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The Structure and Function of Xenopus NO38-Core, A Histone Chaperone in the Nucleolus. Variketta Namboodiri, Ildiko Akey, Marion Schmidt-Zachmann, James Head, Christopher Akey, Dept. of Physiology and Biophysics, Boston Univ. School of Medicine, Boston, MA 02118 USA.

Xenopus NO38 is an abundant nucleolar protein and a member of the Nucleoplasmin (Np) family of chaperones. Here, we report crystal structures of the N-terminal domain of NO38, as a pentamer and a decamer. As expected, the NO38 monomer shares the Nucleoplasmin (Np) family fold. However, the conformation of the signature α -hairpins and water-mediated interactions between the pentamers, differ in the NO38 and Np decamers. Further studies show that NO38 and Np each will bind equal amounts of the four core histones. However, NO38 prefers to interact with the (H3-H4)₂ tetramer, while Np prefers the (H2A-H2B) dimer. The ability of these chaperones to discriminate between histone partners may reflect differences in their respective decamers. In addition, NO38 and Np will each bind non-cognate histones, when their preferred partner is absent. When taken together, these data suggests that NO38 may function as a histone chaperone in the nucleolus.