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# SIMPLE PRESENTATION FOR COMPETITION UW-MADISON AND PREPARATION FOR HUMAP

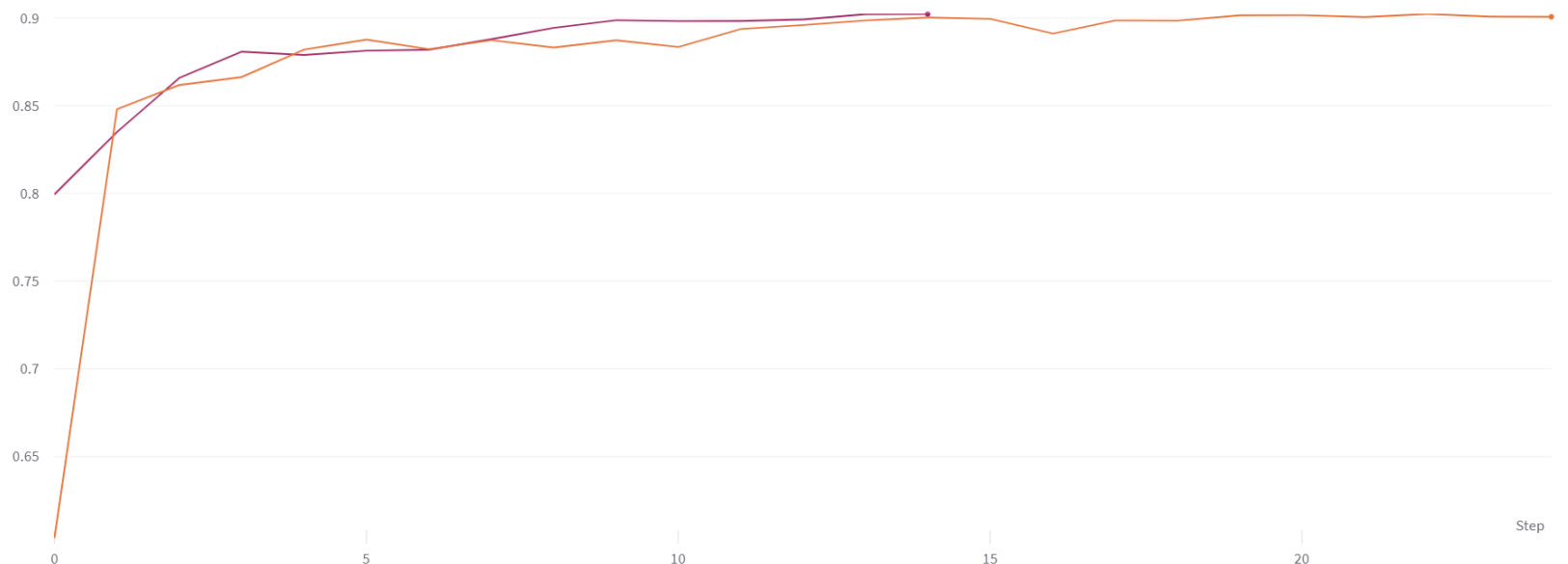
UW-MADISON GITRACT IMAGE SEGMENTATION

BOTAO JIANG   MINGZIRUI WU



# IN LAST PRE...

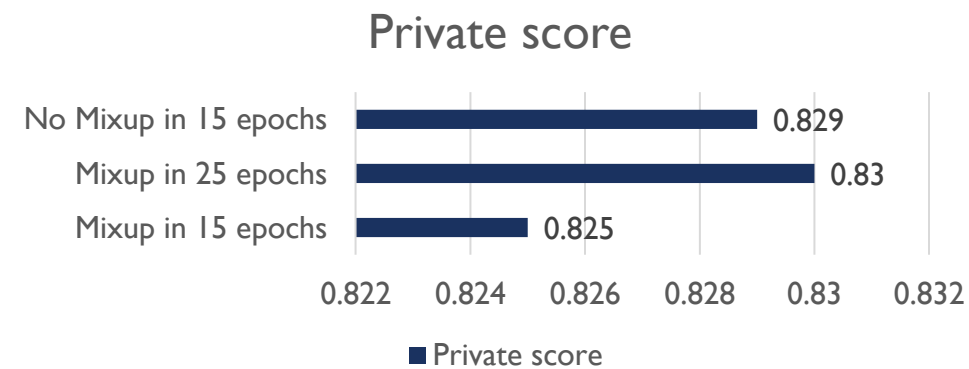
## Mixup Data Augmentation Strategy



- The highest dice for 15 epochs is 0.9023 at epoch 15.
- The highest dice for 25 epochs is 0.9024 at epoch 23.
- It seems not efficient!

