# EF-Hand Domain

National Cancer Institute

## Source

*National Cancer Institute. EF-Hand Domain. NCI Thesaurus. Code C13956.*

Forming a single Ca2+-binding site in many calcium-binding proteins, the basic EF-Hand Domain consists of a conserved 12-residue loop region between two perpendicular 10-12 residue alpha helices (helix-loop-helix). Ca2+ interacts with loop residues in a pentagonal bipyramidal configuration; each loop residue is important for Ca2+ coordination. Loop residues 1, 3, 5, 7, 9, and 12 (invariant Glu or Asp) are directly necessary for Ca2+ binding. Amino-acid variations at positions 1, 3, 5, 7, and 9 alter ion affinity. Single or multiple domains cause structural/functional variations. EF-hand Proteins are grouped into either regulatory/signaling or structural/buffering/transport categories. Ca2+ binding to regulatory proteins induces conformational/functional change; Ca2+ binding to structural proteins seems to provide a Ca2+ buffer. (NCI)