

Molecular Cell Biology

1. Staffs and Students

Professor	Hiroshi Shibuya
Associate Professor	Toshiyasu Goto
Assistant Professor	Atsushi Sato
Graduate Students	Kayo Kogure

2. Purpose of Education

Various signaling molecules inducing the cell-growth and differentiation regulate morphogenesis and organogenesis of the vertebrate. The failure of these signal molecules has also been caused with induction of the diseases. Therefore, the elucidation of signal transduction network regulating generation and differentiation is important upon clarifying the mechanism of morphogenesis, organogenesis and diseases. Our research aim is to clarify the signal transduction network regulating the mechanisms of morphogenesis and organogenesis in developmental process. We serve these research and following education to provide graduate students who will become senior scientists in life sciences.

3. Research Subjects

- 1) Roles of IQGAP1 on the canonical Wnt signaling.
- 2) WNK protein kinases, the causative genes of pseudohypoaldosteronism type II (PHAII) disease

5. Publications

1. Watanabe, Y., Itoh, S., Goto, T., Ohnishi, E., Inamitsu, M., Itoh, F., Satoh, K., Wiercinska, E., Yang, W., Shi, L., Tanaka, A., Nakano, N., Mommaas, A M., Shibuya, H., ten Dijke, P. and Kato, M. (2010). TMEPAI, a transmembrane TGF- β -inducible protein, sequesters Smad proteins from active participation in TGF- β signaling. **Mol. Cell** 37, 123-134.
2. Ohnishi, E., Goto, T., Sato, A., Kim, M., Iemura, S., Ishitani, T., Natsume, T., Ohnishi, J. and Shibuya, H. (2010). NLK, an essential effector of anterior formation, functions downstream of p38 MAP kinase. **Mol. Cell. Biol.** 30, 675-683.
3. Nifuji, A., Ideno, H., Ohyama, Y., Takanabe, R., Araki, R., Abe, M., Noda, M. and Shibuya, H. (2010). Nemo-like kinase (NLK) expression in osteoblastic cells and suppression of osteoblastic differentiation. **Exp. Cell Res.** 316, 1127-1136.
4. Maruyama, T., Kadowaki, H., Okamoto, N., Nagai, A., Naguro, I., Matsuzawa, A., Shibuya, H., Tanaka, K., Murata, S., Takeda, K., Nishitoh, H. and Ichijo, H. (2010). CHIP-dependent termination of MEKK2 regulates temporal ERK activation2 required for proper hyperosmotic response. **EMBO J.** 29, 2501-2514.
5. Ogawa, Y., Nonaka, Y., Goto, T., Ohnishi, E., Hiramatsu, T., Kii, I., Yoshida, M., Ikura, T., Onogi, H., Shibuya, H., Hosoya, T., Ito, N. and Hagiwara, M. (2010). Development of a novel selective inhibitor of the Down syndrome-related kinase Dyrk1A. **Nat. Commun.** 1, 1090.
6. Goto, T., Fukui, A., Shibuya, H., Keller, R. and Asashima, M. (2010). Xenopus furry contributes to release of microRNA gene silencing. **Proc. Natl. Acad. Sci. USA** 107, 19344-19349.
7. Hanafusa, H., Ishikawa, K., Kedashiro, S., Saigo, T., Iemura, S., Natsume, T., Komada, M., Shibuya, H., Nara, A. and Matsumoto, K. (2011). Leucine-rich repeat kinase LRRK1 regulates endosomal trafficking of the EGF receptor. **Nat. Commun.** 2, 158.