



多色細胞系譜追跡法と幹細胞研究

Multicolor lineage tracing method and stem cell research

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Keywords

成体幹細胞
がん幹細胞
胎生前駆細胞
多色細胞系譜追跡法
蛍光蛋白質

Summary

Recently, significant progress has been made in stem cell research ; adult stem cells as well as embryonic (ES) and induced pluripotent stem (iPS) cells are major focus areas. Studies on adult stem cells are important as sources for regenerative medicine as well as for analyzing the mechanisms of tissue homeostasis, tissue repair after injury, carcinogenesis, and aging, whereas ES and iPS cells are mainly important for regenerative medicine. However, many adult stem cells, especially those in low-turnover tissues, have remained unidentified. Considering the potential for such tissues to lead to malignant tumors, identifying adult stem cells in them is important. We have been working on the development of methods using multiple fluorescent markers, to improve the accuracy of lineage-tracing analyses of adult stem cells and their fetal progenitors. With this method, we could identify lingual epithelial stem cells (LESCs). LESCs, located at the bottom of the interpapillary pit (IPP), are slow-cycling and Bmi1-positive. They supply mature keratinized epithelial cells to three or four surrounding filiform papillae. Additionally, we could potentially identify candidate cancer stem cells in chemical-induced tongue carcinomas. In this review, I would like to discuss how the multicolor lineage tracing method could be used in various stem cell and developmental biology studies.

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