



CIFAR



**1PM**

6PM in London (GMT), 3AM in Tokyo (GMT+9)

## Multiscale Illustrations and Animations

**Moderator:** Todd Theriault, *Indiana University*

### Presenters:

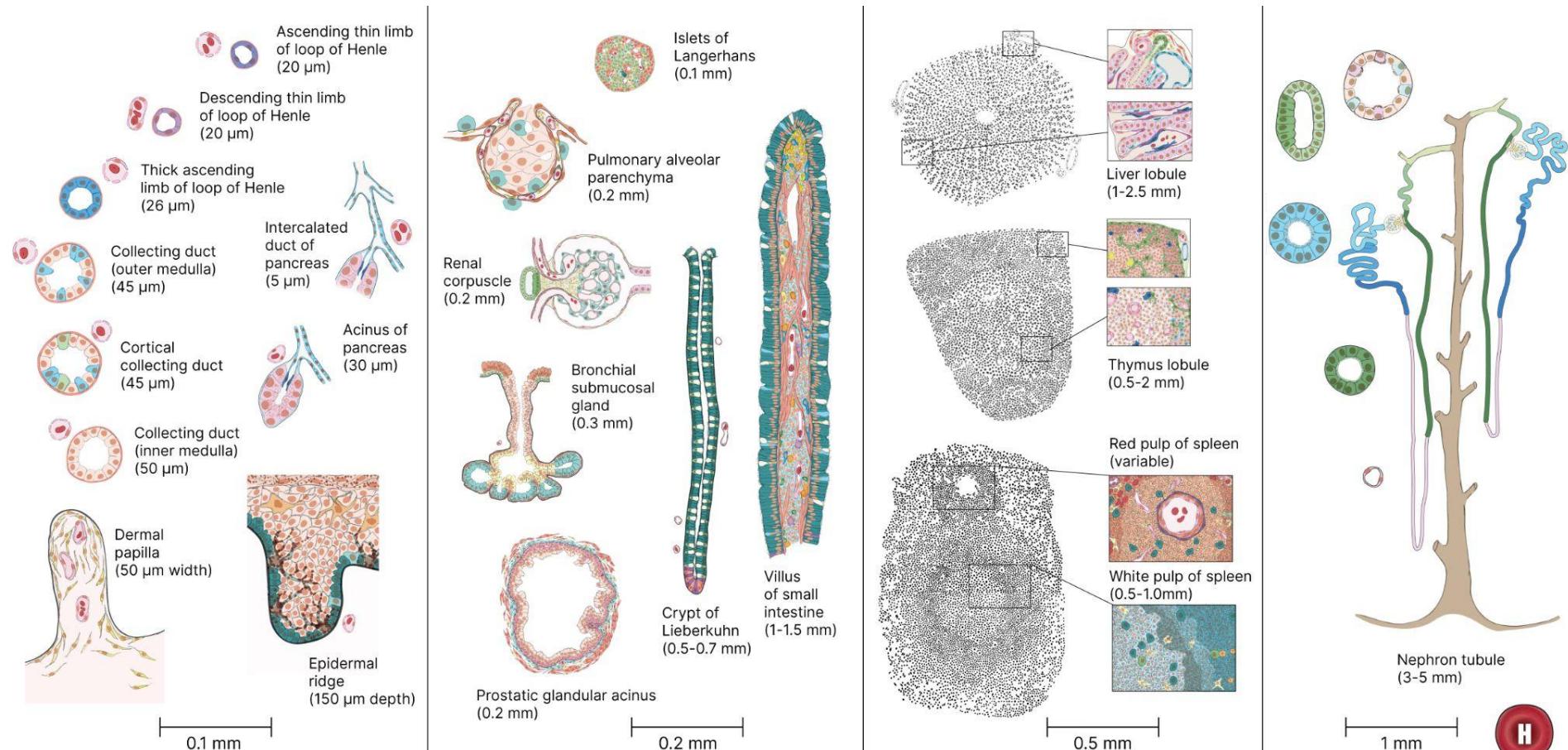
- Heidi Schlelein, *Indiana University*
- Ushma Patel, *Indiana University*
- Rachel Bajema, *Indiana University*



**Rachel Bajema, *Indiana University***

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# Functional Tissue Unit Interactive Illustrations

