



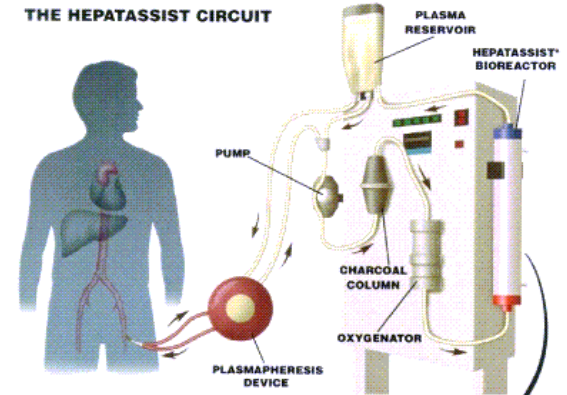
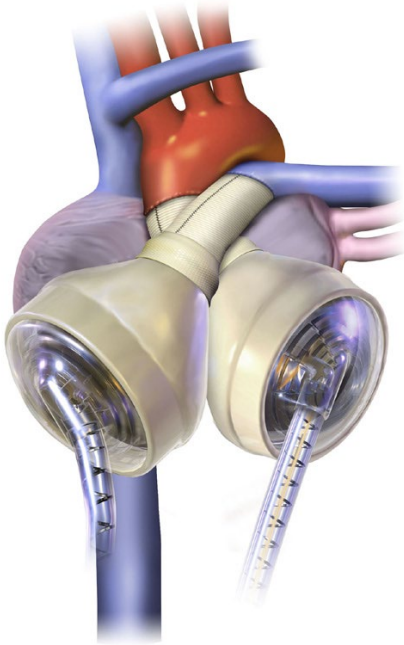
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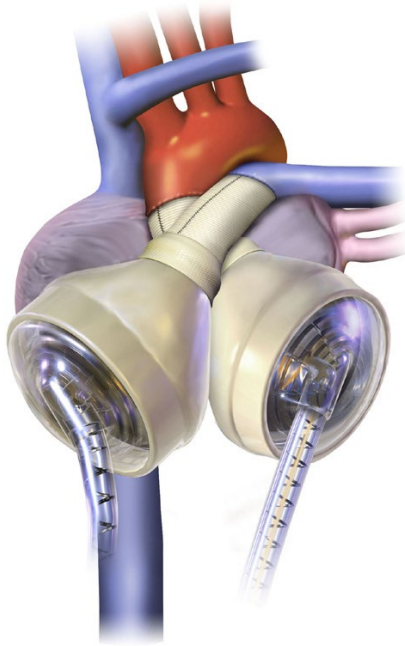
Cell and Tissue Engineering

An Overview of Artificial Organs

Internal artificial organs



Total artificial heart (TAH)

