

Supplemental table 2

RA pathway					
Genes	Xenbase.gene.ID	description	St 10	St 11	St 14
cyp26a1.L	XB-GENE-866599	cytochrome P450 family 26 subfamily A member 1 [Source:Xenbase;Acc:XB-GENE-855583]	+	+	+
cyp26c1.S	XB-GENE-1219119	cytochrome P450 family 26 subfamily C member 1 [Source:Xenbase;Acc:XB-GENE-1219115]	-	-	+
dhrs3.L	XB-GENE-955331	dehydrogenase/reductase (SDR family) member 3 [Source:Xenbase;Acc:XB-GENE-955324]	+	+	+
rara.L	XB-GENE-865415	retinoic acid receptor alpha [Source:Xenbase;Acc:XB-GENE-480836]	-	-	+
cyp26a1.S	XB-GENE-17332184	cytochrome P450 family 26 subfamily A member 1 [Source:Xenbase;Acc:XB-GENE-855583]	-	+	+
rdh13.L	XB-GENE-965073	retinol dehydrogenase 13 (all-trans/9-cis) [Source:Xenbase;Acc:XB-GENE-965068]	+	-	-
FGF pathway					
Genes	Xenbase.gene.ID	description	St 10	St 11	St 14
dusp6.S	XB-GENE-17333168	dual specificity phosphatase 6 [Source:Xenbase;Acc:XB-GENE-978216]	+	+	+
fgf2.L	XB-GENE-487006	fibroblast growth factor 2 [Source:Xenbase;Acc:XB-GENE-487002]	-	-	+
fgf3.S	XB-GENE-1018521	fibroblast growth factor 3 [Source:NCBI gene;Acc:493516]	-	+	-
fgf8.L	XB-GENE-865429	fibroblast growth factor 8 [Source:Xenbase;Acc:XB-GENE-480983]	+	-	-
fgfr3.L	XB-GENE-479259	fibroblast growth factor receptor 3 (achondroplasia, thanatophoric dwarfism) [Source:Xenbase;Acc:XB-GENE-479255]	-	-	+
fgfrl1.L	XB-GENE-482476	fibroblast growth factor receptor like 1 [Source:Xenbase;Acc:XB-GENE-482472]	-	-	+
Wnt pathway					
Genes	Xenbase.gene.ID	description	St 10	St 11	St 14
fzd8.S	XB-GENE-6254029	frizzled class receptor 8 [Source:Xenbase;Acc:XB-GENE-480800]	-	+	-
sfrp2.S	XB-GENE-485151	secreted frizzled-related protein 2 [Source:Xenbase;Acc:XB-GENE-485147]	-	-	+
trabd2a.S	XB-GENE-6488536	TraB domain containing 2A - Metalloprotease that acts as a negative regulator of the Wnt pathway [Source:Xenbase;Acc:XB-GENE-6050964]	-	-	+
wnt11b.L	XB-GENE-6079153	wingless-type MMTV integration site family, member 11B [Source:Xenbase;Acc:XB-GENE-5858981]	-	-	+

