群馬大学　生体調節研究所
内分泌・代謝学共同利用共同研究拠点セミナー

Stem cell–derived beta cells for diabetes therapy: Do they engraft better than primary islets?

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場所：生体調節研究所1 階会議室

（予約不要・直接会場にお越しください）

Beta cell replacement therapy, the transplantation of insulin-producing cells, represents a promising strategy for diabetes treatment. Recent advances in stem cell–derived islet technology have accelerated clinical translation, with multiple clinical trials currently underway worldwide. While stem cell–derived islets recapitulate many key characteristics of primary cadaveric islets, they also exhibit distinct physiological properties that may influence transplantation outcomes.

Successful clinical transplantation depends on multiple factors governing graft engraftment. Oxygen availability is a critical determinant of early graft survival and a key limitation in primary islet transplantation. In contrast, stem cell populations have long been suggested to possess enhanced hypoxia tolerance. This raises the possibility that stem cell–derived islets may represent a more favorable cell source for transplantation than primary islets, particularly under oxygen-limited conditions.

However, quantitative evaluation of hypoxia resistance has been challenging due to the lack of established measurement platforms. We have developed a quantitative method to assess hypoxia resistance in three-dimensional cell constructs, enabling systematic comparison of oxygen tolerance across diverse cell sources. This approach reveals significantly greater hypoxia resistance in stem cell–derived beta cells compared with primary islets.

This seminar will present not only the physiological distinctions between primary and stem cell–derived beta cells, but also technical advances for quantifying hypoxia resistance profiles across a wide range of cell types.

Professional Appointments

- Associate Professor (2024): Department of Surgery, University of California, San Francisco (UCSF)
- Assistant Research Professor (2019): Arthur Riggs Diabetes & Metabolism Research Institute, City of Hope
- Postdoctoral Fellow (2014): Beckman Research Institute, City of Hope

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発表言語：日本語（The presentation will be given in Japanese. Questions are welcome in English.）