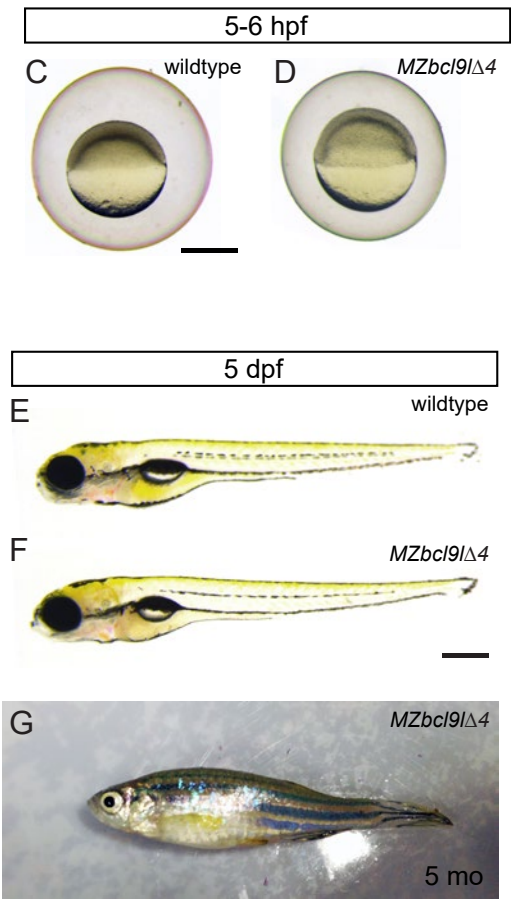
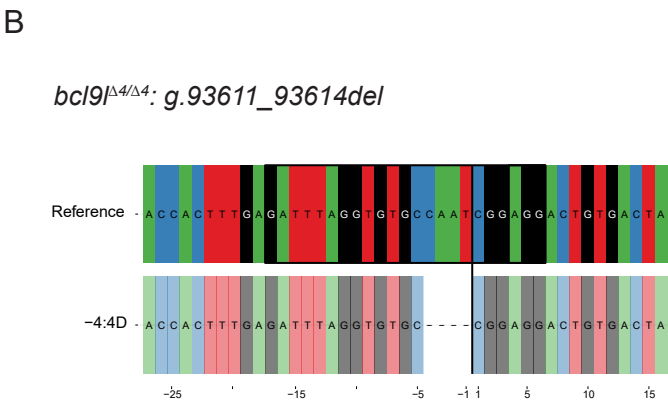
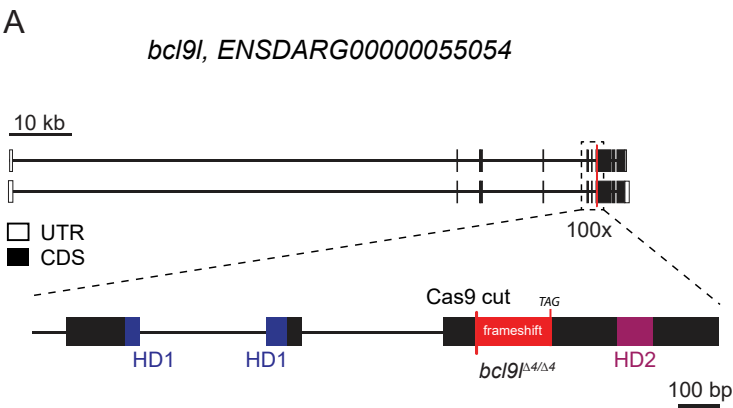
