COMPARATIVE STUDIES ON PROTEIN INGESTION BY EMBRYOS IN FOUR GOODEID SPECIES: *Xenoophorus captivus, Ameca splendens, Girardinichthys viviparus* AND *Ataeniobius toweri*

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ABSTRACT

Goodeid embryos are highly dependent on maternal nutrient supply during gestation within the lumen of the ovary. The embryos except those in *A. toweri* are characterized by trophotaeniae extending from the perianal lips. These mostly ribbon-like processes are predominantly covered with gut-derived absorptive epithelium that serves as a site of nutrient absorption. Embryotrophe provided by the inner ovarian epithelium contains a wide variety of proteins. There are two morphologically distinct, species-specific basic types of trophotaenial absorptive cells (TACs) based on the absence or presence of an endocytic complex. The one represented by *G. viviparous* is conspicuously devoid of an apical membrane system for absorption and transport of macromolecules. Nonetheless, unspecific fluid-phase as well as adsorptive endocytosis was studied using horseradish peroxidase (HRP) and cationized ferritin (CF), respectively. The second type of TACs is distinct by an extensive endocytic apparatus consisting of coated pits, small coated and non coated vesicles, endosomes, lysosomes, dense tubules and various pleomorphic vacuoles. It is represented by *X. captivus* and *A. splendens*. Functional studies of unspecific protein absorption in *X. captivus* showed its ability to direc tendocytosed proteins to their various destinations. *Ataeniobius toweri* embryos were exposed to CF in the ovarian cavity. Swallowed iron core protein was traced in the anterior, middle, and posterior gut segments, all of which were shown to contain protease activity. Electron microscopic visualization showed the tracer granules in process of disintegration. TACsin *A. splendens* are of the endocytic type. They were shown to ingest a wide variety of proteins by receptor mediated endocytosis. Binding, uptake and digestion of a host of tracer substances was characterized by using transmission electron microscopy, electrophoretic techniques, Au-conjugated tracers, radioiodinated labels, enzyme histochemistry, and fluorescence spectrophotometry.