

Fig.S1. A genome-wide siRNA screen identifies modulators of TGFβ1 signaling.

A. A siRNA screen identifies 321 genes (yellow, 1.8%) to affect TGFβ1-induced Smad4 nuclear translocation when knocked down. Knockdown of 48.3% of these genes (green) leads to an enhancement of Smad4 translocation, while knockdown of 51.7% of them (red) leads to an inhibition of

Smad4 translocation. The great majority of genes in the screen (98.2%, blue) does not change Smad4 behavior.

B. Gene ontology analysis of genes that when knocked down inhibit (yellow) or enhance (blue) Smad4 nuclear translocation.

C. Correlation of Smad4 and Smad2 nuclear translocation in response to 1 hour and 6 hours TGF β 1 treatment when the genes identified in the siRNA screen were knocked down.

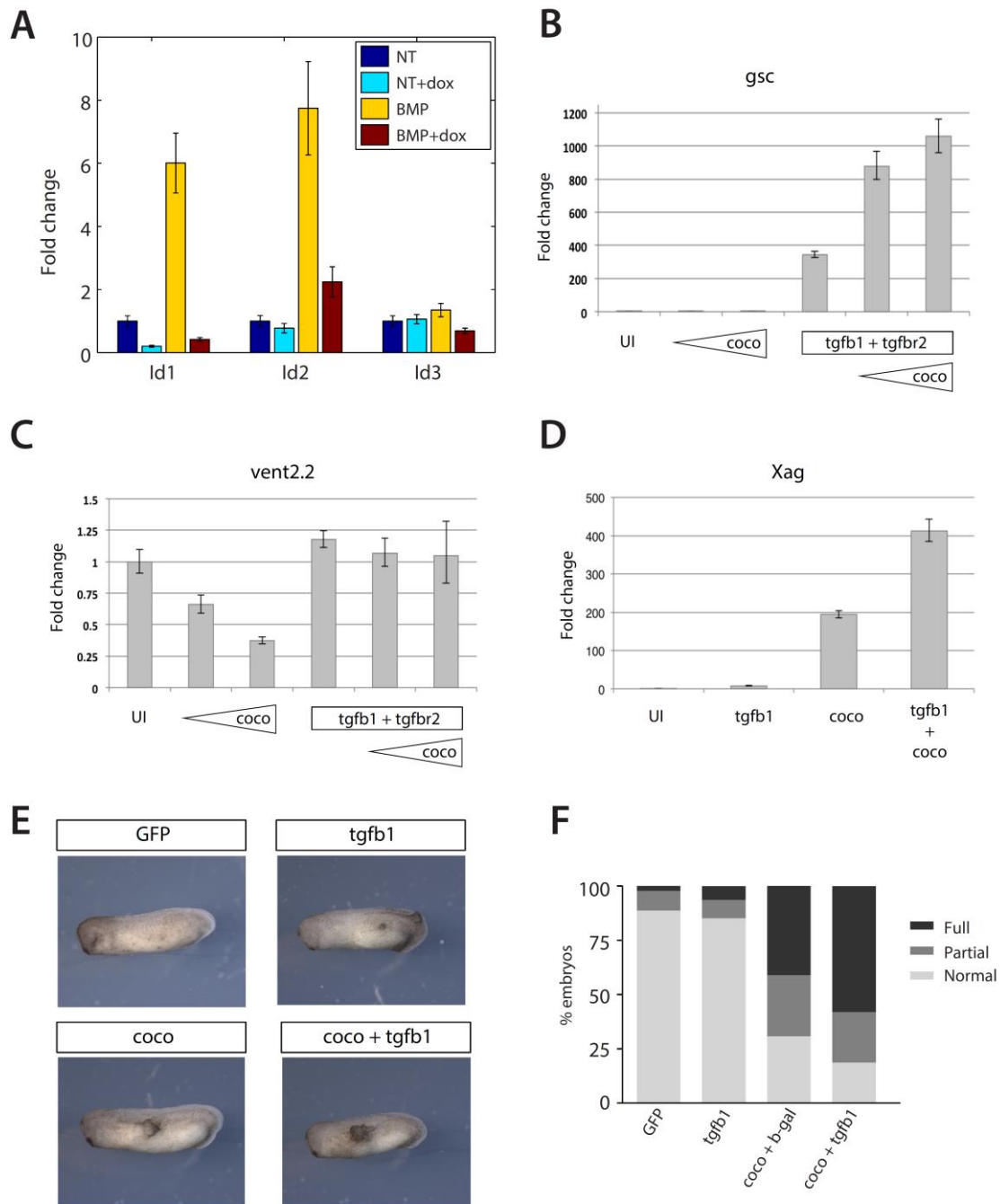


Fig.S2. Coco modulates TGF β signaling

A. qRT-PCR quantification of the changes in expression levels of the BMP-responsive genes *ID1*, *ID2*, and *ID3* in RUES2 treated with vehicle (NT) or BMP4 (BMP) in the absence or presence (+dox) of doxocycline. Doxocycline treatment leads to the production of Coco.

B. Coco enhances expression of the Smad2-responsive gene *gsc* in animal cap explants injected with *tgfb1* and *tgfbr2* in a dose-dependent manner.

C. Expression of Coco in *Xenopus* animal caps leads to a dose-dependent decrease in the expression levels of the BMP-induced gene *vent2.2*. When animal caps are injected with *tgfb1* and *tgfbr2*, *vent2.2* levels are not affected.

D. Coco and TGF β 1 synergize to induce the cement gland marker *Xag*

E. Coco and TGF β 1 synergize to induce cement gland in *Xenopus* embryos. Embryos were injected with constructs encoding the indicated genes and the emergence of ectopic cement glands was observed.

F. Quantification for experiment in E. Embryos were scored based on the presence of ectopic cement glands and given a score of “normal” if no ectopic cement glands were observed, “partial” if ectopic extrusions were observed in the embryo, and “full” if ectopic, fully formed cement glands were observed.

