

## Platelets using iPSC cell technology; large scale manufacturing

Eto K<sup>1,2</sup>

### Abstract

Induced pluripotent stem cell (iPSC) derived-platelet like particle product (iPS-platelets) is aimed to complement the current blood donor-dependent system, which is expecting the shortage of blood donors in the younger population due to the aging societies in developed countries and platelet transfusion refractoriness due to alloimmune responses. One of the strategies is to establish expandable megakaryocyte lines as a source of manufacturing cGMP grade platelets. Additionally, by scaling up of the bioreactor with novel physical parameters in optimal range, more than 100 billion iPS-platelets were produced in a 8L newly developed reactor tank towards supply of an one unit platelets concentrate (300 billion of platelets, USA). In vitro and in vivo evaluation of iPS-platelets showed the functionality comparable with donor-derived platelets. We further plan to establish the proof-of-concept of the universal HLA class-I knocked out platelets towards clinical application and the further industrial production.

*This lecture was delivered in the Plenary Session of NCRM NICHE 2019. NCRM NICHE ([www.ncrmniche.org](http://www.ncrmniche.org)) is a day of commemorative events to celebrate the inaugural Anniversary of Nichi-In Centre for Regenerative Medicine, conducted every year since 2006 in the month of October. NCRM NICHE provides a platform that augments the interaction of scientists and clinicians. It enables them to exchange ideas in order to arrive at synergies while working towards a common goal of discovering clinically applicable solutions for diseases without a definitive treatment to yield relief to numerous patients. Conducted in India till 2016, it has been conducted in Japan from 2017 onwards. NCRM NICHE has two components: 1. Active Knowledge Gaining (AKG) events which refer to any knowledge gaining activity in which the participant plays an active role before and during the event instead of being a passive listener to a lecture by a speaker or a conversation among third parties. AKG events of NCRM NICHE include a. Fujio Cup Quiz (FCQ); b. Oral Presentation session and c. Tour to Premier Institutes and Inter Disciplinary Conclave (IDC); 2. Passive Knowledge Gaining (PKG) events which refer to an event, where there is no mandatory preparation by the participants before the event. During the event, they have to merely be a passive listener to others either delivering a lecture or interacting among third parties. PKG events of NCRM NICHE include a. Lectures & Orations and b. Inter-Disciplinary Interactions and Solutions (IIDIAS) Session. NCRM NICHE 2019 was conducted at the Shibaura Institute of Technology, Tokyo, Japan from 14 ~ 16 October 2019.*

Author Names in full: Koji Eto<sup>1,2</sup>

<sup>1</sup>Department of Regenerative Medicine, Graduate School of Medicine Chiba University, Chiba; Graduate School of Medicine, Kyoto University, Kyoto, Japan. <sup>2</sup>Center for iPSC Cell Research and Application (CiRA), Kyoto University, Japan

JSRM/Vol15 No.2, 2019; P52

Proceedings of Annual Plenary Session on Regenerative Medicine (PAPRM); Published online 24 December 2019