

Biochemical Genetics

1. Staffs and Students (April, 2010)

Professor	Shigetaka Kitajima MD, PhD	
Associate Professor	Yujiro Tanaka MD, PhD	
Assistant Professor	Junya Kawauchi MD, PhD	
Secretary	Kuniko Takayanagi	
Graduate Student	Liu Qin,	Kenji Taketani,
	Kaori Sasaki,	Aiko Motoshita,
	Hisaharu Masaki,	Manami Kodaka,
	Jun Mitamura,	Saori Ooya,
	Daiki Miyamoto,	Makoto Inoue,
	Manabu Hirata,	Chika Miyagi
Research Student	Masashi Aoki	

2. Purpose of Education

Transcriptional regulation is one of the most important processes by which genome information is expressed from DNA to mRNA to protein. The faithful synthesis of mRNA is achieved by transcriptional machinery comprised of RNA polymerase II, basal factors and many other protein factors, whose dysfunction is implicated in various human diseases. Our research interest is focused on the basic mechanism of transcription cycle and implication of early response transcription factors in determining cell fate in stress response. We are also studying on the mechanism of cell cycle arrest of terminally differentiated cardiac cells and its re-activation to provide novel regeneration therapy.

Key words

- To provide novel paradigm of transcriptional regulation
- To understand role of transcription factor in cell fate determination
- To innovate novel in situ regeneration therapy of heart

3. Research Subjects

- 1) Transcription
- 2) Cell fate determination by activating transcription factor ATF3
- 3) Mechanism of cell cycle arrest in terminal differentiation of cardiac cells and its re-activation both in vivo and in vitro

4. Clinical Services

none

5. Publications

Original Article

1. Miyazaki K, Inoue S, Yamada K, Watanabe M, Liu Q, Watanabe T, Adachi-T M, Tanaka Y, and Kitajima S. Differential usage of alternate promoters of the human stress response gene ATF3 in stress response and cancer cells. *Nucleic Acids Res* 37, 1438-1451, 2009
2. Turchi L, Fareh M, Aberdam E, Kitajima S, Simpson F, Wicking C, Aberdam D, and Virrolo T. ATF3 and p15PAF are novel gatekeepers of genomic integrity upon UV. *Cell Death and Differentiation* 16, 728-737, 2009
3. Suganami T, Yuan X, Shimoda Y, Uchio-Yamada K, Nakagawa N, Shirakawa I, Usami T, Tsukahara T, Nakayama K, Miyamoto Y, Yasuda K, Matsuda J, Kamei Y, Kitajima S, Ogawa Y. Role of ATF3 constitutes as a negative regulator of saturated fatty acid/Toll-like receptor 4 signaling and macrophage activation in obese adipose tissue. *Circ Res* 105, 25-32, 2009
4. Okada M, Sakai T, Nakamura T, Adachi TM, Kitajima S, Matsuki Y, Watanabe E, Hiramatsu R, Sakaue H, Kasuga M. Skp2 promotes adipocyte differentiation via a p27kip1-independent mechanism in primary mouse embryonic fibroblasts. *Biochem Biophys Res Commun* 379, 249-254, 2009
5. Rondon, GA, H. Mischo, J. Kawauchi and N.J.Proudfoot Failsafe transcriptional termination for protein coding genes in *S. cerevisiae*. *Mol.Cell* 36, 88-98, 2009