

Gene expression of muscular and neuronal pathways is cooperatively dysregulated in patients with idiopathic achalasia

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Table S1. Differentially expressed genes involved in the smooth muscle contraction pathway (z-score = 1.455)

RefSeq	Genes in dataset	Prediction (based on expression direction)	Fold change	Findings
NM_001006630	<i>CHRM2</i>	Affected	9.241	Affects (3)
NM_001161353	<i>KCNMA1</i>	Affected	8.739	Affects (2)
NM_001299	<i>CNN1</i>	Affected	8.268	Affects (1)
NM_002474	<i>MYH11</i>	Increased	7.704	Increases (3)
NM_001146312	<i>MYOCD</i>	Increased	6.758	Increases (1)
NM_000064	<i>C3</i>	Increased	5.057	Increases (2)
NM_000702	<i>ATP1A2</i>	Affected	5.003	Affects (1)
NM_199460	<i>CACNA1C</i>	Affected	4.715	Affects (2)
NM_001141945	<i>ACTA2</i>	Affected	4.260	Affects (1)
NM_000963	<i>PTGS2</i>	Increased	3.762	Increases (1)
NM_001172895	<i>CAV1</i>	Affected	3.686	Affects (3)
NM_003131	<i>SRF</i>	Increased	3.101	Increases (1)
NM_005406	<i>ROCK1</i>	Affected	2.755	Affects (1)
NM_000962	<i>PTGS1</i>	Increased	2.544	Increases (1)
NM_001002029	<i>C4A/C4B</i>	Increased	2.500	Increases (1)
ENST00000315872	<i>ROCK2</i>	Affected	2.046	Affects (1)
NM_006681	<i>NMU</i>	Decreased	-2.017	Increases (2)
NM_001955	<i>EDN1</i>	Decreased	-2.089	Increases (3)

Fold change in expression and the number of scientific papers reporting the predictions are reported in the last two columns.

Table S2. Differentially expressed genes involved in the smooth muscle contractility pathway (z-score = 2.623)

RefSeq	Genes in dataset	Prediction (based on expression direction)	Fold change	Findings
NM_001128205	<i>SULF1</i>	Increased	4.021	Increases (2)
NM_001098579	<i>MRVI1</i>	Increased	4.248	Increases (2)
NM_001172895	<i>CAV1</i>	Increased	3.686	Increases (3)
NM_002474	<i>MYH11</i>	Increased	7.704	Increases (3)
NM_001006630	<i>CHRM2</i>	Increased	9.241	Increases (4)
NM_001098512	<i>PRKG1</i>	Increased	4.769	Increases (1)
NM_198596	<i>SULF2</i>	Increased	2.266	Increases (2)

Fold change in expression and the number of scientific papers reporting the predictions are reported in the last two columns.

Table S3. Differentially expressed genes involved in the damage to nervous tissue pathway (z-score = 1.611)

RefSeq	Genes in dataset	Prediction (based on expression direction)	Fold change	Findings
NM_002006	<i>FGF2</i>	Decreased	8.752	Decreases (3)
ENST00000361475	<i>TGM2</i>	Decreased	5.507	Decreases (7)
NM_000963	<i>PTGS2</i>	Increased	3.762	Increases (1)
ENST00000520164	<i>EBF2</i>	Affected	3.594	Affects (1)
NM_001111283	<i>IGF1</i>	Decreased	3.566	Decreases (23)
NM_001168272	<i>ITPR1</i>	Increased	3.540	Increases (1)
NM_031850	<i>AGTR1</i>	Increased	2.581	Increases (1)
ENST00000404625	<i>IL6</i>	Increased	2.531	Increases (6)
NM_000311	<i>PRNP</i>	Increased	2.415	Increases (3)
ENST00000316403	<i>CLU</i>	Affected	2.011	Affects (2)
NM_001145412	<i>NFE2L2</i>	Increased	-2.139	Decreases (2)
NM_004836	<i>EIF2AK3</i>	Increased	-2.604	Decreases (1)
ENST00000278836	<i>MYRF</i>	Increased	-3.038	Decreases (2)

ENST00000397026	<i>PPARG</i>	Increased	-3.583	Decreases (5)
NM_175617	<i>MT1E</i>	Increased	-4.288	Decreases (1)
ENST00000216492	<i>CHGA</i>	Affected	-4.751	Affects (1)
ENST00000296677	<i>F2RL1</i>	Decreased	-5.020	Increases (1)
NM_005951	<i>MT1H</i>	Increased	-10.206	Decreases (1)

Fold change in expression and the number of scientific papers reporting the predictions are reported in the last two columns.

