

## Light and electron microscopic observation of presumptive erythropoietic foci in the medaka yolk sacs

Gen Niimi<sup>1</sup> and Hideki Imada<sup>2</sup>

<sup>1</sup> Laboratory of Electron Microscopy,

<sup>2</sup> Department of Physiology, School of Medicine, Fujita Health University, Toyoake, Aichi, 470-1192, Japan.

*Key Words:* fish, embryo, yolk sac, erythropoiesis, hematology.

---

---

### SUMMARY

---

---

The medaka, *Oryzias latipes* is a useful animal model for the study of primary vasculature in vertebrate embryos. Using benzidine stain for erythroid cells, we found presumptive erythropoietic foci in the yolk sac vitellogenesis zone at stage 39. These foci were present in the yolk syncytial layer, in the extravascular and vitellogenesis zone from 9 days post fertilization (dpf) to 11 dpf, and then declined between 12 to 13 dpf with yolk mass depletion. A table of previous reports on various species of fish showing yolk sac erythropoiesis is also presented.

### INTRODUCTION

Zebrafish, medaka, pufferfish, and cichlids are teleost fish models that are very useful for study of developmental genetics. Medaka is a small fish native to East Asia that is easy to cultivate, making it useful for laboratory procedures, and it has become a satisfactory model for hematological genetics (Koh et al., 2004).

In most vertebrate groups, primitive erythropoiesis first appears in the yolk sac (Zon, 1995). In this study, we present a histochemical characterization of the presence of an erythropoietic site in the medaka yolk sacs from 9 days post fertilization (dpf) through 13 dpf using light and electron microscopy.

### MATERIALS AND METHODS

#### *Animals*

Medaka, *Oryzias latipes*, orange-red type fish obtained from a local pet shop were held in a plastic aquarium (16 × 32 × 22 cm), with a common air source, at 26°C and fed Tetra-KilliMin (Tetra, Tokyo, Japan) daily. Fish were mated, and