Optimizing the Photocontrol of bZIP Coiled Coils with Azobenzene Crosslinkers: Role of the Crosslinking Site


Abstract:

DNA binding by bZIP-type coiled-coil proteins can be inhibited by dominant negative versions of the proteins in which the N-terminal basic region is replaced by an acidic extension. Photocontrol of bZIP function can be achieved by introducing intramolecular azobenzene-based crosslinkers into dominant negatives. We show that the largest degree of photocontrol is achieved when the crosslinker is introduced into the zipper region of the dominant negative between Cys residues placed at f sites in the heptad segment showing the highest intrinsic helical propensity. The overall affinity of the dominant negative can then be tuned by varying the length of the acidic extension.

Keywords:

azobenzene; coiled coils; CREB; helical propensity; photocontrol

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