Table S4. Differentially expressed genes involved in the synaptic transmission of cells pathway (z-score = -1.062)

RefSeq	Genes in dataset	Prediction (based on expression direction)	Fold change	Findings
NM_005314	<i>GRPR</i>	Affected	18.122	Affects (1)
ENST00000264381	<i>BCHE</i>	Decreased	16.378	Decreases (1)
NM_001006630	<i>CHRM2</i>	Increased	9.241	Increases (2)
NM_014286	<i>NCS1</i>	Increased	9.111	Increases (1)
NM_001161353	<i>KCNMA1</i>	Affected	8.739	Affects (2)
NM_201596	<i>CACNB2</i>	Affected	7.862	Affects (1)
NM_001165037	<i>GABRA5</i>	Affected	6.850	Affects (1)
NM_000109	<i>DMD</i>	Affected	6.824	Affects (1)
NM_001390	<i>DTNA</i>	Affected	5.053	Affects (1)
NM_015669	<i>PCDHB5</i>	Affected	4.979	Affects (1)
NM_199460	<i>CACNA1C</i>	Affected	4.715	Affects (1)
NM_001796	<i>CDH8</i>	Affected	3.811	Affects (1)
NM_021032	<i>FGF12</i>	Affected	3.755	Affects (1)
NM_015678	<i>NBEA</i>	Affected	3.671	Affects (1)
NM_001111283	<i>IGF1</i>	Increased	3.566	Increases (1)
NM_000304	<i>PMP22</i>	Affected	3.420	Affects (1)
NM_020957	<i>PCDHB16</i>	Affected	2.989	Affects (1)
ENST00000334082	<i>HOMER1</i>	Affected	2.787	Affects (3)
NM_001256012	<i>MYH10</i>	Affected	2.623	Affects (1)
NM_002088	<i>GRIK5</i>	Affected	2.510	Affects (1)
NM_000311	<i>PRNP</i>	Decreased	2.415	Decreases (1)
NM_000909	<i>NPY1R</i>	Affected	2.342	Affects (1)
NM_002522	<i>NPTX1</i>	Affected	2.231	Affects (1)
NM_014330	<i>PPP1R15A</i>	Increased	2.219	Increases (1)
NM_006154	<i>NEDD4</i>	Decreased	2.167	Decreases (2)
NM_001166160	<i>PPP1R9A</i>	Affected	2.138	Affects (1)
NM_014905	<i>GLS</i>	Affected	2.119	Affects (1)
NM_001135659	<i>NRXN1</i>	Affected	2.017	Affects (1)
NM_006681	<i>NMU</i>	Decreased	-2.017	Increases (1)
NM_001048	<i>SST</i>	Affected	-2.108	Affects (1)
NM_004762	<i>CYTH1</i>	Decreased	-2.128	Increases (1)
NM_176875	<i>CCKBR</i>	Decreased	-2.512	Increases (1)
NM_004170	<i>SLC1A1</i>	Affected	-2.726	Affects (1)
NM_001049	<i>SSTR1</i>	Affected	-2.814	Affects (2)
NM_004999	<i>MYO6</i>	Affected	-3.354	Affects (1)
NM_000379	<i>XDH</i>	Decreased	-3.627	Increases (3)

Fold change in expression and the number of scientific papers reporting the predictions are reported in the last two columns.

Table S5. Differentially expressed genes involved in the leukocyte migration pathway (z-score = 2.474)

