Insight into the complex sexuality of the only self-fertilizing vertebrate, the mangrove rivulus.

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The rivulus (*Kryptolebias marmoratus*) is a fish remarkable for its ability to maintain both ovarian and testicular tissue, which enables it to self-fertilize. Furthermore, its sexuality is particularly labile, with incubation temperature determining the initial differentiation into males or hermaphrodites, and environmental factors potentially triggering the transition from hermaphrodites to secondary males.

Because of its ease of rearing and the uniqueness of its reproduction, which permit the simultaneous study of male and female gonads and the production of clonal offspring, the rivulus appears as a promising model organism in the study of vertebrate sex determination. Additionally, because different populations show starkly different ratios of males and self-fertilization, it also represents an exceptional opportunity to understand the drivers behind sexual reproduction.

The laboratory of evolutionary and adaptive physiology of professor F. Silvestre is launching a new project aimed at investigating this divergence in reproductive strategy between populations. As a first step, we will study the transcriptional and epigenetic mechanisms that allows for the production of males at low temperature. More specifically, we plan to investigate the role of DNA methyltransferases in the temperature-dependent sex determination process as well as the effects of *dmrt1*-knockout on the pathway of testicular differentiation