

Supplementary data

Table S1: Examples of pathways that may be altered at the transcriptional level by exposure to Glyphosate (CAS# 1071-83-6) in zebrafish (*Danio rerio*) using the Comparative Toxicogenomics Database (March/2023) [1].

Bibliographic Reference	Phenotype	Phenotype ID	Co-Mentioned Terms	Interaction of glyphosate	Anatomy	Possible interaction (genes/proteins)	References interrelation
[2]	Oviposition	GO:0018991		Affects oviposition	Embryo, Nonmammalian	RACK1	[3]
	Hatching	GO:0035188		Results in increased hatching		CD63	[3]
	Regulation of steroid biosynthetic process	GO:0050810		Affects regulation of steroid biosynthetic process		DDX20	[4]
						LEP	[5]
						NR5A1	[6]
				STAR	[7]		
[6]	Oocyte growth	GO:0001555		Affects oocyte growth	Ovary	KMT2D	[8]
						NANOS3	[9]
[10]	Locomotion involved in locomotory behaviour	GO:0031987		Results in decreased locomotion involved in locomotory behaviour		FZD4	[11]
						PPP3CB	[3]
	Memory	GO:0007613		Results in decreased memory		APP / CASP1 / IGF1	[12]
						ATXN1 / KMT2B	[8]
						B4GALT2 / KALRN / RELN / SHANK3	[13]
						CACNA1D / CREB1 / EP30 / FEN1 / FGF13 / ITGA3 / ITGA5 / ITPR3 / PLCB1 / PSEN2 / TUBA1A	[11]
					DRD1	[14]	

	Larval development	GO:0002164		Affects larval development		GRIN1	[15,16]
						HDAC4	[5]
						IL1B	[17]
						OXT	[18]
						PLK2	[4]
						PPP3CB	[3]
						PTGS1	[19]
						S100B	[20,21]
						SLC6A1	[22]
[24]	Aggressive behaviour	GO:0002118		Results in decreased aggressive behaviour		SLC6A4	[15]
						TH	[23]
						FMO-2	[25]
[24]	Cellular metabolic process	GO:0044237		Results in decreased cellular metabolic process	Brain / Cells / Cultured		
[24]	NADH dehydrogenase (ubiquinone) activity	GO:0008137		Results in decreased NADH dehydrogenase (ubiquinone) activity	Brain	ND1 / ND2 / ND4 / ND5 / ND6	[26]
						ND3	[8]
						NDUFA6	[24]
[24]	Cytochrome-c oxidase activity	GO:0004129		Results in decreased cytochrome-c oxidase activity	Brain	COX1 / COX2	[27]
[24]	Regulation of mitochondrial membrane potential	GO:0051881		Affects regulation of mitochondrial membrane potential	Brain / Cells / Mitochondrial Membranes	BAX	[9,11,12,28-33]
						BCL2	[9,12,28-34]
						BCL2L1	[3]
						SOD1	[2,21,29,35]
						SOD2	[31]
						UBB	[4]
[24]	Reactive oxygen species metabolic process	GO:0072593	Reactive Oxygen Species	Affects reactive oxygen species metabolic process, which results in increased abundance of Reactive Oxygen Species	Brain / Cells	BCL2	[9,12,28-34]
						BNIP3	[11]
						CAT	[2,19,20,23,36-43]
						DDIT4	[5,11]
						ND2	[26]
						PMAIP1	[11,28]
						SESN2	[44]
						SOD1	[2,21,29,35]
						SOD2	[31]
						TP53	[5,12,28,34]

						<i>TRP53</i>	[45]
[24]	Exploration behaviour	GO:0035640		Results in decreased exploration behaviour		<i>ABAT</i>	[26]
						<i>ITGA3</i>	[11]
						<i>SHANK3</i>	[13]
						<i>CAZ</i>	[26]
[46]	Larval locomotory behaviour	GO:0008345		Affects larval locomotory behaviour	Embryo / Nonmammalian		
[46]	Regulation of membrane potential	GO:0042391		Affects regulation of membrane potential	Mesencephalon / Neurons	<i>ASIC2 / NEDD4L / SLC4A8</i>	[13]
						<i>GRIN1</i>	[15,16]
[46]	Microglial cell activation	GO:0001774		Affects microglial cell activation	Microglia	<i>APP / CASP1 / SNCA</i>	[12]
						<i>CLU</i>	[4]
						<i>IFNG</i>	[12,47]
						<i>IFNGR1 / JUN</i>	[11]
						<i>IL13</i>	[47]
						<i>TNF</i>	[12,16,17,28,48]
[23]	Adult locomotory behaviour	GO:0008344		Affects adult locomotory behaviour		<i>APP</i>	[12]
						<i>ATXN1</i>	[8]
						<i>CAZ</i>	[26]
						<i>CXCL12</i>	[3,49]
						<i>ENPP1</i>	[13]
						<i>GRIN1</i>	[15,16]
						<i>ID2</i>	[11]
						<i>INPP5F</i>	[4]
						<i>KALRN / MSR1 / NTF4 / PCDH15</i>	[13]
						<i>PMP22</i>	[26]
						<i>PPT1</i>	[8]
						<i>SNCA</i>	[12]
						<i>TSC1 / TUBA1A</i>	[11]
[23]	Social behaviour	GO:0035176		Affects social behaviour		<i>ATXN1</i>	[8]
						<i>CHD8</i>	[11]
						<i>DRD1</i>	[14]
						<i>GRIN1</i>	[15,16]
						<i>IL1B</i>	[17]
						<i>KALRN / NRXN1 / RELN / SHANK3</i>	[13]
						<i>MTOR</i>	[11,15]
						<i>OXT</i>	[18]
						<i>RPTOR</i>	[11]
						<i>SLC6A4</i>	[15]

