

[Open Peer Review on Qeios](#)

Helix-Loop-Helix Domain

National Cancer Institute

Source

National Cancer Institute. *Helix-Loop-Helix Domain*. NCI Thesaurus. Code C13313.

In transcription regulators of cell cycle control, cell determination, and cell differentiation, the conserved HLH (Helix-Loop-Helix) Domain of 40-50 amino acids forms amphipathic helices between a variable loop. HLHs typically mediate homo- or heterodimerization through interactions with self or other motifs to activate or inactivate trans-activating function. The N-helix often contains DNA-interacting basic residues; the C-helix typically contains characteristically spaced hydrophobic residues. An adjacent basic region of 15 amino acids in most HLH proteins binds to DNA. Basic (b)HLH proteins bind variants of the 'CANNTG' E-box. Proteins lacking the basic domain act as inhibitors, failing to bind DNA. bHLH proteins exhibit specific dimerization partner combinations. In calcium-binding proteins, certain invariant hydrophilic loop residues in the HLH motif bind calcium. (NCI)