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About Roswell Park Cancer Institute

Roswell Park Cancer Institute (RPCI) was established in 1898 by the world-renowned surgeon, Dr. Roswell Park, based on the principle of integrating clinical cancer care, cancer research, and cancer education. RPCI is the oldest ‘cancer institute’ in the US and is one of only a handful of freestanding National Cancer Institute-designated comprehensive cancer centers in the country. Several pioneering observations made at Roswell Park Cancer Institute in the early 20th century, shortly after its founding, laid the foundation of tumor immunology research for the next century:

- In 1904, the first scientific observations implicating immunological reactions with malignancy were reported by Drs. Harvey R. Gaylord, George H.A. Clowes, and F.W. Baeslack.

- In 1904, Dr. G.H.A. Clowes, driven by the fact that his son had leukemia, initiates the first cancer chemotherapy program in the United States.

Over its long history, Roswell Park Cancer Institute has made fundamental contributions to reducing the cancer burden and has successfully maintained an exemplary leadership role in setting the national standards for cancer care, research and education. The Roswell Park Graduate Division of the University of Buffalo was chartered in 1955 through the efforts of the institute director, Dr. George Moore.

The campus spans 25 acres in downtown Buffalo and consists of 15 buildings with about 1.6 million square feet of space. A new hospital building, completed in 1998, houses a comprehensive diagnostic and treatment center. In addition, the Institute built a new medical research complex and renovated existing education and research space to support its future growth and expansion. The RPCI campus is located in the heart of the 100 acre Buffalo Niagara Medical Campus in the downtown area. The focus of the Buffalo Niagara Medical Campus, which incorporates components of the State University of New York at Buffalo and is home to the Hauptmann Woodward Institute for Structural Biology, is to encourage collaborative biomedical research.
No Smoking
For Your Health
CLEAN AIR
LETS CLEAR

- Designated smoking in Doubletree Hotel in smoking permitted in Doubletree Hotel in smoking permitted in Doubletree Hotel in

- In the connecting bridges
- In leased spaces
- In the grounds
- On the grounds

- In surface lots
- On campus
- Parking ramps
- In privately owned vehicles
- In vehicles parked in building

- In vehicles parked on the grounds

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Quick Facts About Buffalo, NY

Roswell Park Cancer Institute is centrally located in the City of Good Neighbors, 10 minutes from the world-famous Albright-Knox Art Gallery, Delaware Park, Buffalo Zoo and Erie Basin Marina, and within two blocks of historic Allentown, a community noted for artists, antiques, gourmet restaurants, coffeehouses and Victorian homes.

Buffalo is located at the eastern end of Lake Erie, 30 miles from Niagara Falls, and less than a two-hour drive from Toronto, Canada. Lake Erie moderates winter and summer temperatures and provides outstanding recreational activities. The hills, fields and forests surrounding the Queen City afford excellent winter skiing and summer hiking, camping and boating.

The Buffalo metropolitan area - Erie and Niagara counties - has a population of 1.25 million. Although Buffalo is the second largest city in New York and has the cultural and social advantages of a large city, it offers a relaxed pace of life and easy access to the surrounding countryside.

The downtown theater district boasts many theaters in active production. Cultural centers include the Albright-Knox Art Gallery, internationally known for its collection of modern art; The Frank Lloyd Wright Darwin D. Martin House Complex, the site of the 1904 masterwork that is widely considered Wright’s grandest Prairie House; and Kleinhans Music Hall, home of the Buffalo Philharmonic, which is consistently ranked among the top 10 symphonies in the nation.

For sports fans, major league teams - including the NFL Bills, the NHL Sabres, and baseball’s American Association Buffalo Bisons, play to sell-out crowds.

Other local attractions include Artpark, Buffalo Science Museum, Letchworth State Park, Tifft Farm Nature Preserve, Shakespeare in the Park, Botanical Gardens, Allentown Art Festival, Galleria Mall, Buffalo and Erie County Historical Society, and the Naval and Servicemen’s Park. Restaurants offer the finest in dining and a variety of ethnic cuisines, including French, Polish, Italian, Chinese, Indian, Thai and Greek.
Buffalo Landmarks & Events

