Signal-anchored proteins follow a unique insertion pathway into the outer membrane of mitochondria.

Abstract:
Signal-anchored proteins are a class of mitochondrial outer membrane proteins that expose a hydrophilic domain to the cytosol and are anchored to the membrane by a single transmembrane domain in the N-terminal region. Like the vast majority of mitochondrial proteins, signal-anchored proteins are synthesized on cytosolic ribosomes and are subsequently imported into the organelle. We have studied the mechanisms by which precursors of these proteins are recognized by the mitochondria and are inserted into the outer membrane. The import of signal-anchored proteins was found to be independent of the known import receptors, Tom20 and Tom70, but to require the major Tom component, Tom40. In contrast to precursors destined to internal compartments of mitochondria and those of outer membrane beta-barrel proteins, precursors of signal-anchored proteins appear not to be inserted via the general import pore. Taken together, we propose a novel pathway for insertion of these proteins into the outer membrane of mitochondria.