

**Supplementary Table S1.** PCR array analysis of cytokines/chemokines correlated to neuroinflammation and oxidative stress.

Gene of interest	Neuroimmunological purpose	References	Associated Signaling Pathway	Downregulated or Upregulated by EGCG	Fold Change t/-
Macrophage migration inhibitory factor (MIF)	Cytokine is implicated in inflammatory processes in Alzheimer's disease.	[1-3]		downregulated	Both EGCG 150 +LPS
Cytokine C-C motif ligand 2 (CCL2) aka Monocyte chemoattractant protein-1 (MCP-1)	Cytokine has a major role in amyloidogenesis in neurodegenerative disease.	[4, 5]	NF-κB	downregulated	EGCG 150 +LPS vs LPS alone 1.44-fold decrease
Interleukin 3 (IL-3)	Glycoprotein is involved in neuronal cell survival and development. It also is neuroprotective via microglia.	[6, 7]		upregulated	EGCG 150 +LPS vs LPS alone 2.33-fold increase
Interleukin 11 (IL-11)	Member of the IL-6 family of cytokines that may exhibit neurorescue capability.	[8, 9]	.	upregulated	EGCG 150 +LPS vs LPS alone 5.14-Fold increase

Interleukin 6 (IL-6)	Proinflammatory cytokine prominent in neurodegenerative disorders	[10]	NF-κB	downregulated	
Nitric Oxide (NO)	Many functions are related to inflammation, cellular survival, and neuronal immunology. It is a prominent biomarker for reactive oxygen species (ROS) and neuroinflammation.	[11, 12]	NF-κB	downregulated	
Colony-stimulating factor 2 (CSF2), aka Granulocyte-macrophage colony-stimulating factor (GM-CSF)  Colony Stimulating Factor 3 (CSF3), aka Granulocyte colony-stimulating factor (G-CSF)	Cytokine expelled by macrophages is increased in AD patients. It regulates neuroinflammation.	[13, 14]	NF-κB	upregulated	EGCG 150 +LPS vs LPS alone 8.92-fold increase (CSF3)
Tumor Necrosis Factor Subfamily, 10 (TNFS10) aka Tumor necrosis, factor-related apoptosis-inducing ligand (TRAIL)	The gene associated with the TNF superfamily exhibits proinflammatory properties in AD.	[15]	NF-κB	upregulated	EGCG 150 +LPS vs LPS alone 1.62-fold increase

**Supplementary Table S2.** PCR array evaluation of signaling pathways linked to neuroinflammation and oxidative stress.

Gene of interest	Neuroimmunological function	References	Signaling Pathway	Down/upregulation by EGCG	Fold Change +/-
Mitogen-activated protein kinase (MAPK) kinase kinase (MAP3k1) and Mitogen-Activated Protein Kinase 3 (MAPK3)	A key constituent of the MAPK/ERK pathway and the regulation of inflammatory processes i.e.apoptosis and lysosomal clearance mechanisms	[16]	NFkB and mTOR	downregulated	EGCG 150 +LPS and EGCG
Protein kinase c beta (PRKCB)	Enzyme correlated with mediating NO production via microglial INOS regulation	[17]	mTOR	downregulated	EGCG 150 +LPS vs LPS alone 4.03 fold decrease
Mechanistic target of rapamycin (mTOR)	Signaling pathway involved in cellular survival, nutrient sensing, autophagy, aging, and inflammation	[18]	mTOR	downregulated	EGCG 150 +LPS vs LPS alone 1.46 fold decrease
AKT Serine/Threonine Kinase 1 (AKT1)  AKT3 aka Thymoma viral proto-oncogene 3	An enzyme that is associated with insulin signaling in the brain  Serine Threonine protein kinase acting on the brain	[19-21]	mTOR/PI3k-Akt	downregulated	EGCG 150 +LPS vs. LPS alone 1.49 fold decrease (AKT3)  EGCG 150 +LPS vs. LPS alone 1.54 fold decrease (AKT1)

	may exhibit neuroprotective properties or serve to heighten ROS				
Insulin 2 (INS2)	A gene that codes for preproinsulin	[22]	mTOR	upregulated	EGCG 150 +LPS vs. LPS alone 10.42 fold increase
Phospholipase D2 (PLD2)	It is an enzyme that modulates membrane phospholipid activity, which may serve as a biomarker for aberrant protein aggregation in AD	[23]	mTOR	upregulated	EGCG 150 +LPS vs. LPS alone 1.78 fold increase
SMAD Family Member 3 (SMAD3), aka Mothers against decapentaplegic homolog 3	An effector of TGF- $\beta$ signaling and enhancer of NF $\kappa$ B, but it also may affect aging in neurodegenerative disorders	[24]	NF $\kappa$ B	downregulated	EGCG 150 +LPS vs. LPS alone 1.66 fold decrease
C-C Motif Chemokine Ligand 5 (CCL5)  aka Regulated upon Activation, Normal T Cell	A chemokine that exhibits proinflammatory properties in microglia and in AD.	[25]	NF $\kappa$ B	downregulated	EGCG 150 +LPS vs LPS alone 1.30 fold decrease