# IN LAST PRE...

<a href="#">UWMGI: Unet [Infer] [PyTorch]</a> unet++-efficientnet-b1 with Mixup BCE&Dice v2 (version 10/10) 2 days ago by <a href="#">KaggleJbt</a> Notebook UWMGI: Unet [Infer] [PyTorch]   unet++-efficientnet-b1 with Mixup BCE&Dice v2	Succeeded	0.830	0.836	<input type="checkbox"/>
<a href="#">UWMGI: Unet [Infer] [PyTorch]</a> Unet++ Efficientnet-b1 Mixup Dice+CE (version 9/10) 3 days ago by <a href="#">KaggleJbt</a> Notebook UWMGI: Unet [Infer] [PyTorch]   Unet++ Efficientnet-b1 Mixup Dice+BCE	Succeeded	0.825	0.833	<input type="checkbox"/>
<a href="#">UWMGI: Unet [Infer] [PyTorch]</a> Unet++ with Efficientnet_b1_success_2 (version 8/10) 4 days ago by <a href="#">KaggleJbt</a> Notebook UWMGI: Unet [Infer] [PyTorch]   Unet++ with Efficientnet_b1_success_2	Succeeded	0.829	0.840	<input checked="" type="checkbox"/>

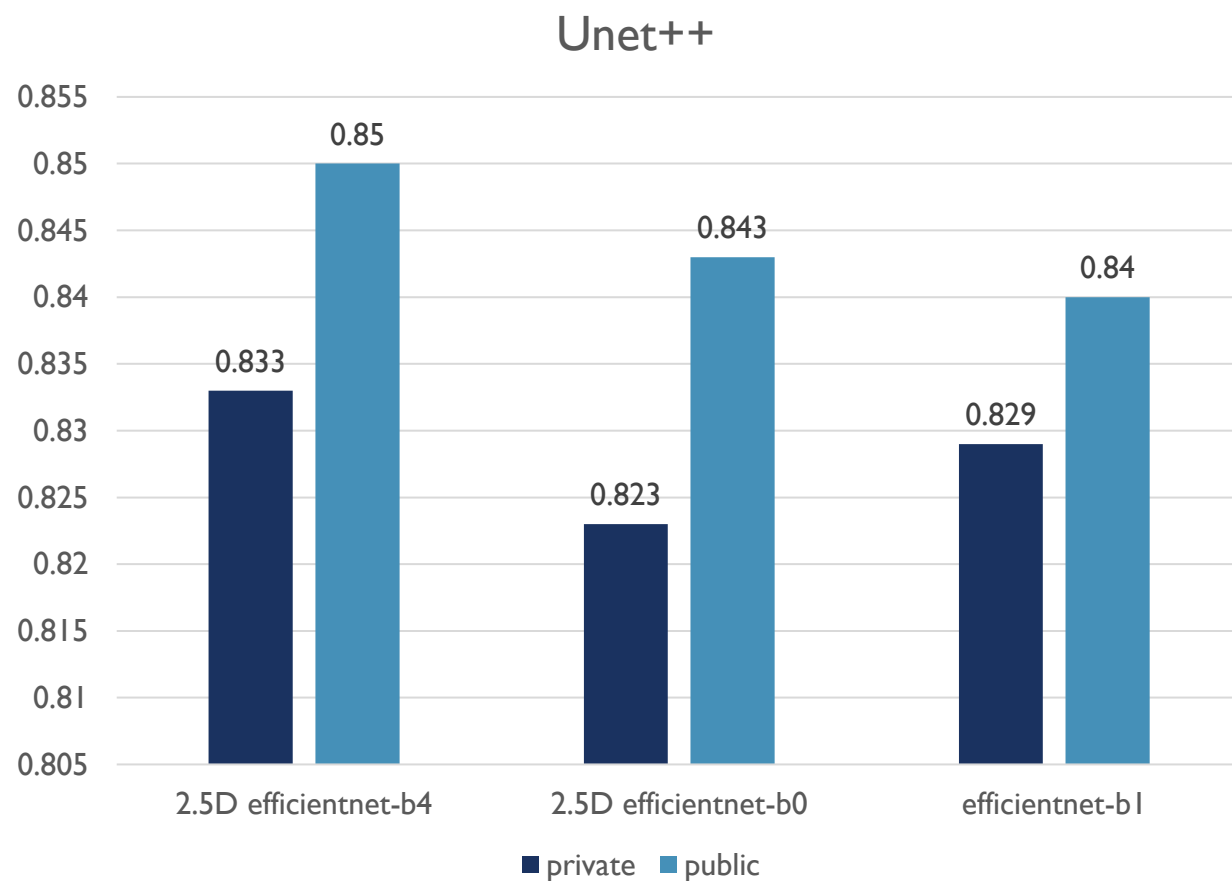


# FINAL RESULTS ON 2.5D DATA

<a href="#">UWMGI: 2.5D [Infer] [PyTorch]</a> Unet++ 2.5D dataset with efficientnet-b4 epoch 15 (version 5/11 hours ago by <a href="#">KaggleJbt</a> ) Notebook UWMGI: 2.5D [Infer] [PyTorch]   Unet++ 2.5D dataset with efficientnet-b4 epoch 15	Succeeded	0.833	0.850	<input type="checkbox"/>
<a href="#">UWMGI: 2.5D [Infer] [PyTorch]</a> 0.5BCE+0.2Tv+0.3Dice (version 5/5) 15 hours ago by <a href="#">cenxun</a> Notebook UWMGI: 2.5D [Infer] [PyTorch]   0.5BCE+0.2Tv+0.3Dice	Succeeded	0.810	0.829	<input type="checkbox"/>
