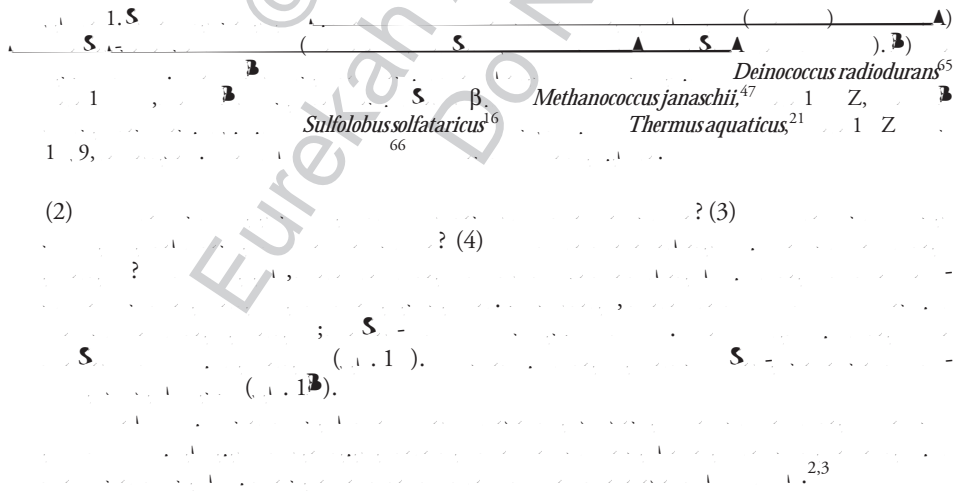
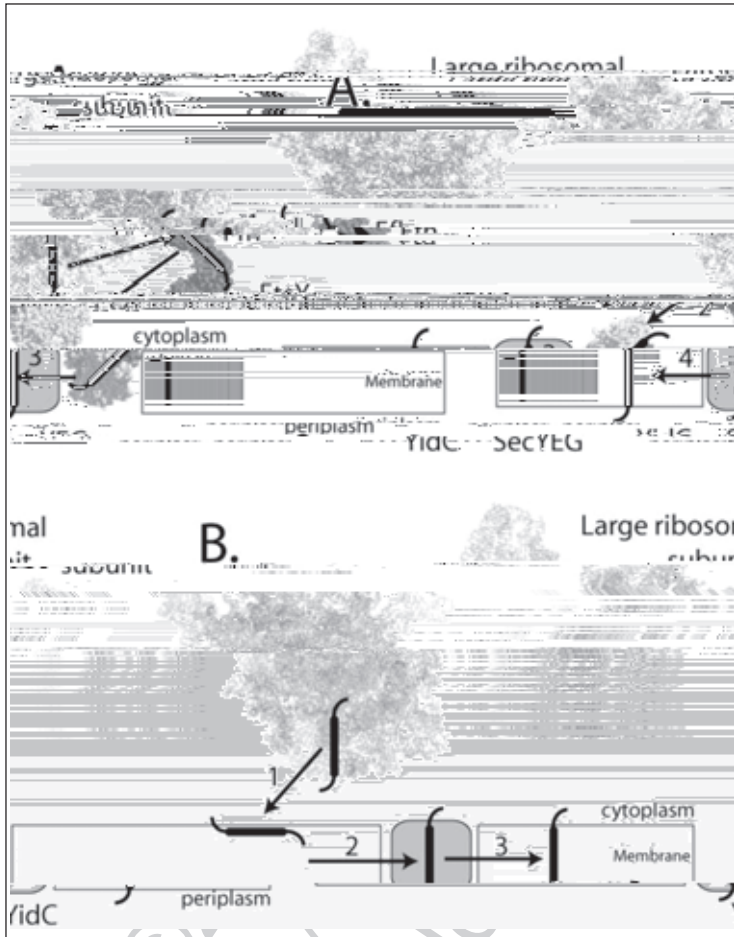

