

# Brain Interdisciplinary Research Division (“BIRD”)

R & D Infrastructure for the Study of the Brain, Neural Information and Neural Systems

Period : April 1, 2016~March 31, 2021

## Members :

Director **Teiichi FURUICHI** (Prof., Appl. Biol. Sci., Fac. of Sci. & Tech.)

**Jun-ichiro OKA** (Prof., Pharm., Fac. of Pharm. Sci.) ~2017

\* **Osamu ARAKI** (Prof., Appl. Physics, Fac. of Sci. Div. I)

**Naoyuki AIKAWA** (Prof, Appl. Electronics, Fac. of Ind. Sci. Tech.)

**Toru IKEGUCHI** (Prof., Info. Comp. Tech., Fac. of Eng.)

\* **Takeshi NAKAMURA** (Prof., Res. Inst. Biomed. Sci.)

**Hiroyuki NISHIYAMA** (Prof., Ind. Admin., Fac. of Sci. & Tech.)

**Akiyoshi SAITOH** (Prof., Pharm., Fac. of Pharm. Sci.) 2018~

\* **Eri SEGI-NISHIDA** (Assoc. Prof., Biol. Sci. Tech., Fac. Ind. Sci. Tech.)

\* **Hiroshi TAKEMURA** (Assoc. Prof., Mech. Eng., Fac. of Sci. Tech.)

**Hiroko ICHIKAWA** (Lect., Lib. Arts, Fac. of Sci. & Tech.)

**Tomokazu URAKAWA** (Assist. Prof., Appl. Physics, Fac. of Sci. Div. I)

**Yoshitake Sano** (Assist. Prof., Appl. Biol. Sci., Fac. of Sci. & Tech.)

**Daisuke YAMADA** (Assist. Prof., Pharm., Fac. of Pharm. Sci.) 2018~

# **Mitsuhiro HASHIMOTO** (Assist. Prof., Fukushima Med. Univ.)

# **Takahiro KIMURA** (Assoc. Prof., Kanazawa Univ.)

\* Executive Secretary; # Visiting Researcher at TUS

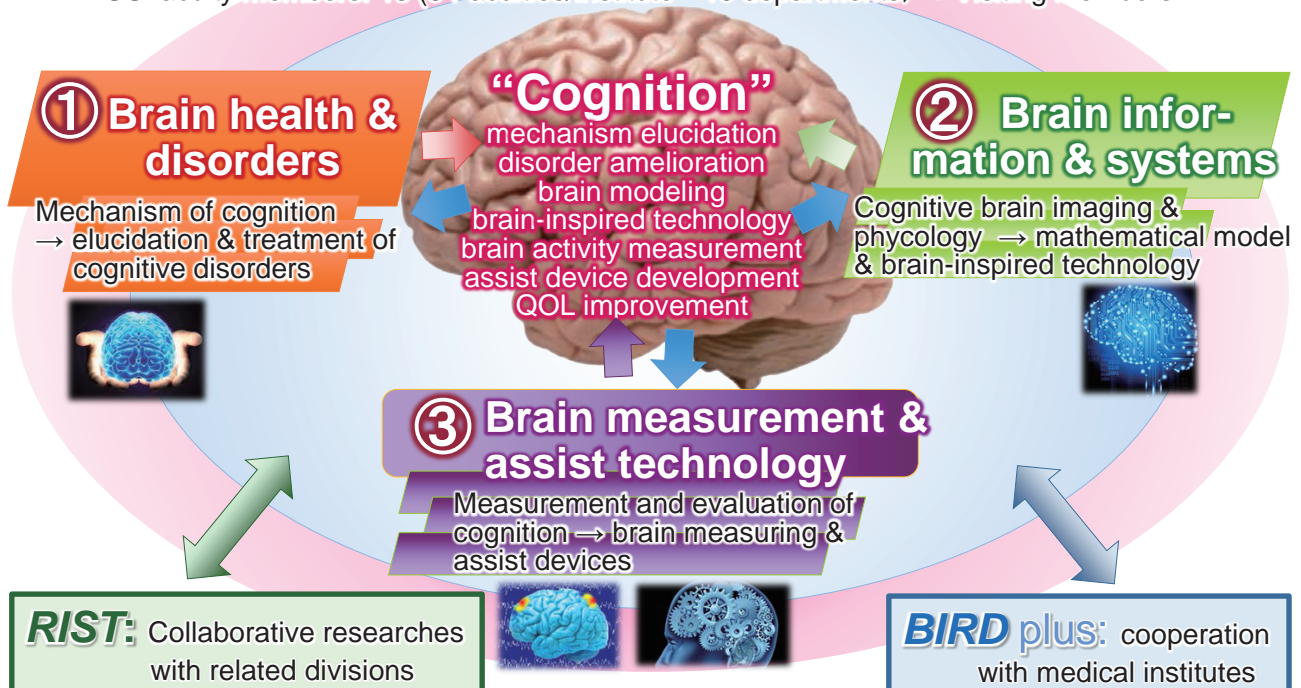
Objectives

## Creative & Innovative Brain Science in TUS

(Brain health · Brain modeling · Brain measurement & assist device)

R & D Infrastructure for the interdisciplinary study of the brain,  
neural information and neural systems

TUS faculty members: 13 (6 Faculties/Institute - 10 departments) + Visiting members: 2

