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Characterization of ligand-induced endocytosis in the olfactory system of larvae *Xenopus laevis*

In vertebrates, olfactory perception depends on the activation and adaptation of olfactory signalling transduction in olfactory receptor neurons (ORNs). However, so far the olfactory adaptation mechanisms has not been studied as well as the activation mechanism, especially with aspect to the internalization of olfactory receptors (ORs). To investigate olfactory adaptation and examine a staining method taking advantages of this mechanism, several different experiments were performed in aquatic vertebrates, *Xenopus laevis* larvae. First, this study demonstrates that ligand-induced endocytosis happens after odorant exposure in the ORNs of larval *Xenopus laevis* by ligand-induced staining (LIS). Second, LIS was characterized to further understand the adaptation mechanism in ORNs and the applied staining method. Third, this study provides evidences that [Ca\(^{2+}\)]\(_{in}\) and [Ca\(^{2+}\)]\(_{out}\) are influencing factors of LIS and proposes a model of calcium modulation for olfactory adaptation in larval *Xenopus laevis* ORNs.