N>40 per condition

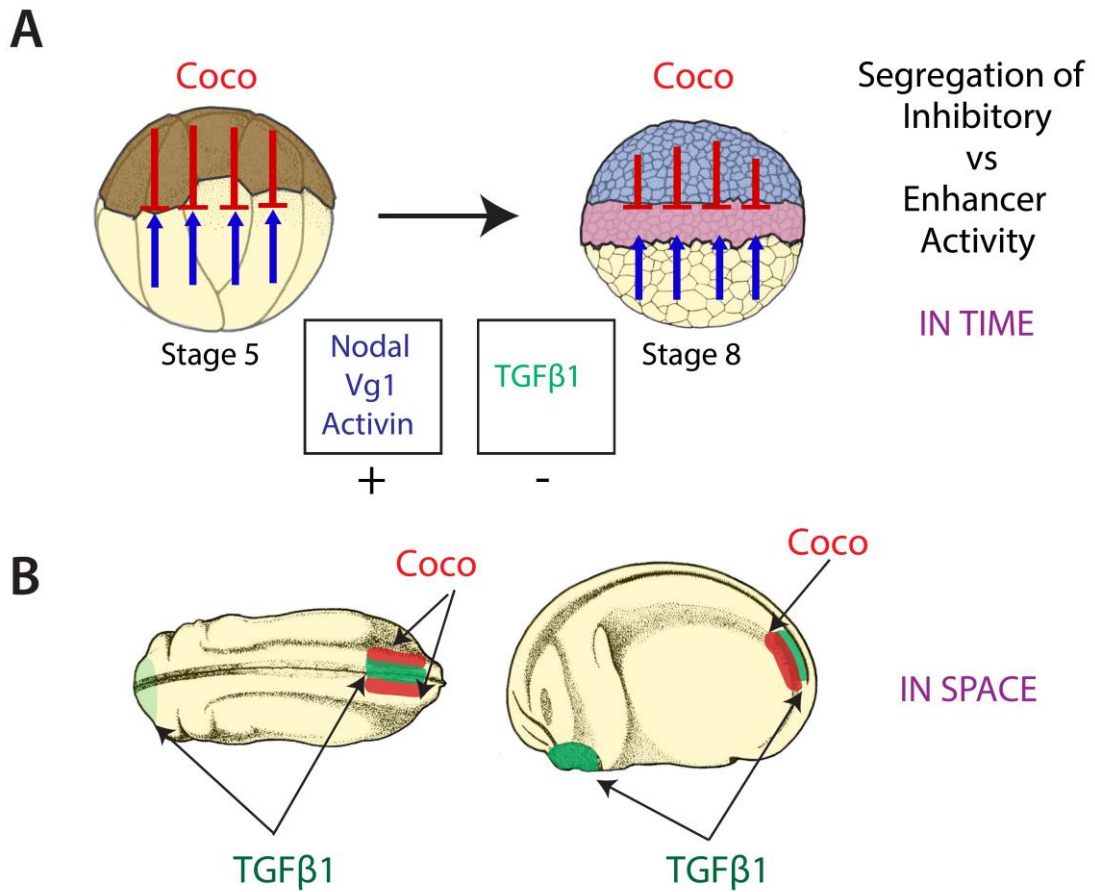


Fig.S3. Model of Coco activity during early embryo development

A-B. Model for the segregation of inhibitory and enhancer activities of Coco

(A) in time and (B) in space.

Table S1

List of genes that affect Smad4 nuclear translocation at 1 hour or 6 hours after application of TGF β 1 as identified in the siRNA screen.

