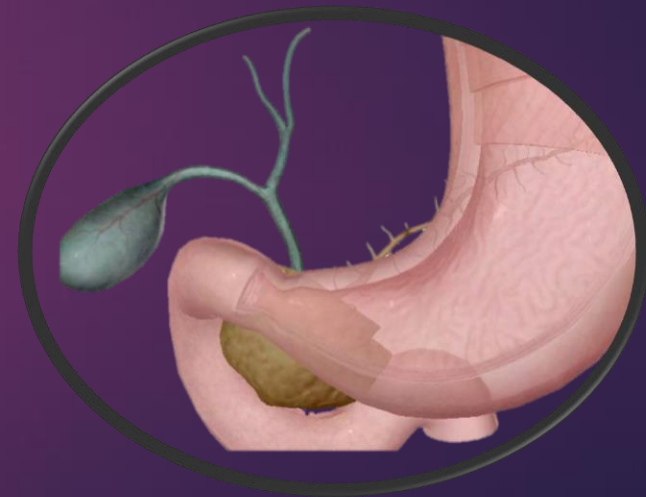


Pancreatic cancer and Whipple operation

LECTURER : 陳以理

DATE : 2022/10/30



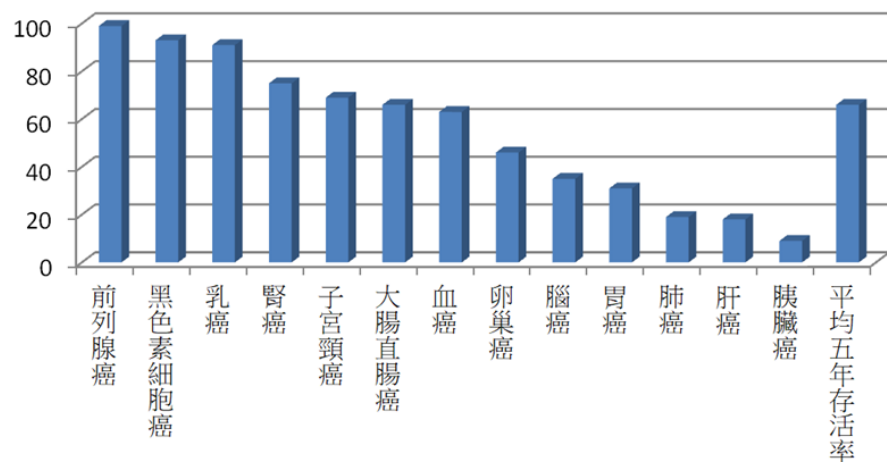
Pancreas Location



- 胃的後方，脊柱的前方
- 不容易檢查而忽略異狀

Pancreas Cancer

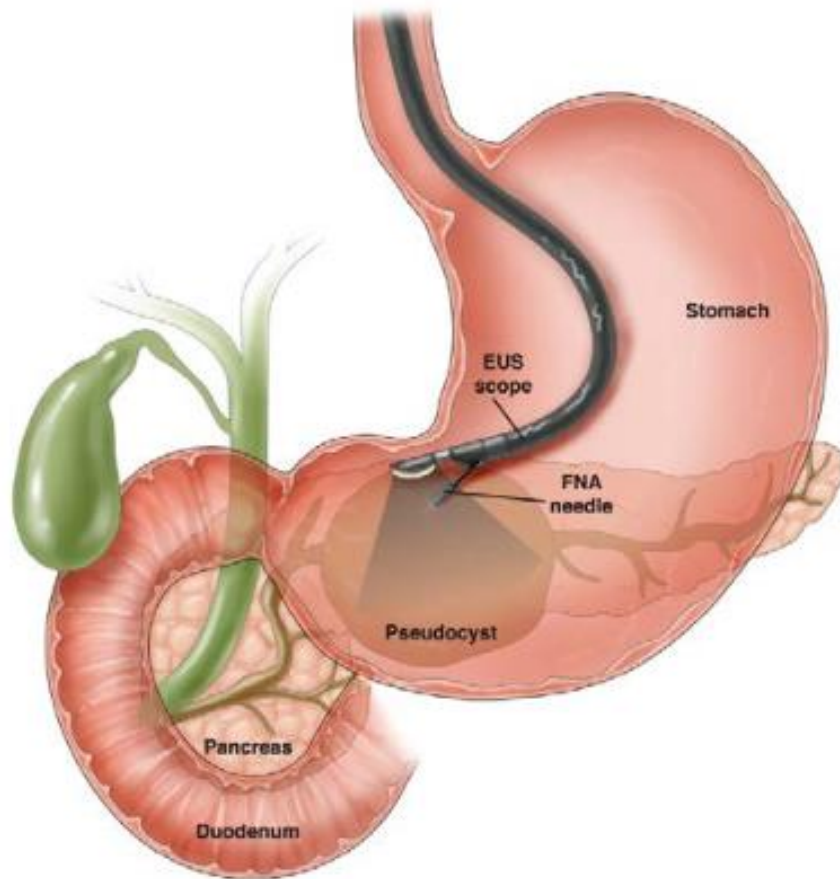
癌症五年存活率



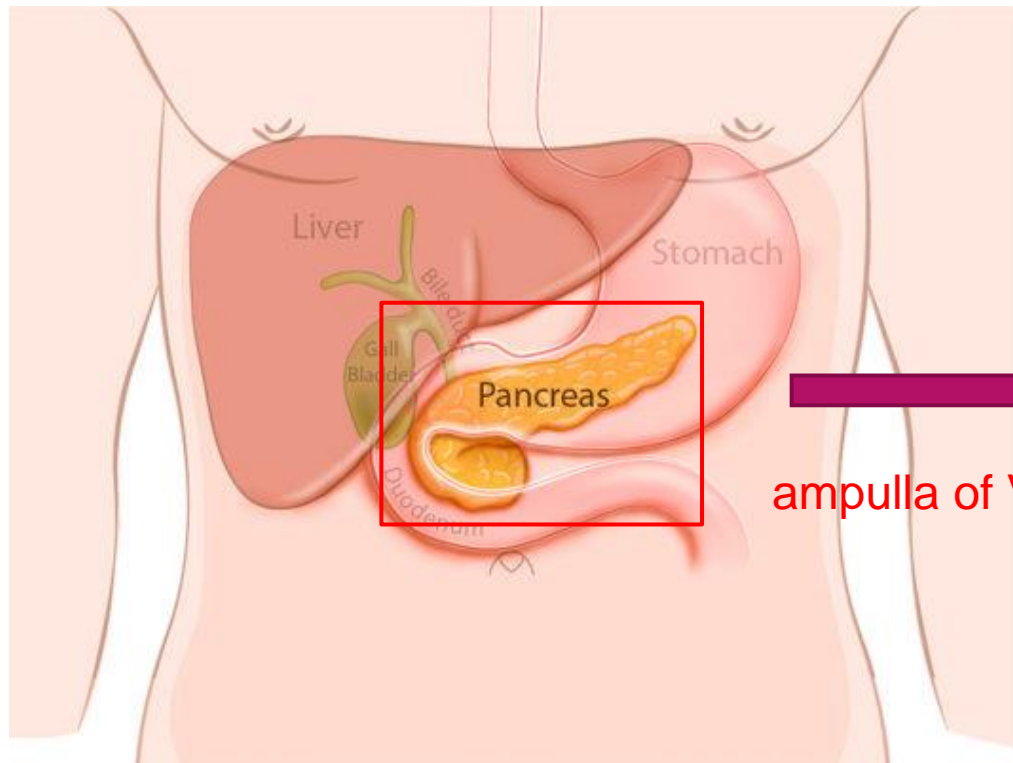
