



A mitochondrial late embryogenesis abundant protein stabilizes model membranes in the dry state

Submitted by Emmanuel Lemoine on Thu, 02/12/2015 - 13:00

Titre	A mitochondrial late embryogenesis abundant protein stabilizes model membranes in the dry state
Type de publication	Article de revue
Auteur	Tolleter, Dimitri [1], Hinch, Dirk K [2], Macherel, David [3]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2010
Langue	Anglais
Date	2010/10
Numéro	10
Pagination	1926 - 1933
Volume	1798
Titre de la revue	Biochimica et Biophysica Acta (BBA) - Biomembranes
ISSN	0005-2736
Mots-clés	Cardiolipin [4], Desiccation [5], LEA protein [6], Mitochondrial membrane [7], phospholipid [8], Seed [9]
Résumé en anglais	<p>Late embryogenesis abundant (LEA) proteins are a highly diverse group of polypeptides expected to play important roles in desiccation tolerance of plant seeds. They are also found in other plant tissues and in some anhydrobotic invertebrates, fungi, protists and prokaryotes. The LEA protein LEAM accumulates in the matrix space of pea (<i>Pisum sativum</i>) mitochondria during late seed maturation. LEAM is an intrinsically disordered protein folding into amphipathic α-helix upon desiccation. This suggests that it could interact with the inner mitochondrial membrane, providing structural protection in dry seeds. Here, we have used Fourier-transform infrared and fluorescence spectroscopy to gain insight into the molecular details of interactions of LEAM with phospholipid bilayers in the dry state and their effects on liposome stability. LEAM interacted specifically with negatively charged phosphate groups in dry phospholipids, increasing fatty acyl chain mobility. This led to an enhanced stability of liposomes during drying and rehydration, but also upon freezing. Protection depended on phospholipid composition and was strongly enhanced in membranes containing the mitochondrial phospholipid cardiolipin. Collectively, the results provide strong evidence for a function of LEAM as a mitochondrial membrane protectant during desiccation and highlight the role of lipid composition in the interactions between LEA proteins and membranes.</p>
URL de la notice	http://okina.univ-angers.fr/publications/ua7722 [10]
DOI	10.1016/j.bbamem.2010.06.029 [11]
Lien vers le document	http://dx.doi.org/10.1016/j.bbamem.2010.06.029 [11]

Liens

- [1] [http://okina.univ-angers.fr/publications?f\[author\]=11830](http://okina.univ-angers.fr/publications?f[author]=11830)
- [2] [http://okina.univ-angers.fr/publications?f\[author\]=11831](http://okina.univ-angers.fr/publications?f[author]=11831)
- [3] <http://okina.univ-angers.fr/d.macherel/publications>
- [4] [http://okina.univ-angers.fr/publications?f\[keyword\]=11835](http://okina.univ-angers.fr/publications?f[keyword]=11835)
- [5] [http://okina.univ-angers.fr/publications?f\[keyword\]=11836](http://okina.univ-angers.fr/publications?f[keyword]=11836)
- [6] [http://okina.univ-angers.fr/publications?f\[keyword\]=11837](http://okina.univ-angers.fr/publications?f[keyword]=11837)
- [7] [http://okina.univ-angers.fr/publications?f\[keyword\]=11838](http://okina.univ-angers.fr/publications?f[keyword]=11838)
- [8] [http://okina.univ-angers.fr/publications?f\[keyword\]=3015](http://okina.univ-angers.fr/publications?f[keyword]=3015)
- [9] [http://okina.univ-angers.fr/publications?f\[keyword\]=11839](http://okina.univ-angers.fr/publications?f[keyword]=11839)
- [10] <http://okina.univ-angers.fr/publications/ua7722>
- [11] <http://dx.doi.org/10.1016/j.bbamem.2010.06.029>

Publié sur *Okina* (<http://okina.univ-angers.fr>)