RefSeq	Genes in dataset	Prediction (based on expression direction)	Fold change	Findings
NM_138576	<i>BCL11B</i>	Increased	-2.345	Decreases (3)
NM_001048	<i>SST</i>	Increased	-2.108	Decreases (1)
NM_001920	<i>DCN</i>	Increased	3.792	Increases (1)
NM_001554	<i>CYR61</i>	Increased	2.224	Increases (3)
NM_002922	<i>RGS1</i>	Increased	-2.448	Decreases (4)
NM_000929	<i>PLA2G5</i>	Increased	3.492	Increases (5)
ENST00000404625	<i>IL6</i>	Increased	2.531	Increases (12)
NM_003248	<i>THBS4</i>	Increased	5.623	Increases (1)
ENST00000466675	<i>RARRES2</i>	Increased	2.054	Increases (15)
NM_002704	<i>PPBP</i>	Increased	5.727	Increases (14)
NM_001957	<i>EDNRA</i>	Increased	3.166	Increases (1)
NM_000601	<i>HGF</i>	Increased	2.103	Increases (5)
NM_006500	<i>MCAM</i>	Increased	3.846	Increases (3)
NM_001198	<i>PRDM1</i>	Increased	-4.254	Decreases (1)
NM_001078	<i>VCAM1</i>	Increased	2.034	Increases (40)
NM_002977	<i>SCN9A</i>	Increased	2.485	Increases (1)
ENST00000435819	<i>CD36</i>	Increased	2.434	Increases (3)
NM_000899	<i>KITLG</i>	Increased	2.754	Increases (12)
NM_000311	<i>PRNP</i>	Increased	2.415	Increases (3)
ENST00000272928	<i>ACKR3</i>	Increased	4.365	Increases (2)
ENST00000260356	<i>THBS1</i>	Increased	3.439	Increases (17)
NM_000212	<i>ITGB3</i>	Increased	3.056	Increases (4)
NM_001114753	<i>ENG</i>	Increased	2.164	Increases (4)
NM_001736	<i>C5AR1</i>	Increased	2.271	Increases (11)
NM_001002029	<i>C4A/C4B</i>	Increased	2.500	Increases (1)
NM_004951	<i>GPR183</i>	Increased	2.683	Increases (2)
ENST00000278836	<i>MYRF</i>	Increased	-3.038	Decreases (4)
ENST00000367976	<i>CTGF</i>	Increased	2.124	Increases (2)
NM_000963	<i>PTGS2</i>	Increased	3.762	Increases (6)
NM_004621	<i>TRPC6</i>	Increased	6.312	Increases (4)
NM_002644	<i>PIGR</i>	Increased	-10.606	Decreases (2)
ENST00000537021	<i>PIP5K1C</i>	Increased	2.311	Increases (5)
NM_004530	<i>MMP2</i>	Increased	2.938	Increases (4)
NM_173842	<i>IL1RN</i>	Increased	-6.493	Decreases (6)
NM_000064	<i>C3</i>	Increased	5.057	Increases (15)
NM_012431	<i>SEMA3E</i>	Increased	4.295	Increases (1)
ENST00000264870	<i>F13A1</i>	Increased	2.793	Increases (1)
NM_181523	<i>PIK3R1</i>	Increased	2.636	Increases (6)
ENST00000231751	<i>LTF</i>	Increased	-4.517	Decreases (4)
NM_003734	<i>AOC3</i>	Increased	9.280	Increases (18)
ENST00000398117	<i>BCL2</i>	Increased	2.162	Increases (1)
ENST00000361475	<i>TGM2</i>	Increased	5.507	Increases (9)
NM_002615	<i>SERPINF1</i>	Increased	3.982	Increases (1)
ENST00000266718	<i>LUM</i>	Increased	3.916	Increases (9)
NM_000450	<i>SELE</i>	Increased	5.496	Increases (57)
NM_020988	<i>GNAO1</i>	Increased	2.777	Increases (2)
NM_001145808	<i>ITGAM</i>	Increased	2.076	Increases (23)
NM_000906	<i>NPR1</i>	Increased	2.220	Increases (1)
NM_006919	<i>SERPINB3</i>	Increased	-9.571	Decreases (1)
NM_199168	<i>CXCL12</i>	Increased	3.052	Increases (256)

