GRADUATE PROGRAM IN CANCER BIOLOGY
CANCER BIOLOGY DIRECTORY

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Steering Committee

Name                   Department
Elizabeth Lawlor, M.D., Ph.D.   Pediatrics and Pathology
Michael Imperiale, PhD.   Microbiology & Immunology
Colin Duckett, Ph.D.   Pathology and Internal Medicine
Gary Hammer, M.D., Ph.D.   Molecular & Integrative Physiology, Internal Medicine
Eric Fearon, M.D., Ph.D.   Internal Medicine, Human Genetics, and Pathology
Diane Robins, Ph.D.   Human Genetics

Student Representatives
Jillian Boden (krookma@umich.edu)   Vivian Cheung Lab
Julian Bahr (jcbahr@umich.edu)   Steven Weiss Lab
Introduction

The Cancer Biology Program is an interdisciplinary Ph.D. granting program at the University of Michigan that offers academic and research training in the field of cancer biology. Formal classroom instruction in cancer biology and related fields will be combined with intensive mentoring by program faculty to provide the students with the intellectual and technical skills required for their careers. The Cancer Biology Program spans many disciplines, including cell biology, genetics, biochemistry, microbiology, pharmacology, pathology, epidemiology, bioinformatics, and immunology, to name a few. The Cancer Biology Program represents a unique set of training and educational activities that, taken collectively, are distinct from anything currently offered in the existing doctoral programs at University of Michigan and that expose the student to the full breadth of cancer biology while allowing immersion in a dissertation topic of the student’s choice. Students in this program are expected to perform and publish research of high quality and of scientific and biomedical relevance.

This handbook provides the information necessary for students to complete the requirements for a Ph.D. degree in the Cancer Biology Program.

Steering Committee

The Steering Committee is advisory to the Director and is responsible for determining and overseeing program policy. Additionally, it also advises students and reviews each student’s progress annually, addresses student concerns, approves thesis committee selections, and resolves issues concerning the Program’s curriculum.

Academic Mentoring

During the first year of study, academic mentoring will be provided by the Cancer Biology Director as needed for information about Cancer Biology and coursework. Once a mentor and a dissertation committee are chosen, they will assume the bulk of the responsibility for continued mentoring and career planning. The Director and Steering Committee will remain available to all students to provide additional advice throughout the course of their graduate studies.
TIMETABLE

A provisional timetable for completion of the program is provided, although each student will be guided through the program individually.

<table>
<thead>
<tr>
<th>Milestone</th>
<th>To be completed by</th>
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<tbody>
<tr>
<td><strong>PRE-CANDIDATE:</strong></td>
<td></td>
</tr>
<tr>
<td>Lab rotations (2 mandatory; additional possible)</td>
<td>August 31 of year 1 (within PIBS)</td>
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<tr>
<td>Choice of Ph.D. Program</td>
<td>End of year 1 in PIBS (usually by June 1)</td>
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| All course work | End of year 2
**COMMENT:** Journal Club/Research Student Seminar (Cancer Bio 800) is taken for credit in Fall and Winter semesters of years 1 and 2. After year 2, attendance is required every semester. |
| Selection of thesis advisor (mentor) | By the end of year 1 for most students, with occasional exceptions |
| Preliminary Exam, oral and written, after which candidacy is achieved | End of Year 2 |
| **CANDIDATE:** | |
| Completion of degree requirements | Expected to be 5 years from time of matriculation into PIBS |
Course Selection and Grades

The Rackham Graduate School requires students to complete a minimum of 18 credits of graded coursework in order to achieve candidacy including the grade of S – Satisfactory. Courses elected as visit (audit) do not meet this requirement, nor do any doctoral courses (those designated as 990, etc.).

All coursework for the Cancer Biology Program must be passed with a cumulative minimum GPA of B (3.00 on a 4.00 point scale).

The requirements described below are based on the structures of both the Rackham Graduate School and PIBS.

Cancer Biology Program Requirements

The program requires all of the following courses:

Cancer Biology 553: Molecular Biology of Cancer  
(Fall semester; 3 credits)

Cancer Biology 554: Cancer Pathogenesis and Treatment  
(Winter semester; 3 credits)

Cancer Biology 800: Cancer Biology Journal Club  
(Fall and Winter semesters; 1 credit each, taken during the 1st & 2nd year)

Bioinformatics 525: Foundations in Bioinformatics and Systems Biology (or an equivalent course)  
(Winter semester, 3 credits)

Training in Ethical Issues in Science

On entering the Graduate Program through PIBS, students are issued copies of the Rackham Graduate School “Student Handbook” and the University of Michigan Medical School “Guidelines for Responsible Conduct of Research.” The former addresses the standards of student behavior expected of all members of the graduate community. The latter discusses in depth the responsibilities of a Ph.D. mentor, appropriate methods of data collection and analysis, guidelines for manuscript authorship and issues pertaining to relationships between industry and academic institutions. During the first year, graduate students attend an 8 session seminar series in Ethics in Research prepared and presented as part of PIBS 503.
**Elective Coursework**

Cancer Biology students may take additional elective credits to reach 18 credits required by Rackham. It is recommended that the elective courses be selected to complement the student’s research interests and include relevant PIBS core courses to fill in any gaps in the student’s undergraduate education. Courses and the offered times do change frequently; students are to check the PIBS Curriculum Guide for the most updated listing and should consult the Program Director.