<a href="#">UWMGI: 2.5D [Infer] [PyTorch]</a> 0.2*BCELoss+0.8*DiceLoss (version 4/5) 20 hours ago by <a href="#">cenxun</a> Notebook UWMGI: 2.5D [Infer] [PyTorch]   0.2*BCELoss+0.8*DiceLoss	Succeeded	0.804	0.820	<input type="checkbox"/>
<a href="#">UWMGI: 2.5D [Infer] [PyTorch]</a> unetplusplus-efficientnet_b0 (version 4/5) a day ago by <a href="#">KaggleJbt</a> Notebook UWMGI: 2.5D [Infer] [PyTorch]   unetplusplus-efficientnet_b0	Succeeded	0.823	0.843	<input checked="" type="checkbox"/>
<a href="#">UWMGI: Unet [Infer] [PyTorch]</a> unet++-efficientnet-b1 with Mixup BCE&Dice v2 (version 10/10) 2 days ago by <a href="#">KaggleJbt</a> Notebook UWMGI: Unet [Infer] [PyTorch]   unet++-efficientnet-b1 with Mixup BCE&Dice v2	Succeeded	0.830	0.836	<input type="checkbox"/>
<a href="#">UWMGI: 2.5D + timm-reg [Infer] [PyTorch]</a> UnetPlusPlus_timm-regent008_epoch5 (version 1/1) 2 days ago by <a href="#">cenxun</a> Notebook UWMGI: 2.5D + timm-reg [Infer] [PyTorch]   UnetPlusPlus_timm-regent008_epoch5	Succeeded	0.806	0.829	<input type="checkbox"/>
<a href="#">UWMGI: 2.5D [Infer] [PyTorch]</a> Unet++ 2.5D dataset with resnet34_2 (version 2/5) 2 days ago by <a href="#">KaggleJbt</a> Notebook UWMGI: 2.5D [Infer] [PyTorch]   Unet++ 2.5D dataset with resnet34_2	Succeeded	0.700	0.714	<input type="checkbox"/>

- The greatest one is Unet++ with efficientnet-b4 at epoch 15: 0.833
- Basing on Unet++ with efficientnet-b0, we tried different loss functions, but failed.
- Higher results cost more time:
  - Efficientnet-b4: 19M parameters; 2.5 times of b1
  - 2:20 per epoch
  - 1 hour for submitting

