

GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

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Current Events

- Application Deadline - January 1, 2005



News Items

- Labs moving to Blue Flame on January 1, 2005.

Contact Information

[Kathy Hobson](#), Graduate Program Advisor
University of Washington
Department of Pathology
Box 356100
Seattle, WA 98195-6100
(206) 598-8000 FAX: (206) xxx-xxxx

Web Editor: [Michelle](#)

[Rickard](#)

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Current Events

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Department of Pathology
Box 356100
Seattle, WA 98195-6100
(206) 598-8000 FAX: (206) xxx-xxxx

Web Editor: [Michelle](#)

[Rickard](#)

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Program Brochure

Points to Include · The discipline of graduate pathology · Training in context · Employment opportunities · Redirect clinically-minded to residency page · Incorporate elements from Ray's PowerPoint and the Pomona site · Include pics

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People



Graduate Students



Faculty



Administration

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ADMISSIONS

Prerequisites for Graduate Study

-
-

Contacts

Timeline/Overview of Process

Application Process for US Students

Application Process for International Students

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM

INTRODUCTION

The graduate program is designed to provide students with the training necessary to study the cellular and molecular mechanisms of disease. The required course curriculum can be completed during the first two years while making a substantial start toward a thesis research project. The description and requirements delineated in this document apply to students entering the Pathology Ph.D. program in the 2004/2005 academic year. It is expected that all requirements for the Ph.D. can be completed within 5 years.

COURSES

[PATH 410 Introduction to Pathology](#)

[PATH 444 General and Systemic Pathology](#)

[PATH 450 Cell Biology of Aging](#)

[PATH 498 Undergraduate Thesis](#)

[PATH 499 Undergraduate Research](#)

[PATH 500 Molecular Basis of Disease](#)

[PATH 501 Pathology Proseminars](#)

[PATH 502 Inflammation and Repair](#)

[PATH 507 Introduction to Pathology Research](#)

[PATH 510 Introduction to Pathology Methods](#)

[PATH 511 Topics in Experimental Pathology](#)

[PATH 512 Molecular Basis of Disease: Death and Repair](#)

[PATH 513 Mechanisms of Neurodegeneration](#)

[PATH 516 Molecular Basis of Human Genetic Disease](#)

[PATH 520 Experimental Pathology Seminar](#)

[PATH 522 Hematopathology Seminar](#)

[PATH 530 Human Cytogenetics](#)

[PATH 535 Fundamentals of Human Disease](#)

[PATH 551 Experimental and Molecular Pathology](#)

[PATH 552 Contemporary Anatomic Pathology](#)

[PATH 555 Environmental Pathology](#)

[PATH 700 Master's Thesis](#)

[PATH 800 Doctoral Dissertation](#)

STUDY TIMELINE

- [Typical Schedule for First Year Students](#)
- [Dissertation Defense](#)

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Ph.D. RESEARCH

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

STUDENT LIFE

STIPENDS AND BENEFITS

HOUSING

TOUR OF THE CAMPUS

TOUR OF THE CITY

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People - Graduate Students



[Carmen Booth](#)

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Dan Bowen-Pope
Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



[Leslie Caromile](#)

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Dan Bowen-Pope
Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



[Bethany Cool](#)

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. George Martin
Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people who are getting older.



[Monja Dishmon](#)

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Dan Bowen-Pope
Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



[Leslie Caromile](#)

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Dan Bowen-Pope
Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



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Richard Fox

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Steve Schwartz

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Cynthia Glover

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Kemp

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Jonathan Golob

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Chuck Murry

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Ingrid Harten

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Tom Wight

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people who have hearts.



Matt Holdren

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Tony Parks

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.

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Jenny Kanter

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Karin Bornfeldt

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Paul Keire

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Tom Wight

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Jiang Li

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. ???? Bumgarner

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Izumi Maezawa

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Tom Montine

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people with brains.



Di Kim Nguyen

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Christine Disteche

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.

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Thomas Nhan

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Steve Schwartz

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Mary Nivison

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. XXX Olson

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Chong In Pae

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: On Leave

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Julie Rice

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. C. C.

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Jennifer Schleit

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Peter Byers

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.

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Weiliang Tang

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Nelson Fausto

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Marc Vermulst

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Larry Loeb

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



Roland Walter

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. XXX Collins

Pursuing the investigation of little tiny molecules in rats and mice to see if they can do the same thing in people.



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[Myra Wang](#)

B.S. (Biology), University of Somewhere, City, State - 2000
Research Lab: Dr. Karen Swisshelm
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Comparative Pathology

[G. L. VanHoosier Jr., DVM](#), *DVM, Texas A&M*. Virus infections of laboratory animals.

