccq|EP

MSQCPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMVDEVKEFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRISKVFNLM
SEAVSDMMKRFEKYPNASIIIEVDEAMTFITADVIFRTIMSSKLDEEQGKKILDVFTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQALSDIIKPRYDAVSSGKAENFEDIL
GSLLLVVDAQTNQRFSEIEILDQVAMFLAGHETTASLTWTLYLLSLYPDEQEKAYKEI
IQVLQGENIQISHLKQFRYLTHIFKESLRLYPPVGGFFAREAKKDTKVRDKMIKKSGVVI
APWLIHRHEGFWANPHEFKPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANIL
KKYKLELEEGFVPDVVGRRLTIRSANGMIRIKFSKREP

>YSQ_01815|KEGG|CYP172A|[Campylobacter coli RM1875]ccf|EP

MSQCPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMVDEVKEFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRISKVFNLM
SEAVSDMMKRFEKYPNASIIIEVDEAMTFITADVIFRTIMSSKLDEEQGKKILDVFTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQVLSDIKPRYDAVNSEKAQSFEDIL
GSLLLVVDAQTNQRFSEIEILDQVAMFLAGHETTASLTWTLYLLSLYPDEQEKAYKEI

IQVLQGENIQISHLRQFKYL TNIFKESLRLYPPVGGFFAREAKKDTKIRDKMIKKGSGVVI
APWLIHRHEGFWANPHEFKPSRFESEYKKDAYLPFGVGERICIGQGFAMQEAILILANIL
KKYKLELEEGFVPDVVGR LTVRSANGMRIKFSKREP

>YSS_07600|KEGG|CYP172A|[Campylobacter coli RM4661]ccy|EP

MSQCPFFPKPYKNKASTLLTFL LKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVKEFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRISKVFNLM
SEAVSDMMKRFEKYPNASII EVDETMTFITADVIFRTIMSSKLDEEQGKKILD AFVTFQE
QSVHTAMRRMFRFPKWSYVLGDRKRAKAGDVIRQALSDI IKPRYDAVSSGKAENFEDIL
GSLLLVVDAQTNQRFSFEEILDQVAMLFLAGHETTASSLTWTLYLLSLYPDEQEKAYKEI
IQVLQGENIQISHLKQFRYLTHIFKESLRLYPPVGGFFAREAKKDTKVRDKMIKKGSGVVI
APWLIHRHEGFWANPHEFKPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANIL
KKYKLELEEGFVPDVVGR LTI RSANGMRIKFSKRES

>YSU_01845|KEGG|CYP172A|[Campylobacter coli RM5611]cco i|EP

MSQCPFFPKPYKNKASTLLTFL LKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVKEFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRISKVFNLM
SEAVSDMMKRFEKYPNASII EVD EAMTFITADVIFRTIMSSKLDEEQGKKILD AFVTFQE
QSVHTAMRRMFRFPKWSYVLGDRKRAKAGDVIRQALSDI IKPRYDAVSSGKAENFEDIL
GSLLLVVDAQTNQRFSFEEILDQVAMLFLAGHETTASSLTWTLYLLSLYPDEQEKAYKEI
IQVLQGENIQISHLKQFRYLTHIFKESLRLYPPVGGFFAREAKKDTKVRDKMIKKGSGVVI
APWLIHRHEGFWANPHEFKPSRFEGEYKKDAYLPFGVGERICIGQGFAMQEAILILANIL
KKYKLELEEGFVPDVVGR LTI RSANGMRIKFSKRES

>VC76_07055|KEGG|CYP172A|[Campylobacter coli FB1]ccof|EP

MSQCPFFPKPYKNKASTLLTFL LKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVKEFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRISKVFNLM
SEAVSDMMKRFEKYPNASII EVD EAMTFITADVIFRTIMSSKLDEEQGKKILD AFVTFQE

QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQALSDIIKPRYDAVSSGKAENFEDIL
GSLLLVVDQAQTNQRFSEEEILDQVAMLFLAGHETTASLTWTLYLLSLYPKEQEKAYEEI
TQVLQGGVIEISHLRQFKYLTNIFKESLRLYPPVGGFFAREAKKDTKVRDKMIKKGSGVVI
APWLIHRHEGFWANPHEFKPSRFEGEYKKDAYLPFGVGERICIGQGAMQEAILILANIL
KKYKLELEEGFVPDVVGRILTIRSANGMRIKFSKREP

>ATE51_00744|KEGG|CYP172A|[Campylobacter coli OR12]ccoo|EP

MSQCPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVKEFPKSAFLHELLSPLLGESIFTTNGEVWKKQRELLRPSFEMTRISKVFNLM
SEAVSDMMKRFEKYPNASIIIEVDEAMTFITADVIFRTIMSSKLDEEQGKKILDADFVTFQE
QSVHTAMRRMFRFPKWLSYVLGDRKRAKAGDVIRQALSDIIKPRYDAVSSGKAENFEDIL
GSLLLVVDQAQTNQRFSEEEILDQVAMLFLAGHETTASLTWTLYLLSLYPKEQEKAYEEI
TQVLQGGVIEISHLRQFKYLTNIFKESLRLYPPVGGFFAREAKKDTKVRDKMIKKGSGVVI
APWLIHRHEGFWANPHEFKPSRFEGEYKKDAYLPFGVGERICIGQGAMQEAILILANIL
KKYKLELEEGFVPDVVGRILTIRSANGMRIKFSKREP