ENST00000297450	<i>ANGPT1</i>	Increased	8.781	Increases (2)
ENST00000264741	<i>ITGA9</i>	Increased	4.306	Increases (1)
NM_003247	<i>THBS2</i>	Increased	2.976	Increases (5)
NM_015055	<i>SWAP70</i>	Increased	2.160	Increases (9)
ENST00000373304	<i>CYSLTR1</i>	Increased	13.666	Increases (3)
AK130813	<i>IGHG1</i>	Increased	-8.159	Decreases (2)
ENST00000263967	<i>PIK3CA</i>	Increased	2.205	Increases (1)
NM_006289	<i>TLN1</i>	Increased	4.586	Increases (3)
NM_005406	<i>ROCK1</i>	Increased	2.755	Increases (8)
NM_002982	<i>CCL2</i>	Increased	5.557	Increases (212)
ENST00000242208	<i>INHBA</i>	Increased	6.216	Increases (1)
NM_003064	<i>SLPI</i>	Increased	-3.388	Decreases (6)
ENST00000354785	<i>FN1</i>	Increased	6.598	Increases (22)
NM_001911	<i>CTSG</i>	Increased	2.705	Increases (15)
NM_003266	<i>TLR4</i>	Increased	2.566	Increases (25)
ENST00000315872	<i>ROCK2</i>	Increased	2.046	Increases (1)
NM_001145657	<i>RAP1GAP</i>	Increased	-3.928	Decreases (4)
NM_001204286	<i>MUC1</i>	Increased	-14.648	Decreases (1)
NM_001031680	<i>RUNX3</i>	Increased	-2.236	Decreases (3)
NM_032801	<i>JAM3</i>	Increased	4.453	Increases (7)
NM_003080	<i>SMPD2</i>	Increased	-2.356	Decreases (1)
NM_001456	<i>FLNA</i>	Increased	8.187	Increases (1)
NM_024164	<i>TPSAB1/TPSB2</i>	Increased	2.846	Increases (2)
NM_033439	<i>IL33</i>	Increased	3.473	Increases (8)
ENST00000391555	<i>HSPA1A/HSPA1B</i>	Increased	4.517	Increases (2)
NM_178155	<i>FUT8</i>	Increased	-2.396	Decreases (1)
NM_198578	<i>LRRK2</i>	Increased	3.595	Increases (1)
NM_001135597	<i>CCDC88A</i>	Increased	2.079	Increases (1)
NM_001202429	<i>ASB2</i>	Increased	2.282	Increases (1)
NM_177551	<i>HCAR2</i>	Increased	-2.059	Decreases (1)
ENST00000353479	<i>COL17A1</i>	Increased	-2.640	Decreases (1)
NM_006147	<i>IRF6</i>	Decreased	-10.886	Increases (2)
ENST00000368722	<i>S100A7</i>	Decreased	-3.175	Increases (8)
NM_005739	<i>RASGRP1</i>	Decreased	-2.632	Increases (4)
ENST00000300177	<i>GREM1</i>	Decreased	3.513	Decreases (2)
NM_001955	<i>EDN1</i>	Decreased	-2.089	Increases (3)
NM_002421	<i>MMP1</i>	Decreased	-2.356	Increases (1)
NM_004887	<i>CXCL14</i>	Decreased	-4.303	Increases (3)
NM_003254	<i>TIMP1</i>	Decreased	2.183	Decreases (3)
NM_001006946	<i>SDC1</i>	Decreased	-3.536	Increases (3)
ENST00000222902	<i>CCL24</i>	Decreased	-2.161	Increases (13)
NM_006419	<i>CXCL13</i>	Decreased	-2.322	Increases (42)
NM_004288	<i>CYTIP</i>	Decreased	-2.925	Increases (3)
NM_012092	<i>ICOS</i>	Decreased	-2.278	Increases (9)
NM_005060	<i>RORC</i>	Decreased	-2.846	Increases (1)
NM_004925	<i>AQP3</i>	Decreased	-4.133	Increases (7)
NM_000362	<i>TIMP3</i>	Decreased	3.079	Decreases (2)
NM_001562	<i>IL18</i>	Decreased	-4.559	Increases (13)
NM_001490	<i>GCNT1</i>	Decreased	-5.136	Increases (11)
NM_003102	<i>SOD3</i>	Decreased	6.477	Decreases (1)
NM_002843	<i>PTPRJ</i>	Decreased	-2.145	Increases (1)
NM_005219	<i>DIAPH1</i>	Decreased	-2.679	Increases (6)
NM_002538	<i>OCLN</i>	Decreased	-23.350	Increases (2)

