Transcriptional activity and expression of liver X receptor in the ascidian Halocynthia roretzi.

Ahmed Ahmed Raslan, Jung Hwan Lee, Jihye Shin, Yun Kyung Shin and Young Chang Sohn

Abstract:

Liver X receptors, LXR, are ligand-activated transcription factors that belong to the group H nuclear receptor (NR) superfamily. In this study, an LXR (HrLXR) cDNA was cloned from the ascidian Halocynthia roretzi hepatopancreas and characterized to examine the functional conservation of ancestral LXR in chordates. A phylogenetic analysis of HrLXR showed that it belongs to the tunicate (urochordate) LXR subgroup, which is distinct from vertebrate LXR. Quantitative real-time PCR analysis revealed that HrLXR mRNA was expressed predominantly in the gills, and highly expressed in unfertilized eggs followed by decrease at later embryonic and larval stages. Unexpectedly, HrLXR was not activated by GW3965, whereas a synthetic ligand for a farnesoid X receptor, GW4064, activated HrLXR. This activation was abolished by the deletion of 51 amino acids from the N-terminus. In a mammalian two-hybrid system, HrLXR interacted with HrRXR in the presence of GW4064 or 9-cis retinoic acid. The injection of GW3965 and GW4064 in vivo increased the ATP-binding cassette sub-family G member 4 and HrLXR mRNA levels in the hepatopancreas and gills. These results suggest that the mRNA expression and transcriptional properties of HrLXR are different from those of vertebrate LXR, although HrLXR is likely responsive to the related NR ligand, GW4064.

Published In:

Zoological Science, 30(9), 731-41