

Significant Selective Pressure in N-terminus of TBP Suggests Placental Protection Predicated on Two Valines

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TATA Box-Binding Protein (TBP) is very highly conserved in all eukaryotes due to its essential role in initiating transcription. TBP helps recruit transcriptional machinery to gene promoters by interacting with various transcription factors. The C-terminal DNA-binding domain is one of the most highly conserved domains known, but the function and structure of the N-terminal vertebrate domain, which contains a variable poly-Q region, is less understood. Researchers have shown that recombinant mice lacking the N-terminus of TBP develop placental defects that usually trigger maternal immune response. Using PAUP, ModelTest and TreeSAAP, we identified significant selective pressure among eutherian mammals to preserve two valine residues just after the end of the poly-Q repeat. Neither valine is present in marsupials, suggesting that the residues cause the formation of a hydrophobic pocket that alters transcriptional regulation to avoid maternal immune response in eutherian mammals.