CHAPTER 5

Membrane Protein Insertion in Bacteria

Mark Paetzel and Ross E. Dalbey*

Abstract

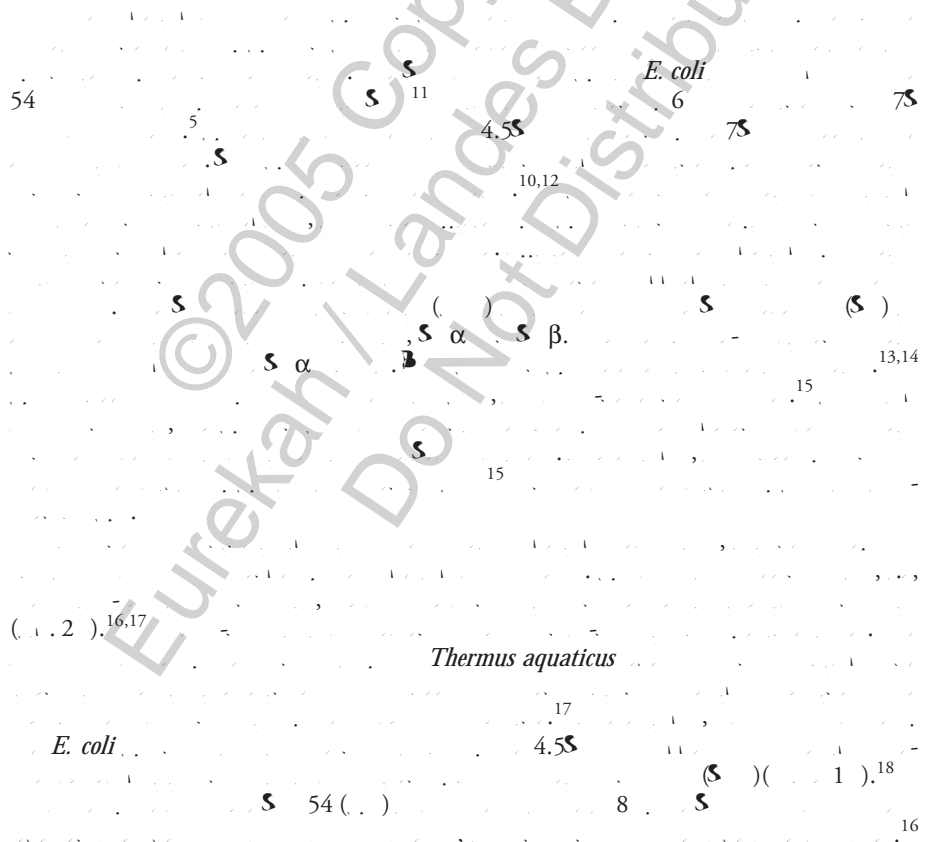
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Insertion by the Sec-Translocase Mediated Pathway



