

GOTOH, Mari  
MURAKAMI-MUROFUSHI, Kimiko

Center for Informational Biology  
The Natural/Applied Sciences Division / Department of Biology

<http://bios.cc.ocha.ac.jp/data/murofushi/top.html>

■ Researcher information

Contact

Email: [murofushi.kimiko@ocha.ac.jp](mailto:murofushi.kimiko@ocha.ac.jp) / TEL: 03-5978-5362 / FAX: 03-5978-5362  
Email: [gotoh.mari@ocha.ac.jp](mailto:gotoh.mari@ocha.ac.jp) / TEL: 03-5978-2568 / FAX: 03-5978-2568

Major

Cell biology, Lipid biochemistry

■ Research topics

## Investigation on biological activities of cyclic phosphatidic acid (cPA) toward drug development

Keywords

Cyclic phosphatidic acid (cPA), Bioactive lipid, Inhibition of cancer cell invasion & metastasis, Prevention of cerebrovascular diseases, Antinociceptive effect

Contents

■ Overview (background, goal, detail)

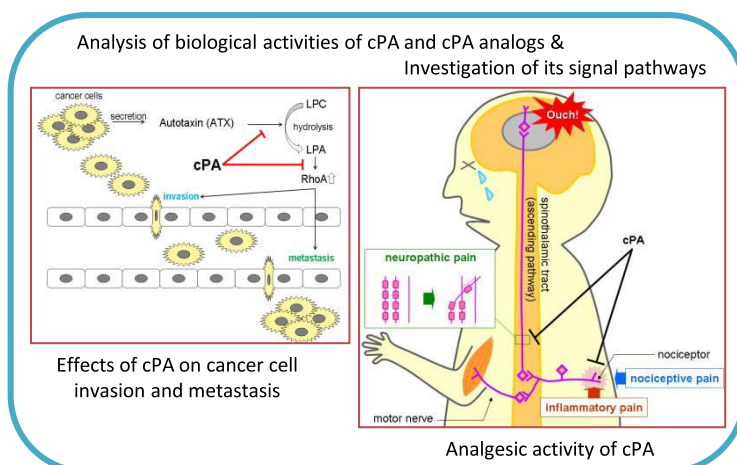
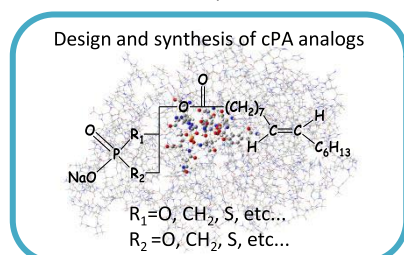
Cyclic phosphatidic acid (cPA) is one of the bioactive lipid in serum, which has a unique structure possessing a cyclic phosphate ring at *sn*-2 and *sn*-3 positions of the glycerol backbone. We have identified several bioactivities of cPA, 1) inhibition of cancer cell invasion & metastasis (K. Murakami-Murofushi, *et al.*, *Biochim. Biophys. Acta*, 1582, 1-7 (2002)), 2) prevention of delayed neuronal death in the hippocampus CA1 region following transient ischemia (M. Gotoh, *et al.*, *E. J. Pharm.*, 649, 206-209 (2010)), 3) antinociceptive effect on animal models of acute and chronic pain (Y. Kakiuchi, J. Nagai, M. Gotoh, *et al.*, *Mol. Pain*, 7, 33 (2011)). Now, based on cPA bioactivities, we are investigating new cPA derivatives for cancer treatment, neuronal protection against ischemia and suppression of pain.

■ Process, case study

- Design and synthesis of cPA derivatives
- Analysis of biological activities of cPA derivatives
- Investigation of molecular mechanisms of biological activities
- Finding a suitable way of cPA and its derivatives administration, and study of toxicity

■ Potential (applications, future goals)

We believe that cPA can be applied for treatment of cancer and cerebrovascular diseases, and for relief of pain, which causes reduction of QOL.



Intellectual properties (Patents, computer programs), productization, publications and social/industrial contributions

- 1) Mari GOTOH, Harumi HOTTA, Kimiko MURAKAMI-MUROFUSHI, "Effects of cyclic phosphatidic acid on delayed neuronal death following transient ischemia in rat hippocampal CA1", *European Journal of Pharmacology*, 649: 206-209, 2010
- 2) Yasutaka KAKIUCHI, Jun NAGAI, Mari GOTOH, Harumi HOTTA, Hiromu MUROFUSHI, Tomoyo OGAWA, Hiroshi UEDA, Kimiko MURAKAMI-MUROFUSHI, "The anti-nociceptive effects of cyclic phosphatidic acid and its derivative in animal models of acute and chronic pain", *Molecular Pain*, 7, 33, 2011
- 3) Japanese Patent Application No. 2009-268225

Potential of social/industrial contribution

- Joint research / Knowledge sharing