# FINAL RESULTS



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  - Efficientnet-b4: 19M parameters; 2.5 times of b1
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## ADDITIONAL INFORMATION

UWMGI: Unet [Infer] [PyTorch]  
(version 1/1)

7 days ago by [cenxun](#)

Notebook UWMGI: Unet [Infer] [PyTorch] | Version 1 

Succeeded

0.830

0.838



UWMGI: Unet [Infer] [PyTorch]

Unet\_with\_resnet34\_success (version 5/10)

5 days ago by [KaggleJbt](#)

Notebook UWMGI: Unet [Infer] [PyTorch] |

Unet\_with\_resnet34\_success

Succeeded

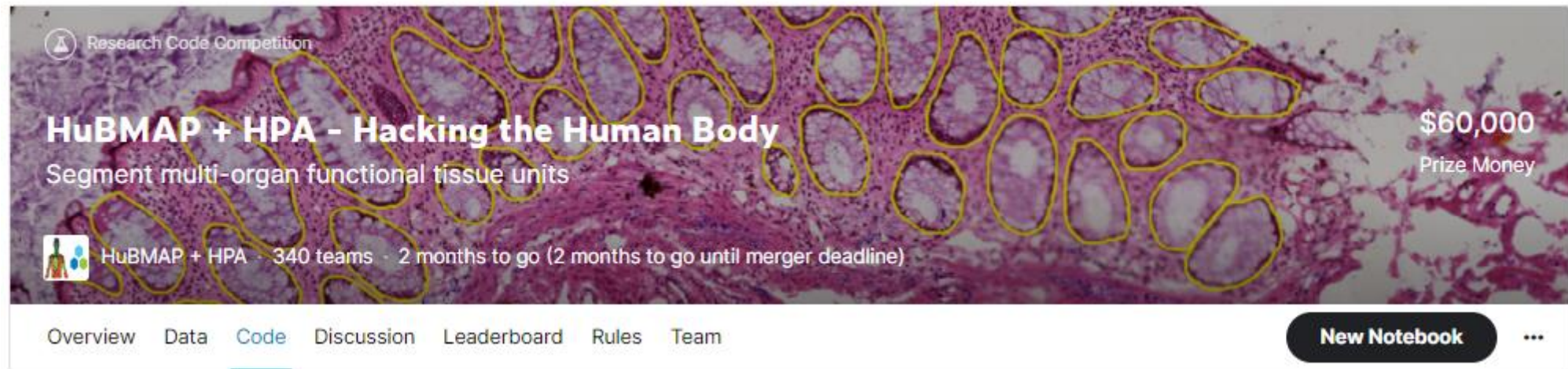
0.815

0.823



- The Unet private score is even higher than Unet++!
- The difference between Unet++ private and public scores is larger than those in Unet architecture.

# FUTURE PLAN



The image is a screenshot of a banner for the "HuBMAP + HPA - Hacking the Human Body" Research Code Competition. The banner features a background image of a histological section with yellow outlines highlighting various tissue units. The text on the banner includes the competition title, the task description "Segment multi-organ functional tissue units", the prize money "\$60,000", and the number of teams "340 teams". It also mentions a deadline: "2 months to go (2 months to go until merger deadline)". At the bottom, there is a navigation bar with links for "Overview", "Data", "Code", "Discussion", "Leaderboard", "Rules", and "Team". A "New Notebook" button is visible on the right side of the banner.

Research Code Competition

## HuBMAP + HPA - Hacking the Human Body

Segment multi-organ functional tissue units

\$60,000  
Prize Money

HuBMAP + HPA · 340 teams · 2 months to go (2 months to go until merger deadline)

