## **Description of Additional Supplementary Files**

**Supplementary Data 1**: Primary Chondrocytes Osmotic stress RNAseq Rhythmic Genes

**Supplementary Data 2**: Primary Chondrocytes Osmotic stress RNAseq T0 vs T4 DEGs

**Supplementary Data 3**: Primary Chondrocytes Osmotic stress RNAseq Rhythmic Canonical Pathways

**Supplementary Data 4**: Primary Chondrocytes Osmotic stress RNAseq Rhythmic Upstream Regulators

Supplementary Data 5: Primary Chondrocytes Osmotic stress RNAseq T0 vs T4

Supplementary Data 6: Primary Chondrocytes Osmotic stress RNAseq T0 vs T4

**Supplementary Data 7**: Cartilage Running WT DEGs

**Supplementary Data 8**: IVD Running WT DEGs

**Supplementary Data 9**: Cartilage Running Canonical Pathways

**Supplementary Data 10**: Cartilage Running Upstream Regulators

**Supplementary Data 11**: IVD Running Canonical Pathways

**Supplementary Data 12**: IVD Running Upstream Regulators

**Supplementary Movie 1:** Bioluminescence imaging of PER2::Luc mouse spine segment. The tissue was synchronised with Dex at the beginning of recording. After 3 days sorbitol was added to increase osmolarity by +200 mOsm.