NM_003955	SOCS3	Decreased	3.685	Decreases (3)
ENST00000504154	SLIT2	Decreased	8.499	Decreases (8)
NM_006113	VAV3	Decreased	-2.532	Increases (1)
NM_176072	P2RY2	Decreased	-3.402	Increases (2)
ENST00000250018	TPH1	Decreased	-4.275	Increases (3)
NM_001174167	SYK	Decreased	-2.027	Increases (2)
NM_001910	CTSE	Decreased	-15.113	Increases (2)
NM_000527	LDLR	Decreased	-2.143	Increases (6)
ENST00000369478	CD2	Decreased	-2.398	Increases (2)
NM_003253	TIAM1	Decreased	-2.094	Increases (1)
NM_005564	LCN2	Decreased	-5.985	Increases (3)
NM_001002857	ANXA2	Decreased	-2.347	Increases (2)
NM_006080	SEMA3A	Decreased	8.997	Decreases (4)
NM_007329	DMBT1	Decreased	-2.968	Increases (1)
NM_002426	MMP12	Decreased	-2.505	Increases (2)
NM_001993	F3	Decreased	-3.002	Increases (3)
ENST00000296677	F2RL1	Decreased	-5.020	Increases (6)
NM_002305	LGALS1	Decreased	3.121	Decreases (7)
ENST00000297439	DEFB1	Decreased	-3.610	Increases (24)
NM_001098512	PRKG1	Decreased	4.769	Decreases (3)
NM_003680	YARS	Decreased	-2.326	Increases (2)
NM_016946	F11R	Decreased	-5.286	Increases (11)
NM_003255	TIMP2	Decreased	2.829	Decreases (2)
ENST00000397026	PPARG	Decreased	-3.583	Increases (6)
ENST00000380739	SERPINB1	Decreased	-3.585	Increases (1)
NM_000379	XDH	Decreased	-3.627	Increases (1)
ENST00000368702	S100A14	Decreased	-9.354	Increases (2)
NM_020156	C1GALT1	Decreased	-2.026	Increases (3)
NM_001204	BMPR2	Decreased	2.195	Decreases (5)
NM_004329	BMPR1A	Decreased	3.160	Decreases (1)
NM_005761	PLXNC1	Decreased	2.094	Decreases (1)
NM_007309	DIAPH2	Affected	2.087	Affects (2)
NM_003379	EZR	Affected	-2.551	Affects (2)
NM_002737	PRKCA	Affected	2.320	Affects (1)
NM_001773	CD34	Affected	4.451	Affects (1)
ENST00000282588	ITGA1	Affected	4.122	Affects (3)
NM_004360	CDH1	Affected	-41.610	Affects (1)
NM_001097579	GPR34	Affected	2.508	Affects (1)
NM_001172895	CAV1	Affected	3.686	Affects (2)
NM_001207066	CXADR	Affected	-11.706	Affects (1)
ENST00000531198	CRYAB	Affected	4.493	Affects (2)
NM_001145412	NFE2L2	Affected	-2.139	Affects (1)
NM_001014796	DDR2	Affected	5.827	Affects (1)
NM_000575	IL1A	Affected	-5.208	Affects (2)
NM_001845	COL4A1	Affected	3.224	Affects (2)
ENST00000316403	CLU	Affected	2.011	Affects (1)
ENST00000410009	CD207	Affected	-2.889	Affects (1)
ENST00000377211	EDNRB	Affected	2.378	Affects (1)
NM_001127197	ELF4	Affected	-2.144	Affects (1)
NM_001014795	ILK	Affected	2.983	Affects (1)
NM_001135599	TGFB2	Affected	3.520	Affects (1)
NM_001197293	DPYSL2	Affected	2.369	Affects (2)

Fold change in expression and the number of scientific papers reporting the predictions are reported in the last two columns.

Table S6. Differentially expressed genes involved in the recruitment of phagocytes pathway (z-score = 2.416)

RefSeq	Genes in dataset	Prediction (based on expression direction)	Fold change	Findings
NM_001554	<i>CYR61</i>	Increased	2.224	Increases (1)
ENST00000404625	<i>IL6</i>	Increased	2.531	Increases (2)
NM_001078	<i>VCAM1</i>	Increased	2.034	Increases (4)
ENST00000435819	<i>CD36</i>	Increased	2.434	Increases (2)
ENST00000260356	<i>THBS1</i>	Increased	3.439	Increases (2)
NM_001736	<i>C5AR1</i>	Increased	2.271	Increases (8)
NM_004621	<i>TRPC6</i>	Increased	6.312	Increases (1)
ENST00000537021	<i>PIP5K1C</i>	Increased	2.311	Increases (3)
NM_004530	<i>MMP2</i>	Increased	2.938	Increases (1)
NM_173842	<i>IL1RN</i>	Increased	-6.493	Decreases (3)
ENST00000264870	<i>F13A1</i>	Increased	2.793	Increases (1)
ENST00000231751	<i>LTF</i>	Increased	-4.517	Decreases (1)
NM_001172895	<i>CAV1</i>	Increased	3.686	Increases (1)
NM_000450	<i>SELE</i>	Increased	5.496	Increases (5)
NM_001145808	<i>ITGAM</i>	Increased	2.076	Increases (3)
NM_199168	<i>CXCL12</i>	Increased	3.052	Increases (3)
NM_003247	<i>THBS2</i>	Increased	2.976	Increases (1)
ENST00000296677	<i>F2RL1</i>	Increased	-5.020	Decreases (1)
NM_005406	<i>ROCK1</i>	Increased	2.755	Increases (1)
NM_002982	<i>CCL2</i>	Increased	5.557	Increases (31)
NM_003064	<i>SLPI</i>	Increased	-3.388	Decreases (4)
NM_001911	<i>CTSG</i>	Increased	2.705	Increases (2)
NM_003266	<i>TLR4</i>	Increased	2.566	Increases (9)
NM_001204286	<i>MUC1</i>	Increased	-14.648	Decreases (1)
NM_033439	<i>IL33</i>	Increased	3.473	Increases (2)
ENST00000391555	<i>HSPA1A/HSPA1B</i>	Increased	4.517	Increases (2)
NM_178155	<i>FUT8</i>	Increased	-2.396	Decreases (1)
NM_177551	<i>HCAR2</i>	Increased	-2.059	Decreases (1)
ENST00000353479	<i>COL17A1</i>	Increased	-2.640	Decreases (1)
NM_001955	<i>EDN1</i>	Decreased	-2.089	Increases (1)
ENST00000466675	<i>RARRES2</i>	Decreased	2.054	Decreases (2)
NM_002421	<i>MMP1</i>	Decreased	-2.356	Increases (1)
NM_001562	<i>IL18</i>	Decreased	-4.559	Increases (5)
NM_001490	<i>GCNT1</i>	Decreased	-5.136	Increases (1)
NM_000575	<i>IL1A</i>	Decreased	-5.208	Increases (1)
ENST00000504154	<i>SLIT2</i>	Decreased	8.499	Decreases (1)
NM_006113	<i>VAV3</i>	Decreased	-2.532	Increases (1)
NM_176072	<i>P2RY2</i>	Decreased	-3.402	Increases (2)
ENST00000531198	<i>CRYAB</i>	Decreased	4.493	Decreases (1)
NM_005564	<i>LCN2</i>	Decreased	-5.985	Increases (1)
NM_001993	<i>F3</i>	Decreased	-3.002	Increases (1)
ENST00000397026	<i>PPARG</i>	Decreased	-3.583	Increases (4)
NM_000379	<i>XDH</i>	Decreased	-3.627	Increases (1)
NM_001145412	<i>NFE2L2</i>	Affected	-2.139	Affects (1)
ENST00000316403	<i>CLU</i>	Affected	2.011	Affects (1)
NM_006147	<i>IRF6</i>	Affected	-10.886	Affects (1)