Environmental Toxicology and Developmental Biology

[Daniel F. Bowen-Pope, PhD](#), *PhD, 1979 University of California (Berkeley)*. Gene regulation, development growth factors and receptors.

[Nelson Fausto, MD](#), *MD, 1960 University of Sao Paulo*. Liver regeneration, tumor biology, carcinogenesis, growth factors.

[Raj P. Kapur, MD PhD](#), *MD, PhD, UCLA*. Molecular and cellular events underlying normal and abnormal enteric neurodevelopment.

[S. J. Tapscott, MD PhD](#), *MD, PhD, Pennsylvania*. Gene transcription; tumor-cell biology; neuromuscular disease.

[R. Hevner, MD PhD](#), *MD, PhD, 1992 Medical College of Wisconsin (Milwaukee)*. Cerebral cortex development, transcription factors, axon guidance.

Extracellular Matrix Biology

[P. H. Byers](#), *M.D., Case Western Reserve*. Matrix synthesis; genetic disorders; secretion.

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A. S. Narayanan, *Ph.D., Madras (India)*. Matrix synthesis and degradation; matrix pathology.

W. Tony Parks, *M.D., Washington University*. TGF-Beta signal transduction pathways.

V. Vasioukhin, *Ph.D., Institute of Cytology of the Academy of Sciences, Leningrad*. Role of cell-cell adhesion in regulation of cell proliferation.

T. N. Wight, *Ph.D., New Hampshire*. Proteoglycans in pathology; atherosclerosis.

Genetic and Metabolic Disease

K. Bornfeldt, *Ph.D., 1991, Linkoping University (Sweden)*. Signal transduction in vascular complications of diabetes.

P. H. Byers, *M.D., Case Western Reserve*. Extracellular matrix synthesis; genetic disorders of collagen metabolism; secretion of collagen.

C. Disteche, *Ph.D., Liege (Belgium)*. Molecular genetics; human and mouse cytogenetics.

M. Horwitz, *M.D., Ph.D., University of Washington*. Genetics of hematopoietic disease.

G. M. Martin, *M.D., Washington (Seattle)*. Somatic-cell genetics; pathobiology of aging.

A. D. Miller, *Ph.D., Stanford*. Retroviral-mediated gene transfer.

T. H. Norwood, *M.D., Maryland*. Somatic-cell genetics; pathobiology of aging; mitotic cell-cycle regulation.

G. J. Oshima, *M.D., University of Tsukuba; Ph.D., Boston University*. Pathobiology of aging.

G. Stamatoyannopoulos, *M.D., Athens*. Hematopoietic differentiation.

K. Stephens, *Ph.D., Indiana*. Molecular genetics of human inherited disease, gene mapping, regulation, and imprinting.

K. Swisshelm, *Ph. D., Washington (Seattle)*. Retinoids and retinoic acid receptors in breast cancer; cellular senescence in human epithelial cells; transcriptional regulation retinoic acid receptor beta; differential display of mRNA methodologies, Werner syndrome gene in aging and cancer.

Inflammation and Repair

D. F. Bowen-Pope, *Ph.D., Berkeley*. Structure and function of PDGF receptors; expression and function of tyrosine phosphatases; use of chimeric mice and transgene expression in modified cells to evaluate gene function in vivo.

J. Harlan, *M.D., Chicago*. Heterotypic cell adhesion molecules; cytokines.

W. C. Liles, *Ph.D., University of Washington*. Cellular and molecular regulation of innate immunity and inflammation.

C. E. Murry, *M.D., Ph.D., 1989, Duke University*. Molecular biology of myocardial infarction and atherosclerosis. Cardiac and skeletal muscle differentiation pathways. Cell proliferation in infarct repair.

A. S. Narayanan, *Ph.D., Madras (India)*. Pathology and biochemistry of connective tissues and mechanisms of destruction of connective tissue.

E. Raines, *M.S., University of California Medical Center*. Molecular mechanisms of vascular cell migration, proliferation and survival.

Molecular Biology and Tumor Biology

D. F. Bowen-Pope, *Ph.D., 1979 University of California (Berkeley)*. Gene regulation, development growth factors and receptors.

B. Clurman, *M.D., Ph.D., Cornell University*. Protein regulation of cell cycle and gene mutations that lead to tumorigenesis.

S. J. Collins, *M.D., 1973, Columbia University of Physicians and Surgeons*. Molecular genetics of leukemia.

H. Eisen, *Ph.D., Toronto*. Molecular genetics of *T. cruzi* infection.

N. Fausto, *M.D., Sao Paulo (Brazil)*. Liver regeneration; tumor biology; carcinogenesis; growth factors.

M. T. Groudine, *M.D., Ph.D., Pennsylvania*. Chromatin structure; gene expression, development.

C. Kemp, *Ph.D., Associate Member, Fred Hutchinson Cancer Research Center*. Environmental and genetic control of cancer cell evolution.

