ARTICLE	DISEASE/PROCESS	SYNOPSIS/KEY FINDINGS
Servaes et al. 2001	CFS/CRF	-study examining CFS and CRF patients -19% of disease-free cancer patients are fatigued -no relationship between fatigue and type of cancer -fatigue associated with lower motivation, concentration, physical activity -relation between fatigue, depression, and anxiety -similar “fatigue experience” between CRF and CFS
Stussman et al. 2020	CFS	-study examining CFS patients -range of symptoms attributed to exertion -core symptoms: exhaustion, cognitive difficulties, neuromuscular complaints -unique variations particular to different individuals -post-exertional malaise varies greatly between individuals and causes a reduced quality of life
Park et al. 2019	CFS/CRF	-study examining CFS and CRF patients -both CFS/CRF patients show comparable levels of fatigue but different presentation -CRF patients had higher high sensitivity C-reactive protein (hs-CRP) levels and reduced heart rate variability (HRV)-index -different pathophysiological mechanisms underlie CFS and CRF; inflammatory markers and EEG markers may distinguish the diseases
Franc et al. 2014	CRF	-fatigue affects many with cancer -often diagnosed during treatment -oftentimes the feeling is specific to the individual and may be subjective -pathogenesis is unknown still -CRF causes reduced quality of life -treatment may be attempted based on the suspected underlying cause
Ryan et al. 2007	CRF	-review about the suspected mechanisms of cancer-related fatigue -very prevalent in cancer patients with a large effect on quality of life -still poorly understood and may involve contributions from comorbid disorders, therapy, or cancer itself -suspected to often involve dysregulation of several physiological and biochemical systems -may include dysregulation of several systems: HPA axis, 5-HT, ATP metabolism, circadian rhythms, cytokine dysregulation, and muscle alterations -however, still very little evidence directly linking these processes to CRF
Saligan et al. 2015	CRF	-systematic review paper of current literature on cancer-related fatigue

		-47 current articles reviewed; 25 cross-sectional and 22 longitudinal -findings suggest that CRF is liked to immune/inflammatory, genetic, neuroendocrine, and metabolic markers -gaps exist in current research
Berger et al. 1998	CRF	-study of CRF in breast cancer patients, specifically related to adjuvant therapy (chemotherapy) -the study found unexpected variance in reported fatigue over the course of the treatment cycle, peaking during treatment and waning at midpoints
Jereczek-Fossa et al. 2002	CRF	-radiotherapy-induced fatigue is very common in patients undergoing radiation therapy -poorly understood etiology -may depend on site of tumor and treatment regime -psychological mechanisms have been preposed -some potential treatments include group psychotherapy, relaxation therapy, exercise, and sleep
Kamal et al. 2019	CRF	-a study using dosimetric data from disease-free nasopharyngeal cancer patients -dosimetric data obtained from several regions in the brains following radiation therapy -a “dose-fatigue” relationship is present for the pituitary gland, determined through patient and observer reporting
McManimen et al. 2016	CFS	-study to determine if CFS patients die earlier than the rest of the population from the cause—56 cases were examined -significantly increased risk of earlier all-cause death, cardiovascular-related mortality -directionally lower age of death for suicide and cancer -findings should be replicated due to sample size of the study and the use of only severely ill patients
Levine et al. 2011	CFS, Cancer	-attempt to use population-based data to determine relationship between cancer and CFS, if any -some evidence of increased non-Hodgkin lymphoma (NHL). however this needs follow-up studies -not all CFS patients exhibit immune dysregulation, and a single causative agent is highly unlikely between both diseases -focusing on subgroups in each disease may prove more useful
Levine et al. 1994	CFS, Cancer	-CFS has been associated with immune dysregulation in the past, however this is very contentious in the literature