Gene name	siRNA	Smad4 1h - trial1	Smad4 1h - trial2	Smad4 6h - trial1	Smad4 6h - trial2	Smad2 - 1h	Smad2 - 6h
0610030I09Rik	75400	1.664	2.1385	2.0195	2.0844	1.026612774	0.23208093
1110001A23Rik	68472	-4.0538	-5.5601	-3.0741	-4.0956	-3.80939617	-2.8845832
1110004B15Rik	74165	2.1254	2.1372	2.4198	2.0521	-1.055870247	-1.784663
1110012M11Rik	73711	-4.4023	-3.9954	-3.6414	-3.287	-4.116401895	-2.7311913
1110018G07Rik	68497	-3.6142	-3.7287	-2.9521	-2.2546	-2.828468812	-1.2052422
1300007B12Rik	57439	1.9214	1.2244	2.2817	2.4787	0.933861984	0.28780813
1700016D06Rik	76413	1.7408	1.2759	2.6434	1.9359	-0.915484618	-0.5744852
1810009M01Rik	65963	-4.3446	-3.9764	-2.4946	-2.869	-3.104351661	-1.5113031
2010003K11Rik	69861	1.9857	1.5716	2.999	2.5732	0.95847377	0.39288047
2210415F13Rik	70163	-3.4281	-3.7383	-1.7487	-2.0166	-2.019776433	-0.9077318
2300003C06Rik	71912	1.682	1.5323	2.5602	1.9648	0.115555732	-0.137986
2310056K19Rik	75689	0.74815	0.87339	2.1244	2.0244	1.645071321	-0.203623
2400006A19Rik	66413	2.1427	3.1321	3.0424	3.5059	2.547159488	3.91705751
2400009B11Rik	66985	1.8991	1.6324	2.4511	2.5595	0.699123252	0.39851497
2510048O06Rik	66537	1.2071	1.2909	2.9229	3.8901	3.711456536	3.82603435
2810032G03Rik	72669	2.0565	1.9268	2.4338	2.1488	0.820389767	-0.0178512
2810406C15Rik	68298	-4.1397	-3.0314	-2.1263	-1.4581	-2.042188435	-1.8786331
2900027G03Rik	72865	-3.5174	-3.7285	-2.2043	-2.7047	-3.194434194	-1.6214416
2900073H19Rik	68205	2.3656	2.4836	2.0778	2.3612	1.021697206	0.0962536
2900090M10Rik	329977	-3.5385	-2.8673	-1.7268	-2.7171	-1.16726489	-0.5284162
3632451O06Rik	67419	-3.2644	-3.3845	-2.1919	-2.8973	-1.717428275	-1.2089862
4921511C20Rik	245598	-3.9738	-3.899	-2.4402	-2.9279	-3.354434568	-1.4034444
4930412M03Rik	320201	1.1335	0.88291	2.1742	2.452	0.582242728	0.62189949
4930429A08Rik	74648	1.0692	1.1471	2.1345	2.7026	0.768640516	1.01031561
4930449I24Rik	67410	-3.6372	-3.6273	-2.8825	-2.2769	-4.508825796	-2.6030435
4930529M08Rik	78774	1.3171	1.5153	2.6845	1.4015	0.172064393	0.05820836
4930534B04Rik	75216	1.5968	1.6715	2.7829	2.2456	0.045780469	-0.0570765
4933421H10Rik	68178	-3.9326	-3.7393	-1.2865	-1.571	-2.965833132	-2.9514312
5530600A18Rik	71452	1.6941	1.5973	3.0773	2.5962	-2.291490554	-1.4131133
5530600A18Rik	77582	0.7408	0.40804	2.2073	2.5653	0.834274209	1.44564266
5530600A18Rik	432450	-3.5852	-4.1159	-4.0744	-2.5189	-1.4274573	-0.9923853
5730589L02Rik	74552	-3.9977	-2.7313	-2.0469	-2.4623	-2.534804372	-3.1585053
9930117H01Rik	320782	2.8625	2.4885	3.326	2.8708	-1.175880712	-0.0761918
A2lp	233871	2.5482	2.0897	2.3547	2.0764	0.475417391	-0.0493538
A630007B06Rik	213993	-3.1695	-3.3922	-2.006	-2.6316	-1.218077196	-0.7353482
A930006D11	278304	1.2226	1.2096	2.3801	2.1688	0.631534195	0.06562835
A930008A22Rik	235283	1.8486	1.8931	2.1482	2.2232	0.696319206	0.41963818
A930013B10Rik	414094	1.3309	2.0182	2.8371	2.4594	2.008232656	0.99257187
AA407526	231279	-3.8253	-3.489	-1.0107	-1.7075	0.231091944	0.3233265
AB041803	232685	2.0183	1.5037	2.1422	2.4683	-0.467421106	0.25875832
Accn4	241118	-3.8334	-2.7027	-1.7686	-1.2842	-3.156657648	-2.5098703
Acp5	11433	0.77669	1.0269	2.1484	2.0113	-0.602375169	1.32192457
Actg	11465	0.82704	1.1729	2.1797	2.1111	1.691864267	1.25875884
Actr3	74117	-4.2777	-2.4767	-3.4422	-3.0043	0.16846598	0.45437191
Adam21	56622	-3.5149	-3.134	-2.3048	-3.1901	-1.201965811	0.27272101
Agtrap	11610	-4.4631	-3.8006	-2.4087	-2.4567	-3.979893047	-2.329628
Ahsg	11625	-3.4473	-3.4417	-2.0295	-1.2521	-1.139916952	-1.2690443
A1118078	244886	-4.0926	-4.0332	-3.0788	-3.2749	-2.681490618	-1.6489345
A1507495	105866	1.2629	1.8684	2.688	2.2151	1.293662538	0.22189311
A1847670	330050	1.3456	1.2829	2.0639	2.1159	0.545640758	0.0492191
AK122209	382038	-4.8392	-3.8581	-2.3746	-1.9541	-3.300152849	-1.532173
Apba2	11784	-3.1533	-3.2089	-2.0242	-2.2422	-1.183206538	-0.7833774
Apg7l	74244	1.7753	1.6365	2.0908	2.2373	0.571624015	0.18238364
Arch	67106	-3.2581	-3.1196	-2.8231	-3.4799	-1.088215226	-0.9041176
Arhgap10	78514	-3.3146	-3.0201	-2.9258	-2.2983	-1.54052215	-0.8223803
Asrij	68095	1.7169	2.9291	2.0695	2.1259	0.904035894	-0.0654788
Atp4a	11944	1.2568	1.1761	2.3833	2.458	-0.417179114	-1.4519741
Atp6v0a1	11975	0.96987	0.60082	2.1658	2.1476	1.510898046	1.54548208
AW742319	57874	2.8576	1.3132	3.4732	1.8784	-0.821708619	-2.326366
B230354K17Rik	320063	-2.4488	-3.5461	-1.6169	-2.1246	-0.169010834	-0.9123717
BC005752	233189	1.9745	2.0317	2.3262	2.6102	1.808133741	3.01831739
BC011210	70461	1.8045	1.8767	2.5234	2.4521	0.999903045	0.596328
BC016235	216019	-4.1057	-4.1918	-2.5586	-2.062	-3.734508444	-2.0288371
BC024561	232983	0.68459	1.4334	2.1088	2.1843	0.685279547	0.15374776
BC034054	217125	-4.4652	-3.8043	-2.0132	-1.3508	-1.672556745	-1.4689641
BC048082	332110	-4.3555	-4.6338	-3.6749	-3.5804	-2.073895205	-1.6075469
BC050092	235048	-3.0264	-3.9104	-2.2492	-1.2765	-0.949364015	-1.0961849
BC057627	330474	-3.3855	-3.1081	-1.7417	-2.0908	-0.730539773	-0.869699