L. A. Loeb, *M.D., New York University; Ph.D., Berkeley*. Mutation and chemical carcinogenesis.

A. D. Miller, *Ph.D., Stanford*. Retroviral-mediated gene transfer

R. J. Monnat Jr., *M.D., Chicago*. Molecular genetic analysis of human somatic mutation and small-cell lung cancer.

W. Tony Parks, *M.D., Washington University*. TGF-Beta signal transduction pathways.

P. Porter, *M.D., New Mexico*. Molecular mechanisms of cancer initiation and progression; cell cycle dysfunction.

B. Preston, *Ph.D., University of Wisconsin*. Causes and consequences of somatic mutation in human disease.

G. R. Smith, *Ph.D., MIT*. Mechanisms of genetic recombination and gene regulation.

K. Swisshelm, *Ph.D., Washington (Seattle)*. Retinoids and retinoic acid receptors in breast cancer; cellular senescence in human epithelial cells; transcriptional regulation retinoic acid receptor beta; differential display of mRNA methodologies, Werner syndrome gene in aging and cancer.

S. J. Tapscott, *M.D., Ph.D., 1982, University of Pennsylvania*. Gene transcription, tumor cell biology, neuromuscular disease. FHCRC.

L. D. True, M.D., 1971, *Tulane University*. Urologic pathology, nuclear aspects of tumor differentiation.

N. S. Wolf, D.V.M., *Kansas State*; Ph.D., *Northwestern*. Hematopoiesis control; stem-cell biology.

R. Yeung, M.D., *University of Toronto*. Tumor suppressor gene function; mechanisms of tumorigenesis.

Neuropathology

E. Alvord, M.D., *Cornell*. Neuropathology, experimental allergic encephalitis, multiple sclerosis, brain tumors.

R. Hevner, M.D., PhD, 1992 *Medical College of Wisconsin (Milwaukee)*. Cerebral cortex development, transcription factors, axon guidance.

T. Montine, M.D., *McGill University*; Ph.D., *University of Rochester*. The role of toxic injury on the development of Alzheimer's and Parkinson's Disease.

C. Shaw, M.D., *National Taiwan University*. Neuropathology, Immunopathology.

I. Vincent, Ph.D., *Indiana University*. Pathogenesis of Alzheimer's Disease.

Somatic-Cell Genetics and Aging

G. M. Martin, M.D., *Washington (Seattle)*. Somatic-cell genetics; aging; malignancy.

T. H. Norwood, M.D., *Maryland*. Somatic-cell genetics; growth control; aging.

G. J. Oshima, M.D., *University of Tsukuba*; Ph.D., *Boston University*. Pathobiology of aging.

P. S. Rabinovitch, M.D., Ph.D., *Washington (Seattle)*. Growth control; cell-cycle kinetics.

K. Swisshelm, *Ph.D., 1989, University of Washington*. Retinoids and retinoic acid receptors in breast cancer; cellular senescence in human epithelial cells; transcriptional regulation retinoic acid receptor beta; differential display of mRNA methodologies, Werner syndrome gene in aging and cancer.

I. Vincent, *Ph.D., Indiana University*. Pathogenesis of Alzheimer's Disease.

Vascular Biology

K. Bornfeldt, *Ph.D., 1991, Linkoping University (Sweden)*. Signal transduction in vascular complications of diabetes.

D. F. Bowen-Pope, *Ph.D., Berkeley*. Structure and function of PDGF receptors; Expression and function of tyrosine phosphatases; use of chimeric mice and transgene expression in modified cells to evaluate gene function in vivo.

A. W. Clowes, *M.D., Harvard*. Regulation of vascular smooth-muscle cell growth after arterial injury and in the atherosclerosis; vascular gene therapy; vascular graft healing.

C. Giachelli, *Ph.D., University of Washington*. Adhesive molecules in cardiovascular disease and development.

J. Harlan, *M.D., Chicago*. Heterotypic cell adhesion molecules; cytokines.

A. D. Miller, *Ph.D., Stanford*. Gene therapy in the vessel wall.

C. E. Murry, *M.D., Ph.D., Duke University*. Molecular biology of myocardial infarction and atherosclerosis. Cardiac and skeletal muscle differentiation pathways. Cell proliferation in infarct repair.

W. Tony Parks, *M.D., Washington University*. TGF-Beta signal transduction pathways.

E. Raines, *M.S., University of California Medical Center*. Molecular mechanisms of vascular cell migration, proliferation and survival.

