

**Table S1: Primers for qPCR**

Gene	Primer sequence listed fw/rev (5'-3') or published [PMID for PubMed]	Genbank Accession Number	Product length [bp]	Start position	
				Fw Primer	Rev Primer
<i>Adgre1 (F4/80)</i>	24796813	NM_010130.4	164	905	1068
<i>Ccl2</i>	23301011	NM_011333.3	90	257	346
<i>Ccl3</i>	23301011	NM_011337.2	122	364	485
<i>Cd68</i>	23301011	NM_001291058.1	116	847	962
<i>Cdh1</i>	ATCGCCACAGATGATGGTTC CAGTAAAGGGGGACGTGTTG	NM_009864.3	187	1847	2033
<i>Cldn1</i>	AGGTCTGGCGACATTAGTGG AAGAGGGCCTGGCCAAATTC	NM_016674.4	111	600	710
<i>Gapdh</i>	22028848	NM_001289726.1	164	944	1107
<i>Gfap</i>	24796813	NM_001131020.1	176	636	811
<i>Hmbs</i>	33782119	NM_013551.2	106	1132	1237
<i>Iba1 (Aif)</i>	23301011	NM_001361501.1	146	478	623
<i>Ifng</i>	CAGCAACAACATAAGCGTCATT GTTGACCTCAAACCTGGCAATAC	NM_008337.4	106	370	475
<i>Il10</i>	22028848	NM_010548.2	98	990	1087
<i>Il1ra</i>	CTTCTTCCTCATTTCTGGGTA TGGGTTGTTTTACTTGTTG	NM_031167	98	2021	2118
<i>Il1a</i>	22028848	NM_010554.4	158	879	1036
<i>Il1b (Colon)</i>	ATGCCACCTTTTGACAGTGATG ATGTGCTGCTGCGAGATTTG	NM_008361.4	137	118	254
<i>Il1b (Hippocampus)</i>	22028848	NM_008361.4	96	382	477
<i>Il6</i>	GGGAAATCGTGGAATGAGA TCCAGTTTGGTAGCATCCATC	NM_031168.2	131	257	387
<i>Itgam (Cd11b)</i>	AACCTCACGGCTTCAGAGATG AGGCACTTGAGAGGTTCTGG	NM_001082960	175	2927	3101
<i>Muc2</i>	TGATTGTGTTTCAGGCTCCA GACAGCAGAGCAAGGGACTC	NM_023566.4	94	13358	13451
<i>Ocln</i>	TCGGTACAGCAGCAATGGTA GATATCCCTGACCCAGTCCT	NM_008756.2	164	1274	1437
<i>P2rx7</i>	AAGAAGTTCCAAGACCCAGAT TTTCCTCAGATTGTCCAGGAGT	NM_011027.4	96	1427	1522
<i>S100b</i>	CTTCCTTGCTCCCTCTGCT CGACTCTCAGCCTCACCAA	NM_009115.3	171	1199	1369
<i>Tjp1</i>	AAAGCTGTCCCTGTGAGTCC GAATGGCTCCTTGTTGGGATA	NM_009386.2	157	5233	5389
<i>Tnf</i>	22028848	NM_013693.3	102	313	414