BMP pathway							
Genes	Xenbase.gene.ID	description			St 10	St 11	St 14
bmp7.2.L	XB-GENE-856288	bone morphogenetic protein 7, gene 2 [Source:Xenbase;Acc:XB-GENE-855954]			-	+	-
bambi.L	XB-GENE-866425	BMP and activin membrane-bound inhibitor [Source:Xenbase;Acc:XB-GENE-495359]			-	-	+
bambi.S	XB-GENE-17343852	BMP and activin membrane-bound inhibitor [Source:Xenbase;Acc:XB-GENE-495359]			-	-	+
bmp4.L	XB-GENE-483062	bone morphogenetic protein 4 [Source:Xenbase;Acc:XB-GENE-483058]			-	-	+
bmp4.S	XB-GENE-6254046	bone morphogenetic protein 4 [Source:Xenbase;Acc:XB-GENE-483058]			-	-	+
pnhd.L	XB-GENE-6488002	pinhead [Source:Xenbase;Acc:XB-GENE-480588]			-	-	+
smad7.L	XB-GENE-865569	SMAD family member 7 [Source:Xenbase;Acc:XB-GENE-486004]			-	-	+
Signaling (others)							
Genes	Xenbase.gene.ID	description			St 10	St 11	St 14
ccn2.L	XB-GENE-855558	cellular communication network factor 2 - growth factor [Source:Xenbase;Acc:XB-GENE-855547]			-	-	+
cxcr4.L	XB-GENE-489921	C-X-C motif chemokine receptor 4 [Source:Xenbase;Acc:XB-GENE-489917]			-	-	+
igf3.L	XB-GENE-5807497	insulin-like growth factor 3 [Source:Xenbase;Acc:XB-GENE-5807444]			-	-	+
mal.L	XB-GENE-5745230	mal, T cell differentiation protein - Members of chemokine-like factor super family [Source:Xenbase;Acc:XB-GENE-5745206]			-	-	+
p2ry4.L	XB-GENE-943452	pyrimidinergic receptor P2Y, G-protein coupled, 4 [Source:Xenbase;Acc:XB-GENE-943446]			-	-	+
sema3fl.S	XB-GENE-17335950	semaphorin 3F like [Source:Xenbase;Acc:XB-GENE-940271]			-	-	+
tdgf1.2.S	XB-GENE-876243	teratocarcinoma-derived growth factor 1, member 2 [Source:NCBI gene;Acc:100486054]			-	+	+
tab3.S	XB-GENE-6254217	TGF-beta activated kinase 1 (MAP3K7) binding protein 3 [Source:Xenbase;Acc:XB-GENE-942652]			-	-	+
Extracellular matrix							
Genes	Xenbase.gene.ID	description			St 10	St 11	St 14
chsy1.S	XB-GENE-17339959	chondroitin sulfate synthase 1 [Source:Xenbase;Acc:XB-GENE-961883]			-	-	+
col5a2.L	XB-GENE-6485617	collagen, type V, alpha 2 [Source:Xenbase;Acc:XB-GENE-6032476]			-	-	+
habp2.L	XB-GENE-6486520	hyaluronan binding protein 2 [Source:Xenbase;Acc:XB-GENE-979150]			-	-	+
hapln3.S	XB-GENE-17346258	hyaluronan and proteoglycan link protein 3 [Source:Xenbase;Acc:XB-GENE-5867355]			-	-	+
hyal2.L	XB-GENE-6464375	hyaluronidase 2 [Source:NCBI gene;Acc:100144942]			-	-	+
mig30.L	XB-GENE-6251788	Basement membrane-specific heparan sulfate proteoglycan (HSPG) core protein [Source:Xenbase;Acc:XB-GENE-6259003]			-	-	+
mmp3.L	XB-GENE-5932566	matrix metallopeptidase 3 [Source:Xenbase;Acc:XB-GENE-5932509]			-	-	+
vcan.L	XB-GENE-922310	versican [Source:Xenbase;Acc:XB-GENE-922302]			-	-	+
has-rs.S	XB-GENE-6252031	hyaluronan synthase related sequence protein - Chitin synthase/hyaluronan synthase [Source:Xenbase;Acc:XB-GENE-12450674]			-	-	+
mmp28.L	XB-GENE-6254971	matrix metallopeptidase 28 [Source:Xenbase;Acc:XB-GENE-984024]			-	-	+
spam1.L	XB-GENE-5793489	sperm adhesion molecule 1 (PH-20 hyaluronidase, zona pellucida binding) [Source:Xenbase;Acc:XB-GENE-5793485]			-	-	+
timp2.S	XB-GENE-17334759	TIMP metallopeptidase inhibitor 2 [Source:Xenbase;Acc:XB-GENE-949671]			-	-	+