Fold change in expression and the number of scientific papers reporting the predictions are reported in the last two columns.

Table S7. Differentially expressed genes involved in the adhesion of immune cells pathway (z-score = 2.461)

RefSeq	Genes in dataset	Prediction (based on expression direction)	Fold change	Findings
NM_002922	<i>RGS1</i>	Increased	-2.448	Decreases (1)
NM_002438	<i>MRC1</i>	Increased	2.991	Increases (1)
ENST00000404625	<i>IL6</i>	Increased	2.531	Increases (4)
NM_002704	<i>PPBP</i>	Increased	5.727	Increases (6)
NM_000601	<i>HGF</i>	Increased	2.103	Increases (1)
NM_006500	<i>MCAM</i>	Increased	3.846	Increases (1)
NM_001078	<i>VCAM1</i>	Increased	2.034	Increases (36)
NM_001144996	<i>ITGA7</i>	Increased	3.397	Increases (1)
NM_002332	<i>LRP1</i>	Increased	2.693	Increases (2)
NM_000899	<i>KITLG</i>	Increased	2.754	Increases (4)
NM_012092	<i>ICOS</i>	Increased	-2.278	Decreases (4)
ENST00000260356	<i>THBS1</i>	Increased	3.439	Increases (4)
NM_000212	<i>ITGB3</i>	Increased	3.056	Increases (2)
ENST00000316403	<i>CLU</i>	Increased	2.011	Increases (1)
NM_000963	<i>PTGS2</i>	Increased	3.762	Increases (3)
NM_000064	<i>C3</i>	Increased	5.057	Increases (2)
ENST00000231751	<i>LTF</i>	Increased	-4.517	Decreases (3)
NM_003734	<i>AOC3</i>	Increased	9.280	Increases (7)
NM_000450	<i>SELE</i>	Increased	5.496	Increases (22)
NM_001145808	<i>ITGAM</i>	Increased	2.076	Increases (44)
NM_199168	<i>CXCL12</i>	Increased	3.052	Increases (29)
NM_003247	<i>THBS2</i>	Increased	2.976	Increases (1)
NM_015055	<i>SWAP70</i>	Increased	2.160	Increases (4)
NM_001773	<i>CD34</i>	Increased	4.451	Increases (2)
ENST00000263967	<i>PIK3CA</i>	Increased	2.205	Increases (1)
NM_006289	<i>TLN1</i>	Increased	4.586	Increases (1)
NM_002982	<i>CCL2</i>	Increased	5.557	Increases (6)
ENST00000354785	<i>FN1</i>	Increased	6.598	Increases (14)
NM_003266	<i>TLR4</i>	Increased	2.566	Increases (5)
ENST00000397026	<i>PPARG</i>	Increased	-3.583	Decreases (1)
NM_078481	<i>CD97</i>	Increased	2.524	Increases (6)
NM_001145657	<i>RAP1GAP</i>	Increased	-3.928	Decreases (3)
NM_002444	<i>MSN</i>	Increased	2.780	Increases (2)
NM_032801	<i>JAM3</i>	Increased	4.453	Increases (3)
NM_033439	<i>IL33</i>	Increased	3.473	Increases (2)
NM_005739	<i>RASGRP1</i>	Decreased	-2.632	Increases (3)
NM_001920	<i>DCN</i>	Decreased	3.792	Decreases (4)
NM_000575	<i>IL1A</i>	Decreased	-5.208	Increases (4)
NM_005219	<i>DIAPH1</i>	Decreased	-2.679	Increases (1)
ENST00000537021	<i>PIP5K1C</i>	Decreased	2.311	Decreases (1)
NM_006113	<i>VAV3</i>	Decreased	-2.532	Increases (2)
ENST00000250018	<i>TPH1</i>	Decreased	-4.275	Increases (1)
ENST00000369478	<i>CD2</i>	Decreased	-2.398	Increases (4)
NM_004360	<i>CDH1</i>	Decreased	-41.610	Increases (2)
ENST00000297450	<i>ANGPT1</i>	Decreased	8.781	Decreases (3)
NM_005406	<i>ROCK1</i>	Decreased	2.755	Decreases (5)
NM_016946	<i>F11R</i>	Decreased	-5.286	Increases (2)
ENST00000265769	<i>ADAM28</i>	Decreased	-9.698	Increases (1)
ENST00000318602	<i>A2M</i>	Decreased	2.301	Decreases (1)
NM_000820	<i>GAS6</i>	Decreased	2.105	Decreases (5)