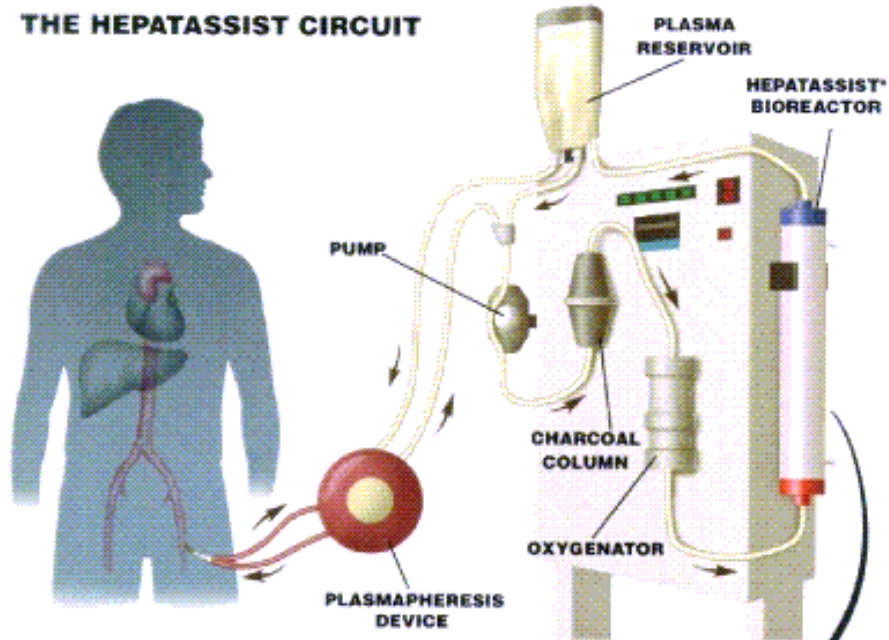


Wearable artificial kidney

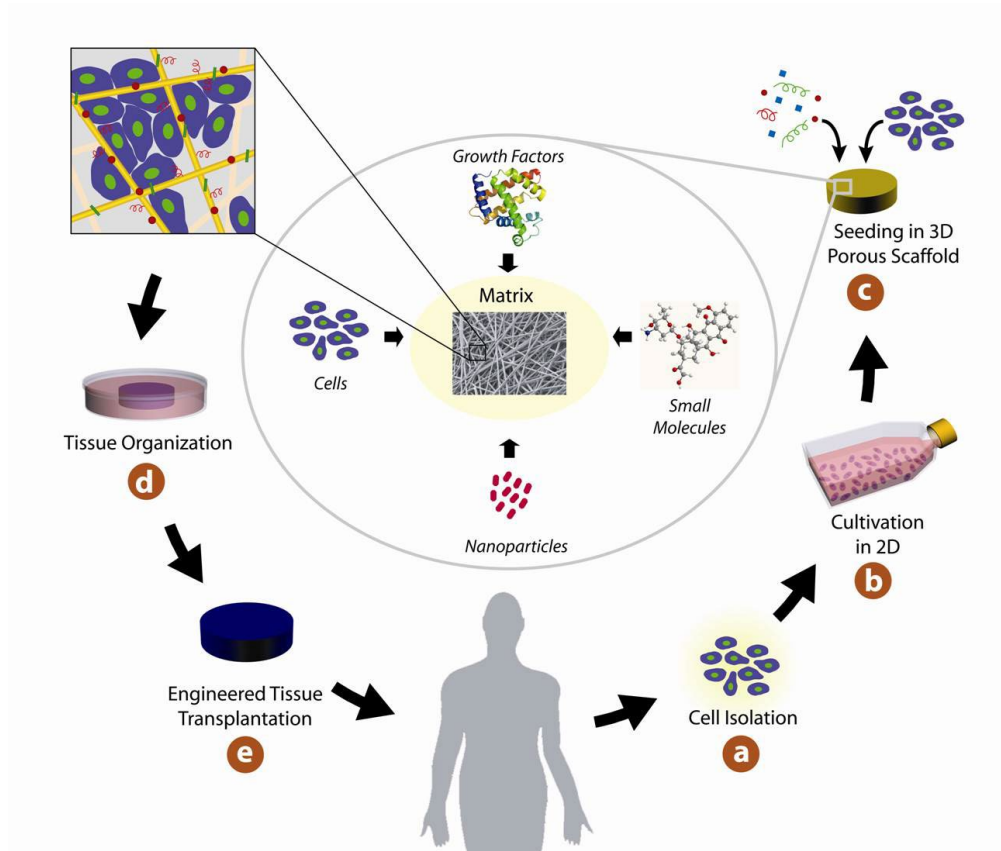


Liver assist device

THE HEPATASSIST CIRCUIT



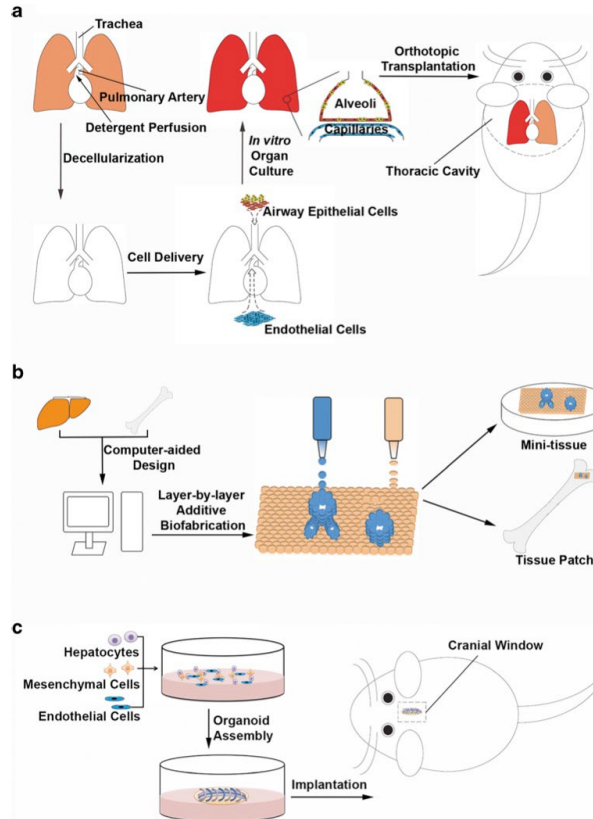
Towards bioartificial organs