		-it is difficult to warrant association of CFS with cancer given the then-current data -no consistent trends associating NHL with CFS -upward trend in the incidence of CNS tumors may be related to a general increase in cases in the general population -several recommendations given for later studies, including latent period for specific tumors
Servaes et al. 2002	CFS/CRF	-study of 57 severely fatigued but disease-free breast cancer patients and in 57 gender and age matched patients with CFS -CFS patients tend to self-report worse level of fatigue, functional impairment, physical pain, pain, and efficacy -a subgroup of severely fatigued breast cancer patients scored equally to the CFS patients -some similarities between the patient groups but also a great deal of differences—cognitive-behavioural therapy should differ between the patient groups
Chang et al. 2012	CFS/Cancer	-epidemiological study on 1.2 cancer cases -sought to determine whether CFS can be linked to cancer based on the hypothesis of immune dysfunction and metabolic dysregulation -CFS seems to be associated with some types of NHL -these numbers remained elevated after excluding patients with autoimmune conditions or other conditions unrelated to NHL or CFS -some associations with other cancers, however significant after multiple comparisons
Light et al. 2013	CFS/CRF	-prostate cancer patients undergoing androgen-deprivation therapy with self-reported fatigue (PCF) and CFS patients were assessed for several potential biomarkers using RT-qPCR -PCF patients showed high expression than CFS patients of two genes involved in immune transcription (NR3C1 and TLR4), chemokine CXCR4, and SOD2 (superoxide dismutase) -CFS patients showed high metabolite detecting receptors (P2Rx7) and lower HSPA2 -both CFS and PCR patients showed correlations with fatigue severity that were similar between the groups in a GABA-A receptor modulator
Cleare 2004	CFS	-many studies have reported CFS may be linked to alterations in the HPA axis -early prospective studies may indicate no changes in the early stages of the illness

		-changes may be reversed by modifying behaviour -this article presents the opinion that there is no actual change in the HPA axis of CFS patients that causes the disease, but that the etiology is multifactorial and play a role in “exacerbating or perpetuating symptoms late on in the course of the illness”
Holtorf 2011	CFS	-there is significant controversy regarding the relevance of HPA-axis dysfunction in CFS -some studies exist that have demonstrated a deficiency through stimulation tests -CFS dysfunction of the HPA axis is in the pituitary-hypothalamic level mostly according to studies -treatment of low physiologic doses of cortisol have been shown to be helpful in these cases, so administration of cortisol (<15 mg) may be useful in treatment
Papadopoulos & Cleare 2012	CFS	-there is considerable evidence of reduction of cortisol levels in some CFS patients, and these changes appear more pronounced in women than in men -the hypothalamic–pituitary–adrenal (HPA) axis may be to blame for this, along "with attenuated diurnal variation, enhanced negative feedback and blunted response to challenges" -ow cortisol levels may contribute to symptoms and an overall worsened outcome -multidimensional etiological model is most probable -low cortisol appears late in the illness and may be moderated by exercise, existing mental health conditions such as depression, early trauma, and psychotropics -cortisol levels may be improved by cognitive behavioral therapy -better research design is required for future studies on CFS
Vangeel et a. 2015	CFS	-study quantified DNA methylation in the 1F promoter region of NR3C1, a biomarker for HPA-dysfunction -overall methylation was lower in CFS patients compared to controls -no significant differences between patients with childhood trauma and those without trauma -results consistent with HPA-axis dysfunction in CFS patients
Houdenhove et al. 2009	CFS	-narrative review -the etiology of CFS is poorly understood -although HPA axis dysfunction is common in CFS patients, it is unclear is it is causative or merely a consequence of the illness -HPA axis dysfunction is hypothesized to point to “neurobiological stress”, imbalance between

		glucocorticoid and inflammatory signalling pathways, and a "cytokine-induced sickness" -these processes are hypothesized to underly CFS where HPA-axis dysfunction in present
Van Den Eede et al. 2008	CFS	-letter to the editor -there appears to be evidence for HPA-axis dysfunction in CFS, glucocorticoid negative feedback insensitivity, and blunted adrenocorticotropin response to stressors are the current and main findings
Morris et al. 2017	CFS	-systematic review -considerable evidence of HPA-axis dysfunction in CFS -there is also evidence that neuro-immune and pro-oxidative processes are implicated in the pathophysiology of CFS -hypothesized that the above processes occur either as a consequence of HPA axis dysfunction or are causative -results indicate that these are not secondary processes to HPA axis dysfunction and are most likely causative
Andrykowski et al. 2005	CRF	-study of female breast cancer patients undergoing adjuvant therapy -patients completed clinical interview on measures of fatigue, distress, coping, and quality of life -baseline incidence of CRF was 10%, and following treatment 26% -results support multifactorial etiology—patient scores were significantly different in relation to various parameters of the questionnaire
Bower 2007	CRF	-narrative review -the author considers the emerging evidence for inflammatory processes in CRF -evidence suggests that this occurs both during and after treatment -author identifies potential mechanisms for the inflammation, focusing on the HPA axis
Bower et al. 200	CRF	-epidemiological study on fatigue in a large sample of breast cancer survivors -breast cancer patients somewhat more fatigued than the general population overall -approximately one third of breast cancer survivors reported severe fatigue -symptoms included increased depression, pain, and sleep disturbances -depression and pain were the strongest indicators of fatigue severity