NM_000697	<i>ALOX12</i>	Decreased	-3.203	Increases (1)
NM_000062	<i>SERPINC1</i>	Decreased	4.031	Decreases (5)
NM_005761	<i>PLXNC1</i>	Decreased	2.094	Decreases (1)
ENST00000314134	<i>SLC35C1</i>	Affected	-2.058	Affects (1)
NM_001911	<i>CTSG</i>	Affected	2.705	Affects (4)
NM_003379	<i>EZR</i>	Affected	-2.551	Affects (1)
NM_001993	<i>F3</i>	Affected	-3.002	Affects (3)
NM_021913	<i>AXL</i>	Affected	4.242	Affects (2)
NM_002522	<i>NPTX1</i>	Affected	2.231	Affects (1)
NM_001174167	<i>SYK</i>	Affected	-2.027	Affects (1)
NM_006419	<i>CXCL13</i>	Affected	-2.322	Affects (1)
ENST00000435819	<i>CD36</i>	Affected	2.434	Affects (1)

Fold change in expression and the number of scientific papers reporting the predictions are reported in the last two columns.

Table S8. Differentially expressed genes involved in the regeneration of nerves pathway (z-score = 2.200)

RefSeq	Genes in dataset	Prediction (based on expression direction)	Fold change	Findings
NM_002006	<i>FGF2</i>	Increased	8.752	Increases (1)
NM_173842	<i>IL1RN</i>	Increased	-6.493	Decreases (1)
ENST00000282588	<i>ITGA1</i>	Increased	4.122	Increases (1)
NM_199168	<i>CXCL12</i>	Increased	3.052	Increases (1)
NM_001111283	<i>IGF1</i>	Increased	3.566	Increases (3)
ENST00000316403	<i>CLU</i>	Affected	2.011	Affects (1)

Fold change in expression and the number of scientific papers reporting the predictions are reported in the last two columns.

Table S9. Differentially expressed genes involved in the synaptogenesis pathway (z-score = 2.164)

RefSeq	Genes in dataset	Prediction (based on expression direction)	Fold change	Findings
NM_001135659	<i>NRXN1</i>	Increased	2.017	Increases (5)
NM_001128310	<i>SPARCL1</i>	Increased	5.453	Increases (1)
ENST00000260356	<i>THBS1</i>	Increased	3.439	Increases (1)
NM_000212	<i>ITGB3</i>	Increased	3.056	Increases (1)
NM_001242607	<i>NCAM1</i>	Increased	2.277	Increases (3)
NM_001172895	<i>CAV1</i>	Increased	3.686	Increases (1)
NM_003247	<i>THBS2</i>	Increased	2.976	Increases (1)
NM_001111283	<i>IGF1</i>	Increased	3.566	Increases (2)
ENST00000457714	<i>NLGN1</i>	Increased	3.163	Increases (3)
NM_004734	<i>DCLK1</i>	Decreased	3.488	Decreases (1)
NM_144505	<i>KLK8</i>	Decreased	-2.869	Increases (1)
NM_020957	<i>PCDHB16</i>	Affected	2.989	Affects (1)
NM_015669	<i>PCDHB5</i>	Affected	4.979	Affects (1)
NM_014987	<i>IGSF9B</i>	Affected	3.146	Affects (1)
NM_002923	<i>RGS2</i>	Affected	4.092	Affects (1)
NM_001843	<i>CNTN1</i>	Affected	15.193	Affects (1)
NM_004360	<i>CDH1</i>	Affected	-41.610	Affects (1)
NM_004999	<i>MYO6</i>	Affected	-3.354	Affects (1)
NM_016588	<i>NRN1</i>	Affected	3.196	Affects (2)
NM_022740	<i>HIPK2</i>	Affected	-2.121	Affects (3)
NM_005233	<i>EPHA3</i>	Affected	4.199	Affects (1)

