

Transcriptomic of the leech *Ozobranchus jantseanus*

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The *Ozobranchus jantseanus* is a turtle leech with ability to survive after exposure to super-low temperatures such as storage in liquid nitrogen. It is capable to long-term storage at temperatures as low as -90°C without any viability loss. Leeches can endure repeated freeze-thaw cycles in the temperature range from 20°C to -100°C .

In order to understand the genetic and molecular mechanisms underlying such a unique ability we initiated genomic and transcriptomic projects.

Preliminary whole-genome analysis showed that the genome size is 110Mb - indicating that the *O. jantseanus* genome size was one of the smallest in Annelida group. De novo transcriptome assembly resulted to 34 thousands of sequences.

With the aim of get new insights about biomolecules defining the resistance of the leech to low temperature, we analyzed of mRNA expression in several groups of leeches: control active animals, and in the process of recovery after complete freezing (immediately after freezing - 3h - 24h after freezing). We observed little changes of expression in most of Top - 100 abundant transcripts by RPKM. Surprisingly that among them more than 38% of the 100 most prevalent transcripts (by mRNA copy number) expressed in the leech are orphan genes and they weren't found in known organisms in data base.

We observed dramatically decreasing in RPKM value for coadhesin, thrombospondin, destabilase, GLIPR1-like protein, properdin, brain-specific angiogenesis inhibitor, innexin expressing genes transcripts, and increasing in gene expression for copper transport protein, fibrinolytic enzymes, expansin-like proteins, trypsin, chymotrypsinogen, carboxypeptidase, apoptosis preventing protein and etc. Experiments described above were measured from immediately after freezing state to control active animals. Probably increasing of the gene transcripts expression was a result of damaged structures reparation or removal.