>CINS_0316|KEGG|CYP172A|[Campylobacter insulaenigrae]cis|EP

MGQCPFYKPYKNKASTLATFLFKRRSWLDGLYERSYKMMMGRVKMPGFDLYVVNDPKEV
RRIMVDEVREYPKSLLHELLEPLLGVSIFFTNDRVWEKQRELLRPSFEMTRISKVFDLM
SQAANDMMIRFAKDDGKIIIEVDEAMTFVTADVIFRTIMSSKLDEQKGVLDADFVTVQE
ETIKTAMRKMFRFPNWSNFLGEKKRLKAGSTIRKVLSDIIKPRYDNALADQGKYKDILS
SLLMVVDEDTNERFSFNEILDQVAMLFLAGHETTASLTWTLYILSISQNEQQKAYEEII
QVANFNDFKIEHIKEMKYLTNVFKESLRLYPPVGGFFAREARHESKMRDKLIQEGSGVVVA
PWLIHRHDNFWENPHEFDPTRYEDKGKIKKDTYMPFGMGERVCIGQGAMQEAILILANI
LRTYKLELEENFIPDIVGRILTIRSANGMRIKFIKRKK

>CVOL_0316|KEGG|CYP172A|[Campylobacter volucris]cvo|EP

MGQCPFHFKPYKNKASTLMTFLKRRSWLDGLYERSYKMMMGRVQMPGFDLYVVNDPKEV

RRIMVDEVREYPKSQLLHELLEPLLGVSIFTTNGRVWEKQRELLRPSFEMTRISKVFGLM
SEAASDMMARFDKYEDGAIIEVDEAMTFVTADVIFRTIMSSKLDEVKGVLDADFVTVQE
QTVKTAMRRMFRFPTWLSNLLGEKKRLKAGMTIRKVLSDI IKPRYENALADKGKYEDILS
SLLMVVDADTNERFSFNEILDQVAMLFLAGHETTASLTTWTLTYILSISEKEQEKAYEEIM
QVAGDEKFTIEHIKSMKYLTNIFKESLRLYPPVGGFFAREAKHESKMRDKLIKEGSGVVVA
PWLIIHRHDFWENPHEFDPSRHEDKSKIKKDTYMPFGMGERICIGQGFAMQEAILILANI
LRTYKQLQLEENFTPDPVGRILTIRSANGMNIKFIKRKK

>CPEL_0328|KEGG|CYP172A|[Campylobacter peloridis]cpel|EP

MGQCPFHPKPYKNKASTLTTFLKRRSWLDGLYDRSYKMMGRVKMPGFDLYVVNDPKEV
RRIMIDEVREYPKSQLLHELLEPLLGVSIFTTNDRVWEKQRELLRPSFEMTRISKVFNLM
SEAAADMMARFAKYEDKAIIEVDEAMTFVTADVIFRTIMSSKLDEQKGLVLDADFVTVQE
ETVKTAMRRMFRFPTWLSNLLGERKRLKAGGVIRKVLSDI IKPRYDINAINDQGKYEDILS
SLLMVVDADTNERFSFNEILDQVAMLFLAGHETTASLTTWTLTYILSISPKEQQKAYEEIM
QIAGNDEFKIEHIKAMKYLTNVFKESLRLYPPVGGFFAREARNESKMRDKLIKKGSGVVVA
PWLIIHRHDFWENPHEFDPTRHEDKSKIKKDTYMPFGMGERVCIGQGFAMQEAILILANI
LRTYKLELQENFVPDIVGRILTIRSANGMNIRFIKRQK

>CAQ16704_0328|KEGG|CYP172A|[Campylobacter sp. RM16704]camr|EP

MGQCPFHPKPYKNKASTLTTFLKRRSWLDGLYERSYKMMGRVKMPGFDLYVVNDPKEV
RRIMVDEVREYPKSQLLHELLEPLLGISIFTTNDRVWEKQRELLRPSFEMTRISKVFDLM
SDAASDMMARFNKYEDGATIEVDEAMTFVTADVIFRTIMSSKLDEQKGVLDADFVTVQE
QTVKTAMRRMFRFPTWLSNLLGEKKRLKAGTTIRKVLSDI IKPRYDNALNDQGKYEDILS
SLLMVVDADTNERFSFNEILDQVAMLFLAGHETTASLTTWTLTYILSMPNEQQKAYEEIM
QIAGKEEFKIEHIKAMKYLTNIFKESLRLYPPVGGFFAREARNESKMRDKLIKKGSGVVVA
PWLIIHRHDFWENPHEFDPSRHDDKSKIKKDTYMPFGMGERVCIGQGFAMQEAILILANI
LRTYKLELEENFVPDIVGRILTIRSANGMNIRFIKR

>CSUB8521_0354|KEGG|CYP172A|[Campylobacter subantarcticus LMG 24374]csm|EP

MGQCPFHPKPYKNKASTLTTFLKRRSWLDGLYERSYKMMMGRVKMPGFDLYVVNDPKEV
RRIMVDEVREYPKSQLLHELLEPLLGISIFTTNDRVWEKQRELLRPSFEMTRISKVFNLM
NEAASDMMARFAKHENGAVVEVDEAMTFVTADVIFRTIMSSKLDEQKGKLVLDAFVTVQE
ETVKTAMRRMFRFPTWLSNLLGERKRLKAGATIRQVLSDI IKPRYDNALNDQGKYEDILS
SLLAVVDADTNERFSFNEILDQVAMLFLAGHETTASLTTWTLYILSISPKEQQKAYEEIM
QVAGNEEFKIEHIRAMKYVANVFKESLRLYPPVGFFAREAKNESKMRDKLIKKGSGVVVA
PWLIIHRHDSFWENPHEFDPSRHEGKSKIKKDTYMPFGMGERVCIGQGFAMQEAVLILANI
LRTYRLELEENFVPDVVGRLTIRSANGMNIRFIKREK

>CSUB8523_0336|KEGG|CYP172A|[Campylobacter subantarcticus LMG 24377]csf|EP

MGQCPFHPKPYKNKASTLTTFLKRRSWLDGLYERSYKMMMGRVKMPGFDLYVVNDPKEV
RRIMVDEVREYPKSQLLHELLEPLLGISIFTTNDRVWEKQRELLRPSFEMTRISKVFNLM
NEAASDMMARFAKHENGAVVEVDEAMTFVTADVIFRTIMSSKLDEQKGKLVLDAFVTVQE
ETVKTAMRRMFRFPTWLSNLLGERKRLKAGATIRQVLSDI IKPRYDNALNDQGKYEDILS
SLLIVVDADTNERFSFNEILDQVAMLFLAGHETTASLTTWTLYILSISPKEQQKAYEEIM
QVAGNEEFKIEHIRAMKYVANVFKESLRLYPPVGFFAREAKNESKMRDKLIKKGSGVVVA
PWLIIHRHDSFWENPHEFDPSRHEGKSKIKKDTYMPFGMGERVCIGQGFAMQEAVLILANI
LRTYRLELEENFVPDVVGRLTIRSANGMNIRFIKREK