M. A. Reidy, *Ph.D., Cambridge*. Vascular biology; atherosclerosis; endothelial cell injury; smooth-muscle cell proliferation.

S. M. Schwartz, *M.D., Boston University; Ph.D., Washington (Seattle).*

Development molecular biology; growth control of vascular cells.

T. N. Wight, *Ph.D., New Hampshire.* Proteoglycans in pathology; atherosclerosis.

Virology

D. A. Galloway, *Ph.D., NYU.* Herpesvirus pathogenesis and transformation.

N. C. Kiviat, *M.D., 1975, University of Washington.* Epidemiologic and molecular biologic studies of the relationship between HPV, HIV, and Neuroplasia.

A. D. Miller, *Ph.D., 1982, Stanford University.* Virology and gene transfer for treatment of human genetic disease.

D. Myerson, *M.D., Ph.D., Yeshiva (Einstein).* Molecular biology of RNA tumor viruses.

P. E. Neiman, *M.D., Washington (Seattle).* Transformation by retroviruses and oncogenes.

L. R. Rohrschneider, *Ph.D., Wisconsin.* Retroviral transformation proteins and cell architecture.

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Nov-2004 13:31:06 PST

GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

PEOPLE - ADMINISTRATION

Dan Bowen-Pope

Program Director

Phone: (206) 685-2148

Email: bp@u.washington.edu

Kathy Hobson

Graduate Advisor/Coordinator

Phone: (206) 598-8001

Email: kah@u.washington.edu

Michelle Rickard

Academic Program Manager

Phone: (206) 598-4933

Email: monnat@u.washington.edu

Tony Parks

Recruiting Committee

Phone: (206) 543-4317

Email: parkst@u.washington.edu

Brad Preston

Recruiting Committee

Phone: (206) 616-5062

Email: bradp@u.washington.edu

Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 410 Introduction to Pathology

Course Director: Narayanan

Quarters Offered: Autumn

Credits: 3

Basic pathologic processes, including cell and tissue involvement in degenerative processes, cell death, inflammation and repair, immunopathologies, cell cycle events, carcinogenesis, and responses to alterations in hormone and growth factor levels. Illustrative disease conditions are reviewed. Required for physical therapy students. Others with suitable biology background by permission of instructor.

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 444 General and Systemic Pathology

Course Director: Narayanan

Quarters Offered:

Credits: 2-3, max. 5

Basic pathologic processes that underlie disease, including cell alterations, genetic and developmental pathology, environmental pathology, neoplasia, immunopathology, inflammation, infection, and systemic diseases. Correlates gross, functional, and biochemical alterations. For first-year dental students and graduate students. Requires reasonable grounding in biological and chemical sciences. Prerequisite for nondental students: permission of instructor.

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 450 Cell Biology of Aging

Course Director: Martin, Rabinovitch, Wolf

Quarters Offered: Winter

Credits: 3

Pathophysiology of aging at cell and tissue levels (cell replication limits, telomere shortening, accrual of oxidative damage, caloric restriction effects, loss of postreplicative cells, longevity assurance genes). Proseminar based on student participation. Undergraduate honors students, graduate students with biology, zoology, genetics or medical sciences back grounds. Prerequisite: permission of instructor.

Instructor Course Description: [Norman Wolf](#)

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CURRICULUM - COURSES

PATH 498 Undergraduate Thesis

Course Director:

Quarters Offered:

Credits:

Elective.

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 499 Undergraduate Research

Course Director:

Quarters Offered:

Credits:

Elective.

Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 500 Molecular Basis of Disease

Course Director: Parks

Quarters Offered:

Credits: 3

Designed for first and second-year graduate students to introduce the concepts of general pathology at the cellular and molecular levels.

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 501 Pathology Proseminars

Course Director:

Quarters Offered: Autumn, Winter, Spring, Summer

Credits: 1

Small group discussions and presentations by students based on critical reading of original papers, or on concurrent seminars, in many areas of experimental pathology and medicine. Topic varies by quarter. Prerequisite: permission of instructor.

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Nov-2004 15:31:24 PST

GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 502 Inflammation and Repair

Course Director:

Quarters Offered: Even years

Credits: 2

Lecture-seminar; a seminar course dealing with an in-depth examination of the processes involved in inflammation and repair. Credit/no credit only. Prerequisite: permission of instructor.

Web Editor: [Michelle Rickard](#)

Last modified: Wednesday, 03-Nov-2004 15:31:37 PST

GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 507 Introduction to Pathology Research

Course Director: Bornfeldt, Swisshelm

Quarters Offered: Autumn

Credits: 2

Current developments and approaches to investigation of the molecular and cellular basis of disease. Members of the Pathology faculty present and discuss their own research projects. Credit/no credit only. Prerequisite: permission of instructor.