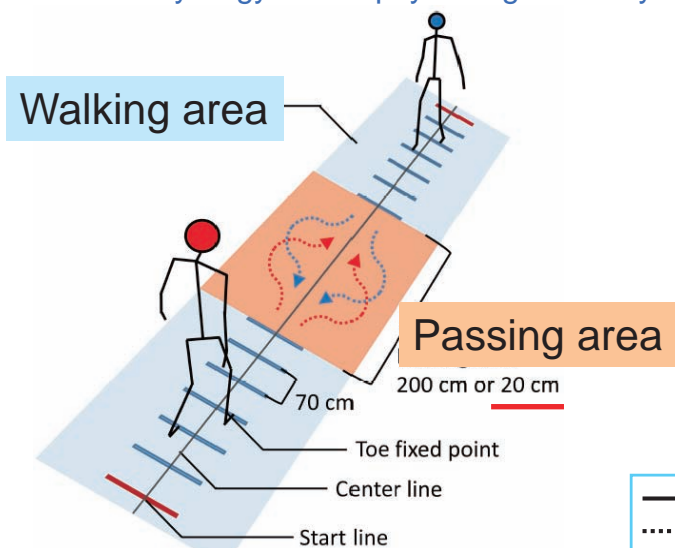




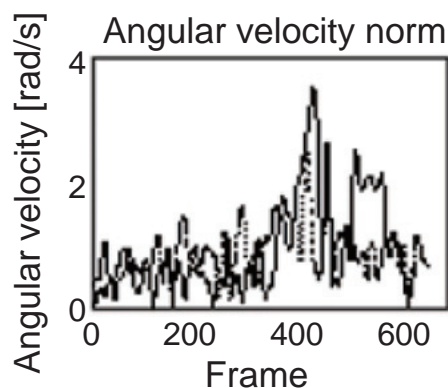
High autistic traits can be estimated by hip movement pattern (increased angular velocity) during passing each other.

Relationship between gait information and personality trait:  
Subjects with autistic-like traits showed increased angular velocity at the hip.

Synergy: Neuropsychological analysis + Bio-mechanical engineering



(a) Schematic diagram

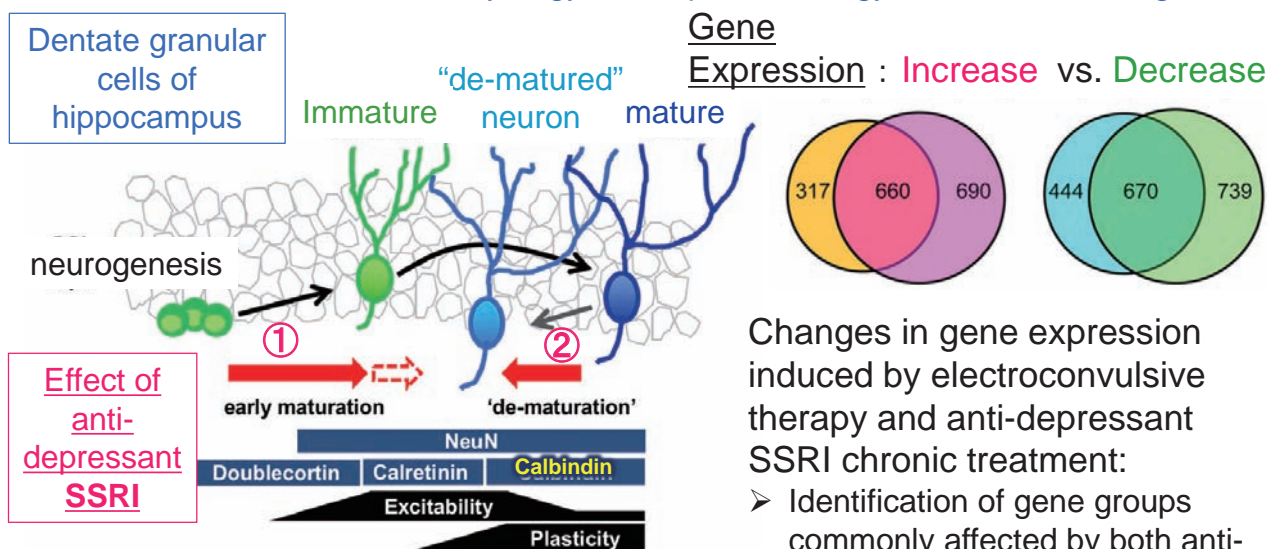


— : a subject with high SATQ score (autistic)  
..... : a subject with low SATQ score

Sigeta M. et al., Adv Biomed Eng 7: 55–62, 2018.

- ◆ Analysis of differentially-expressed genes induced by anti-depressant therapy suggested regulation of neuronal differentiation in hippocampal dentate gyrus.
- ◆ Anti-depressant SSRI induced adult neurogenesis and change in differentiation states in hippocampus.

Synergy: Neuropharmacology + Machine learning



Analysis of the neuronal circuit and gene expression patterns in hippocampus treated with antidepressant SSRI

Eri Segi-Nishida, Frontiers in Cellular Neuroscience 11:142, 2017

Changes in gene expression induced by electroconvulsive therapy and anti-depressant SSRI chronic treatment:

- Identification of gene groups commonly affected by both anti-depressant therapy
- Identification of genes common in hippocampus and hypothalamus by machine learning approach

Imoto et al. Molecular Brain 10:8, 2017