➤ 5年存活率最低的是胰臟癌

➤ 5年存活率 < 5%

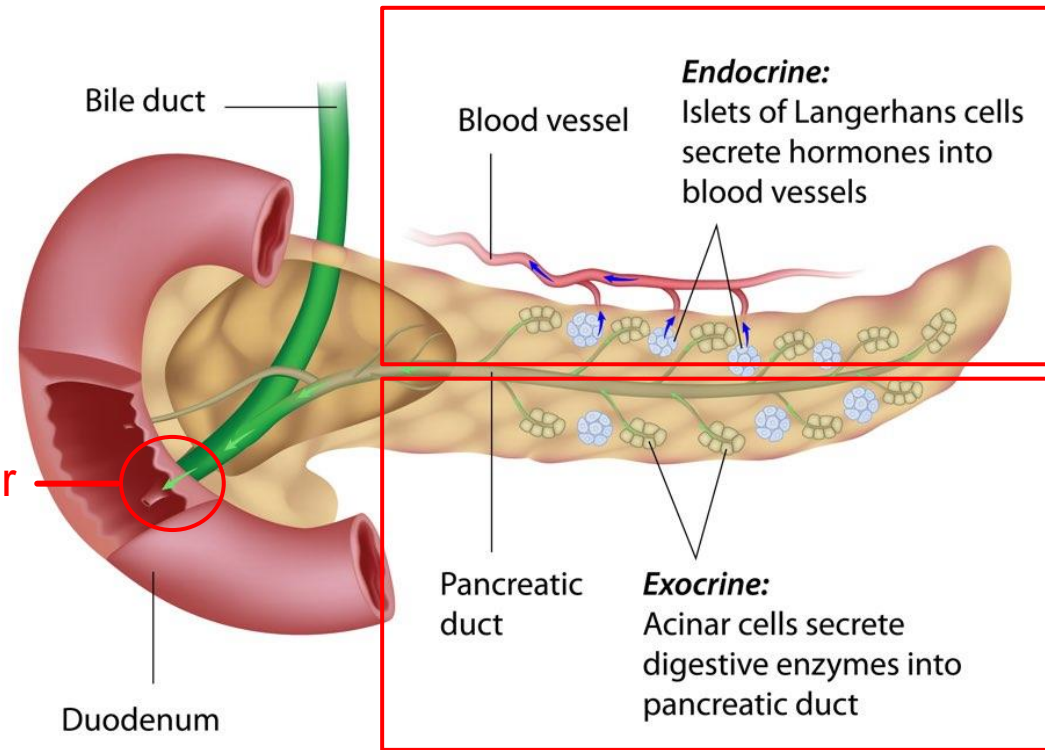
EUS-guided fine needle aspiration (EUS-FNA)



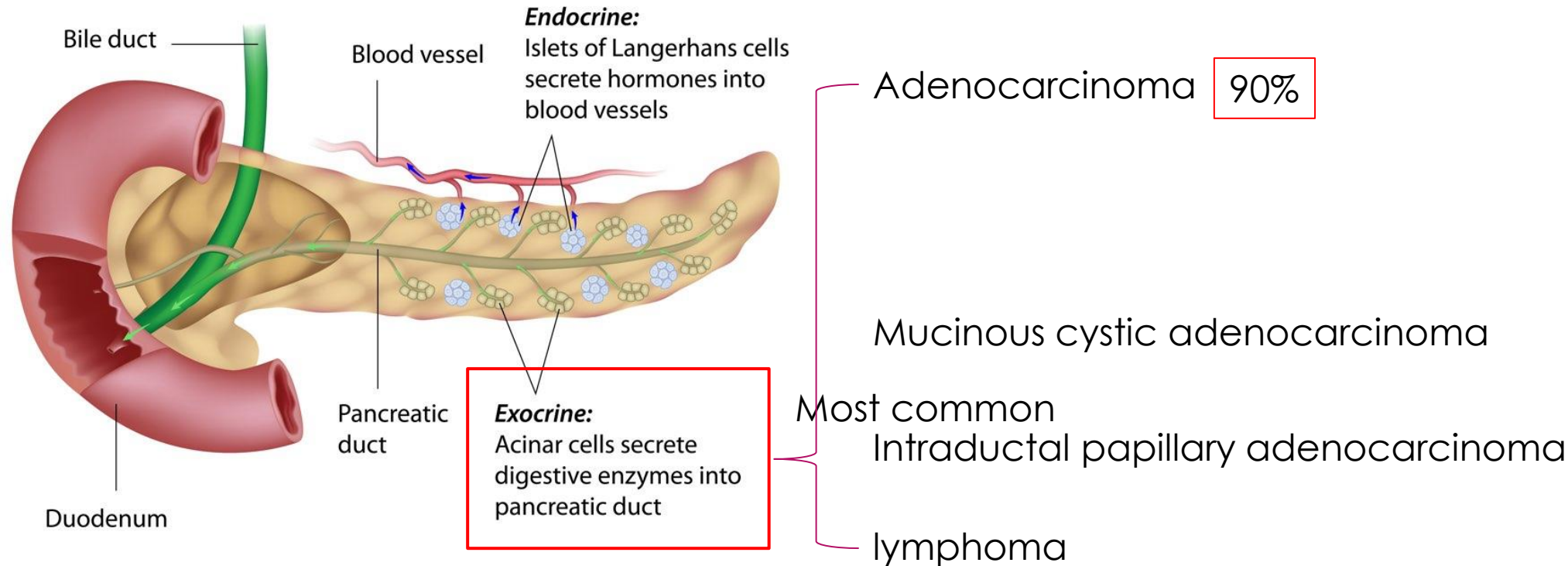
Pancreas



ampulla of Vater



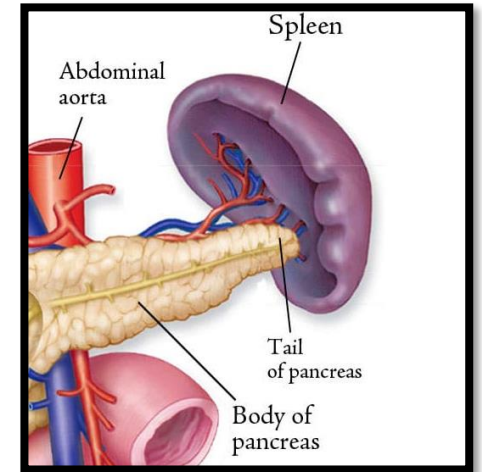
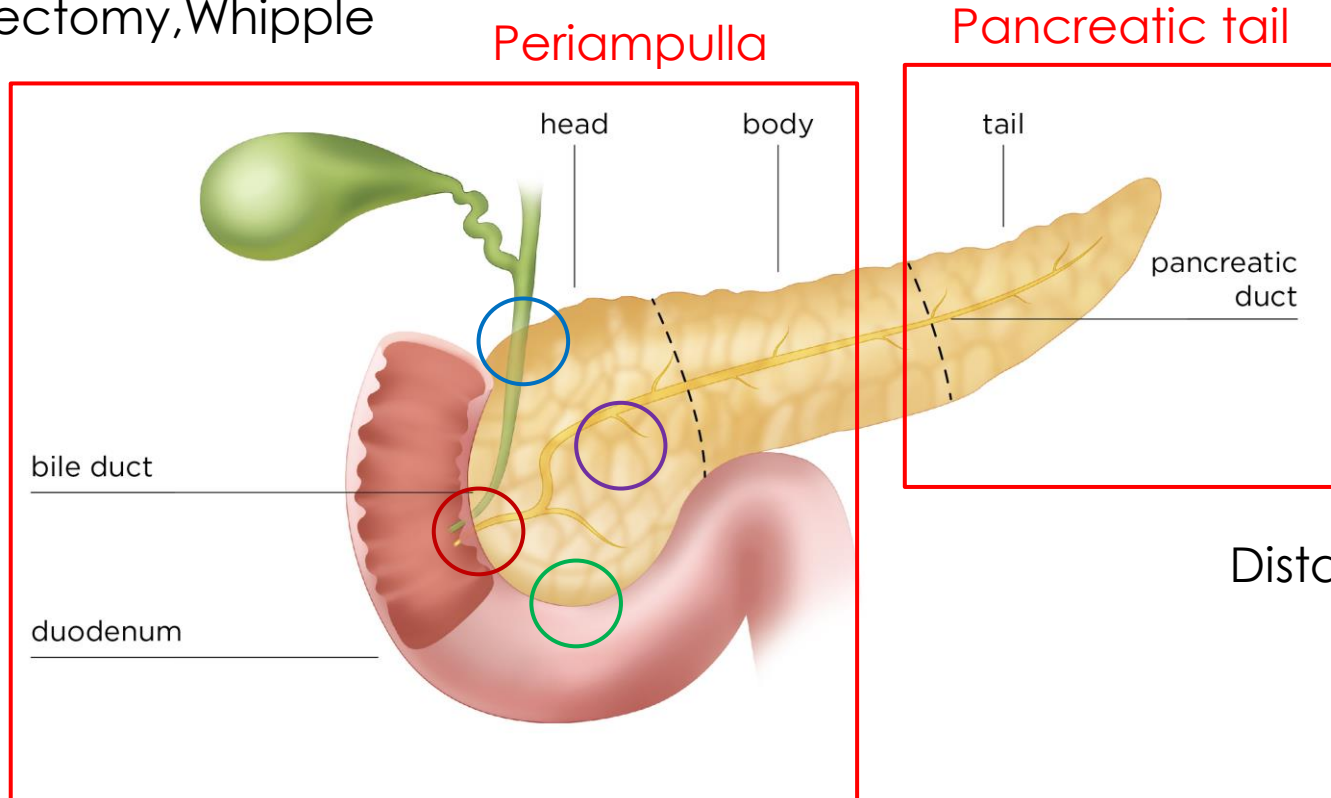
Pancreatic cancer



