



## Germ cells transplantation in fish: the Nile-tilapia model<sup>1</sup>

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### Abstract

Spermatogonial transplantation, developed in the past decade by Brinster and colleagues, is a fascinating and powerful technique utilized to investigate male reproductive biology, mainly the aspects related to spermatogenesis and the stem cell biology. This technique also offers tremendous potential for studies involving biotechnology, transgenic animals, and the preservation of the genetic stock of valuable animals or endangered species. Although germ cell transplantation is well characterized for mammals, there is no study utilizing this approach for fish. Due to its fast growth, relative small size when it reaches sexual maturity, good adaptability to different environmental conditions and economical importance, the tilapia (*Oreochromis niloticus*) is an excellent experimental model. In the present study, we investigated the viability of adult tilapias as a recipient model for germ cells transplantation in fish. For this purpose, all approaches utilized in the present study for spermatogonial transplantation, such as endogenous spermatogenesis depletion, obtention, selection and spermatonia labeling, and the transplantation through the common urogenital papilla, were standardized in our laboratory. The preliminary results found for the recipient tilapia testes, evaluated by light and fluorescence microscopy, showed the presence of PKH26 labeled germ cells cysts in the seminiferous tubules. These findings obtained, for the first time in fish, suggest that spermatogonial germ cells can be successfully transplanted directly into the testis of this teleost. Therefore, tilapias might be utilized as an experimental model to investigate the germ cell biology and the testis function in teleosts. Moreover, this technique could be also utilized as a potential approach for fish bioengineering, preservation of genetic stock of endangered fish species or fish strains carrying commercially valuable traits.

**Keywords:** spermatogonia, transplantation, testis, tilapia (*Oreochromis niloticus*).