University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Public Health Resources | Public Health Resources

2012

Building the primary cilium membrane

CJ Westlake
NIH-NCI, chris.westlake@nih.gov

J Rahajeng
University of Nebraska Medical Center

Q Lu
NIH-NCI

RH Scheller
Genentech

S Caplan
University of Nebraska Medical Center

See next page for additional authors

Follow this and additional works at: http://digitalcommons.unl.edu/publichealthresources

Westlake, CJ; Rahajeng, J; Lu, Q; Scheller, RH; Caplan, S; and Jackson, PK, "Building the primary cilium membrane" (2012). *Public Health Resources*. 287.
http://digitalcommons.unl.edu/publichealthresources/287

This Article is brought to you for free and open access by the Public Health Resources at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Public Health Resources by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Authors
CJ Westlake, J Rahajeng, Q Lu, RH Scheller, S Caplan, and PK Jackson

This article is available at DigitalCommons@University of Nebraska - Lincoln: http://digitalcommons.unl.edu/publichealthresources/287

Cilia

ORAL PRESENTATION Open Access

Building the primary cilium membrane

CJ Westlake[1*], J Rahajeng[2], Q Lu[1], RH Scheller[3], S Caplan[2], PK Jackson[3]

From First International Cilia in Development and Disease Scientific Conference (2012) London, UK. 16-18 May 2012

Ciliogenesis involves coordinated assembly of a microtubule-based axoneme from the mother centriole and vesicular membrane transport and fusion forming a ciliary membrane around the developing axoneme. We, and others have reported that a Rab11-Rab8 cascade functions in ciliogenesis. Using live high-resolution fluorescence microscopy imaging we show that ciliary membrane assembly proceeds following Rabin8 (a Rab8 activator) binding to Rab11 membranes. Rabin8 transport via Rab11 vesicles to the centrosome is observed resulting in localized activation of Rab8 and leads to initiation of ciliary membrane assembly. Using proteomics approaches, we have discovered that Rabin8 binds to the TRAPPII tethering complex and find that this interaction is important for Rabin8 centrosomal targeting during ciliogenesis. Our work suggests that Rabin8 membrane transport is a highly regulated process controlled by serum-dependent and serum-independent signaling. Interestingly, following ciliogenesis Rabin8 centrosomal localization is lost resulting in reduced Rab8 activation at the ciliary membrane. This finding along with a previous report describing Rabin8 association with Bardet-Biedl syndrome (BBS) proteins has led us to hypothesize that regulation of centrosomal Rabin8 levels is important for establishing the length of primary cilium, an important factor in ciliary signaling. Finally, we describe the discovery of additional factors associated with the Rab11-Rab8 trafficking pathway that function in organizing membrane structure during ciliogenesis.

doi:10.1186/2046-2530-1-S1-O15
Cite this article as: Westlake *et al.*: Building the primary cilium membrane. *Cilia* 2012 **1**(Suppl 1):O15.

Author details
[1]NIH-NCI, USA. [2]University of Nebraska Medical Center, USA. [3]Genentech, USA.

Published: 16 November 2012

* Correspondence: chris.westlake@nih.gov
[1]NIH-NCI, USA
Full list of author information is available at the end of the article

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit

BioMed Central

BioMed Central

© 2012 Westlake et al; licensee BioMed Central Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/2.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.