						<i>TH</i>	[23]
[23]	Neurotransmitter metabolic process	GO:0042133	3,4-Dihydroxyphenylacetic Acid	Affects neurotransmitter metabolic process, which results in increased abundance of 3,4-Dihydroxyphenylacetic Acid	Telencephalon / Optic Lobe, Nonmammalian / Cerebellum	<i>GLUL</i>	[37]
[23]	Neurotransmitter metabolic process	GO:0042133	Dopamine	Affects neurotransmitter metabolic process, which results in increased abundance of Dopamine	Telencephalon	<i>GLUL</i>	[37]
[23]	Neurotransmitter metabolic process	GO:0042133	Norepinephrine	Affects neurotransmitter metabolic process, which affects the abundance of Norepinephrine	Telencephalon / Optic Lobe, Nonmammalian / Cerebellum	<i>GLUL</i>	[37]
[23]	Neurotransmitter metabolic process	GO:0042133	Homovanillic Acid	Affects neurotransmitter metabolic process, which results in increased abundance of Homovanillic Acid	Telencephalon / Optic Lobe, Nonmammalian / Cerebellum	<i>GLUL</i>	[37]
[23]	Neurotransmitter metabolic process	GO:0042133	Serotonin	Affects neurotransmitter metabolic process, which results in increased abundance of Serotonin	Telencephalon	<i>GLUL</i>	[37]
[23]	Superoxide dismutase activity	GO:0004784		Increased superoxide dismutase activity	Brain	<i>NQO1</i>	[42]
						<i>SOD1</i>	[2,21,29,35]
						<i>SOD2</i>	[31]
						<i>SOD3</i>	[4]
[23]	Glutamate-cysteine ligase activity	GO:0004357		Decreased glutamate-cysteine ligase activity	Brain	<i>GCLM</i>	[42]
[23]		GO:0006749	Glutathione	Affects glutathione metabolic process -	Brain	<i>CLIC5</i>	[13]
						<i>CTH / GSTK1 / OPLAH</i>	[4]

	Glutathione metabolic process			which results in decreased abundance of Glutathione		<i>DPEP1 / GGT1</i>	[26]
						<i>G6PD</i>	[29,35,41]
						<i>GCLM</i>	[42]
						<i>GPX1</i>	[19,38,42]
						<i>GPX3</i>	[31]
						<i>GSR</i>	[41]
						<i>GSTM1</i>	[28]
						<i>HBB</i>	[27]
						<i>SOD1</i>	[2,21,29,35]
						<i>SOD2</i>	[31]
[23]	Lipid catabolic process	GO:0016042		Affects lipid catabolic process – which results in increased abundance of Malondialdehyde	Brain	<i>ABHD2 / LIPH</i>	[49]
						<i>ABHD4</i>	[22]
						<i>IRS1 / PLCB1 / PLD1 / TBL1XR1</i>	[11]
						<i>LIP1 / PLCE1</i>	[13]
						<i>LIPO1 / PPT1</i>	[8]
						<i>PNPLA4</i>	[22]
[50]	Aerobic respiration	GO:0009060		Results in decreased aerobic respiration	Embryo / Nonmammalian / Mitochondria	<i>ATP5F1D</i>	[8]
						<i>CAT</i>	[2,19,20,23,36-43]
						<i>COX1</i>	[27]
						<i>ND1 / ND2 / ND4 / ND5 / ND6</i>	[26]
						<i>ND3</i>	[8]
						<i>NDUFA6</i>	[24]
						<i>NDUFB11</i>	[4]
						<i>SDHC</i>	[8,24]

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