>CHELV3228_0153|KEGG|CYP172A|[Campylobacter helveticus]chv|EP

MSGCPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSELLHRLLSPLLGESIFTTNGEVVHRQRELLKPSFEMTRISKVFNLM
SEAVADLMARFEKYPNHSYIEVDEMMTFVTADVIFRTIMSSKLDKNEGRKILEAFVTFQE
ESVRTAMRGMFYFPKWLSYLLGDRKRKAGEVIRRALS DI IKPRYDEANLEKSSYEDILA
SLLLVDADTNERFSFEEILDQVAMLFLAGHETTASLTTWTLYLLSLYPKEQEKAKEIC
EVLQDSEEIKITHLRQFKFLTNVFKEALRLYPPVGFFAREAKKDTQVRDKLVKKGSGVVI
APWLIHRHELFWQNPFGFDPSRFEREYKKDAYLPFGMGERICIGQGFAMQEAILILANIL
RIYKLGLENFVPDVVGRLTIRSANGMWIKFSKR

>CCUN_1453|KEGG|CYP172A|[Campylobacter cuniculorum]ccun|EP

MSQCPFHPKPKYKNKASTLLTFLKRRSWLDGLYERSYEMQTGYVKMPNFDLYVINDPKEV
KRIMVDEVREFPKSAFLHELLKPLLGESIFTTNGEIWSKQRELLRPSFEMTRISKVFNLM
SEAVKDMMKRFEKYPNDSIIIEVDEMFTFVTADVIFRTIMSSKLDEQKGGKILHAFVNFQE
QSVHTAMRKMFREFPKWFSYILGDRKRLKSGEIIREILSDIIKPRYNAVSEGKNLGNEDIL
ESLLLVDAKTNQRFSFEEILDQVAMFLAGHETTASSLTWTLYLLSLYPQEKEKAYEEV
RQILNGEEIQISHLRQFKFLTNVFKESLRLYPPVGGFFAREAKKDTKIRDKNIKKSGV
APWLIHRHKHFWDNPNDFNPSRFDKEYRKDAYLPFGMGERICIGQGAMQEAILILASIL
KIYKLELESGFVPDVVGRILTIRSANGMNIKFSKR

>CLAN_0140|KEGG|CYP172A|[Campylobacter lanienae]clx|EP

MGVCPFHPKPHSSKAGLITTFLLKRRSWLDGLYEKSYKMRVGRVKMPGFDLFFVNDPKEV
RKIMVDNVKEFPKSDMLHELLKPLLGVSIFFTNGEVWKKQRELLRPSFEMTRISKVFDLM
SSAAADMMEFRKYEDGAVVEVDEHMTFVTADVIFRTIMSAKLDEEKGEILDADFVTFQE
ETAKTAIRKFFCVPQWLSNLLGENKRIKAGAVIRKNLSNIIKPRYDNYANDTHCDILSSL
LHTTDADSGERFSFEEILDQVSMLFLAGHETTASSLTWTLYCLSLDQDAQKAYNEIISI
NKDSKFEISDIRDMKYLTNVFKEALRLYPPVGGFFARQNKNEIKIRDKVLQKGAGVVAPW
LIHRHDDYWEAPHEFRPERHNENIPKERYMPFGLGERVCIGHGFAMQEAIILANILREF
KLELKDGFIPDVVGRILTIRSANGMMIKMTQRH

>CAV_1397|KEGG|CYP172A|[Campylobacter avium]cavi|EP

MACPFHPKPKKTKASTLMTFLKRRSWLDGLYEKSYSMQSGRVKMPGFDLYVNDVREVK
RIMVDEVKEFPKSELLHRLLEPLLGVSIFFTNGDVWKKQRELLMPSFEMTRINKVFE
DAANDLLIRLEKKDKDFIDADEEMTFVTADVIFRTIMSAKLDEEKGEILKAFSIMQEET
IRTGIREMFCFPKWLSKLLGENKRMKAGACIRDNLAQIIKPRYDEQREGKADYRQDILAS
LLRVIDADTNEPFSFKEILDQVSMLFLAGHETTASSLTWTLYCLCPEPSWQEKAYDEIMQ

ITKGEELSIAHVKAFKVLNNIFKEALRLYPPVGGFFPRTAKKDTKIRDKEIKAGSGVVVAP
WLIHRHRSKLWQDPHEFKPQRFDEQINKDAYMPFGMGERICIGQGAMQEAMIILASILKK
YKLQLKENFTPDVVGRLTVRSANGMSIKFIRR

>A2J15_004785|KEGG|CYP172A|[Campylobacter hepaticus]chw|EP

MNQCFFFPKPYKNKASTLLTFLKRRSWLDGLYERSYKMQTGYVKMPNFDLYVVNNTKEV
KRIMVNEVRQFPKSAFLHELLSPLLGESIFTTNGDVWKKQRELLRPSFEMTGINKVFNLM
KDAAADMMQRFDKYPNNAIIEVDEAMTFVTADVIFRTIMSSKLDEEQGKKILNAFVTFQE
QTVHTAMRRMFHFPKWFSYILGDRKRAKAGELIRQVLKDIVKPRYDKANEANQEEFKDIL
SSLLLVDQAQTNKRFSFEEILDQVAMFLAGHETTASSLTWTLYLLSLYPKDQEKAYEEL
CEILQNKDIEIVHLKQFKYLINIFKESLRLYPPVGGFFAREAKQDTQIRDKFIKKGSGVVI
APWLIHRHEKFWSDPNGFNPSRFEHEYQKDAYLPFGVGERICIGQGAMQEAILILANIL
RVYKLELEEGFVDPVVGRLTVRSANGMRIKFTKRKA

