Franziska Hempel

Department of Cell Biology
Philipps-University Marburg
Karl-von-Frisch-Straße 8
35043 Marburg
Tel: +49 642128-21542
Fax: +49 642128-22057
E-Mail: Franziska.hempel [at] t-online.de

---

s-ERAD dependent pre-protein transport across the 2nd outermost plastid membrane of diatoms

The diatom *Phaeodactylum tricornutum* harbours a plastid that is surrounded by four membranes and evolved by way of secondary endosymbiosis. Like land plants, most of its plastid proteins are encoded as pre-proteins on the nuclear genome of the host cell and are resultantly redirected into the organelle. Because two more membranes are present in diatoms than the one pair surrounding primary plastids, the targeting situation is obviously different and more complex. In my talk I focus on pre-protein transport across the2nd outermost plastid membrane – an issue that was experimentally inaccessible until now. Recently, we postulated that an ERAD (ER-associated degradation)-derived transport system mediates pre-protein translocation across this membrane. The basis for this assumption came from the finding that in the genome of heterokontophytes, haptophytes, cryptophytes and apicomplexa components of the ERAD system were detected in two independent versions, one set of ERAD components for the host and a second set of homologous versions for the symbiont (s-ERAD). As the ER within the highly reduced symbiontic cytosol was not retained in all these organisms and because one central function of ERAD is retro-translocation of proteins across a biomembrane, we postulated that the symbiontic ERAD-like system provides the translocon in the 2nd outermost plastid membrane. Here, we present first evidence that our hypothesis of an ERAD-derived pre-protein transport system is correct. Our data demonstrate that the symbiontic Der1 proteins, which are core components of ERAD, form an oligomeric complex within the 2nd outermost membrane of the complex plastid of *P. tricornutum*. Moreover, we provide first evidence that the complex interacts with transit peptides of pre-proteins being transported across this membrane into the periplastidal compartment, but not with transit peptides of stromal-targeted proteins. Thus, the sDer1-complex might have an additional role in discriminating pre-proteins that are transported across the two outermost membranes from pre-proteins directed across all four membranes of the complex plastid.

Short CV

2001-2006 Graduate studies in biology, Philipps-University Marburg
Since 2007 PhD student in Uwe Maier´s lab (Cell Biology, Philipps-University Marburg)