Specific interaction of IM30/Vipp1 with cyanobacterial and chloroplast membranes results in membrane remodeling and eventually in membrane fusion

Jennifer Heidrich, Adrien Thurotte, Dirk Schneider

PII: S0005-2736(16)30327-3
DOI: doi: 10.1016/j.bbamem.2016.09.025
Reference: BBAMEM 82322

To appear in: *BBA - Biomembranes*

Received date: 22 July 2016
Revised date: 19 September 2016
Accepted date: 21 September 2016

Please cite this article as: Jennifer Heidrich, Adrien Thurotte, Dirk Schneider, Specific interaction of IM30/Vipp1 with cyanobacterial and chloroplast membranes results in membrane remodeling and eventually in membrane fusion, *BBA - Biomembranes* (2016), doi: 10.1016/j.bbamem.2016.09.025

Specific interaction of IM30/Vipp1 with cyanobacterial and chloroplast membranes results in membrane remodeling and eventually in membrane fusion

Jennifer Heidrich[1], Adrien Thurotte[1] and Dirk Schneider[1]

[1]Institute of Pharmacy and Biochemistry, Johannes Gutenberg-University Mainz, Johann-Joachim-Becher-Weg 30, 55128 Mainz, Germany

To whom correspondence should be addressed:

Prof. D. Schneider, Institute of Pharmacy and Biochemistry, Johannes Gutenberg-University Mainz, Johann-Joachim-Becher-Weg 30, 55128 Mainz, Germany, Telephone: +49 6131 39-25833, Fax: +49 6131 39-25348; E-mail: Dirk.Schneider@uni-mainz.de

Abstract

The photosynthetic light reaction takes place within the thylakoid membrane system in cyanobacteria and chloroplasts. Besides its global importance, the biogenesis, maintenance and dynamics of this membrane system are still a mystery. In the last two decades, strong evidence supported the idea that these processes involve IM30, the *inner membrane- associated protein of 30 kDa*, a protein also known as the *vesicle-inducing protein in plastids 1* (Vipp1). Even though we just only begin to understand the precise physiological function of this protein, it is clear that interaction of IM30 with membranes is crucial for biogenesis of thylakoid membranes. Here we summarize and discuss forces guiding IM30-membrane interactions, as the membrane properties as well as the oligomeric state of IM30 appear to affect proper interaction of IM30 with membrane surfaces. Interaction of IM30 with membranes results in an altered membrane structure and can finally trigger fusion of adjacent membranes, when Mg^{2+} is present. Based on recent results, we finally present a model summarizing individual steps involved in IM30-mediated membrane fusion.