Pancreatic adenocarcinoma

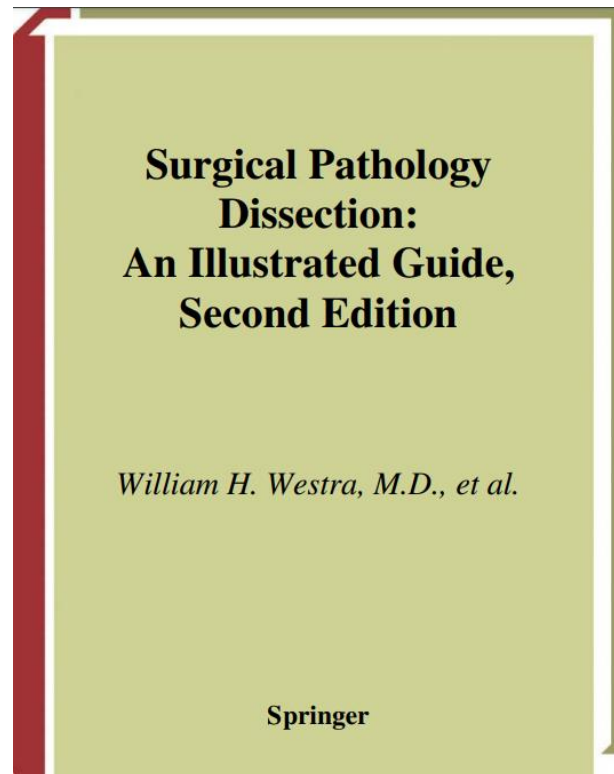
Pancreaticoduodenectomy, Whipple

- 1. Pancreatic carcinoma
- 2. Distal bile duct carcinoma
- 3. Duodenal cancer
- 4. Ampullary cancer



Distal pancreatectomy

Specimen Dissection



Specimen Dissection (Distal Pancreatectomy)

1. Weigh and measure the specimen

2. Ink the surface of the gland (Margin)

3. Sample the cut surface of the proximal pancreatic margin

◦ Are there any masses or calculi in pancreas?

4. Bread-loaf it into 2-mm slices

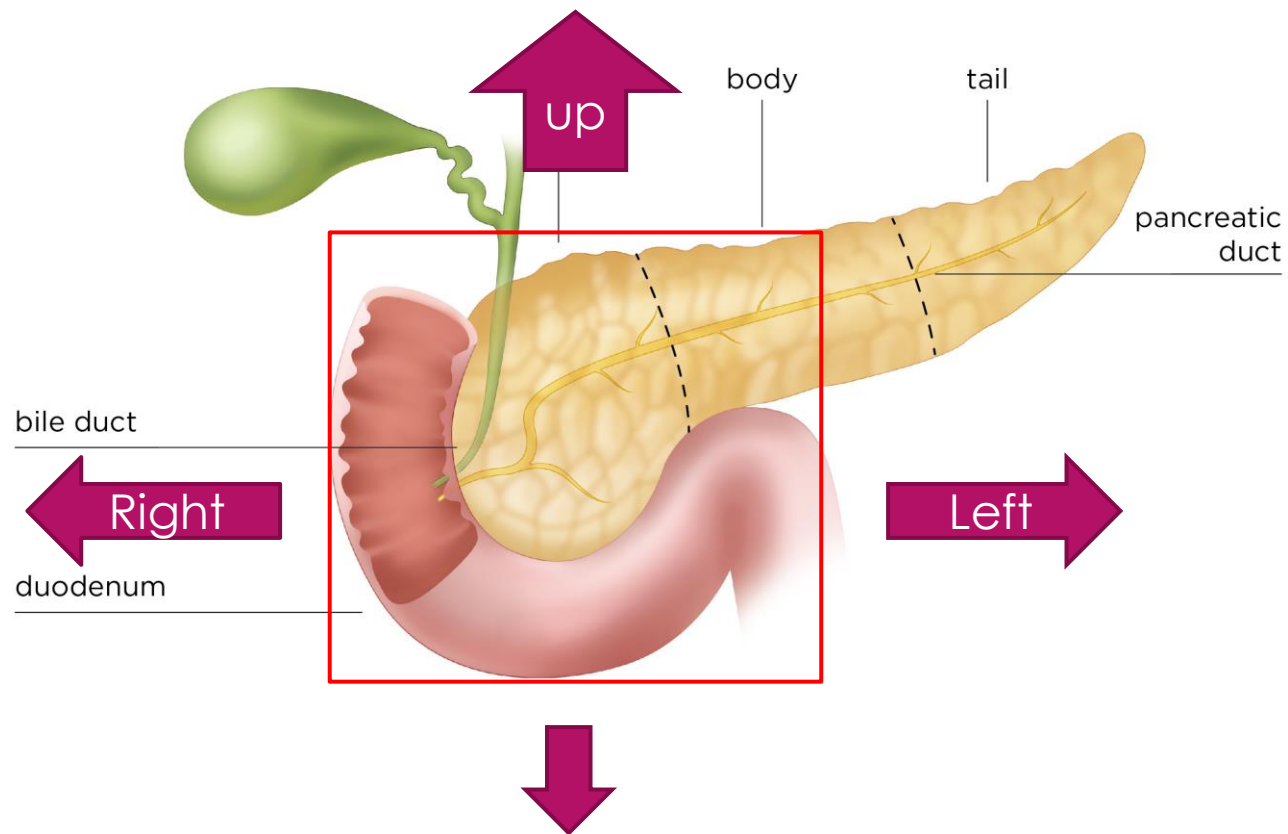
◦ Note the size, location, and gross appearance

5. Examine the specimen

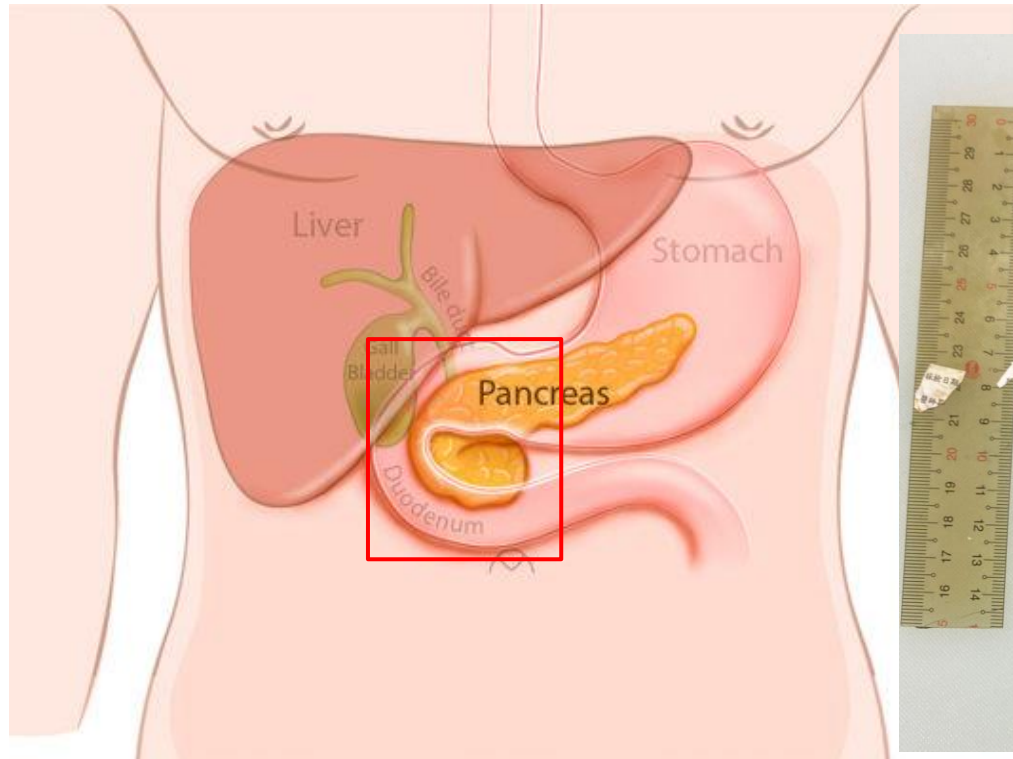
◦ Representative section of each (including spleen)



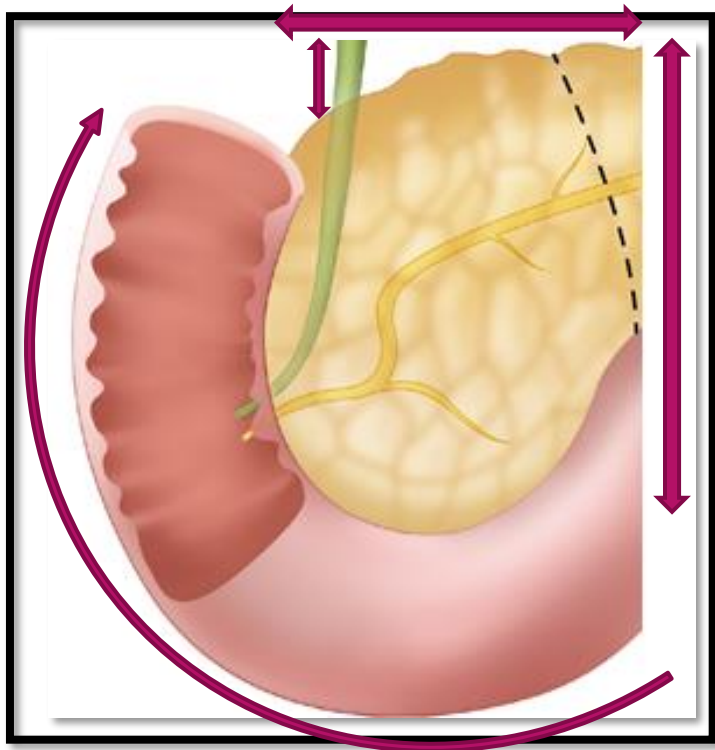
Specimen Dissection (Whipple)