BC066223	407786	-3.3786	-4.6417	-2.8388	-1.9606	-3.070642	-1.1440967
Brd4	57261	2.6571	2.5183	3.9225	4.6362	4.851067113	4.00914331
Brsk2	75770	-3.6334	-3.2506	-0.38198	-0.36405	-2.028989728	-2.5610504
Btbd12	52864	1.3642	1.3577	2.4559	2.2269	0.117558622	-1.0616056
Btf3	218490	2.305	2.0732	2.8354	2.4081	-0.464678165	1.14701406
C130099A20Rik	235534	1.6293	2.0626	2.9123	2.8995	0.023157994	1.3712141
C1qb	12260	0.61111	0.91771	2.5444	2.4915	1.472055555	-0.785237
C230004F18Rik	331424	2.0132	1.6837	2.5131	1.7966	0.265534866	0.71999049
C330027G06Rik	652994	1.2535	1.2937	3.5831	1.1235	0.514083356	-0.1093563
C630007C17Rik	241514	1.7346	1.2606	2.9438	1.5182	1.587965187	0.13176579
C730027E14Rik	216871	-3.9352	-4.3338	-2.9888	-3.2754	-2.451613139	-0.9252655
Cacnb3	12297	1.9748	2.1755	2.6743	1.9364	1.397636302	1.88470751
Cd19	12478	-3.9174	-3.7164	-2.5497	-3.5353	-1.683046458	-1.2367077
Cd207	246278	-3.5213	-3.1191	-1.8436	-2.5576	-2.120036364	-1.282383
Cdk3	69681	-4.0409	-4.0076	-3.4624	-4.8825	-2.46413969	-0.9456844
Cdyl2	75796	1.2018	0.99463	2.3859	2.4014	0.958663875	0.05156681
Chd3	216848	1.6735	1.5247	2.9968	3.2713	1.015851482	2.47171511
Chd9	109151	-3.5637	-2.9728	-2.8161	-3.4354	-0.740241909	0.02513655
Cicn4-2	12727	-4.89	-4.5971	-3.7897	-3.8565	-4.020819901	-3.4653138
Cldn15	60363	-9.9629	-0.1886	0.67826	0.044912	0.095289199	0.02041024
Clecsf9	56619	-3.8497	-4.03	-2.7959	-1.8695	-4.622467749	-4.3935115
Clns1a	12729	-0.27718	0.39345	3.3154	-0.53586	0.750213926	1.07192444
Col1a1	12842	-3.232	-3.6625	-2.4746	-2.6161	-1.013490448	-1.4829885
Col4a3	12828	-3.5292	-4.2191	-2.3418	-2.1092	-1.183715747	-0.5757225
Copa	12847	-3.9262	-4.4704	-2.2548	-1.9629	-2.656668359	-3.9997574
Copb1	70349	-5.6244	-5.0193	-2.0148	-2.138	-2.701485573	-3.3268793
Copb2	50797	-4.8246	-4.6046	-2.9873	-1.9178	-3.182790273	-4.0499894
Copg	54161	-3.5074	-2.7638	-3.2044	-2.6018	-1.644618124	-2.5476499
Cox8a	12868	1.4568	0.71121	2.2226	2.0778	1.869333918	1.67201124
Cpsf4	54188	-4.6113	-3.6211	-2.2341	-2.7888	-2.606623262	-1.961013
Crygd	12967	1.6796	1.7767	2.8338	1.0357	0.663451438	0.26052528
Ctnnb1	12387	0.67612	-0.66977	2.7657	1.804	-3.150798345	-3.1026607
Cul3	26554	2.0184	2.4861	2.6237	2.5967	0.57958126	-1.0701562
D430014M15	269902	-3.3369	-3.3644	-1.4829	-2.6491	-2.375326785	-1.0107098
D530030D03Rik	98417	-4.8782	-5.2332	-3.7892	-4.0114	-2.815562052	-1.1752595
D5Erttd577e	320549	1.4254	1.3399	3.2879	1.6305	-2.579309271	-2.5692365
D8Erttd325e	66855	0.91618	1.1274	2.3715	2.0733	1.892098972	1.30391517
Dctd	320685	0.90999	1.6147	2.6063	2.9114	0.677912985	0.48130261
Dcx	13193	1.3468	2.0784	2.4746	2.8902	0.471180769	0.22497602
Dfna5h	54722	-4.895	-4.6578	-3.6425	-3.1717	-3.342899279	-1.7621744