Expressed and Presumably Secreted (RANTES)					
Nucleotide-binding oligomerization domain-containing protein 1 (NOD1)	Intracellular inspectors of inflammation serve as biomarkers for aberrant cellular action	[26]	NFκB	downregulated	EGCG 150 +LPS vs LPS alone 1.43 fold decrease
Heme Oxygenase 1 (HMOX1)	Enzymes with antioxidative action, which may act as a regulator of ferroptosis	[27]	NFκB	upregulated	EGCG 150 +LPS vs LPS alone 3.24 fold increase
Tnf receptor-associated factors (TRAF 2,3 and 5)	Constitutive elements have been implicated as biomarkers for AD, especially Traf2. They regulate autophagy, cytokine activity, and cellular development.	[28]	NFκB	downregulated	EGCG 150 +LPS vs LPS alone 1.49 fold decrease (Traf2)  EGCG 150 +LPS vs LPS alone 1.42 fold decrease (Traf 3)  EGCG 150 +LPS vs LPS alone 1.88 fold decrease (Traf 5)
Tumor Necrosis Factor (TNF)	A known inflammatory signaling pathway that involves the cytokine TNF-α, which is known to present inflammation in microglia. This gene is a biomarker for neuroinflammation in AD	[29]	NFκB	upregulated	EGCG 150 +LPS vs LPS alone 4.01 fold increase

tumor necrosis factor alpha-induced protein 3 (TNFAIP3)	This gene is shown to regulate autophagy and have anti-inflammatory properties.	[30]	NFκB	upregulated	EGCG 150 +LPS vs. LPS alone 1.41 fold increase
Toll-like receptors (TLR 1, 3, and 4) emphasis on TLR4	Intracellular ligands are a form of pattern recognition receptors (PRRs) acting to mediate immunosurveillance and aging mechanisms.	[31, 32]	NFκB and PI3k-Akt	upregulated	EGCG 150 +LPS vs. LPS alone 2.17 fold increase (TLR3)  EGCG 150 +LPS vs. LPS alone 1.86 fold increase and (TLR4)  EGCG 150 +LPS vs. LPS alone 3.05 fold increase (TLR1)
RelB Proto-Oncogene, NF-KB Subunit (RELB).	Gene is important for the proper function of microglial and neural homeostasis.	[33]	NF-κB	downregulated	EGCG 150 +LPS vs. LPS alone 1.76 fold decrease
Interleukin 1 beta (IL1B)	A cytokine that is linked to IL-1 receptor activity that functions in microglial inflammation and other CNS responsibilities, i.e., functioning as a growth factor	[34]	NF-κB	downregulated	EGCG 150 +LPS vs. LPS alone 1.16 fold decrease

Nuclear Factor Kappa B2 (Nf- $\kappa$ B2)	The gene encodes a subunit of NF $\kappa$ B. NF $\kappa$ B is a transcription factor that is responsible for a multitude of cellular activities, but in microglia, it may regulate Tau	[35]	NF $\kappa$ B	downregulated	EGCG 150 +LPS vs. LPS alone 1.62 fold decrease
FBJ osteosarcoma oncogene AP-1 Transcription Factor Subunit (FOS) aka c-fos or Activator Protein 1 (AP-1)	Transcription mediators correlated with control of inflammation and microglial development. It functions to control proper brain maturation.	[36, 37]	NF $\kappa$ B and PI3k-akt	downregulated	EGCG 150 +LPS vs. LPS alone 2.03 fold decrease (NF $\kappa$ B)  EGCG 150 +LPS vs. LPS alone 1.84 fold decrease (PI3K-Akt)
Signal Transducer And Activator Of Transcription 1 (STAT1)	Important transcription factors involved in aging and neurodegenerative activity	[38]	NF $\kappa$ B	downregulated	EGCG 150 +LPS vs. LPS alone 2.14 fold decrease
Glutathione Peroxidases (GPX 1 and 4)	Enzymes implicated in oxidative stress regulation related to neurodegeneration.	[39]	NO	downregulated	EGCG 150 + vs. LPS alone 2.63 fold decrease (Gpx1)  EGCG 150 +LPS vs. LPS alone 2.84 fold decrease (Gpx4)