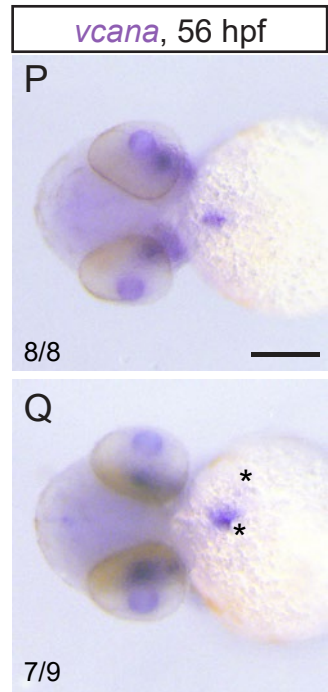
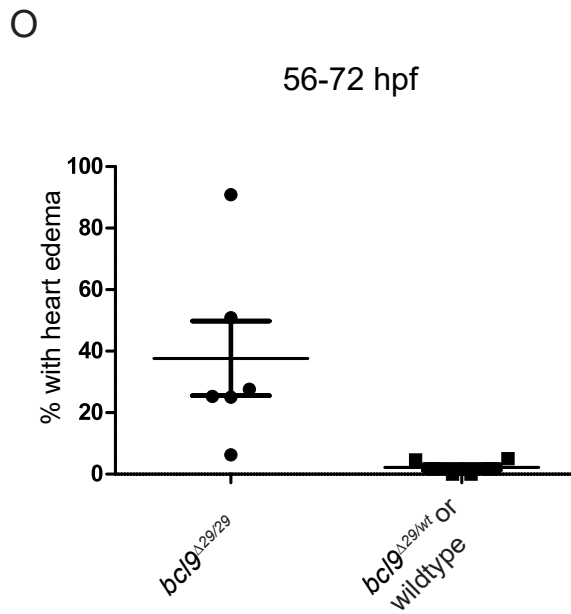
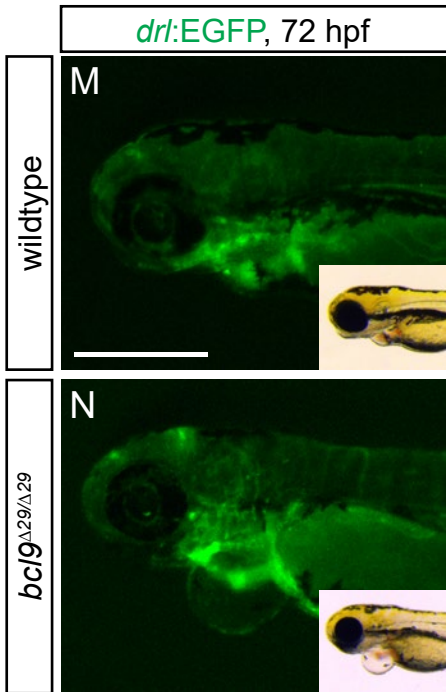
