



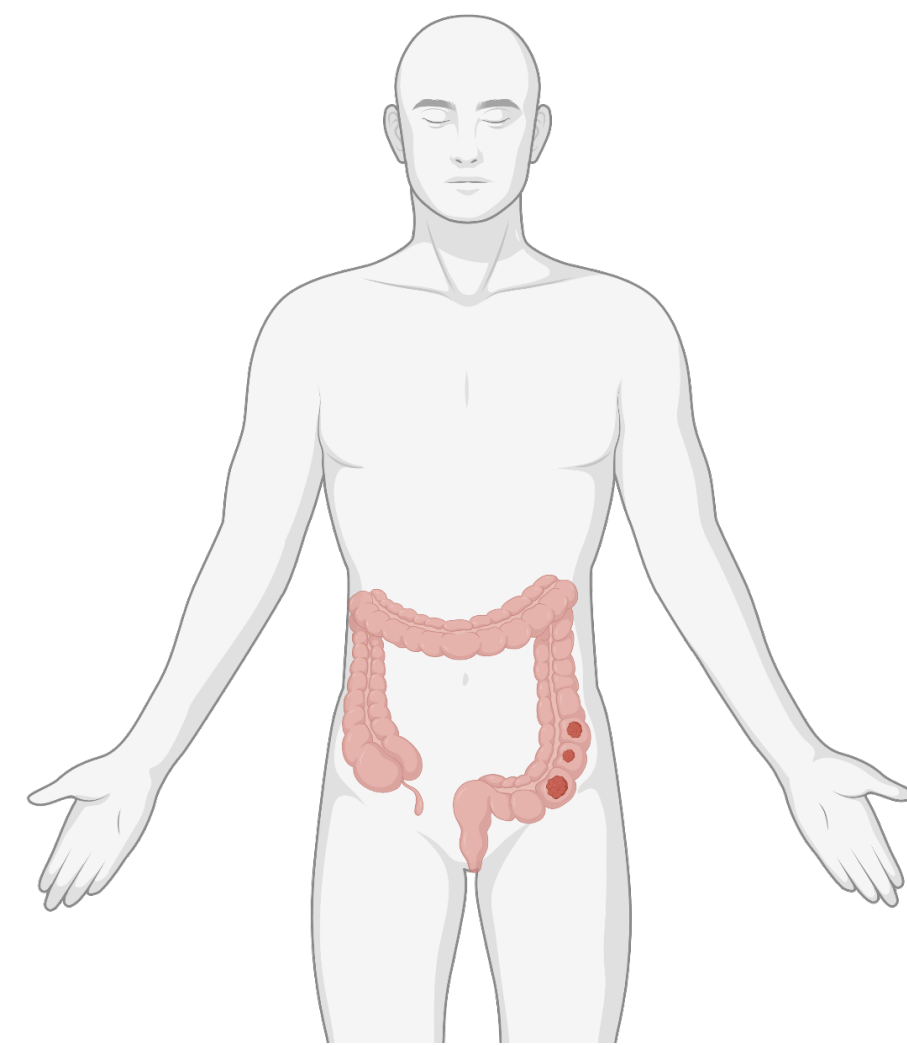
Engineering of Designer Materials to Study Intestinal Cancer