The program strongly recommends the following course be taken in the second year, before the prelim exam:

Pharmacology 502: Introduction to Scientific Communication

**Typical Cancer Biology Student Curriculum**

**Cancer Biology Graduate Program Course Requirements:**
In addition to the above courses, the Cancer Biology graduate program also requires all of the following courses:

1: CancBio 553: Molecular Biology of Cancer (Fall semester; 3 credits)
2: CancBio 554: Cancer Pathogenesis and Treatment (Winter semester; 3 credits)
3. CancBio 800: Cancer Biology Student Seminar (Fall and Winter semesters of Year 1 and 2; 1 credit each)
4. Bioinf 525: Foundations in Bioinformatics & Systems Biology (Winter semester; 3 credits)

**Year One:**

**Fall Semester**

- PIBS 503 (1 credit)
- PIBS 600 (lab rotation) (1-8 credits)
- PIBS 800 (1 credit)
- *Human Genetics 541 (3 credits)
- Cancer Biology 553 (3 credits)
- Cancer Biology 800 (1 credit)

* Only if student feels weak in that area and wants to remediate in order to prepare for prelims.

**Total credits: minimum of 9**

**Year One:**

**Winter Semester**

- Cancer Biology 554 (3 credits)
- Bioinformatics 525 (3 credits)
- Cancer Biology 800 (1 credit)
- PIBS 600 (lab rotation) (1-8 credits)
- PIBS 800 (1 credit)

**Total credits: minimum of 9**
Year Two:
*Fall Semester*
- Cancer Biology 800 (1 credit)
- Elective courses (variable for each student)
- Cancer Bio 599 (1-8 credits)
**Total credits: minimum of 9**

*Winter Semester*
- Cancer Biology 800 (1 credit)
- Pharmacology 502 (2 credits)
- Cancer Bio 995 (1-8 credits)
**Total credits: maximum of 8**

Students are required to take Cancer Biology 800 during the fall and winter terms of Year 1 and Year 2. However, they must participate and attend each term and present once an academic term until they successfully defend. Please note that Cancer Biology students must register for their mentor’s section of Cancer Biology 995 (candidate) each Fall and Winter term until they successfully defend.

**Requirements of the Cancer Biology Program**

1. A minimum of 18 credit hours in graduate-level course work (*course numbers designated 500 and above), excluding 800, with no grades of “B-” or below. Courses must be re-taken if a grade of B- or lower is obtained.

2. At least two laboratory research rotations.

3. Successful completion of the preliminary examination.

4. Successful completion of a research project and defense of a thesis.

5. At least one first authored peer-reviewed research manuscript in press.
Grades

Students whose cumulative grade point average falls below a “B” will be placed on academic probation by Rackham for the subsequent term. The student must then consult with the Cancer Biology Program Director. Two consecutive terms of probation will result in a review by the Steering Committee, and may result in loss of monetary support and/or a request for the student’s withdrawal from the graduate program.

COURSE REQUIREMENTS FOR MSTP STUDENTS

MSTP students come into the Program with 18 credits toward their Ph.D. Once in the Program, the following courses are required:

- Cancer Biology 553: Molecular Biology of Cancer (Fall semester; 3 credits)
- Cancer Biology 554: Cancer Pathogenesis and Treatment (Winter semester; 3 credits)
- Cancer Biology 800: Cancer Biology Journal Club (Fall and Winter semesters; 1 credit each, taken during the 1st & 2nd year)
- Bioinformatics 525: Foundations in Bioinformatics and Systems Biology (Winter semester, 3 credits)

Transfer Students

Graduate students who wish to transfer to the Cancer Biology Program from other Departments/Programs within the University’s Horace Rackham School for Graduate Studies should first contact the Cancer Biology Program Director, who will then bring up the matter with the Steering Committee. The Program Director will also request that the student’s academic file be provided for review. If the transfer is approved, the student will be responsible for completing all Cancer Biology Program requirements, as detailed in the Program’s Handbook.

Cancer Biology Seminar Series

The Cancer Biology Seminar Series, held during the Fall and Winter terms, include formal presentations by Cancer Biology Program students, faculty members as well as invited guest speakers from outside the University. The following external speakers are scheduled for the 2015-2016 academic year:

- David Langenau, PhD on 9/9/15 (Harvard), Alan Meeker, PhD (Hopkins) on 9/16/15, John Byrd, MD (Ohio State) on 10/28/15, Benjamin Berman, PhD (USC) on 11/4/15, William Schiemann, PhD (Case Western) on 11/11/15, Michelle Monje, MD, PhD (Stanford) on 12/16/15, Cigall Kadoch, PhD (Harvard) on 1/13/16, and Alison McBride, PhD (NIH) on 5/11/16. Cancer Biology students are expected to attend these Wednesday 4 pm seminars, as well as to participate in selected luncheons with speakers throughout the academic year.
Cancer Biology Annual Retreat

In the fall, the Cancer Biology Program sponsors an on-campus retreat, which highlights selected research within the Program. The retreat program features a keynote speaker, a poster session/reception, short talks presented by Program faculty, students and postdocs highlighting the diverse and excellent research in the Cancer Biology program, a panel discussion, as well as meals. All members of the Cancer Biology Program are invited to submit abstracts of their research. The Steering Committee makes the decision as to who is selected to present at the retreat.

