

Molecular Cell Biology

1. Staffs

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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) Regulation of TAK1-NLK signaling for anterior formation in *Xenopus* development
- 2) WNK protein kinases, the causative genes of pseudohypoaldosteronism type II (PHAII) disease

5. Publications

1. Kim, M., Kondo, T., Takada, I., Youn, M.-Y., Yamamoto, Y., Takahashi, S., Matsumoto, T., Fujiyama, S., Shirode, Y., Yamaoka, I., Kitagawa, H., Takeyama, K., Shibuya, H., Ohtake, F. and Kato, S. (2009). DNA demethylation in hormone-induced transcriptional derepression. **Nature** 461, 1007-1012.
2. 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.
3. Ohnishi, E., Goto, T., Sato, A., Kim, M., Iemura, S., Ishitani, T., Natsume, T., Ohnishi, J. and Shibuya, H. (2010). NLK, an essential effector for of anterior formation, functions downstream of p38 MAP kinase. **Mol. Cell. Biol.** 30, 675-683.