Dnahc8	13417	-4.5377	-5.1413	-1.7543	-2.9147	-1.198211241	-1.0744439
Dner	227325	0.74793	0.68891	2.1805	2.6246	0.735087013	-0.969631
Dpp4	13482	1.2974	1.8177	2.3425	2.7868	0.437973528	0.70156715
Dte	23863	-4.0276	-3.1736	-1.5109	-1.7942	-1.774357883	-1.6854352
Dufd1	71804	-3.7126	-3.483	-1.8073	-2.7996	-1.99562633	-1.3534012
Dullard	67181	1.2656	1.4943	3.3954	3.6075	3.24639901	0.9706455
E030041M21Rik	75089	2.4128	2.2345	2.11	2.3123	0.006876873	-1.2280335
E330040A16Rik	330660	-4.1696	-3.7484	-2.1179	-2.2564	-1.752237828	-1.4002936
E430028B21Rik	211948	-4.4924	-4.3927	-2.2186	-3.3399	-3.278270425	-2.9363935
Ecg2	408198	0.0027139	-6.0515	0.14739	1.9023	-2.029111938	-1.8620571
Eif2s1	13665	-3.7325	-3.7761	-2.6397	-2.4464	-2.306984098	-0.5885917
Emd	13726	-3.8433	-3.6866	-2.7001	-2.8948	0.011873914	-0.0938861
Enpp5	83965	2.4636	1.6954	3.0787	2.7643	0.340958958	0.28375524
Epx	13861	-3.3697	-3.6998	-2.9606	-2.8217	-1.675191055	-2.0222264
Ern2	26918	0.92642	1.2601	2.7593	1.8509	0.135781528	0.18635621
Esx1	13984	-3.6266	-2.5375	-2.3902	-1.9753	-2.495887197	-0.8967532
Exosc3	66362	-3.4206	-3.1542	-2.4516	-2.2672	-4.862339311	-3.2393283
Faim2	72393	-1.4342	-3.731	-0.50773	-0.83627	-0.035475768	-0.1325986
Fgf21	56636	1.2565	0.74757	2.0283	2.0031	0.294532642	-0.6094492
Fgf3	14174	2.2144	2.0974	2.5115	2.6835	0.652425358	0.28170409
Frmf3	242506	-4.0374	-3.996	-2.0302	-2.8907	0.194585026	0.1123663
G0s2	14373	1.1221	0.60656	2.34	2.0588	-0.14963372	-0.6095913
Gbp2	14469	1.985	2.0677	2.6688	2.5181	1.090128156	0.40532951
Gcet2	14525	-4.2405	-3.936	-1.6875	-2.5176	-0.385200766	-0.3628409
Ghsr	208188	2.3494	2.742	3.2586	4.1687	1.109776849	0.45906733
Gm14	195046	-3.6907	-4.2075	-2.3478	-2.53	1.331785346	1.01627756
Gm185	235497	1.3417	1.1401	3.9929	1.2115	-0.149063406	0.31445463
Gm867	333670	-3.9656	-4.1497	-1.3853	-2.5028	-0.775248356	-1.920169
Gmppa	69080	0.91705	1.0295	3.3294	0.45913	0.340354696	-0.5728311
Gnat1	14685	-3.6161	-2.8099	-1.8677	0.041448	-0.477951556	-0.0742333
Grin1a	28015	-3.4865	-3.2196	-2.3063	-0.91011	-2.187252001	-0.300225
Gsn	227753	-3.2066	-3.5012	-2.6866	-1.9239	-1.838810211	-1.3296337
H2-Q6	110557	2.3804	2.222	3.1616	3.634	1.329633088	1.66606783
H2-T24	15042	1.2397	1.5808	2.394	2.081	1.217505184	-0.0185308
H2-Tw3	547339	-3.4448	-3.5982	-2.5219	-2.345	-2.255832319	-1.7213613
H2afy2	67552	-4.8256	-4.6595	-2.8043	-3.1132	-3.092639845	-1.2354844
Hapl1	12950	-0.13856	0.71139	2.283	2.4507	1.652505778	0.70434733
Hdac7a	56233	-3.0534	-3.2186	-1.589	-3.0998	-0.27648117	-0.437356
Hddc2	69692	-3.6826	-2.2849	-0.11309	-0.74505	-0.101102672	-0.403759
Hnrpab	15384	-3.199	-3.027	-2.3514	-2.7298	-1.242308772	-0.6244375
Hp	15439	-4.0972	-4.1657	-1.9048	-2.9111	-2.940712137	-2.3234869