sorted alphabetically

**Table S2: Gene selection criteria**

	Gene	Gene selection criteria [ <i>PMID for PubMed</i> ]	Database link
Cytokines & Chemokines	<i>Tnf</i>	Upregulation in hippocampus of 24 vs. 5 months old male C57BL/6 mice [24796813]	<a href="http://www.informatics.jax.org/marker/MGI:104798">http://www.informatics.jax.org/marker/MGI:104798</a>
	<i>Ifng</i>	Upregulation in whole brain of 24-26 vs. 2 months old female BALB/c mice [10805375]	<a href="http://www.informatics.jax.org/marker/MGI:107656">http://www.informatics.jax.org/marker/MGI:107656</a>
	<i>Il1a</i>	Upregulation in hippocampus of 24 vs. 5 months old male C57BL/6 mice [24796813]	<a href="http://www.informatics.jax.org/marker/MGI:96542">http://www.informatics.jax.org/marker/MGI:96542</a>
	<i>Il1b</i>	Upregulation in hippocampus of 24 vs. 5 months old male C57BL/6 mice [24796813]	<a href="http://www.informatics.jax.org/marker/MGI:96543">http://www.informatics.jax.org/marker/MGI:96543</a>
	<i>Il6</i>	Upregulation in whole brain of 24 vs. 6 months old male BALB/c mice [11431008]	<a href="http://www.informatics.jax.org/marker/MGI:96559">http://www.informatics.jax.org/marker/MGI:96559</a>
	<i>Il10</i>	Downregulation in hippocampus of 24 vs 3 months old male rats [15890435]	<a href="http://www.informatics.jax.org/marker/MGI:96537">http://www.informatics.jax.org/marker/MGI:96537</a>
	<i>Il1ra</i> ( <i>Il1rn</i> )	Antagonist of Il1 [19258032]	<a href="http://www.informatics.jax.org/marker/MGI:96547">http://www.informatics.jax.org/marker/MGI:96547</a>
	<i>Ccl2</i>	Higher serum Ccl2 protein in 26 vs. 2 months old female C57BL/6 mice [27069796]	<a href="http://www.informatics.jax.org/marker/MGI:98259">http://www.informatics.jax.org/marker/MGI:98259</a>
	<i>Ccl3</i>	Upregulation in hippocampus of 24 vs. 5 months old male C57BL/6 mice [24796813]	<a href="http://www.informatics.jax.org/marker/MGI:98260">http://www.informatics.jax.org/marker/MGI:98260</a>
Astrocytes	<i>Gfap</i>	Upregulation in hippocampus of 24 vs. 5 months old male C57BL/6 mice [24796813], mainly expressed in astrocytes and enteric glia cells [25975510]	<a href="http://www.informatics.jax.org/marker/MGI:95697">http://www.informatics.jax.org/marker/MGI:95697</a>
	<i>S100b</i>	Upregulation in cerebral cortex in 16 vs. 5 months old male albino mice [20099023], expressed in astrocytes (less specific) [17199889]	<a href="http://www.informatics.jax.org/marker/MGI:98217">http://www.informatics.jax.org/marker/MGI:98217</a>
Microglia	<i>Iba1</i> ( <i>Aif1</i> )	Upregulation in hippocampus of 24 vs. 5 months old male C57BL/6 mice [24796813], expressed in microglia [32848611]	<a href="http://www.informatics.jax.org/marker/MGI:1343098">http://www.informatics.jax.org/marker/MGI:1343098</a>
	<i>Adgre1</i> ( <i>Emr1</i> , <i>F4/80</i> )	Upregulation in hippocampus of 24 vs. 5 months old male C57BL/6 mice [24796813], expressed in microglia [32848611]	<a href="http://www.informatics.jax.org/marker/MGI:106912">http://www.informatics.jax.org/marker/MGI:106912</a>
	<i>Cd68</i>	Upregulation in hippocampus of 24 vs. 5 months old male C57BL/6 mice [24796813], expressed in microglia [32848611]	<a href="http://www.informatics.jax.org/marker/MGI:88342">http://www.informatics.jax.org/marker/MGI:88342</a>
	<i>Itgam</i> ( <i>Cd11b</i> )	Protein upregulated in hippocampus of 21 vs. 4 months old female C57BL/6 mice [22155499], expressed in microglia [32848611]	<a href="http://www.informatics.jax.org/marker/MGI:96607">http://www.informatics.jax.org/marker/MGI:96607</a>
	<i>P2rx7</i>	Modulates neuroinflammatory processes and has role in CNS diseases as reviewed here [32848594], expressed in diverse tissues and cells, such as microglia,	<a href="http://www.informatics.jax.org/marker/MGI:1339957">http://www.informatics.jax.org/marker/MGI:1339957</a>

		oligodendrocytes, Schwann cells, and possibly in astrocytes and neurons [32848594]; highly expressed in microglia [28716092]	
Intestinal barrier function	<i>Ocln</i>	Involved in gut barrier function [19855405], downregulation in ileum of 24 vs 12 months old male rats [24243034]	<a href="http://www.informatics.jax.org/marker/MGI:106183">http://www.informatics.jax.org/marker/MGI:106183</a>
	<i>Cdh1</i>	Involved in gut barrier function [19855405]	<a href="http://www.informatics.jax.org/marker/MGI:88354">http://www.informatics.jax.org/marker/MGI:88354</a>
	<i>Tjp1</i> (ZO-1)	Involved in gut barrier function [19855405], downregulation in ileum of 24 vs 12 months old male rats [24243034]	<a href="http://www.informatics.jax.org/marker/MGI:98759">http://www.informatics.jax.org/marker/MGI:98759</a>
	<i>Cldn1</i>	Involved in gut barrier function [19855405]	<a href="http://www.informatics.jax.org/marker/MGI:1276109">http://www.informatics.jax.org/marker/MGI:1276109</a>
	<i>Muc2</i>	Involved in gut barrier function [19855405], reduced colonic mucus thickness in 19 vs. 2 months old male C57BL/6 mice [30723224]	<a href="http://www.informatics.jax.org/marker/MGI:1339364">http://www.informatics.jax.org/marker/MGI:1339364</a>

**Table S3: Gene Ontology results for significantly differentially expressed genes stratified by experiment type and tissue.**

Only significant results according to uncorrected p-value were reported for colon while the top 5 hits were reported for HC. Query ratio indicates the number of genes found for a GO-term in relation to the size of the input gene list. Background ratio gives the number of all tested genes which belong to a certain GO biological process in relation to all tested genes. The size of the background gene sets was 16 for HC and 21 for colon.

