

Center for Stem Cell Biology and Regenerative Medicine

Division of Somatic Stem Cell Research

体性幹細胞研究分野

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Somatic stem cells, which are derived from mesoderm, include mesenchymal stromal cells (MSCs), blood cells, and other mesenchymal tissues. MSCs exist in the interstitium of systemic organs; they have self-renewal ability, migrate to the sites of inflammation and tissue damage, and exert anti-inflammatory effects and tissue repair ability. Among various somatic stem cells, we focused on umbilical cord blood (CB) and umbilical cord-derived MSCs (UC-MSCs) and we explored new immune and regenerative gene/cell therapies using CB and UC-MSCs. Another mission is to manage the IMSUT-HLC cell processing facility (IMSUT-HLC-CPF) for translational research. To achieve the high-quality processing and tests for UC-MSCs therapy, IMSUT-HLC-CPF obtained manufacturing license as the first national University in 2023.

Cord blood and umbilical cord-derived cells for immune-cell therapy and regenerative medicine

Sudo K, Takahashi A, Hori A, Miharu Y, Yamaura N, Nagaya N, Mori Y, Yoshino T, Zhang T, Huang X, Hu D, Nagamura-Inoue T

We explored new immune and regenerative gene/cell therapies using umbilical cord blood (CB) and umbilical cord-derived MSCs (UC-MSCs) with high quality and safety standards. For the high quality and safety standards. We have been exploring UC-MSCs to apply the several diseases including acute radiation injury, cleft palate, hemorrhagic arthropathy, and acceleration of engraftment of hematopoietic

stem cells using mice models in collaboration with companies.

Management of IMSUT-HLC-CPF

Sudo K, Takahashi A, Hori A, Miharu Y, Yamaura N, Nagaya N, Mori Y, Yoshino T, Nagamura-Inoue T

It is our mission to keep the IMSUT-HLC cell processing facility (IMSUT-HLC-CPF) clean and functional to enable high-quality manufacturing for translational gene and cell therapy. To achieve this mission IMSUT-HLC-CPF obtained manufacturing license for UC-MSCs therapy as the first national University in 2023.

Publications

- 1) Trang Thi Binh Pham, Kenshi Sei, Yuki Yamamoto, Takeo Mukai, Hiroyuki Akai, Tokiko Nagamura-Inoue, Umbilical cord-derived mesenchymal stromal cells attenuate radiation-induced neuron damage in vitro. *Stem Cell Research & Therapy*, 2026 in press.
- 2) Yamazaki R, Yakushijin K, Yoshihara S, Ikeda K, Ishida A, Kajiwara M, Kikuta A, Takagi N, Nagamura-Inoue T, Namba N, Haraguchi K, Fujimori Y, Fujiwara SI, Yamada-Fujiwara M, Okuyama Y,

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- Tanosaki R, Ueda Y, Evaluation of peripheral blood stem cell collection in the Japan Marrow Donor Program (JMDP), *Transfusion*. 2025 Dec; 65(12):2345-2353.
- 3) Fujita K, Ikeguchi R, Aoyama T, Noguchi T, Yoshimoto K, Sakamoto D, Iwai T, Miyamoto T, Miyazaki Y, Akieda S, Nagamura-Inoue T, Nagamura F, Nakayama K, Matsuda S, Efficacy and safety of Bio 3D conduits composed of human umbilical cord-derived mesenchymal stromal cells: A proof-of-concept study in a canine ulnar nerve defect model. *Cell Transplant*. 2025 Jan-Dec; 34: 9636897251361711
- 4) Tingting Zhang, Kai Kang, Jun Takeda, Atsuo Itakura, Tokiko Nagamura-Inoue, A Comprehensive Analysis of Immune Infiltration-related Genes in Cerebral Palsy through Bioinformatics and Machine Learning, AI and Clinical Practice, 2025, in press