Specimen Dissection (Whipple)



Specimen Dissection (Whipple)

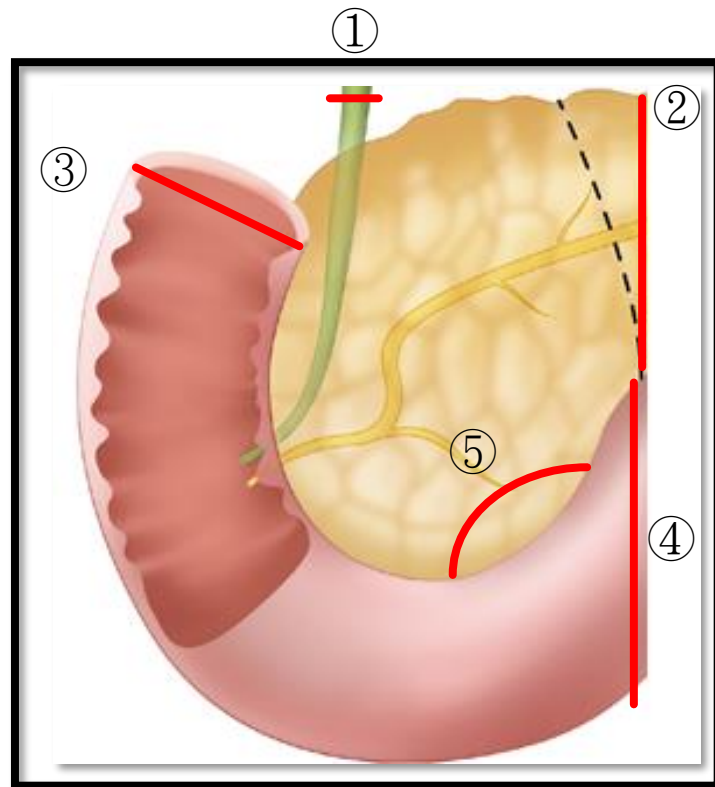


1. Measure the specimen of each.

- Distal portion of common bile duct (length, diameter)
- Pancreas
- Duodenum
- (Distal portion of common bile duct)
- (Omentum)



Specimen Dissection (Whipple)



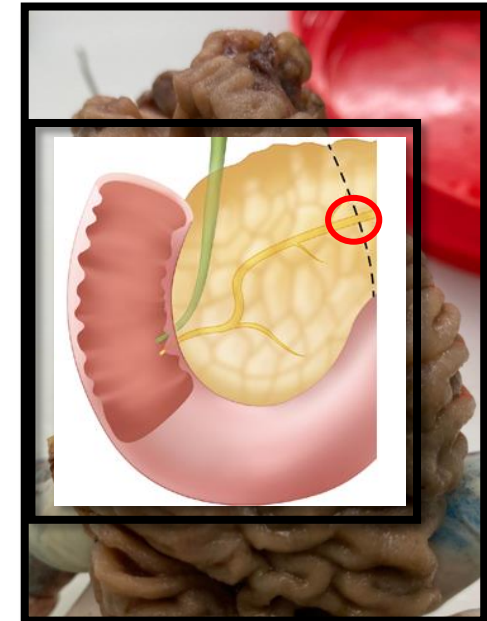
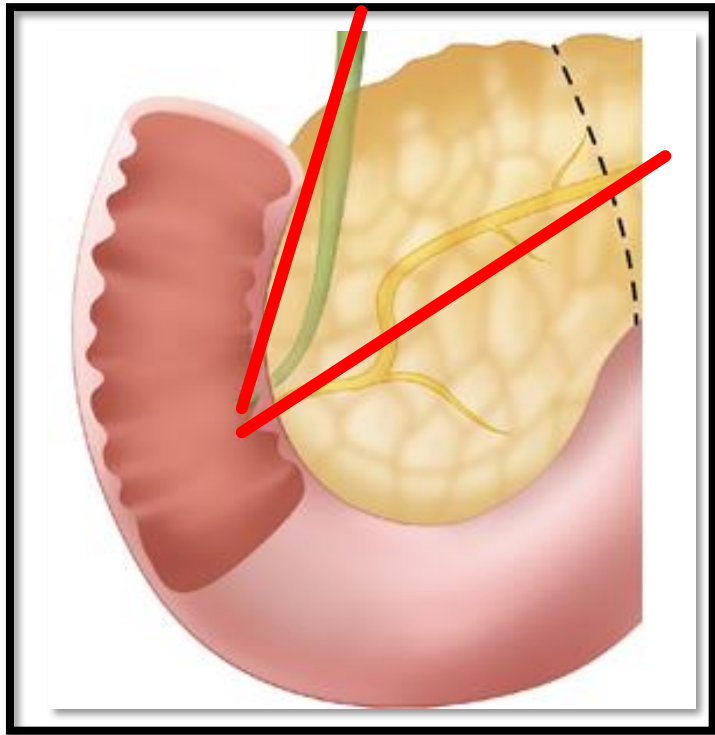
2. Ink the surface of the gland

3. Submit the sections of the margins

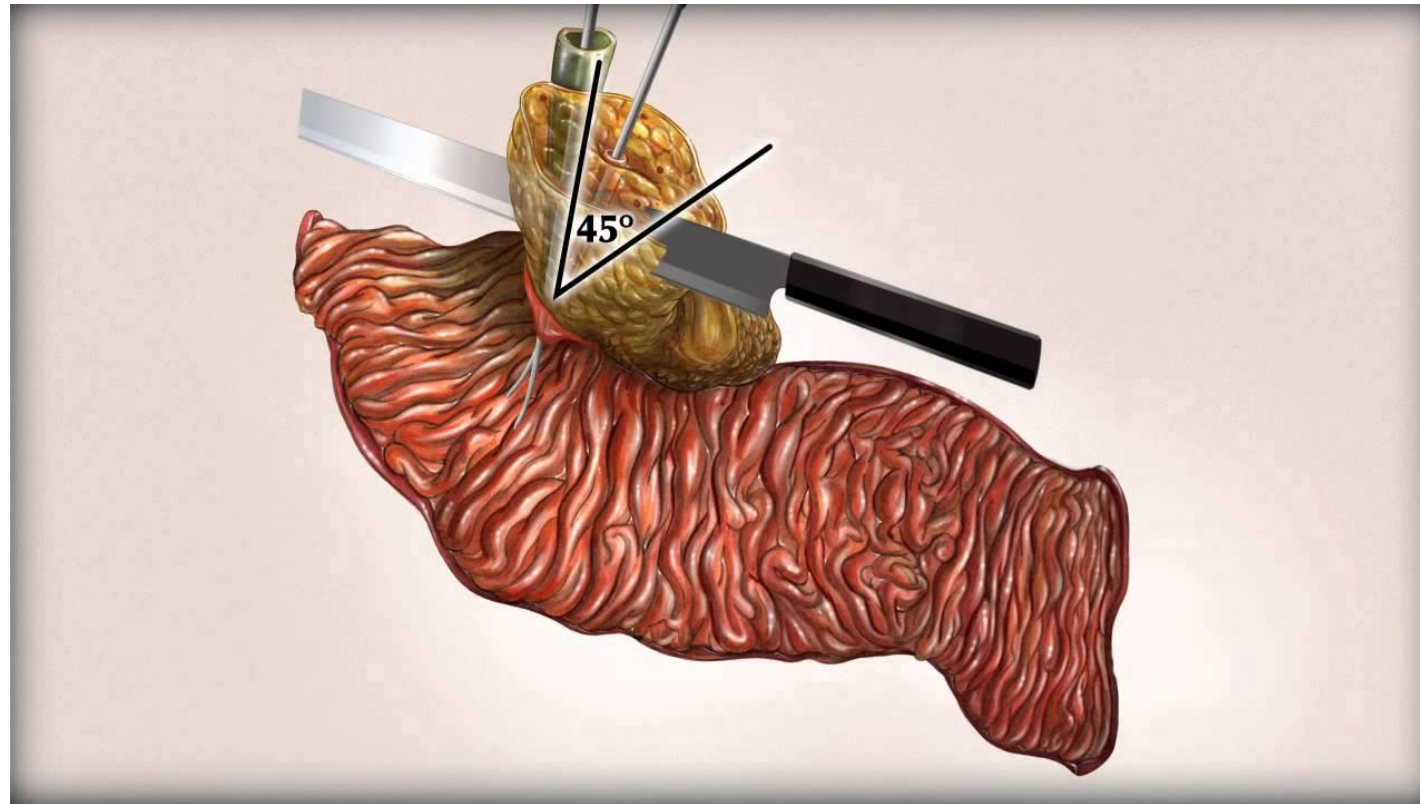
- CBD margin
- Pancreatic neck margin
- Proximal duodenal margin
- Distal duodenal margin
- Uncinate margin with vasculature



