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Attn: All media

Sysmex Corporation
HEALIOS K.K.
Sumitomo Dainippon Pharma Co., Ltd.

Sysmex, Healios and Sumitomo Dainippon Pharma Begin Joint R&D Related to Pre-Transplant Immune Reaction Testing Method for Retinal Pigment Epithelial Cells (RPE Cells) Derived from Allogeneic iPS Cells

Sysmex Corporation (HQ: Kobe, Japan; Chairman and CEO: Hisashi Ietsugu, “Sysmex”), HEALIOS K.K. (HQ: Minato-ku, Tokyo, Japan; President and CEO: Hardy TS Kagimoto, “Healios”) and Sumitomo Dainippon Pharma Co., Ltd. (HQ: Osaka, Japan; President and CEO: Masayo Tada, “Sumitomo Dainippon Pharma”) hereby provide notice that the three companies have begun pursuing joint research and development toward the establishment of a pre-transplant immune reaction testing method for retinal pigment epithelial cells (RPE cells) derived from allogeneic induced pluripotent stem (iPS) cells.

iPS cell¹ transplantation therapy is divided into two methods: autologous transplantation, where cells produced from iPS cells derived from a patient's own body, and allogeneic transplantation, which uses cells produced from iPS cells derived from a donor who meets certain criteria (allogeneic iPS cells). Autologous transplantation already has a track record of use in therapy, but involves a number of issues. This method requires producing iPS cells from a patient's own cells and then inducing cellular differentiation² suitable for transplantation therapy. Producing cells for transplant requires time and the production costs are substantial.

The method of allogeneic transplantation, on the other hand, may have the potential to provide cells with assured quality for transplantation therapy timely, stably and inexpensively, because allogeneic iPS cells are stored and managed in cell banks³, and cells for transplant are produced systematically in standardized processes. However, since allogeneic transplantation, —the treatment method using cells derived from allogeneic iPS cells— may induce post-transplant immunorejection⁴, it is necessary to develop a new testing method to confirm prior to transplantation whether cells are suitable for transplant, including the possibility to cause immunorejection.

To this end, Sysmex, Healios and Sumitomo Dainippon Pharma have commenced joint R&D on pre-transplant immune reaction testing for a regenerative medicine containing RPE cells⁵ derived from allogeneic iPS cells, which is jointly developed in Japan by Healios and Sumitomo Dainippon Pharma, targeting age-related macular degeneration⁶ and other ocular diseases.

Healios and Sumitomo Dainippon Pharma will provide Sysmex with RPE cells they have produced from allogeneic iPS cells, and Sysmex will use its proprietary imaging flow cytometers and protein analysis technology to develop a pre-transplant immune reaction testing method. It is anticipated that testing results can be reflected in immunosuppressive therapy such as optimizing immunosuppressive agent administration frequency and dosages



for patients following allogeneic cell transplantation.

Sysmex, Healios and Sumitomo Dainippon Pharma will work together on technological developments to further enhance the quality and efficiency of healthcare and pursue R&D toward the commercialization of leading-edge technologies.

- 1 iPS cells:
An abbreviation for induced pluripotent stem cells, iPS cells that are produced from human skin cells or others by transfection of several factors are capable of differentiation into many types of cells organizing tissue or organ.
- 2 Cellular differentiation:
The process where a cell, including stem cell such as embryonic stem (ES) cell, iPS cell, or progenitor cell, changes to other type of cell with a specific function and morphology.
- 3 Cell bank:
To produce final products on a sustained and stable basis, cells that have been prepared from a single cell under defined conditions (cultivation in advance) are dispensed into multiple containers and stored under defined conditions. For iPS cells, a project of “iPS Cell Stock for Regenerative Medicine” is underway by using cells harvested from healthy Japanese volunteers.
- 4 Immunorejection:
In this reaction, the body works to protect itself by resisting the invasion of foreign substances, activating immune cells to block the invasion. As this reaction is central to the success or failure of tissue and cell transplants, currently immunosuppressive agents are used to control the rejection reaction.
- 5 Retinal pigment epithelial cells (RPE cells):
These cells form the tissue on the outermost layer of the retina. Including melanin pigment, they absorb excess light entering the retina, prevent scattering and perform other functions. They also serve as a control gate to regulate the flow of substances between the exterior choroid and the internal retina.
- 6 Age-related macular degeneration:
Retinal maculae play an important role in the ability to see, but damage due to advancing age can cause degeneration, resulting in illness in which the eyesight is impaired. In one type of age-related macular degeneration, the macular structure takes on an “atrophic form” along with advancing age. In another, the “exudative form,” new vessels form just below the retina (neovascularity), causing damage to the maculae.

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