- The Albright-Knox Art Gallery
- Anchor Bar
- Buffalo Bisons
- Buffalo Bills
- Buffalo and Erie Botanical Gardens
- Buffalo and Erie County Historical Society Building
- Buffalo City Hall
- The Buffalo Lighthouse
- Buffalo Naval Park
- Buffalo Place
- Burchfield Penney Art Center
- Darwin Martin House
- Delaware Park
- Elmwood Avenue Festival of the Arts
- Lafayette Square
- Market Arcade Film & Arts Center
- Niagara Falls
- Our Lady of Victory Basilica
- Parkside Candy
- The Peace Bridge
- Shea's Performing Arts Center
- Thursday at the Square
- Wilcox Mansion – Theodore Roosevelt Inaugural National Historic Site
The history of Immunology at the Roswell Park Cancer Institute is a long and illustrious one, including the first scientific observation implicating immune responses against malignancies (1904), pioneering use of antibodies for cancer treatment (1954), demonstration of the anti-tumor immunomodulatory effects of chemotherapy (1960), and defining the immunomodulatory mechanisms of fever-range hyperthermia (1998). The work of the Department is now focused on the increasingly complex interactions between tumors and the immune system.

Emerging studies indicate that the tumor-immune system interface functions as a dual-edged sword. Research in the Immunology Program has shown that, on the one hand, immune cells elicit cancer suppression and, on the other hand, elicit tumor growth and spread. Lack of an integrated understanding of these interactions is a significant barrier to developing effective immune-based approaches. This complexity emphasizes the need to develop novel, immune-based strategies to combat human malignancies in addition to “traditional” elicitation of anti-tumor immunity. The overarching goal of the Immunology Program is to understand and utilize the ability of the immune system to prevent, diagnose and treat human cancers. The scientific approach to achieve this goal is to: 1) Characterize the specific interactions between tumor and immune cells that lead to tumor recognition and tumor rejection (or failure to do so), 2) Define the broader host-tumor immune interactions that modulate tumor cell biology and the anti-cancer immune response, and 3) Translate this understanding to clinical applications based on the mechanistic underpinnings of tumor-immune system interactions. Research in the Department of Immunology runs the complete gamut from basic mechanisms of immune responses, through translational development of novel therapies, to the development and implementation of clinical trials.
Faculty

Scott Abrams, PhD  
Member, UB Graduate Faculty, Director of Graduate Studies  
Associate Professor of Oncology, Department of Immunology  
Director, Graduate Studies, Department of Immunology  
Cytotoxic T cells, myeloid-derived suppressors, apoptosis, tumor escape, immunotherapy

Xuefang, Cao, PhD  
Member, UB Graduate Faculty  
Assistant Professor of Oncology, Department of Immunology  
Regulatory T cells, tumor immunity, immune tolerance, immunotherapy

Myron Czuczzman, MD  
Member, UB Graduate Faculty  
Professor of Oncology, Department of Medicine  
Chief, Lymphoma / Myeloma Service

Sharon S. Evans, PhD  
Member, UB Graduate Faculty  
Professor of Oncology, Department of Immunology  
Lymphocyte trafficking, IL-6, thermal stress, adoptive T cell transfer, cancer immunotherapy

Sandra O. Gollnick, PhD  
Member, UB Graduate Faculty  
Professor of Oncology, Department of Cell Stress Biology  
Photodynamic therapy (PDT), cytokines, immunotherapy, inflammation

Bonnie Hylander, PhD  
Associate Member, UB Graduate Faculty  
Department of Immunology

Aimin Jiang, PhD  
Member, UB Graduate Faculty  
Assistant Professor of Oncology, Department of Immunology  
Dendritic cells, tolerance, E-cadherin, beta-catenin, regulatory T cells

Danuta Kozbor, PhD  
Member, UB Graduate Faculty  
Associate Professor, Department of Immunology  
Virotherapy of cancer, oncolytic vaccine for cancer, targeting of tumor-associated antigens

Joseph Lau, PhD  
Member, UB Graduate Faculty  
Professor, Department of Molecular & Cellular Biology
Faculty

**Kelvin P. Lee, MD**  
Member, UB Graduate Faculty  
Professor of Oncology, Chair, Department of Immunology  
Jacobs Family Chair in Immunology  
Dendritic cells, plasma cells, myeloma, CD28, myeloid-derived suppressor cells

**William J. Magner, PhD**  
Associate Member, UB Graduate Faculty  
Department of Immunology

**Kirsten Moysich, PhD**  
Member, UB Graduate Faculty  
Professor of Oncology, Cancer Prevention and Control  
Immune function in the etiology and prognosis of cancer, molecular epidemiology, ovarian cancer, multiple myeloma, and breast cancer

**Michael Nemeth PhD**  
Member, UB Graduate Faculty  
Assistant Professor of Oncology, Department of Immunology  
Hematopoietic stem cells, leukemia stem cell, bone marrow transplantation, Wnt signaling

**Kunle Odunsi, MD, PhD**  
Member, UB Graduate Faculty  
Professor of Gynecology & Obstetrics  
Chair & Research Program Director, Division of Gynecologic Oncology  
Director, Center for Immunotherapy  
Molecular characterization of tumor antigens in ovarian cancer, development of vaccine therapies