>CVIC12175_1523|KEGG|CYP172A|[Campylobacter sp. RM12175]camz|EP

MGVCPFHFKPHNSKAGLITTFLLKRRSWLDGLYAKSYKMRAGRVMKPGFDLFFVNDPKEV
RKIMIDNVKEFPKSDMLHELLKPLLGVSIFFTNGEVWKKQRELLKPSFEMTRISKVFDLM
SSAAADMMERFRKYPDGSIVEVDEHMTFVTADVIFRTIMSSKLDEIKGKEILHAFVTFQE
ETARTAIRKFFCVPQWLSNILGENKRMKAGAVIRKSLSDIIQPRYDSYKSDNYSDILSSL
LHTVDASSGERFSFEEILDQVSMFLAGHETTASSLTWTLYCLSLDQDAQKAYNEIISI
NKDGKFSISDIKEMKYLTNVFKEALRLYPPVGGFFARQSKGEAKIRDKVLQKSGVVVAPW
LIHRHDDFWEAPHEFRPDRHNENIPKEKYMPFGLGERICIGQGAMQEAIILANILREF
KLELKDGFVDPVVGRLTVRSANGMMIKMSKRQ

>CSUIS_0153|KEGG|CYP172A|[Campylobacter sp. RM6137]camy|EP

MGVCPFHFKPHNNKAGLITTFLLKRRSWLDGLYVKSYSKMRSGRVKMPGFDLFFVNDPNEV
RKIMIDNVKEFPKSDLLHELLKPLLGVSIFFTNGEVWKKQRELLRPSFEMTRISKVFDLM
SSAAADMMDRFRKYEDGSIIEVDEHMTFVTADVIFRTIMSAKLDEEKGKEILHAFVTFQE

ETARTAIRKFFCVPQWLSNILGENKRMKAGEIIRQNLSNIIKPRYDNYANDTHCDILSSL
LHTIDADSNQRFSFEEILDQVSMFLFLAGHETTASSLTWTLYCLSLDQDAQKAYNEVISI
NKDGFKFSISDIKNMRYLTNVFKEALRLYPPVGGFFARQSKNDTKIRDKVLKKGSGVVAPW
LIHRHEDFWDAPHEFRPDRHNDIPKEKYMPFGLGERICIGQGFAMQEAIILANILREF
KLELKDGFIPDVVGRRLTVRSANGMMIKMTRRQ

>CORN_0326|KEGG|CYP172A|[Campylobacter ornithocola]coj|EP

MGQCPFHPKPYKNKASTLTTFLKRRSWLDGLYERSYKMMGRVKMPGFDLYVVNDPKEV
RRIMVDEVREYPKSOLLHELLEPLLGVSIFFTNDKVWEKQRELLKPSFEMTRISKVFDLM
SEAASDMMGRFAKYENKAVIEVDEAMTFVTADVIFRTIMSSKLDEQKGLVLDADFVTVQE
ETVKTAMRRMFRFPTWLSNLLGEKKRLKAGGVIRKVLSDIIPRYDNALNDQGYEDILS
SLLMVVDADTNKRFSFNEILDQVAMFLFLAGHETTASSLTWTLYILSISPNEQQKAYEII
QVAGNGEFKIEHIRAMKYVTNVFKESLRLYPPVGGFFAREARNESKMRDKLIKKGSGVVVA
PWLIHRHDNFWENPHEFDPSRHEDKGIKIKDTYMPFGMGERICIGQGFAMQEAVLILANI
LRTYKLELEENFVPDIVGRILTIRSANGMNIRFIKRQK

>CUP3940_1510|KEGG|CYP172A|[Campylobacter upsaliensis]cux|EP

MSECPFFPKPYKNKASTLLTFLKRRSWLDGLYERSYQMGTGYVKMPNFDLYVINDTKEV
KRMMVDEVREFPKSELLHRLLSPLLGESIFTTNGEVVHKQRELLKPSFELTRISKVFNLM
SEAVADLMRRFEKYPDNSYIEVDEMMTFVTADVIFRTIMSSKLDEVQGRQILEAFATFQE
ESVRTAMRGMFYFPKWLSYLLGDRKRAKAGELIRKALSDIIPRYEANLEKSDYEDILSS
LLLVDVDAKTNRFSFEEILDQVAMFLFLAGHETTASSLTWTLYLLSLYPEEQERAYNEICE
ILQDSKEIKIAHLRQFKFLTNTVFKESLRLYPPVGGFFAREAKKDTQVRDKLIKQSGVVIA
PWLIHRHELFWQNPFGFDPSRFEREYKKEAYLPFGMGERICIGQGFAMQEAILILANILK
TYRLELKEDFVDPDVVGRILTIRSLNGMWIKFSKR

>CARM_0293|KEGG|CYP172A|[Campylobacter armoricus]carm|EP

MGQCPFHPKPYKNKASTLTTFLFKRRSWLDGLYERSYKMMGRVQMPGFDLYVVNDPKEV

RRIMVDEVREYPKSQLLHELLEPLLGVSIFFTNGRVWEKQRELLRPSFEMTRISKVFGLM
SEAASDMMARFAKYEDKAIIEVDEAMTFVTADVIFRTIMSSKLDEQKGKIVLDAFVTVQE
QTVKTAMRRMFRFPTWLSNLLGERKRLKAGGVIRKVLSDI IKPRYENALNDQGKYEDILS
SLLMVVDADTNERFSFDEILDQVAMLFLAGHETTASSLTWTLYILSMPNEQQKAYEEM
QVAGDEKFTIEHIKSMKYLTNIFKESLRLYPPVGGFFAREARNESKMRDKLIKKGSGVVVA
PWLIIHRHDSFWENPHEFDPSRHEDKSKIKKDTYMPFGMGERICIGQGAFAMQEAILILANI
LRTYKLELEENFVPDIVGRLTIRSANGMNIRFIKR

