Abstract

Cadherins are the principal cell surface proteins functioning as the biochemical anchor that bind cells together. Other than cell adhesion, cadherins also play a vital role in cell migration, proliferation, differentiation and overall organization of complex neural structures. Based upon the structural, and functional criteria classical cadherin subfamily is divided into two major subgroups: type I and type II. Prominently expressed in the nervous system, N-cadherin is a member of type I cadherin subgroup and is characterized by the presence of five extracellular (EC) domains, followed by a single transmembrane domain and conserved motif for catenin binding in the cytoplasm. Many studies published in the past and recent literature have suggested different structural and functional roles of extracellular domains. We intend to study the biophysical and biofunctional role of multiple combinations of EC domains. Here we describe the structural characterization of the constructs: N3-N4-N5 and N4-N5 of N-cadherin. Rest of the domain combinations are also being explored in parallel. By employing biochemistry, structural bioinformatics and biophysical studies, we aim to gain insights into the mechanical unfoldability, stretch-ability and refolding-ability of individual domains and linker regions, and their calcium-binding characteristics, to understand their modes of function.