

IMAGING

Early detection for pancreatic cancer

There is a pressing need for the early diagnosis of pancreatic cancer, as most cases are currently diagnosed at a late stage when survival rates are low. By discovering a biomarker for early-stage pancreatic cancer and attaching its targeting peptide to a nanoparticle that can be imaged, Kelly *et al.* have been able to visualize early stages of the disease in mouse

models, offering the potential for earlier diagnosis in patients.

Using a primary cell lines derived from a mouse model of pancreatic ductal adenocarcinoma, the authors screened a phage display library for phage peptides that specifically bound to tumour cells. After testing localization of the candidate phage to the tumour in whole animals, the authors selected one particular phage clone for further development.

First, they used affinity purification and subsequent mass-spectroscopic analysis to identify the cytoskeletal protein plectin 1 as the binding partner of the phage. Using an antibody, they confirmed that plectin 1 is present in the membrane of both murine and human pancreatic carcinoma cells, whereas in normal cells it is confined to the nucleus and cytoplasm.

They then chemically synthesized the targeted peptide and attached it

to a magnetofluorescent nanoparticle so that its location could be easily tracked both optically and with magnetic resonance imaging. When this nanoconstruct was injected into the mouse model at a pre-symptomatic age, imaging revealed that it localized to the small, early lesions that are present at that stage.

This technology now needs to be refined so that it is ready to test in patients. It could be of particular use for screening groups that are at increased risk of pancreatic cancer, such as those with hereditary cancer syndromes, chronic pancreatitis or new-onset diabetes.

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ORIGINAL RESEARCH PAPER Kelly, K. A. *et al.* Targeted nanoparticles for imaging incipient pancreatic ductal adenocarcinoma. *PLoS Med.* **5**, e85 (2008)

FURTHER READING Duncan, R. Polymer conjugates as anticancer medicines. *Nature Rev. Cancer* **6**, 688–701 (2006)