>CNZW441b_1292|KEGG|CYP172A|[Campylobacter novaezeelandiae]cnv|EP

MSQCPFFPKPYKTKASTLLTFLKRRSWLDGLYERSYKMOTGYVKMPNFDLYVINDTKEV
KRIMIDEVKEFPKSEFLHQLLSPLLGESIFTTNGEVWRKQRELLRPSFEMTRINKVFNL
SEAVADMMSRFEKYHDESIIEVDEAMTFVTADVIFRTIMSSKLDEKKGKVLDAFVTFQE
QSVHSAMRRMFRFPKWISYILGDKKRLQAGETIREVLSEIIRPRYESFDPQNTNEFDILE
SLLCVIDANTNKRFSEFEEILDQVAMLFLAGHETTASSLTWTLYLLSSFEDEQEKAYREVE
EVLQGKDIEITHLKQFKILTNIKFESLRLYPPVGGFFAREAKQDTKIRDKFVKKGSGVVVA
PWLIIQRHENYWEKPNEFNPSRFEGDYKKDAYLPFGMGERICIGQAFAMQEAILILANILR
KYKLQEQEGFIPDVVGRRLTVRSANGMNIKFIKRKK

>AMYT_2277|KEGG|CYP2724A1|[Helicobacter winghamensis]amyt|EP
MKSLEIPQKLFQPLKNIKATSALRAMLYAEFWPEEILNKPSVSLKTTTGELLFLSDPFL
VKEVLTRNDGTIPRSRLQQRFAGHGTGRENVITDIGKRSAMHRKTLAPLFSDFRNTYFP
FIKMTLEEAIKPIFDAIEKKEPIDIGRVCVNGTFGVIWQILFGEDKKLTPPLIVEQMANT
LYEAGLSGELTQTSKAVKQAKEISLSLRPLVPLVSDTPFAKNPKINLQLTNKELEDNAQF
LLTSGHESTALTITWALFLLAHYQDEQELIANEIKNILGNKELTLDILHKLPRLNLFNE
TMRLYPSAILVNRETIQDVTVGELSIKKGTTIAVCFYSMHRHKNYWKEPDSFNPDRFNTL
NKEQLRAFMPFSTGHHSCLOGGLAWLEAMTILTTILKDVKILSCKNSIKPIARYTLRPDG
PVMLEVQKRN

Table S4. Identification of P450s that are part of the secondary metabolite biosynthetic gene clusters (sm-BGCs) in alphaproteobacterial species. Reference cluster information was obtained by performing BLAST at the anti-SMASH database [3], as indicated in the materials and methods section. The cluster type and most similar known cluster names available in the anti-SMASH database[3], were listed in the table.

Betaproteobacteria

Species name	Species code	No of P450s part of cluster	Region	Type	Most similar known cluster	Similarity	P450
<i>Chromobacterium phragmitis</i> IIBBL 112-1	chri	1	Region 4	transAT-PKS,NRPS,NRPS-like	sorangicin A	8%	CYP261D1
<i>Aquitalea magnusonii</i>	amah	1	Region 3	butyrolactone			CYP1200A5
<i>Ralstonia syzygii</i> subsp. <i>celebesensis</i>	rsg	1	Region 5	transAT-PKS,NRPS-like,siderophore	rhizoxin A	100%	CYP1464A2
<i>Cupriavidus basilensis</i>	cbw	1	Region 2	NRPS-like	iturin	22%	CYP107DG5
<i>Burkholderia mallei</i> ATCC 23344	bma 2	2	Region 1	RiPP-like			CYP1488A1
			Region 1 1	hgIE-KS,terpene	lipopolysaccharide	16%	CYP1013A3
<i>Burkholderia mallei</i> SAVP1	bmv 2	2	Region 6	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 7	RiPP-like			CYP1488A1
<i>Burkholderia mallei</i> NCTC 10229	bml 2	2	Region 7	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3

			Region 8	RiPP-like			CYP1488A1
<i>Burkholderia mallei</i> NCTC 10247	bmn 2	2	Region 1	RiPP-like			CYP1488A1
			Region 1 1	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
<i>Burkholderia mallei</i> 23344	bmal 2	2	Region 2	RiPP-like			CYP1488A1
			Region 3	terpene,hgIE-KS	myxochromide D	20%	CYP1013A3
<i>Burkholderia mallei</i> 6	bmae 2	1	Region 7	RiPP-like			CYP1488A1
<i>Burkholderia mallei</i> BMQ	bmaq 2	2	Region 6	RiPP-like			CYP1488A1
			Region 7	terpene,hgIE-KS	myxochromide D	20%	CYP1013A3
<i>Burkholderia mallei</i> 2000031063	bmai 2	2	Region 1	RiPP-like			CYP1488A1
			Region 1 1	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
<i>Burkholderia mallei</i> FMH 23344	bmaf 2	2	Region 5	hgIE-KS,terpene	N-myristoyl-D-asparagine / cis-7-tetradecenoyl-D- asparagine / (R)-N1-((S)-5- oxohexan-2-yl)-2- tetradecanamid e	8%	CYP1013A3
			Region 6	RiPP-like			CYP1488A1
<i>Burkholderia mallei</i> NCTC 10247	bmaz 2	2	Region 1	NRPS	glidopeptin	62%	CYP1488A1
			Region 1 1	hserlactone	L-2-amino-4-methoxy-trans- 3-butenoic acid	20%	CYP1013A3
<i>Burkholderia mallei</i> 2002734299	bmaab 2	2	Region 8	RiPP-like			CYP1488A1
			Region 9	terpene,hgIE-KS	myxochromide D	20%	CYP1013A3
<i>Burkholderia pseudomallei</i> 1710b	bpm 2	2	Region 1 0	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 1 1	RiPP-like			CYP1488A1