**Elizabeth A. Repasky, PhD**  
Member, UB Graduate Faculty  
Professor of Oncology, Department of Immunology  
The Dr. William Huebsch Professorship in Immunology  
Immunotherapy, lymphocytes, cancer vaccines, heat shock proteins, hyperthermia, tumor antigens

**Brahm Segal, MD**  
Member, UB Graduate Faculty  
Professor of Oncology, Department of Medicine  
NADPH oxidase, neutrophil, macrophage, Nrf-2

**Ben K. Seon, PhD**  
Member, UB Graduate Faculty  
Professor of Oncology, Department of Immunology  
Angiogenesis, novel antigens, endoglin, CD231
Faculty

Joseph Skitzki, MD
Associate Member, UB Graduate Faculty
Department of Surgical Oncology
Immunotherapies, melanoma, animal modeling, regional therapies, clinical translation

Ashwani K. Sood, PhD
Member, UB Graduate Faculty
Assistant Professor of Oncology, Department of Immunology
Breast tumor antigen identification, breast DNA microarrays, breast cancer prevention and therapy

Yasmin Thanavala, PhD
Member, UB Graduate Faculty
Professor of Oncology, Department of Immunology
Development and delivery of vaccines, hepatitis B, C and HPV, oral vaccines, nanotechnology

Thomas B. Tomasi, MD, PhD
Member, UB Graduate Faculty
Professor of Oncology, Department of Immunology
Epigenetic regulation, MHC Class II genes, chromatin structure, trophoblast cells

Eunice Wang, MD
Member, UB Graduate Faculty
Assistant Professor of Oncology, Department of Immunology
Leukemia, tumor microenvironment, hypoxia, angiogenesis, vascular niche

Meir Wetzler, MD
Member, UB Graduate Faculty
Associate Professor, Department of Immunology
Acute myeloid leukemia, acute lymphoblastic leukemia, lymphoblast-derived dendritic cells
The Immunology Graduate Program

Kelvin Lee, MD, Chairman • CGP Rm L5-318B, 716.845.4106

Scott Abrams, PhD, Graduate Studies Director • CGP Rm L5-314 716.845.4375

Natalie Brock, Graduate Program Administrator • CGP Rm L5-309; 716.845.3257

The Immunology Department at Roswell Park is located on the 5th floor of the Center for Genetics and Pharmacology (CGP), Virginia Street, Buffalo, New York 14263.

The Immunology Training Program at Roswell Park Cancer Institute offers a highly interactive, multidisciplinary course of study leading to a doctoral degree that prepares students for successful careers as independent investigators in cellular, molecular, and tumor immunology. Students are exposed to contemporary research problems in basic and tumor immunology and, at the same time are given a strong background in cancer biology. The program’s setting within a world-class comprehensive cancer center offers students the invaluable opportunity to become involved in translational research that brings investigator-initiated approaches for treating cancer into a clinical setting.

The Department is the recipient of a prestigious National Institutes of Health National Cancer Institute sponsored pre-doctoral fellowship program in Translational Tumor Immunology, which provides funds for student stipends and travel.
Program of Study – Program Requirements

The Department of Immunology has ongoing research programs in many aspects of immunology with an emphasis on understanding why immune responses are generally ineffective against malignant cells in cancer patients, directly coupled with efforts to therapeutically elicit more potent anti-tumor immunity. This is being done through collaborative research programs that are grouped into 4 major areas of focus:

1. Identifying the molecular mechanisms by which tumor cells become resistant to immune recognition and killing;
2. Characterizing the molecular and cellular elements of the tumor microenvironment that influence tumor cell growth and immune control;
3. Designing new strategies to enhance active specific immunotherapy; and
4. Translation of novel laboratory findings into investigator-initiated clinical trials.

The specific research topics being investigated by the faculty include: dissection of molecular pathways controlling lymphocyte trafficking to the tumor microenvironment, molecular basis of the role of interactions between the host immune system and tumor cells, epigenetic mechanisms influencing the antigenic profile of tumor cells and their immunogenicity, role of cytokines in the induction of humoral and cellular antigen-specific immunity, characterization of antigen processing abnormalities in malignant cells and their role in the clinical course of disease, the biology of professional antigen presenting cells, immunization strategies for enhancing systemic and cellular immunity by oral and intranasal vaccine delivery, molecular mechanisms of immune cell trafficking in the tumor microenvironment, immunosuppressive mechanisms of myeloid cells, signaling circuitry, effector T cell function, and development of long-term immune memory, antibody-based strategies to control tumor associated angiogenesis, antibody based immunotherapy of solid and liquid tumors, adoptive T-cell immunotherapy, molecular basis of the cross-talk between cells of the innate and adaptive immune system and their impact on tumor growth, enhancement of tumor immunogenicity with heat shock proteins, impact of metabolism on immunity, and nanotechnology based immunodiagnostics and immunotherapeutic approaches. The faculty has expertise in a broad range of cutting-edge technologies that encompass molecular and cellular immunology, nanotechnology, recombinant gene and protein expression, and imaging.

