

Molecular Basis of Cellular Movements

—細胞遊走の分子基盤—

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14:40-16:10 (7-8限)

名工大4号館2F 第3会議室

My long-range goal is to establish the molecular basis of actin-based cellular motility. The protein actin forms filaments that contribute, like the frame of a building, to the structure of the cell. In addition, motor molecules, called myosins, use actin filaments as tracks through the cytoplasm. Together the tracks and the motors allow cells to change shape and to move. This capacity for movement is essential for cell division, embryonic development, and defense against microorganisms. Movement of cells out of primary tumors is the chief cause of mortality in cancer. We study the structure of actin-binding proteins, the dynamics of their interactions, and their functions in live cells. We aim to account for how actin filaments initiate in specific locations (such as the leading edge of motile cells) become crosslinked into bundles or networks, rearrange during cellular movements, and turn over on a time scale of minutes. We also study myosin motor proteins with the goal of understanding their structure and functions in cell locomotion and cell division. Research projects range from purely biophysical, such as determination of atomic structures of proteins by x-ray crystallography, to purely biological, such as characterizing yeast mutations that produce defects in cell division.

学外からの聴講も歓迎します。

本セミナーは下記の授業として行います。

博士前期 1) 材料・エネルギー特別演習1,2

2) 情報・社会特別演習1,2

博士後期 1) 材料・エネルギー先進特別演習1,2

2) 情報・社会先進特別演習1,2

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Let's see
the molecular basis
of cell motility!

Recent publications

1. Molecular organization of cytokinesis nodes and contractile rings by super-resolution fluorescence microscopy of live fission yeast. *PNAS* 2016
2. Avoiding artefacts when counting polymerized actin in live cells with LifeAct fused to fluorescent proteins. *Nat Cell Biol* 2016
3. New Light on Growth Cone Navigation. *Dev Cell* 2015
4. Three myosins contribute uniquely to the assembly and constriction of the fission yeast cytokinetic contractile ring. *Curr Biol* 2015
5. A role for F-BAR protein Rga7p during cytokinesis in *S. pombe*. *J Cell Sci* 2015
6. Aip1 promotes actin filament severing by cofilin and regulates constriction of the cytokinetic contractile ring. *J Biol Chem* 2015