<i>Burkholderia pseudomallei</i> 1106a	bpl 2	2	Region 1	RiPP-like			CYP1488A1
			Region 1 7	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
<i>Burkholderia pseudomallei</i> 668	bpd 2	2	Region 1	RiPP-like			CYP1488A1
			Region 1 7	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
<i>Burkholderia pseudomallei</i> MSHR305	bpse 1	2	Region 1 3	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 1 4	RiPP-like			CYP1488A1
<i>Burkholderia pseudomallei</i> MSHR511	bpsm 2	2	Region 2	RiPP-like			CYP1488A1
			Region 3	terpene,hgIE-KS	myxochromide D	20%	CYP1013A3
<i>Burkholderia pseudomallei</i> MSHR146	bpsu 2	2	Region 1 4	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 1 5	RiPP-like			CYP1488A1
<i>Burkholderia pseudomallei</i> MSHR520	bpsd 2	2	Region 7	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 8	RiPP-like			CYP1488A1
<i>Burkholderia pseudomallei</i> 1026b	bpz 2	2	Region 1	RiPP-like			CYP1488A1
			Region 1 5	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
<i>Burkholderia pseudomallei</i> BPC006	bpq 2	2	Region 1	RiPP-like			CYP1488A1
			Region 1 7	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
<i>Burkholderia pseudomallei</i> NCTC 13179	bpk 2	2	Region 8	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 9	RiPP-like			CYP1488A1

<i>Burkholderia pseudomallei</i> HB PUB10134a	bps h 2	2	Region 1 4	RiPP-like			CYP1488A1
			Region 1 5	terpene,hgIE-KS	myxochromide D	20%	CYP1013A3
<i>Burkholderia pseudomallei</i> NAU35A-3	bps a 2	2	Region 2	RiPP-like			CYP1488A1
			Region 3	terpene,hgIE-KS	myxochromide D	20%	CYP1013A3
<i>Burkholderia pseudomallei</i> A79A	bps o 2	2	Region 1 2	RiPP-like			CYP1488A1
			Region 1 3	terpene,hgIE-KS	myxochromide D	20%	CYP1013A3
<i>Burkholderia pseudomallei</i> TSV202	but 2	2	Region 7	RiPP-like			CYP1488A1
			Region 8	terpene,hgIE-KS	myxochromide D	20%	CYP1013A3
<i>Burkholderia thailandensis</i> E264	bte 2	2	Region 1	Ripp-Like			CYP1488A2
			Region 1 4	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
<i>Burkholderia thailandensis</i> 2002721723	btq 2	2	Region 2	RiPP-like			CYP1488A2
			Region 1 5	hgIE-KS	myxochromide D	20%	CYP1013A3
<i>Burkholderia thailandensis</i> E444	btj 2	2	Region 7	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 8	RiPP-like			CYP1488A2
<i>Burkholderia thailandensis</i> H0587	btz 2	1	Region 1 3	RiPP-like			CYP1488A2
<i>Burkholderia thailandensis</i> MSMB121	btd 2	2	Region 2	transAT-PKS,PKS-like,NRPS,NRPS-like	thailanstatin A	100%	CYP1486A1
			Region 7	RiPP-like			CYP1488A2
<i>Burkholderia thailandensis</i> MSMB59	btv 2	2	Region 7	RiPP-like			CYP1488A2
			Region 8	terpene,hgIE-KS	myxochromide D	20%	CYP1013A3

<i>Burkholderia thailandensis</i> E254	bthe 2	2	Region 1 0	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 1 1	RiPP-like			CYP1488A2
<i>Burkholderia thailandensis</i> USAMRU Malaysia #20	bthm 2	2	Region 1 0	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 1 1	RiPP-like			CYP1488A2
<i>Burkholderia thailandensis</i> 2003015869	btha 2	2	Region 1 3	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 1 4	RiPP-like			CYP1488A2
<i>Burkholderia thailandensis</i> 2002721643	bthl 2	2	Region 1 1	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
			Region 1 2	RiPP-like			CYP1488A2
<i>Burkholderia oklahomensis</i> C6786	boc 2	1	Region 5	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
<i>Burkholderia mayonis</i>	buu 2	2	Region 9	terpene	sodorifen	50%	CYP117C2
			Region 1 7	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
<i>Burkholderia multivorans</i> ATCC 17616 (Tohoku)	bmj 1	1	Region 2	hgIE-KS	myxochromide D	20%	CYP1013A4
<i>Burkholderia multivorans</i> ATCC 17616 (Tohoku)	bmj 3	2	Region 2	redox-cofactor			CYP116B113
			Region 3	terpene	sodorifen	75%	CYP117C1
<i>Burkholderia multivorans</i> ATCC 17616 (JGI)	bmu 1	1	Region 3	hgIE-KS	myxochromide D	20%	CYP1013A4
<i>Burkholderia multivorans</i> ATCC 17616 (JGI)	bmu 3	2	Region 2	terpene	sodorifen	75%	CYP117C1
			Region 3	redox-cofactor			CYP116B113