Hspa14	50497	-3.13	-3.0315	-3.6821	-3.4545	-2.732452293	-1.1991443
Hspa8	15481	-1.2952	-1.5636	2.821	1.6732	0.31975548	-0.1899136
Hspg2	15530	2.2702	2.3927	2.4529	2.0516	0.192113664	-0.9309
Hyal3	109685	-4.7214	-0.75392	-1.6954	-0.65599	0.031244238	-0.0589361
Ifna12	242519	-4.2366	-3.5138	-2.5412	-2.3353	-2.3663647	-1.5627612
Ik	24010	1.8216	1.4787	2.0755	2.0042	-1.093965898	-0.6517265
Il27	246779	-3.2404	-3.1111	-2.6308	-2.7879	0.275739422	-0.9561935
Itgad	381924	-5.3181	-5.3209	-2.5634	-2.8129	-3.223914022	-0.5071941
Ixl	67224	-4.1633	-4.5526	-2.8399	-3.4751	0.88465199	-0.4151207
Kcnc4	99738	2.5668	2.0096	2.4368	2.7192	1.734094698	0.83521976
Kcnk15	241769	2.0778	1.6369	2.2626	3.5385	1.208244363	0.5944313
Kcnmb2	72413	-4.3828	-4.8846	-2.9586	-2.7484	-3.285888197	-2.0025922
Kif5a	16572	0.81579	0.39417	2.6241	1.9576	-3.870637083	-2.5956976
Klkb1	16621	1.1884	1.4207	2.0409	2.1238	1.065204055	1.20127086
Krtcap3	69815	-3.4315	-4.1288	-1.6607	-2.3414	1.407800121	0.8112237
L1cam	16728	-3.3247	-3.7529	-0.95586	-1.6737	-2.587633147	-1.1365099
Lgi1	56839	0.96119	1.0701	2.912	2.6937	1.213309298	0.55557671
Lmo1	109594	1.8783	1.9154	2.9317	1.0813	1.28272472	-0.1994898
LOC434448	434448	-0.27118	-0.22462	5.208	-0.987	0.24204334	-1.05607
LOC547347	547347	-3.6262	-3.7794	-2.674	-2.0881	-2.444552102	-1.525167
Lrrc15	74488	-4.2493	-4.1573	-2.6247	-2.6077	-2.972072645	-1.6662643
Ltbp2	16997	1.2823	1.9614	2.2252	2.1679	0.747613564	0.448515
Magea7	17143	-3.4996	-4.2711	-2.9371	-2.7901	-1.318364284	-1.0600735
Mdm2	17246	2.3058	2.1634	3.1038	2.3548	-0.543008145	0.14908324
Mical3	194401	1.2342	1.1919	2.6614	2.1708	1.095899196	0.58357623
Mknk2	17347	-3.4287	-3.4168	-1.9674	-1.373	-2.026606628	-2.9247105
Mlycd	56690	1.7261	1.539	2.0727	2.0791	-0.213373155	-0.6670361
Mmp14	17387	0.52535	0.54504	2.3062	3.0581	1.405783652	0.14317689
Mmp1b	83996	0.82865	0.70032	2.8045	2.0046	0.89028724	0.6451171
Mrpl4	66163	-3.5136	-4.7314	-1.565	-2.3892	-2.913615409	-2.3462103
Mrplf4	107849	-4.1236	-3.495	-2.3042	-2.1975	-1.521416614	-1.637579
Ms4a4d	66607	2.6711	2.5076	3.1145	2.5597	1.737292533	0.40553339
Mtnr1a	17773	-0.094032	-0.81067	2.0933	2.3291	0.453596071	-0.1472038
Mum1	68114	1.6838	2.1351	3.1247	1.7194	-0.858955588	-1.9468773
Mup5	17844	1.562	1.6215	2.5979	2.5569	1.176204909	0.22616223
Myst1	67773	-3.6709	-3.3411	-2.7412	-2.9203	-3.072909679	-1.6215404
Naca	17938	2.4349	3.0195	4.8456	5.1971	-0.782003867	0.53592392
Nanos3	244551	-4.0489	-4.9706	-3.1256	-3.4742	-2.286147251	-1.2283301
Ndrq2	29811	1.9739	1.6072	2.5721	2.8598	1.874887695	0.40423597
Nfkbie	18037	-3.2785	-3.6645	-2.2882	-1.737	-4.298053852	-2.4504424
Nkx1-2	20231	-4.1358	-3.8101	-3.0269	-2.501	-2.74188964	-1.6975568
Nphp4	260305	0.99167	1.4379	2.2739	2.0498	0.904293893	0.9761132
Nqo2	18105	1.6125	2.1551	2.0257	2.0069	0.644237271	-0.2840135
Nucb2	53322	-0.89456	-4.1663	-1.0163	-1.6029	-1.228790961	-0.7336925
Nudt3	56409	-2.9129	-3.6178	-1.9315	-2.3655	-2.635254407	-1.3044885
Nutf2	68051	0.32109	0.932	2.0847	2.2382	-0.331638729	-1.0851445
Nxf	225872	-3.3048	-3.0557	-2.0802	-2.0284	-1.545872243	-1.2412733
Olf101	258831	-3.6138	-2.6229	-1.9659	-1.8407	-1.227820068	-0.8564653
Olf1181	258060	-3.7346	-4.3202	-2.8755	-3.5646	-2.62356975	-0.4605241
Olf1269	258339	1.8107	1.6195	2.4376	2.8046	-0.027769733	-0.4648551
Olf1133	258828	-3.2808	-4.0204	-2.3656	-2.3903	-2.066175591	-0.2652256
Olf11361	258534	-4.5246	-4.1346	-2.2027	-1.9157	-4.728777088	-4.1469093
Olf1525	258958	1.6822	2.063	2.8517	2.692	1.749907346	0.01944027
Olf1575	259118	3.0013	3.0973	2.3529	2.7408	1.282317353	1.4975641
Olf1808	258930	0.60977	0.77736	2.5374	0.73421	0.50625511	-0.665683
Olf1809	258321	0.96139	0.94398	2.4242	2.1522	0.68486539	-0.9223
Olf1860	258521	-0.064173	0.47345	6.1901	0.094614	-1.968067918	-0.4393268
Ormdl2	66844	2.4619	2.5897	2.2191	2.963	2.17914369	1.81991692
Ott	18422	2.278	2.1297	2.5855	2.6809	1.357666761	0.71204535
Pcdhqa2	93710	1.8682	2.256	2.542	3.1085	1.78295164	0.6758968
Pcdhgb4	93701	1.1578	0.7995	3.5124	3.1837	3.28086909	2.93688278
Pcsk4	18551	1.5064	1.3853	2.1186	2.4094	1.550059641	1.66721698
Pcyt1a	13026	-3.1331	-3.4355	-2.7416	-3.266	-2.292760183	-0.9333466
Pde6b	18587	1.1558	1.377	2.032	2.4262	0.887944877	-0.0454306
Pdlim3	53318	-3.267	-3.2916	-1.0262	-0.95565	-0.064120493	-1.534842
Pes1	64934	-4.8624	-4.7872	-1.7871	-2.5716	-5.198125551	-4.1857454
Pex12	103737	-3.0572	-3.747	-1.6931	-1.8074	-2.873455763	-2.4678154
Pglyrp4	384997	1.1996	1.3462	2.1884	2.0871	0.789049628	0.22264067
Phf5a	68479	2.3154	1.5096	2.4515	2.7979	0.006415189	1.26730326
Phyh	16922	-3.4283	-3.2491	-3.6669	-3.5704	-1.914139251	-2.011359
Pik3cb	74769	-2.5987	-4.1801	-1.7141	-2.5355	-1.710638817	-1.2909398
Pip	18716	-3.9578	-3.2747	-2.2761	-2.5049	-3.181473118	-1.3962345
Pkp2	67451	1.7906	1.862	2.2867	2.2661	0.636531236	-0.3774338
Plac8	231507	-3.6444	-4.0372	-2.054	-2.3369	-2.354870148	-1.4960245
Plaur	18793	1.9081	2.1122	3.6335	3.4412	1.395640201	1.41457258
Plg	18815	0.4848	-4.57	-0.33269	-0.43048	-0.111300439	0.18660951
Pofut1	140484	1.9411	2.3082	2.7453	3.3244	1.118983354	1.45355691
Ppargc1b	170826	-4.8757	-5.4442	-5.0552	-4.4096	-1.297126859	-0.3241964
Ppp3r2	19059	-3.5103	-3.7085	-2.6057	-2.9751	0.191258192	-1.7208794
Prcc	94315	1.4276	1.8078	2.1868	3.1174	0.555532999	-0.5742398
Prkwnk4	69847	0.69653	0.224	2.0477	2.4485	-1.274219226	-1.1118899