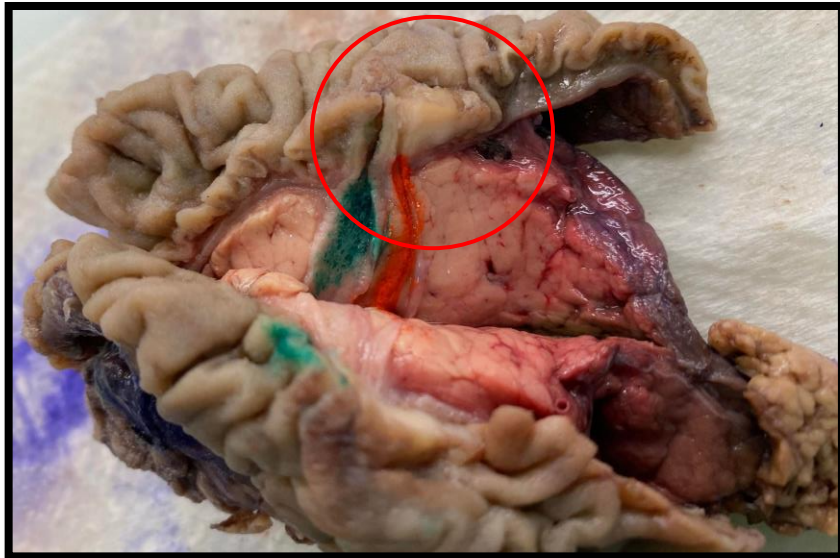
Specimen Dissection (Whipple)



Specimen Dissection (Whipple)



Specimen Dissection (Whipple)

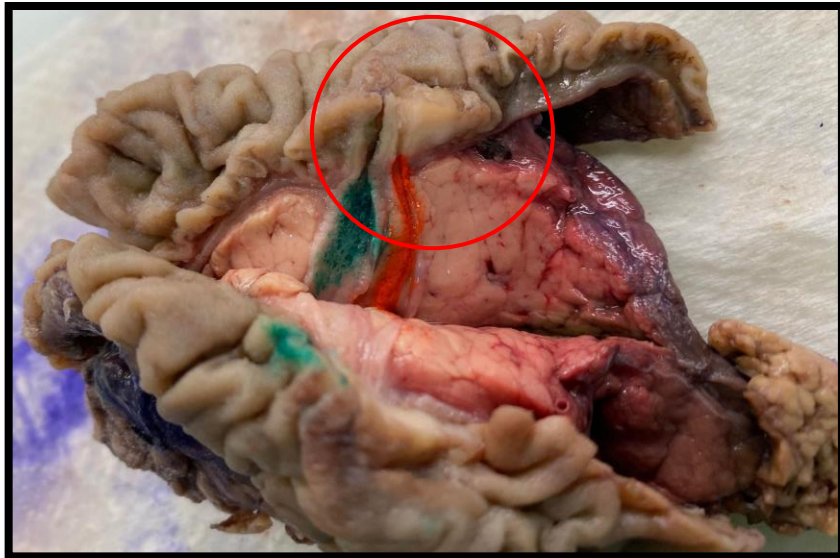


4. Now that the various components of the specimen have been exposed, there are some questions to answer:

- Tumor location
pancreas, bile duct, ampulla of Vater, or duodenum
- Tumor size
(AJCC TNM system)

Stage grouping	Tumor size
T1	< 2cm
T2	2cm < tumor < 4cm
T3	> 4cm

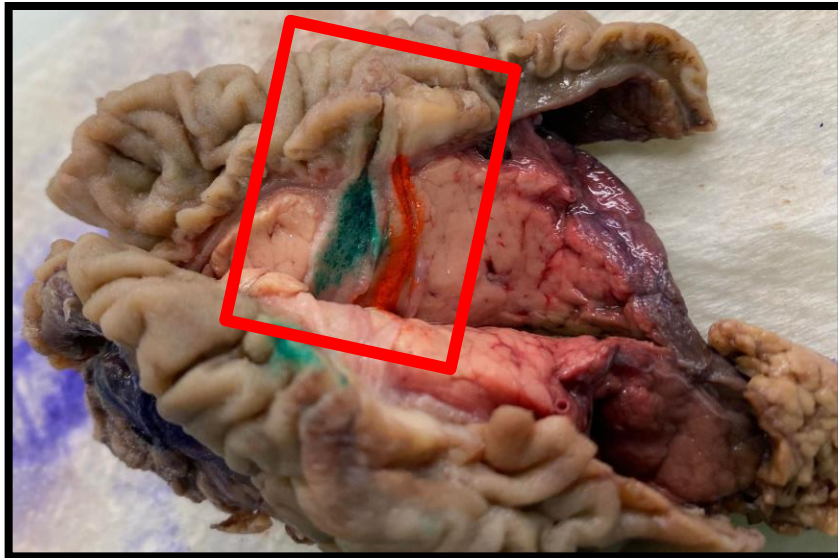
Specimen Dissection (Whipple)



- Tumor appearance
Solid or cystic? / Ulcerative or polypoid?
- Lymph nodes
(AJCC TNM system)

Stage grouping	Metastatic LN number
N0	not spread
N1	Metastatic LN < 4
N2	$4 \leq$ Metastatic LN

Specimen Dissection (Whipple)



5. Ink the mucosa of the CBD and PD

- Without the paint in the CBD and PD, it can be almost impossible to distinguish the bile duct from the pancreatic duct microscopically.

6. Submit sections of representative sections.

- Tumor with CBD, PD, ampulla, duodenum or pancreatic parenchyma (anterior and posterior margin)

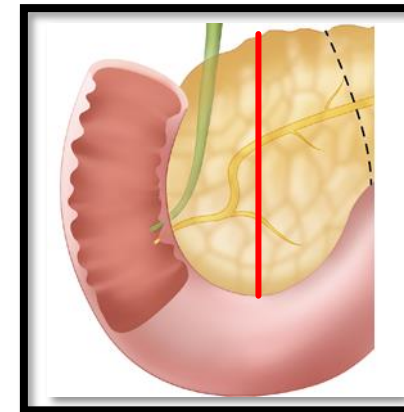
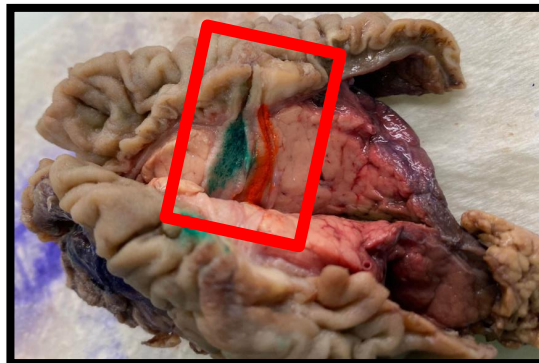
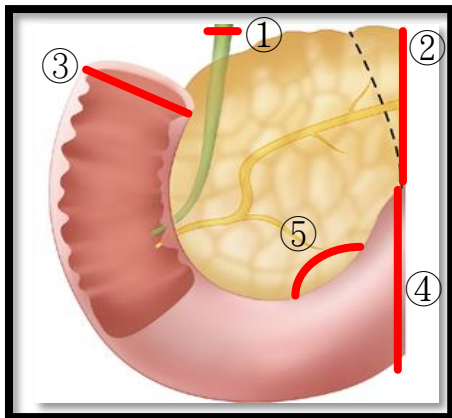
One section for each 1 cm of maximum tumor length.

- Pancreatic parenchyma One section for each 1 cm of maximum pancreatic length.