<i>Burkholderia multivorans</i> DDS 15A-1	bmk 1	1	Region 2	hgIE-KS	myxochromide D	20%	CYP1013A4
<i>Burkholderia multivorans</i> DDS 15A-1	bmk 3	2	Region 2	terpene	sodorifen	75%	CYP117C1
			Region 3	redox-cofactor			CYP116B113
<i>Burkholderia multivorans</i> ATCC BAA-247	bmul 3	1	Region 2	redox-cofactor	lankacidin C	13%	CYP116B113
<i>Burkholderia gladioli</i> BSR3	bgd 1	1	Region 3	transAT-PKS,T3PKS,PKS-like	isobongkreki acid / bongkreki acid	85%	CYP267C1
<i>Burkholderia gladioli</i> ATCC 10248	bgo 2	1	Region 1 2	terpene	desotamide	9%	CYP183AG1
<i>Burkholderia</i> sp. 2002721687	bul 2	3	Region 1	transAT-PKS,PKS-like,NRPS,NRPS-like	thailanstatin A	100%	CYP1486A1
			Region 5	RiPP-like			CYP1488A2
			Region 6	terpene,hgIE-KS	myxochromide D	20%	CYP1013A3
<i>Burkholderia plantarii</i> PG1	bgp 2	1	Region 1 1	blactam			CYP107DN1
<i>Burkholderia plantarii</i> ATCC 43733	bpla 1	1	Region 9	CDPS	bicyclomycin	75%	CYP1481A2
<i>Burkholderia plantarii</i> ATCC 43733	bpla 2	1	Region 1 2	blactam			CYP107DN1
<i>Burkholderia</i> sp. Bp5365	bud 2	3	Region 1	RiPP-like			CYP1488A2
			Region 5	NRPS-like,transAT-PKS,NRPS,PKS-like	thailanstatin A	100%	CYP1486A1
			Region 1 3	hgIE-KS,terpene	myxochromide D	20%	CYP1013A3
<i>Paraburkholderia phymatum</i>	bph 2	1	Region 5	terpene			CYP133C2
<i>Paraburkholderia caribensis</i>	bcai 2	1	Region 1	terpene			CYP133C2
<i>Paraburkholderia hospita</i>	phs 2	1	Region 5	terpene			CYP133C2
<i>Paraburkholderia terrae</i>	pter 2	1	Region 5	terpene			CYP133C2
<i>Paraburkholderia megapolitana</i>	pmeg 2	1	Region 4	NRPS-like			CYP1686A1

<i>Mycetohabitans rhizoxinica</i>	brh	1	Region 6	transAT-PKS,NRPS-like	rhizoxin A	88%	CYP1464A3
<i>Achromobacter</i> sp. AONIH1	achr	1	Region 6	NRPS-like			CYP2308A1
<i>Paralcaligenes</i> sp. KSB-10	park	1	Region 5	NRPS			CYP107DG1 1
<i>Acidovorax</i> sp. JS42	ajs	1	Region 2	NRPS-like			CYP1318A1
<i>Massilia umbonata</i>	mum	1	Region 6	linaridin			CYP1104B1
<i>Methyloversatilis</i> sp. RAC08	metr	1	Region 7	terpene			CYP1246A

Deltaproteobacteria

Species name	Species code	Number of P450s part of clusters	Region	Type	Most similar known cluster	Similarity	P450s
<i>Archangium violaceum</i>	avm	4	Region 26	T1PKS,NRPS,lanthipeptide-class-ii,lanthipeptide-class-i	ajudazol A	84%	CYP1224J3
			Region 31	NRPS-like	glidobactin	10%	CYP109R10
			Region 39	NRPS,T1PKS,NRPS-like	puwainaphycin A / puwainaphycin B / puwainaphycin C / puwainaphycin D	50%	CYP242A6
			Region 40	terpene			CYP1329A2

<i>Melittangium boletus</i> DSM 14713	mbd	4	Reg ion 1	T1PKS	microsclerdermin M	18%	CYP253D
			Reg ion 3	proteusin	haliamide	29%	CYP262F1
			Reg ion 5	terpene			CYP167B10 , CYP251V1
<i>Cystobacter fuscus</i>	cfus	6	Reg ion 16	NRPS			CYP105EK1
			Reg ion 17	proteusin,RiPP-like			CYP120G3
			Reg ion 18	terpene			CYP251V1
			Reg ion 19	terpene			CYP262B4
			Reg ion 28	NRPS,T1PKS,NRPS- like	minutissamide A / minutissamide C / minutissamide D	30%	CYP1011E3
			Reg ion 40	terpene			CYP183BE1
<i>Sorangium cellulosum</i> So ce56	scl	3	Reg ion 13	T3PKS			CYP262A1
			Reg ion 20	hglE-KS,T1PKS			CYP263A1

			Reg ion 34	terpene	eremophilene	100 %	CYP264B1
<i>Chondromyces crocatus</i>	ccro	6	Reg ion 4	T1PKS,NRPS,RiPP-like			CYP110R2
			Reg ion 9	T1PKS			CYP263A3
			Reg ion 13	T1PKS,NRPS- like,NRPS	crocacin	100 %	CYP1011F1
			Reg ion 15	NRPS,T1PKS			CYP147L1
			Reg ion 17	NRPS,RiPP-like			CYP107HW1
			Reg ion 20	T1PKS,NRPS-like	ajudazol A	38%	CYP107HU1
<i>Sandaracinus amylolyticus</i>	samy	2	Reg ion 2	terpene			CYP110T1
			Reg ion 15	terpene			CYP51B3
<i>Minicystis rosea</i>	mrm	6	Reg ion 5	hglE-KS,T1PKS,terpene			CYP51B2, CYP263A2
			Reg ion 8	terpene			CYP183AH3

			Region 14	NRPS-like	ralsolamycin	40%	CYP1499A1
			Region 26	lanthipeptide-class-ii,LAP			CYP1448B1
			Region 42	hglE-KS,T1PKS			CYP1069H1
<i>Haliangium ochraceum</i> DSM 14365	hoh	10	Region 1	RRE-containing			CYP107HZ1
			Region 2	RRE-containing			CYP107JA1, CYP262C1, CYP1490A1, CYP1504A1, CYP1489A2
			Region 18	NRPS,T1PKS,phenazine	aurafuron A	71%	CYP1486B2, CYP126B3, CYP110U1
			Region 23	RiPP-like			CYP1069B2
<i>Archangium gephyra</i>	age	6	Region 9	NRPS-like,T1PKS,NRPS	crocacin	38%	CYP107DP4, CYP1011E
			Region 14	terpene,lanthipeptide-class-ii			CYP1329A1
			Region 19	terpene			CYP1298A1, CYP1347B3
			Region 35	T1PKS,NRPS	microsclerdermin	21%	CYP253G3