Wang 2012	CRF	-narrative review of the possible mechanisms behind CRF -CRF is influenced by a number of factors, including the effect of tumor burden, cancer treatment, or other pathophysiological conditions -compelling research exists in the pro-inflammatory hypothesis of CFS induction, the involvement of serotonin, anemia, and lack of adenosine triphosphate
Badawy et al. 2005	CFS	-study that assess the serotonin status of CFS patients -examined various parameters of tryptophan metabolism -free tryptophan was higher in CFS patients -total tryptophan ratio to CAA ratio was significantly different between patient groups -CAA was not significantly different between groups, however it was lower overall in men than in women -there appeared to be two subtypes of CFS patients: ones with normal and high serotonin status when covaried with age end gender
Morrow et al. 2003	CRF	-it is known that fatigue and depression typically occur together in cancer patients, which suggests a common underlying mechanism -cancer patients undergoing chemotherapy were assessed for fatigue -if fatigue was reported, patients were placed on a paroxetine hydrochloride daily dose (a selective serotonin reuptake inhibitor) or a placebo -the SSRI had no effect on the reduction of fatigue -there was a mean between the groups with respect to depression, however -authors hypothesize that serotonin may have no effect on fatigue levels
Barsevick et al. 2012	CRF	-systematic review of CRF and issues in the investigation of biological mechanism -current research is beginning to incorporate biological and genetic perspectives of these experiences -evidence suggest that the HPA axis, serotonin, circadian rhythm, and metabolism may be involved, however further research is required to elucidate these connections -advances in understanding CRF will contribute to increased quality of life in patients
Roscoe et al. 2005	CRF	a study using the same SSR as Morrow et al. 2003 on breast cancer patients undergoing chemotherapy -analysis showed that paroxetine managed to reduce depression effectively, however not fatigue -authors hypothesize that serotonin is not the primary mechanism of CRF fatigue

O'Higgins et al. 2018	CRF	-narrative review -fatigue is a debilitating symptom of cancer -current research suggests that it is a multifactorial condition and likely involves immune dysfunction, muscular changes, and neuroendocrine modulation -some current hypotheses are presented, including HPA axis, disruption of circadian rhythm, serotonin dysregulation -authors explain different controversies surrounding these avenues of research
Dantzer et al. 2014	CRF	-narrative review -the general pathophysiology of fatigue is not fully understood -however, studying chronic inflammatory diseases, cancers, and neuropathologies can help elucidate these mechanisms -there is convergent data from many different sources on the importance of inflammation in fatigue -neurological dysfunction may also be implicated
LayVoy et al. 2016	CRF	-narrative review -cancer-related fatigue is a debilitating condition, as previously reviewed -authors discuss concepts such as the HPA axis, disruption of circadian rhythm, serotonin dysregulation
Liu et al. 2017	CFS	-rat model of exercise-induced fatigue -study focuses on the involvement of serotonin in the manifestation of fatigue -increased serotonin in the CNS is important to the adjustment to chronic fatigue -serotonin plays an important role in exercise-induced fatigue
Pinho et al. 2012	RIBE	-study to determine if measurable levels of bystander factors are present in esophageal carcinoma patients' urine, and to determine if serotonin levels play a role in RIBE -specifically, patients undergoing radiotherapy -some of the data suggested significant effect of serotonin molecular signalling after high doses of radiation from high dose rate intraluminal brachytherapy -further research required to determine if serotonin plays a role in RIBE
Lyng et al. 2012	RIBE	-study to determine the importance of serum serotonin levels in the measurement of bystander cell death