The PhD degree usually requires four to six years of full-time study and research. Students are encouraged through a variety of training opportunities to analyze data critically, to question existing paradigms, and to propose new solutions to long-standing problems. These goals are achieved through courses, seminars, journal clubs, and laboratory research with a highly motivated research and teaching faculty. There are frequent opportunities for students and faculty to present and discuss data and ideas in open forums. Close collaborative interactions exist between the basic research faculty and the clinical staff at Roswell Park Cancer Institute. Thus, students are able to observe first-hand the interactions between basic and translational research and ultimately, the clinical applications that result.
All students in the program take a core curriculum over the first two years of study that consists of didactic coursework in Immunology, Biochemistry, Genetics, Molecular and Cellular Biology, Ethical Conduct of Research, Tumor Immunology, Grantsmanship, and Oncology. In addition to didactic courses, students are required to participate in Student Seminar and Journal Club every semester of study. Guidelines for these courses are provided in subsequent sections.

During the first year, all students complete three research rotations, after which a research mentor is selected and a supporting thesis committee is established to help the student set up a program in his or her major field of interest. In subsequent years, the student concentrates on laboratory research; participates in advanced seminars; passes a qualifying exam which consists of writing and presenting an NIH-style grant; and prepares a dissertation.

A typical program for the first two years of study is shown below and on the following pages along with detailed descriptions of the required courses.

---

**Course Work:**

**Required:**

- Molecular Immunology MIR 511 Fall of the first year
- First Year Journal Club MIR 507 Fall of the first year
- Ethics/Conduct of Research RPN 541 Fall of the first year
- Oncology for Scientists RPN 530/532 First Year (Fall and Spring Semesters)
- Advanced Immunology MIR 508 Spring of the first year
- Biological Chemistry BCH 503 Fall of the second year
- Trends in Tumor Immunology MIR 509 Fall of the second year
- Advanced Mol. Genetics BIO 504 Spring of the second year
- Basics in Grantsmanship & Ethical Conduct of Research MIR 510 Spring of the second year
- Student Seminar MIR 503 Every year (Fall and Spring Semesters)
- Journal Club MIR 521/522 Every year (Fall and Spring Semesters)

**Required/non-credited:**

- Top 10 Immunology Techniques Fall of the first year
- Writing Course-Elements of Arguing a Position Fall of second and third year
TYPICAL PROGRAM OF STUDY FOR PhD STUDENTS (YEARS 1 & 2)

<table>
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<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
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<tr>
<td></td>
<td>MIR511 Molecular Immunology</td>
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<td>FALL 2013</td>
<td>RPN530 Oncology for Scientists I</td>
<td>4</td>
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<td>MIR503 Immunology Student Seminar</td>
<td>1</td>
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<tr>
<td></td>
<td>MIR507 First Year Journal Club</td>
<td>1</td>
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<td></td>
<td>MIR 601 Graduate Research (SE)</td>
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<td></td>
<td>Top 10 Immunology Techniques</td>
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<td>Maximum Cr</td>
<td>Fall 2013</td>
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<td></td>
<td>MIR508 Advanced Immunology</td>
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<tr>
<td></td>
<td>RPN 532 Oncology for Scientists II</td>
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<td>SPRING 2014</td>
<td>MIR504 Immunology Student Seminar</td>
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<td>MIR522 Journal Club</td>
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<td></td>
<td>MIR 602 Graduate Research (SE)</td>
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<td>Maximum Cr</td>
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<td></td>
<td>BCH503 Biochemical Principles</td>
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<td></td>
<td>MIR509 Trends in Tumor Immunology</td>
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<td></td>
<td>MIR503 Immunology Student Seminar</td>
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<tr>
<td>FALL 2014</td>
<td>Elective Course</td>
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<td>MIR521 Journal Club</td>
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<td>Graduate Research</td>
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<td>Immunology Writing Course</td>
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<td>Maximum Cr</td>
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<td></td>
<td>BIOS04 Advanced Molecular Genetics</td>
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<td></td>
<td>MIR510 Basics in Grantsmanship</td>
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<tr>
<td>SPRING 2015</td>
<td>MIR503 Immunology Student Seminar</td>
<td>NC*</td>
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<td></td>
<td>MIR521 Journal Club</td>
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<td>Graduate Research</td>
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<td>Maximum Cr</td>
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*NC, non-credited courses