Keynote speakers:
2016 - Elaine Fuchs, PhD (Rockefeller)
2015 - Peter Jones, Ph.D., D.Sc. (Van Andel Research Institute)
        Davide Ruggero, Ph.D. (UCSF)
2014 – Scott W. Lowe, Ph.D. (Memorial Sloan Kettering Cancer Center)
2013 - Gabriele Bergers, Ph.D. (UCSF)

Cancer Biology Training Grant

Second year graduate students are eligible for funding from a NCI Training Grant, “Cancer Biology Training Grant,” now in its 22nd year. (Project Director Dr. Elizabeth Lawlor).

Research Rotations

For complete information on rotations please see the PIBS Faculty Rotation Availability Site. All students are required to complete two rotations, in the fall and winter terms. Students that are matriculating in July, prior to the start of the academic term are required to do a minimum of three. Rotations are normally either a full semester or a half semester and 1-4 graded credits (PIBS 600) are earned depending on the length. Students are encouraged to contact faculty members early to discuss rotation possibilities.

Thesis Advisor

Upon completion of the research rotations required by PIBS, the student will choose a mentor who is a member of the Cancer Biology Program faculty to guide the student’s dissertation research. This usually occurs at the end of the first year of graduate school. The mentor must be a member of the instructional track. If the mentor is not on the instructional track, a Cancer Biology Program faculty from the instructional track will be chosen to serve as co-chair of the dissertation committee.

Any student training in the lab of a newly appointed junior faculty member must identify a co-mentor for their dissertation research. Junior faculty will be governed by this policy until they have successfully trained a student in any of the PIBS programs.
The responsibilities of the thesis mentor are to train, mentor and advise the student in biomedical research, prepare the student for a career in science, and set a professional example by maintaining the highest scientific and ethical standards.

**Advancement to Candidacy: The Preliminary Exam**

In addition to coursework, students must successfully pass a preliminary examination to advance to candidacy for the doctoral degree. The exam is taken during the end of the fall or winter term of the 2nd year. The exam is formatted to ensure that we are truly testing the skills that are required to become an independent, critical thinker. The preliminary exam consists of two parts.

**Part One**

The student will prepare a “Commentary” or "News & Views" type document of roughly 750 words on an assigned paper recently published in the cancer research field. In the piece, the student will prepare an introduction to the paper and particularly the major topic/topics covered in the paper in question, so that others not intimately familiar with the specifics of the paper can understand the necessary background for the work and will have a big picture sense of the field from reading this portion of your "News & Views" piece. The student will then critically comment on how the studies and findings in the paper have advanced knowledge in the specific research field in question and the cancer research field generally, emphasizing the major new conclusions and impact of the paper. Finally, in the last third of the piece, the student will discuss some potential new directions and experimental studies that would be likely and promising avenues to extend the findings and conclusions offered in the paper in question. The student’s written document will be submitted one week in advance of Component #2 of the Preliminary Examination (the oral presentation). The document will be critically evaluated by the members of their prelim exam committee.

**Part Two**

The student will have a 120 min oral examination focusing on the paper in question and their News and Views piece. They should prepare a well-focused PowerPoint presentation that provides an overview of the topic and assigned paper and the written piece submitted. Much of the examination will include in-depth questions from the review team about their general knowledge of the topic and the studies and data in the research paper in question, and especially their research plan, including the relevant experimental approaches and the likely results and potential pitfalls of their plans to extend on the published work.

Additional information about the submitted piece is as follows:

1) The main text of the "News & Views" Piece should be roughly 750 words and should be no more than 1000 words.
2) Students should provide a short title for their "News & Views" piece that might be expected to capture interest in the piece.
3) The document should have fewer than or equal to 20 references cited. The reference list is NOT included in the word count.
4) The style and reference format should be similar to that in Cell or Cancer Cell.
5) Students should generate one or two new schematic figure for their piece, along with a figure legend explaining the schematic figure(s). The figure/figures should capture the main findings and conclusions in the research paper as well as highlight the future plans/work that are proposed to pursue. The figure(s) and figure legend(s) are not included in the word length.
6) Students are specifically requested NOT to seek any in-depth assistance from others, including other students or faculty members, in the writing of their piece or the preparation of their PowerPoint presentation.

In closing, students need to write an ORIGINAL piece and should emphasize future research directions and unanswered questions in the last one-third of the written piece. The approaches and data in the published paper and future research plans and unanswered questions should also be front-and-center as the students think about preparing for the oral defense of their piece.

Students will find many examples of commentary, perspective, news-and-views type pieces in Cell, Cancer Cell, Science, and Nature that they can review and perhaps “model” their piece on.

**Selection of Dissertation Committee and Research Topic**

The Dissertation Committee provides critical advice to the student during the course of the training process. The thesis advisor will chair the committee and the membership of the committee will follow the guidelines of the Rackham Graduate School. Both the dissertation topic and the composition of the committee are determined by the student in consultation with the thesis advisor, and must be approved by the Steering Committee and the Rackham Graduate School. The student must be sure to provide a brief description of their proposed project as well as their reasoning for the selection of each committee member (e.g. faculty member has expertise on topic). The committee must include at least four members, three of whom are tenure or tenure-track members of the University of Michigan. At least three of the members must hold appointments in Cancer Biology. One member must be a cognate, i.e., from outside the Cancer Biology Program. The student is expected to meet with the committee at least once a year, with the first meeting occurring no later than six months after advancement to candidacy. The committee chair will prepare a report after each meeting, which will be submitted to the Steering Committee for review. The Rackham website should be consulted for detailed information pertaining to the Ph.D. dissertation and other information regarding graduate training.

