



Scaling Tumor Segmentation: Best Lessons from Real and Synthetic Data

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Email: zzhou82@jh.edu Code, Model & Data: <https://github.com/BodyMaps/AndomenAtlas2.0>



AbdomenAtlas 2.0 10,135

Panorama	2238
KITS	489
MSD-Pancreas	281
LiTS	131
MSD-Colon	126
Kipa	120
ULS-Pancreas	70
ULS-Kidney	50
ULS-Liver	49
3D-IRCADb	20

Numbers of CT Volumes

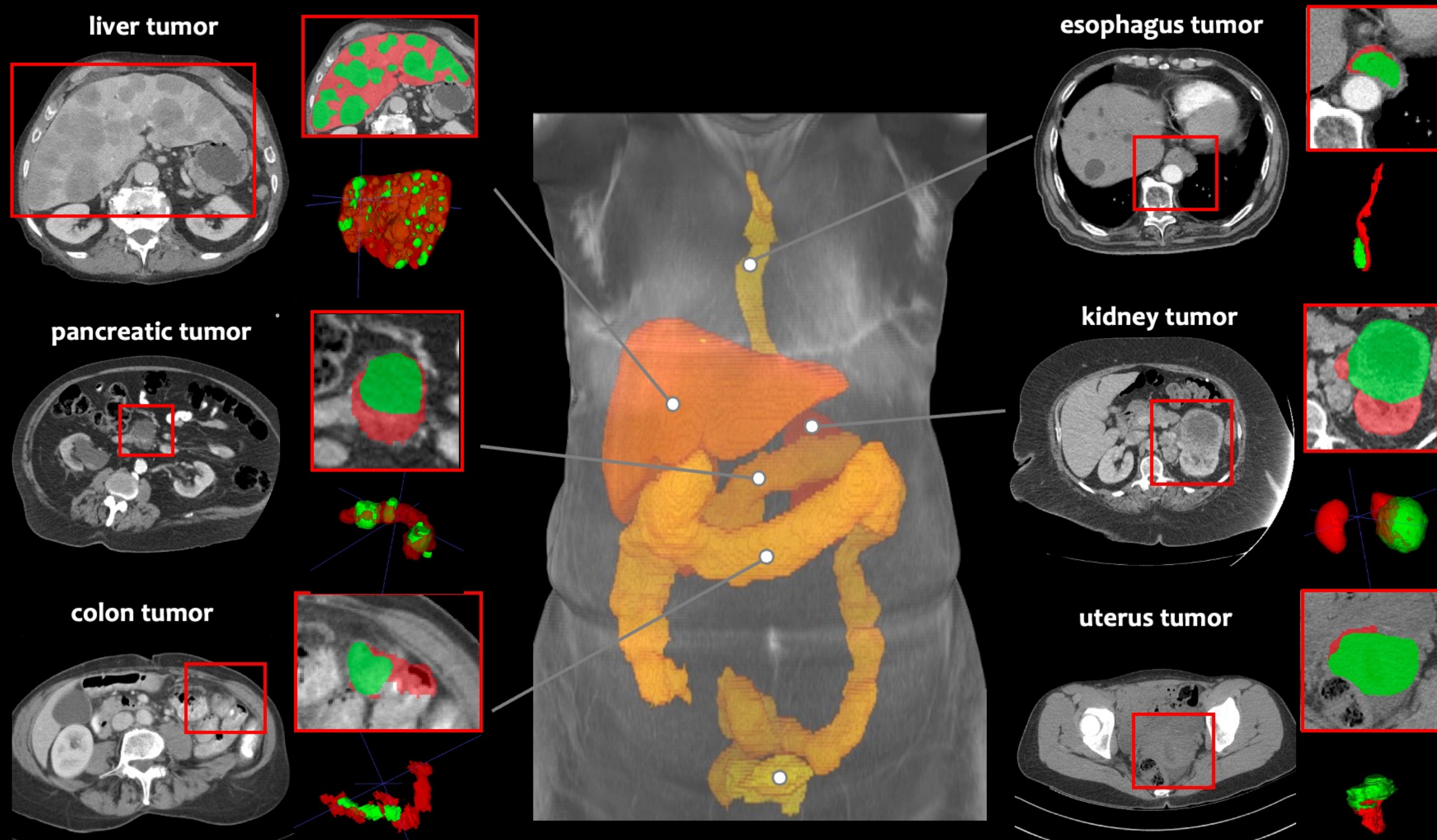
10,135 CT volumes 4.7M slices
89 source hospitals

AbdomenAtlas 2.0 15,130

LiTS	908
Panorama	682
KITS	659
MSD-Pancreas	283
3D-IRCADb	203
Kipa	178
MSD-Colon	133
ULS-Pancreas	120
ULS-Kidney	50
ULS-Liver	49

