

IRB BARCELONA 2010 ANNUAL REPORT

SCIENCE AT IRB BARCELONA

Research Programmes

Cell and Developmental Biology

Jordi Casanova: Morphogenesis in *Drosophila*



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Highlights

- Conversely to previous models, an intracellular lumen can arise by growth of an apical membrane inwardly in the cell. This process is mediated by asymmetric actin accumulation and specific microtubule organization that couples cell elongation and intracellular lumen formation.
- A developmentally regulated two-step process generates a non-centrosomal microtubule network in *Drosophila* tracheal cells.
- A posttranscriptional process controls the absolute amount of Patched receptor present in a cell, which dictates the cell response to the Hedgehog morphogen gradient.

Publications

- Brodu V, Baffet AD, Le Droguen PM, Casanova J and Guichet A. A developmentally regulated two-step process generates a noncentrosomal microtubule network in *Drosophila* tracheal cells. *Dev Cell*, 18 (5), 790-801 (2010)
- Campbell K, Casanova J and Skaer H. Mesenchymal-to-epithelial transition of intercalating cells in *Drosophila* renal tubules depends on polarity cues from epithelial neighbours. *Mech Develop*, 127 (7-8), 345-57 (2010)
- Casali A. Self-induced patched receptor down-regulation modulates cell sensitivity to the hedgehog morphogen gradient. *Sci Signal*, 3 (136), ra63 (2010)
- Gervais L and Casanova J. *In vivo* coupling of cell elongation and lumen formation in a single cell. *Curr Biol*, 20 (4), 359-66 (2010)
- Llimargas M and Casanova J. Apical constriction and invagination: a very self-reliant couple. *Dev Biol*, 344 (1), 4-6 (2010)
- Ventura G, Furriols M, Martín N, Barbosa V and Casanova J. *closca*, a new gene required for both Torso RTK activation and vitelline membrane integrity. Germline proteins contribute to *Drosophila* eggshell composition. *Dev Biol*, 344 (1), 224-32 (2010)

Collaborations

- Identification and characterization of the gene *closca*. Vitor Barbosa, Gulbenkian Institute (Lisbon, Portugal)
- Morphogenesis of the *Drosophila* tracheal tube. Veronique Brodu and Antoine Guichet, Institut Jacques Monod-CNRS (Paris, France)
- New elements in the *Drosophila* terminal system. Stephan Luschnig, University of Zurich (Zurich, Switzerland)
- On the origin of insect tracheal systems. Michalis Averof, IMBB (Crete, Greece)

Research projects

- Analisis del mecanismo de accion del receptor de hedgehog, patched, en el disco imaginal de ala de *Drosophila*. Proyectos Investigación Fundamental (BFU2007-60663). Spanish Ministry of Science and Innovation (MICINN). 2007-2010. Principal Investigator: Andreu Casali
- Cellular properties and morphogenesis. from genes to shape: analysis of morphogenesis in *Drosophila* and vertebrates. Consolider Ingenio-2010 (CSD 2007-008). Spanish Ministry of Science and Innovation (MICINN). 2007-2012. Principal Investigator: Jordi Casanova
- Desenvolupament i morfogènesi a *Drosophila*. Grups de Recerca reconeguts per la generalitat de Catalunya 2009-2013 (2009 SGR 343). Agency for Administration of University and Research Grants (AGAUR). Principal Investigator: Jordi Casanova
- La via de hedgehog en el desarrollo de *Drosophila* y homeostasis en adultos. Acciones Complementarias (BFU2010-16016) Spanish Ministry of Science and Innovation (MICINN). 2010. Principal Investigator: Jordi Casanova
- Regulación de los mecanismos celulares en la morfogénesis de *Drosophila*. Proyectos Investigación fundamental (BFU2009-07629). Spanish Ministry of Science and Innovation (MICINN). 2010-2012. Principal Investigator: Jordi Casanova



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