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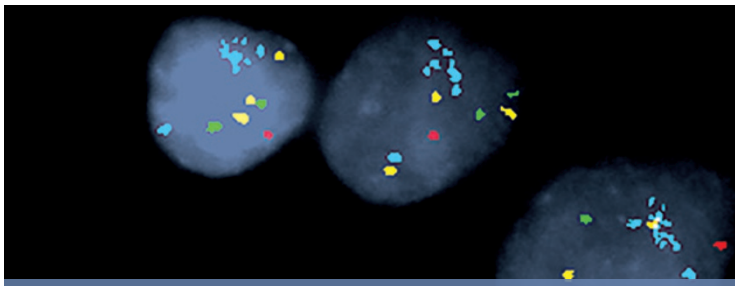

DIAGNOSIS

A better FISH to detect pancreatobiliary cancer?

Fluorescence *in situ* hybridization (FISH) is a technique used to identify chromosomal abnormalities (and therefore cancer) using fluorescently labelled oligonucleotide probes to hybridize with patient samples. Owing to a higher sensitivity, FISH is superior to routine cytology for detecting irregular or malignant cells in samples taken during endoscopic retrograde pancreatography. Presently, many laboratories use a set of FISH probes developed for the detection of bladder cancer, however, Barr Fritcher *et al.* have developed and validated a set of probes that are more sensitive for pancreatobiliary malignancies than the existing set.

The bladder cancer FISH probes have double the sensitivity compared with routine cytology (34–53% versus 8–40%, respectively). Even so, ~50% of patients who develop pancreatobiliary cancer were undetected by FISH. The rationale for the research was, therefore, to increase sensitivity by identifying genetic probes that are more relevant for pancreatobiliary cancers than bladder cancer. Of 14 probes initially selected and evaluated in 29 patient samples ($n = 15$ cholangiocarcinoma and $n = 14$ pancreatic adenocarcinoma), four probes best met the criteria and these were: 1q21, 7p12, 8q24 and 9p21, together called PB FISH. The criteria included signal quality and frequency of gain or loss in a tumour cell.

To determine the cut-off values for PB FISH, 89 patient samples were tested and categorized as polysomy, tetrasomy, single locus gain plus 9p21 loss, single locus gain or homozygous 9p21 loss. Polysomy was most associated with pancreatobiliary cancer compared with the other categories and the best cut-off value provided a sensitivity of 57% and specificity of 90%. PB FISH was validated on a further 183 patient samples. Of these samples 62% were negative, 3% were single locus gain and polysomy was detected in 34%.

In comparison with the bladder cancer FISH probe set, the sensitivity of a polysomy result using PB FISH was significantly higher (46% versus 65%, respectively; $P < 0.001$). The specificity of each test was roughly the same (91% versus 93%, respectively). Adjusting for confounding factors, polysomy PB FISH, detection of a mass by cross-sectional imaging, routine cytology and primary sclerosing cholangitis remained statistically significant for cancer prognosis.

"Although FISH is one of the more established molecular tests in the clinical laboratory, advancements in other genetic testing methods hold promise for further improving our ability to detect this lethal cancer," says corresponding author Benjamin Kipp.

Gillian Patman

Original article Barr Fritcher, E. G. *et al.* An optimized set of fluorescent in situ hybridization probes for detection of pancreatobiliary tract cancer in cytology brush samples. *Gastroenterology* doi:10.1053/j.gastro.2015.08.046