Phytosphingosine-phosphate is a signal for AtMPK6 activation and Arabidopsis response to chilling

Titre	Phytosphingosine-phosphate is a signal for AtMPK6 activation and Arabidopsis response to chilling
Type de publication	Article de revue
Auteur	Dutilleul, Christelle [1], Benhassaine-Kesri, Ghouziel [2], Demandre, Chantal [3], Rézé, Nathalie [4], Launay, Alban [5], Pelletier, Sandra [6], Renou, Jean-Pierre [7], Zachowski, Alain [8], Baudouin, Emmanuel [9], Guillas, Isabelle [10]
Editeur	Wiley
Type	Article scientifique dans une revue à comité de lecture
Année	2012
Langue	Anglais
Date	2012
Numéro	1
Pagination	181 - 191
Volume	194
Titre de la revue	New Phytologist
ISSN	1469-8137
Mots-clés	Arabidopsis thaliana [11], chilling [12], long-chain bases [13], MAP kinase [14], sphingolipids [15]
Résumé en anglais	Long-chain bases (LCBs) are pleiotropic sphingolipidic signals in eukaryotes. We investigated the source and function of phytosphingosine-1-phosphate (PHS-P), a phospho-LCB rapidly and transiently formed in Arabidopsis thaliana on chilling.PHS-P was analysed by thin-layer chromatography following in vivo metabolic radiolabelling. Pharmacological and genetic approaches were used to identify the sphingosine kinase isoforms involved in cold-responsive PHS-P synthesis. Gene expression, mitogen-activated protein kinase activation and growth phenotypes of three LCB kinase mutants (lcbk1, sphk1 and lcbk2) were studied following cold exposure. Chilling provoked the rapid and transient formation of PHS-P in Arabidopsis cultured cells and plantlets. Cold-evoked PHS-P synthesis was reduced by LCB kinase inhibitors and abolished in the LCB kinase lcbk2 mutant, but not in lcbk1 and sphk1 mutants. lcbk2 presented a constitutive AtMPK6 activation at 22°C. AtMPK6 activation was also triggered by PHS-P treatment independently of PHS/PHS-P balance. lcbk2 mutants grew comparably with wild-type plants at 22 and 4°C, but exhibited a higher root growth at 12°C, correlated with an altered expression of the cold-responsive DELLA gene RGL3. Together, our data indicate a function for LCBK2 in planta. Furthermore, they connect PHS-P formation with plant response to cold, expanding the field of LCB signalling in plants.
URL de la notice	http://okina.univ-angers.fr/publications/ua7810 [16]
DOI	10.1111/j.1469-8137.2011.04017.x [17]

Lien vers le document	http://dx.doi.org/10.1111/j.1469-8137.2011.04017.x [17]

Liens
[1] http://okina.univ-angers.fr/publications?f[author]=12297
[2] http://okina.univ-angers.fr/publications?f[author]=12298
[3] http://okina.univ-angers.fr/publications?f[author]=12299
[4] http://okina.univ-angers.fr/publications?f[author]=12300
[5] http://okina.univ-angers.fr/publications?f[author]=12301
[6] http://okina.univ-angers.fr/publications?f[author]=11878
[7] http://okina.univ-angers.fr/publications?f[author]=11747
[8] http://okina.univ-angers.fr/publications?f[author]=12302
[9] http://okina.univ-angers.fr/publications?f[author]=12303
[10] http://okina.univ-angers.fr/publications?f[author]=12304
[11] http://okina.univ-angers.fr/publications?f[keyword]=11982
[12] http://okina.univ-angers.fr/publications?f[keyword]=12104
[13] http://okina.univ-angers.fr/publications?f[keyword]=12105
[14] http://okina.univ-angers.fr/publications?f[keyword]=12106
[15] http://okina.univ-angers.fr/publications?f[keyword]=12107
[16] http://okina.univ-angers.fr/publications/ua7810
[17] http://dx.doi.org/10.1111/j.1469-8137.2011.04017.x