Targeting



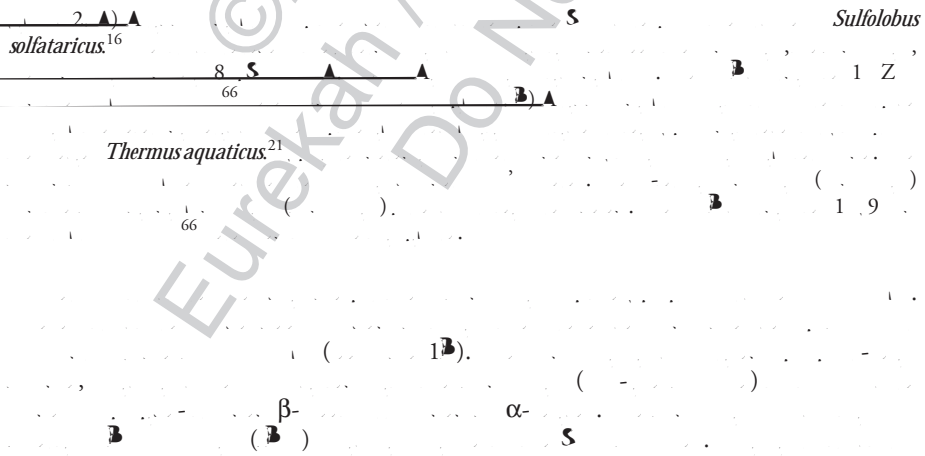
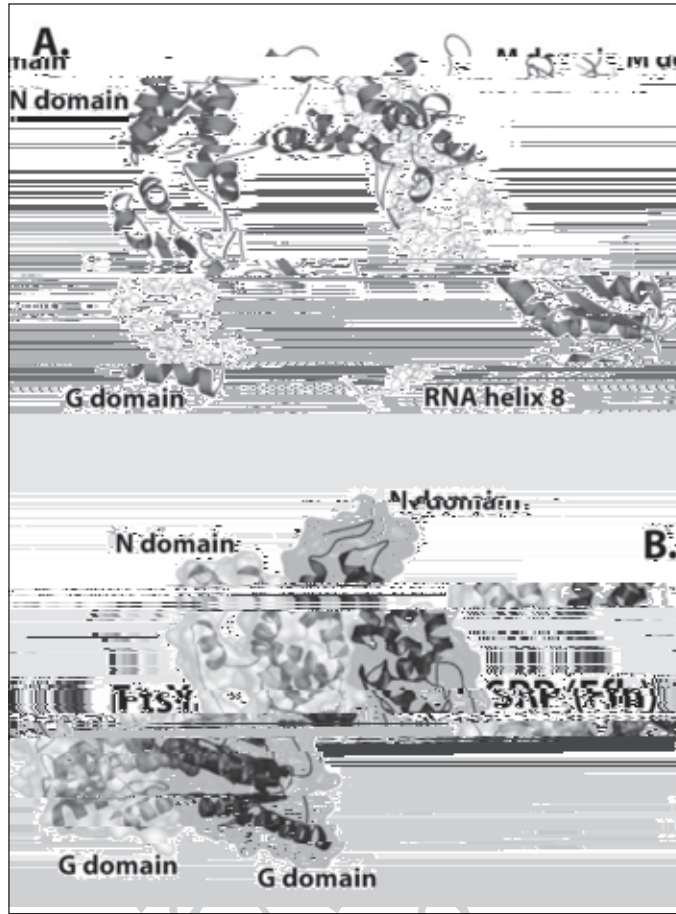


Table 1A. SRP Protein/RNA complex structures

PDB ID	Source	Method	Description	R Value	Resolution [Å]	Reference
1DUL	<i>E. coli</i>	X-ray	Domain IV of 4.5 S RNA, domain M of Ffh	0.199	1.8	Batey et al. 2000 ¹⁸
1HQ1	<i>E. coli</i>	X-ray	4.5S RNA, M-domain of Ffh	0.151	1.5	Batey et al. 2001 ⁶⁷
1QZW	<i>S. solfataricus</i>	X-ray	The complete SRP 54 (Ffh) with helix 8	0.340	4.1	Rosendal et al. 2003 ¹⁶

2.2 *E. coli* (S α),¹⁹

T. aquaticus (1.9),^{20,21}

23).²²

3

γ

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Table 1C. SRP RNA Structures

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Translocation/Insertion

The translocation of a protein across a membrane is a process that involves the movement of the protein through the lipid bilayer. This process is often mediated by a protein channel or pore. The protein is synthesized in the cytoplasm and then moves through the channel into the extracellular space. The translocation is driven by the energy of the protein synthesis and the energy of the lipid bilayer. The protein is then inserted into the membrane and remains there for the rest of its life. The translocation of a protein across a membrane is a complex process that involves many steps and is often regulated by various factors. The translocation of a protein across a membrane is a process that involves the movement of the protein through the lipid bilayer. This process is often mediated by a protein channel or pore. The protein is synthesized in the cytoplasm and then moves through the channel into the extracellular space. The translocation is driven by the energy of the protein synthesis and the energy of the lipid bilayer. The protein is then inserted into the membrane and remains there for the rest of its life. The translocation of a protein across a membrane is a complex process that involves many steps and is often regulated by various factors.