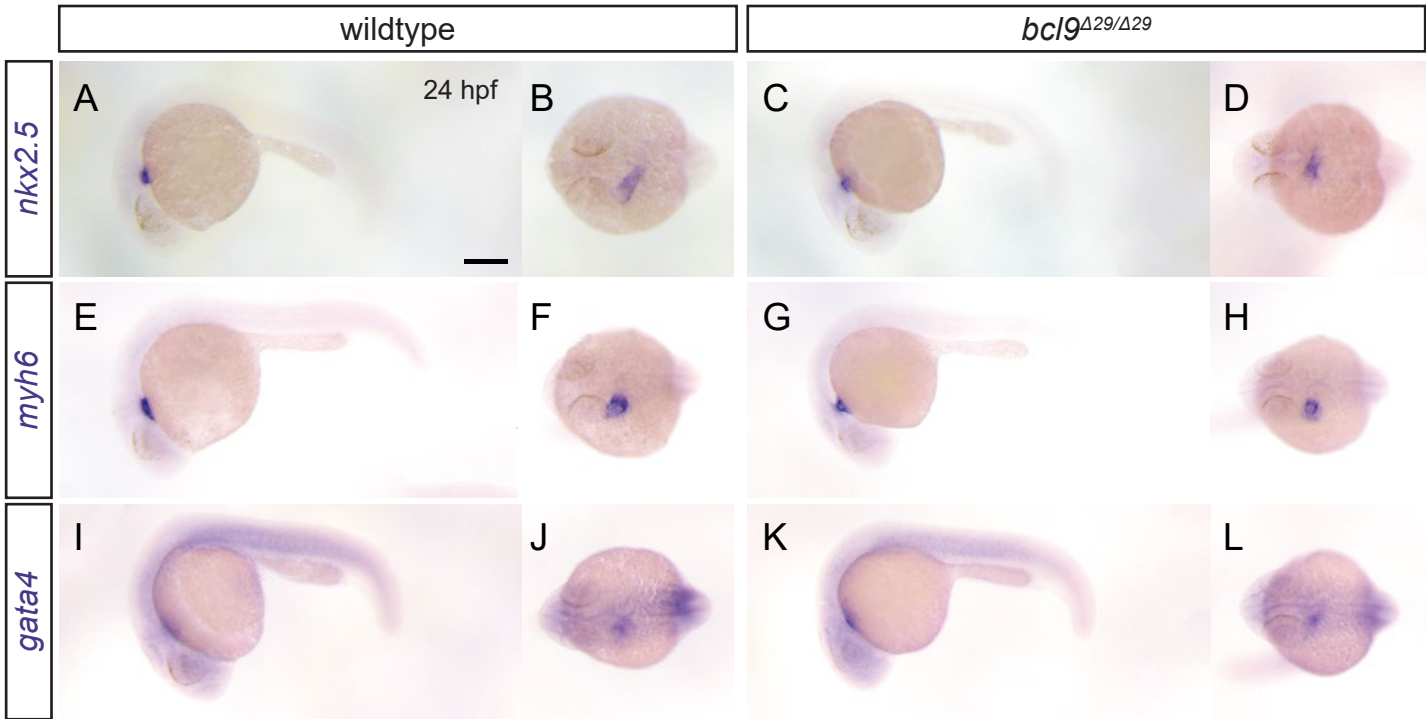
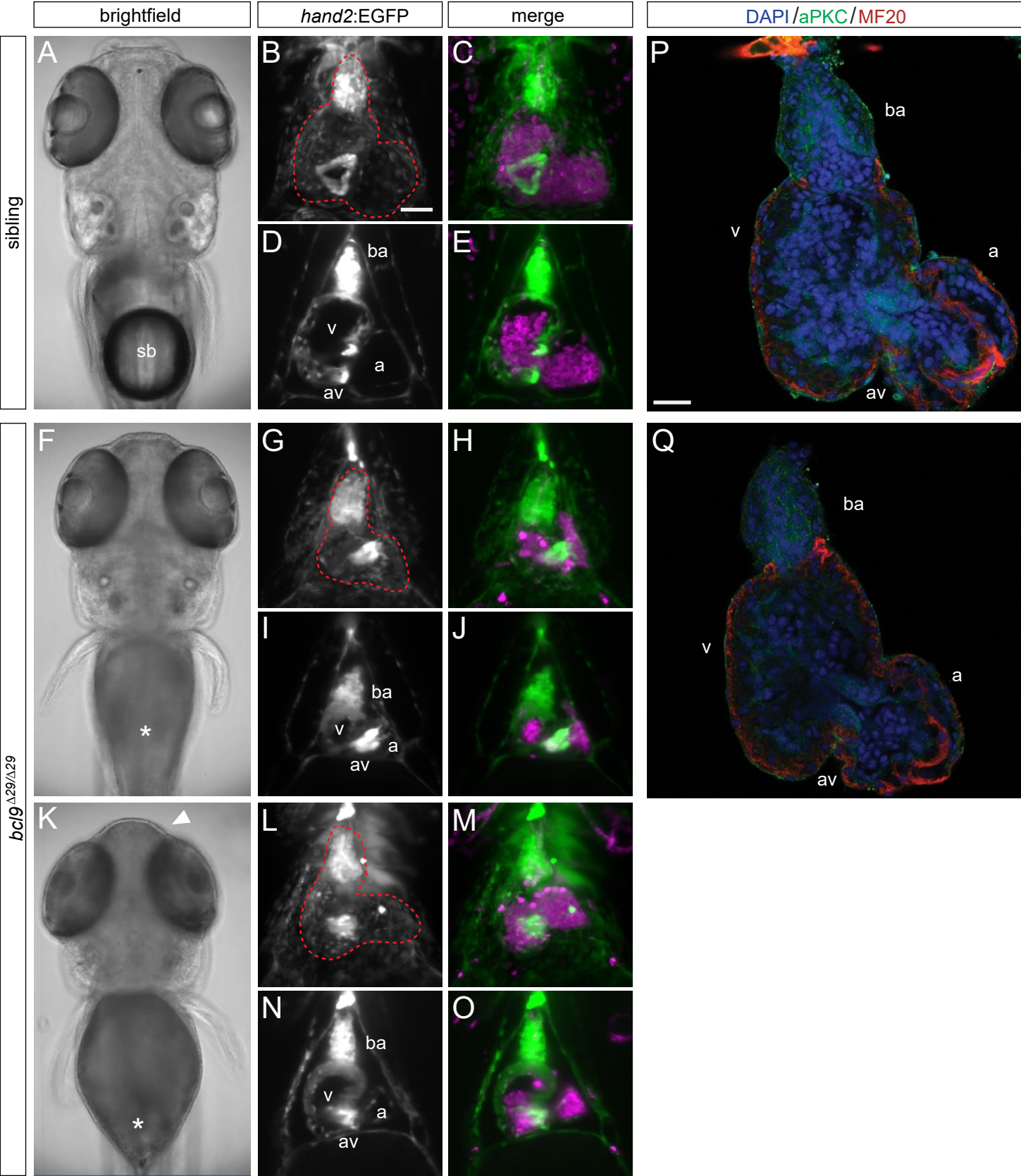