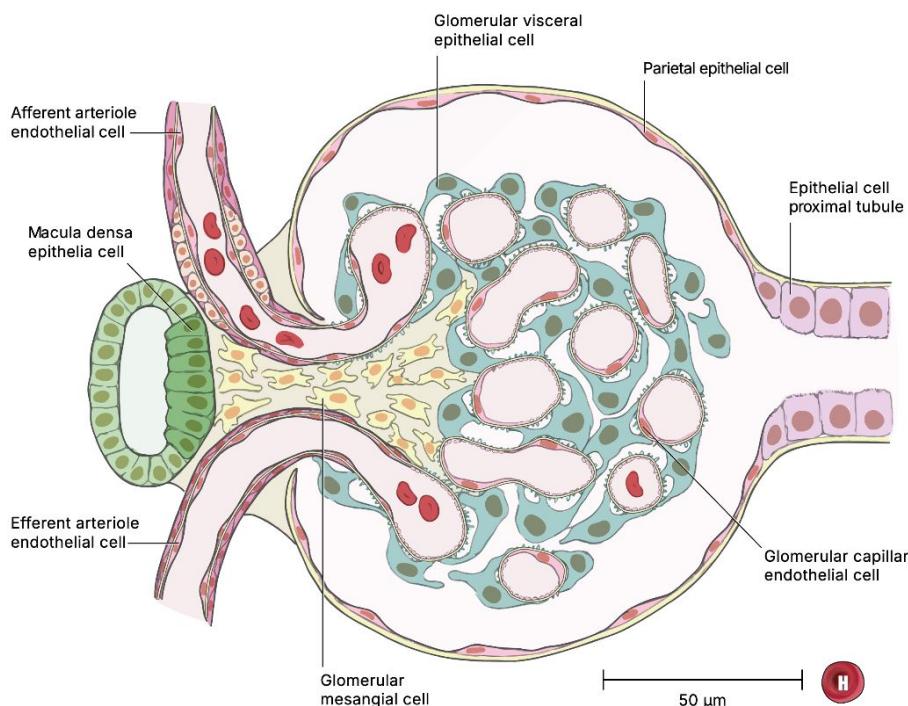


# Human Reference Atlas Functional Tissue Unit Explorer

## FTU Library

- Kidney
  - loop of Henle ascending limb thin segment
  - Cortical Collecting Duct
  - descending limb of loop of Henle
  - inner medullary collecting duct
  - nephron
  - outer medullary collecting duct
  - renal corpuscle**
  - thick ascending limb of loop of Henle
- Large Intestine
  - crypt of Lieberkühn of large intestine
- Liver
  - liver lobule
- Lung
  - bronchus submucosal gland
  - alveolus of lung
- Pancreas
  - intercalated duct of pancreas
  - islet of Langerhans
  - pancreatic acinus
- Prostate Gland
  - prostate glandular acinus
- Skin
  - papillary layer of dermis
  - epidermal ridge of digit
- Small Intestine
  - intestinal villus
- Spleen
  - red pulp of spleen
  - white pulp of spleen
- Thymus
  - thymus lobule

## renal corpuscle

[Embed Illustration](#)[Download Illustration](#)[Illustration Metadata](#)

50 µm



## Cell Types by Gene Biomarkers

Cell Type	Cell Count	A2M [ENSG000...]	A4SS [ENSG00...]	AKAP9 [ENSG0...]	AKT3 [ENSG0...]	ALDHMA2 [ENSG...]	ALS2CL [ENSG...]	ANHD36 [EN...]	ANHD38C [EN...]
glomerular capillary endothelial ...	344	●	●	●	●	●	●	●	●
glomerular mesangial cell	99	●	●	●	●	●	●	●	●
glomerular visceral epithelial cell	341	●	●	●	●	●	●	●	●
parietal epithelial cell	266	●	●	●	●	●	●	●	●

## Cell Types by Protein Biomarkers

Cell Type	Cell Count	A2M [ENSG000...]	A4SS [ENSG00...]	AKAP9 [ENSG0...]	AKT3 [ENSG0...]	ALDHMA2 [ENSG...]	ALS2CL [ENSG...]	ANHD36 [EN...]	ANHD38C [EN...]
glomerular capillary endothelial ...	344	●	●	●	●	●	●	●	●
glomerular mesangial cell	99	●	●	●	●	●	●	●	●
glomerular visceral epithelial cell	341	●	●	●	●	●	●	●	●
parietal epithelial cell	266	●	●	●	●	●	●	●	●