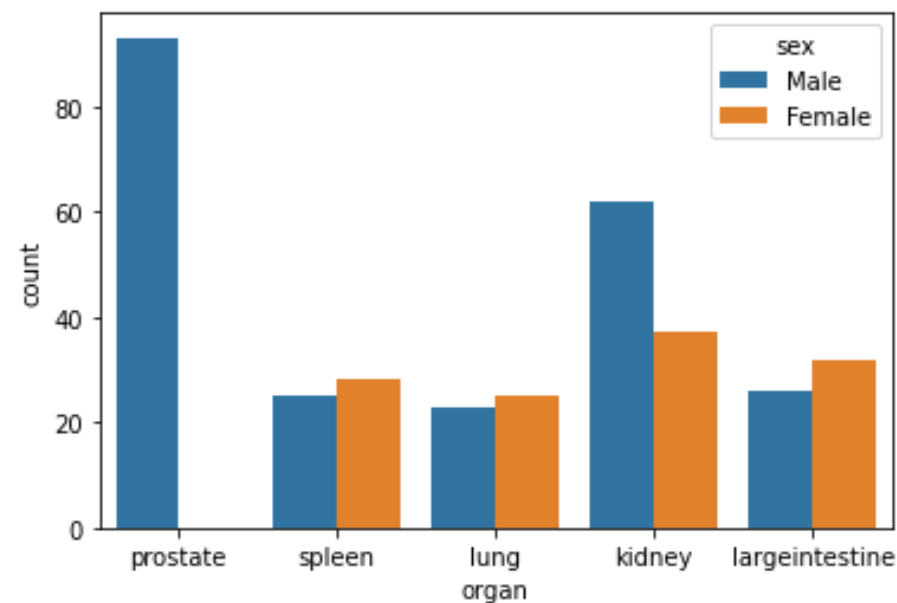
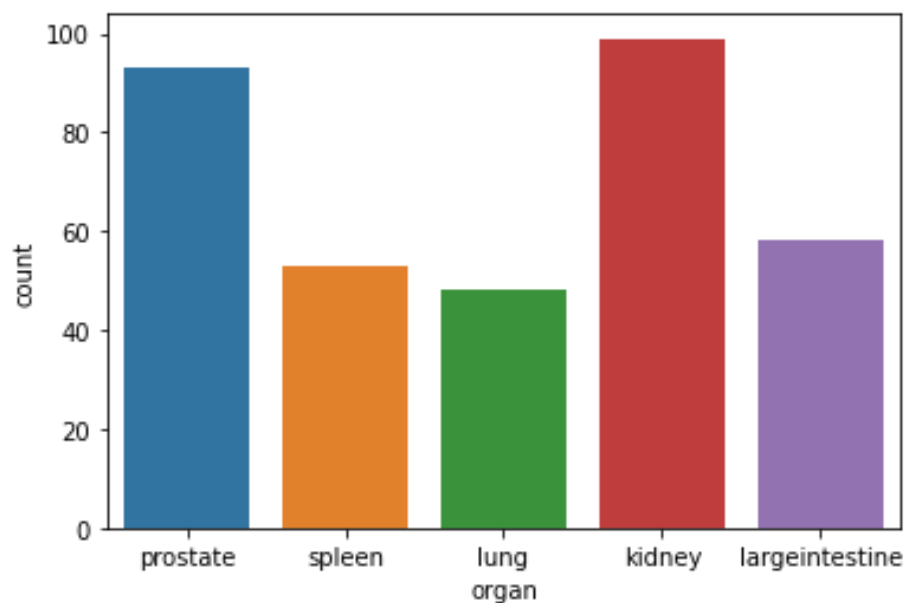
Overview Data Code Discussion Leaderboard Rules Team

New Notebook ...

- Task: Identify and segment functional tissue units (FTUs) across five human organs

# FUTURE PLAN

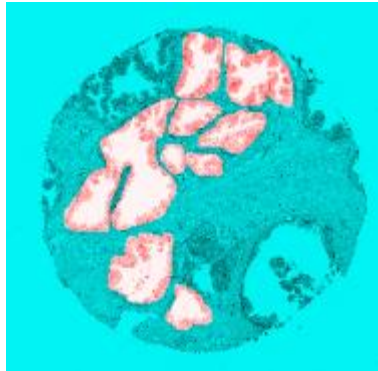
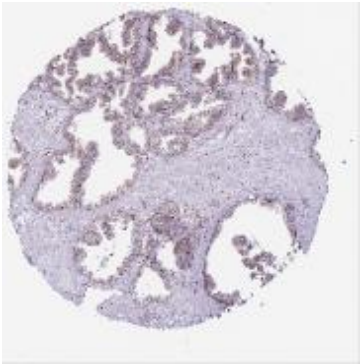
- Five human organs.
- Images Size: 3000 x 3000.
- 351 Train Cases, One with One Mask.



