Phyllodes Tumor Research (PHYTR) Laboratory

Greetings from the PHYTR Lab!

As we move into the second half of the year, there is much to celebrate across the PHYTR Lab. Our research collaborations continue to expand, bringing together talented investigators from across Duke University and other institutions who share our commitment to advancing the understanding and treatment of phyllodes tumors and related rare breast sarcomas. We are especially grateful for the growing network of partners, patients, advocates, and supporters who make this work possible! We continue to be so grateful for your engagement and support.

This season also marks an exciting milestone as we begin reviewing the first data emerging from our collaborative U01 award with Memorial Sloan Kettering Cancer Center and Brigham and Women's Hospital (now Mass General Brigham). These early findings represent years of planning, coordination, and specimen collection, and we are super excited about some work being submitted this fall. These data will continue our understanding of this disease biology and identify new avenues for treatment.

In addition to these developments, our team has several new projects underway, recent accomplishments to share, and updates on ongoing studies. We hope you enjoy reading about the progress being made and thank you for your continued support of our mission.

Lastly, a special congratulations to several members of our PHYTR team. Dr. Elle Reason recently graduated from Duke Medical School and we are delighted will be staying at Duke to begin her surgical residency. Megan Z was awarded the Dr. Ralph Randal Bollinger Scholarship in recognition of her work in rare tumors. We also extend our congratulations to Dr. Tim Rengers on his recent engagement!

Warmly,



Laura Rosenberger, MD
on behalf of the PHYTR Lab

In this newsletter:

Lab Updates

Looking ahead

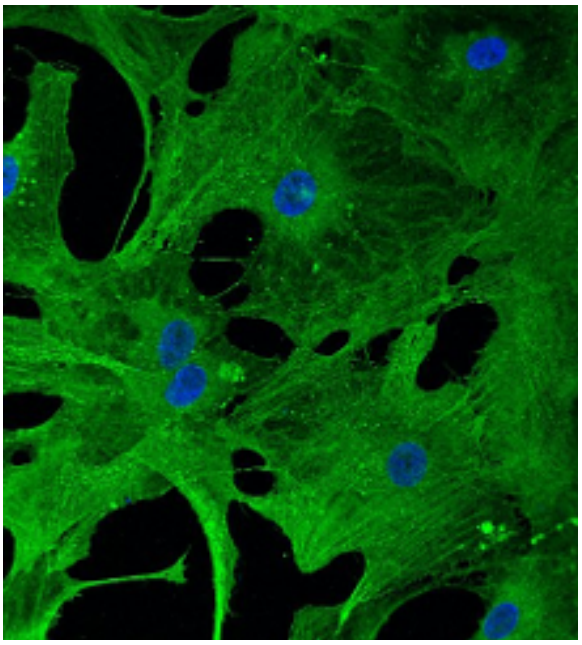
Staying Connected

PHYTR Lab Updates

From Tumor to Lab: Developing Patient-Derived Cell Lines

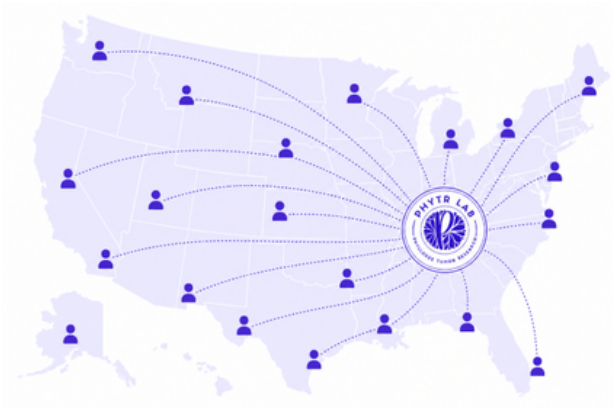
After a phyllodes tumor is surgically removed, the tumor tissue is typically discarded. Instead, our team has been using these specimens to develop patient-derived phyllodes tumor cell lines, creating valuable laboratory models for future research. Remarkably, malignant phyllodes tumor cells were able to grow indefinitely in culture without any genetic manipulation, establishing what we believe are bona fide patient-derived cell lines. Their ability to thrive in the relatively inhospitable environment of a laboratory dish further highlights the aggressive biology of these tumors.

To determine how faithfully these cell lines represent the original tumors, we performed whole exome sequencing on matched normal tissue, primary tumors, and derived cell lines from five patients. These analyses demonstrated strong genomic concordance and identified recurrent alterations in the telomerase (TERT) promoter in four of five cases. Ongoing work will focus on understanding how these alterations contribute to tumor development and whether they may represent future therapeutic targets.



Pictured to the right: immunofluorescent microscopy image showing a cell line derived from a malignant phyllodes tumor brain metastasis. Telomerase stained green, nuclei stained blue.

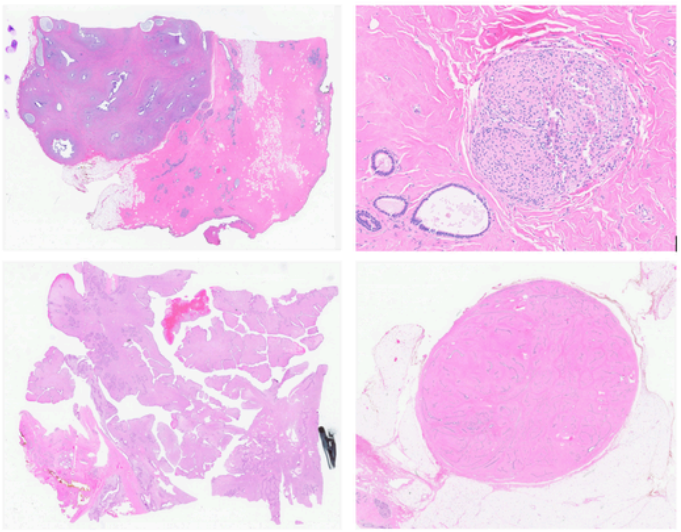
Prospective Rare Tumor Registry Surpasses 200 Patients



