Molecular and Cellular Pathology

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Our group mainly conducts two major projects by molecular pathological and biochemistrical approaches. One of the two is try to elucidate a novel mechanism of cancer progression such as tumor growth, invasion/metastasis by identifying a key regulator with specific gene function. In these studies, we endeavor to demonstrate our findings practically related to tumors from the patients. Another is to develop novel tumor-targeting technologies using our tumor-homing peptides as a DDS tool, namely, tumor-targeting therapeutic agents (PDC; peptide-drug conjugate), non-invasive tumor-imaging probes, novel tumor markers identified by using these peptides. Thus, our goal is always in providing an important clue to overcome human malignancies and contributing to the cancer patients.

Research interests

1. Molecular pathology and histopathology of human tumors, especially in tumor invasion/metastasis.
2. Development of novel tumor targeting technology using non-invasive bio-tools such as novel peptide, antibody, glycans.
3. Identifying a novel tumor marker which is available to diagnosis, therapeutics for the cancer patients.

Materials and methods for collaborations

1. Histochemistrical analysis using tissue section from the tumor patients and mouse tumor models.
2. Molecular analysis of genetic alteration including genome DNAs and mRNAs on tumor tissues.
3. Generation of specific gene-knockout clone from human/mouse tumor cell lines.
4. Mouse CDX tumor model resembling human patient tumor tissues (*i.v.*, *i.p.*, liver meta., subcutaneous).
5. *in vivo* laser-confocal microscopic analysis of the live mouse bearing tumors.
6. Development of the novel tumor-homing peptide using the random peptide library (*negotiable).

Links to additional info

1. Saito K, et al. PODXL1 promotes metastasis of the pancreatic ductal adenocarcinoma by activating the C5aR/C5a axis from the tumor microenvironment. ***Neoplasia.*** 2019 Dec;21(12):1121-1132. doi: 10.1016/j.neo.2019.09.003.
2. Iioka H, et al. Crumbs3 is a critical factor that regulates invasion and metastasis of colon adenocarcinoma via the specific interaction with FGFR1. ***Int J Cancer.*** 2019 Nov 15;145(10):2740-2753. doi: 10.1002/ijc.32336.
3. Saito K, et al. Peptide-based tumor inhibitor encoding mitochondrial p14(ARF) is highly efficacious to diverse tumors. ***Cancer Sci.*** 2016 Sep;107(9):1290-301. doi: 10.1111/cas.12991.
4. Saito K, et al. Coxsackie and adenovirus receptor is a critical regulator for the survival and growth of oral squamous carcinoma cells. ***Oncogene.*** 2014 Mar 6;33(10):1274-86. doi: 10.1038/onc.2013.66.
5. Kondo E, et al. Tumour lineage-homing cell-penetrating peptides as anticancer molecular delivery systems. ***Nat Commun.*** 2012 Jul 17;3:951. doi: 10.1038/ncomms1952
6. Lab HP (Japanese) : https://www.med.niigata-u.ac.jp/pa2/index.html