1b) Transcription factors

Promoter regions

only found upstream (5’) of gene

- \textit{cis}-acting element:
  located on same strand as
  gene it controls

- \textit{trans}-acting element:
  binds within regulatory region of a
  gene
Enhancer regions

- increase efficiency of initiation
- located upstream, downstream, or within gene
- can stimulate transcription at a distance from gene
- also has cis- and trans-acting elements
Transcription factors

- DNA-binding (DBD)
- Trans-activation
- Dimerization (optional)
- Ligand-binding (LBD) (optional)
DNA binding domains (DBD)

A. helix-turn-helix (HTH)
B. zinc finger
C. basic helix-loop-helix (bHLH)
D. basic zipper (bZIP)
Transactivation domains

- recruits RNA polymerase to promoter
  (protein-protein interactions)

Dimerization domains

- Leucine zipper (heptad repeat)

Ligand-binding domains (LBD)

- Hormone binding domain