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WHAT ARE INTESTINAL CANCERS

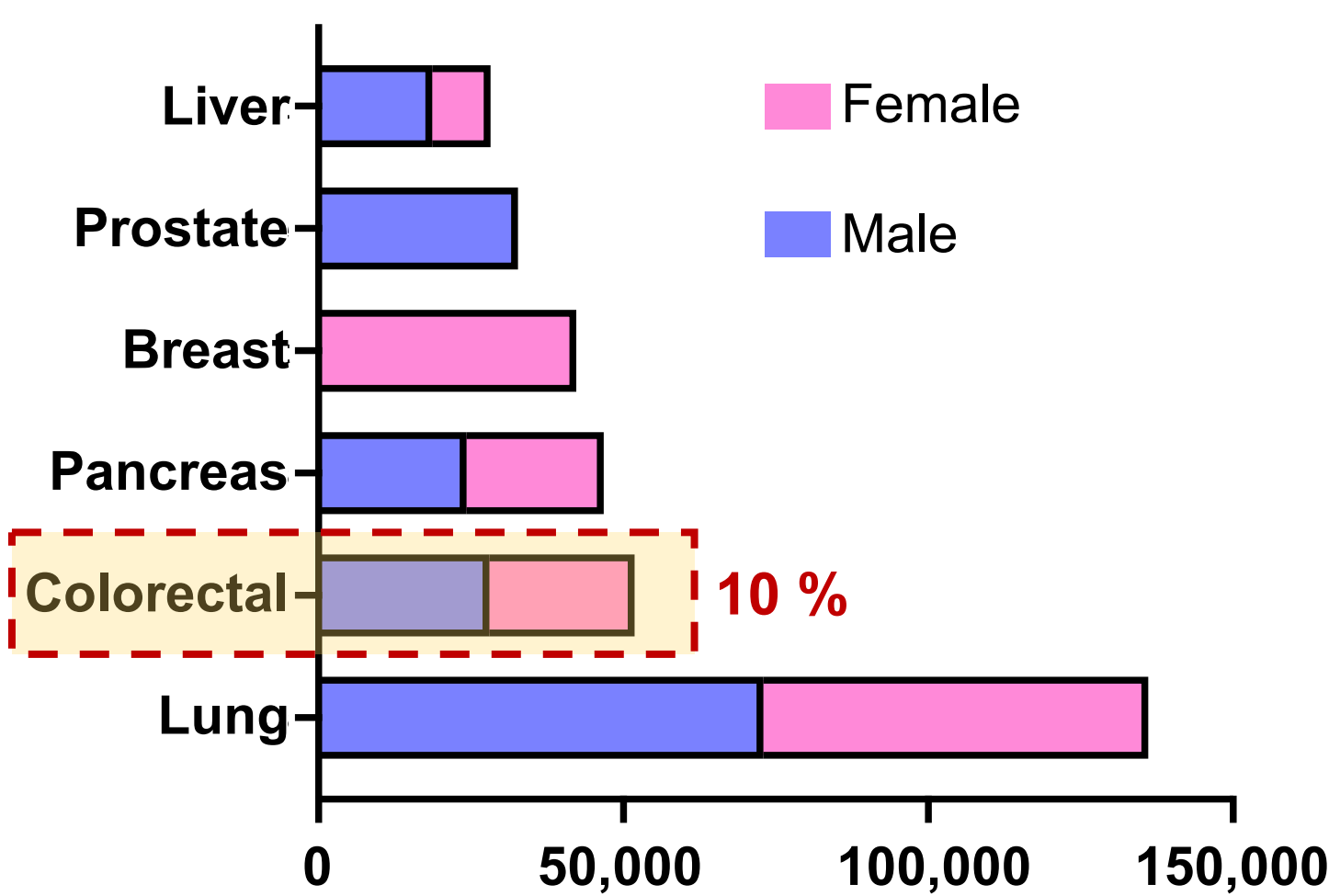


- **Colorectal Cancer** (most common)
- Lymphoma
- Carcinoid tumors
- Melanoma
- Sarcomas

Survival of colorectal cancer patients depend greatly on timely detection of tumor