Specimen Dissection (Whipple)

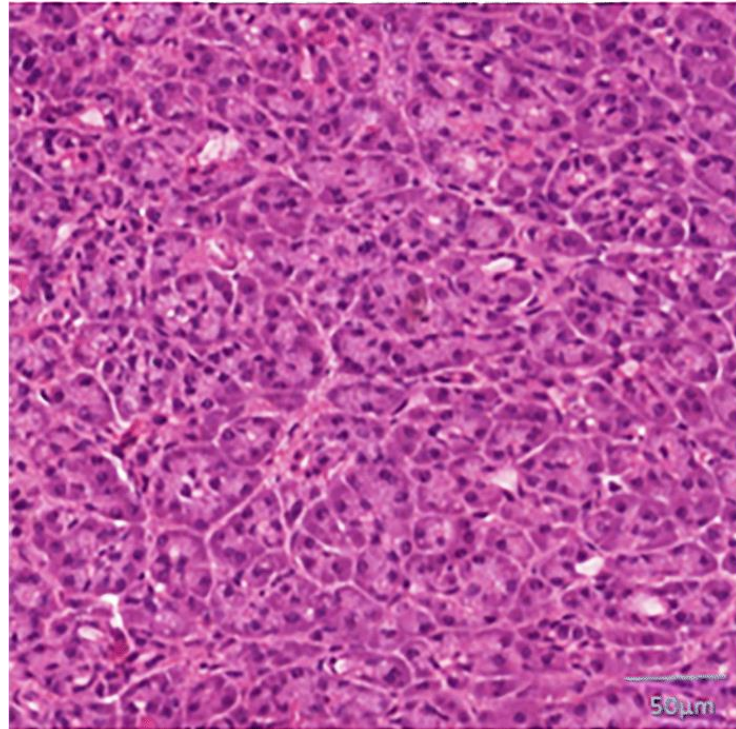
Submit the representative section

- ▶ Five margins
- ▶ The relationship of the mass to each of the four components of the specimen.
- ▶ The relationship of the mass to anterior and posterior soft tissue margin
- ▶ Tumor (one section per centimeter)
- ▶ Lymph nodes

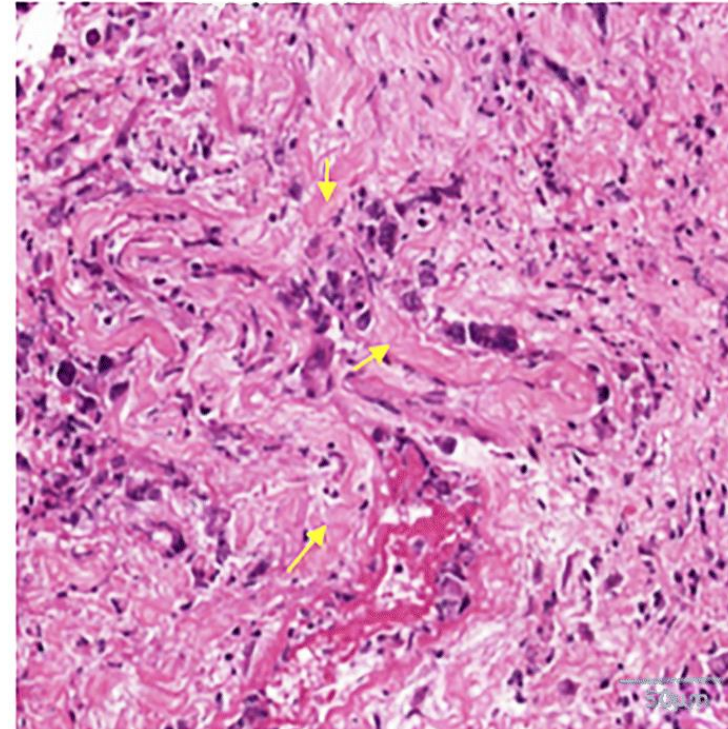


Hematoxylin-eosin stain (H&E stain)

Normal pancreas

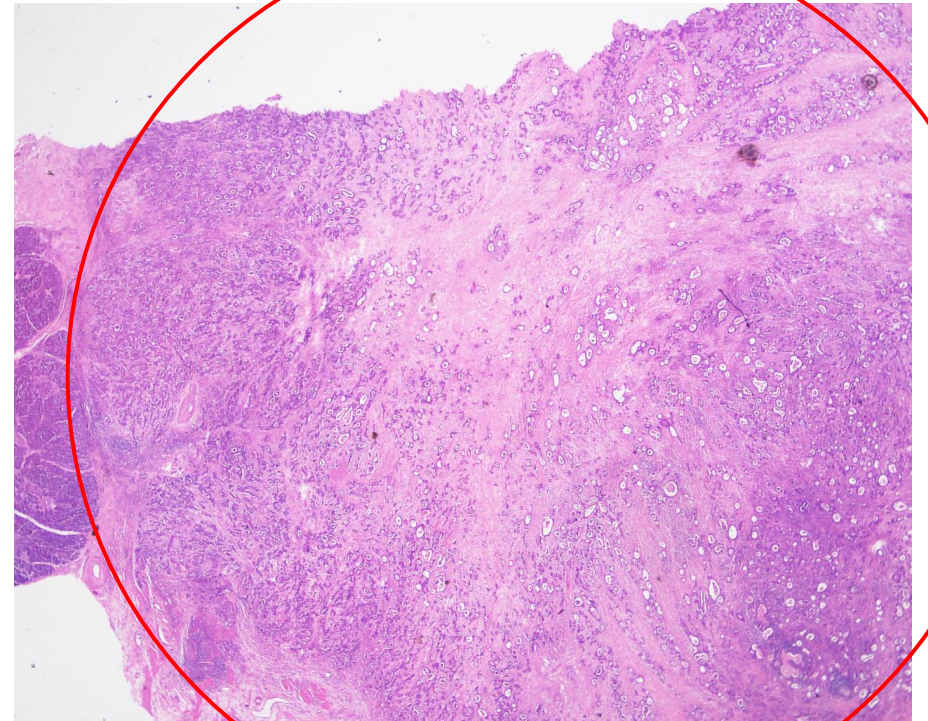
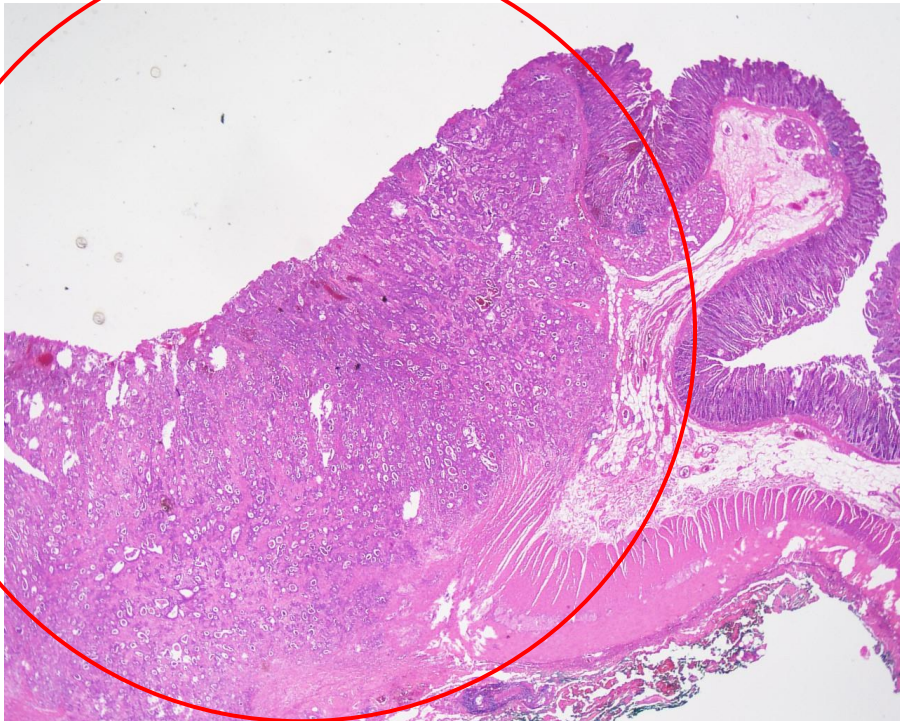