Web Editor: [Michelle Rickard](#)

Last modified: Wednesday, 03-Nov-2004 15:31:52 PST

GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 510 Introduction to Pathology Methods

Course Director: Bowen-Pope

Quarters Offered: Spring

Credits: 3

Laboratory course designed to introduce graduate students to the fundamentals of image analysis, histology, histopathology, post mortem evaluation, surgical pathology, and other methods used to investigate disease etiology, progression, and manifestation in humans and in animal models. Prerequisite: permission of instructor.

Instructor Course Description: [Daniel Bowen-Pope](#)

Web Editor: [Michelle Rickard](#)

Last modified: Wednesday, 03-Nov-2004 15:32:05 PST

GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 511 Topics in Experimental Pathology

Course Director: Bornfeldt

Quarters Offered: Autumn, Winter, Spring, Summer

Credits: 1-2, max. 10

Focus on areas of research relevant to experimental pathology.

Prerequisite: permission of instructor.

Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 512 Molecular Basis of Disease: Death and Repair

Course Director:

Quarters Offered:

Credits: 1.5

First in a series designed to introduce students to medically important diseases and physiologic processes and experimental approaches to elucidating the cellular processes underlying these diseases. Covers basic cell/tissue processes that underlie normal homeostasis and most disease and, including apoptosis, necrosis, stem cells, inflammation, granulation tissue, tissue regeneration, repair and fibrosis.

Web Editor: [Michelle Rickard](#)

Last modified: Wednesday, 03-

Nov-2004 15:32:35 PST

GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 513 Mechanisms of Neurodegeneration

Course Director:

Quarters Offered:

Credits: 1.5

Introduction to the cellular and molecular mechanisms that underlie neurodegenerative diseases, including introduction to the normal development and anatomy of the central nervous system, a review of epidemiologic, genetic, and clinical research tools used in the investigation of these diseases, and a systematic review of the major neurodegenerative diseases.

Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 516 Molecular Basis of Human Genetic Disease

Course Director:

Quarters Offered: Spring

Credits: 3

Introduces the underlying mechanisms in human genetic disorders , ranging from the single nucleotide, through genomic instability, and chromosomal rearrangements. Includes tissue and organ specific examples of the manner in which these disorders provide insights into human biology.

Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 520 Experimental Pathology Seminar

Course Director:

Quarters Offered:

Credits: 1

Review of current research in various areas of experimental pathology by members of the department and visiting scientists.
Credit/no credit only.

Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 522 Hematopathology Seminar

Course Director: Sabath

Quarters Offered: Even years

Credits: 2

Identification of normal lymphocyte and bone marrow subpopulations, diagnosis of leukemias, lymphomas, and benign conditions that resemble them. Emphasis on histopathology, cytochemical, immunological, and molecular markers. Clinicopathologic correlation. Offered: jointly with LAB M 522

Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 530 Human Cytogenetics

Course Director: Disteché

Quarters Offered: Even years

Credits: *, max. 4

Sources and methods of preparation and identification of human chromosomes. Molecular structure and mapping of chromosomes. Human cytogenetic pathology: karyotype-phenotype interactions, chromosome breakage, and cancer cytogenetics. Prerequisite: permission of instructor.

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 535 Fundamentals of Human Disease

Course Director:

Quarters Offered:

Credits: *, max. 20

Students study human pathology through participation in the autopsy service under direct supervision of a faculty member. They analyze the histologic, cellular, and biochemical aspects of selected cases, and present their observations in weekly seminars. Prerequisite: PATH 444 or PATH 555 and permission of course director. Graduate students only.

Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 551 Experimental and Molecular Pathology

Course Director:

Quarters Offered:

Credits: 2-5, max. 20

Introduction to experimental pathology. A tutorial course designed to introduce a graduate student (medical, dental) or senior undergraduate to selected methods and problems through literature surveys and/or laboratory experience. Exploration of causes at the cellular and molecular levels in the study of disease is emphasized. Prerequisite: permission of instructor.

Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 552 Contemporary Anatomic Pathology

Course Director: Schwartz

Quarters Offered:

Credits: 2-5, max. 30

Study of recent developments in anatomic pathology. Subject includes areas of basic science and review of systemic pathology. Recent developments and interpretation of these findings are stressed. For pathology residents, fellows, and trainees. Credit/no credit only. Prerequisite: permission of instructor.

Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 555 Environmental Pathology

Course Director: Monnat, Rhim

Quarters Offered: Alternate years

Credits: 3

Modern morphologic, cell biological, and molecular approaches to environmental disease associated with exposure/predisposition. Lectures, seminar discussion, and student presentations. Prerequisite: PATH 410 or PATH 444 or HUBIO 520; recommended: ENV H 514 and ENV H 515.