Grades: The University requires that all graduate students maintain a 3.0 GPA. Failure to maintain a 3.0 will result in the student being placed on academic probation.
ROSSWELL PARK CANCER INSTITUTE DEPARTMENT OF IMMUNOLOGY

MD/PhD STUDENT REQUIRED CURRICULUM

PROGRAM OF STUDY (72 Total Credit Hours)

Pre-requisites:
- IMC 502 Fundamentals I 7.2 Credit Hours
- IMC 504 Fundamentals II 3.8 Credit Hours
- IMC 510 GI & Metabolism 5.5 Credit Hours
- IMC 500 Medicine and Society 2.0 Credit Hours
- IMC 602 Cardiovascular 7.2 Credit Hours
- IMC 604 Pulmonary 8.0 Credit Hours
- IMC 606 Neuroscience I 2.3 Credit Hours
OR
- IMC 516 Microbio/Pathogenesis 5.0 Credit Hours

Laboratory Rotations .......................................................... TOTAL 36.0 credits

Required:
- MIR 511 Molecular Immunology 3 Credit Hours
- MIR 508 Advanced Immunology 4 Credit Hours
- MIR 509 Trends in Tumor Immunology 2 Credit Hours
- MIR 510 Basics in Grantsmanship and 1 Credit Hour
  Ethical Conduct of Research
- RPN 541 Ethical Conduct of Research 1 Credit Hour
- MST 601/MIR 503 MSTP Seminar/MIR Seminar 1 Credit (1/2 Semester)
- MIR 521 Journal Club 1 Credit Hour
- MIR PhD Research Credit Hours to be determined

Required Non-credit Courses:
- Top 10 Immunology Techniques
- Immunology Writing Course

Elective M.S.T.P. Courses (optional/not required):
(Students may also take electives in other departments)
- RPN 507/508 Observations in Clinical Oncology 1 Credit Hour

* Students are required to attend a seminar course and journal club every semester of their study. Since MSTP Seminar is only ½ a semester, the students are expected to attend MIR student seminar the remainder of the semester.
Course Descriptions (1)

**Molecular Immunology (MIR 511):** The Immunology series begins in the fall semester with a general course, “Molecular Immunology”, which is an introductory immunology course with an emphasis on molecular mechanisms of immunology. The course is coordinated by Dr. Sandra Gollnick and Dr. Scott Abrams and taught by the immunology faculty. This course is taught at the upper division level and assumes that the students have a background in both biochemistry and genetics. The course material includes textbook reading, lecture notes and articles from the current literature. This course is designed to give students sufficient background in basic immunology, as well as experience in reading and understanding the current literature, to prepare them for a more in-depth examination of topics in the Advanced Immunology course given in the Spring. The course is supplemented by Recitation/Exam Prep Sessions led by advanced Immunology students.

**Ethics/Conduct of Research (RPN 541):** Students are required to participate in the Medical and Scientific Ethics course headed by Dr. Norman Karin and taught by Immunology faculty at Roswell Park Cancer Institute. The topics covered include: scientific writing and data handling, biohazards and the worker’s right to know, animal use in research, research with human subjects, peer review, proprietary rights, conflict of interest/science and industry, human genome project, science and the media, medical and health care ethics, and identifying and reporting misconduct.

**Advanced Topics in Immunology (MIR 508)** is the flagship course of the Immunology training program. The course is coordinated by Dr. Yasmin Thanavala and Dr. Aimin Jiang and is team taught by Immunology faculty from both clinical and scientific departments at Roswell Park Cancer Institute. Lectures concentrate on an in-depth analysis of a variety of issues in current immunology. The course emphasizes current literature, problem solving and data evaluation. A unique feature of this course is that one lecture is given by an invited speaker (for example Dr. Polly Matzinger) from academia or industry with expertise in a topical area relevant to current advances in basic or clinical immunology. Students have further opportunities to interact with the guest speaker at a luncheon held after the class.

**Molecular Biology Series (BCH503/BIO504):** The two-semester series: “Biochemical Principles/Advanced Molecular Genetics”, is given in the Biology Graduate Program at the SUNY/Buffalo. The first semester (Fall) concentrates on principles of biochemistry of proteins, carbohydrates and nucleic acids) followed by a second semester (Spring) course that focuses entirely on advanced molecular biology. This course provides an in-depth, modern approach to molecular biology and also emphasizes the understanding of macromolecular interactions. Additional training in molecular biology issues related to immunology is provided by formal Immunology courses, electives, and research opportunities.

