
シンポジウム

[2S13m]異分野融合研究の醍醐味：揺らぎ、振動、バラツキに視点をおいた 生命科学研究の新たな到達点

オーガナイザー：井倉 毅（京都大学大学院生命科学研究科附属放射線生物研究センター、クロマチン動態制御学
分野）、今吉 格（京都大学 大学院生命科学研究科 脳機能発達再生制御学）

2022年11月10日(木) 09:00 ~ 11:00 第13会場(431)

10:29 ~ 10:58

[2S13m-04]遺伝子発現の光操作を用いた神経幹細胞の制御機構の解析

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キーテクノロジー：光遺伝学

キーワード：神経幹細胞、分化運命決定、転写因子、光遺伝学

The mammalian brain consists of a complex ensemble of neurons and glial cells. Their production during development and remodeling is tightly controlled by various regulatory mechanisms in neural stem cells. Among such regulations, basic helix-loop-helix (bHLH) factors have key functions in the self-renewal, multipotency, and fate determination of neural stem cells. Here, we highlight the importance of the expression dynamics of bHLH factors in these processes. We propose the multipotent state correlates with oscillatory expression of several bHLH factors, whereas the differentiated state correlates with sustained expression of a single bHLH factor. We also developed new optogenetic methods that can manipulate gene expressions in neural stem cells by light. We used this technology to manipulate the growth and fate-determination of neural stem cells. We are also analyzing dynamic changes in downstream gene expressions and cellular states caused by systematic light-induced manipulations of bHLH transcription factors.