		-significant reduction in cell survival obtained in HaCaT cells treated with medium from irradiated cells, however no difference was found between bovine serum batches -data suggest that serum serotonin does not play a role in the system used
Mothersill et al. 2010	RIBE	-study to again confirm or refute importance of serum serotonin levels in generations of a bystander signal from cells *in vitro* -serotonin level varied widely between batches -serum serotonin levels may affect ability to obtain a bystander signal and may explain different results between labs
Curtis et al. 2018	RIBE	-another study investigating the importance of serum serotonin concentration in bystander effects *in vitro* -used the HaCaT cell lines and two types of HCT116 (transformed keratinocytes and intestinal epithelial cells, respectively) -serotonin-depleted media significantly increased cell survival in *TP53* wild-type cells -indicative of serotonin receptor heterogeneity that may underlie sensitivity to serum serotonin levels with respect to bystander responses
Kalanxhi et al. 2012	RIBE	-study investigating the role of serotonin and p53 status in RIBE -medium transfer was used to assess responses in HCT116 and a breast cancer cell line, MCF-7 -high serotonin conditions in donor cells promoted a significant increase in bystander responses, while low serotonin levels did not show any bystander effect -bystander effects can be induced in p53 null cell reporters with high enough serotonin concentrations (100 ng/mL) -results indicate that serotonin levels play a role in RIBE and there could be an interaction with p53
Morin 1999	Circadian Rhythm	-narrative review paper -the suprachiasmatic nucleus controls the primary circadian clock in mammals -review of the circadian clock in mammals -the involvement of serotonin is not immediately obvious -there is conflicting information on whether serotonin affects the rhythm phase -further research is ongoing
Ciarleglio et al. 2011	Circadian Rhythm	-narrative review paper -the molecular biology of circadian and serotonin systems are described

		-these two systems are interconnected at the molecular level -serotonin-circadian interactions in the brain may be implicated in various disorders, such as autism spectrum disorder, major depression, and seasonal affective disorder
Lee 2019	Circadian Rhythm	-narrative review paper on insomnia and how serotonin receptors may be implicated in this disorder -suggested that insomnia is comorbid with several additional condition -various serotonin receptors have been identified as targets for sleep aids -others are potential future targets, as these have shown to be involved in sleep/wake cycles
Shan et al. 2020	CFS	-a narrative review of the neurological symptoms of CFS -endothelial dysfunction is discussed and other possible mechanisms of pathogenesis -other mechanisms include impaired cerebral blood flow, increased intercranial pressure, and adrenergic hyperactivity -these may explain the symptoms of brain fog, headache, sleep disturbances, and hypersensitivity
Tyron et al. 2004	CFS	-study suggesting that some CFS symptoms are the same as those of a disrupted circadian rhythm -CFS patients show lower daytime activity overall and less regular activity-rest cycles compared to the control -the authors conclude that CFS may impair the circadian rhythm in these patients
Focan et al. 1986	CRF	-a study showing that CEA and AFP, two tumor biomarkers, can be demonstrated in individuals who do not suffer from cancer -those with cancer exhibit a different circadian activity when compared to the initial group
Reinberg & Halberg 1971)	Circadian Rhythm	-various species are susceptible to chemicals that can interfere with the circadian rhythm and other biological rhythms -the effects of adrenal secretion in mice induced by ATHC are discussed
Levin et al. 2005	CRF	-study examining whether those with advanced non-small cell lung cancer exhibit disrupted circadian rhythms -33 patients were used in the study -patients during or shortly after chemotherapy had significantly more abnormal circadian rhythm -daily sleep/wake cycles are disturbed in these patients and greatly affect quality of life

