

Novel secreted protein AFRO regulates anterior formation in amphibian embryos
両生類胚の前方形成を調節する新規分泌型ペプチド AFRO

Master Program, Graduate School of Media and Governance, Keio University

Yuka Sato

Abstract

Many proteins secreted from dorsal side of gastrula embryos in vertebrates have important roles for the dorsoventral patterning of early embryogenesis. Here we describe a novel secreted protein, AFRO (amphibian-specific factor regulating optic formation), which is specifically expressed in dorsal side according to the RNA-seq analysis that we previously performed.

AFRO had 259 amino acids as secreted region in addition to 17 amino acids as N-terminal signal peptide motif. Sequence similarity searching revealed that AFRO was only reported in gene database for *Xenopus laevis* and *tropicalis* and consisted of no characterized domain inside. Using *Xenopus laevis* embryos, we first checked expression pattern of *AFRO* by RT-PCR and in situ hybridization, resulting that *AFRO* was expressed spatiotemporally, localized at dorsal side of gastrula embryo, and remarkably detected at anterior neuroectoderm and midline in neurula stage. Functional analysis using microinjection of *AFRO* mRNA or antisense oligonucleotide targeting it revealed that AFRO could make severe effects on anterior neural and especially optic formation.

Most proteins consist of multiple domains, and each domain determines evolutionary relationship to other molecules. However, AFRO is recognized as *Xenopus*-specific and uncharacterized protein, while it has very strong activity to regulate optic formation. We would like to discuss this somehow unusual situation on AFRO.