## Cell Types by Lipid Biomarkers

Cell Type	Cell Count	A2M [ENSG000...]	A4SS [ENSG00...]	AKAP9 [ENSG0...]	AKT3 [ENSG0...]	ALDHMA2 [ENSG...]	ALS2CL [ENSG...]	ANHD36 [EN...]	ANHD38C [EN...]
glomerular capillary endothelial ...	344	●	●	●	●	●	●	●	●
glomerular mesangial cell	99	●	●	●	●	●	●	●	●
glomerular visceral epithelial cell	341	●	●	●	●	●	●	●	●
parietal epithelial cell	266	●	●	●	●	●	●	●	●

Biomarker Expression Mean in FTU



Percentage of Cells in FTU



## Source Data

<input checked="" type="checkbox"/> Authors	Year	Paper Title	Paper DOI
<input checked="" type="checkbox"/> Yoshitomo Muto, Parker C ...	2021	Single cell transcriptional ...	<a href="https://doi.org/10.1038...">https://doi.org/10.103...</a>

<https://apps.humanatlas.io/ftu-explorer>



**Heidi Schlelein, *Indiana University***

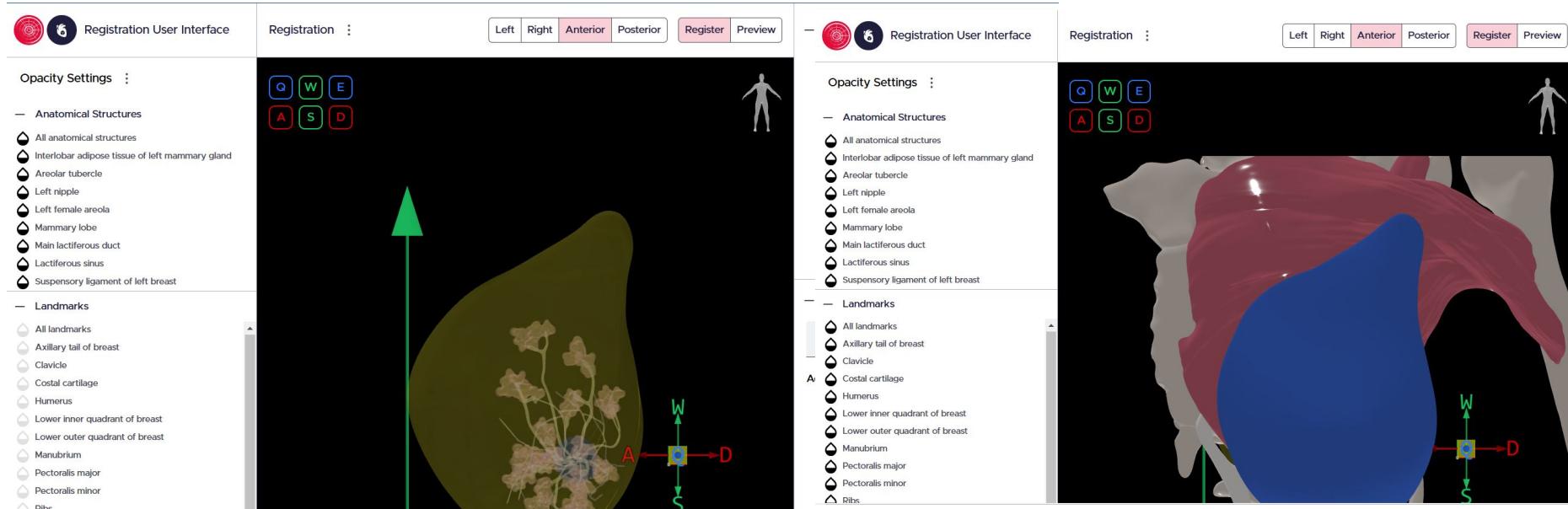
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# Other art