Sephton & Spiegel 2003	CRF	-narrative review on the biological mechanisms that underlie the psychosocial effects on the progression of cancer, focusing on neuroendocrine and immune circadian rhythms -various alterations to rhythm are discussed and potential psychosocial effects on tumor growth are also discussed -review of evidence the effect of circadian rhythm dysregulation on immune responses
Mormont et al. 1996	CRF	-a study of the circadian rhythm of 30 patients with metastatic colorectal cancer -a wide inter-patient variability was observed -cancer patients appear to have altered rest-activity circadian rhythms -further research required to determine significance to prognosis
Singh et al. 1998	CRF	-a study of 25 breast cancer patients and 15 controls, specifically on the "circadian periodicity" of various urinary compounds -urinary corticoids were significantly different in breast cancer patients; these were elevated compared to controls -the degree of elevation was more pronounced in advanced case -mastectomy returned values closer to the control group
Bower et al. 2005	CRF	-a small study on the cortisol rhythm and fatigue patterns in breast cancer survivors -fatigued survivors had a flatter cortisol slope than non-fatigued survivors -results suggest "a subtle dysregulation in hypothalamic–pituitary–adrenal axis functioning in breast cancer survivors with persistent fatigue"
Evengård et al. 2005	CFS	-narrative review of CFS and suspected underlying causes -causes may include immune activation, HPA axis dysfunction, and other dysfunction of other parts of the central nervous system -the disease is likely to be complex and one cause likely does not exist
Roscoe et al. 2007	CRF	-narrative review on CRF -fatigue is common in cancer patients -symptomatology is discussed: headaches, lack of energy, malaise, disturbance of sleep, and drowsiness -it may occur as a consequence of the cancer itself or possibly treatment

		-quality of life is usually affected greatly
Mormont et al. 1998	CRF	-a study of women with ovarian cancer and metastatic colorectal cancer, focusing on circadian rhythms and cortisol levels -the clinical value of a 2-timepoint estimation of serum cortisol was evaluated
Petrovsky et al. 1998	Circadian Rhythms	-a study that measured IFN-gamma, TNF-alpha, IL-1, and IL12 production in 13 healthy volunteers over 24 hours -cytokines exhibited distinct diurnal rhythms and peaked in the early morning -pro-inflammatory cytokine rhythms may have therapeutic relevance
Kronfol et al. 1997	Circadian Rhythms	-a study that analyzed the blood samples of healthy volunteers over 24 hours -the group measured ACTH, cortisol, norepinephrine, and epinephrine -some biomarkers showed significant circadian rhythm, such as neutrophil percentage, CD4+ cells, CF56+ cells, number of total lymphocytes, among others -most of these markers are associated closely with the regulation of cortisol
Stephon et al. 2000	CRF	-study of cortisol rhythms in those with metastatic breast cancer, with various parameters measured -cortisol slope was a predictor of survival up to 7 years after measurement -NK cell count was another predictor of survival -metastatic breast cancer patients whose cortisol rhythms are flattened appear to exhibit earlier mortality -immune biomarkers may be prognostic in metastatic breast cancer
Touitou et al. 1996	CRF	-a study of 33 breast and ovarian cancer patients and their blood serum profiles -most patients had “deeply altered cortisol circadian patterns” -the patients mostly exhibited erratic peaks and fluctuations, or a flattened response -no relationship with tumor antigens was found -these findings could be relevant to future therapies
DeFreitas et al. 1991	CFS	-a study that suggests HTLV could be involved in CFS -patients were screened for the virus, and most patients were found to be positive for the antibodies -twenty from a control group were not positive for the viral antigens

Kannian et al. 2010	HTLVs	-a narrative review about the human T lymphotropic viruses, outlining the different subtypes -some of these viruses are associated with adult T cell leukemia and other diseases
Roucoux & Murphy 2004	HTLVs	-a narrative review about the human T lymphotropic virus subtype II -the virus has been linked to a few diseases, including HTLV-associated myelopathy/tropical spastic paraparesis -infection causes increased risk of arthritis, pneumonia, and bronchitis
Beilke et al. 2004	HTLVs	-a study investigating the clinical outcomes and disease progression of patients coinfected with HTLV-I and HTLV-II -coinfected patients had greater neurological complications, infections, and hepatitis C, and other complications
Meeus et al. 2009	CFS/CRF	-a narrative review outlining the characteristic fatigue in CFS and cancer -there is a review of several molecular factors that may underlie immune dysfunction, such as NF-kB and RNAse L -the natural killer cell hypothesis is discussed in this section -oxidative stress and excessive nitric oxide and their implication in both fatigue states is discussed -these abnormalities may link the two conditions
Noda et al. 2018a	CFS	-a narrative review of the possible underlying causes of CFS -discussion of autonomic, immune, neuroendocrine, and central nervous systems are discussed along with neuroinflammation -the authors hypothesize that inflammation of microglia and astrocytes may be responsible for the immune state that leads to CFS -the authors describe cytokine signaling in these cells, along with extracellular serotonin signalling
Ojo-Amaize et al. 1994	CFS	-a study conducted on blood specimens from 50 healthy individuals and 50 patients of CFS, specifically for NK cell activity screening -results showed that low levels of NK activity are correlated with severity of CFS -these findings may be useful especially if confirmed by other groups with larger sample sizes
Broderick et al. 2010	CFS	-a study of 16 cytokines in CFS patients and healthy controls