Pancreatic tumor

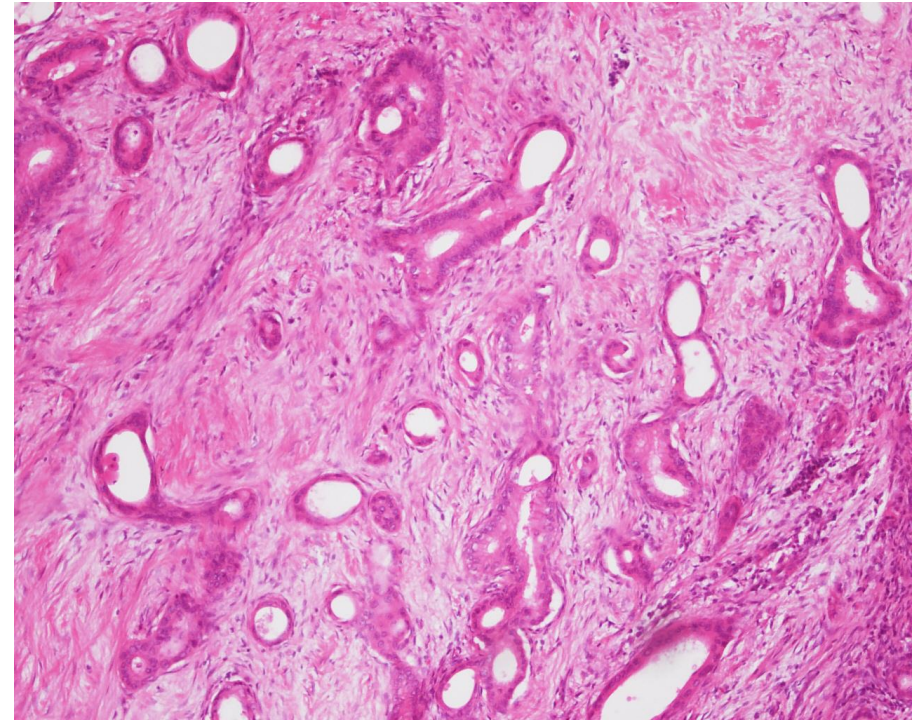
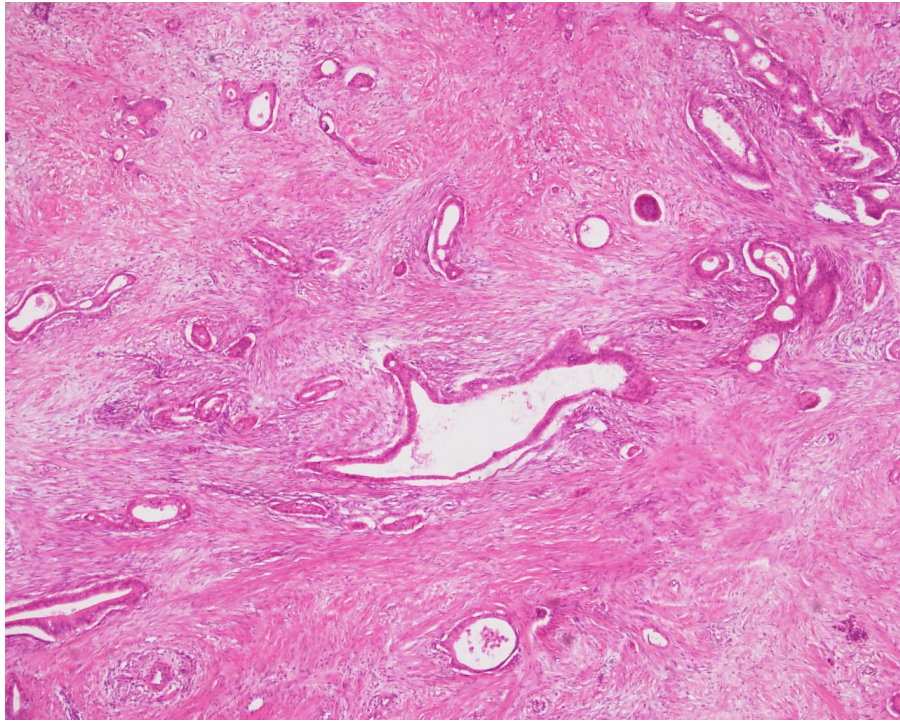


Development of highly dense fibrotic (Desmoplasia) environment around the tumor cells

Hematoxylin-eosin stain(H&E stain)



Hematoxylin-eosin stain(H&E stain)



Development of highly dense fibrotic (Desmoplasia) environment around the tumor cells

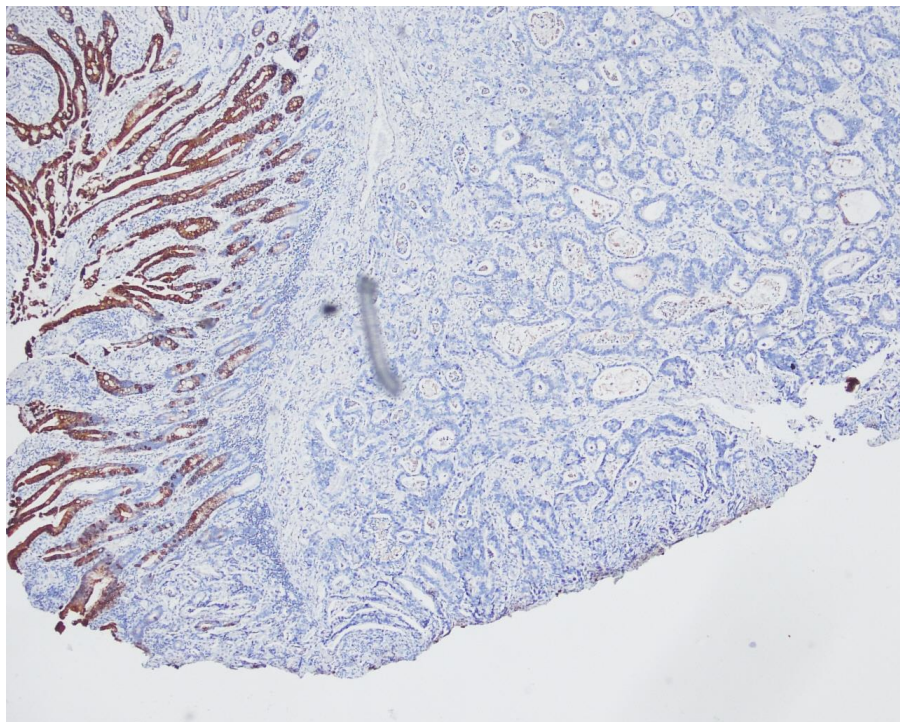
Immunostain (IHC)

1. CK7, CK20

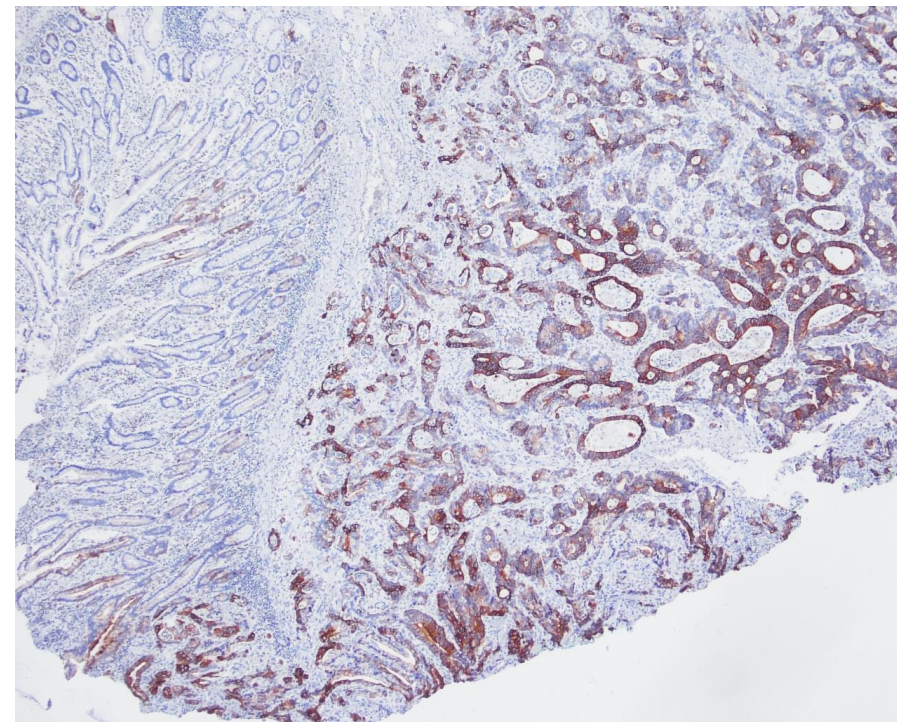
118 cases of colorectal, and 32 cases of pancreatic adenocarcinomas

	colorectal adenocarcinomas	pancreatic adenocarcinomas
CK7(+), CK20(+)	20%	22%
CK7(+), CK20(-)	2%	16%
CK7(-) , CK20(+)	64%	0%

Immunostain (IHC)



CK20

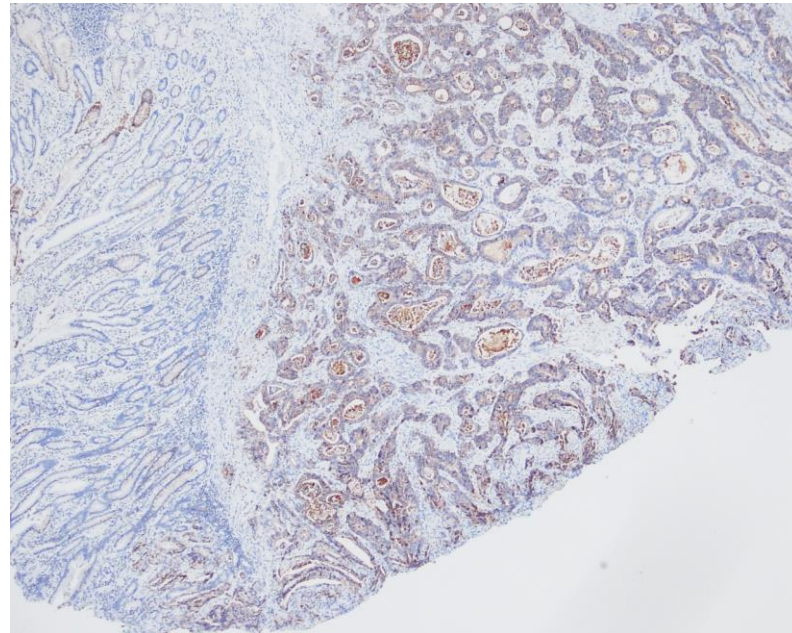


CK7

Immunostain (IHC)