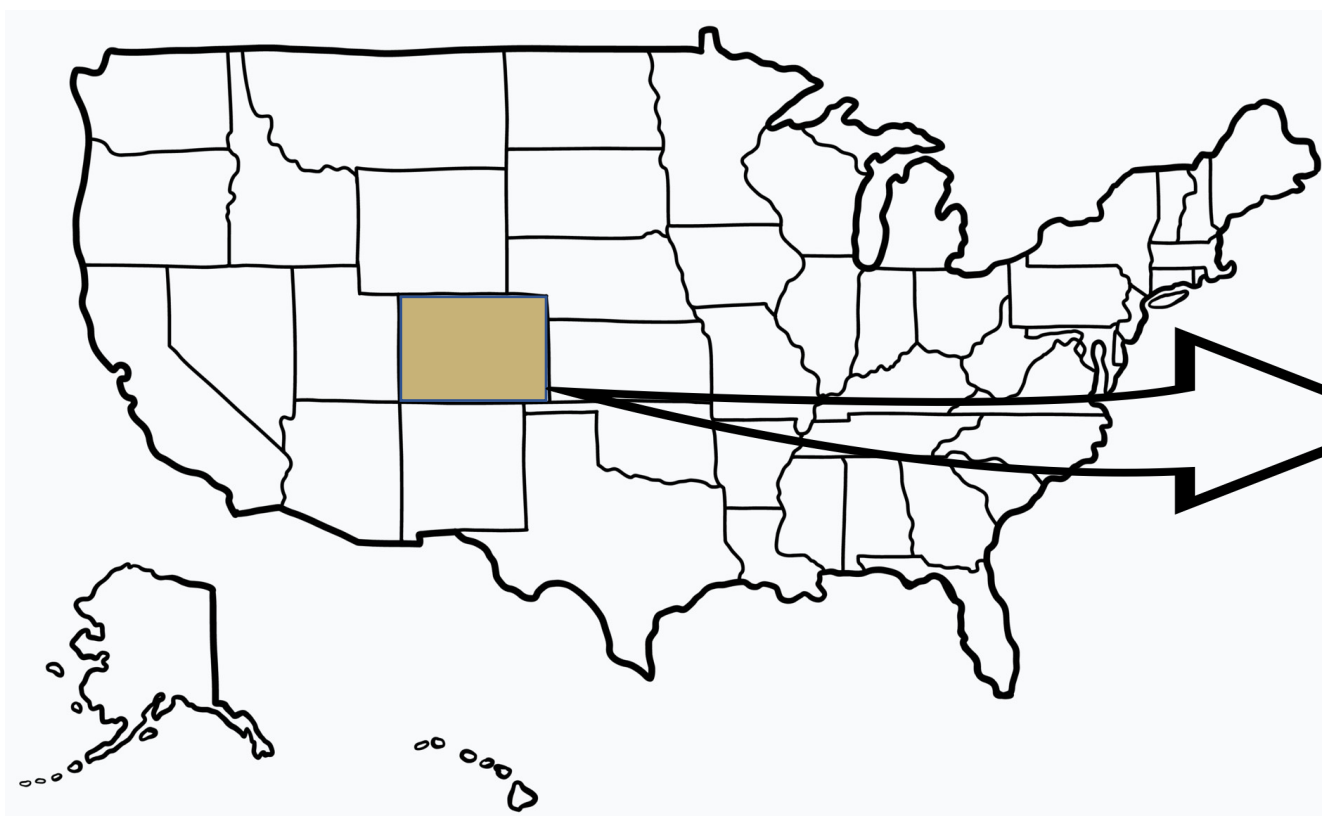
WHY WE CARE

Number of Cancer Deaths in USA in 2020



• **Colorectal Cancer is the 2nd largest cause of cancer related deaths in USA**

• In 2020, 10% of cancer deaths were due to colorectal cancer



Annual Colorectal Cancer cases:

