Expression profiles for six sex-specific genes during gonadal development in eels

Benjamin Geffroy, Agnes Bardonnet, Alexis Fostier, Julien Bobe, Yann Guiguen

Poster presentation

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Benjamin Geffroy [1,2], Agnès Bardonnet [1,2], Alexis Fostier [3], Julien Bobe & Yann Guiguen [3]

[1]INRA, UMR Ecobiop, [2]UPPA, UMR Ecobiop, [3]INRA-LPGP

E-mail address: bardonne@st-pee.inra.fr

The timing of sex differentiation varies greatly between teleost species. For instance it can be histologically detected very early as in Nile tilapia (19-21 days post fertilization, dpf), intermediate as in Rainbow trout (63 dpf) or late in juvenile stages as in sea bass (120– 150 dpf). In eel, histological sex differentiation occurs very lately and it is more a question of size, than age. Previous studies showed that first sign of histological sex differentiation occur between 25 and 30 cm (Beullens et al. 1997). In this gonochoristic species, it has been proposed that the undifferentiated gonad could develop into either an intersexual stage (Syrski organ) or directly into ovaries. The Syrski organ could then develop into either an ovary or a testis. In order to discriminate females, males and intersexual eels (all between 29 and 40 cm) at different stage of gonad development, we investigated the expression profile of 6 genes (qPCR) involved at different step of the sex differentiation process. Among these genes, the gene encoding the DM related transcription factor 1 (*dmrt1*) was previously reported to well discriminate male from female gonad at the earliest stages of sexual differentiation in several fish species. The gene encoding the Anti-Müllerian hormone (*amh*) and the gene encoding the gonadal soma derived factor (*gsdf*) were also reported to have a male-biased expression profile during sex differentiation. The expression of two "oocytes-specific" genes: zygote arrest 1 (*zar1*) and zona pellucida glycoprotein 3 (*zp3*), was also studied. In addition, the expression of the Forkhead box (Fox) transcription factors (foxn5) previously reported (from a transcriptomic analysis) to be female-biased, was also investigated. The PCA analysis based on this 6 genes (Fig 1) allowed to well discriminate female from male at different developing stages. In addition, data confirmed our previous results revealing that the Syrski organ could not develop into an ovary Geffroy et al. 2013). Nevertheless, the histological classification of developmental stages was different from the PCA classification (based on gene expression profile) for males and intersexuals eels, revealing the complex process that shapes sexual differentiation in eels.

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