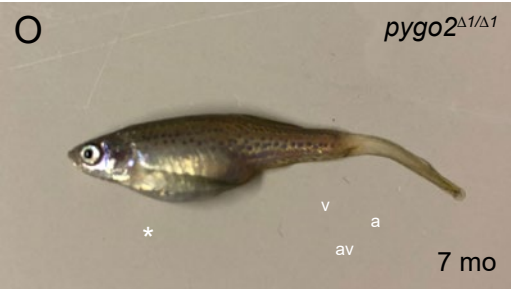
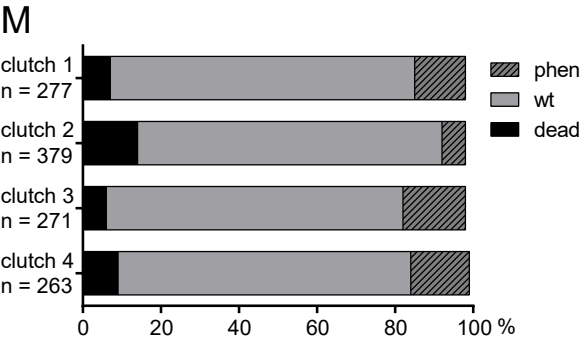
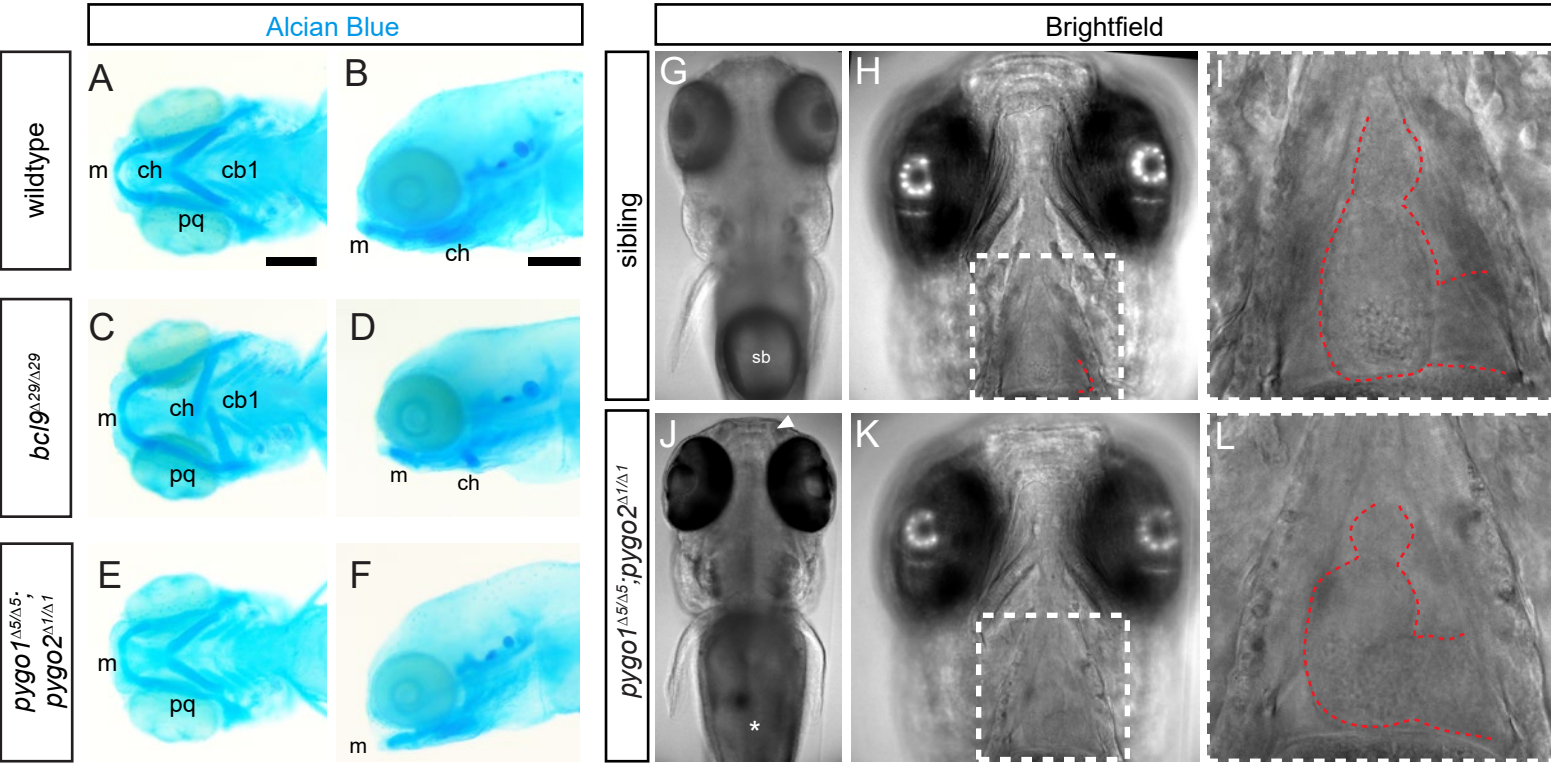