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 700 Master's Thesis

Course Director:

Quarters Offered:

Credits:

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - COURSES

PATH 800 Doctoral Dissertation

Course Director:

Quarters Offered:

Credits:

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - TIMELINE First Year Students

Full time students must enroll for a minimum of 10 credits. Please note that full-time student status is required if you are paid on a training grant.

Fall Quarter:

- **PATH 507 Introduction to Pathology**
Research Current developments and approaches to investigation of the molecular and cellular basis of disease. Members of the Pathology faculty present and discuss their own research projects.
2 credits CR/NCR
Directors: Karin Bornfeldt and Karen Swisshelm
- **PATH 512 Molecular Basis of Disease: Death and Repair**
Covers basic cell/tissue processes that underlie normal homeostasis and most disease and, including apoptosis, necrosis, stem cells, inflammation, granulation tissue, tissue regeneration, repair and fibrosis.
Weeks 1-5
1.5 graded credits
Director: Dan Bowen-Pope
- **PATH 513 Molecular Basis of Disease: Mechanisms of Neurodegeneration**
Introduction to the cellular and molecular mechanisms that underlie neurodegenerative diseases, including introduction to the normal development and anatomy of the central nervous system, a review of epidemiologic, genetic, and clinical research tools used in the investigation of these diseases, and a systematic review of the major neurodegenerative diseases.
Weeks 6-10
1.5 graded credits

Director: Tom Montine

- **PATH 551 Lab Rotation**

As many non-graded credits as you need to make a total of 10. You will present results at the end of the quarter in a 10 minute, oral presentation along with other rotating students.

- **PATH 501 Proseminar**

If the topic looks interesting, and if schedule permits.

Most/many students choose to wait and take proseminar classes in their second/third year.

1-2 credits CR/NCR

Directors: Graduate Program Faculty

Winter Quarter:

- **PATH 500 Introduction to General Pathology**

The lecture component of this course is taken by medical students as HUBIO 520. For graduate students we have a special discussion section.

3 graded credits.

Director: Tony Parks

- **CONJ 538 Genetic Instability and Cancer**

Focuses on molecular pathways that maintain genomic stability in all cells and that carry out programmed changes in genomic structure in the immune system.

Special attention devoted to understanding how failure in these pathways leads to genomic instability and malignancy. Prerequisite: permission of instructor.

Weeks 1-5

1.5 graded credits

Directors: Nancy Maizels and Ray Monnat

- **PATH 551 Lab Rotation**

As many non-graded credits as you need to make a total of 10. You will present results at the end of the quarter in a 10 minute, oral presentation along with other rotating students.

- **PATH 501 Proseminar**

If the topic looks interesting, and if schedule permits.

Most/many students choose to wait and take proseminar classes in their second/third year.

1-2 credits CR/NCR

Directors: Pathology Graduate Faculty

Spring Quarter:

- **PATH 510 Introduction to Histology and Pathology**
Methods Laboratory course designed to introduce Pathology graduate students to the fundamentals of image analysis, histology, histopathology, postmortem evaluation, surgical pathology, flow cytometry, cytogenetics and other methods used to investigate disease etiology, progression, and manifestation in humans and in animal models.
3 credits CR/NCR
- **PATH 514 Molecular Basis of Disease: Atherosclerosis and Myocardial Infarction**
Covers mechanisms of atherogenesis, including lipids, extracellular matrix, intracellular signal transduction, cell proliferation, inflammation, and downstream complications of atherosclerosis such as myocardial infarction.
Weeks 1-5
1.5 graded credits
Director: Chuck Murry
- **CONJ 539 Biological Basis of Neoplasia**
Lecture/discussion on cellular and molecular mechanisms underlying phenotypes associated with cancer, including genetic pre-disposition, injury, and instability; alteration in control of cell division and cell death; failure of differentiation; tumor angiogenesis and metastasis. Molecular biology of tractable model systems is emphasized. Prerequisite: introductory biochemistry and cell biology.
Weeks 6-10
1.5 graded credits
Directors: Chris Kemp and Helmut Zarbl
- **PATH 516 Molecular Basis of Disease: Human Genetic Diseases**

The identification of mechanisms by which mutations occur and by which they cause clinical phenotypes, the technology for recognizing those changes, and the opportunity for treatment represent some of the greatest challenges to and opportunities for medical sciences in the coming decades. This course provides an introduction to the mechanisms of genetic disease, to the techniques and technologies used to dissect disease mechanisms, to some of the disorders themselves, and to evolving strategies for therapy. Covers genetic diseases not related to cancer or aging, including connective tissue diseases, hematopoiesis, skin diseases and muscular dystrophy, as well as common diseases affecting human development.