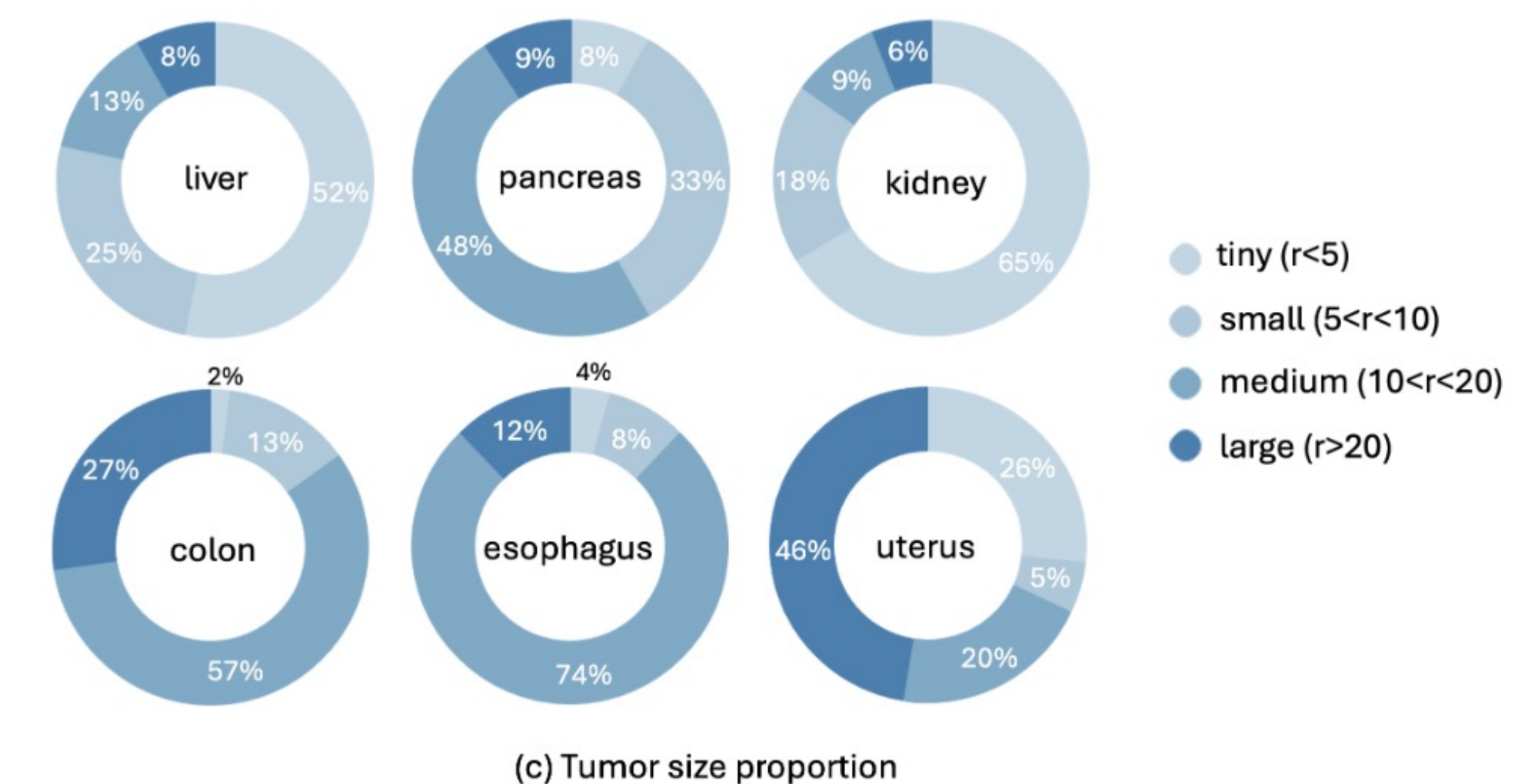
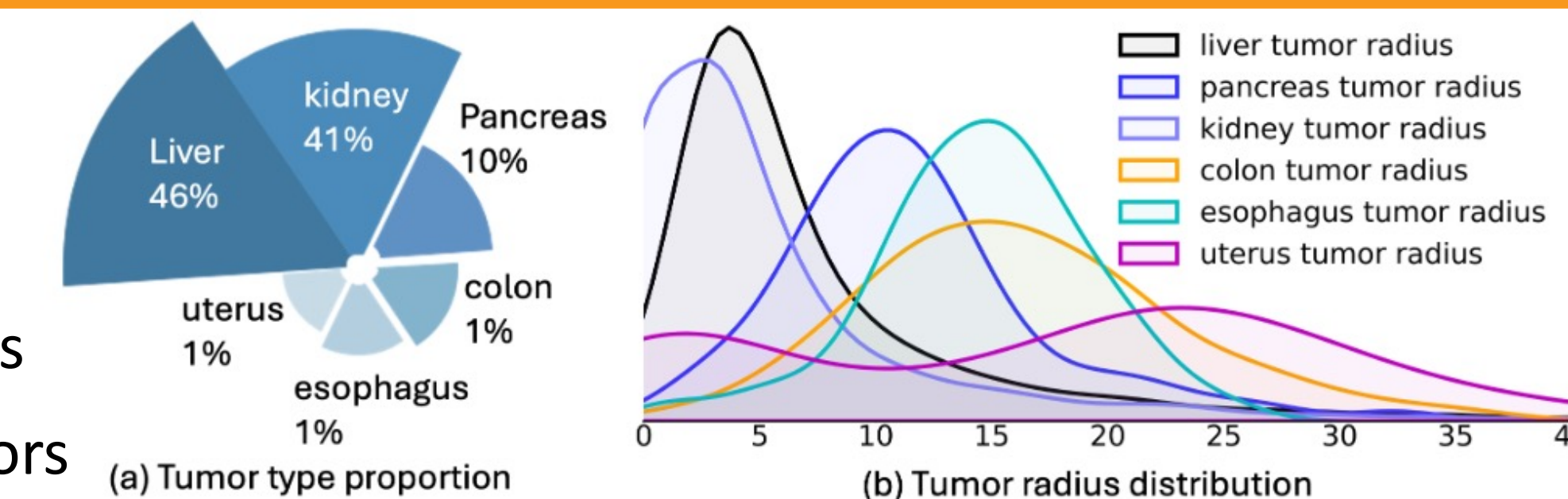
Numbers of Tumors