Since launching our prospective registry study in 2020, we have enrolled more than 200 patients with phyllodes tumors. Designed to capture high-quality clinical, surgical, and pathologic data, the registry provides a unique opportunity to better understand treatment decisions, surveillance practices, recurrence patterns, and long-term outcomes. This growing resource will help answer important questions about the optimal management of phyllodes tumors and guide future research efforts. We are deeply grateful to the patients from across the country who have generously contributed their data to this study. If you are one of those patients reading this: thank you for helping advance care for future patients.

The Hidden Extensions of Phyllodes Tumors

While surgical management is indicated for all phyllodes tumors, the debate continues on just how extensive the surgery should be. Last year, we published a case report describing a patient with a well-circumscribed, borderline phyllodes tumor who had a narrow negative margin at their initial surgery (Reason *et al*, 2025). Surprisingly, their second surgery revealed a distinct satellite phyllodes lesion at the site of the previously negative margin. We've since found that this was not an isolated occurrence. We're diving deeper with pathologist Dr. Gina Sotolongo to examine 9 additional cases of satellite phyllodes tumors that exist outside of the main tumor. These patients' cases show us that early recurrences may be due to silent satellites, and that wide negative margins should still be the goal of surgical treatment for phyllodes tumors.





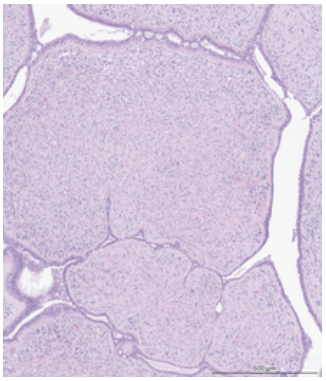
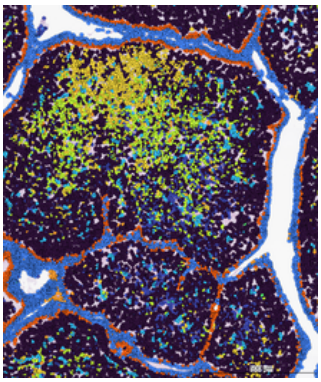
Top left: initial excision
Top right: satellite lesion
Left: Dr. Gina Sotolongo, collaborator in the Department of Pathology

Uniting Experts to Advance Treatment for Malignant Phyllodes

Our team recently completed a comprehensive scoping review evaluating the role of systemic therapy in malignant phyllodes tumors. After screening more than 4,000 published studies, we identified and synthesized the available evidence regarding chemotherapy and other systemic treatments in both localized and metastatic disease. This effort brought together collaborators from 12 institutions across the United States and internationally, reflecting a shared commitment to advancing research in this rare disease. The manuscript is currently under review at *Cancer Treatment Reviews*. This work highlights important gaps in knowledge while providing a foundation for future clinical trial development and evidence-based treatment recommendations for patients with malignant phyllodes tumors.

Spatial Sequencing to Visualize Gene Usage in Phyllodes Tumors

The lack of targeted molecular therapeutics for phyllodes tumors stems partly from poor understanding of the molecular and cellular characteristics of these rare tumors. To address this challenge, our team is utilizing spatial sequencing technology, which enables us to visualize gene activity at the level of individual cells while preserving their location within the tumor. By combining information about what genes are active with where cells are positioned in the tissue, we hope to identify mechanisms important to tumor development that may be targetable with currently available or novel therapeutics.


Left: traditional pathology image
Middle: sequencing map showing location and identity of cells within the tumor
Right: Adam Miltner, Ph.D., collaborator in the Snyder lab

PHYTR Trial: Using ctDNA to Predict Metastatic Progression

Building on our prior work demonstrating that circulating tumor DNA (ctDNA) is a reliable marker of metastatic disease, we have designed the PHYTR Trial, a prospective multi-center study evaluating ctDNA as a predictor of future metastatic progression. This study has the potential to improve how we identify and monitor patients at highest risk for recurrence. **Philanthropic support plays a critical role in helping move innovative rare tumor research from promising findings to practice-changing studies.**

Lab Fun!

Our team recently enjoyed some great bonding doing an escape room in Durham, NC. We had a blast, and successfully escaped!

Pictured from left to right: (top row) Laura Rosenberger, Tim Rengers, Elle Reason, Sabrina Collias, (bottom row) Michael Aiduk, Megan Zhao, Beth Bronson



Looking ahead...

Linking Tumor Biology to Patient Outcomes

Using data generated through our multi-institutional genomic profiling study, our team is investigating how tumo genomic alterations and malignant heterologous elements influence outcomes in patients with malignant phyllodes tumors. By integrating molecular data with clinical outcomes, we hope to better understand the biologic factors that contribute to disease progression and identify features that may help guide future risk stratification and treatment strategies. This work represents an important step toward a more personalized approach to caring for patients with these rare tumors.



Stay Connected!

- Website: https://surgery.duke.edu/divisions/surgical-oncology/research/research-laboratories/phyllodes-tumor-research-phytr
- Twitter/X: @RosenbergerMD

Donations

Scan the QR code below if you would like to make a charitable gift to the PHYTR Lab!
For more info using retirement accounts, charitable gift annuities or other giving vehicles, please contact Catherine Cross at catherine.cross@duke.edu or 919-385-1585.

Thank you for reading, and have a great summer!