**Trends in Tumor Immunology (MIR 509):** This course is coordinated by Dr. Elizabeth Repasky and Dr. Aimin Jiang and is designed to give students an in-depth look at cutting-edge topics of importance in tumor immunology by examining current literature in a highly interactive forum. In addition, the course provides students with the experience to develop hypotheses, specific aims and experimental designs to address novel questions in each topic.
Course Descriptions (II)

**Oncology for Scientists Series:** Cancer Oncology (Oncology for Scientists, RPN 530/532) is team-taught by the faculty of the Roswell Park Graduate Division. "Oncology for Scientists" is designed as a two-semester introductory graduate level course on cancer covering the whole range of the disease process from the molecular level to clinical management. The first semester defines the morphological and molecular structure of the cancer cell, covering topics such as the cell cycle, cancer-associated genes, regulation of cancer cell protein expression, cancer genetics, immune system, carcinogenesis, metastasis, apoptosis, and laboratory research techniques. The second semester builds upon the theoretical basis of the previous semester, with lectures covering the hormones, chemotherapy and drug development. A large part of the semester is taught by the Institute medical staff and deals with the clinical and pathological description of various organ systems. Immunology faculty lecture in sections related to the immune system, immunotherapy, and immune-based cancers. Lectures on cancer epidemiology, prevention, statistics, bioinformatics, and clinical treatment (chemotherapy, cancer immunotherapy, diagnostic imaging, radiation therapy, photodynamic therapy) are also presented.

**Basics in Grantsmanship and Ethical Conduct of Research** (MIR 510). This is an introductory level course for graduate students in the biomedical sciences covering the anatomy of a scientific research grant; techniques of effective grant writing, the peer-review process for federal grant applications, and issues surrounding ethical conduct in research. The course organizer is Sharon Evans PhD and faculty include Scott Abrams PhD, Brahm Segal MD, and Joseph Skitzki MD. The course provides second year students with the toolbox of skills necessary for the preparation of a grant proposal to fulfill the qualifying exam requirement and for submission of successful predoctoral grant applications.

**Immunology Journal Club** (MIR 521/522): The importance of training students in the skills of critical review of published reports, and of effectively leading a discussion is recognized by the program faculty. The course is led by Dr. Mike Nemeth and Dr. Aimin Jiang. Faculty and students discuss current, late-breaking topics in immunology/tumor immunology. All students are required to participate by critically evaluating and presenting at least one current published paper per year, asking relevant and informed questions of presenters, and writing critiques on student presentations. The goals are to train students to critically evaluate the scientific literature and provide students with the experience of making oral presentations on diverse topics. An additional component of the course is a round table discussion in one class on the implications of publication misconduct.

**Immunology Student Seminar** (MIR 503/504): Students are required to present a formal seminar on their thesis research once a year. These presentations take place in the Student Seminar course, which is coordinated by Dr. Xuefang Cao and is attended by the faculty and all students in the program. Students are required to formally evaluate the presentations of their fellow students in order to train students in critical analysis of current research and to provide constructive criticism to the presenter. First year students present their work following each rotation; second year students present their Qualifying Exam Seminar in this forum.
NOTE: Effective Fall 2013 – there is no longer a requirement for additional elective courses. **Elective courses may be taken in the second year, upon approval by the DGS, but are optional.**

**Recommended elective:**

**Observations in Clinical Oncology (RPN507/508).** This course is designed to expose students to all facets of translational research. Students are partnered with a clinical mentor; the scope of the training is worked out on a case-by-case basis. Frequently students attend patient treatment planning sessions, Disease Site Research Group meetings, institute review of clinical protocols at the standing Scientific Review Committee (SRC) and Institute Review Board (IRB). Students often are given an opportunity to present at Disease Site Research Group meetings and to accompany their mentor on clinical rounds or surgery. Students prepare a brief written summary of their experiences at the end of the semester.

**Required Non-credit courses/workshops:**

**Top 10 Immunology Techniques (Non-credit course):** This is a student-led workshop aimed to familiarize incoming predoctoral students with commonly used techniques in tumor immunology (e.g., ELISA/Elispot, flow cytometry, PCR, Western blotting, and ChIP assays). The goal is to accelerate understanding of primary papers discussed in the Immunology Journal Club (MIR 521/522) and to provide students in the Immunology predoctoral program with the opportunity to gain teaching experience.

