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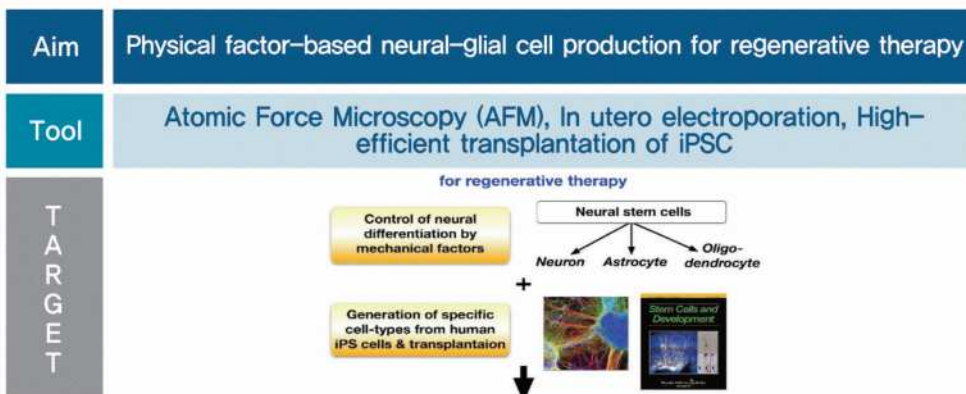
<http://kosodo.wixsite.com/neuroregeneration>

Neural Regeneration

Although mechanical properties have been shown to influence stem cell fate, little is known if mechanical properties of the stem cell niche change *in vivo* and whether and how this can influence behavior, growth and differentiation of stem cells.

We will seek mechanisms and logics how mechanical factors control differentiation towards specific neural and glial cells by systematic use of molecular biology, biochemistry, mouse genetics, biomaterials, bioinformatics, and advanced microscopy.

Furthermore, we will apply our knowledge to invent novel strategies to understand and recover from developmental brain disorders by producing specific neurons and astrocytes for transplantation and drug screening.



Research keywords

Neurogenesis, human iPS cells, Neural and glial differentiation, Brain development disorders, Extracellular physical factors, CRISPR/Cas9 genome edition, Transplantation, Biomaterial

Curriculum Vitae

2015~Present : Principle Researcher, KBRI
 2010~2015 : Associate Professor, Department of Anatomy,
 Kawasaki Medical School, Kurashiki, Japan
 2005~2010 : Research Scientist, RIKEN Center for
 Developmental Biology, Kobe, Japan
 2001~2005 : Postdoctoral Fellow, Max-Planck-Institute of
 Molecular Cell Biology and Genetics
 (MPI-CBG), Dresden, Germany

Academic Credential

2001 : Ph.D. in Life Sciences, Dept. of Biotechnology, University of Tokyo
 1998 : M.Sc. in Life Sciences, Dept. of Biotechnology, University of Tokyo
 1996 : B.Sc. in Engineering, Dept. of Chemistry and Biotechnology,
 University of Tokyo

Awards/Honors/Memberships

2000~2002 : Research Fellowship of the JSPS for PhD student
 1998~1999 : Junior Research Associate at the RIKEN Institute

Key techniques

- 1) Measurement of tissue and cellular stiffness during organogenesis using Atomic Force Microscopy. (AFM) (Iwashita et al, 2014 Development)
- 2) In utero electroporation and tissue live imaging. (Kosodo et al, 2011 EMBO J)
- 3) High-efficient transplantation to the developing brain. (Nagashima et al, 2014 Stem Cells Dev)

Research Interests/Topics

- Understanding the mechanism of neural and glial differentiation during formation of brain cortex.
- Production of specific neural cells from human iPS cells to analyze and apply for brain development disorders.

Research Publications (selected, *Corresponding author)

- Iwashita M, Ohta H, Fujisawa T, Cho M, Ikeya M, Kidoaki S, **Kosodo Y**. Brain-stiffness-mimicking tilapia collagen gel promotes the induction of dorsal cortical neurons from human pluripotent stem cells. *Sci Rep.*, 9(1):3068, 2019.
- Iwashita M, Kataoka N, Toida K, **Kosodo Y**. Systematic profiling of spatiotemporal tissue and cellular stiffness in the developing brain. *Development*, 141:3793-98, 2014.
- Nagashima F, Suzuki IK, Shitamukai A, Sakaguchi H, Iwashita M, Kobayashi T, Tone S, Toida K, Vanderhaegheon P and **Kosodo Y**. Novel and robust transplantation reveals the acquisition of polarized processes by cortical cells derived from mouse and human pluripotent stem cells. *Stem Cells Dev.*, 15:23(18) 2129-42, 2014.
- **Kosodo Y**, Suetsugu T, Suda M, Mimori-Kiyosue Y, Toida K, Baba SA, Kimura A, Matsuzaki F. Regulation of interkinetic nuclear migration by cell cycle-coupled active and passive mechanisms in the developing brain. *EMBO J.*, 30:1690-1704, 2011.
- **Kosodo Y**, Toida K, Dubreul V, Alexandre P, Schenk J, Kiyokage E, Attardo A, Mora-Bermudez F, Arai T, Clarke JD, Huttner WB. Cytokinesis of neuroepithelial cells can divide their basal process before anaphase. *EMBO J.*, 27:3151-63, 2008.

External grants (Korean)

- NRF (2016~19) Investigation to Uncover How Mechanical Factors Control Brain Formation and Application for Neural Regeneration.
- NRF (2017~19) Elucidation of mechanical factor-driven neural and glial differentiation of the CNS and PNS derived from human induced pluripotent stem cells.

Patents (Korean)

- **Kosodo Y**, Iwashita M. A method for inducing dorsal cortical neurons from pluripotent stem cells by using tilapia collagen gel. (10-2018-0099003, patent application)