CantuFelkerZimmerli\_Supplemental\_Fig\_S1

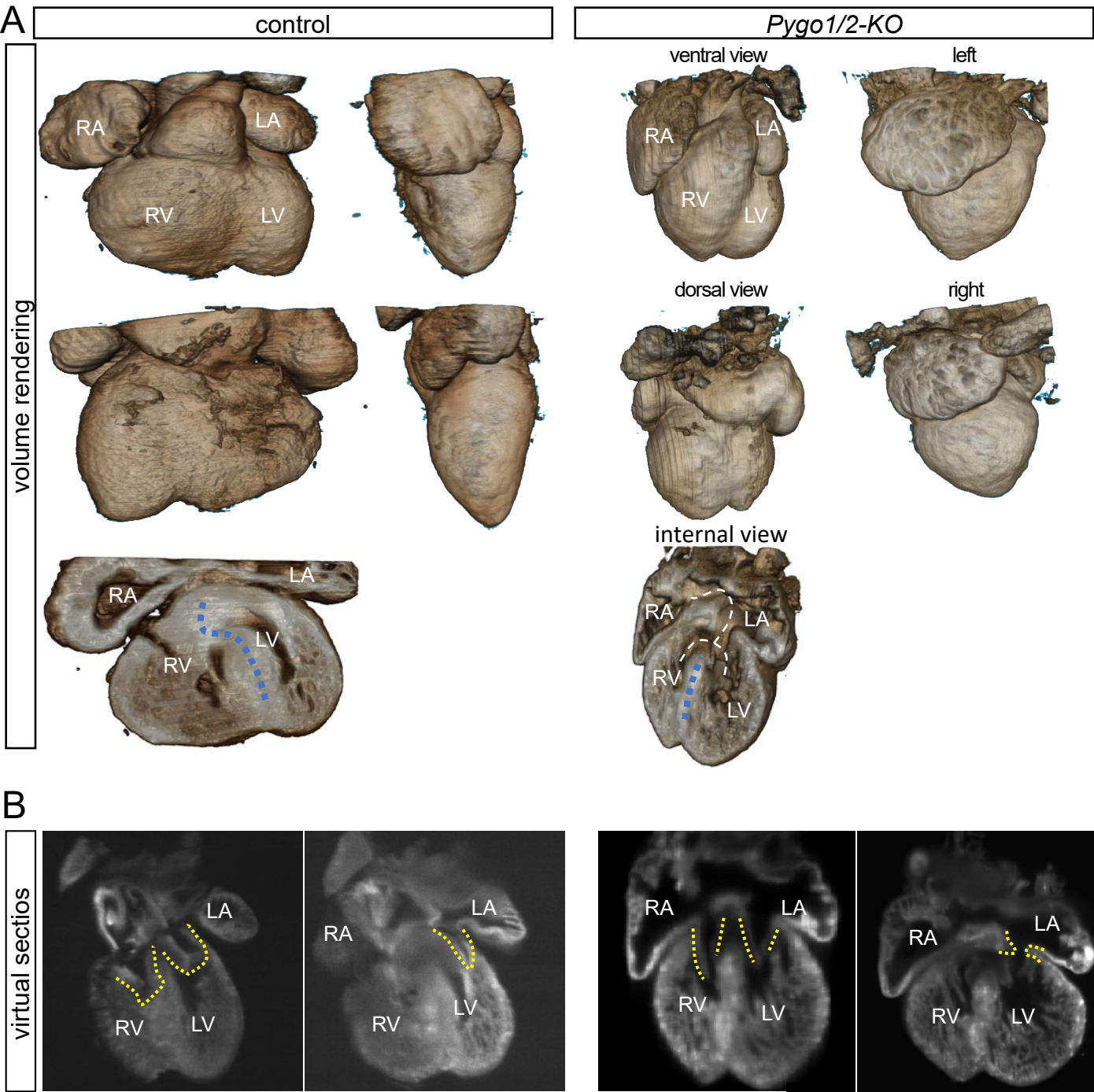






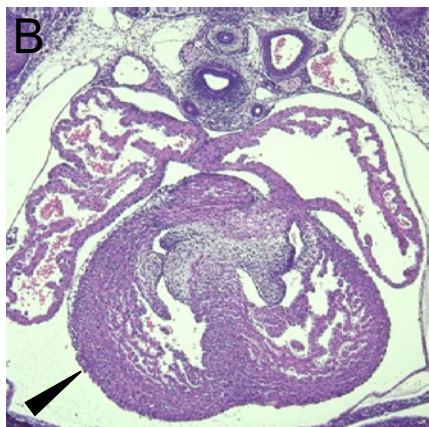




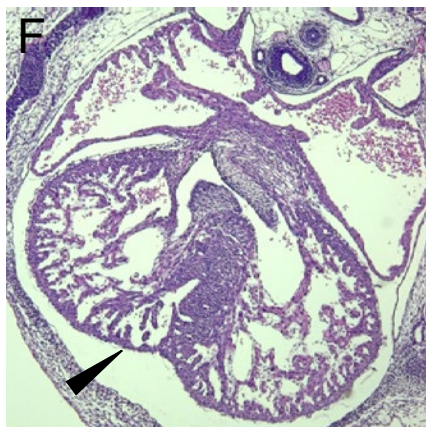
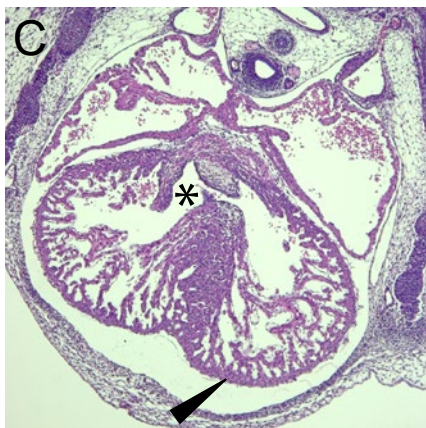




