

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: This file contains all AS events of all types detected to be *Esrp*-dependent in sea urchin, zebrafish, mouse and human species.

File Name: Supplementary Data 2

Description: This file contains clusters of identified homologous exons to those detected as *Esrp*-dependent in sea urchin, zebrafish, mouse or human.

File Name: Supplementary Data 3

Description: This table contains the list of differentially expressed genes in WT vs. *Esrp* DMUT zebrafish larva at 5dpf stage.

File Name: Supplementary Data 4

Description: This table contains the list of differentially expressed genes in Control vs. spIESRP morpholino injected embryos at 24hpf.