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Dr. Lemberg is Research Group Leader of the Center for Molecular Biology at
the University of Heidelberg. He received his undergraduate degree in
biochemistry from Eberhard-Karls University Tübingen, a diploma of natural
sciences from (Swiss Federal Institute of Technology) ETH Zürich, Switzerland
and his Ph.D. in natural sciences from the Institute of Biochemistry, ETH Zürich,
Switzerland. Lemberg lab research includes the mechanism and function of intramembrane proteases
in the control of protein homeostasis, the intramembrane proteolysis as new regulatory arm of the
ERAD pathway, and the regulation of mitophagy by the rhomboid protease PARL. Dr. Lemberg has
numerous publications and was the recipient of a Ph.D.-Student Fellowship from Boehringer Ingelheim
Funds, an EMBO Long-Term Fellowship, an Award and Silver Medal for a distinguished Ph.D. thesis, and
an SNF Fellowship for Advanced Researchers.

“Function of Intramembrane Proteases in Membrane Protein
Homeostasis”

The ER-associated degradation (ERAD) pathway serves as an important cellular safeguard by
directing incorrectly folded and unassembled proteins from the ER to the proteasome. However, still
little is known about the components mediating turnover of membrane proteins. A number of
studies have identified key players of the ERAD dislocation apparatus, but still little is known about
the molecular mechanism how proteins cross the ER membrane and how hydrophobic stretches are
extracted from the lipid bilayer. We found that intramembrane proteolysis serves as an alternative to
classical dislocation of full-length membrane proteins. Here we show that ER-resident
intramembrane proteases cleave single spanning and polytopic membrane proteins leading to their
degradation by the canonical ERAD machinery. Our current models of how intramembrane
proteases monitor the stability of membrane-integral domains and of how clipping of ERAD
substrates within the plane of the membrane facilitates removal of soluble cleavage fragments will
be discussed.