Z3 1 1 Role for Yin Yang 1 (YY1), a Vertebrate Polycomb Group (PcG) Gene in Xenopus Embryonic Development

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Polycomb group (PcG) proteins are involved in the heritable stable expression of genes. Yin Yang 1 (YY1), a homolog of the Drosophila Polycomb group (PcG) gene pleiohomeotic (pho), is a zinc finger-containing transcription factor that can act as a transcriptional repressor, an activator, or an initiator element-binding protein. To investigate the role of YY1 in early development of vertebrate, we analyzed the expression pattern of this gene and performed the gain- and loss-of-function experiment using sense and antisense YY1 RNA in Xenopus embryo. Xenopus YY1 mRNA expresses in ubiquitous fashion during embryogenesis with weak staining in CNS, tail tip and protodeum. The YY1 antisense caused defects in Xenopus development. Many embryos failed to fuse the neural folds along the dorsal midline, resulting in split tail phenotype, and displayed deficiency in eye development. In contrast, this antisense injection did not disrupt mesoderm induction and patterning. Our data suggest that YY1 may have an important role during Xenopus embryogenesis.

Z3 12 Characterization of the shk-1, shank homologue in C. elegans

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Shank is a novel family of the PSD (post-synaptic density) protein complex. It was found in rat brain and contains multiple sites for protein interaction including a PDZ (PSD-95, Disk-Large, ZO-1) domain that mediates binding to GKAP, ankyrin repeats, a SH3 domain, a SAM domain that mediates multimerization, and a proline-rich domain that binds cortactin. It was reported that these multiple protein-interactions cause shank to function as a scaffold protein in the PSD, cross-linking receptor/PSD-95 complexes and coupling them to regulators of the actin cytoskeleton. A shk-1(C33B4.3), C. elegans homologue of shank, was found in the C. elegans genome database and shows about 40% identity over 1,000 amino acids. A shk-1 shows relatively high sequence identities in the regions of ankyrin repeats and the PDZ domain. GFP expression of promoter regions of shk-1 was seen mainly in pharyngeal muscle, head sensory neurons, nerve cords and the tail region. Whole-mount immunostaining patterns with shank-1 polyclonal antibodies showed similar expression patterns. shank-1 polyclonal antibodies were raised against ankyrin repeats-containing region of rat shank-1. This expression not only confirms our previous GFPexpression results, but also shows the conservation of shank protein. We cloned and sequenced the full cDNA from a cDNA library and a EST clone from Yuji Kohara. Currently we are conducting RNAi experiments to observe loss-of function phenotypes and elucidate its biological role in C.elegans. Screening for deletion mutant by UV-TMP mutagenesis is also under way.