Students should be sure to email their committee a copy of the data they'll be presenting at least three working days in advance of the committee meeting. Not at their first committee meeting, but in subsequent meetings, they should also include in the email to their committee a brief self-assessment of the progress they've made since the last meeting. Students and their mentors are responsible for ensuring that their Ph.D. progress report is completed, signed by the student and each member of their committee, and returned to the Student Services Representative within 7 days after the meeting.

**Dissertation Defense**

Each student must write and successfully defend a dissertation. In addition, the student must have at least one publication published or in press in a recognized peer-reviewed journal prior to the defense date.
Teaching

While the program has no formal requirements for teaching, students are encouraged to seek out opportunities to act as teaching assistants of Graduate Student Instructors. The PIBS office can facilitate this process.

Master’s Degree Policy

The Cancer Biology Program is a doctoral program. As such, it is fully expected that all students will successfully complete all the requirements for the Ph.D. The Steering Committee has determined that, if a student decides to withdraw from the Program prior to completing these requirements, it will only consider awarding a Master’s degree if the withdrawal is due to extenuating or exceptional circumstances, and the student has made significant progress towards the PhD. The latter includes having completed all course requirements with a “B” or better average, advanced to candidacy, and demonstrated research accomplishments as evidenced by authorship on a publication (which has at least been submitted) in a peer-reviewed journal. Each student’s petition will be decided on an individual basis and must also have the approval of the thesis mentor and dissertation committee.

Vacation Policy

The Cancer Biology Program adheres to the vacation policy set forth by PIBS. Students are entitled to time off during vacation periods, such as University-designed holidays, winter and spring breaks, and may request time off during the summer. Students must discuss proposed vacation periods with their mentors well ahead of time. Any further vacation time should have the additional approval of the Cancer Biology Program Director, and it may be granted without financial support. Since progress towards completion of dissertation studies is normally directly related to the amount of time devoted to work in the lab, it is highly recommended that students enrolled in classes take advantage of time off from classwork to make progress in the laboratory.

Student Financial Aid

All students in good standing will be provided with a monthly stipend, comprehensive health care coverage, and coverage of tuition and fees. For the first year, PIBS will cover all expenses. In year two, the student may be supported by a combination of individual fellowships, pre-doctoral training grant funds, institutional funds and research grants. Once a mentor has been selected and the student has passed the preliminary examination at the end of year 2, funding will be provided by the mentor’s laboratory unless training grant support or other fellowships are available. Cancer Biology faculty members who accept Cancer Biology students must complete and submit the Financial Commitment Form listing the source(s) of funding (including the grant number) that will support that student in the years that the graduate student is a member of their lab.

Should the mentor not be able to meet the financial responsibility for any Cancer Biology student in his or her lab, the financial obligation for the student falls on the mentor’s primary department. The chair of the mentor’s primary department must sign and date the letter of financial responsibility before a Cancer Biology student is formally accepted in a mentor’s lab.
Student Employment Outside the Program

The faculty of the Cancer Biology Program believes that Ph.D. training is a full-time endeavor. Outside employment subtracts from the time and mental energy a student can devote to his or her research. In addition, it is an NIH policy that students who are supported by a federal training grant may not be employed outside their training program. For this reason, students are forbidden to engage in outside employment.

RESPONSIBILITIES OF STUDENTS FOR THEIR PROGRESS THROUGH THE PROGRAM

In addition to fulfilling the above requirements of the Cancer Biology Program, students are responsible for:

1. Ensuring that the preliminary written proposal and oral exam are completed in a timely fashion.

2. Ensuring that the thesis advisor and dissertation committee are chosen in a timely fashion and according to the guidelines of the program. The first committee meeting must be held within 6 months of achieving candidacy.

3. Scheduling thesis committee meetings at least once a year and submitting progress reports following each committee meeting.

4. Making timely progress toward completion of the Ph.D. and giving careful and timely consideration to further career goals (post-docs, jobs, etc.).

5. Ensuring that Rackham requirements for the dissertation, defense and graduation are met.

6. Actively participating in the weekly Journal Club/Research Seminar Series, Annual Program Retreat, the PIBS annual recruitment weekends.

7. Serving as a student representative for the Cancer Biology Program.

RESPONSIBILITIES OF CANCER BIOLOGY FACULTY

1. Serving on committees as asked, particularly on preliminary examination committees, and on dissertation committees.

2. Should a faculty member lose their funding or for any reason is unable to support their student, the student’s financial support will be the responsibility of the faculty member’s primary department.

3. Monitoring and assuring timely progress through the Cancer Biology Program of students in their laboratories. Should the mentor, for any reason, leave the University or be unable to continue to serve as a student’s mentor, it is the responsibility of the mentor to resolve and document the following issues for Immunology students in the lab:
   
   A. What experimental aims must be completed to finish the student’s thesis, and what is the anticipated time frame for completion of these studies?
   
   B. How frequently will the student’s Committee meet?
   
   C. What will be the source of the student’s individual financial support, and how will the student’s research be supported?
   
   D. In which lab will the student’s research be performed?

4. Submitting required reports in a timely fashion (rotation evaluations, thesis progress evaluations).
5. Ensuring timely scheduling of the organization of dissertation committees for their trainees, and scheduling of thesis committee meetings and dissertation defenses.

6. Active participation in the weekly Journal Club/Research Seminar Series (each faculty member is alphabetically assigned to give a verbal critique to one trainee after their presentation) a minimum of two times per academic year, the Annual Program Retreat, the PIBS annual recruitment weekends, PIBS 503.