USA – 150,000

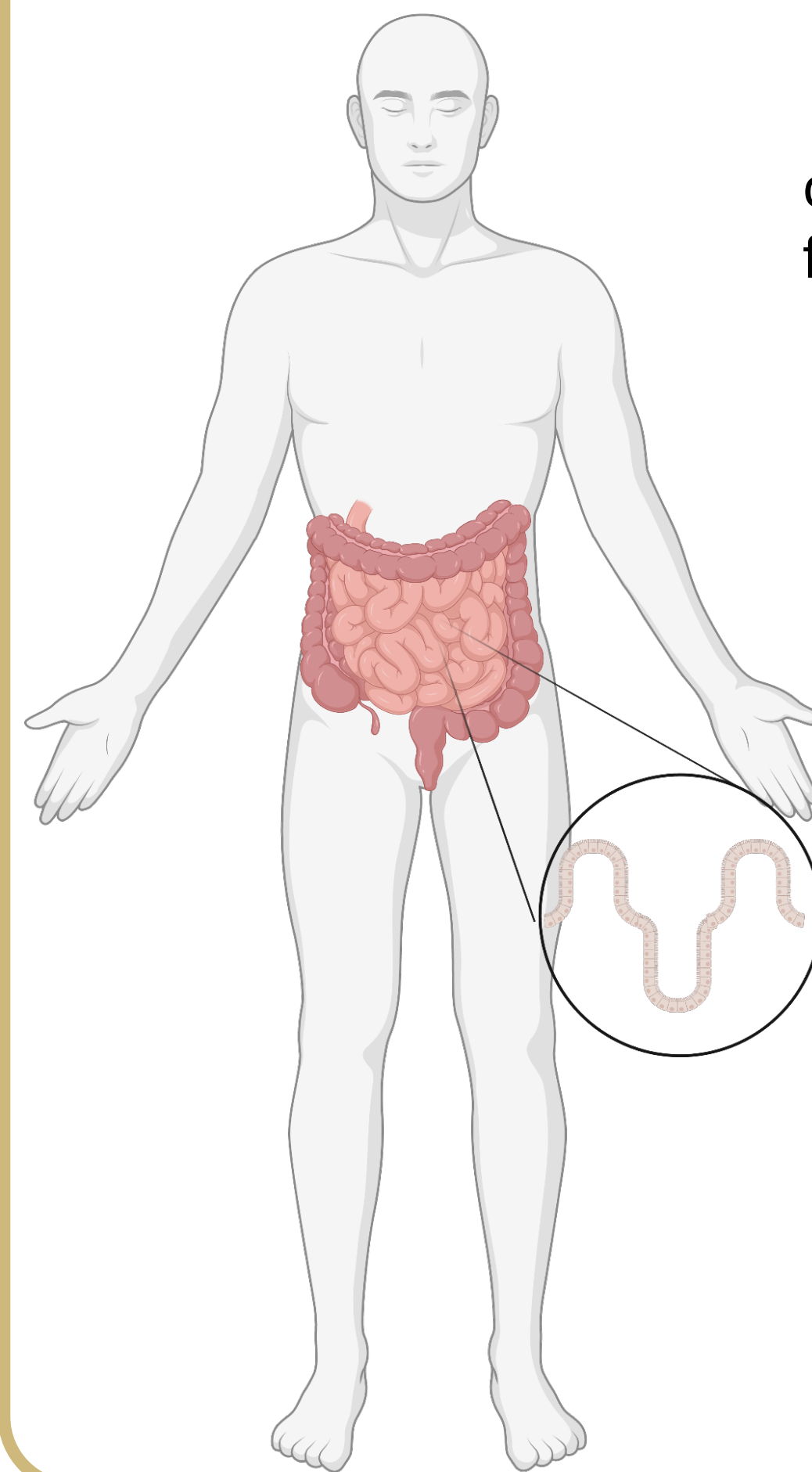
Colorado – 2,100

Need to study intestinal cells in the context of human body

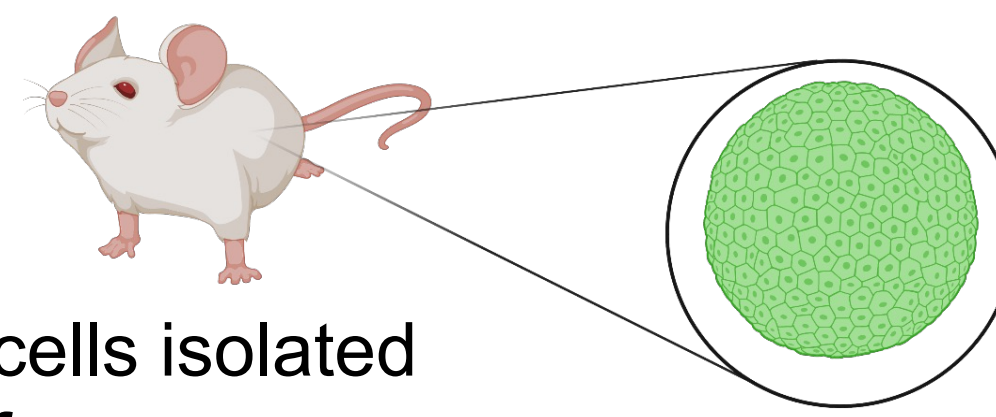


METHODS WE USED

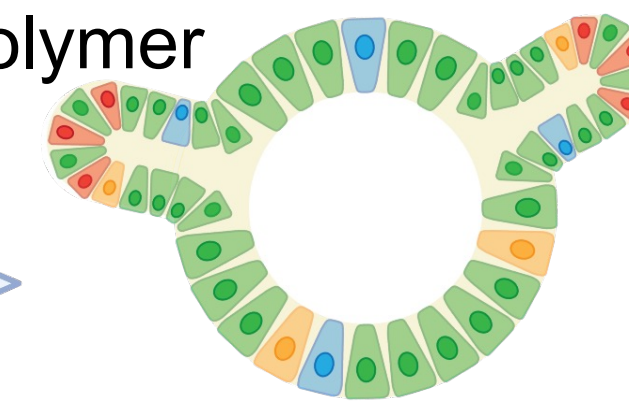
human intestine has complex 3D structure



