

ナノ量子センサーを用いた iPS 細胞由来再生脳オルガノイド機能解明

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The elucidation of functions of iPS cell-derived regenerative brain organoid by quantum-nano sensor (¹*Graduate school of Engineering, Nagoya University*, ²*Graduate school of Medicine, Nagoya University*, ³*National Institutes for Quantum and Radiological Science and Technology*) ○Masato Tokunaga,¹ Hiroshi Yukawa,¹ Tsutomu Miwata,² Hidetaka Suga,² Hiroshi Arima,² Yushi Nishimura,³ Yoshinobu Baba¹

In regenerative medicine, there are concerns that changes of cellular state of differentiated cells affect the expression of regenerative functions of the cells. However, there are few technologies to measure the cellular state *in vitro* as well as *in vivo*. In this research, a labeling method for iPS cell-derived regenerative brain organoid by quantum-nano sensor such as nitrogen vacancy center (NVC) fluorescent nano-diamonds make it possible to measure temperature change was constructed. Furthermore, the relationship between the cellular temperature and the regenerative function was investigated.

Keywords : Quantum-nano sensor; Adenohypophysis organoid; Fluorescent nano-diamond; Temperature

再生医療において再生細胞の細胞状態の違いが再生機能発現に影響することが懸念されている。しかし、これまで生体内外を問わず細胞状態の計測はほとんど実現されていない。本研究では、温度情報を取得可能なナノ量子センサーである窒素格子欠陥蛍光ナノダイヤモンド¹⁾を用いて i P S 細胞由来再生脳オルガノイド²⁾の標識方法を構築するとともに、細胞内温度測定を実施した。さらに細胞温度と再生機能発現との関係も検証したので報告する。

1) H. Yukawa et al, *Nanoscale Adv.*, **2020**.

2) H. Suga, et al, *Nat. Comm.*, **2016**.