**Immunology Writing Course-Elements of Arguing a Position (Non-credit course):** This course coordinated by Sharon Evans, PhD and Jennifer Morrison, PhD (Director, Academic Writing Institute, State University of New York at Buffalo) aims to address the need to develop analytical and writing skills early on during training of predoctoral students. The course focuses on all aspects of the writing process relevant to scientific research. During Phase I (Fall semester of second year) topics include: analysis of research paper components; effective argument of a position; critical review of literature and critical evaluation of sources; problem areas in primary publications; and sentence structure/grammar. Students will write and evaluate assignments on the topic of ethical conduct of research. During Phase II (Fall of third year) students will critically evaluate their completed grant proposals from the Qualifying Exam requirement.
Overview of Graduate Program
Requirements (I)
(in addition to required coursework)

I. Seminars/Journal Club:

   **Seminar:** Every student will be required to give one seminar presentation/year. First year students will present their rotation experience, students in their second year and beyond will present research seminars.

   **Journal Club:** Students will give journal club presentations during the year.

II. Laboratory Rotations:

   The first year students will do three lab rotations. These rotations begin in October of the Fall semester. The Director of Graduate Studies must approve rotations. Rotations last 8-9 weeks. (See additional guidelines in subsequent section)

III. Ph.D. Committee:

   During the first year of the program, the Director of Graduate Studies will supervise and assist the student in planning their academic program and research activities. Students will establish their thesis committee in the Fall of their second year. The Doctoral Dissertation Committee must be comprised of at least three core members (the major professor and two additional core committee members) and a fourth member who is from an outside graduate program. **Each of the core members must be on the faculty of the Immunology graduate faculty and/or the NRSA T32 Tumor Immunology Training Grant as well as a Member of the UB Graduate Faculty.** The outside (fourth) member is generally a Member of the UB Graduate Faculty. *Associate Members* of the UB Graduate Faculty may not serve on doctoral dissertation committees as core members, but may serve as additional (e.g., fourth) committee member(s). On occasion, individuals who are neither Members nor Associate Members of the UB Graduate Faculty may serve as additional Dissertation Committee members if their expertise would be of significant value to the student and the core members of the committee. The thesis committee must be approved by the Director of Graduate Studies. Immunology Program members are listed in the handbook; the best way to determine whether someone has a graduate faculty appointment is to check the UB directory -- [http://www.grad.buffalo.edu/academics/facultyroster/roster.cgi](http://www.grad.buffalo.edu/academics/facultyroster/roster.cgi)
Overview of Graduate Program Requirements (II)
(in addition to required coursework)

IV. Thesis Committee Meetings:

Students are responsible for scheduling their meeting and updating the Graduate Program Administrator (Natalie Brock). Students are required to meet with their committee a minimum of once per year. Generally the thesis committee meeting is scheduled following the annual student seminar. Students should provide a brief summary of the project objectives and a copy of their slides for each committee meeting. The Chair of the Committee will be selected from the thesis committee members (excluding the mentor) and will be responsible for preparing a written progress report detailing strengths and weaknesses as well as recommendations for the project after each committee meeting. This progress report is typically based on a written summary of the meeting provided by the student. Following approval by all thesis committee members, progress reports are submitted to the Graduate Program Administrator, Chair of the Progress Committee, and Director of Graduate Studies.

A sufficiency meeting is required to determine if a student has made sufficient progress on the research project to allow him/her to write the dissertation. As part of this evaluation, the thesis committee will review plans to fulfill the publication requirement prior to the formal defense of the thesis. The thesis committee must also approve recommendations by the student/mentor for an outside reader. Subsequent approval of the outside reader must be obtained from the Director of Graduate Studies and the Dean of the RPCI Graduate Division.

V. Qualify Exam:

Each student is required to pass a qualifying exam at the end of his or her second year of study. The exam consists of three parts: (1) a seminar presentation of the specific aims of the dissertation proposal, (2) a written proposal in the NIH predoctoral grant format outlining his or her research project, and (3) an oral examination. The goal of the exam is to evaluate the candidate for comprehensive knowledge of the broad field of immunology in which his/her dissertation will focus. The student should also demonstrate the ability to apply analytical thinking to research questions and develop a linear strategy for investigating specific questions. See additional guidelines and instructions for qualifying exam in subsequent sections.
VI. Application to Candidacy (ATC):

The Application to Candidacy ("ATC") is required to formally establish candidacy for conferral of the Ph.D. degree. According to UB regulations, doctoral students must have their ATC submitted prior to registering for fewer than nine credit hours per semester. Immunology students typically register for less than nine credits at the beginning of the fifth semester (Year 3; after completing the Qualifying Exam). Therefore, Immunology PhD students are required to submit the ATC form prior to the semester in which they submit the Certification of Full-Time Status form. Additional guidelines for the ATC and Certification of Full-Time Status are provided in a subsequent section.

