

Author's Accepted Manuscript

Progesterone modulates microtubule dynamics and epiboly progression during zebrafish gastrulation

Stephanie Eckerle, Mario Ringler, Virginie Lecaudey, Roland Nitschke, Wolfgang Driever



PII: S0012-1606(17)30715-7
DOI: <https://doi.org/10.1016/j.ydbio.2017.12.016>
Reference: YDBIO7654

To appear in: *Developmental Biology*

Received date: 7 October 2017
Revised date: 19 December 2017
Accepted date: 23 December 2017

Cite this article as: Stephanie Eckerle, Mario Ringler, Virginie Lecaudey, Roland Nitschke and Wolfgang Driever, Progesterone modulates microtubule dynamics and epiboly progression during zebrafish gastrulation, *Developmental Biology*, <https://doi.org/10.1016/j.ydbio.2017.12.016>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Progesterone modulates microtubule dynamics and epiboly progression during zebrafish gastrulation**Stephanie Eckerle¹, Mario Ringler¹, Virginie Lecaudey^{1,2,3}, Roland Nitschke^{2,4}, Wolfgang Driever^{1,2*}**¹Developmental Biology, Institute Biology I, Faculty of Biology, Albert-Ludwigs-University Freiburg, Hauptstrasse 1, D-79104 Freiburg, Germany²BIOSS - Centre for Biological Signalling Studies, Albertstrasse 19, 79104 Freiburg, Germany³Current address: Institute for Cell Biology and Neuroscience, Goethe-Universität Frankfurt, Max-von-Laue-Strasse 13, D-60438 Frankfurt am Main, Germany⁴Zentrum für Biosystemanalyse, Albert-Ludwigs-University Freiburg, Habsburgerstr. 49, D-79104 Freiburg, Germany

*Correspondence to: Wolfgang Driever, Institute Biology I, Albert-Ludwigs-University Freiburg, Hauptstrasse 1, D-79104 Freiburg, Germany; Phone: +49-761-203-2587; Fax +49-761-203-2550; E-mail: driever@biologie.uni-freiburg.de

ABSTRACT

Control of microtubule dynamics is crucial for cell migration. We analyzed regulation of microtubule network dynamics in the zebrafish yolk cell during epiboly, the earliest coordinated gastrulation movement. We labeled microtubules with EMTB-3GFP and EB3-mCherry to visualize and measure microtubule dynamics by TIRF microscopy live imaging. Yolk cell microtubules dynamics is temporally modulated during epiboly progression. We used maternal zygotic Pou5f3 mutant (*MZspg*) embryos, which develop strong distortions of microtubule network organization and epiboly retardation, to investigate genetic control of microtubule dynamics. In *MZspg* embryos, microtubule plus-end growth tracks move slower and are less straight compared to wild-type. *MZspg* embryos have altered steroidogenic enzyme expression, resulting in increased pregnenolone and reduced progesterone levels. We show that progesterone positively affects microtubule plus-end growth and track straightness. Progesterone may thus act as a non-cell-autonomous regulator of microtubule dynamics across the large yolk cell, and may adjust differing demands on microtubule dynamics and stability during initiation and progression phases of epiboly.

Abbreviations

Download English Version:

<https://daneshyari.com/en/article/8467492>

Download Persian Version:

<https://daneshyari.com/article/8467492>

[Daneshyari.com](https://daneshyari.com)