

STSM Scientific Report

Description of the work carried out during the STSM

Quantitative real-time Polymerase Chain Reactions (qPCR) were carried out to determine the expression of the 5 estradiol receptors identified by the host laboratory in the European eel: 3 nuclear (*ESR1*, *ESR2a*, *ESR2b*), and 2 membrane (*GPERa* and *GPERb*) receptors. Their expression was measured in the brain-pituitary-gonad (BPG) axis, in male eels in freshwater (FW) and seawater (SW), before and during hCG-induced spermatogenesis (Week1 to Week8), and under two thermal regimes (T10 and T15) (experiments performed at UPV, Valencia). In addition, synteny and phylogenetic analyses of nuclear progesterin receptor genes (*pgr*) were performed to better understand their evolutionary history.

Description of the main results obtained

Under T10 and T15 regimes, the increase in water salinity (FW to SW) induced an increase of *ESR1*, *ESR2a* and *ESR2b* expression in all the tissues of the BPG axis. In hCG-treated eels, the expression of the 3 nuclear receptors increased in the pituitary and testis up to W5 for T15 and W6-7 for T10, then decreased. The expression of the 2 membrane receptors increased at the end of the spermatogenesis, only for T15. The low temperature regime seems to ~~affect and~~ delay the changes in the expression of estrogen receptors in the BPG axis. In the testis, estrogen nuclear receptors may play a role in spermatogonia renewal, while membrane receptors would be involved in the final stages of spermatogenesis. A preliminary study indicated that E2 treatment does not affect sperm motility. Phylogeny and synteny analyses allowed us to infer the origin of the duplicated eel *pgr*. Phylogeny analysis clustered teleost PGR in two clades, one encompassing Japanese and European eel PGR1, and the second one encompassing all other teleost PGR, with Japanese and European eel PGR2 at the basis of this second clade. Synteny analysis showed that *pgr* genomic region has been duplicated in the eel as well as in the other teleosts investigated, likely as a result of the teleost specific 3R.

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