

Unraveling the Genetic Basis of Seahorse Male Pregnancy

For seahorses, a unique mode of reproduction—male pregnancy—closely resembles the pregnancy of female mammals, including humans.

In a new study, corresponding author Wilson and an international team of researchers have taken a major step toward answering the question of whether the structures of complex reproductive systems—like the seahorse's—reflect a common genetic architecture.

“Scientists have long been fascinated with the unique form of reproduction in the seahorse, and we were interested in understanding just how seahorse pregnancy takes place,” said Wilson. “Our findings provide a unique perspective on the origins of internal reproduction in animals. We were surprised to learn that reproductive systems across species are not only superficially similar, but are also controlled in much the same way.”

Male seahorses carry offspring in the brood pouch, which is functionally equivalent to the mammalian uterus. Whittington et al. (2015) tracked brood pouch gene activity of pot-bellied seahorses (*Hippocampus abdominalis*) over the duration of pregnancy and identified critical genetic changes.

A systematic comparison between the seahorse genes and reproduction in mammals, reptiles, and fishes revealed that many of the key genes are identical across species, a result that

suggests the existence of a common evolutionary toolkit associated with internal reproduction.

“While the presence of these genes in all species reflects their common ancestry,” noted Wilson, “their repeated recruitment into reproduction suggests that diverse lineages of animals have overcome the challenges of pregnancy in similar ways. Genetic studies such as ours emphasize how the shared evolutionary ancestry of animals may help to facilitate the origin of new organ systems.”

Next, the team will continue their work on the genetic basis of male pregnancy and study the genetic regulation of reproduction in species with more rudimentary forms of male pregnancy.

Reference

Whittington CM, Griffith OW, Qi W, Thompson MB, Wilson AB. 2015. Seahorse brood pouch transcriptome reveals common genes associated with vertebrate pregnancy. *Mol Biol Evol.* 32(12):3114–3131.

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