Abstract

Cadherins are calcium-dependent cell surface proteins that play a key role in cell-cell adhesive interactions. We cloned, expressed and purified over 30 different constructs of extracellular domains derived from human E- and N-cadherin, both singly and in combinations (i.e., as fused domains), with a view to study the structural contents and structural-biochemical behavior(s) of these domains.

We have studied the extent to which a cadherin domain's behavior changes when it is present in the context of its neighboring domains. The first part of the talk will demonstrate evolutionary relationships between extracellular (EC) domains of E- and N-cadherins through a discussion of how they are related, in terms of similarities and differences of structure, sequence and function. The second part of the talk will describe results obtained from structural-biophysical characterization of individual domains and domain fusions, querying differences in structural contents, stabilities and relative reusabilities, as well as calcium binding and its effects upon structure and stability, and dimer formation. The results support the prevalent notion that the extracellular domains 1, and 2, of E- and N-cadherin, are mainly involved in intermolecular and inter-cellular interactions, with domains 3, 4 and 5 performing supporting roles.