

## E0062

**X-ray Structure of a Protein-Conducting Channel.** William M. Clemons, Bert Van Den Berg Jr., Ian Collinson, Yorgo Modis, Enno Hartmann, Stephen C. Harrison, Tom A. Rapoport, 612 LHRRB, Dept Of Cell Biology, Harvard Medical School, 240 Longwood Ave., Boston, MA 02115.

A conserved heterotrimeric membrane protein complex (Sec61/SecY complex) forms a protein-conducting channel, allowing polypeptides to be transferred across or integrated into membranes. We report the crystal structure of the complex from *Methanococcus jannaschii* at 3.2 Å resolution. The structure suggests that one copy of the heterotrimer serves as a functional translocation channel. The  $\alpha$ -subunit has two linked halves, trans-membrane segments (TM) 1-5 and 6-10, clamped together by the  $\gamma$ -subunit. A cytoplasmic funnel leading into the channel is plugged by a short helix. Plug displacement can open the channel into an “hourglass” with a ring of hydrophobic residues at its constriction. This ring may form a seal around the translocating polypeptide, hindering other molecules from permeating the membrane. The structure also suggests mechanisms for signal sequence recognition and for lateral exit of TMs of nascent membrane proteins into lipid, and indicates binding sites for partners that provide the driving force for translocation.