Diagnosis of early stage pancreatic ductal adenocarcinoma using a serum biomarker signature


Introduction
Pancreatic ductal adenocarcinoma (PDAC) shows a very poor survival rate with less than 7% 5-year survival. By resecting more tumors when they are still confined to the pancreas, the overall 5-year PDAC patient survival rate would increase significantly. In an effort to achieve reliable early detection we have developed IMMray™ PanCan-d, a microarray-based blood test for diagnosis of PDAC patients.

Objective
The purpose of the IMMray™ PanCan-d microarray-based test is to detect both early and late stage PDAC from a blood sample. The purpose of the IMMray™ PanCan-d microarray-based test is to detect serum biomarkers associated with PDAC.

Conclusions
- PDAC stage I and II patients were detected with 96% accuracy and validated with a distinct patient cohort.
- PDAC stage I to IV patients were detected with 98% accuracy and validated with a distinct patient cohort.
- Chronic pancreatitis was discriminated from PDAC with an accuracy of 83%.
- IPMN samples of all grades were classified as positives.
- Six studies covering 2482 samples demonstrated robustness and high accuracy of the IMMray™ PanCan-d platform.
Results

Discovery: In a retrospective study on a South Scandinavian cohort, 1355 blood samples were analyzed.

Validation: In a retrospective study on a North American cohort, 429 blood samples were analyzed.

The IMMray™ PanCan-d signature discriminated 148 patients in PDAC stage I and II from 888 healthy controls with an accuracy* of 96%.

The IMMray™ PanCan-d signature discriminated 90 patients in PDAC stage I and II patients from 219 healthy controls very accurately.

Methodology

Antibody micorarray slides are printed and incubated with biotinylated patient serum. Levels of bound antigens are detected by fluorescence scanning. State-of-the-art machine learning algorithms were employed in the development of the IMMray™ PanCan-d signature. Hundreds of analytes were thus reduced to generate a comprehensive signature capable of distinguishing PDAC from controls.

IMMray™ Microarray technology

![IMMray™ Microarray Technology](image)

**Fig 1. IMMray™ Microarray Technology**

References


*Based on specificity and sensitivity values generated by the classification model.  **Healthy controls vs PDAC patients.