

Pancreatic cancer		
	 Each tumor is unique, so trial-and-error determines treatment regimen. Median survival after diagnosis is 6-24 months. Poor tolerance for drug toxicity This problem needs innovations from engineers & physical scientists 	



Tumor organoids		
 Progress in regenerative medicine has created realistic "tumors in a dish" (3D tumor organoids) 	Tumor Mechanical dissociation 3D matrix	
 Genetic expression profiles in organoids closely mimic the host tumor. 	Surgery or Biopsy Progression Model	
 Heterogeneity and cell types of host tumor are maintained in organoids. 	Protein and Gene Signatures	
 Functional imaging tools are needed to understand dynamic, single-cell behavior of organoids. ^[1-3] 	Validation of Genes in Human PDA	
 Oldenburg et al. Optica 2015 2. Xylas, Georgakoudi et al. Int J Cancer 2014 Chen, Mycek et al. Biomaterials 2014 	Pancreatic Ductal Organoids Boj, Clevers, Tuveson et al. Cell 2015	













Outline

o Imaging single cell adaptation in oncology

- Single cell analysis tools
- Tumor cells
- Fibroblasts
- Immune cells

o Clinical translation













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