2.IMP3

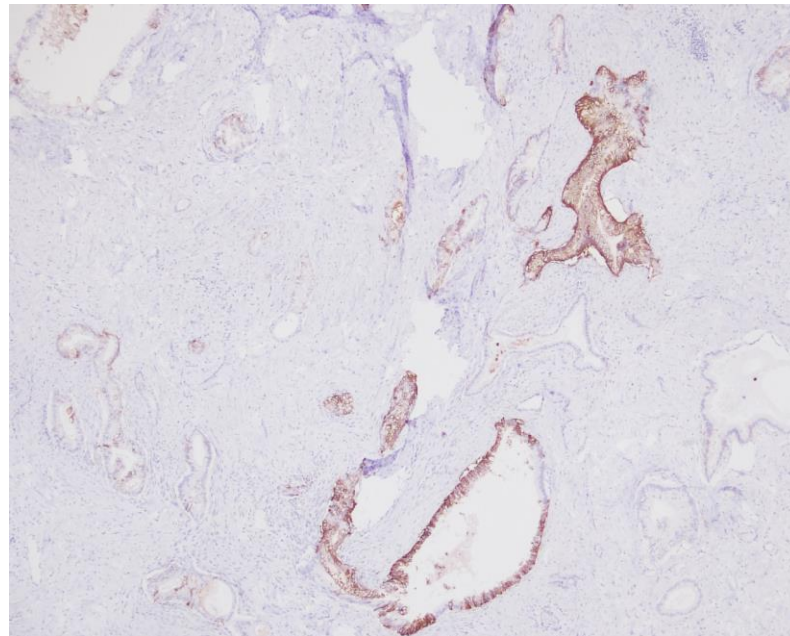
Strong IMP3 expression was found in 99 of 112 (88.4%) PDACs



Immunostain (IHC)

3. Claudin-18

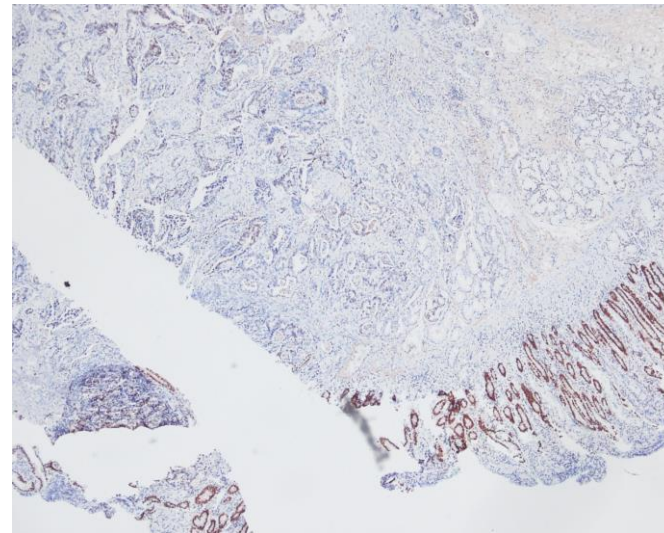
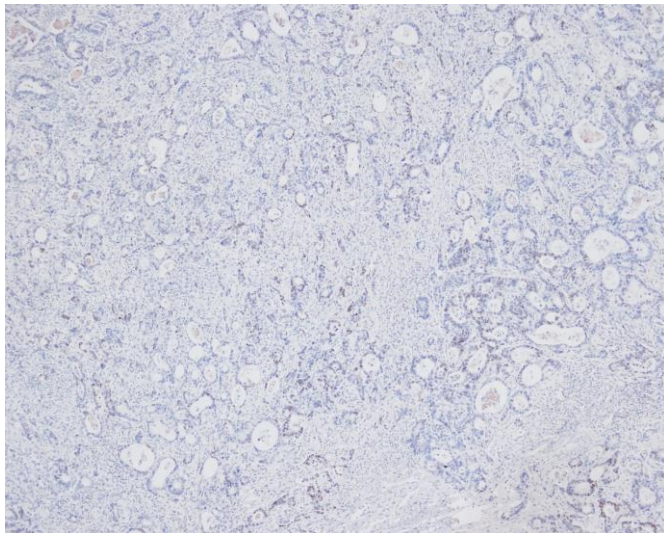
Claudin-18 expression was found in 61 of 65 (95%) PDACs



Immunostain (IHC)

4. CDX2

Colorectal adenocarcinomas	114 of 118 (97%)
Gastric adenocarcinomas	36 of 59 (61%)
Pancreatic adenocarcinomas	5 of 32 (16%)



Reference

- ▶ David Lukas Wachter 1, Anne Schlabrakowski, Josef Hoegel, Glen Kristiansen, Arndt Hartmann, Marc-Oliver Riener. Diagnostic value of immunohistochemical IMP3 expression in core needle biopsies of pancreatic ductal adenocarcinoma. *Am J Surg Pathol*. 2011 Jun;35(6):873-7. doi: 10.1097/PAS.0b013e3182189223.
- ▶ Mariko Tanaka, Junji Shibahara, Noriyoshi Fukushima, Aya Shinozaki, Makoto Umeda, Shumpei Ishikawa, Norihiro Kokudo, and Masashi Fukayama. Claudin-18 Is an Early-Stage Marker of Pancreatic Carcinogenesis. *J Histochem Cytochem*. 2011 Oct; 59(10): 942–952. doi: 10.1369/0022155411420569
- ▶ Xing Shugang, Yang Hongfa, Liu Jianpeng, Zheng Xu, Feng Jingqi, Li Xiangxiang, and Li Wei. Prognostic Value of SMAD4 in Pancreatic Cancer: A Meta-Analysis. *Transl Oncol*. 2016 Feb; 9(1): 1–7. Published online 2016 Jan 23. doi: 10.1016/j.tranon.2015.11.007
- ▶ Christoph Burdelski, Nilofar Jakani-Karimi, Frank Jacobsen, Christina Möller-Koop, Sarah Minner, Ronald Simon, Guido Sauter, Stefan Steurer, Till S. Clauditz, and Waldemar Wilczak. IMP3 overexpression occurs in various important cancer types and is linked to aggressive tumor features: A tissue microarray study on 8,877 human cancers and normal tissues. *Oncol Rep*. 2018 Jan; 39(1): 3–12. Published online 2017 Nov 2. doi: 10.3892/or.2017.6072
- ▶ Reyhan Bayrak, Hacer Haltas & Sibel Yenidunya. The value of CDX2 and cytokeratins 7 and 20 expression in differentiating colorectal adenocarcinomas from extraintestinal gastrointestinal adenocarcinomas: cytokeratin 7-/20+ phenotype is more specific than CDX2 antibody. *Diagnostic Pathology* volume 7, Article number: 9 (2012)

Reference

- ▶ David Lukas Wachter 1, Anne Schlabrakowski, Josef Hoegel, Glen Kristiansen, Arndt Hartmann, Marc-Oliver Riener. Diagnostic value of immunohistochemical IMP3 expression in core needle biopsies of pancreatic ductal adenocarcinoma. *Am J Surg Pathol*. 2011 Jun;35(6):873-7. doi: 10.1097/PAS.0b013e3182189223.
- ▶ Thomas, D., Radhakrishnan, P. Tumor-stromal crosstalk in pancreatic cancer and tissue fibrosis. *Mol Cancer* 18, 14 (2019).

Reference

- ▶ https://www.researchgate.net/figure/Histopathological-staining-of-normal-and-primary-pancreas-tumor-tissues-Development-of_fig2_330528044
- ▶ <https://www.cancer.org/cancer/pancreatic-cancer/detection-diagnosis-staging/staging.html>
- ▶ <https://www.mayoclinic.org/diseases-conditions/pancreatic-cancer/symptoms-causes/syc-20355421>
- ▶ <https://voices.uchicago.edu/grosspathology/gi-liver/pancreas-whipple/>
- ▶ <https://www.drnikhilagrawal.com/periampullary-cancer>
- ▶ <https://www.pancan.org/facing-pancreatic-cancer/about-pancreatic-cancer/types-of-pancreatic-cancer/exocrine/>

Thank you for listening

Thanks ♡

