

Protocol for Inducing Ovulation in Xenopus laevis

Introduction

Xenopus laevis, commonly known as the African clawed frog, is an aquatic frog belonging to the family Pipidae. X. laevis and their eggs and embryos are commonly used models in biological research, in part due to their relatively close evolutionary relationship with humans. Another appeal is that injection of gonadotropin hormones to induce ovulation in females and mating behavior in males allows female X. laevis to predictably produce a large number of oocytes throughout the year. The protocol below details the procedure to induce ovulation in female X. laevis.

Gonadotropin Hormones

The protocol for inducing ovulation in X. laevis requires the use of the following gonadotropin hormones:

Pregnant Mare Serum Gonadotropin (PMSG):

- Prepare a stock of 100 IU/mL in 1x PBS and store at -20 ° C.
 - Ilex Life Sciences LLC, Cat. No. A22721K (1000 IU) or Cat. No. A22725K (5000 IU)
 - o https://ilexlife.com/products/pregnant-mare-serum-gonadotropin-pmsg

Human Chorionic Gonadotropin (hCG):

- Prepare a stock of 1000 IU/mL in 1x PBS.
 - o Ilex Life Sciences LLC, Cat. No. A225005 (5 mg) or Cat. No. A225010 (10 mg)
 - https://ilexlife.com/products/human-chorionic-gonadotropin-hcg

Protocol

Using a 27G-30G needle, the PMSG and hCG hormones are generally injected subcutaneously into the dorsal lymph sacs of the animal in a priming step followed by a boosting step. Approximately 8-9 hours after the hCG boosting injection, *X. laevis* females kept at 18° C can be expected to being ovulating. Female *X.* laevis should rest for 3 months between ovulations to allow their oocytes to mature.

Wild type X. laevis:

- A large adult female should be initially primed with 50 IU PMSG or 50 IU hCG.
- 24 hours to 7 days after the priming injection, a boosting injection of 500 IU hCG should be given to induce ovulation.

Inbred J strain:

- Inbred J strain *X. laevis* females are smaller than wild type and thus a lesser quantity of hormone is required. An adult female should be initially primed with 30 IU PMSG or 30 IU hCG.
- 24 hours to 7 days after the priming injection, a boosting injection of 350 IU hCG should be given to induce ovulation.

Acknowledgement

This protocol has been adapted from Wlizla, Marcin et al. "Generation and Care of Xenopus laevis and Xenopus tropicalis Embryos." *Methods in molecular biology (Clifton, N.J.)* vol. 1865 (2018): 19-32. doi:10.1007/978-1-4939-8784-9_2.

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