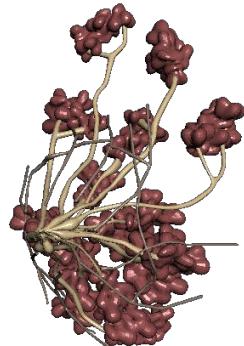
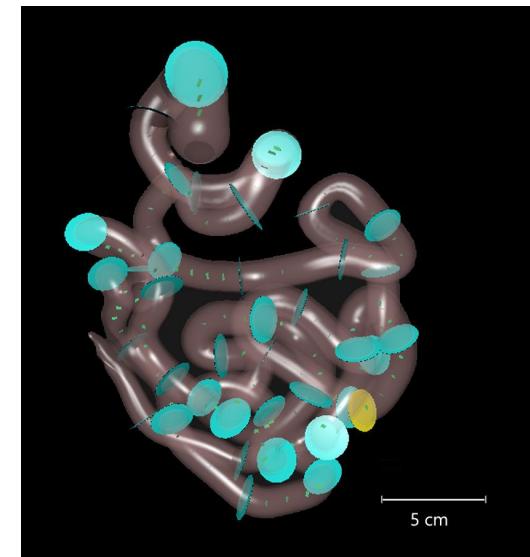
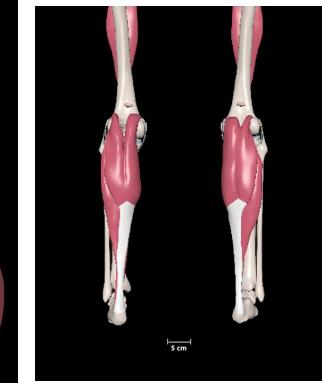
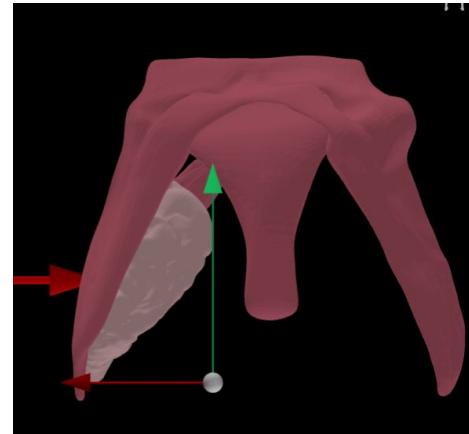
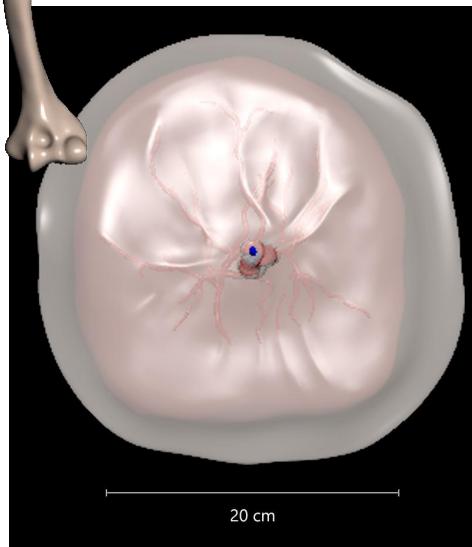
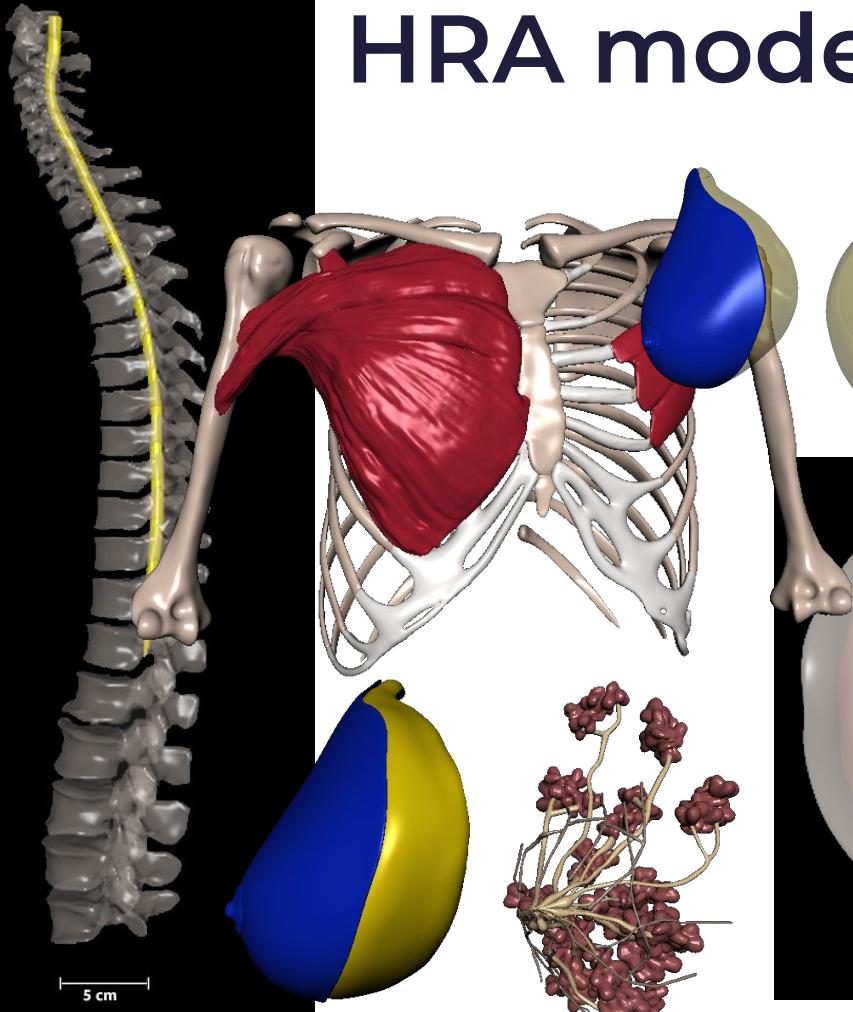


