

Radiologic Pathologic Correlation in Renal Cell Carcinoma

Date: 2024/02/29

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 completed and sent out a first draft of our journal article. The team has decided to submit our article to the BMC Medical Research Methodologies Journal. The team has completed a final prototype of the coring device that will be used for testing at UW Health on Friday 1/1.

Difficulties / advice requests

The team has had trouble 3d. printing the coring tube this week.

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
Coring Tube	Biomed clear resin	Makerspace	1	\$11.50
Coring Tube	Biomed clear resin	Makerspace	1	\$12.75
Coring Tube	Biomed clear resin	Makerspace	1	\$8.95
Coring Tube	Biomed clear resin	Makerspace	1	\$11.04

Major team goals for the next week

1. Our goal is to complete testing with Dr. Lubner at UW Health
2. The team also needs to finalize and standardize our prototype
3. The team will also document all of our results from testing

Next week's individual goals

- Aleks Skutnik
 - Complete testing with the client
 - Complete tissue damage testing
 - Prepare materials for outreach and practice run-through with team
- Emily Wheat
 - Complete testing with the client
 - Complete tissue damage testing
 - Prepare materials for outreach and do a practice run-through with the team
- Erin Schlegel
 - Complete testing with the client
 - Edit any changes needed to the report
 - Finalize tube files for client
- Olivia Jaekle
 - Complete testing with client
 - Complete tissue damage test
 - Prep materials for outreach and do a run through
 - Run analysis on testing with client
- Ellie Steger
 - Complete testing with client
 - Verify that the prototype is finalized and make any necessary adjustments

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		X	X	X											
Blade Prototyping		X													
Packaging Prototyping															
Compatability Testing															
Final Device Testing															
Testing Analysis															
Deliverables															
Prelim Report				X											
User Manual															
Maintenance Instructions															
Service Instructions															
Safety Precautions															
Final Poster															
Final Report															
Meetings															
Client		X		X											
Advisor	X	X	X	X											
Website															
Update	X	X	X	X											

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

Previous week's goals and accomplishments

- Week 5 Goals:
 - a. One goal is to verify that the adjustments to the coring tubes's printing setup are effective.
 - Our final iteration is currently printing
 - b. Another goal we have is to verify that we will be submitting to Medical Devices: Evidence and Research and format our prelim report accordingly.
 - We have decided to switch our Journal to BMC Medical Research Methodologies
 - c. Lastly, our team will complete the preliminary report with user manual, service manual and safety hazard outlines attached.
- Week 4 Goals:
 - a. Finalize coring tube design and meet with Sylvana

- Met with Sylvana and established new printing criteria
 - b. Finalize testing protocol documents
 - c. Begin compatibility testing between the blade and the coring device
 - The new coring device will be ready for testing for next week
- 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.