



Development of the novel cell-penetrating peptide targeting human cholangiocarcinoma

【Keywords】

Peptide	Bile duct cancer	Tumor imaging	DDS	Therapy tools
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■ Summary

The variable patterns of invasion in cholangiocarcinoma give rise to the major issue of therapy and it is difficult to recognize the area of invasion in endoscopic and surgical operation. It requires developing new techniques of the early detection and therapy for cholangiocarcinoma.

To develop the imaging tool for the cholangiocarcinoma, we screened the cell-penetrating peptides (CPPs) by mRNA display technology. These CPPs are useful tools for developing peptide-based molecular delivery systems.

■ Subject Details

We applied mRNA display technology to obtain novel cell-penetrating peptide (CPP) as “tumor-homing peptide” (Kondo et al. *Nat. Commun.*, 3:951-963 2012) and identified the CPPs that targeted cholangiocarcinoma.

FITC-conjugated synthetic CPPs efficiently accumulated in the cholangiocarcinoma in the xenograft mouse models. These CPPs have the potential to detect the cancer invasion and metastasis.

○ Advantages

1. Tumor are detected by the CPPs in the process of active targeting.
2. These CPPs selectively accumulate in the targeting tumor.
3. The molecular size of each CPPs are small. the CPPs has low antigenicity and noninvasive.

○ Applications

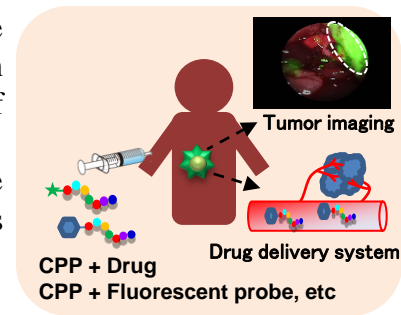
1. Tools for diagnosis and image-guided tumor resection.
2. Drug delivery system.

○ Plans

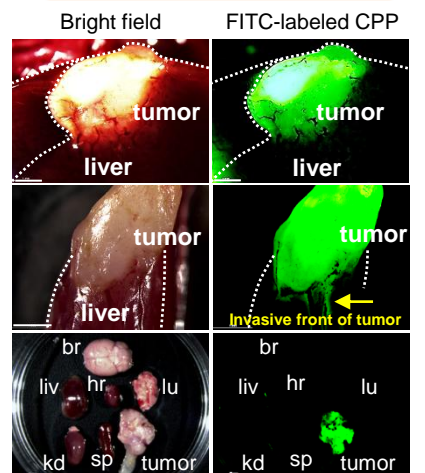
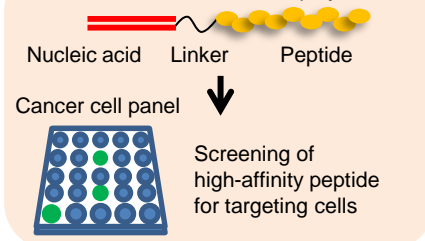
We will assess the efficiency of CPPs (selectivity, stability, administration and half-life) in the xenograft mouse model. CPPs will be useful as a tool for diagnosis and therapy.

■ Fields of Research & Development

For long-term imaging in deep tumor area by CPPs, we have hope that our systems cooperate with diagnostic technologies developing the fluorescent probe and endoscope etc.



In vitro selection of mRNA-display libraries



The peptide has the potential to detect the cancer invasion and organs had a lower uptake of peptide than tumor tissues.