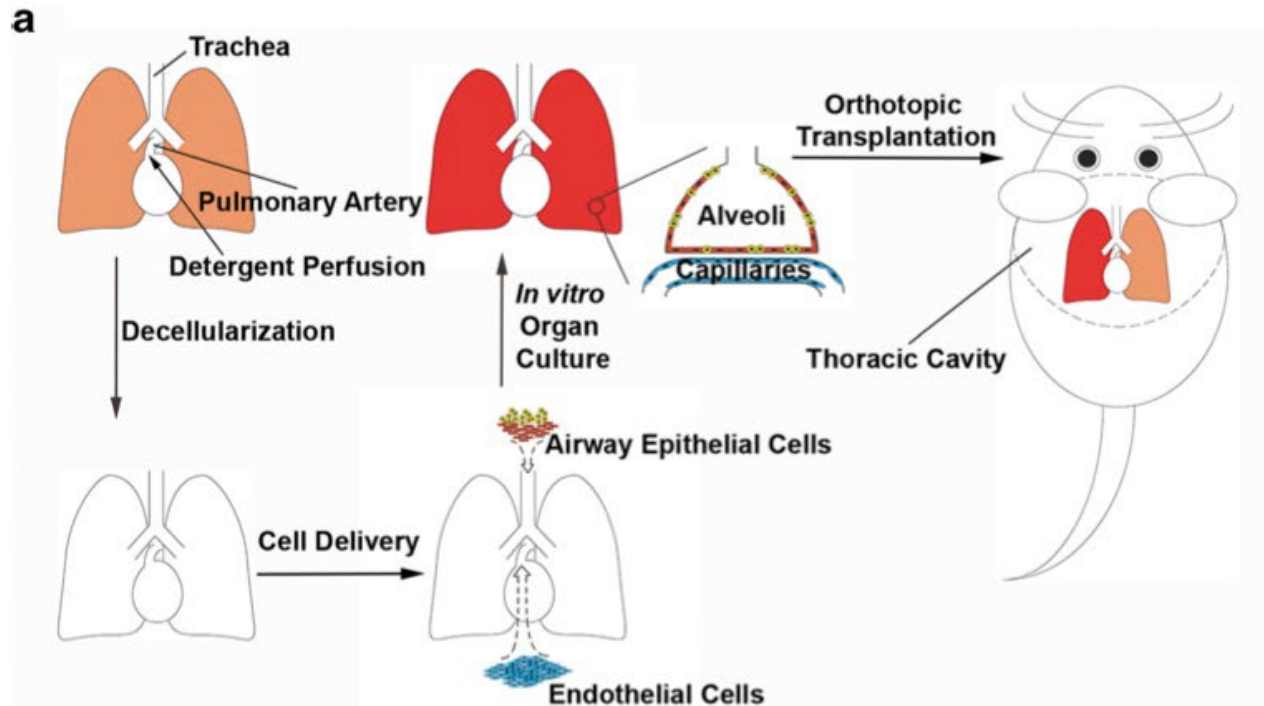
Design considerations

- Cell types
- Cell numbers
- Cell delivery techniques
- Cell-cell interactions
- Cell-matrix interactions
- Tissue formation
- Mature tissue function
- Physiological sustainability
- Surgical implementation

