

## **SUPPLEMENTAL MATERIAL**

**NodeCilia.mov:** Representative movies demonstrating cilia motility in E7.75 wildtype (Wt) and *Dnaic1* mutant (KO) mouse nodes. Nodal cilia in wildtype embryos displayed normal clockwise rotational motion generating leftward fluid flow as highlighted by the movement of 0.35 $\mu$ m microspheres placed into the surrounding bathing media. Conversely, nodal cilia in *Dnaic1* mutant embryos appeared completely immotile and no nodal flow was observed with microspheres in the bathing media displaying randomized Brownian motion. Nodal cilia moves have slowed to 30% playback speed. Scale bars = 5  $\mu$ m.

**Supplemental movie 1a, Supplemental movie 1b:** Z-Stack resections demonstrating normal aortic arch anatomy in a *Dnaic1* mutant mouse (ie. From which the images in Figure 4C,F were taken).

**Supplemental movie 2a, Supplemental movie 2b:** Z-Stack resections demonstrating hypoplastic transverse aortic arch anatomy in a *Dnaic1* mutant mouse (ie. from which the images in Figure 4D,G were taken).

**Supplemental movie 3a, Supplemental movie 3b:** Z-Stack resections demonstrating interrupted aortic arch anatomy in a *Dnaic1* mutant mouse (ie. from which the images in Figure 4E,H were taken).