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A Comparison of Oct-1/DNA/SNAP190 Transcriptional Signaling Complexes. S.L. Hovde, K. Strong, A. Brooks, J.H. Geiger, Dept. of Chemistry, Michigan State Univ., East Lansing, MI, 48824.

The Oct-1 protein acts as a transcriptional activator of the human small nuclear (sn) RNA gene family. In human snRNA transcription there is a protein complex, SNAPc which is composed of five proteins and functions to nucleate pre-initiation complexes for both Pol II and Pol III transcription. Transcriptional activation of human snRNA genes by Oct-1 requires direct protein interactions between Oct-1 and the SNAP190 component of SNAPc. The crystal structure of the Oct-1 POU protein/U1 octamer/SNAP190 peptide (884 - 910) ternary complex has been refined to an R-factor of 22.8 at 2.4 Å resolution. The U1 octamer site weakly recruits the Oct-1 POU domain, although this recruitment is stimulated by this peptide containing the Oct-1 binding domain of SNAP190. The ternary structure revealed that the SNAP190 peptide makes several protein contacts with the Oct-1 POU-specific domain and with the DNA phosphate backbone within the enhancer. Two other complex crystal structures have been solved involving Oct-1 POU and a longer SNAP190 peptide on different DNA sequences. These DNA sequences include the U1, U6, and H2B octamer sequences.

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