3 graded credits

Director: Peter Byers

- **PATH 551 Lab Rotation**

As many non-graded credits as needed to make a total of 10. You will present results at the end of the quarter in a 10 minute, oral presentation along with other rotating students.

- **PATH 501 Proseminar**

If the topic looks interesting, and if schedule permits.

1-2 credits CR/NCR

Directors: Pathology Graduate Faculty

Summer Quarter:

- **The Biomedical Research Integrity series**

A series of lectures and discussion sections which cover issues of ethics in research and academia.

Elective Courses:

Electives offered by other departments may also be taken during the first year, especially in fulfillment of the 18 graded credits required before students can take the General Examination. It is often advisable, however, to take the electives after choosing a Thesis Advisor and entering a home lab so as not to interfere with the core course work taken earlier, or with the interactions necessary for successful lab rotations.



Web Editor: [Michelle Rickard](#)

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GRADUATE PROGRAM IN MOLECULAR BASIS OF DISEASE

CURRICULUM - STUDY TIMELINE **Dissertation Defense**

After the General Exam:

After passing the General Exam, students usually devote full time to their research projects (plus occasional elective courses). Upon completion of the GE students are considered a Ph.C. and must now register for research as PATH800. The Thesis Advisor and Supervisory Committee, will assist in determining when each student's research opus is sufficient to warrant writing a dissertation and scheduling a Final Examination. In general, the student must have demonstrated the ability to identify a significant scientific question, to design experiments to answer the question, to interpret the results of those experiments, and to redesign experiments based on earlier findings prior to commencing writing a dissertation.

The graduate school now requires that PhD students earn at least 90 credits, 60 of which must be earned at the University of Washington. It is no longer a Graduate School requirement for students to be registered full-time for a specified number of quarters. This is important information for students whose tuition is not paid by a training grant, because it is possible to save tuition expenses by not registering as a student during some quarters when research is being done but no classes are taken. For students paid on training grants, it is irrelevant, since training grants require that the trainee be a full time student at all times in order to receive a stipend.

Publication Requirement:

Publications are very important for one's future career. It is anticipated that students will produce one or more first-author peer-reviewed publications resulting from their graduate research. Before the thesis committee can permit the thesis defense (Final Examination) to be scheduled, the student must

have submitted to a journal at least one first-author manuscript, containing primary data(i.e. not a review), that the committee agrees is of publishable quality.

The Dissertation and Reading Committee:

The student begins work on the written dissertation when the Supervisory Committee judges that a sufficient project has been accomplished. The dissertation is the written report of the student's research project. Format and other requirements are described on the Graduate School's Webpage: www.grad.washington.edu/stsv/stylman/00stylman.htm

Students are encouraged to bring a draft of the dissertation to the receptionist's desk in G-1 Communications to have and "advisor" evaluate it for formatting. This prevents a rude surprise at the last minute when the final draft is submitted for approval.

As the student nears completion of the dissertation, and before scheduling the Final Examination, a Reading Committee is selected by the Supervisory Committee in consultation with the student. The Reading Committee consists of three members of the Supervisory Committee. The GSR cannot be one of these three. The voting members need not be from Pathology. The list of Reading Committee members should be sent to the Program Coordinator so that she can submit the list to the Dean for approval.

The reading committee indicates, when they sign the Request for Final Examination form, that they have read a complete draft of the dissertation and find it adequate to permit a FE to be scheduled. **This means that you must have a draft of your thesis completed and provided to the Reading Committee before you can schedule a final examination.**

The Final Examination (FE):

The Final Examination (FE), also known as the "*Dissertation Defense*", consists of a formal and public seminar in which the student presents his/her research project and answers questions asked by the Supervisory Committee and audience. After the question period the student leaves the room and the

Supervisory Committee discusses the decision and fills out the warrant accordingly. The student is invited back into the room and informed of the decision.

Scheduling the Final Examination (FE):

The Graduate School requires that a student have taken at least 3 quarters (30 credits) of PATH 800 before he/she can be granted a Ph.D. Since PATH 800 cannot be taken until after the GE has been passed, and since a maximum of 10 credits of PATH 800 can be taken per quarter, this means that a student must be registered for at least 3 quarters after the GE before getting a Ph.D. The third quarter could be the quarter in which the FE is taken.

Once the requirement for 30 credits of PATH 800 have been satisfied, the FE can be scheduled when the Supervisory Committee has agreed that the student is prepared to take it, i. e. when the Committee believes that the student has accomplished, and can defend, an adequate research project. The decision to schedule a FE is agreed upon at a supervisory committee meeting. A draft of the thesis must have been read by the reading committee before a FE can be scheduled.

