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Human pluripotent stem cells as a tool for therapeutic development for the treatment of common diseases

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Human pluripotent stem cells including embryonic stem cells (ESCs) and induced pluripotent stem cells (iPSCs) have been expected to provide an excellent tool for regenerative medicine. However, there are two major concerns in their clinical application: Immunological rejection and risk of tumorigenicity in the case of ESCs and iPSCs, respectively. Hence, their clinical application has been considered only in those cases where there are no alternative measures for effective treatments. Here, we propose that human ESCs/iPSCs can contribute to therapeutic development for the treatment of common diseases. As we recently reported, transient existence of human iPSC-derived vascular endothelial cells can exert a sustainable therapeutic effect on an injured artery preventing stenosis induction even after they are immunologically rejected. In this case, immunological rejection creates beneficial outcomes by nullifying the risk of tumorigenesis without decreasing therapeutic effects. Another utility of human pluripotent stem cells is to provide a feasible tool for drug discovery that are otherwise unavailable. For example, sufficient amounts of brown adipocytes, which has been attracting a great deal of attention as a new target of drug discovery for the treatment of metabolic disorders, are unobtainable from living individuals due to technical as well as ethical problems. However, brown adipocytes can easily be produced from human ESCs/iPSCs as we previously reported. Potential contribution of human pluripotent stem cells to therapeutic development for the treatment of common diseases will be further discussed.

Biography

Kumiko Saeki has completed her graduation from the Faculty of Medicine, Tokyo University in 1988. After Residency training, she entered Graduate School of Tokyo University and was conferred a Doctor degree in 1995. After working as a Post-doctoral fellow, she became the Division Chief of Department of Hematology, Research Institute, International Medical Center of Japan in 1999. Since 2010, she has been the Chief of Stem Cell Therapy, Department of Disease Control, Research Institute, National Center for Global Health and Medicine. She has published more than 40 papers and has been serving as an Editorial Board Member of *World Journal of Stem Cells*.

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