Cooperative assembly of β-barrel pore-forming toxins

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Abstract: Bacterial β-barrel pore-forming toxins are secreted as water-soluble monomeric proteins and assemble into β-barrel-shaped pores/channels through membranes of target cells, causing cell death and lysis. The pore assemblies that undergo various intermediate stages are symbolized by the association of multi-subunit structures in cells. Crystal structures of water-soluble monomers and membrane-embedded oligomeric pores, and recent studies involving biochemical detection and direct visualization of the sequential assembly of the toxin monomers have solved the mystery of how the pores are formed. Here, we review the mechanism of the cooperative assembly of several toxins of interest to explain the nature of the activities of the toxins.

Author Keywords: Cooperative assembly; Membrane binding; Oligomerization; Pore-forming toxins; Single-molecule imaging

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