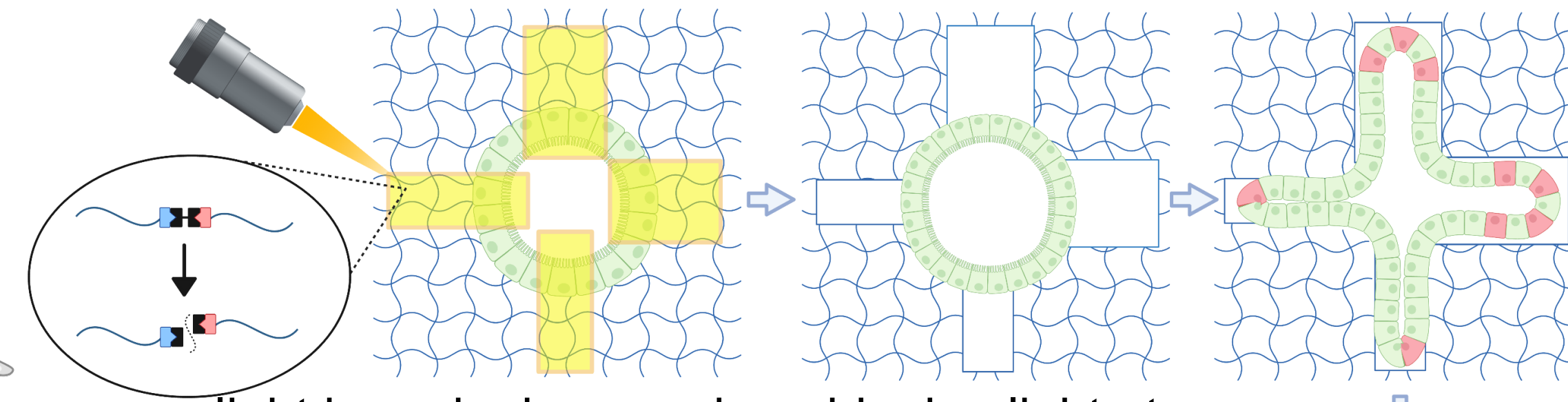
cells isolated from mouse



growth in engineered polymer material

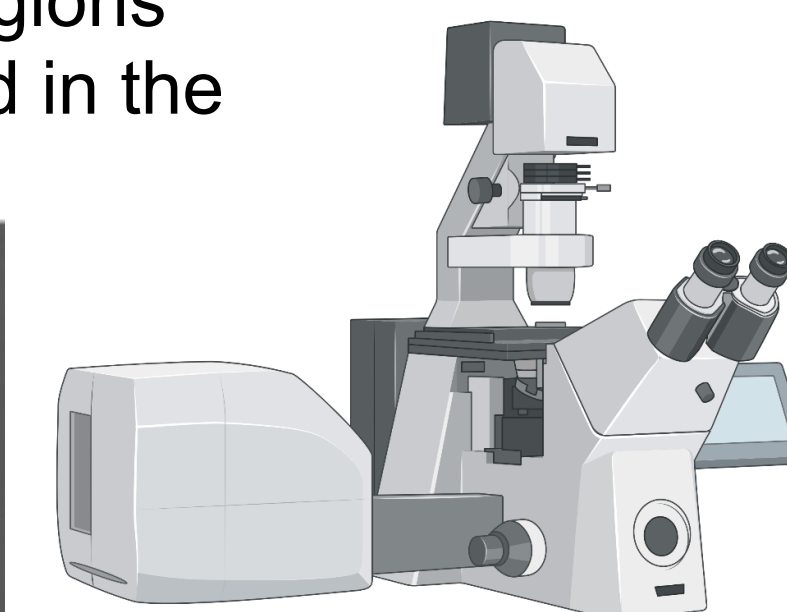
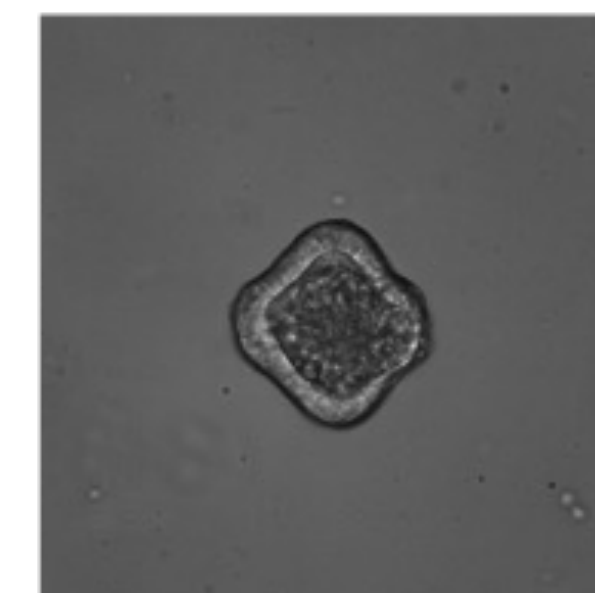
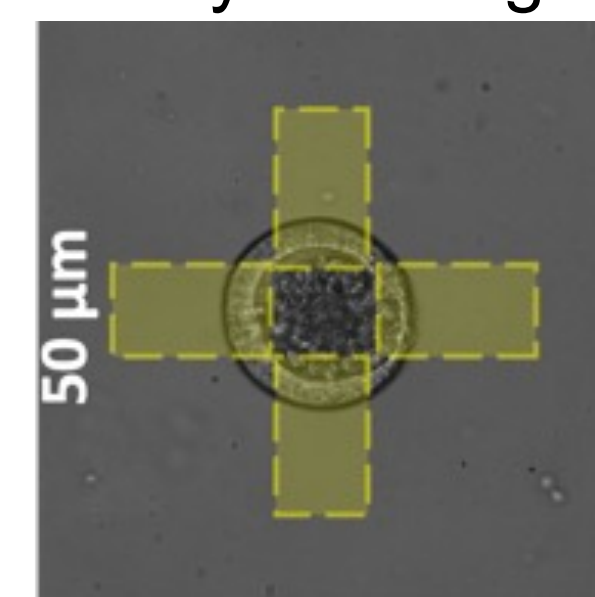


