

Abstract 23:

What goes wrong during early development of artificially reproduced European eel *Anguilla anguilla*? Clues from the larval transcriptome and gene expression patterns.

Pauline Jéhannet¹, Arjan P. Palstra^{1*}, Leon T.N. Heinsbroek², Leo Kruijt¹, Ron P. Dirks³, William Swinkels⁴, Hans Komen¹

¹ Animal Breeding and Genomics, Wageningen University & Research, Wageningen 6708 PB, The Netherlands

² Wageningen Eel Reproduction Experts, Wageningen 3708 AB, The Netherlands

³ Future Genomics Technologies B.V., Leiden, 2333 BE The Netherlands

⁴ DUPAN foundation, Wageningen 6708 WH, The Netherlands

* Corresponding author. E-mail: pauline.jehannet@wur.nl

The European eel cannot be reproduced in captivity yet but we manage to produce larvae now on a weekly basis. Larval resilience is however low and mortality during the first week is high. Larval transcriptomes were sequenced and compared between larvae that were collected at 1 day post-hatch (dph) from batches that survived less than 3dph (non-viable larvae) and larvae that survived for at least a week (viable larvae) to understand what goes wrong during early ontogeny. Expression of genes involved in inflammation and host protection was higher in non-viable vs. viable larvae suggesting that non-viable larvae suffered from infection. Expression of genes involved in homeostasis was higher in non-viable vs. viable larvae implying that non-viable larvae were possibly damaged. Morphogenesis was reduced in non-viable vs. viable larvae, probably because non-viable larvae invested energy in the immune response and homeostasis rather than in development. Major histocompatibility complex class-I (*mhc1*), M-protein (*myom2*), the dopamine 2B receptor (*d2br*), the melatonin receptor (*mtr1*) and heat-shock protein beta-1 (*hspb1*) showed strong differential expression and were therefore studied in 1, 8 and 15 dph larvae by RT-PCR to comprehend their role during ontogeny. Expression of *d2br*, *hspb1* and *mtr1* increased during ontogeny which may reflect the increase in movement at the start of swimming (8 dph) and feed searching behavior (15 dph). Expression of *mhc1* was highly expressed at all time points reflecting an active immune system. Expression of *myom2* decreased during ontogeny reflecting the growth investment. This study revealed that microbial control and salinity reduction might enhance larvae survival.