		-the networks in CFS patients appeared to be different compared to healthy controls -there were highly attenuated immune responses in CFS according to some of these biomarkers -there was also indirect evidence of diminished NK cell responsiveness to IL-12 and lymphotoxin-alpha exposure -These findings may also help therapeutics and indicate IL-2, IFN-gamma, and TNF-alpha could be targets
Brodrick et a. 2012	CFS	-a small study of cytokine concentrations in plasma samples from 9 post-infection CFS patients and 12 recovered controls -results showed significant differences in IL-8 and IL-23 between groups -results suggest that "co-expression patterns in as few as 5 cytokines associated with Th17 function may hold promise as a tool for the diagnosis of post-infectious CFS"
Pusztai et al. 2004	CRF	-a study of 90 breast cancer patients undergoing paclitaxel chemotherapy -it was suspected that changes in the blood concentration of various interleukins is associated with fatigue, flu-like symptoms, and musculoskeletal symptoms -no difference in baseline cytokine levels between the groups -treatment schedule-dependent changes were found with 3 cytokines: Il6, 8, and 10 -these also correlated with symptoms associated with treatment
Hong et al. 1995	Cytokines	-an animal study investigating whole-body and midbrain irradiation of mice and its effects on cytokines in the brain -results showed that several cytokine concentrations were increased following irradiation -therefore, it was concluded that these cytokines play a role in the inflammatory response upon radiation exposure of the brain
Hallahan et al. 1993	Cytokines	-a narrative review of the involvement of cytokines in radiation responses following exposure -remedying some of the harmful effects of radiation therapy can be done by attenuating the production of TNF, TGF-beta, and other cytokines -some cytokines are useful for cancer therapy, such as TNF-alpha which enhances killing of tumor cells -more research is required to understand cytokine signalling networks

Greenberg et al. 1993	Cytokines	-a study of cytokine levels (specifically IL-1) during external beam irradiation for prostate cancer -localized irradiation was found to cause increased fatigue and sleep requirement for patients -changes in serum IL-1 concentrations were also noted in the patient group
Bianco et al. 1992	Cytokines	-phase I-II trial of pentoxifylline (PTX) in the downregulation of TNF-alpha production in those receiving bone marrow transplantation -overall, administration of PTX resulted in reduced morbidity and mortality in patients undergoing transplantation -future trials and directions are discussed, including randomized trials
Benzing et al. 1999	Cytokines	-an animal study of RGS7, a regulator of G-protein signalling, and the prevention of its degradation by TNF-alpha -this process requires activation of p38 -TNF-alpha mediated upregulation of RGS7 may promote changes in central nervous system function upon infection of the CNS
Raison et al. 2005	Cytokines	-a narrative review of interferon alpha and its use in medical conditions -adverse effects are discussed, including development of a confused state and depressive symptoms -discussion of the use of antidepressants for treatment of depression induced by interferon alpha
Capuron et al. 2002	Cytokines	-another study of the major depression induced by interferon-alpha therapy -studies have previously shown that this effect may be attenuated by the antidepressant paroxetine -forty patients with malignant melanoma were given this antidepressant or a placebo and neuropsychiatric assessments were conducted at regular intervals -several symptoms appeared including fatigue, anorexia, and pain upon IFN-alpha therapy in a large proportion of patients; later in the disease, there was a significant increase in major depression in the IFN-alpha group -some symptoms, like depression, anxiety, and cognitive dysfunction were effectively treated by the drug, while fatigue and anorexia were less susceptible -data indicate that different mechanisms mediate the behavioural manifestations of cytokine-induced fatigue

