

セミナーのお知らせ

演題 : SPREAD of ERK MAPK activation in mouse skin

マウス皮膚における ERK MAPK 活性化伝播現象 – SPREAD

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場所 : 微研本館1階 微研ホール

Abstract:

Mammalian epidermis undergoes continuous turnover to maintain its structure and function. The basal layer of epidermis keeps replenishing new keratinocytes through growth signal activation at proper time and space. However, technical difficulties have distracted researchers from investigating how growth signals initiate and diffuse in vivo.

Here we visualized Extracellular signal-regulated kinase (ERK) activity at single cell resolution in the epidermis of living mice. In vivo imaging of mice expressing a Förster Resonance Energy Transfer (FRET) –based biosensor of ERK revealed that ERK activity of steady-state mouse skin was not simply maintained at a low level but showed dynamic local ERK activation patterns, which we named SPREAD (Spatial Propagation of Radial ERK Activity Distribution). In each SPREAD, ERK activation initiated in a cluster of a few cells and concentrically propagated to the surrounding 100-300 cells. Interestingly, the emergence of SPREAD was correlated with cell proliferation and SPREADs were induced by topical treatments with a mitotic stimulant, TPA (12-O-tetradecanoylphorbol 13-acetate).

In this seminar I will present molecular mechanisms and biological roles of SPREAD in steady-state and wounded skin as well as my recent approaches to understand the involvement of epidermal stem cells in the emergence of SPREAD. The understanding of the novel ERK activation pattern will provide a fresh insight into how dynamically cell proliferations in vivo are orchestrated spatiotemporally.

Reference: 'Intercellular propagation of extracellular signal-regulated kinase activation revealed by in vivo imaging of mouse skin.' Hiratsuka T, Fujita Y, Naoki H, Aoki K, Kamioka Y, Matsuda M. Elife.

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