

Radiologic Pathologic Correlation in Renal Cell Carcinoma

Date: 2024/02/15

Client: Dr. Meghan Lubner

Advisor: Dr. Tracy Puccinelli

Team:

Ellie Steger (Team Leader)

Erin Schlegel (Communicator)

Emily Wheat (BWIG)

Olivia Jaekle (BPAG)

Aleks Skutnik (BSAC)

Problem statement

The goal of this project is to develop a blade for a tumor resection coring device. The blade should be able to effectively resect a cross-section from an ex-vivo kidney tumor without causing damage to the overall tissue sample. Currently, the resection device used is too blunt and thick to effectively extract tissue without causing surrounding areas to be damaged and un-imageable on CT. By creating a new blade design, the pathologist can preserve the extracted tumor during the coring process. In maintaining the integrity of the tumor, the pathologist will be able to accurately correlate CT image markings and findings with their location in the patient sample.

Brief status update

The team has acquired a new pre-fabricated 10mm circular trephine blade from MicroSurgical technologies that comes along with a silicone blade cap. The team has also outlined what tests will be done throughout the semester and confirmed with advisor.

Difficulties / advice requests

The team would like to get in contact with Sylvana with UW Health to set up a time to talk about our coring tube fabrication feasibility and to get design advice.

Current design

Our current design is our final design from the fall semester, which can be found here: https://bmedesign.engr.wisc.edu/projects/f23/coring_device.

Materials and expenses

Item	Description	Manufacturer	Quantity	Cost
Trephine Blade	AM0570S 100- 10mm d	Miro surgical	1	\$92.71

Major team goals for the next week

1. Finalize coring tube design and meet with Sylvana
2. Finalize testing protocol documents
3. Begin compatibility testing between the blade and the coring device

Next week's individual goals

- Aleks Skutnik
 - Work on preliminary report
 - Continue working on testing protocols, user manuals, safety precaution documents, etc.
- Emily Wheat
 - Draft testing protocols
 - Work on outreach presentation
 - Update website
- Erin Schlegel
 - Meet with Sylvana regarding 3D printing coring device
 - Make changes to the SolidWorks and reprint a compatible device for the pre-fab blade
- Olivia Jaekle
 - Work on preliminary report
 - Work on user manuals, safety precaution documents
 - Meet with Sylvana about 3d printing coring device
- Ellie Steger
 - Consult Sylvana about 3D printing the coring device
 - Finalize solidworks of coring device based on client feedback
 - Look into OSHA standards for recapping a reusable sharp device

Timeline

Task	Feb				March					April				May	
	2	9	16	23	1	8	15	22	29	5	12	19	26	3	10
Project R&D															
Coring Device Prototyping															
Blade Prototyping		X													
Packaging Prototyping															
Compatability Testing															
Final Device Testing															
Testing Analysis															
Deliverables															
Prelim Report															
User Manual															
Maintenance Instructions															
Service Instructions															
Safety Precautions															
Final Poster															
Final Report															
Meetings															
Client		X													
Advisor	X	X	X												
Website															
Update	X	X	X												

Filled boxes = projected timeline
 X = task was worked on or completed

Previous week's goals and accomplishments

- Week 3 Goals:
 - a. Present our preliminary presentation
 - The team presented our presentation to our advisor
 - b. Create testing protocols to compare the purchased circular trephine blade to the blade we fabricated last semester
 - After consultation with our advisor the team has shifted our plans to move forward with the trephine blade with comparison testing
 - c. Create a final solidworks file for the coring device
- Week 2 Goals:
 1. Meet with advisor to discuss preliminary presentation
 2. Practice and present preliminary presentation

- a. The team will present on 2/9
3. Set up payment plan and order premade blades
 - a. The team ordered the blades
- Week 1 Goals:
 1. Set up the team notebook, meet with client,
 - a. The team was able to successfully create a Lab Archives notebook and meet with our client.