control



*Bcl9/9<sup>ΔHD1</sup>*



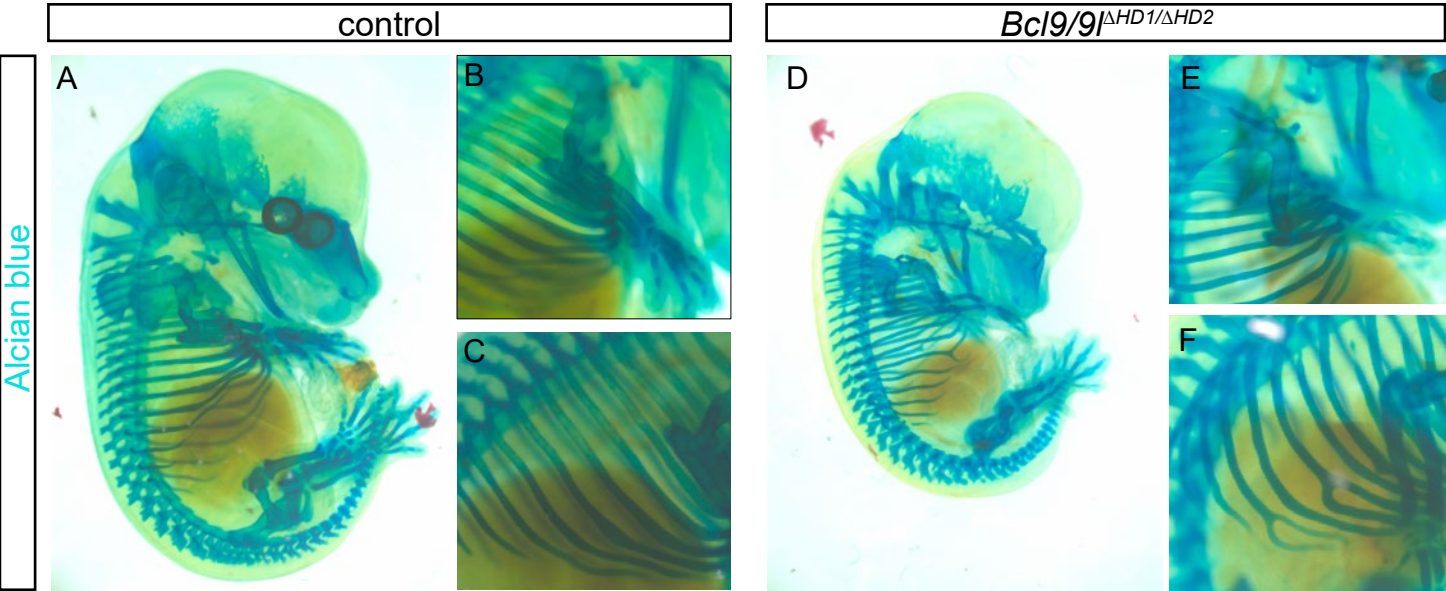
control

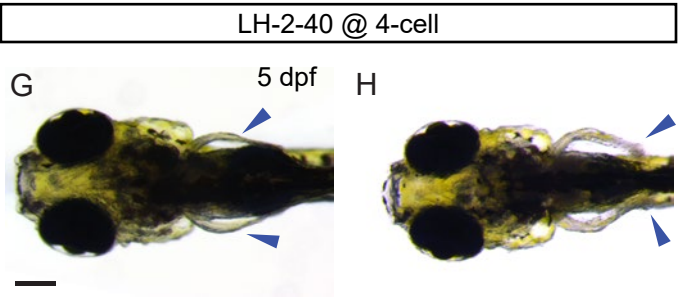
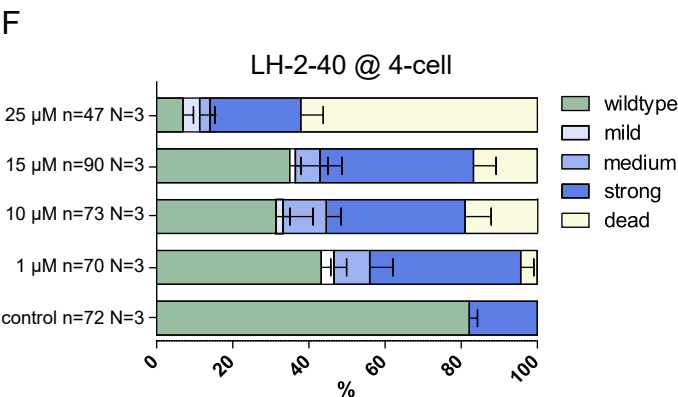
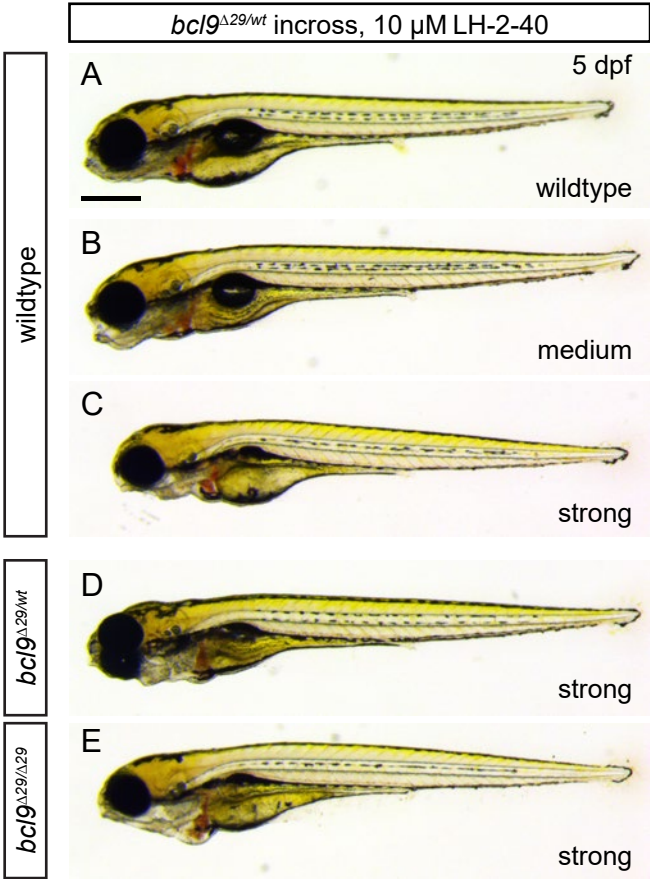


