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Summary

REAL-LIFE EXPERIENCE OF PHARMACOTYPING AND RESPONSE PREDICTION USING PANCREATIC CANCER PATIENT-DERIVED ORGANOIDS

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Pancreas

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Patient-derived organoids from pancreatic cancer tumors predicted drug response with 85.7% accuracy in treatment-naïve patients and demonstrated significantly longer progression-free survival when predicted-effective regimens were administered.

KEY POINTS

- Over 40 pancreatic cancer patient-derived organoids were established from primary tumors and metastases using multiple biopsy and surgical approaches, with drug response evaluated using cytotoxicity assays and Jenks natural breaks classification.
- In treatment-naïve patients, the organoid model achieved 85.7% accuracy for predicting first- and second-line therapy response, while accuracy was lower at 57.1% for pretreated patients receiving subsequent lines.
- The system showed better performance predicting chemoresponsiveness versus unresponsiveness (89.5% versus 68.8%), and patients receiving organoid-predicted effective regimens had significantly longer progression-free survival.
- Whole exome sequencing on 14 organoids captured genetic profiling over treatment time, including a CHEK2-mutated patient who responded to PARP inhibitor maintenance therapy as predicted by organoid testing.
- Automated pipetting and miniaturized screening expanded drug panel capacity and reduced time to pharmacotyping results.

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