7. Serving as a faculty representative for the Cancer Biology Program.

8. Taking on needed roles in administering the Program.
Useful Online Resources

Rackham Resources for Students
- Graduate Student Handbook Policies and Procedures
  http://www.rackham.umich.edu/policies/academic_policies/


- Gradtools - Rackham (www.gradtools.umich.edu)
  This is a special set of on-line tools in the CTools environment to help Rackham doctoral students as they work toward their degrees. Included is a Dissertation Checklist. Students are encouraged to make use of this helpful resource.

Academic Resources
PIBS Curriculum Guide
  http://www.med.umich.edu/pibs/current/index.html

Center for Research on Learning and Teaching
  http://www.crlt.umich.edu/index.php

Disability Resources
  http://www.umich.edu/Disability/
  http://ssd.umich.edu/

Dissertation Resources
  http://www.rackham.umich.edu/dissertation_information/
  http://www.gradtools.umich.edu/

Diversity at Michigan
Association of Multicultural Scientists at U-M
  http://www.umich.edu/~amsweb/AMS/Home.html

Students of Color of Rackham
  http://www.umich.edu/~scorweb/about.html

Funding Resources
Rackham Funding
  https://secure.rackham.umich.edu/Fellowships/support/list.php
  http://www.rackham.umich.edu/funding/
  http://www.med.umich.edu/pibs/prospective/fund/index.html

NIH F31 Fellowships

American Cancer Society
  http://www.cancer.org/Research/ResearchProgramsFunding/index

Scientific Grants and Funding
  http://sciencecareers.sciencemag.org/funding

National Science Foundation
  http://www.nsf.gov/index.jsp
APPENDIX A: CANCER BIOLOGY PROGRAM FACULTY/STUDENT DIRECTORY

CANCER BIOLOGY GRADUATE PROGRAM
2015-2016

For a more detailed list of the research interests of Cancer Biology faculty members, please visit the Cancer Biology Faculty webpage.

PROGRAM DIRECTOR:

Elizabeth R. Lawlor M.D., Ph.D.
Russell G. Adderley Professor of Pediatric Oncology
Associate Professor, Departments of Pediatrics and Pathology
elawlor@umich.edu
Research interests:
Pediatric cancer biology with a focus on Ewing sarcoma and stem cell pathway deregulation.

ASSOCIATE DIRECTOR:

Colin S. Duckett, Ph.D.
Director of Program Development, North Campus Research Complex
Co-Director, Cancer Cell Biology Program, Comprehensive Cancer Center
Associate Director, Cancer Biology Graduate Program
Professor, Departments of Pathology and Internal Medicine
colind@umich.edu
Research interests:
Research is focused on the role of IAP proteins in cancer, with emphasis on the potential of IAP antagonists as therapeutic agents.

FACULTY:

Kate Barald, Ph.D.
Professor of Cell & Developmental Biology
Professor of Biomedical Engineering
Director, Michigan NIH PREP Program
kfbarald@umich.edu
Research interests:
Development of new multifaceted hormone-based therapeutics to reduce tumour burden in neurofibromatosis 1 (NF1) and other hormone-responsive cancers.
David Beer, Ph.D.
John and Carla Klein Professor of Thoracic Surgery
dgbeer@umich.edu
Research interests:
My laboratory is exploring the mechanism by which Wnt signaling regulates target gene expression, using Drosophila as a model system

Kenneth Cadigan, Ph.D.
Professor of Molecular, Cellular, and Developmental Biology
cadigan@umich.edu
Research interests:
My laboratory is exploring the mechanism by which Wnt signaling regulates target gene expression, using Drosophila as a model system.

Christine E. Canman, Ph.D.
Associate Professor of Pharmacology
ccanman@umich.edu
Research interests:
We are investigating how specialized DNA polymerases are regulated by the Fanconi anemia pathway and influence the therapeutic response of cells treated with ionizing radiation or DNA crosslinking agents.

John M. Carethers, M.D.
John G. Searle Professor and Chair, Dept. of Internal Medicine
jcarether@umich.edu
Research interests:
Dr. Carethers’ laboratory studies the development and progression of colorectal neoplasms, using bench to bedside approaches in his translational laboratory. The laboratory focuses on familial and sporadic colorectal cancer, in particular, the consequences of defective DNA mismatch repair (MMR).

Thomas E. Carey, PhD
Professor of Pharmacology and Otolaryngology/Head & Neck Surgery
Co-Director-Head & Neck Oncology Program
careyte@umich.edu
Research interests:
My research interests are the mechanisms of cancer progression and resistance to treatment in head and neck cancer and the role of high-risk Human papilloma viruses in cancers of the oropharynx, nasopharynx, oral cavity, larynx and nasal sinuses.
**Christin Carter-Su, Ph.D.**
Anita H. Payne Distinguished University Professor of Physiology
Henry Sewall Collegiate Professor of Physiology
Professor, Molecular and Integrative Physiology/Internal Medicine
Associate Director of the Michigan Diabetes Research Center
Department of Molecular and Integrative Physiology
cartersu@umich.edu
Research interests:
Obesity; neuronal differentiation and function; signal transduction by receptor tyrosine kinases; JAK-Stat signaling in growth, cancer and metabolism; growth hormone signaling and cellular function; tyrosine kinase adapter proteins; diabetes; cell motility

**Maria Castro, Ph.D.**
Richard Schneider Collegiate Professor of Neurosurgery and Professor of Cell and Developmental Biology
maricas@umich.edu
Research interests:
Cancer biology and therapeutics: epigenetics, cancer metabolism, signaling networks that mediate cancer progression. Uncovering the role of secreted cancer ligands in hematopoietic stem cells' development, anti-tumor immunity, and nanotechnologies to develop novel anti-cancer therapy.

