

Researchers isolate germline stem cells in protogynous hermaphroditic *Monopterus albus*

June 14 2022, by Li Yuan

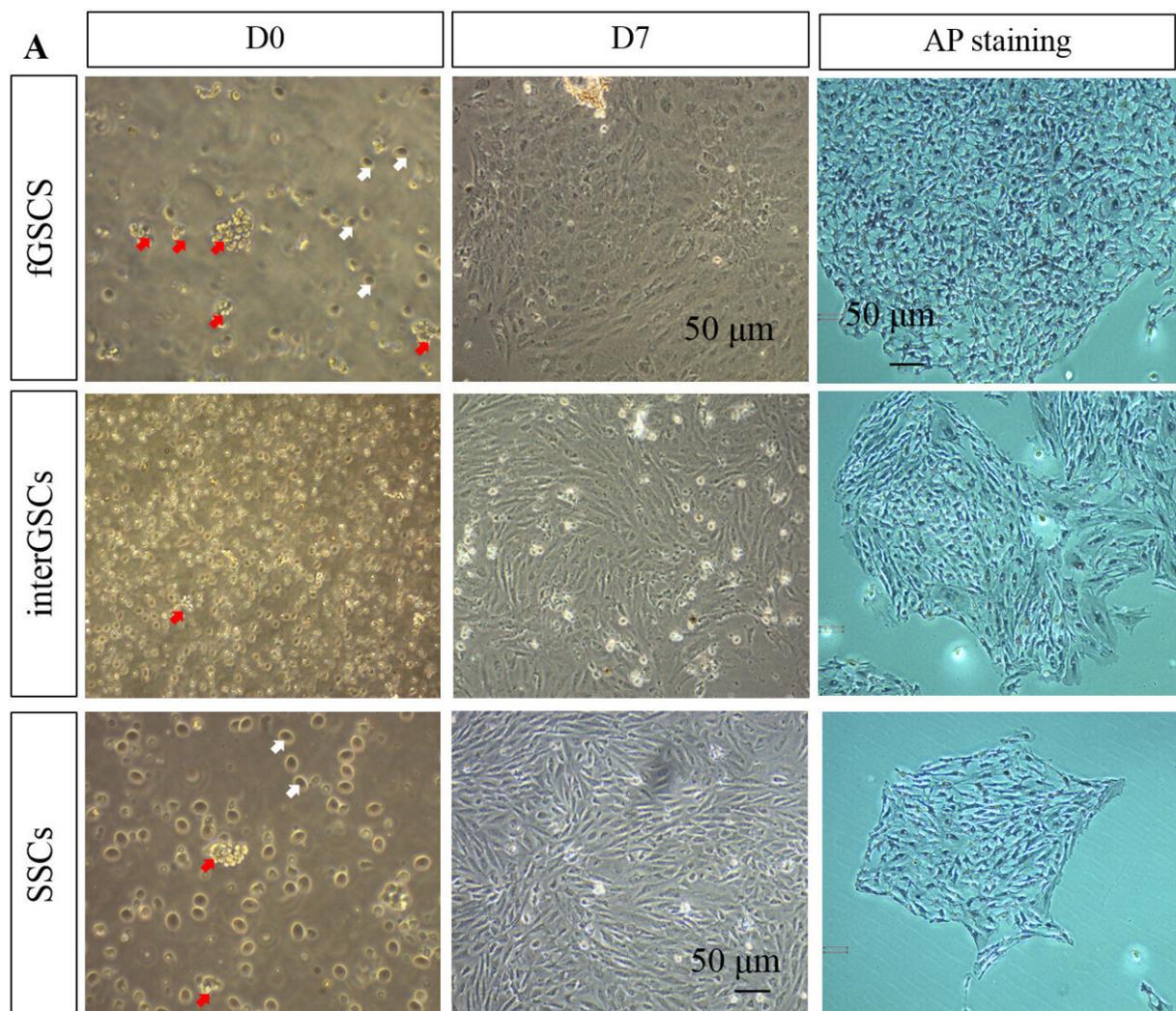


Image of AP staining of fGSCs, interGSCs and SSCs isolated from the ovary, ovotestis and testis, respectively. Credit: IHB

Germline stem cells (GSCs), originating from primordial germ cells (PGCs) during embryogenesis, are a group of unique adult stem cells in gonads that are essential to genetic information transfer.

Unlike [somatic cells](#) in the gonads, GSCs are highly specified and undifferentiated pluripotent cells that maintain the balance between self-renewal and differentiation through mitosis and meiosis.

Recently, a research group led by Prof. Sun Yuhua from the Institute of Hydrobiology (IHB) of the Chinese Academy of Sciences has isolated and enriched GSCs from ovary, ovotestis and testis of *Monopterus albus* (*M. albus*). The study was published in *Molecular Sciences*.

M. albus is one of the most important breeding fish. As a result of environmental stress, over-exploitation and their unique sex-reversal life history, the wild population of *M. albus* has decreased dramatically in recent years.

In this study, the GSCs were found in different stages of gonad development, including the ovary, ovotestis, and testis. The researchers isolated and enriched the female GSCs, interGSCs and spermatogonial stem cells (SSCs) from the ovary, ovotestis and testis, respectively. "Interestingly, interGSCs isolated from ovotestis were a group of mixture of GSCs, containing fGSCs and SSCs," said Prof. Sun.

They further analyzed the characteristic of GSCs. Cell morphology, RT-PCR analysis, immunofluorescence and [alkaline phosphatase](#) staining indicated that the cultured GSCs preserved pluripotent stem cell characteristics after several passages in vitro. Further transcriptome comparison assay suggested that distinct molecular signature existed for each type of GSCs.

To functionally identify the cultured GSCs, the researchers performed the germline transplantation. The results showed that fGSCs could colonize and contribute to the germline cell lineage of host zebrafish gonad after transplantation.

More information: Xiaoyun Sun et al, Isolation and Characterization of Germline Stem Cells in Protogynous Hermaphroditic *Monopterus albus*, *International Journal of Molecular Sciences* (2022). [DOI: 10.3390/ijms23115861](https://doi.org/10.3390/ijms23115861)

Provided by Chinese Academy of Sciences

Citation: Researchers isolate germline stem cells in protogynous hermaphroditic *Monopterus albus* (2022, June 14) retrieved 22 September 2024 from <https://phys.org/news/2022-06-isolate-germline-stem-cells-protogynous.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.