Requirements leading up to the Final Exam:

Obtain a "Request for Final Examination" form from the Graduate Program Coordinator. It is expected that a student will have registered for at least two quarters at the University of Washington after passing the GE before a warrant is authorized for the FE. **The Request for Final Examination must be received in the Graduate School office at least three weeks before the date of the FE.** It must be signed by all of the members of the Supervisory Committee, giving the day, date, time, and place of the scheduled examination, as well as the dissertation title. If necessary a faxed signature or e-mail confirmation can be attached in place of a signature on the request for Final Examination. The reading committee indicates, when they sign the Request for Final Examination form, that they have read a complete draft of the dissertation and find it adequate to permit a FE to be scheduled. **This means that you must have a draft of your thesis completed and provided to**

the Reading Committee before you can schedule a final examination.

The candidate is responsible for arranging the day, date, time, and place of the Final Examination so that at least a quorum of committee members can attend, including the GSR, chair, and at least two other pathology graduate faculty. It is often difficult to schedule rooms, so contact the Graduate Program Coordinator for assistance as early as possible to reserve a lecture room for the Final Examination.

The Final Examination warrant is prepared in the Graduate Office in the Administration Building after evaluating the student's transcript. As with the General Examination, the warrant is mailed to the Graduate Program Coordinator one week before the scheduled examination. The Coordinator gives the warrant to the student who is responsible for bringing it to the FE. With the warrant will be mailed a Survey of Earned Doctorates questionnaire, a diploma card, a Graduate School Exit Questionnaire, and a microfilm agreement form. The student should complete these and return them with the two copies of the dissertation.

It is expected that members of the general scientific public will attend the FE. The Graduate School office arranges for the event to be published in the University Week on the Thursday before the examination is held. Three weeks before the final examination, contact the Graduate Program Coordinator to coordinate announcement of the examination. This will be mailed to members of the Pathology Department and posted on notice boards.

Upon passing the FE, the Supervisory Committee members sign the warrant. If a member is not present, no signature will appear after his/her name. This is fine so long as a quorum is present and do sign. The student is requested to provide a copy of the warrant with signatures to the Graduate Coordinator and has 60 days to submit the dissertation with the reading committee report.

Submitting the Dissertation:

Each student has a maximum of 60 days after taking the FE in which to submit the following to the Graduate School. If this time expires, another FE must be scheduled.

Check the rules on the Graduate School webpage for information about what to bring and where to bring it: www.grad.washington.edu/stsv/stylman/00stylman.htm. This site also has a useful FAQ section about theses.

Due to the numbers of students submitting final documents during Finals Week, the grad school asks that if at all possible, preliminary evaluations of document be done BEFORE Finals Week. Final Submission of Theses and Dissertation are 15 minutes appointments and may be scheduled by phone: (206) 543.5900, email: blueizs@grad.washington.edu, or in person at the Graduate School Receptionist Desk, G-1 Communications.

The Dissertation can be received on the last day of the quarter and the student will still graduate that same quarter. If the dissertation and report are not submitted on or before the last day of the quarter, the student will need to register for the following quarter, even if the 60 day period has not expired. In some cases, it may not be necessary to register for a full 9 credits. The basic rule reflected here is that a student must be a registered student at the time that the Graduate School receives the degree request and documentation.

One copy of the thesis should be provided to the Department.

University of Washington Department of Pathology

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November 23, 2004 - Mark Wurfel - University of Washington
November 30, 2004 - John M. Harlan - University of Washington School of Medicine

As Chairman of the Department of Pathology at the University of Washington School of Medicine I am pleased to welcome you to our web site. It contains information on our clinical, research, teaching and training activities and includes short profiles of our faculty and their areas of work. The University of Washington Department of Pathology is a dynamic organization, one of the best in the country, that has had a consistent level of high achievement in all of its activities.

The Department offers full diagnostic service in all areas of pathology and has the top rank among Departments of Pathology as a recipient of research grants from the National Institute of Health. Our educational and training programs include the Pathology Residency Training Program, the Ph.D. Program in the Molecular Basis of Disease, and the teaching of medical students, postdoctoral research fellows and clinical fellows.

Our operations are based at the University of Washington School of Medicine, University of Washington Medical Center (UWMC), Harborview Medical Center (HMC) and the Seattle Cancer Care Alliance (SCCA). Faculty of the Department of Pathology are also located at Children's Hospital Medical Center, Puget Sound Veterans Affairs Medical Center and the Fred Hutchinson Cancer Research Center. Faculty at all of these sites are engaged in clinical service, research and education. Please contact us for more information about our activities.

Nelson Fausto, M.D.
Professor and Chair
Department of Pathology

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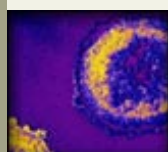
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