Intercellular adhesion							
Genes	Xenbase.gene.ID	description			St 10	St 11	St 14
cdh11.S	XB-GENE-864996	cadherin 11 [Source:Xenbase;Acc:XB-GENE-483599]			-	-	+
cdh15.S	XB-GENE-6485759	cadherin 15 [Source:Xenbase;Acc:XB-GENE-983662]			-	-	+
cldn4.L	XB-GENE-972446	claudin 4 [Source:Xenbase;Acc:XB-GENE-972439]			-	-	+
cldn6.1.L	XB-GENE-959189	claudin 6, gene 1 [Source:Xenbase;Acc:XB-GENE-959181]			-	-	+
dsp.S	XB-GENE-17346609	desmoplakin [Source:Xenbase;Acc:XB-GENE-492195]			-	-	+
pcdh1.L	XB-GENE-983608	protocadherin 1 [Source:Xenbase;Acc:XB-GENE-983603]			-	-	+
Cytoskeleton							
Genes	Xenbase.gene.ID	description			St 10	St 11	St 14
arhgap42.L	XB-GENE-6487105	Rho GTPase activating protein 42 [Source:NCBI gene;Acc:100493816]			-	-	+
arhgap45.L	XB-GENE-990083	Rho GTPase activating protein 45 [Source:Xenbase;Acc:XB-GENE-990078]			-	-	+
cfap300.L	XB-GENE-943462	cilia and flagella associated protein 300 [Source:Xenbase;Acc:XB-GENE-943457]			-	-	+
mfap2.L	XB-GENE-6254690	microfibril associated protein 2 [Source:Xenbase;Acc:XB-GENE-6257614]			-	-	+
mtus1.L	XB-GENE-979441	microtubule associated scaffold protein 1 XB			-	-	+
myo10.2.L	XB-GENE-17344263	myosin 10, gene 2 [Source:Xenbase;Acc:XB-GENE-5995373]			-	-	+
mynp.L	XB-GENE-6486837	myopalladin - Projectin/twitchin and related proteins [Source:Xenbase;Acc:XB-GENE-988987]			-	-	+
prph.L	XB-GENE-866295	peripherin [Source:Xenbase;Acc:XB-GENE-493857]			+	+	+
rnd3.S	XB-GENE-17343479	Rho family GTPase 3 [Source:Xenbase;Acc:XB-GENE-495412]			-	-	+
snx22.L	XB-GENE-17340049	sorting nexin 22 [Source:Xenbase;Acc:XB-GENE-946153]			-	-	+
vim.L	XB-GENE-866225	vimentin [Source:Xenbase;Acc:XB-GENE-493024]			-	-	+
cdc42ep2.L	XB-GENE-17345746	CDC42 effector protein 2 [Source:Xenbase;Acc:XB-GENE-5818741]			-	-	+
ckap2.L	XB-GENE-6486301	cytoskeleton associated protein 2 [Source:Xenbase;Acc:XB-GENE-1004436]			-	-	+
inf2.S	XB-GENE-5862221	inverted formin, FH2 and WH2 domain containing [Source:Xenbase;Acc:XB-GENE-5862185]			-	-	+
myo5b.S	XB-GENE-6487867	myosin VB [Source:Xenbase;Acc:XB-GENE-988439]			-	-	+
rhof.L	XB-GENE-17336827	ras homolog family member F (in filopodia) [Source:Xenbase;Acc:XB-GENE-920536]			-	-	+
rhow.L	XB-GENE-17343382	ras homolog family member V [Source:Xenbase;Acc:XB-GENE-489435]			-	-	+
rnd1.S	XB-GENE-17336490	Rho family GTPase 1 [Source:Xenbase;Acc:XB-GENE-490045]			-	-	+
shroom2.L	XB-GENE-6485952	shroom family member 2 [Source:Xenbase;Acc:XB-GENE-982291]			-	-	+

Channels/transporters							
Genes	Xenbase.gene.ID	description			St 10	St 11	St 14
kcne1.L	XB-GENE-962321	potassium channel, voltage gated subfamily E regulatory beta subunit 1 [Source:Xenbase;Acc:XB-GENE-962320]			-	-	+
slc12a1.L	XB-GENE-6486739	solute carrier family 12 member 1 [Source:Xenbase;Acc:XB-GENE-479925]			-	-	+
slc12a3.L	XB-GENE-6488610	solute carrier family 12 member 3 [Source:Xenbase;Acc:XB-GENE-866805]			-	-	+
slc1a5.S	XB-GENE-6077517	solute carrier family 1 member 5 [Source:Xenbase;Acc:XB-GENE-482596]			-	-	+
slc2a2.L	XB-GENE-865613	solute carrier family 2 member 2 XB			-	-	+
atp1b1.S	XB-GENE-864911	ATPase Na+/K+ transporting subunit beta 1 [Source:Xenbase;Acc:XB-GENE-482813]			-	-	+
slc15a4.L	XB-GENE-986488	solute carrier family 15 member 4 [Source:Xenbase;Acc:XB-GENE-986485]			-	-	+
slc38a2.L	XB-GENE-6254869	solute carrier family 38 member 2 [Source:Xenbase;Acc:XB-GENE-6258676]			-	-	+
vdac1.S	XB-GENE-955070	voltage-dependent anion channel 1 [Source:Xenbase;Acc:XB-GENE-955063]			-	-	+

Proliferation/apoptosis

Genes	Xenbase.gene.ID	description			St 10	St 11	St 14
bok.S	XB-GENE-6251426	BCL2 family apoptosis regulator BOK [Source:Xenbase;Acc:XB-GENE-988663]			-	-	+
dapk1.S	XB-GENE-6251779	death associated protein kinase 1 [Source:Xenbase;Acc:XB-GENE-1011852]			-	-	+
cc-.L	XB-GENE-979551	cyclin O [Source:Xenbase;Acc:XB-GENE-979545]			-	+	-

Supplemental table 2: Genes differentially expressed upon RA disruption. Genes down-regulated that are expected to be positive RA targets are highlighted with green. Genes up-regulated that are expected to be negative targets are highlighted with red. Differential expression observed with a fdr < 0.05 and a $\log_2\text{fc} > 0.5$ (absolute value) at a given stage is indicated by +. Manual annotation of some genes from Xenbase website pages information is indicated in red.