News Release

Title

Identification of Meflin as a potential marker for mesenchymal stromal cells

Key Points

- The research group led by Prof. Masahide Takahashi reported that a cell surface protein Meflin is a marker specific for mesenchymal stromal cells (MSCs), fibroblasts and perivascular cells, but not other types of cells.
- MSCs are known to exhibit multipotential differentiation capacity into osteoblasts, chondroblasts and adipocytes. The research group found that the expression of Meflin in MSCs is downregulated upon their differentiation.
- The research group found that Meflin maintains the undifferentiated state of MSCs both in in vivo and in vitro.
- These results showed that Meflin is a new marker for MSCs. Identification of Meflin could be helpful for efficient isolation of undifferentiated MSCs and understanding the mechanisms for MSC-mediated cell therapies.

Summary

Prof. Masahide Takahashi, Dr. Atsushi Enomoto, Dr. Keiko Maeda (Department of Pathology) and their collaborators in Nagoya University Graduate School of Medicine (Dean: Masahide Takahashi, M.D., Ph.D.) identified a novel marker for mesenchymal stromal cells (MSCs). The research group reported that a cell surface protein Meflin is expressed in MSCs, fibroblasts and perivascular cells in the bone marrow and other multiple organs, but not other types of cells. The research group found that Meflin maintains the undifferentiated state of cultured MSCs, and its expression gets downregulated upon their differentiaition. Consistent with this finding, Meflin-deficient mice exhibited accelerated bone development and increased number of osteoblasts. These data suggested that Meflin is a marker for undifferentiated MSCs and their source cells in vivo. This work was published online in Scientific Reports on February 29, 2016.

Research Background

Mesenchymal stromal cells (MSCs) in culture are derived from bone marrow stromal cells and perivascular fibroblasts in multiple organs. MSCs exhibit multipotential differentiation capacity and have been exploited in multiple cell therapies in clinical medicine. However, the native identity and origin of MSCs are not fully understood due to the lack of identification of their specific marker proteins.

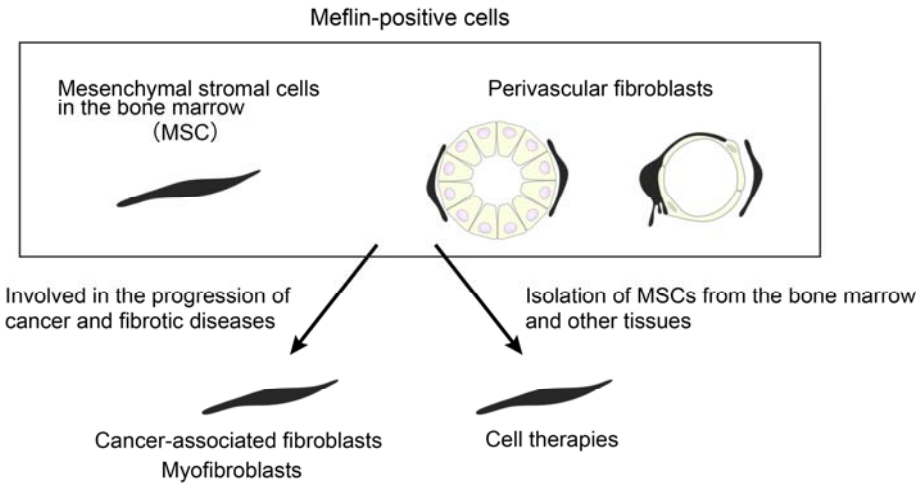
Research Results

The research group identified that a cell surface protein Meflin is expressed in MSCs and perivascular fibroblasts, but not other types of cells. They found that Meflin maintains the

undifferentiated state of cultured MSCs and is downregulated upon their differentiation. Meflin-deficient mice exhibited accelerated bone development and increased number of osteoblasts. These data suggested that Meflin is a marker for MSCs and their source cells in vivo.

Research Summary and Future Perspective

In summary, the present study proposed that Meflin is a novel potential marker for MSCs both in vitro and in vivo. This study may help efficient isolation of MSCs and understand the mechanisms for MSC-mediated cell therapies in future.



Publication

Keiko Maeda, Atsushi Enomoto, Akitoshi Hara, Naoya Asai, Takeshi Kobayashi, Asuka Horinouchi, Shoichi Maruyama, Yuichi Ishikawa, Takahiro Nishiyama, Hitoshi Kiyoi, Takuya Kato, Kenju Ando, Liang Weng, Shinji Mii, Masato Asai, Yasuyuki Mizutani, Osamu Watanabe, Yoshiki Hirooka, Hidemi Goto and Masahide Takahashi. Identification of Meflin as a Potential Marker for Mesenchymal Stromal Cells. Scientific Reports (February 29, 2016)

Japanese ver.

http://www.med.nagoya-u.ac.jp/medical/dbps_data/_material_/nu_medical/_res/topix/2015/meflin_20160301jp.pdf