**Mark Y. Chiang, M.D., Ph.D.**
Assistant Professor of Internal Medicine, Hematology/Oncology
markchia@umich.edu
Research interests:
Our lab is committed to defining the molecular signals that drive induction and maintenance of childhood leukemia. We study strategies to selectively target the oncogenic functions of Notch signaling as opposed to its physiological and tumor suppressor functions.

**Arul Chinnaiyan, M.D., Ph.D.**
Director, Michigan Center for Translational Pathology
S.P. Hicks Endowed Professor of Pathology
Investigator, Howard Hughes Medical Institute
American Cancer Society Research Professor
arul@umich.edu
Research interests:
Functional genomic, proteomic and bioinformatics approaches to study cancer and understand cancer biology as well as to discover clinical biomarkers.
Mark Day, Ph.D.
Professor of Urology
mday@umich.edu
Research interests:
Our research is focused on prostate and bladder epithelial adhesion and survival and the influence of the microenvironment on these processes and on tumorigenesis in these organs.

Zora Djuric, Ph.D.
Research Professor
Departments of Family Medicine and Environmental Health Sciences (Nutrition Program)
zoralong@umich.edu
Research interests:
Dr. Djuric's lab is currently evaluating the relationships between diet composition, obesity and cancer prevention. This research uses biomarkers of cancer risk as an endpoint in clinical trials.

Xing Fan, M.D., Ph.D.
Associate Professor of Neurosurgery and Cell & Developmental Biology
xingf@umich.edu
Research interests:
Study signaling pathways that regulate brain development and tumor formation to develop novel therapy targeting brain cancer stem cells.

Eric R. Fearon, M.D., Ph.D.
Emanuel N. Maisel Professor of Oncology
Professor, Departments of Internal Medicine, Pathology, and Human Genetics
Division Chief, Molecular Medicine & Genetics (MMG)/Int Med
fearon@umich.edu
Research interests:
Studies of oncogene and tumor suppressor gene defects in cancer pathogenesis, particularly gastrointestinal cancers.

David O. Ferguson M.D., Ph.D.
Associate Professor of Pathology
daviferg@umich.edu
Research interests:
The Ferguson laboratory studies how mammalian cells maintain a stable genome. The proteins that accomplish this serve to prevent cancer and ensure proper functioning of the immune system. Currently, our main focus is a multi-protein complex called MRN, which is mutated in human cancer predisposition and immunodeficiency syndromes.
Maria E. Figueroa, M.D.
Assistant Professor of Pathology
marfigue@umich.edu
Research interests:
Role of DNA methylation in transcriptional regulation during normal and malignant hematopoiesis.

Gary D. Hammer, M.D., Ph.D.
Millie Schembechler Professor of Adrenal Cancer
Director - Endocrine Oncology Program
Director - Center for Organogenesis
ghammer@umich.edu
Research interests:
The long range objective of Dr. Hammer’s laboratory is to understand the cellular and molecular mechanisms by which signaling pathways and downstream transcription factors coordinate the specification of adrenocortical cells within the adrenal gland.

Michael Imperiale, Ph.D.
Arthur F. Thurnau Professor
Department of Microbiology and Immunology
imperial@umich.edu
Research interests:
We study the molecular biology of the small DNA tumor virus, BK polyomavirus, which causes significant disease in transplant recipients including cancer patients undergoing BMT.

Venkateshwar G. Keshamouni, Ph.D.
Associate Professor of Internal Medicine, Pulmonary & Critical Care Division
vkeshamo@umich.edu
Research interests:
Deregulation of TGF-beta signaling in lung cancer with a focus on mechanisms of Epithelial-mesenchymal transitions, tumor supression and immune evasion with a goal of identifying therapeutic targets.

David Lombard, M.D., Ph.D.
Associate Professor of Pathology
davidlom@umich.edu
Research interests:
Sirtuin deacylases and their relationships with cancer and other age-associated diseases.
Pedro Lowenstein, M.D., Ph.D.
Richard Schneider Collegiate Professor of Neurosurgery and Professor of Cell and Developmental Biology
pedrol@umich.edu
Research interests:
Cancer biology and therapeutics: is to discover the cellular, molecular, and structural basis of malignant glioma growth and invasion, role of GBM derived micro RNAs into the tumor microenvironment, GBM stem cell biology, tumor derived double-stranded DNA and the STING signaling pathway.

Costas Lyssiotis, Ph.D.
Assistant Professor, Molecular & Integrative Physiology
clyssiot@umich.edu
Research Interests:
Tumor Metabolism, Cancer, Pancreatic Cancer, Metabolomics, Autoimmunity

David M. Markovitz, M.D.
Professor of Internal Medicine, Division of Infectious Diseases
dmarkov@umich.edu
Research interests:
Our laboratory studies the interaction between human cellular factors and retroviruses, and their role in oncogenesis and immunity.