31 annotated structures
25 annotated organ
6 annotated tumor
15,130 tumor masks

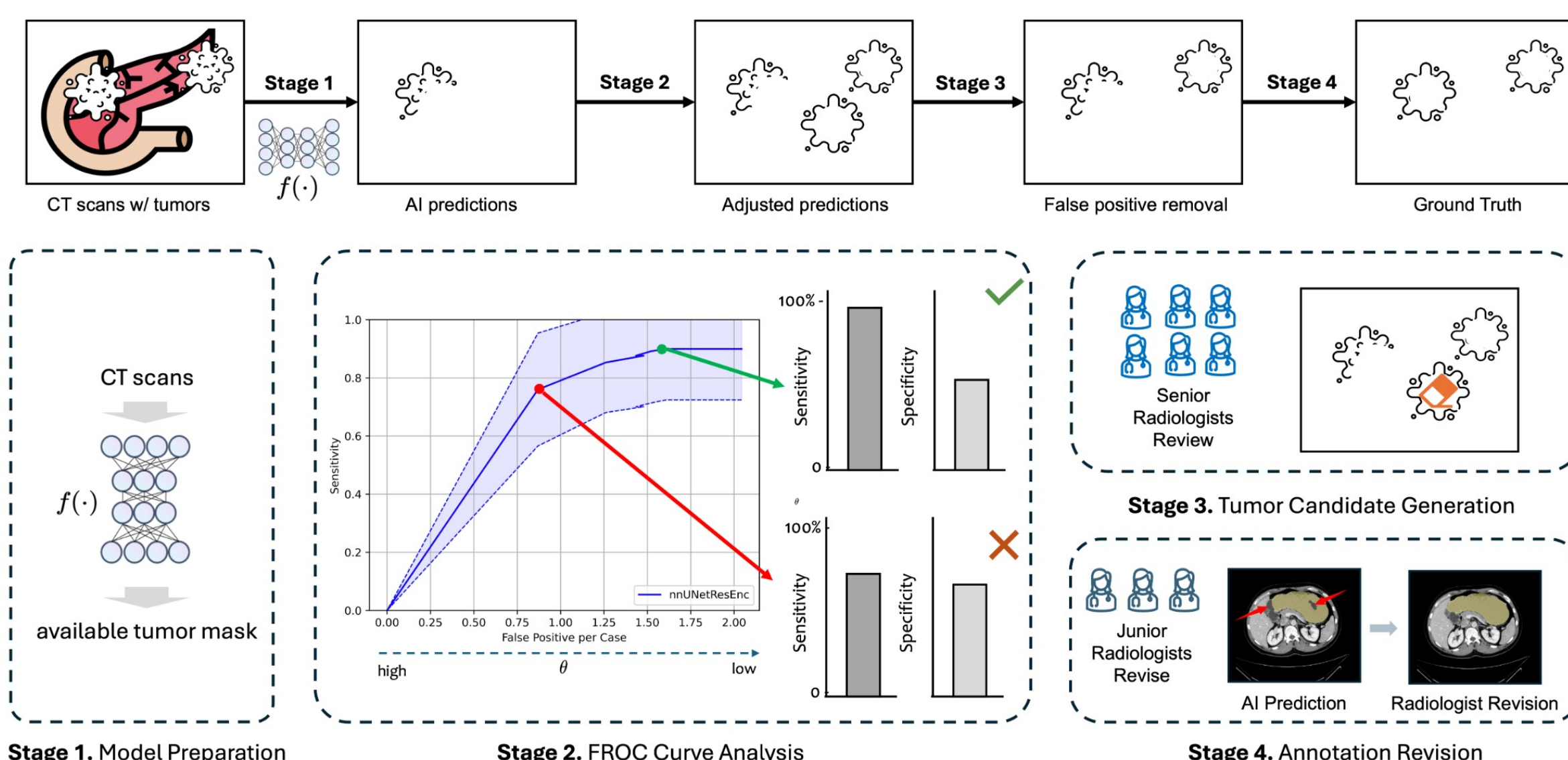


Dataset Description and Statistics

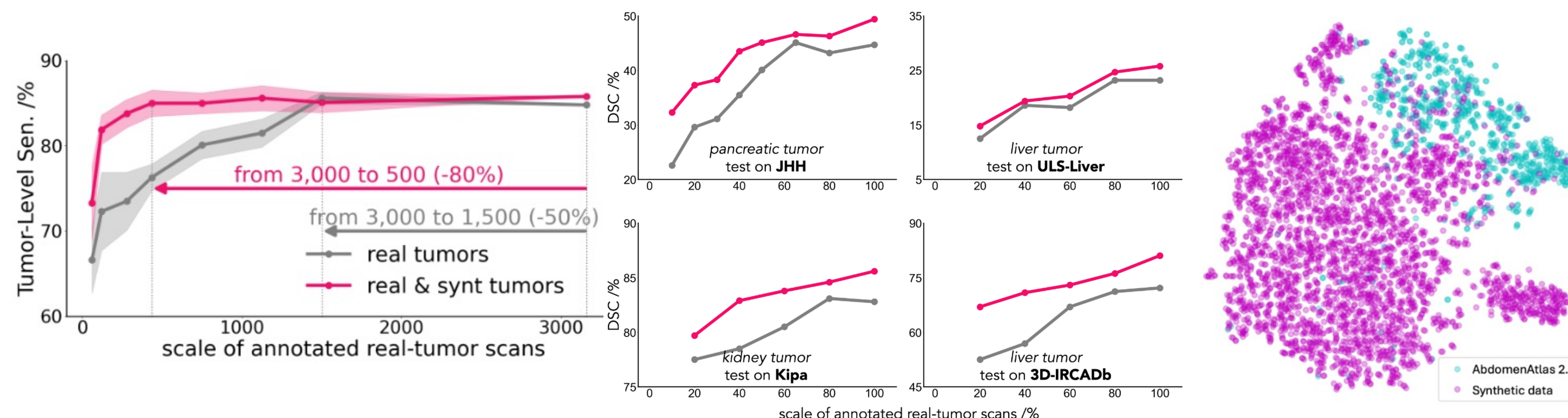
- 10,135 CT from 89 hospitals
- 10,135 masks, 31 structures
- liver, kidney, & pancreatic tumors
- colon, esophagus, & uterus tumors
- 15,130 tumor instances
- small tumors (<2 cm)
 - 5,709 in liver
 - 850 in pancreas
 - 4,638 in kidney
 - 29 in colon
 - 17 in esophagus
 - 39 in uterus



SMART-Annotator



Data Scaling Laws Study



Medical Segmentation Decathlon

Method	Task03 Liver		Task07 Pancreas	
	DSC	NSD	DSC	NSD
Kim <i>et al.</i> [54]	73.0	88.6	51.8	73.1
C2FNAS [102]	72.9	89.2	54.4	75.6
Trans VW [29]	76.9±20.0	92.0±16.8	51.1±32.8	70.1±37.4
Models Gen. [106]	77.5±20.4	91.9±17.9	50.4±32.6	70.0±37.2
nnU-Net [44]	76.0±22.1	90.7±18.3	52.8±33.0	71.5±36.6
DiNTS [33]	74.6±21.3	91.0±17.3	55.4±29.8	75.9±32.0
Swin UNETR [92]	75.7±20.4	91.6±16.8	58.2±28.6	79.1±29.7
Uni. Model [66]	79.4±17.0	93.4±15.2	62.3±26.6	82.9±27.2
AbdomenAtlas 2.0	82.6±11.0	96.9±6.4	67.2±24.7	86.0±25.2
Δ	+3.2	+3.5	+4.9	+3.1