REVIEW

腸管オルガノイド研究の進歩とその展望

Progress and prospects of intestinal organoid research

鶴田　覚[1)2)]　阿久津英憲[2)]
Satoru Tsuruta[1)2)] / Hidenori Akutsu[2)]

[1)] 弘前大学大学院医学研究科消化器外科学講座
[2)] 国立成育医療研究センター再生医療研究部
[1)]Department of Gastroenterological Surgery and Pediatric Surgery, Hirosaki University Graduate School of Medicine
[2)]Department of Reproductive Medicine, National Research Institute for Child Health and Development
akutsu-h＠ncchd.go.jp

KEY WORDS
自己組織化，組織幹細胞，多能性幹細胞，腸管オルガノイド

SUMMARY

Three-dimensional (3D) models of the human intestine have been actively developed using tissue stem cells or pluripotent stem cells based upon recent advancements of gastrointestinal (GI) development. The 3D model function gut tissues and mimics differentiation into GI organ so-called an intestinal organoid. The intestinal organoids are divided into two distinct types based either on the mucosa epithelium stem cells or pluripotent stem cells (PSCs) as a source. The epithelium organoids composed of various epithelial cell types are applying for various disease models including cancers and also chemical screening system in drug development. The PSCs derived gut organoids can mimic the GI-organogenesis *in vitro* and the tissue architecture, and authors have also succeeded in producing highly matured functional intestinal organoids (Mini-Guts) self-organized from the PSCs in a xenogeneic-free condition. The GI organoids become definite models for human intestinal development, and also are applied to biomedical development such as drug development and regenerative medicine. The development of GI organoid systems can provide accurate and physiologically relevant models in establishing appropriate platforms for the development of new therapeutic strategies.

Here, we summarize the GI organoid models of intestinal development and disease, considering where improvements could be made and potential applications in the fields of basic science and biomedical applications.