Sofia D. Merajver, M.D., Ph.D.
Professor of Internal Medicine and Epidemiology
Scientific Director, Breast Oncology Program
Director, Breast and Ovarian Cancer Risk Evaluation Program
smerajve@umich.edu
Research interests:
Molecular genetics of aggressive breast cancer phenotypes and comparative studies and integrated modeling.

Andrew G. Muntean Ph.D.
Assistant Professor of Pathology
andrewmu@umich.edu
Research interests:
Epigenetic and transcriptional mechanisms controlling normal and malignant hematopoietic stem cells
Jacques E. Nör, D.D.S., M.S., Ph.D.
Donald A Kerr Professor of Dentistry
Professor of Otolaryngology
Professor of Biomedical Engineering
jenor@umich.edu
Research interests:
Head and neck cancer stem cells; Tumor angiogenesis; Salivary gland cancer; Cancer Biology

Andrew D. Rhim, M.D.
Assistant Professor of Internal Medicine, Division of Gastroenterology
Assistant Director for Translational Research
arhim@umich.edu
Research interests:
Our research program is focused on the biology of pre-cancerous lesions of epithelial organs and the molecular and cellular events that occur during their transition to cancer with a focus on pancreatic cancer. The overarching goal of these studies is to learn more about how cancer develops and evolves so that we can devise new strategies for early diagnosis and treatment for patients. We employ a unique combination of genetically engineered mouse models, in vitro models, patient specimens and translational clinical trials to test our hypotheses.

Diane M. Robins, Ph.D.
Professor of Human Genetics
drobins@umich.edu
Research interests:
We study hormonally regulated gene transcription and androgen receptor function, from molecular to organismal levels, in mouse models of development and oncogenesis. An additional project focuses on the physiological consequences and genetic diversity of KRAB-ZFP epigenetic modulators.

JoAnn Sekiguchi, Ph.D.
Associate Professor of Internal Medicine Division of Molecular Medicine & Genetics
Associate Professor of Human Genetics
sekiguch@umich.edu
Research interests:
David H. Sherman, Ph.D.
Hans W. Vahlteich Professor of Medicinal Chemistry
Associate Dean for Research and Graduate Education (College of Pharmacy)
Professor of Microbiology & Immunology and Chemistry
Life Sciences Institute
davidhs@umich.edu
Research interests:
The Sherman laboratory works at the interface of bioorganic chemistry and molecular microbiology through the investigation of secondary metabolic systems involved in natural product biosynthesis. Several projects are being pursued in the group including genomic analysis of antibiotic biosynthesis in Streptomyces spp., investigation of the molecular genetics and biochemistry of cyanobacterial secondary metabolic systems, synthetic chemistry of complex natural product substrates to investigate the specificity and mechanisms of natural product biosynthetic enzymes, and development of culture methods for isolation of novel marine bacteria rich in of bioactive metabolite production.

Donna S. Shewach, Ph.D.
Professor of Pharmacology; Faculty Lead, Translational Research Education Certificate Program
dshewach@umich.edu
Research interests:
Improving cancer chemotherapy through novel mechanisms and gene therapy strategies

Yi Sun, M. D., Ph.D.
Professor and Director, Division of Radiation & Cancer Biology, Dept. of Radiation Oncology
sunyi@umich.edu
Research interests:
SAG E3 ubiquitin ligase in angiogenesis, apoptosis and tumorigenesis; Drug discovery by modulating p53 and p53 signal pathways; Discovery of radiosensitizer

Stephen J. Weiss, M.D.
Upjohn Professor of Internal Medicine and Oncology
Research Professor, Life Sciences Institute
sjweiss@umich.edu
Research interests:
Transcriptional and post-translational regulation of the 3-dimensional cell-extracellular matrix interactions that underlie epithelial-mesenchymal transition programs, tumor progression, invasion, metastasis and angiogenesis.

Max S. Wicha, M.D.
Professor, Department of Internal Medicine
Founding Director Emeritus, University of Michigan Comprehensive Cancer Center
Distinguished Professor of Oncology
mwicha@umich.edu
Research interests:
Effects of extracellular matrix components on cell growth and differentiation. Cancer stem cells
Thomas E. Wilson, M.D. Ph.D.
Associate Professor of Pathology and Human Genetics
wilsonte@umich.edu
Research interests:
DNA repair genetics and biochemistry and its influence on genome stability in germline, cancer and yeast; transcription-replication interactions; bioinformatics

Weiping Zou, M.D., Ph.D.
Charles B. de Nancrede Professor
Professor of Surgery, Immunology and Biology
Co-Director, Tumor Immunology and Host Response Program
Director, Translational Research
Co-Director, Immune Monitoring Core
wzou@umich.edu
Research interests:
Tumor immunotherapology and immunotherapy, with an emphasis on cross-talk among immune cell subsets, stromal cells, tumor cells and tumor stem cells in the tumor microenvironment, and its impact on tumor immunity, tolerance and therapy.
CURRENT CANCER BIOLOGY STUDENTS:

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Email</th>
<th>Mentor</th>
<th>Defended:</th>
</tr>
</thead>
<tbody>
<tr>
<td>April Adams</td>
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<td><a href="mailto:linboz@umich.edu">linboz@umich.edu</a></td>
<td>Imperiale</td>
<td></td>
</tr>
</tbody>
</table>

GRADUATE STUDIES COORDINATOR/ADMINISTRATOR:
Zarinah Aquil, M.Ed.  zaquil@umich.edu  734-615-4846

STEERING COMMITTEE:
- Elizabeth Lawlor, M.D., Ph.D.
- Michael Imperiale, PhD.
- Colin Duckett, Ph.D.
- Gary Hammer, M.D., Ph.D.
- Eric Fearon, M.D., Ph.D.
- Diane Robins, Ph.D.

