

Pathological Cell Biology

1. Staffs and Students (April, 2009)

Professor	Shigeomi SHIMIZU	
Associate Professor	Norio SHIMIZU	
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Tokunin Assistant Professor	Ikuko NAKANOMYO,	Reishuku LI,
	Michiko Murohashi,	Tatsushi Yoshida
Secretary	Mimi SAKAGUCHI,	Tomomi HAKUYA
Graduate Student	Yuya NISHIDA,	Hirofumi YAMAGUCHI,
	Kenji FUJITANI,	Tohru SATOH,
	Sawako SUZUKI,	Sayumi ICHIKAWA,
	Miyako HIRASAWA	

2. Purpose of Education

Main objective in the graduate course is to provide students opportunity to study the molecular mechanisms of cell death, the cell death-related diseases, the physiological and pathological roles of autophagy, the development mechanism of Epstein-Barr virus (EBV) infection, the employment of immunodeficiency animals for the creation of virus research models and development of an exhaustive pathogenic microbial screening system.

3. Research Subjects

- 1) Analysis of apoptosis mechanism
- 2) Analysis of non-apoptotic cell death (autophagic cell death)
- 3) Physiological and pathological roles of cell death in mammals
- 4) Analysis of autophagy mechanism
- 5) Physiological and pathological roles of autophagy in mammals
- 6) Development of novel EBV infection animal models using the hNOG mice
- 7) Development of an exhaustive pathogenic microbe screening system

4. Clinical Services

No services.

5. Publications

Original Article

1. Young, A.R.J., Narita, M., Ferreira, M., Kirschner, K., Sadaie, M., Darot, J.F.J., Tavaré, S., Arakawa, S., Shimizu, S., Watt, F.M. and M. Narita. Autophagy mediates the mitotic-senescence transition. *Genes & Dev.* 23, 798-803, 2009
2. Kato, M., Akao, M., Matsumoto-Ida, M., Makiyama, T., Iguchi, M., Takeda, T., Shimizu, S. and T. Kita. The targeting of cyclophilin D by RNAi as a novel cardioprotective therapy: evidence from two-photon imaging. *Cardiovascular Research* 83, 335-344, 2009
3. Yamagata, H., Shimizu, S., Watanabe, Y., Craigen, W.J. and Y. Tsujimoto. Requirement of voltage-dependent anion channel 2 for pro-apoptotic activity of Bax. *Oncogene* 28, 3563-3572, 2009
4. Nishida, Y., Arakawa, S., Fujitani, K., Yamaguchi, H., Mizuta, T., Kanaseki, T., Komatsu, M., Otsu, K., Tsujimoto, Y. and S. Shimizu. Discovery of Atg5/Atg7-independent alternative macroautophagy. *Nature* 461, 654-658, 2009
5. Shimada, H., Hirai, K., Simamura, E., Hatta, T., Iwakiri, H., Mizuki, K., Hatta, T., Sawasaki, T., Matsunaga, S., Endo, Y., and S. Shimizu. Paraquat toxicity induced by voltage-dependent anion channel 1 acting as an NADH-dependent oxidoreductase. *J. Biol. Chem.* 284, 28642-28649, 2009
6. Mouri, A., Noda, Y., Shimizu, S., Tsujimoto, Y. and T. Nabeshima. The role of cyclophilin D in learning and memory. *Hippocampus* in press
7. Shimizu, S., Konishi, A., Nishida, Y., Mizuta, T., Nishina, H., Yamamoto, A. and Y. Tsujimoto. Involvement of JNK in the regulation of autophagic cell death. *Oncogene* in press
8. Nagasawa M., Ogawa K., Nagata K., Shimizu N. Serum granulysin as a possible biomarker of NK cell neoplasm. *Br J Haematol.* 2009 Nov 13. [Epub ahead of print]
9. Yajima M, Imadome KI, Nakagawa A, Watanabe S, Terashima K, Nakamura H, Ito M, Shimizu N, Yamamoto N,

- Fujiwara S.T Cell-Mediated Control of Epstein-Barr Virus Infection in Humanized Mice. *J Infect Dis.* 2009 Oct 15. [Epub ahead of print]
10. Iwata S, Wada K, Tobita S, Gotoh K, Ito Y, Demachi-Okamura A, Shimizu N, Nishiyama Y, Kimura H. Quantitative Analysis of Epstein-Barr Virus (EBV)-Related Gene Expression in Patients with Chronic Active EBV Infection. *J Gen Virol.* 2009 Sep 30. [Epub ahead of print]
 11. Yamanaka Y., Tagawa H., Takahashi N., Watanabe A., Guo Y-M., Iwamoto K., Yamashita J., Saitoh H., Kameoka Y., Shimizu N., Ichinohasama R., and Sawada K. Aberrant overexpression of microRNAs activate AKT signaling via down-regulation of tumor suppressors in natural killer-cell lymphoma/leukemia. *Blood* 114: 3265 – 3275, 2009
 12. Moriai S, Takahara M, Ogino T, Nagato T, Kishibe K, Ishii H, Katayama A, Shimizu N and Harabuchi Y. Production of Interferon- γ -Inducible Protein-10 and Its Role as an Autocrine Invasion Factor in Nasal Natural Killer/T-Cell Lymphoma Cells. *Clin Cancer Res.*15(22):6771-6779, 2009
 13. Miyagawa Y., Kiyokawa N., Ochiai N., Imadome K., Horiuchi Y., Onda K., Yajima M., Nakamura H., Katagiri Y., Okita H., Morio T., Shimizu N., Fujimoto J. and Fujiwara S. Ex vivo expanded cord blood CD4 T lymphocytes exhibit a distinct expression profile of cytokine-related genes from those of peripheral blood origin. *Immunology* 128:405-419, 2009.
 14. Imadome K, Shimizu N, Yajima M, Watanabe K, Nakamura H, Takeuchi H, Fujiwara S. CD40 signaling activated by Epstein-Barr virus promotes cell survival and proliferation in gastric carcinoma-derived human epithelial cells. *Microbes Infect.* 11(3):429-433, 2009 .
 15. Ono Y., Terashima K., Liu A., Yokoyama M., Yokoshima K., Mizukami M., Watanabe K., Mochimaru Y., Furusaka T., Shimizu N., Yamamoto N., Ishiwata T., Sugisaki Y., Yagi T. and Naito Z. Follicular dendritic cell sarcoma with microtubule- reticular structure and virus-like particle production in vitro *Pathol.Int.* 59: 332–344, 2009

Review Article

1. Shimizu, S, Arakawa, S. and Y. Nishida. Autophagy takes an alternative pathway. *Autophagy* 6, in press