Prpf8	192159	-3.0517	-3.7249	-1.6648	-1.3206	-0.794605102	-0.8785029
Psemb2	26445	1.3751	1.9084	2.2341	2.2269	0.995001056	2.03891493
Psemb5	19173	1.5246	1.7391	2.966	2.2966	2.687952485	1.57211004
Psemb6	19175	1.1802	1.9424	2.5382	2.5474	1.850662908	0.73295231
Psemb9	16912	-3.7046	-2.6763	-1.841	-2.3989	-1.706918194	-2.1881044
Psmid14	59029	1.8594	2.1207	2.9153	3.6471	0.553489372	2.97414957
Psmid2	21762	-0.21305	-0.16682	4.1679	4.2935	0.129216122	-0.5870162
Ptprn2	19276	-4.9234	-4.3594	-3.8057	-2.7681	-2.322599852	-0.7814313
Qtrt1	60507	1.2126	1.5865	3.2161	3.0147	0.58709719	0.41701245
Rab18	19330	-3.3166	-4.5921	-3.3774	-3.6364	-3.008396247	-2.5684642
Rad21	19357	1.5912	0.82627	2.2296	2.4865	1.904476154	0.33052408
Ran	19384	0.027267	0.52175	2.8128	1.6313	5.515089715	1.453248
Ranbp1	19385	-0.3905	-0.18495	3.8501	-0.26907	0.14014715	0.62366028
Rara	19401	-3.9301	-3.5015	-2.1078	-2.1464	-2.983153041	-1.3273169
Rasgrp4	233046	-3.6339	-3.16	-1.0599	-1.808	-2.765421902	-1.2867324
Rasl12	70784	-4.3513	-0.24929	1.0889	0.4314	0.66706343	-0.9785215
Rbed1	232089	-4.4339	-3.8407	-3.2492	-2.3689	-3.128107975	-1.1930156
Rbm8	60365	2.5786	1.4697	2.9667	2.9797	1.396767251	2.01569115
Resp18	19711	-3.6429	-2.9531	-2.18	-1.7573	-1.789776743	-1.2833468
Rheb	19744	-5.4918	1.0072	0.37925	0.41899	0.037687434	-0.6881654
Rnf150	330812	-3.9984	-4.415	-2.9003	-2.6654	-3.587822198	-0.9133231
Rnf2	19821	-6.2025	-4.2946	-2.3225	-2.3544	-2.47854692	-3.7208743
Rpn1	103963	-4.2997	-3.2	-1.7694	-1.8072	-1.628737581	-0.4210765
Rps16	20055	0.20822	-0.44299	0.90988	1.8748	-0.131125657	0.93368144
Rragc	54170	-4.9669	-4.4249	-3.6881	-3.4307	-0.111741754	-1.7459814
Rrm1	20133	-0.020454	2.4533	5.4226	1.914	0.037205383	2.3964216
Rsl1	380855	1.3692	1.5308	2.5307	2.1977	0.446351719	1.63601098
S100a8	20201	-6.1628	-0.022413	-0.45882	-0.30108	-0.279427795	-0.4828953
Sbp	20234	-3.2483	-3.2025	-2.3424	-3.1865	-1.8577528	-1.1461973
Scgb1a1	22287	-4.8181	-3.3217	-3.3412	-2.4128	-2.91823903	-1.6021657
Scgb3a1	68662	0.79269	0.90988	2.1678	2.036	1.144722191	0.10477332
Scrib	105782	-4.6754	-3.8166	-2.2237	-2.226	-2.104970556	-1.1917367
Sdk1	330222	-3.3371	-3.1001	-1.7914	-1.9665	0.232938676	-1.907961
Sec61g	20335	-3.6828	-3.7025	-2.0262	-1.2713	-2.621675491	-2.2555208
Seh1l	72124	1.3115	1.3647	2.4353	2.7349	0.345657263	0.33137049
Sertad1	55942	1.1021	0.54988	2.3327	2.2538	1.003107669	-0.2788424
Set7	73251	-3.2404	-3.1676	-2.5434	-3.0679	-2.538042943	-0.8084237
Sf3a1	67465	0.60254	1.0565	2.1207	2.1222	-1.496872722	-0.7903649
Sf3a3	75062	0.78954	1.0691	2.6001	3.4574	0.350973409	0.47681725
Sf3b1	81898	-0.82982	-0.98753	2.8362	2.7068	1.090148525	0.55619453
Sf3b2	319322	0.9341	0.44153	2.0357	2.6308	0.286704397	0.12217725
Sf3b3	101943	1.2735	1.94	2.562	2.5407	1.012769068	0.49712493
Sh2bp1	22083	1.6843	1.4877	2.3161	2.1227	-0.476790558	-1.3367077
Siat8b	20450	-3.5041	-2.6184	-2.4303	-3.3061	0.308104769	-0.3414397
Slamf9	98365	-3.1964	-3.2938	-1.949	-1.6205	-1.434701652	-0.9456535
Slc12a1	20495	-4.1215	-4.1832	-2.2062	-1.8378	-2.815473789	-2.2563363
Slc24a5	317750	1.9599	1.6455	2.7213	2.3713	0.423430508	-0.0073483
Slc2a10	170441	1.9828	1.9329	2.099	2.154	0.985794551	0.2546004
Slc31a2	20530	-3.3796	-3.7355	-2.5824	-2.1179	-1.653899314	-0.4898952
Slc35f2	72022	-3.099	-3.409	-1.654	-2.509	-2.140751001	-1.3220036
Slc7a5	20539	0.075711	0.93623	2.1528	2.4784	2.033720283	0.94824959
Smc5l1	226026	1.5422	1.6135	2.3104	2.657	-0.482480125	-0.6436949
Snrnp116	20624	-3.4579	-3.8712	-2.8169	-1.6778	-1.463081588	-0.1371828
Snrpa1	68981	1.0604	0.74998	2.7363	3.3875	-0.020871644	0.37398759
Snrpd2	107686	-1.5675	-0.69583	2.4108	3.4429	2.008898023	0.18112329
Snrpe	20643	-0.64843	-1.2852	2.6303	3.5164	0.140873622	0.87771947
Spat4	69281	1.4491	1.3204	2.0013	2.0512	0.652289569	-0.2866145
Sprr2d	20758	1.1371	0.33248	2.9382	2.7454	1.087059321	0.20485368
Sprri5	68720	-5.9185	-2.4117	-3.7818	-4.2915	-0.654782997	-0.6350578
Ssrp1	20833	2.6391	1.4896	2.998	3.7887	0.883789729	-0.2768962
Sstk	83984	-3.9491	-3.5272	-5.3094	-3.255	-1.826765712	-0.5410691
Supt16h	114741	1.1934	0.39815	3.0022	2.5059	0.275427107	-0.7473092
Surb7	108098	0.36339	0.12385	3.9012	0.7386	1.68406318	-0.1050192
Tada3l	101206	1.3702	1.1058	3.1103	2.5284	0.685849861	1.24691526
Tcp10a	21460	-3.8989	-3.3437	-2.3719	-2.0098	-3.658534406	-2.8754519
Tdrd6	210510	-3.9543	-4.2451	-3.9744	-2.9522	-2.482654542	-0.1964069
TGFβr1	21812	-6.5442	-5.8763	-3.4675	-4.0597	-4.380124824	-3.3026299
TGFβr2	21813	-3.8618	-3.0052	-2.0338	-1.7408	-0.064684018	0.26173003
Timd2	171284	1.4287	1.2057	2.1042	2.0733	1.719612784	0.88096302
Tle4	21888	1.5555	1.2399	2.0667	2.0703	0.503478222	-0.0316533
Treh	58866	-4.8226	-4.9743	-4.4767	-3.272	-3.475952293	-2.1986382
Trem3	58218	-4.3154	-1.6425	-3.8048	-3.1871	-1.981728308	-0.8686116
Trip6	22051	0.96094	1.0947	2.8715	1.9783	-0.275924434	0.26009899
Trpv1	193034	1.1402	1.4814	2.0435	3.0483	1.19461113	0.11601143
Ube2m	22192	1.3332	1.4471	3.5574	1.8902	-0.708847454	-0.7231834
V1rc15	171188	-3.6239	-3.5336	-2.7207	-1.7368	-2.64964127	-1.857201
V1rh3	171246	0.71908	0.60122	2.0887	2.3914	0.612815658	-0.2252899
V1ri7	171258	-3.8336	-3.3767	-2.6146	-2.9549	-2.014630023	-0.9067124
V2r4	22310	1.0285	1.142	2.5855	2.629	-0.128090769	-0.877156
Vcl	22330	-1.5929	-0.73445	6.1486	-1.6715	0.704072767	-0.6198286
Vps28	66914	1.332	1.5623	3.4496	3.3182	2.588833184	0.4176488