# RUI landmark models

## RUI before and after landmarks

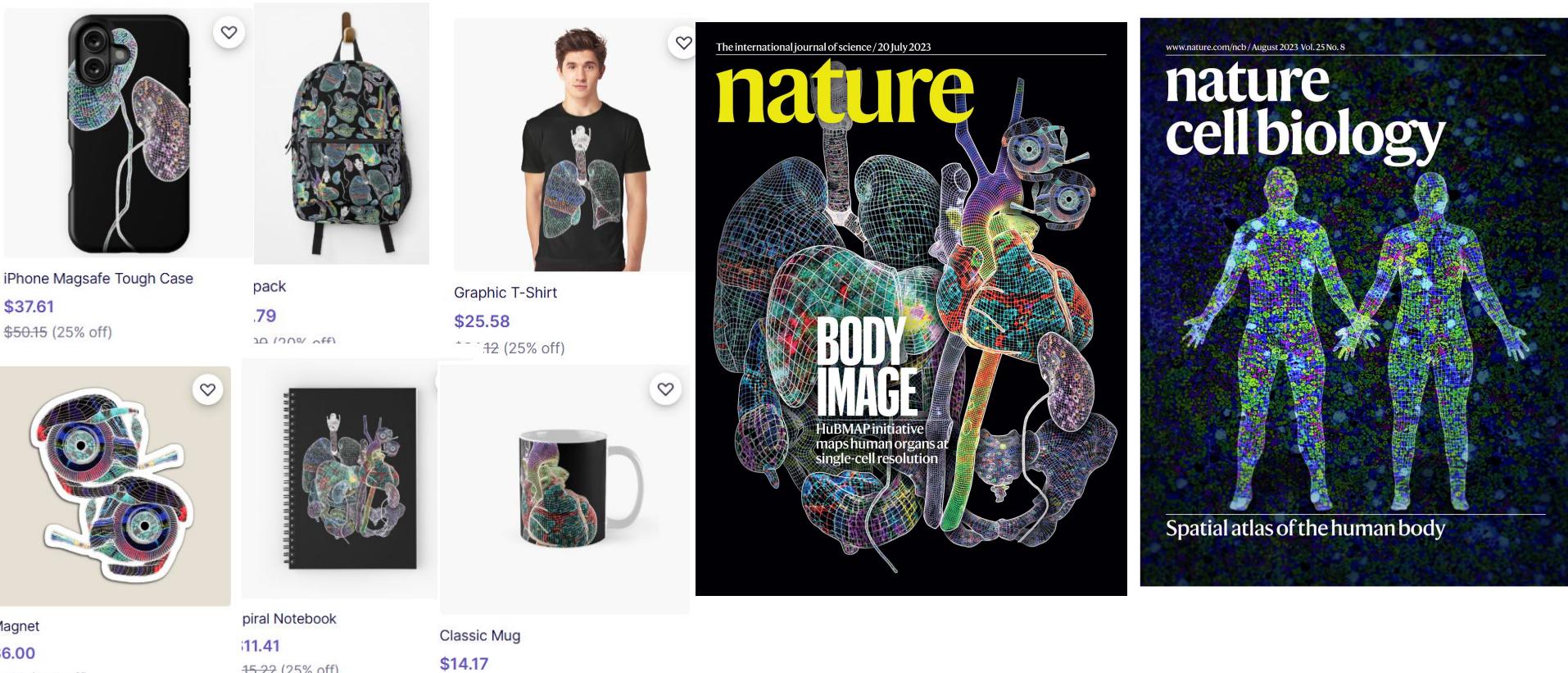


# HRA models



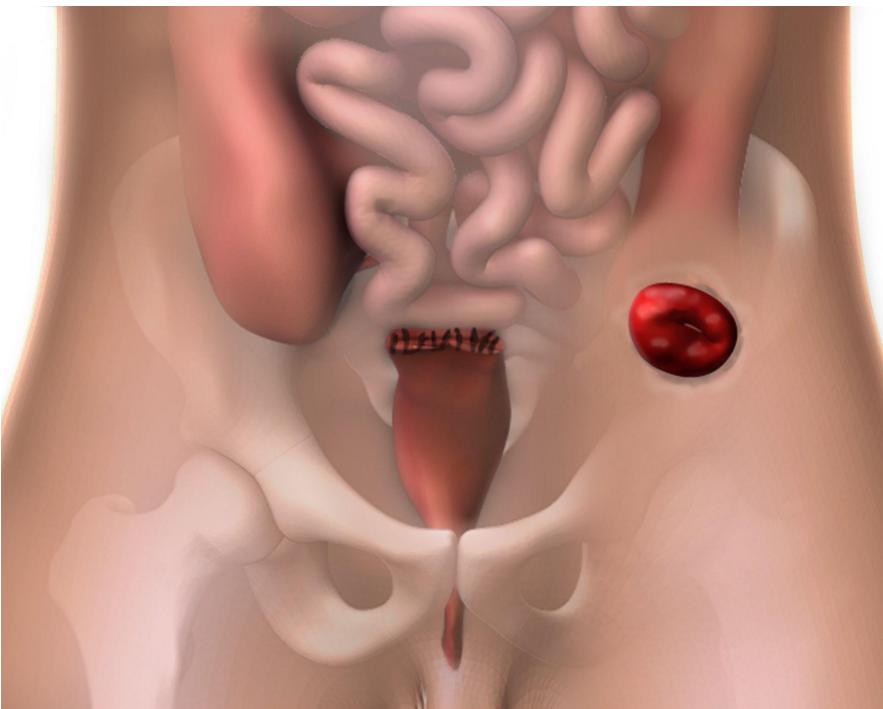
# Nature cover

Swag on Redbubble! <https://www.redbubble.com/people/Hschle/shop>

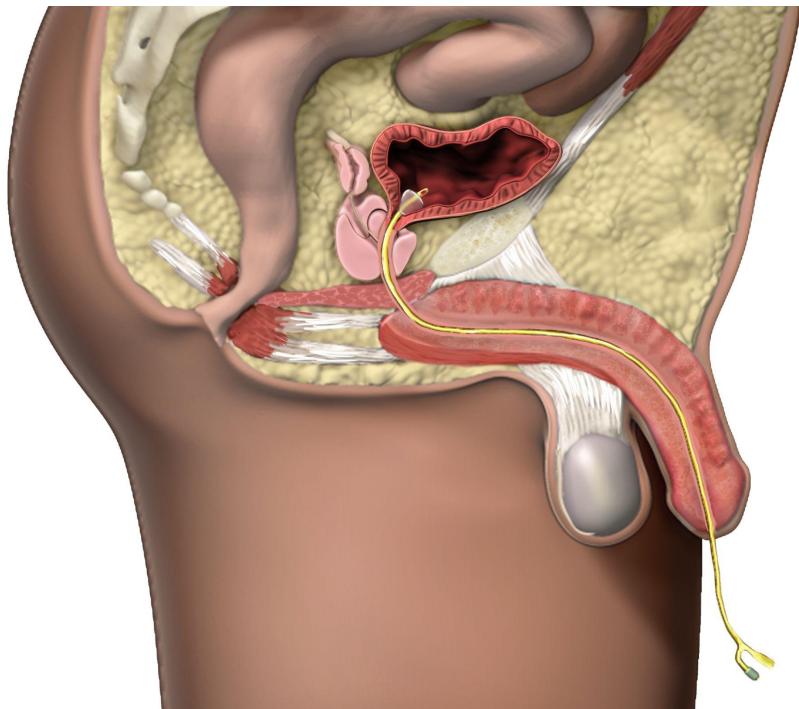


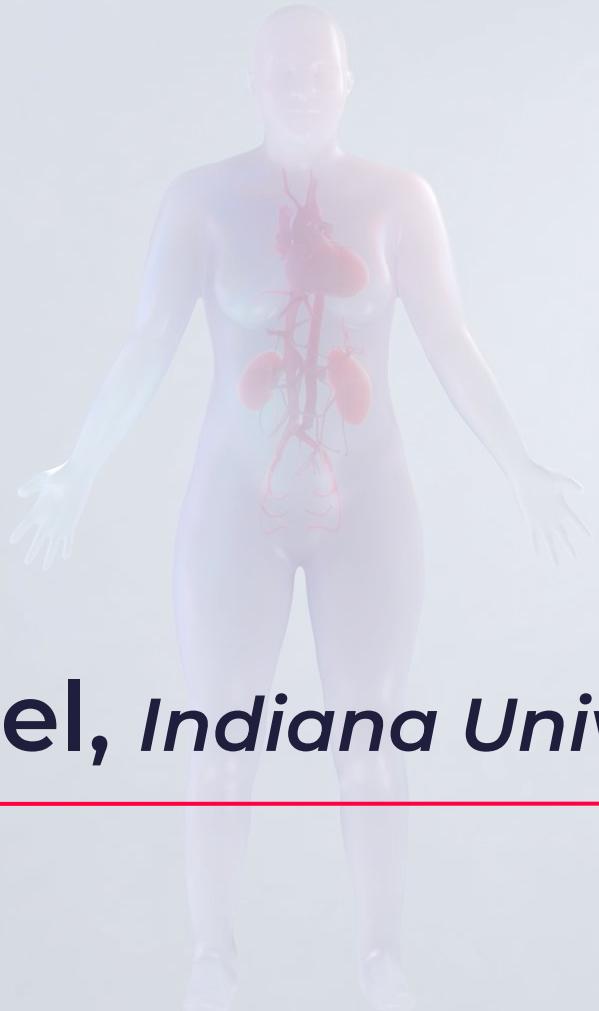
# Other art made with HRA models

Colostomy with Hartmann's pouch



Foley catheter insertion

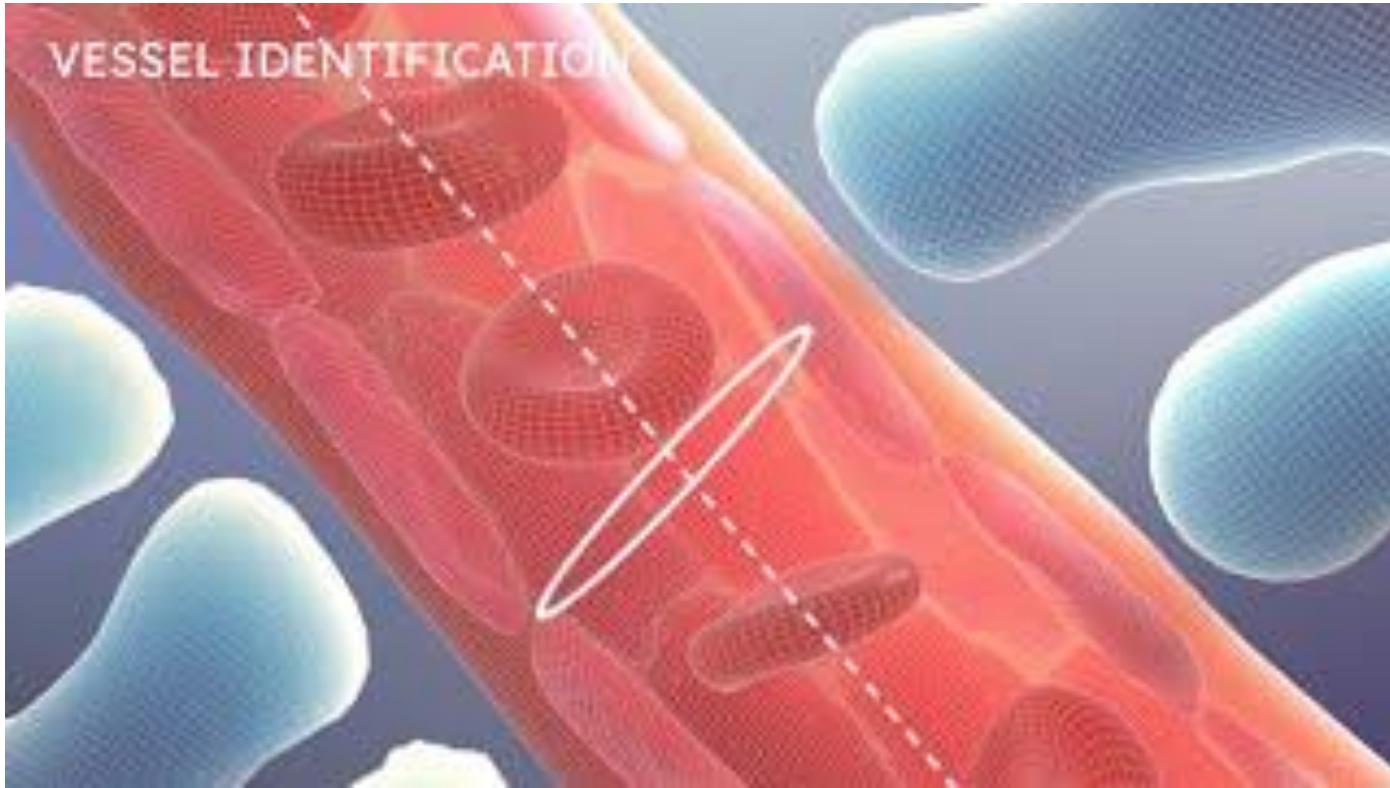




**Ushma Patel, Indiana University**

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# Human Reference Atlas: Vasculature Common Coordinate Framework (VCCF)



Producer (Initial Story / Guidance / Resources): Griffin Weber (Harvard Medical School), Katherine Gustilo (University of Colorado Anschutz Medical Campus), Katy Börner (Indiana University)  
