Crystal Structure and Function of Human Spindlin1

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Spindlin1 (Spin), is an abundant maternal transcript present in the unfertilized egg and 2-cell, but not 8-cell stage embryo. It associates with the meiotic spindle and is phosphorylated by MOS/ MAP kinase pathway in a cell-cycle-dependent fashion. Our study indicated that spin is localized into the cell nuclei and associated with the DNA binding activity. Although experimental results indicate that this protein family includes important players in meiosis and early embryogenesis, their biochemical function is largely unknown.

Here, spin has been cloned, overexpressed and purified, and crystals have been obtained using hanging-drop vapor-diffusion technique. Diffraction data sets up to 2.2 Å (crystal form 2) were collected, and single-wavelength anomalous diffraction (SAD) was used for phasing. The refined structure exhibits a new fold with no obvious similarity to those of other proteins with known three-dimensional (3D) structure. A model of spin-DNA binding is proposed based on the presented structure.

Keywords: spindlin1, DNA-binding, SAD