Wbp5	22381	-3.0482	-3.531	-2.2663	-3.2408	0.554786158	0.30471164
Whsc2	24116	-4.1696	-2.231	-3.2038	-2.768	-1.914451566	-1.1204034
Xlr4	27083	-3.0013	-3.1439	-1.6345	-1.7496	-1.961359933	-0.8061811
Xpo1	103573	-0.28535	0.2653	3.3469	1.906	0.983255293	2.03654251
Ythdf3	229096	1.126	1.2413	2.5651	1.3649	1.359391283	0.34027325
Zcchc9	69085	1.9333	1.4463	3.3276	2.5059	1.629822197	2.26301612
Zf	233490	-0.036777	0.037508	2.576	1.6824	0.5058749	-0.3713915
Zfp265	53861	0.4178	0.94988	2.6213	1.8523	0.642444854	0.03937726
Zfp451	98403	1.3621	1.0896	2.4968	2.3594	0.112161003	-1.1453138
Zppp	53604	-3.0864	-4.1214	-2.0254	-1.5383	-1.721617371	-2.0732582

SUPPLEMENTAL MATERIALS AND METHODS

Primers. List of primers used for quantification of gene expression.

	FORWARD	REVERSE
Mouse genes		
<i>Atp5o</i>	TCTCGACAGGTTCCGGAGCTT	AGAGTACAGGGCGGTTGCATA
<i>Coco</i>	ATGACCCTGTTCTGGGGACA	TTATGGTTCCCACGGAATGC
<i>Ctgf</i>	GGGCCTCTTCTGCGATTTT	ATCCAGGCAAGTGCATTGGTA
<i>Pai1</i>	GTAGCACAGGCACTGCAAAA	GCCGAACCACAAAGAGAAA
Human genes		
<i>ATP5O</i>	ACTCGGGTTTGACCTACAGC	GGTACTGAAGCATCGCACCT
<i>ID1</i>	ATCGCATCTTGTGTCGCTGA	GTGGAATCCCACCCCCTAAA
<i>ID2</i>	GCAAAGCACTGTGTGGCTGA	CCAACTGCAGAAAGGGCATT
<i>ID3</i>	CACCTTCCCATCCAGACAGC	TCCAGGAAGGGATTTGGTGA
<i>LEFTY1</i>	ACCTCAGGGACTATGGAGCTCAGG	AGAAATGGCCAATTGAAGGCCAGG
<i>LEFTY2</i>	TGCTACAGGTGTCGGTGCAGAGG	AGAAACGGCCACTTGAAGGCCAGG
<i>PAI1</i>	GAGAAACCCAGCAGCAGATT	TGGTGCTGATCTCATCCTTG
Xenopus genes		
<i>gsc</i>	TTCACCGATGAACAACCTGGA	TTCCAATTTTGGGCATTTTC
<i>vent2.2</i>	TGACACTTGGGCACTGTTCTG	CCTCTGTTGAATGGCTTGCT