

# Radiologic Pathologic Correlation in Renal Cell Carcinoma

**Date:** 2024/04/01

**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 a final prototype and is awaiting testing with the client. A new final prototype has been printed for testing with the client. The team has also begun creating a draft executive summary.

## Difficulties / advice requests

The team has had trouble with scheduling testing with multiple busy physicians.

## 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](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. Submit executive summary
2. Complete final prototype testing with client
3. Analyze results from client testing

## Next week's individual goals

- Aleks Skutnik
  - Finalize the executive summary
  - Complete testing on kidneys with the client and her team
- Emily Wheat
  - Finalize and submit executive summary
  - Complete further testing with Dr. Lubner
  - Update website
- Erin Schlegel
  - Coordinate and attend final testing
  - Help reprint tube
  - Finish Executive summary draft
- Olivia Jaekle
  - Revise and edit executive summary draft
  - Finish overview essay for outreach
- Ellie Steger
  - Ensure the success of the final prototype print
  - Finalize and submit executive summary

## Timeline

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

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

## Previous week's goals and accomplishments

- Week 8 Goals:
  - a. Test our finalized coring tube on Pig kidneys
    - Scheduled for next week
  - b. Document and analyze testing results
  - c. Experiment with UV Curing
- Week 7 Goals:
  - a. Have a finalized print of the coring tubes with slits
    - Done

- b. Test our finalized coring tube on Pig kidneys
    - Will complete testing Friday 3/15
  - c. Document and analyze testing results
- Week 6 Goals:
  - a. Our goal is to complete testing with Dr. Lubner at UW Health
    - Our testing proved successful
  - b. The team also needs to finalize and standardize our prototype
    - The final iteration of our tube is currently printing
  - c. The team will also document all of our results from testing
- 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.

