SFB 635
Posttranslational control of protein function

Seminars in Genetics and Molecular Cell Biology

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Mitochondrial presequence translocase and respiratory chain complexes – an intimate liaison

Mitochondria are ubiquitous, double membrane-bound organelles of endosymbiotic origin that contain more than 1,000 different proteins. The majority of these proteins is produced on cytosolic ribosomes as preproteins with N-terminal, cleavable presequences. These preproteins enter mitochondria via the general translocase of the outer membrane (TOM complex) and are then committed to the presequence translocase of the inner membrane (TIM23 complex). The essential core of the TIM23 machinery consists of the channel-forming protein Tim23, its partner protein Tim17 and Tim50, which is required for both preprotein recognition and channel gating. The TIM23 core complex cooperates either with respiratory chain complexes for integration of preproteins into the inner membrane by a stop-transfer mechanism or with the presequence translocase-associated import motor (PAM) for complete translocation of soluble preproteins into the matrix.

We have recently shown that the TIM23 machinery closely cooperates with the export translocase OXA for the modular insertion of polytopic inner membrane proteins. To get deeper insights into the coupling of TIM23 to different partners in the inner mitochondrial membrane, we performed a comprehensive proteomic analysis of the molecular environment of this sophisticated molecular machine. These studies shed light on the embedding of the TIM23 core complex into extended protein-interaction networks. We have identified and characterized a novel coupling factor that directly links the import of preproteins via the TIM23 machinery to their assembly into respiratory chain complexes.

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Institute for Genetics,
Zülpicher Str. 47 a, Lecture hall, 4th floor

Host: Marc Bramkamp, Institute for Biochemistry,
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