*Bcl9/9<sup>ΔHD1/ΔHD2</sup>*



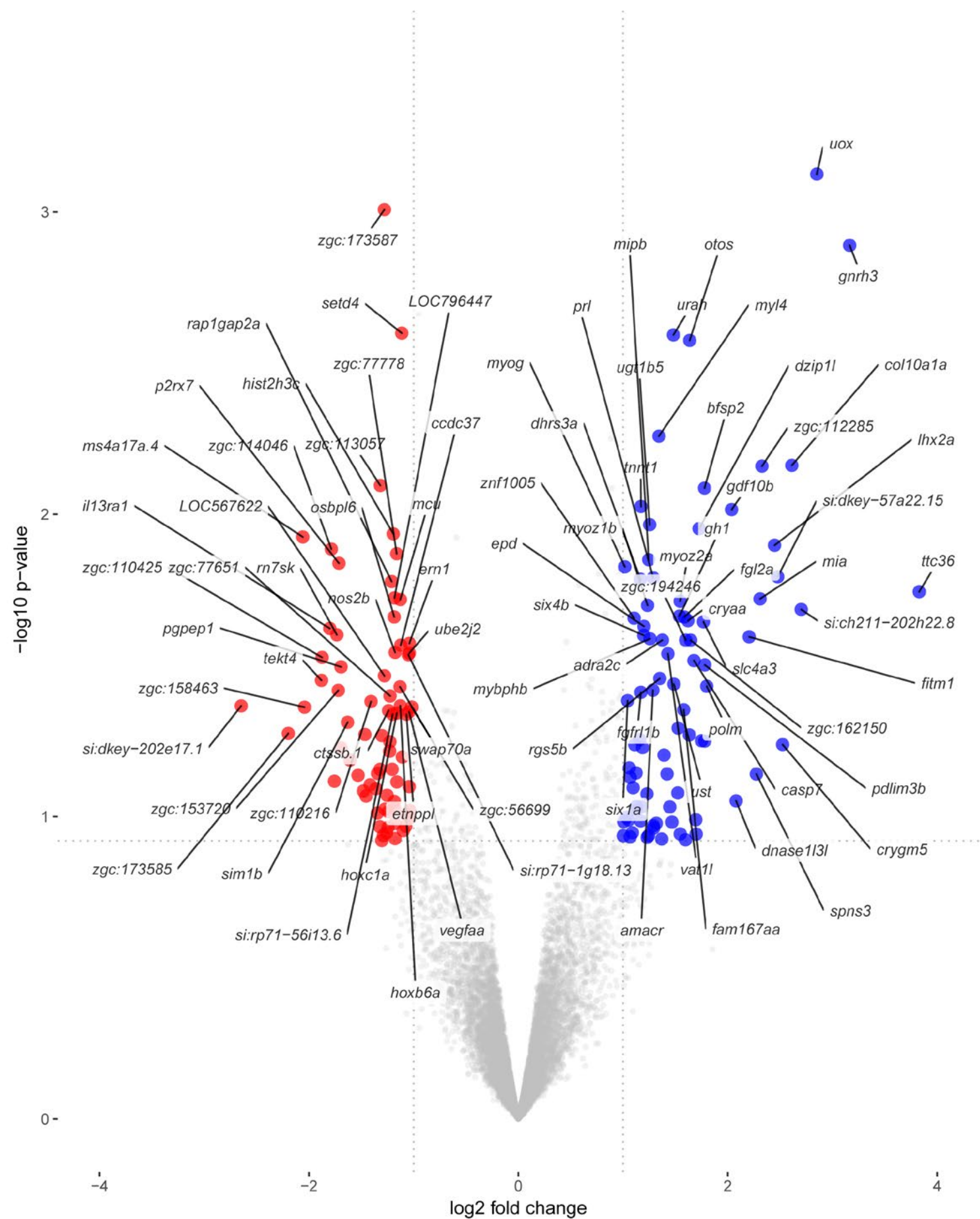








CantuFelkerZimmerli\_Supplemental\_Fig\_S9



**Supplementary Table 1**

Gene name	FC	Zfin ID	Expression
<i>mcu</i>	0.46	ZDB-GENE-061013-24	heart, heart tube
<i>nos2b</i>	0.44	ZDB-GENE-080916-1	mandibular arch skeleton
<i>zgc:56699</i>	0.46	ZDB-GENE-040426-2099	pharyngeal arches
<i>vegfaa</i>	0.49	ZDB-GENE-990415-273	heart, pharyngeal arch
<i>hoxc1a</i>	0.45	ZDB-GENE-000822-2	pharyngeal arch
<i>plaub</i>	0.36	ZDB-GENE-030619-15	heart
<i>cyp3a65</i>	0.43	ZDB-GENE-050604-1	heart
<i>arhgap17a</i>	0.31	ZDB-GENE-050417-56	pharyngeal arch
<i>cdh5</i>	0.43	ZDB-GENE-040816-1	heart, heart primordium, lateral mesoderm
<i>adora2aa</i>	0.46	ZDB-GENE-080723-28	heart
<i>rspo1</i>	0.50	ZDB-GENE-040718-44	heart
<i>met</i>	0.37	ZDB-GENE-041014-1	pharyngeal arch
<i>wtip</i>	0.36	ZDB-GENE-050419-261	heart
<i>tgfbr1a</i>	0.44	ZDB-GENE-051120-75	pharyngeal arch
<i>hoxb4a</i>	0.41	ZDB-GENE-990415-105	pharyngeal arch
<i>vwf</i>	0.40	ZDB-GENE-070103-1	pharyngeal arch
<i>rbck1</i>	0.51	ZDB-GENE-040704-3	pharyngeal arch
<i>mtf1</i>	0.46	ZDB-GENE-020424-1	heart
<i>mcoln1a</i>	0.42	ZDB-GENE-040426-2704	heart
<i>lepr</i>	0.50	ZDB-GENE-080104-1	heart
<i>fgfr1b</i>	0.48	ZDB-GENE-060503-14	pharyngeal arch
<i>sema3ga</i>	0.43	ZDB-GENE-050513-3	pharyngeal arch
<i>cldn15la</i>	0.46	ZDB-GENE-010328-12	heart
<i>ucp3</i>	0.46	ZDB-GENE-040426-1317	heart
<i>cldng</i>	0.48	ZDB-GENE-010328-7	lateral mesoderm, heart
<i>erbb2</i>	0.47	ZDB-GENE-031118-121	neural crest
<i>ltk</i>	0.48	ZDB-GENE-030616-115	neural crest
<i>wnt1</i>	0.50	ZDB-GENE-980526-526	neural crest
<i>matn1</i>	2.68	ZDB-GENE-050307-3	pharyngeal arch
<i>gnrh3</i>	8.96	ZDB-GENE-030724-4	heart
<i>pdlim3b</i>	3.43	ZDB-GENE-060130-104	heart, heart tube, mandibular arch skeleton
<i>srfb</i>	2.87	ZDB-GENE-040426-1294	heart rudiment, primitive heart tube
<i>fabp10a</i>	3.24	ZDB-GENE-020318-1	heart
<i>optc</i>	2.74	ZDB-GENE-030131-1798	pharyngeal arch
<i>myoz2a</i>	2.92	ZDB-GENE-040426-1880	heart



## Supplementary Table 2

Gene	in <i>bcl9</i> <sup>Δ29</sup>	Reference	Biological process
<i>cdh5</i>	down	Li et al., 2016	Valve formation, downstream of Notch
<i>erbb2</i>	down	Camenisch et al. 2002	EMT during valve formation
<i>vegfaa</i>	down	Lee et al. 2006	Valve formation
<i>tgfr1a</i>	down	Mercado-Pimentel et al., 2007	EMT during valve formation