On the road to bioartificial organs



Whole-organ decellularization & recellularization



Bioartificial heart

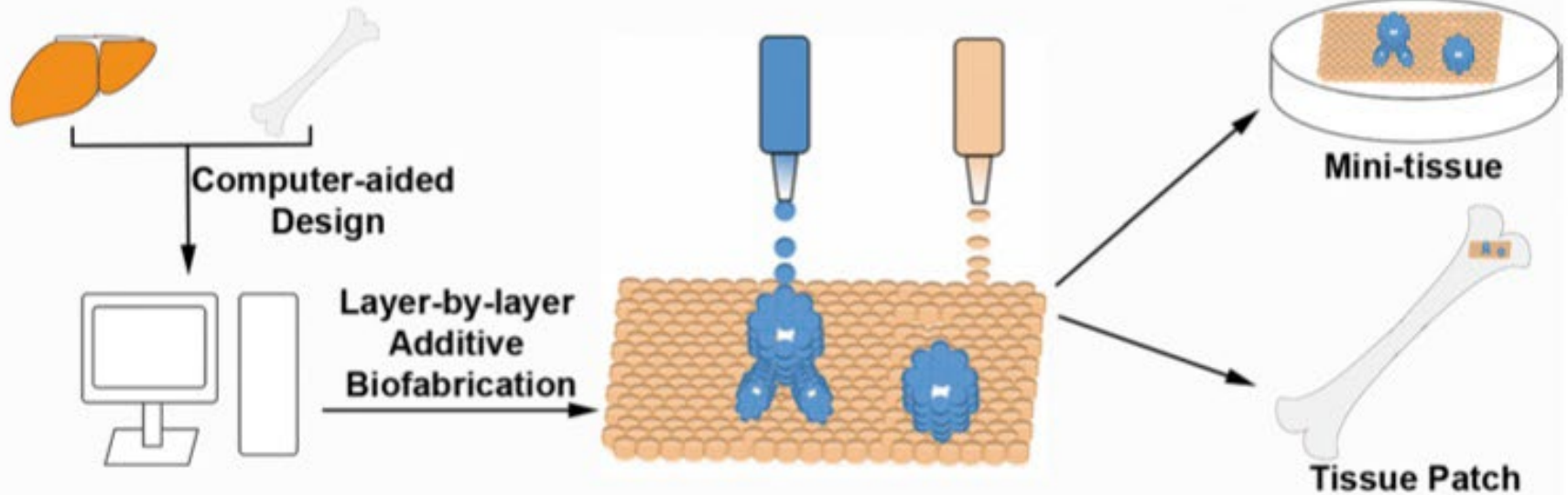


Texas Heart Institute – Dr. Doris Taylor Requirements

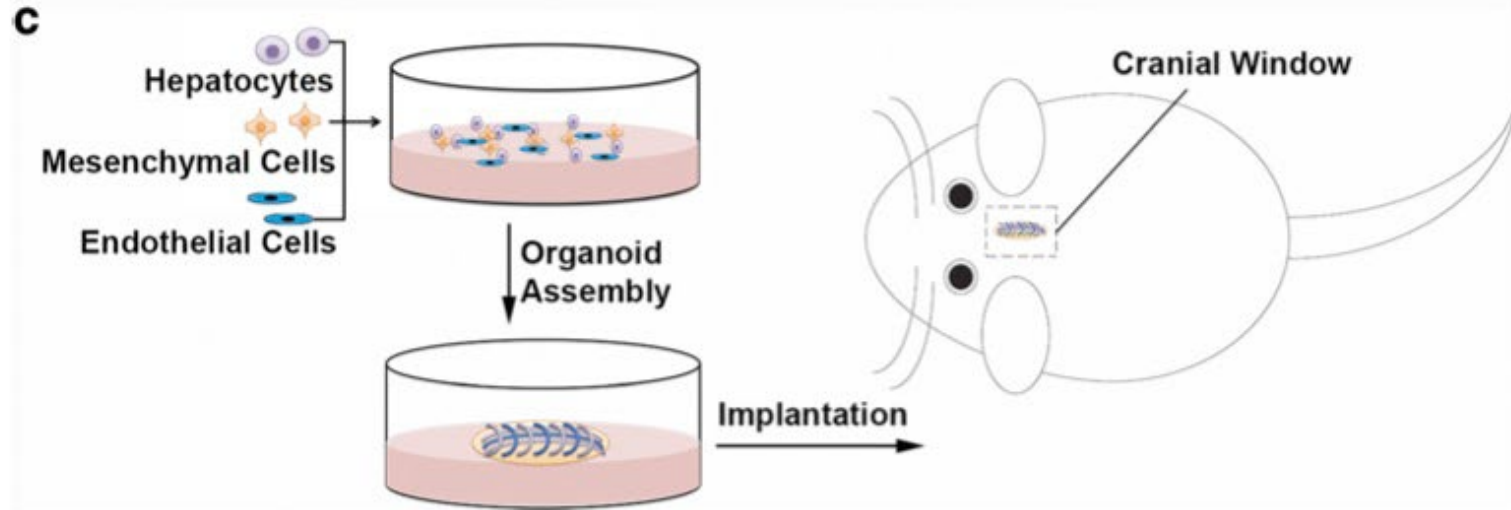
- Perform the organ function
- Sterile
- Able to grow within patient
- Repair/compensate itself if injured