Desai et al. 2013	Cytokines	-a study analyzing the cytokine secretion profile of various human tumor cell lines upon gamma irradiation -there was considerable variation between the cell lines in the number and magnitude of secreted factors -secretion of some cytokines was found in all cell line secretions, like TNF-alpha, IL-6, and IL-8, while some were cell-line specific -there are similarities and differences in the basal and radiation-induced cytokine profile of tumor cell lines and these can influence the growth and survival of bystander cells
Pasi et al. 2010	Cytokines	-a study assessing the release of IL-6 and IL-8 from gamma-irradiated human glioblastoma cells -these two cytokines were found to be differentially modulated by ionizing radiation and likely coordinate the inflammatory microenvironment in the tumor
Facoetti et al. 2006	Cytokines	-a study of the gamma radiation-induced bystander effect in glioblastoma cells, specifically relating to cytokine release and receptors -authors propose that cytokines could act as a radiation-induced bystander signal -secreted signals may promote certain outcomes in bystander cells, such as increased cell death
Mariotti et al. 2012	Cytokines	-a study seeking to elucidate the mechanisms by which bystander transmission works *in vitro* -the level of cytokine secretion from human fibroblasts was detected with an ELISA assay -the effect of radiation was found to be reliant on the IL-6 pathway and shows the involvement of reactive oxygen species -data also seems to suggest that increased linear energy transfer may correlate with the efficiency of radiation-induced release of cytokines
Myhill & Booth 2009	CFS	-a study investigating biomarkers of mitochondrial dysfunction in CFS patients -71 CFS patients and 53 normal patients were used in the study -the “ATP profile test” was used to assess the level of ATP production in neutrophils, efficiency of oxidative phosphorylation, and other biochemical markers for cellular energy production -all patients except for one were found to have different combinations of metabolic lesions -authors conclude that this points to the broad applicability of the ATP profile test in diagnosis of CFS

Naviaux et al. 2016	CFS	-a study of the metabolic features of CFS, which used "broad-spectrum" metabolomics of serum samples from CFS patients -the data showed that the disease response was highly concerted and patients exhibited hypometabolism overall -future avenues of research are discussed
Armstrong et a. 2015	CFS	-another study of the metabolomics of CFS patients -researchers took 49 blood and urine samples total and these underwent spectroscopy; blood glucose was also tested along with lactate, urine pyruvate, and urine alanine—all of these indicated an inhibition of glycolysis -this appears to be indicative of dysfunctional metabolism in CFS patients and increased oxidative stress
Sargent et al. 2002	CFS	-a study of CFS patients and their VO(2max) -contrary to contemporaneous studies, it was found that this value did not differ between CFS and control groups when groups were age and gender matched
Germain et al. 2017	CFS	-another study of energy metabolism in CFS patients, this time focusing on fatty acid synthesis -a small cohort of patients was used and the data revealed 74 metabolites which differed in their plasma signature in CFS patients compared to the control -the data point to several metabolic pathways, including taurine, glycerophospholipid, primary bile acid, glyoxylate, and dicarboxylate metabolism -ATP and ADP levels were also found to be affected, along with glucose and oxaloacetate -potential implications for diagnosis are described
Thomas & Newton 2018	CFS	-a narrative mini-review on the various metabolic abnormalities that have been detected in CFS -many studies over the years have attempted to identify biomarkers for the disease, both for diagnostic purposes and to help with determining appropriate treatments -several avenues of research are discussed, including immune dysregulation, mitochondrial dysfunction, and skeletal muscle acidosis -future directions for research are discussed
Martinez et al. 2010	RIBE	-a narrative review of reactive oxygen species (ROS) and their role as bystander signals -review of the mechanisms of oxidative damage and paradigm shift away from targeted DNA damage

		-oxidative metabolism and regulation of inflammation are linked -end of review provides potential methods that may be used for future investigations
Gorman et al. 2009	RIBE	-a study where researchers sought to elucidate the mechanisms that allow RIBE to produce genomic instability -the group wanted to examine if radiation and chemotherapy can induce genomic instability and focus on mitochondrial effects and generation of ROS -results demonstrate the radiation and chemotherapy bystander responses can induce genomic instability -results also showed that mitochondrial function is also affected -restoration of mitochondrial activity may rescue the genomic instability effect induced by RIE