

STSM Scientific Report

Purpose of the STSM

The Vitellogenin Receptor (VtgR) belongs to the low-density lipoprotein receptor superfamily (LDLR). The receptor-mediated uptake of VTG is crucial for oocyte growth in egg-laying animals because they mediate a key step in female gamete development. In this STSM we tried to know if the European eel possesses one or two VtgR, as a result of the teleost third whole genome duplication event (3R), by performing phylogenetic analyses of the vertebrate LDLR superfamily.

Description of the work carried out during the STSM

We performed the phylogenetic analyses of the Low Density Lipoprotein Receptor superfamily, which includes the Vitellogenin Receptor (VtgR). We first searched for LDLR genes, by BLAST analyses in various vertebrate genomes, including European and Japanese eel draft genomes, by using the CLC DNA Workbench 6 software and the NCBI and e!ENSEMBL websites. We then performed phylogenetic analyses by using Neighbourhood Joining and Maximum Likelihood Methods.

Description of the main results obtained

First, the search in European and Japanese genomes revealed in each species 4 genes coding for LDLR superfamily members. Phylogenetic analysis of LDLR superfamily revealed a single VtgR gene in the eel, orthologous to other vertebrate VtgR. The three other genes belong to other clades of the LDLR superfamily. This indicates that the putative second VtgR gene, issued from the teleost-specific 3R, is lacking in the eel as in other teleosts, and would have been lost early after the 3R.

Confirmation by the host institution of the successful execution of the STSM

Dr. Sylvie Dufour, Director of the Research Unit BOREA "Biology of Aquatic Organisms and Ecosystems", National Museum of Natural History, National Center for Scientific Research (MNHN, CNRS, Paris, France) certifies that Marina Morini visited her laboratory as a guest researcher from December 11th to 28th of 2014 thanks to a grant awarded by Short Term Scientific Mission, COST Action FA1205. Marina Morini has been trained under the supervision of Dr Anne-Gaëlle Lafont, Research Scientist at BOREA, and she successfully performed the phylogenetic analyses for VtgR.

Signed: Sylvie Dufour
Director, Research Unit BOREA

Signed: Marina Morini

A handwritten signature in blue ink, appearing to read 'S Dufour', written in a cursive style.A handwritten signature in blue ink, appearing to read 'M Morini', written in a cursive style.