3D-organ printing

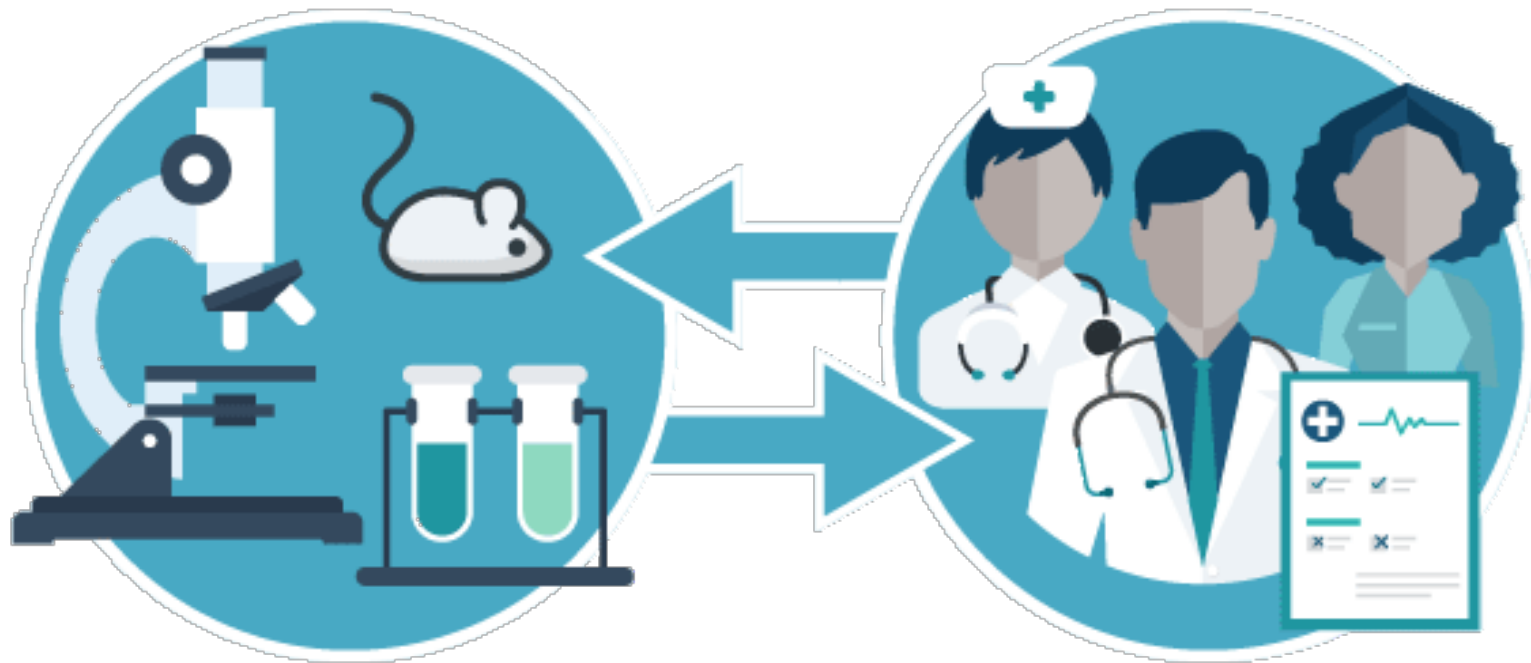
b



Organoid engineering



Beyond the bench





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