Autophagosomes In Oocytes And Eggs Of The Insect Vector *Rhodnius Prolixus*

Fonseca, A.S[1] ; Masuda, H.[1] ; Ramos, I.[1]

[1]Instituto de Bioquímica Médica, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brasil

Macronutrients required for embryo development are stored in specialized yolk organelles during oogenesis. Part of those nutrients is mobilized during early embryogenesis and the mechanisms involved in this mobilization are poorly understood. Macroautophagy is a degradation pathway of intracellular components, where double-membrane vesicles, named autophagosomes, are formed around target organelles leading to their degradation after fusion with lysosomes. The autophagy-related protein 8 (Atg8) is conjugated to the phosphatidylethanolamine of the autophagic membrane. Atg8 lipidation (form Atg8-II) is considered a central marker of autophagy, since it is important for the elongation and closure of the autophagosome. We test if autophagy is involved in the yolk degradation during early embryogenesis using the insect vector *Rhodnius prolixus* as a model. We analyzed the expression of the RpAtg8 protein and mRNA during oogenesis and embryogenesis of the insect. When compared to mature oocytes, RpAtg8 mRNA expression increases 70% after 72h of embryogenesis, when part of the main yolk proteins are massively degraded. Immunoblotting against RpAtg8 throughout oogenesis and early development show that RpAtg8-II is present in oocytes since vitellogenesis, suggesting that the biogenesis of the yolk organelles leads to the formation of autophagosomes. Considering these results and assuming that autophagy is initiated only after fertilization, we search for autophagy-triggering mechanisms, like the levels of free amino acids and AMP:ATP ratio. We found that amino acids levels increases 50% in the first 24h after fertilization, suggesting that their low levels at early development could be acting as an autophagy trigger. Our results support the hypothesis that autophagy participates in yolk degradation. We intend to quantify AMP and ATP in the egg cytoplasm during early development and to immunolocalize RpAtg8 to identify autophagosomes within the yolk organelles.

Palavra chave: Rhodnius prolixus, autophagy, yolk organelles
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