EMERGING RESEARCH FRONTS - 2008

August 2008

PDF

Takashi Shinohara talks with *ScienceWatch.com* and answers a few questions about this month's Emerging Research Front Paper in the field of Molecular Biology & Genetics.

Article: Generation of pluripotent stem cells from neonatal mouse testis
Authors: Kanatsu-Shinohara, M;Inoue, K;Lee, J;Yoshimoto, M;Ogonuki, N;Miki, H;Baba, S;Kato, T;Kazuki, Y;Toyokuni, S;Toyoshima, M;Niwa, O;Oshimura, M;Heike, T;Nakahata, T;Ishino, F;Ogura, A;Shinohara, T
Journal: CELL, 119 (7): 1001-1012 DEC 29 2004
Addresses: Kyoto Univ, Horizontal Med Res Org, Kyoto 6068501, Japan. Kyoto Univ, Horizontal Med Res Org, Kyoto 6068501, Japan.
(addresses have been truncated.)

SW: Why do you think your paper is highly cited?

This is probably because it was the first paper to show the derivation of Embryonic Stem-like (ES-like) pluripotent cells (multipotent germline stem cells, mGS cells) from postnatal animals.

SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

It's a discovery of a method that allows derivation of a new germ cell line.

SW: Would you summarize the significance of your paper in layman's terms?

We showed that spermatogonial stem cells in postnatal animals can give rise to ES-like cells. This still is the only way to derive pluripotent cells without genetic treatment.

"We have made knockout mice using these mGS cells."

SW: How did you become involved in this research and were any particular problems encountered along the way?

This is a complete byproduct of our research on gene targeting experiments using spermatogonial stem cells (SSCs). We first described our long-term culture of SSCs in 2003. These cells, which we named "Germline Stem" (GS) cells, can make sperm in the testis after microinjection into seminiferous tubules. Using these cells, we made knockout mice in 2006.

In the course of these knockout mouse experiments, we noticed ES-like colonies in the GS cell culture. Although we initially thought that they came from embryonic fibroblasts that were used in GS cell culture, it turned out that the cells were coming directly from testis cells.

This was totally unexpected, because people have assumed that these germline cells lose pluripotency in midgestation.

SW: Where do you see your research leading in the future?

We have made knockout mice using these mGS cells. We are now trying to increase the efficiency of derivation and extend this technique to other animal species.

SW: Do you foresee any social or political implications for your research?

Because induced pluripotent stem cells, commonly abbreviated as iPS cells or iPSCs, need exogenous genes to maintain their pluripotency, people have been looking for methods to derive iPS cells without viruses. In this sense, mGS cells can be derived without any genetic treatment and, with these efforts continuing into the future, researchers will eventually establish similar cells from human testes.

Takashi Shinohara, Professor
Department of Molecular Genetics
Graduate School of Medicine
Kyoto University
Kyoto, Japan

Keywords: Embryonic Stem-like, ES-like, pluripotent cells, multipotent germline stem cells, mGS cells, spermatogonial stem cells, SSCs, Germline Stem, GS, cells, knockout mice, knockout mouse experiments, induced pluripotent stem cells, iPS cells or iPSCs.

PDF

back to top

2008 : August 2008 : Takashi Shinohara

Scientific Home | About Scientific | Site Search | Site Map

Copyright Notices | Terms of Use | Privacy Statement