Fold change in expression and the number of scientific papers reporting the predictions are reported in the last two columns.

Table S10: regulatory networks explaining the gene expression changes in the dataset.

Molecules in Network	Score	Focus Molecules	Top Diseases and Functions
ACFP, AR15A, SLNK, CCND2, CD79A, CMA1, CPA3, DAB2, DDR1, EDN1, EDNRA, FGL2, FUT8, GFRA1, HBEFG, IGHM, IGHK, IL2RG, INHBA, ITGB3, LRRK2, MMP2, NEK7, PDGFRB, PRDM1, PTPRJ, RGS1, RGS2, SYK, TIMEL, 33	35		Cell Morphology, Humoral Immune Response, Cellular Movement
ESS, TIMP2, TLR4, TPSA1B, TPSB2, USP12, ZC3H12C			
A2M, ALDOA, ATP1A2, ATP1B2, CNN1, DEF6, DES, EIF2S1, FOS, FOSB, FXR1, GNAO1, HSPA1A, HSPA1B, IDH1, KLK8, LCAT, LRP1, MEOX2, MFG8, MT2A, MYH11, MYOC, NRA41, PLCB1, PLCB4, PPP1R15A, PPP1R3C, 33	35		Organ Morphology, Skeletal and Muscular System Development and Function, Neurological Disease
PRKAR2B, PRKG2, PRNP, ROCK2, SCN7A, SRF, SWAP70, TRPV4			
ANTXR1, AP1B1, ATP11B, C5AR1, CAMK4, CCND2, CCR4, CD28, CEBPB, ERN1, FOXO3, GLI1, ICOS, ICOSLG, OC102723996, IGF1, IGF2, IGF1R, IGF1R2, IGF1R3, IGF1R4, IGF1R5, IGF1R6, IGF1R7, IGF1R8, IGF1R9, IGF1R10, IGF1R11, IGF1R12, IGF1R13, IGF1R14, IGF1R15, IGF1R16, IGF1R17, IGF1R18, IGF1R19, IGF1R20, IGF1R21, IGF1R22, IGF1R23, IGF1R24, IGF1R25, IGF1R26, IGF1R27, IGF1R28, IGF1R29, IGF1R30, IGF1R31, IGF1R32, IGF1R33, IGF1R34, IGF1R35, IGF1R36, IGF1R37, IGF1R38, IGF1R39, IGF1R40, IGF1R41, IGF1R42, IGF1R43, IGF1R44, IGF1R45, IGF1R46, IGF1R47, IGF1R48, IGF1R49, IGF1R50, IGF1R51, IGF1R52, IGF1R53, IGF1R54, IGF1R55, IGF1R56, IGF1R57, IGF1R58, IGF1R59, IGF1R60, IGF1R61, IGF1R62, IGF1R63, IGF1R64, IGF1R65, IGF1R66, IGF1R67, IGF1R68, IGF1R69, IGF1R70, IGF1R71, IGF1R72, IGF1R73, IGF1R74, IGF1R75, IGF1R76, IGF1R77, IGF1R78, IGF1R79, IGF1R80, IGF1R81, IGF1R82, IGF1R83, IGF1R84, IGF1R85, IGF1R86, IGF1R87, IGF1R88, IGF1R89, IGF1R90, IGF1R91, IGF1R92, IGF1R93, IGF1R94, IGF1R95, IGF1R96, IGF1R97, IGF1R98, 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Figure legends

Figure S1: Heatmap of differentially expressed genes between achalasic and control sample tissues.

Samples are grouped by hierarchical clustering.

Figure S2: Graph connecting network-eligible molecules as calculated by IPA and over-representing the cell morphology, humoral immune response, and cellular movement processes. The achieved score of the graph was 33, while the sparseness ρ value was 5.25.

Figure S3: Graph connecting network-eligible molecules as calculated by IPA and over-representing the organ morphology, skeletal and muscular system development processes, and neurological disease processes. The achieved score of the graph was 33, while the sparseness ρ value was 6.01.