<i>rbck1</i>	down	Wang et al., 2013	Candidate gene for a rare CHD
<i>fgfr1b</i>	down	Review: Rochais 2009	SHF/OFT development
<i>wtip</i>	down	Wijk et al., 2009; Powell et al. 2016	Canonical Wnt inhibitor, epicardial development
<i>pdlim3b</i>	up	Pashmforoush et al., 2001	RV cardiomyopathy, actin filament organization
<i>myoz2a</i>	up	Gomes et al., 2016	Cardiomyocyte maturation, myofibril assembly
<i>myl4</i>	up	Review: England & Loughna 2013	Atrial myosin
<i>sema3ga</i>	down	Yu et al., 2005	Cranial neural crest cell migration
<i>wnt1</i>	down	Dorsky et al. 1998	Neural crest fate induction
<i>rbck1</i>	down	Landgraf et al., 2010	Craniofacial development
<i>ltk</i>	down	Simoes-Costa et al., 2014	Cranial neural crest development
<i>matn1</i>	up	Shao et al., 2016	Craniofacial development

Supplementary Table 3

P<0.05 - GO biological process	Gene number	Expected Number	Fold Enrichment	P-value
ribosome biogenesis	71	18.56	3.83	5.60E-17
gene expression	325	207.72	1.56	1.59E-12
primary metabolic process	669	517.83	1.29	1.00E-11
cellular nitrogen compound biosynthetic process	289	181.69	1.59	1.66E-11
cellular protein metabolic process	291	190.65	1.53	1.81E-09
ribosomal large subunit biogenesis	29	5.22	5.55	3.43E-09
macromolecular complex subunit organization	170	95.11	1.79	3.72E-09
cellular component assembly	223	136.6	1.63	4.57E-09
rRNA processing	44	12.42	3.54	1.78E-08
ribosome assembly	26	4.59	5.67	3.52E-08
organelle organization	284	191.21	1.49	7.76E-08
cytoplasmic translation	21	3.03	6.92	1.11E-07
RNA processing	103	50.1	2.06	1.36E-07
rRNA metabolic process	45	13.9	3.24	1.86E-07
ribonucleotide metabolic process	56	20.18	2.78	2.49E-07
ATP metabolic process	39	11.22	3.48	5.36E-07
ncRNA processing	56	21.45	2.61	2.27E-06
ribosomal small subunit biogenesis	24	5.08	4.72	8.31E-06
nucleotide metabolic process	64	28.36	2.26	3.55E-05
ribosomal small subunit assembly	12	1.34	8.95	1.68E-04
mitochondrial ATP synthesis coupled electron transport	18	3.6	5	4.28E-04
mitochondrion organization	53	24.13	2.2	1.69E-03
regulation of programmed cell death (	154	102.52	1.5	4.35E-03
cellular localization	187	132.16	1.41	1.17E-02
regulation of cell death	162	111.91	1.45	1.82E-02
regulation of gene expression	341	270.03	1.26	2.03E-02
regulation of apoptotic process	149	101.32	1.47	2.12E-02
muscle system process	37	16.09	2.3	4.12E-02