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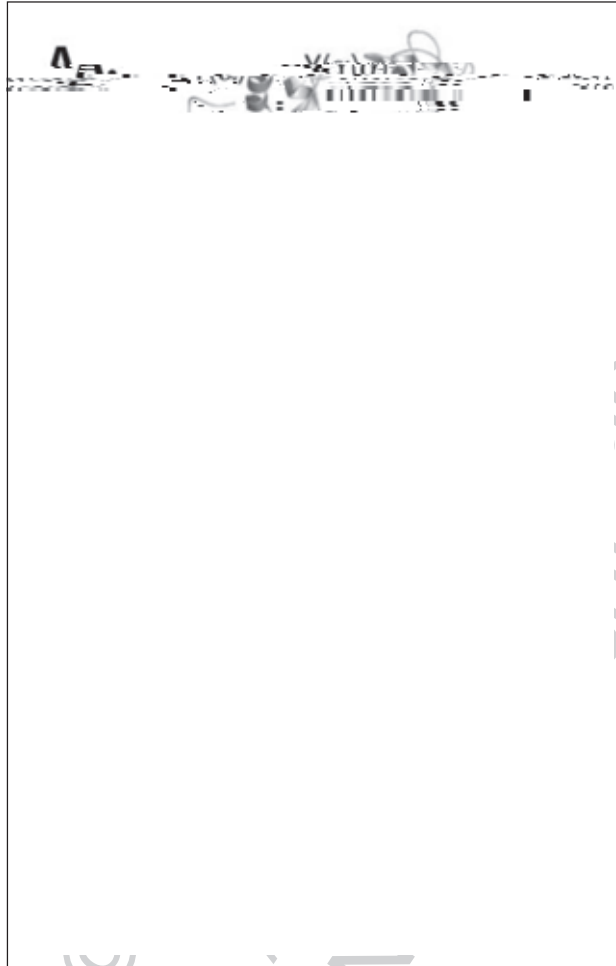


Table 2. SecA Structures

PDB ID	Source	Method	Description	R Value	Resolution [Å]	Reference
<u>1M6N</u>	<i>B. subtilis</i>	X-ray	Nucleotide free	0.220	2.7	Hunt et al. 2002 ³³
<u>1M74</u>	<i>B. subtilis</i>	X-ray	Mg-ADP-bound	0.217	3.0	Hunt et al. 2002 ³³
<u>1NKT</u>	<i>M. tuberculosis</i>	X-ray	Complex with ADP-bS	0.216	2.6	Sharma et al. 2003 ³⁴
<u>1NL3</u>	<i>M. tuberculosis</i>	X-ray	Nucleotide free	0.196	2.8	Sharma et al. 2003 ³⁴
<u>1TF2</u>	<i>B. subtilis</i>	X-ray	Monomeric, open conformation, ADP bound	0.228	2.9	Osborne et al. 2004 ³⁵
<u>1TF5</u>	<i>B. subtilis</i>	X-ray	Monomeric, open conformation, nucleotide free	0.241	2.2	Osborne et al. 2004 ³⁵
<u>1OZB</u>	<i>H. influenzae</i>	X-ray	SecB complexed with the SecA C-terminus	0.226	2.8	Zhou and Xu, 2003 ³⁹
<u>1SX0</u>	<i>E. coli</i>	NMR	C-terminal zinc-binding domain of SecA	n/a	n/a	Dempsey et al. 2004 ³⁷
<u>1SX1</u>	<i>E. coli</i>	NMR	C-terminal zinc-binding domain of SecA	n/a	n/a	Dempsey et al. 2004 ³⁷
<u>1TM6</u>	<i>E. coli</i>	NMR	Th0 Tw M-terminal zinc-binding domain of SecA			

Structure of the SecY_Eb Complex

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4 ▲▲ Methanococcus
 jannaschii.⁴⁷ S (S 61α-), S (S 61γ-) S 61β- ()
 S)
 B Z 66 B▲
 () S β ()
 2 7
 ▲
 S S S
 S 20 25 ()
 5) S S S

S. ... S. ... S. ...

S. ... S. ...

Lateral Integration, Assembly and Folding

S. ... 47

S. ... 48

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The text in this section is extremely faint and difficult to read. It appears to contain several paragraphs of biological text. A small number '2' is visible in the middle of the text. There are also several small letters, possibly 's', scattered throughout. The text seems to describe a process related to protein movement or membrane transport, but the specific details are illegible due to the low contrast.

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