Tissue	Experiment	Change	Gene Ontology ID	Involved Genes	Description	Query Ratio	Background Ratio	P-value	P-adjusted
Hippocampus	Aging	increased (old)	GO:0006911	<i>Iba1, Itgam</i>	phagocytosis, engulfment	2/7	2/16	0.175	0.99
			GO:0010575	<i>Il1a, Il6</i>	positive regulation of vascular endothelial growth factor production	2/7	3/16	0.400	0.99
			GO:0048661	<i>Il6, Iba1</i>	positive regulation of smooth muscle cell proliferation	2/7	3/16	0.400	0.99
			GO:0001781	<i>Il6, Itgam</i>	neutrophil apoptotic process	2/7	3/16	0.400	0.99
			GO:0008284	<i>Il6, S100b, Iba1</i>	positive regulation of cell population proliferation	3/7	6/16	0.549	0.99
Colon	Aging	increased (old)	GO:0043410	<i>Tnf, Il6, P2rx7</i>	positive regulation of MAPK cascade	3/4	3/21	0.003	0.22
			GO:0051384	<i>Tnf, Il6, Il1ra</i>	response to glucocorticoid	3/4	4/21	0.012	0.22
			GO:0006954	<i>Tnf, Il6, Il1ra, P2rx7</i>	inflammatory response	4/4	8/21	0.012	0.22
			GO:0032731	<i>Tnf, Il6, P2rx7</i>	positive regulation of interleukin-1 beta production	3/4	5/21	0.028	0.22
			GO:2000660	<i>Il6, Il1ra</i>	negative regulation of interleukin-1-mediated signaling pathway	2/4	2/21	0.029	0.22
			GO:0045837	<i>Il6, Il1ra</i>	negative regulation of membrane potential	2/4	2/21	0.029	0.22
			GO:0006953	<i>Il6, Il1ra</i>	acute-phase response	2/4	2/21	0.029	0.22
			GO:0045779	<i>Il6, P2rx7</i>	negative regulation of bone resorption	2/4	2/21	0.029	0.22
			GO:0060664	<i>Tnf, Il6</i>	epithelial cell proliferation involved in salivary gland morphogenesis	2/4	2/21	0.029	0.22
			GO:1904996	<i>Tnf, Il6</i>	positive regulation of leukocyte adhesion to vascular endothelial cell	2/4	2/21	0.029	0.22
			GO:1900017	<i>Tnf, Il6</i>	positive regulation of cytokine production involved in inflammatory response	2/4	2/21	0.029	0.22
			GO:0043154	<i>Tnf, Il6</i>	negative regulation of cysteine-type endopeptidase activity involved in apoptotic process	2/4	2/21	0.029	0.22
			GO:0033138	<i>Tnf, Il6</i>	positive regulation of peptidyl-serine phosphorylation	2/4	2/21	0.029	0.22
			GO:0051897	<i>Tnf, Il6</i>	positive regulation of protein kinase B signaling	2/4	2/21	0.029	0.22
			GO:0042127	<i>Tnf, Il6</i>	regulation of cell population proliferation	2/4	2/21	0.029	0.22
			GO:0010033	<i>Tnf, P2rx7</i>	response to organic substance	2/4	2/21	0.029	0.22
Colon	VWR	decreased (runners)	GO:0090026	<i>Ccl2, Iba1</i>	positive regulation of monocyte chemotaxis	2/5	2/21	0.048	0.56
			GO:0006874	<i>Ccl2, S100b</i>	cellular calcium ion homeostasis	2/5	2/21	0.048	0.56
			GO:0048662	<i>Ifng, Iba1</i>	negative regulation of smooth muscle cell proliferation	2/5	2/21	0.048	0.56
			GO:1904783	<i>Ifng, Ccl2</i>	positive regulation of NMDA glutamate receptor activity	2/5	2/21	0.048	0.56
			GO:0051770	<i>Ifng, Ccl2</i>	positive regulation of nitric-oxide synthase biosynthetic process	2/5	2/21	0.048	0.56
			GO:2000273	<i>Ifng, Il10</i>	positive regulation of signaling receptor activity	2/5	2/21	0.048	0.56
			GO:0045348	<i>Ifng, Il10</i>	positive regulation of MHC class II biosynthetic process	2/5	2/21	0.048	0.56
			GO:0001938	<i>Il10, Ccl2</i>	positive regulation of endothelial cell proliferation	2/5	2/21	0.048	0.56
			GO:0043524	<i>Il10, Ccl2</i>	negative regulation of neuron apoptotic process	2/5	2/21	0.048	0.56