2P181 Molecular configurations of purified radial spoke of *Chlamydomonas flagella*

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Radial spokes of eukaryotic flagella are large protein complexes (~2 M) which connect 9 peripheral microtubules and the central-pair apparatus. They are thought to play important roles for generating well-ordered flagellar waveforms. In order to examine properties and molecular configurations of radial spoke in vitro, we purified radial spoke from *Chlamydomonas*. For purification, we used the strain (pf14::PF14-12His). Radial spoke was purified from the 0.6M-NaBr extract of axonemes successfully by combining the His-tag purification method and sucrose-density gradient centrifugation. By negative-staining electron microscopy, we observed structures consisting of a base, a shaft, and a heart shaped head in the sample in the same way as radial spokes in flagellar axonemes.

2P182 波型弾性バタニングゲル上での流れ誘導メカノタクシスに見られるがん細胞の接着スイッチング挙動 Adhesion switching of tumor cells in shear-flow-induced mechanotaxis on wave-like elastically-patterned gels

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Epithelial tumor cells migrate into mesenchyme, invade into blood vessel, and spread to other organs in their metastasis process. In this process, motility of tumor cells is affected by the mechanical conditions of matrix-stiffness and shear stress. In this study, to systematically address the effect of those conditions on the motility regulation of tumor cells, we newly developed flow-chamber system with the microelastically-patterned gels, and analyzed the migration of breast cancer cell line MDA-MB-231 in the system. Interestingly, MDA-MB-231 cells were found to exhibit significant adhesion switching especially on wave-like elastically-patterned gels under the shear-induced mechanotaxis, while normal mammary epithelial cells did not show such switching phenomenon.

2P183 粘性流体中におけるバクテリアの Twitching 運動のシミュレーション Simulation study of the twitching motility of bacterium in viscous fluid

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We present a dynamical model of a bacterium, which crawls over solid surfaces by extending and retracting their multiple pili. This motion is called “twitching motility” which has been experimentally investigated on *P. aeruginosa* and *T. thermophilus*. In the model, the drag force of the bacterial body in the viscous fluid balances with the other force caused by retracting movement of the pili. We investigate dynamical properties of our bacterial model by computer simulation. The peculiar motion found in experiments, in which the bacterial body turns in a short time like oversteering, is reproduced in our simulation. We suggest that the bacteria skillfully locomote against a viscous fluid by means of twitching on the solid surfaces.

2P184 大面積弾性マイクロバタニングゲルを用いた間葉系幹細胞の分化フラストレーションの誘導と評価

Characterization of frustrated differentiation of mesenchymal stem cells cultured on large-scale microelastically-patterned gels

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In the previous study, we found the emergence of suppressed differentiation of mesenchymal stem cells (MSCs) into multiple lineages when cultured on microelastically-patterned gelatinous gels having alternating arrays of hard and soft bands. On the gels MSCs migrate among the different region of elasticity, receive a kind of oscillating mechanosignals from substrate during culture, and are blocked to differentiate into the elasticity-specific lineages. We named such phenomenon as “frustrated differentiation”. In the present study, to fully characterize stemness of MSCs in the frustrated differentiation, we investigated multi-lineage differentiation ability of the MSCs using newly-developed large-scale elastically-patterned gels to prepare enough numbers of MSCs.

2P185 1 分子追跡法により明らかにされた伸展中の細胞における Dystroglycan の形成中の接着斑へのリクルート Dystroglycan recruitment to forming focal adhesions during cell spreading as observed by single-molecule tracking

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Dystroglycan (DG) is a transmembrane protein, considered to be responsible for mechanically linking the plasma membrane (PM) to the actin cytoskeleton (ASK) via dystrophin (DP). Another key mechanical linkage between PM and ASK is done by the focal adhesion (FA). Here, we found that DG was recruited to forming FAs during cell spreading, but not mature FAs in steady-state cells. Within the FA, DG underwent diffusion with intermittent, transient binding to, perhaps, the FA-protein islands in the archipelago architecture of the FA reported previously (Shibata et al. 2012 and 2013, both published in Cytoskeleton). Since the DG-DP complex and the FA had been considered to work totally independently, the crosstalk between the FA and the DG-DP complex was unexpected.

2P186 付着型珪藻の二次元運動への培地温度の影響 Effects of variation in medium temperature on two-dimensional motion of attached diatom

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Some types of diatoms are known to glide on a substrate. In this research, we observed the variation in the velocity of a gliding diatom cell by varying the temperature of a medium to 15°C, 18°C, and 25°C. We selected samples of freshwater pennate diatoms, *Nitzschia palea*, and used glass, polystyrene, and PDMS substrates. Our results show that with an increase in the medium temperature, the ratio of the stationary cells to the total number of cells decreased and the average velocities of the cells increased. These velocity changes were observed for all the used substrates. These results indicate that a change in temperature is an important factor affecting the velocity of cell motion.