<i>Stigmatella aurantiaca</i> DW4/3-1	sur	10	Region 1	T1PKS,NRPS	nostopeptolide A2	25%	CYP1494A1
			Region 6	NRPS,T1PKS,NRPS- like	minutissamide A / minutissamide C / minutissamide D	30%	CYP1011E2
			Region 11	T1PKS	dawenol	100 %	CYP107DP2
			Region 13	indole			CYP120H1
			Region 18	NRPS,furan,terpene	myxochelin A / myxochelin B	100 %	CYP1498A1
			Region 29	T1PKS	aurafuron A	100 %	CYP1486B1, CYP126B2, CYP264J1, CYP1495A1
			Region 38	microviridin	microviridin K	25%	CYP264J1
<i>Desulfocurvibacter</i> <i>africanus</i> subsp. <i>africanus</i> str. Walvis Bay	daf	1	Region 3	NRPS-like,RiPP-like			CYP152E2
<i>Myxococcus xanthus</i> DK 1622	mxs	1	Region 13	transAT- PKS,NRPS,PKS-like	myxovirescin A1	78%	CYP209A1
<i>Myxococcus stipitatus</i> DSM 14675	msd	7	Region 11	NRPS,T1PKS	pyridomycin	7%	CYP253L1
			Region 16	NRPS,T1PKS	phenalamide A2	100 %	CYP1491A1

			Reg ion 19	T1PKS,other	dawenol	77%	CYP1497A1, CYP120F1, CYP1503A1, CYP1495A1
			Reg ion 28	T3PKS	alkylpyrone-407 / alkylpyrone- 393	25%	CYP229H1
<i>Myxococcus hansupus</i>	mym	1	Reg ion 3	terpene	geosmin	100 %	CYP109S1
<i>Corallocccus coralloides</i> DSM 2259	ccx	2	Reg ion 16	NRPS			CYP264D1
			Reg ion 21	NRPS			CYP264D6

Epsilonproteobacteria

Species names	Species code	No of p450s	Cluster Count	Region	Type	From	To	Most similar known cluster	Similarit y	P450 in Clusters
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<i>Helicobacter winghamensi</i>	hwi	1								
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> NCTC 11168 = ATCC 700819	cje	1								
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> NCTC 11168- BN148	cjb	1								
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 81-176	cjj	1								
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 81116	cju	1								

<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> ICDCCJ0700 1	cjn	1								
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> IA3902	cji	1								
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> M1	cjm	1								
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> S3	cjs	1								
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> PT14	cjp	1	1	Region 1	betalactone	858,63	888,467			

<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-2426	cjej	1	1	Region 1	betalactone	859,152	888,989			
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-2538	cjeu	1	1	Region 1	betalactone	897,707	927,544			
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-2544	cjen	1	1	Region 1	betalactone	897,708	927,545			
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-2425	cjei	1	1	Region 1	betalactone	897,706	927,543			
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> R14	cjer	1	1	Region 1	betalactone	963,554	993,393			

<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> MTVDSCj20	cjv									
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-1597	cjl	1	1	Region 1	betalactone	856,759	886,598			
<i>Campylobacter jejuni</i> subsp. <i>jejuni</i> 00-6200	cjw	1	1	Region 1	betalactone	857,862	887,699			
<i>Campylobacter jejuni</i> RM1221	cjr	1								
<i>Campylobacter jejuni</i> subsp. <i>doylei</i> 269.97	cjd	1	1	Region 1	betalactone	935,951	965,789			
<i>Campylobacter jejuni</i> 32488	cjz	1	1	Region 1	betalactone	10,63	40,467			

<i>Campylobacter jejuni</i> 4031	cjx	1	2	Region 1	thioamide-NRP	181,841	244,976			
				Region 2	arylpolyene	1,433,255	1,476,717	APE Vf	20%	
<i>Campylobacter lari</i> RM2100	cla	1								
<i>Campylobacter lari</i> RM16701	clr	1								
<i>Campylobacter lari</i> RM16712	clm	1								
<i>Campylobacter lari</i> NCTC 11845	cln	1								
<i>Campylobacter lari</i> subsp. <i>concheus</i> LMG 11760	cll	1								
<i>Campylobacter coli</i> 76339	ccol	1								
<i>Campylobacter coli</i> CVM N29710	ccc	1								

<i>Campylobacter coli</i> 15-537360	ccq	1								
<i>Campylobacter coli</i> RM1875	ccf	1								
<i>Campylobacter coli</i> RM4661	ccy	1								
<i>Campylobacter coli</i> RM5611	ccoi	1								
<i>Campylobacter coli</i> FB1	ccof	1								
<i>Campylobacter coli</i> OR12	ccoo	1								
<i>Campylobacter insulaenigrae</i>	cis	1								
<i>Campylobacter volucris</i>	cvo	1								
<i>Campylobacter peloridis</i>	cpel	1								
<i>Campylobacter</i> sp. RM16704	camr	1								

<i>Campylobacter subantarcticus</i> LMG 24374	csm	1								
<i>Campylobacter subantarcticus</i> LMG 24377	csf	1								
<i>Campylobacter helveticus</i>	chv	1								
<i>Campylobacter cuniculorum</i>	ccun	1								
<i>Campylobacter lanienae</i>	clx	1								
<i>Campylobacter avium</i>	cavi	1								
<i>Campylobacter hepaticus</i>	chw	1								
<i>Campylobacter</i> sp. RM12175	camz	1								
<i>Campylobacter</i> sp. RM6137	camy	1								

<i>Campylobacter ornithocola</i>	coj	1								
<i>Campylobacter upsaliensis</i>	cux	1								
<i>Campylobacter armoricus</i>	carm	1								
<i>Campylobacter novaezeelandicae</i>	cnv	1								
<i>Malaciobacter mytili</i>	amyt	1								

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3. Blin, K.; Shaw, S.; Steinke, K.; Villebro, R.; Ziemert, N.; Lee, S. Y.; Medema, M. H.; Weber, T., antiSMASH 5.0: updates to the secondary metabolite genome mining pipeline. *Nucleic acids research* **2019**.