

## **Description of Additional Supplementary Files Document**

**Supplementary Data1:** QC\_statistic for each library.

**Supplementary Data2:** Celltype DEG of African lungfish gill/lung and cell marker resource.

**Supplementary Data3:** GSEA result of African lungfish lung and gill cell types.

**Supplementary Data4:** Numbers of DEGs between aestivated(case) and freshwater(control) African lungfish lung/gill.

**Supplementary Data5:** DEGs of each cell type between aestivated(case) and freshwater(control) African lungfish lung.

**Supplementary Data6:** DEGs of each cell type between aestivated(case) and freshwater(control) African lungfish gill.

**Supplementary Data7:** URLs for scRNA-seq data of other species.

**Supplementary Data8:** 49 genes from ZFIN.

**Supplementary Data9:** Gene set of cross-species comparison

**Supplementary Data10:** DEGs between African lungfish lung (control) and human lung.

**Supplementary Data11:** DEGs between African lungfish gill (control) and salmon gill.

**Supplementary Data12:** One to one ortholog genes between African lungfish and other species.

**Supplementary Data13:** Marker gene probes for FISH experiment.