- Pediatrics and Pathology
- Microbiology & Immunology
- Pathology and Internal Medicine
- Molecular & Integrative Physiology and Internal Medicine
- Internal Medicine, Human Genetics, and Pathology
- Human Genetics

FIRST YEAR STUDENT ADVISOR:
Michael Imperiale, Ph.D.

MEDICAL SCIENTIST TRAINING PROGRAM (M.D./PH.D.) OPERATING COMMITTEE REPRESENTATIVE:
Michael Imperiale, Ph.D.

JOURNAL CLUB/RESEARCH SEMINAR (Cancer Bio 800) COURSE DIRECTOR:
Elizabeth Lawlor, M.D., Ph.D.

Molecular Biology of Cancer (Cancer Bio 553) COURSE DIRECTOR:
Colin Duckett, Ph.D.

Cancer Pathogenesis and Treatment (Cancer Bio 554) COURSE DIRECTORS:
Christine Canman, Ph.D.

PIBS 503 REPRESENTATIVES:
Zora Djuric, Ph.D.
David Lombard, M.D., Ph.D.
Maria Figueroa, M.D.
Michael Imperiale, Ph.D.
Doctoral Program in Cancer Biology

Progress Report for Ph.D. Candidates

Committee meetings must be held within six months after the student passes the qualifying exam, and at least once each calendar year thereafter until the student defends. This report is to be completed by the members of the thesis advisory committee within 7 days after the committee meeting. This report will be read and signed by the student. Please return form to the office of the Cancer Biology Graduate Program: 2978 Taubman Health Sciences Library pdf/email (zaquil@umich.edu) or 734-936-9715 (fax)

Agree | Disagree
---|---
1. The student has made acceptable progress since the last committee meeting. | 1 2 3 4 5
2. The conclusions drawn from the research are supported by the data. | 1 2 3 4 5
3. The research plan for the upcoming year as presented by the student is acceptable. | 1 2 3 4 5
4. The research presented is in a state suitable for publication. | 1 2 3 4 5
5. The student is finished with the research for the thesis work and should begin writing the thesis. | 1 2 3 4 5

The following research aims have been accomplished since the previous committee meeting:

The research plan for the following year includes the following areas of investigation:

Discussion summary of student’s milestones, goals, and future career plans:

Signed: ___________________________________ Thesis Advisor

___________________________________ Committee Member

___________________________________ Committee Member

___________________________________ Committee Member

___________________________________ Committee Member

___________________________________ Committee Member

I have read and agree with this progress report.

____________________________ Student  ________________ Date
Doctoral Program in Cancer Biology
SUMMARY REPORT ON LABORATORY THESIS PROGRESS

Date: 
Student: 
Mentor: 
Semester: 
Grade Given (S/U) _____  PLEASE NOTE: I will enter the Grade via Wolverine Access for you.

Summary of Research effort:

A. Time put into actual laboratory work:
   Extensive _______  Adequate _______  Little _______

B. Reading relevant scientific research articles
   Extensive _______  Adequate _______  Little: _______

C. Intellectual interest in the project:
   Extensive _______  Adequate _______  Little: _______

D. Student’s capacity to grasp the appropriate concepts and follow the analytical transition between concept and experimental design:
   Good _______  Average _______  Poor _______

E. Please rank (circle) student’s own intellectual input into the experimental design:
   Total passivity with    Strong creative contribution
   All input from advisor     1  2  3  4  5 by the student

Please comment on the student’s strengths and weaknesses in research:

Are you satisfied with the student’s progress?:

When did the student’s Dissertation Committee last meet and what were their recommendations?  
(Please note: The Cancer Biology Graduate Program requires that the Dissertation Committee meet within 6 months after the student passes the preliminary exam, and at least once each year thereafter until the defense):

I HAVE DISCUSSED THIS REPORT WITH MY MENTOR.

STUDENT SIGNATURE: _______________________

MENTOR SIGNATURE: _______________________
### Cancer Biology Research Seminar 800
#### JC/Research Seminar Evaluation
**Fall 2015/Winter 2016**

1. Please briefly comment on the trainee’s JC/research seminar:

<table>
<thead>
<tr>
<th>Suggestions:</th>
<th>a) Introduction/Background</th>
</tr>
</thead>
<tbody>
<tr>
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<td>b) Experimental</td>
</tr>
<tr>
<td></td>
<td>c) Conclusion</td>
</tr>
<tr>
<td></td>
<td>d) Data interpretation</td>
</tr>
<tr>
<td></td>
<td>e) General knowledge of topic (as reflected by presentation of relevant background information and discussion of questions)</td>
</tr>
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</table>

2. Please briefly comment on the trainee’s style and clarity:

<table>
<thead>
<tr>
<th>Suggestions:</th>
<th>a) Ease of speaking</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>b) Flow between slides</td>
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<tr>
<td></td>
<td>c) Depth of explanation</td>
</tr>
<tr>
<td></td>
<td>d) Level of scientific vocabulary</td>
</tr>
</tbody>
</table>

3. Visual presentation:

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Needs improvement</th>
</tr>
</thead>
</table>

4. Positive aspects: ________________________________________________________________
   ____________________________________________________________________________

5. Areas needing improvement (if applicable): ________________________________________
   ____________________________________________________________________________