

# The structural basis for the oriented assembly of a TBP/TFB/promoter complex

Otis Littlefield<sup>1,2</sup>, Yakov Korkhin<sup>1</sup>, and Paul B. Sigler<sup>1,2</sup>

<sup>1</sup>*Department of Molecular Biophysics and Biochemistry and the*

<sup>2</sup>*Howard Hughes Medical Institute, Yale University, New Haven, CT 06511 USA*

Recently, the definition of the metazoan RNA polymerase II and archaeal core promoters has been expanded to include a region immediately upstream of the TATA box called the B-recognition element (BRE), so named because eukaryal transcription factor TFIIB and its archaeal orthologue TFB interact with the element in a sequence-specific manner. Here we present the 2.4-Å crystal structure of archaeal TBP and the C-terminal core of TFB (TFBc) in a complex with an extended TATA-box-containing promoter that provides a detailed picture of the stereospecific interactions between the BRE and a helix-turn-helix motif in the C-terminal cyclin repeat of TFBc. This interaction is important in determining the level of basal transcription and explicitly defines the direction of transcription.