Director (Animation / Art / Design / Editing): Ushma Patel (Indiana University) Voice: Yaël Ksander (Indiana University) Sound Track: "Inspirational Sentimental Romantic" by Aleksey Chistilin

# Q&A

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<https://humanatlas.io/events/2024-24h>

# Questions to discuss

- So our viewers can get to know you a bit better, you could talk about how/why you entered the field of biomedical visualization. What drew you to this profession? Who were your heroes/influences? What were some noteworthy aspects of your training in the field? What are some of the stylistic elements that characterize your work?
- What was the initial goal of the work you were commissioned to do for the HRA? Did that goal modify or deepen over the development period?
- What was the process like? Did you work in a team? If so, how were areas of the project divided amongst the group? What strategies kept everyone on the same page over the length of the project?
- What challenges arose over the course of the project? What strategies did you use to address them?
- Are there any other behind-the-scenes stories that you can share?
- What are you most proud of about the work you did for HRA? How was it received?
- How does the work you did for the HRA fit into the context of your other work? This could be a time where you share other things you've done. It would be cool if viewers came away with both a sense of the HRA-related work you've done and a sense of who you are as an artist.
- What is the effect of different stylistic choices on different audiences?
- What is the effect of AI on the field?
- What are the pros and cons of new publishing models on medical illustrators, particularly, the precarious place of artistic rights/copyright in open-source publications. But also the way that images might be taken from the original context and repurposed.
- What are the ethical/professional issues raised by new technologies (e.g., we employ new tech/methodologies because they're exciting and available, but are there unwanted compromises made in terms of a commitment to accuracy and reality?).

Thank you

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