Pathological Biochemistry

1. Staffs and Students (April, 2009)

Professor	Hirobumi TERAOKA	
Assistant Professor	Ryo SAKASAI	
Research Assistant	Keiko SHIMIZU-SAITO	
Graduate Students	Tomohiro NISHIDA,	Hisaharu MASAKI,
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2. Purpose of Education

Main object of Pathological Biochemistry in the graduate course is to provide students opportunity to study advanced DNA metabolism (replication, repair and recombination) and cell fate (proliferation, differentiation, cell death and cellular transformation). In particular, students are taught on DNA double-strand break signaling/repair and basic regenerative medicine of liver.

3. Research Subjects

1) Signaling of DNA double-strand breaks and molecular mechanism of non-homologous end-joining
2) Genomic instability via carryover of replication stress-induced DNA lesions into the M phase
3) Maintenance of genome integrity in pluripotent stem cells (ES cells, iPS cells)
4) Differentiation of pluripotent stem cells into a hepatocyte lineage

4. Publications

Original Articles

1. Shibata A, Ogino H, Maeda D, Tsutsumi M, Nohmi T, Nakagama H, Sugimura T, Teraoka H, Masutani M. Role of Parp-1 in suppressing spontaneous deletion mutation in the liver and brain of mice at adolescence and advanced age. Mutat. Res.-Fundam. Mol. Mech. Mutagen. 664, 20-27 (2009)
2. Shikanai M, Asahina K, Iseki S, Teramoto K, Nishida T, Saito T, Shimizu-Saito K, Ota M, Eto K, Teraoka H. A novel method of mouse ex utero transplantation of hepatic progenitor cells into the fetal liver. Biochem. Biophys. Res. Commun. 381, 276-282 (2009)
3. Sakasai R, Teraoka H, Tibbetts RS. Proteasome inhibition suppresses DNA-dependent protein kinase activation caused by camptothecin. DNA Repair (in press)
4. Ichijima Y, Yoshioka K, Yoshioka Y, Shinohe K, Fujimori H, Unno J, Takagi M, Goto H, Inagaki M, Mizutani S, Teraoka H. DNA lesions induced by replication stress trigger mitotic aberration and tetraploidy development. PLoS ONE (in press)
5. Masaki H, Nishida T, Sakasai R, Teraoka H. DPPA4 modulates chromatin structure via association with core histone H3 and DNA in mouse embryonic stem cells. Genes Cells (in press)
6. Sakasai R, Teraoka H, Tibbetts RS. Transcription-dependent activation of ataxia telangiectasia-mutated prevents DNA-dependent protein kinase-mediated cell death in response to topoisomerase I poison. J. Biol. Chem. (in press)