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姉妹校交流招待講演

Human multipotent dedifferentiated fat cells exhibit perivascular phenotype and behaviors

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Objective : Dedifferentiated fat (DFAT) cells derived from mature adipocytes have been considered to be a homogeneous group of multipotent cells, which might be an alternative source of adult stem cells for regenerative medicine. However, many aspects of the cellular nature about DFAT cells remained unclarified. Based on recent understandings on the connection between the tissue-specific progenitor and perivascular cells, this study aimed to elucidate the basic characteristics of DFAT cells underlying their perivascular functions and differentiation potentials.

Method : By modified ceiling culture technique, DFAT cells were converted from human adipocytes in the buccal fat pads. Flow cytometry and differentiation analysis were carried out to determine the phenotype and multipotency of those cells. The pro-vascular ability of DFAT cells were studied by Matrigel assay also.

Result : Flow cytometry analysis revealed that those derived cells were a homogeneous population of CD 13 + CD 29+ CD 105+ CD 44+ CD 140 b+ CD 31- CD 34- CD 309- CD 106- CD 146- $\alpha$ -SMA-cells. Compared with previous reports, DFAT cells in this study demonstrated tissue-specific differentiation properties with strong adipogenic but much weaker osteogenic capacity. Neither did they exhibit endothelial phenotype under angiogenic induction. For the first time, we found human DFAT cells could undertake characteristics of perivascular lineage, including expression of pericyte markers, Dil-ac-LDL uptake ability, vascular network formation ability on Matrigel. Furthermore, DFAT cells could largely promote and stabilize the vessels structures formed by human umbilical vascular endothelial cells (HUVECs) in vitro.

Conclusion : This study provided novel evidence on the pericyte nature of human DFAT cells, which also supported the recent understanding about the perivascular origin of adult stem cells that tissue-specific progenitor cells in mesenchymal tissues would associate with the blood vessels, exhibiting perivascular characteristics and functions.

《プロフィール》



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1997 - 2004年 West China School of Stomatology, Sichuan University (7-Year Bachelor-Master Combined Program)

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