Cathepsin B (CTSB)	Lysosomal cysteine protease is active in protein aggregation in neurodegenerative ailments.	[40]	NO	downregulated	EGCG 150 +LPS vs. LPS alone 3.30 fold decrease
Immunity-related GTPase family M protein (Irgm1), aka interferon-inducible protein 1	The enzyme displays autophagic properties.	[41]	NO	downregulated	EGCG 150 +LPS vs. LPS alone 3.46 fold decrease
Nitric Oxide Synthase 1 neuronal (NOS1)	The enzyme that modulates NO activity in the brain may be a possible link to INOS	[42]	NO	downregulated	EGCG 150 +LPS vs. LPS alone 2.05 fold decrease
Phosphoprotein enriched in astrocytes 15A (elf4e )	Protein that is known to function in apoptosis but may have autophagic regulative abilities	[43, 44]	NO	downregulated	EGCG 150 +LPS vs. LPS alone 1.57 fold decrease
Growth factor receptor bound protein 2-associated protein 1 (GAB1)	The molecule that acts to mediate cognitive function	[45]	NO	upregulated	EGCG 150 +LPS vs. LPS alone 2.15 fold increase
Cyclin-dependent kinase inhibitor 1B (CDKN1B)	Involved in cell cycle arrest and currently being studied for its presumed prevention of AD	[46]	PI3k-Akt	downregulated	EGCG 150 +LPS vs. LPS alone 2.14 fold decrease



Growth factor receptor-bound protein 2 (GRB2)	A signaling adaptor domain associated with activated Cdc42-associated kinase 1(ACK1) mediates TLR signaling. It seems to interact with amyloid beta.	[47, 48]	PI3k-Akt	downregulated	EGCG 150 +LPS vs. LPS alone 1.36 fold decrease
Insulin-like growth factor I receptor (IGF1R)	Receptors involved in managing IGF-1, which controls aging and neuroinflammation.	[49, 50]	PI3k-Akt	downregulated	EGCG 150 +LPS vs. LPS alone 1.55 fold decrease
V-raf-leukemia viral oncogene 1 (RAF1)	An initiator of Extracellular signal-regulated kinase (ERK) signaling that is expressed highly in the AD brain	[51]	PI3k-Akt	downregulated	EGCG 150 +LPS vs LPS alone 1.94 fold decrease
Eukaryotic translation initiation factor 4E (ELF4E)	Translational modulator altered in AD.	[52]	PI3K-AKT	upregulated	LPS alone vs. control 8.64 fold increase  Both EGCG 150 +LPS vs. LPS alone 3.45 fold increase

Son of sevenless homolog 1 (Drosophila) (SOS1)	A guanine nucleotide exchange factor (GEF) that interacts with RAS	[53]	PI3k-Akt	downregulated	EGCG 150 +LPS vs. LPS alone 1.70 fold decrease
Glucuronidase, beta (GUSB)	The gene that codes for the processing of $\beta$ glucuronidase, which is involved in the lysosomal breakdown of large cells glycosaminoglycans (GAGs), May be connected to AD.	[54]	PI3k-Akt	downregulated	EGCG 150 +LPS vs. LPS alone 1.42 fold decrease
The regulatory-associated protein of MTOR, complex 1 (RPTOR)	The regulative gene that modulates the nutrient-sensing capabilities of mTORC1	[55]	mTOR	downregulated	EGCG 150 +LPS vs. LPS alone 1.72 fold decrease
Protein kinase, AMP-activated, beta 2 non-catalytic subunit (PRKAB2)	A gene associated with AMPK in regulating energy and cellular bioenergetics along with mTORC1	[56]	mTOR	downregulated	EGCG 150 +LPS vs. LPS alone 1.516 fold decrease
Cytochrome b-245, alpha polypeptide (CYBA)	The gene that encodes for a unit associated with the nicotinamide adenine dinucleotide phosphate oxidase (NADPH) complex that produces superoxide	[57-59]	NO	downregulated	EGCG 150 +LPS vs. LPS alone 3.18 fold decrease

	dismutase (SOD) and is involved in phagocytosis				
Hepsin (HPN)	A transmembrane serine protease involved in many cellular process but may have a role in activating matrix metalloproteinases.	[60-62]	NO	downregulated	EGCG 150 +LPS vs LPS alone 3.08 fold decrease
Growth Arrest and DNA Damage Inducible Protein (GADD45A)	A thoroughly studied protein involved in aging, molecular stress control, DNA repair, and cellular development	[63-66]	NO	downregulated	EGCG 150+ LPS vs LPS alone 2.42 fold decrease

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