3D cell structure known as **organoids**. Organoids mimic human intestine with different cell types

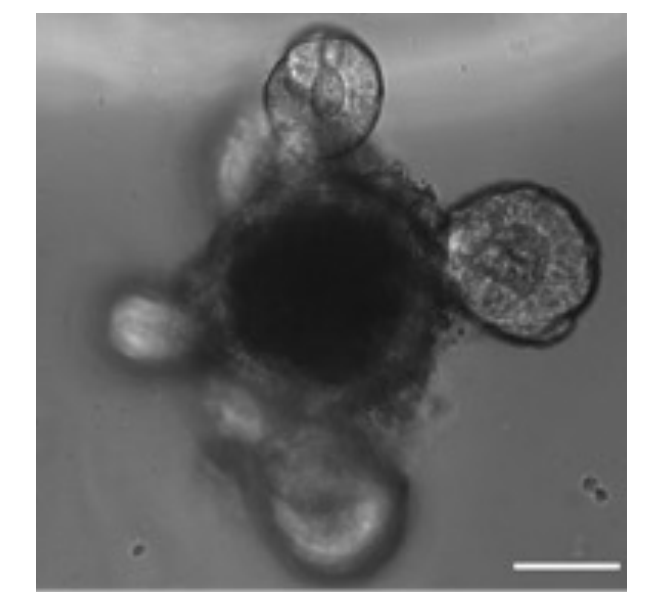


light based microscopic manipulation of engineered polymer in the yellow regions

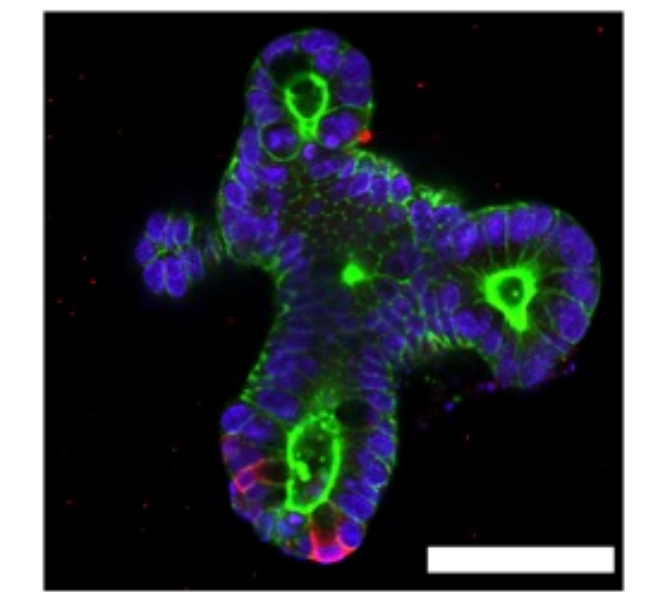
shining light at defined regions create void in the material



scale bars: 50 μ m



cells grow into the void creating well defined organoids



WHAT WE FOUND

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References: 1) F. M. Yavitt *et al.* *Science Advances* (in press).
2) <https://medschool.cuanschutz.edu/colorado-cancer-center>. 3) N. Gjorevski *et al.* *Science* (2022)
4) <https://www.cdc.gov/cancer/dcpc/research/update-on-cancer-deaths/index>.



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