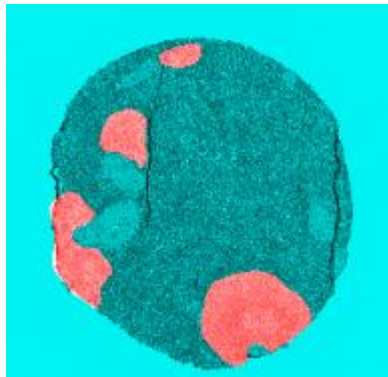
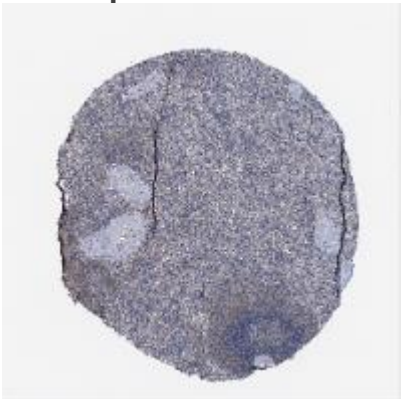


# CASE SAMPLE

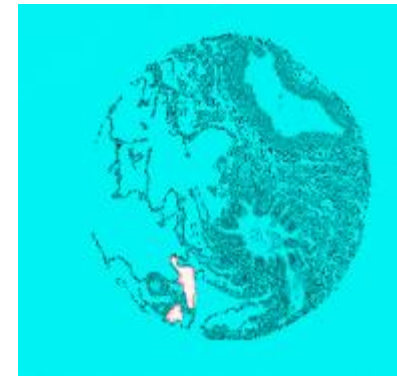
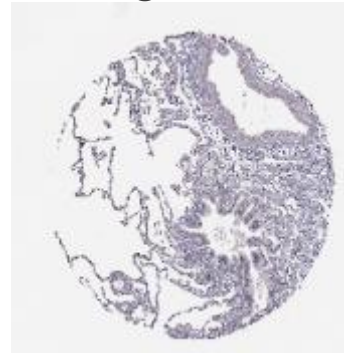
■ Prostate



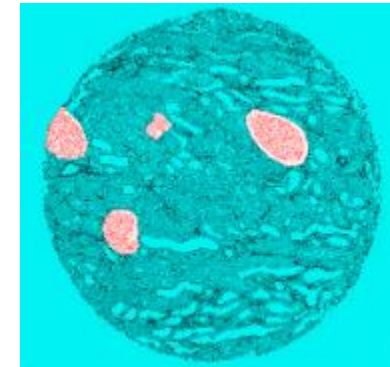
■ Spleen



■ Lung

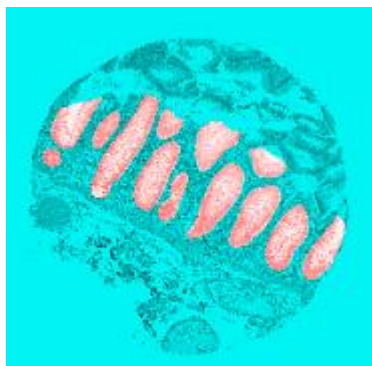
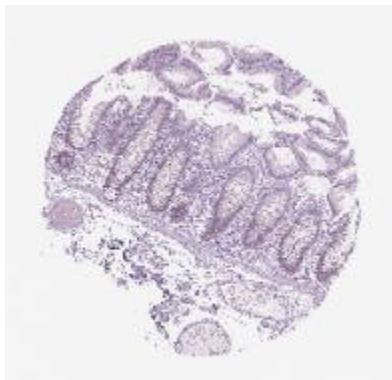


■ Kidney



# CASE SAMPLE

- Large intestine



- File format

- Image: .tiff
- Mask: .json

- Document Directory Structure

**Data Explorer**

9.39 GiB

- ▶ test\_images
- ▶ train\_annotations
- ▶ train\_images
- sample\_submission.csv
- test.csv
- train.csv



Thank you!