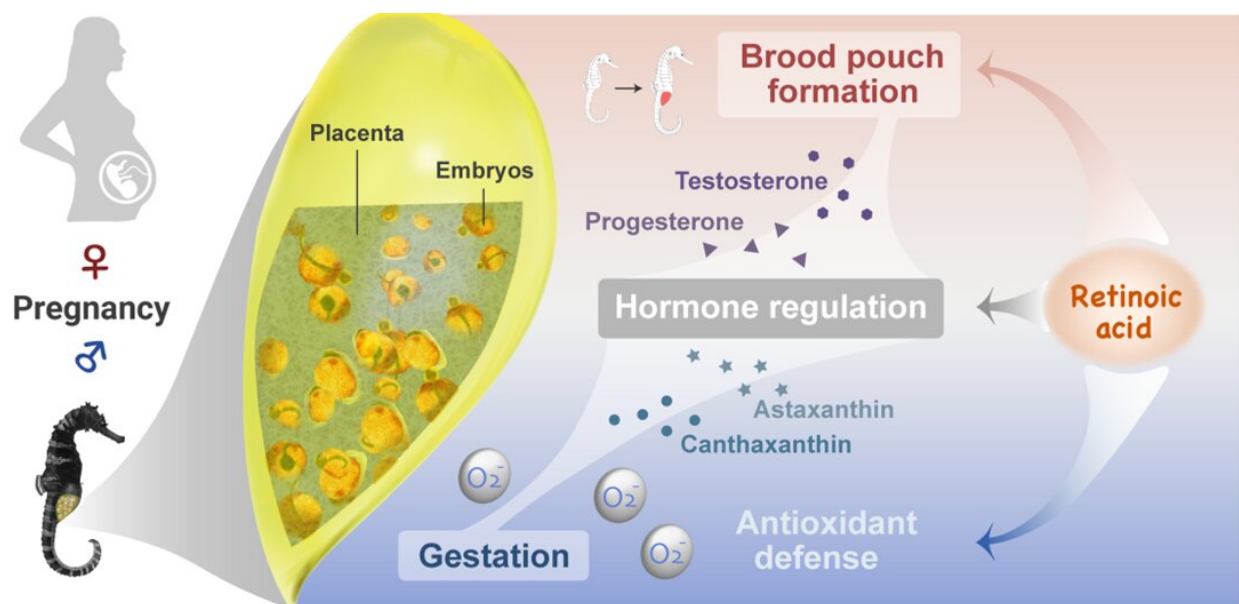


Study reveals how retinoic acid regulates brood pouch formation and pregnancy of male seahorses

November 16 2020, by Li Yuan



Regulatory role of retinoic acid in the brood pouch formation and pregnancy of male seahorses. Credit: SCSIO

Seahorses have the unique characteristic of male pregnancy, which includes the carrying of many embryos in a brood pouch that incubates and nourishes the embryos, similar to the mammalian placenta. However, the regulatory networks underlying brood pouch formation and pregnancy remain largely unknown.

Recently, researchers led by Prof. Lin Qiang from the South China Sea Institute of Oceanology (SCSIO) of the Chinese Academy of Sciences found that [retinoic acid](#) (RA) synthesis and signaling pathway played essential roles in the formation of the brood pouch and pregnancy in seahorses. This work was published in *The Innovation* on Oct. 13.

Researchers from Lin's group have previously shown that seahorses had the highest evolutionary rate among the family Syngnathidae and syngnathid fishes shared convergent genomic changes with placental mammals.

In this study, they further focused on the specific structure of brood pouch in male seahorses and combined transcriptomic and metabolomic analyzes to reveal the regulatory mechanism underlying pouch development.

RA might function upstream of testosterone and progesterone, thereby directly influencing [brood pouch](#) formation by regulating the expression of *fshr* and *cyp7a1*. Further, RA could influence tissue remodeling, organ development and immune defense by regulating target genes.

Additionally, the consistent decrease of RA and some antioxidant substances could regulate the antioxidant defense during pregnancy, which is essential for successful gestation in seahorses.

More information: Chunyan Li et al. Regulatory Role of Retinoic Acid in Male Pregnancy of the Seahorse, *The Innovation* (2020). [DOI: 10.1016/j.xinn.2020.100052](https://doi.org/10.1016/j.xinn.2020.100052)

Yan-Hong Zhang et al. Comparative genomics reveal shared genomic changes in syngnathid fishes and signatures of genetic convergence with placental mammals, *National Science Review* (2020). [DOI: 10.1093/nsr/nwaa002](https://doi.org/10.1093/nsr/nwaa002)

Qiang Lin et al. The seahorse genome and the evolution of its specialized morphology, *Nature* (2016). [DOI: 10.1038/nature20595](https://doi.org/10.1038/nature20595)

Provided by Chinese Academy of Sciences

Citation: Study reveals how retinoic acid regulates brood pouch formation and pregnancy of male seahorses (2020, November 16) retrieved 21 June 2024 from <https://phys.org/news/2020-11-reveals-retinoic-acid-brood-pouch.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.