VII. Dissertation

A dissertation is expected to be an original and significant contribution to the broad discipline of immunology and/or tumor immunology. It should contribute to academic knowledge and be based on empirical research. Students are encouraged to present their findings at national or regional conferences. Prior to the oral defense of their doctoral dissertation, each doctoral student or MD/PhD student is required to publish a first-author, peer-reviewed report or, at a minimum, to obtain a favorable review that indicates a manuscript would be reconsidered at the same journal. In the absence of meeting the publication requirement, the oral defense can only proceed upon a student’s submission of a formal written petition and approval by the thesis committee and the Director of Graduate Studies/Program Chair. Additionally, the student must obtain approval of an outside reader by the thesis committee and the Director of Graduate Studies/Program Chair as well as the signature of the Associate Dean of Educational Affairs of the RPCI Graduate Division. The Outside Reader Appointment Form is available from the Departmental administrator (Natalie Brock). See additional guidelines and checklist for the thesis defense in a subsequent section.
Overview of Graduate Program Requirements (IV)
(in addition to required coursework)

VIII. Oral Defense of Doctoral Dissertation

The Ph.D. Degree is not completed, or conferred until the dissertation is approved by the thesis committee and successfully defended at an oral presentation before the entire Immunology faculty. When approaching the completion of his/her dissertation and after obtaining approval to write the dissertation from the thesis committee at the sufficiency meeting, the student is required to schedule a dissertation defense. The student is responsible for sending the Outside Reader Response Form, along with the dissertation to the outside reader and ensuring that this form is submitted to the Dean of the RPCI Division Graduate Program at least 1 week prior to the defense. Sufficient time should be given for the thesis committee members and the outside reader to read the written dissertation (generally 3-4 weeks). The oral defense must be attended by the candidate’s major professor, thesis committee, and outside reader although arrangements can be made via teleconference or Skype in some exceptional cases. Travel arrangements and the itinerary for the outside reader should be prepared in consultation with the Graduate Program Administrator (Natalie Brock). The student must inform the Graduate Program Administrator and Director of Graduate Studies in the Immunology Department at least one week in advance of the scheduled defense so that the department can post a public announcement of the defense. Students will present a seminar (~ 45 minutes long) on their dissertation research, followed by an open session for questions from the departmental faculty and student body and a closed session for examination questions from the thesis committee arising from the dissertation.
Overview of Graduate Program Requirements (V)
(in addition to required coursework)

IX. Timeline to Degree

The Ph.D. degree must be completed within seven years.

In order to graduate, the following must be on file in the Graduate School:

- An approved Application to Candidacy (with all necessary attachments, including original transcripts)
- An M-Form (Multi-purpose Form) which ensures that the defense of the dissertation was satisfactorily completed and that all academic requirements for the degree have been satisfied. This form must be signed by the major professor, the committee members, and the director of graduate studies or chair of the department. It is the student’s responsibility to ensure that this form is submitted to the Graduate School by the deadlines established for each conferral date.
- Electronic submission of dissertation through the Graduate School’s website: www.grad.buffalo.edu/etd
- Doctoral Degree Recipients Survey available on the Graduate School website: www.grad.buffalo.edu/etd

In addition, the Graduate School will verify satisfactory completion of all courses and minimum number of credits to be applied toward the degree.

X. Additional rules to remember

- Continuous registration must be maintained until the degree is conferred.
- Credits cannot be transferred from any course in which a grade lower than a B was earned.
- A minimum of 72 credit hours of graduate study must be completed

XI. Academic Review / Probation

The Director of Graduate Studies and Chair of the Progress Committee will review each graduate student’s transcripts at the end of each semester. Any student who fails to maintain a 3.0 GPA for one semester will be placed on academic probation. If the student fails to raise his/her GPA above 3.0 in the following semester, the student’s academic record will be reviewed by the Immunology Steering Committee and a student may be terminated from the Immunology graduate program.
Detailed Guidelines for Immunology Graduate Program
GUIDELINES FOR LABORATORY ROTATIONS

1. All rotations will be 8-9 weeks in duration. Each student must complete a minimum of 3 rotations. The dates for rotations for the 2014-2015 academic year are:
   a. First rotation: 09/15/14 - 11/21/14
   b. Second rotation: 01/12/15 - 03/13/15
   c. Third rotation: 03/23/15 - 05/08/15

2. Rotations must be completed by May 29, 2015.

3. Students are responsible for identifying a laboratory for rotation. Students will be provided with a list of labs that are accepting students. A minimum of two out of the three required rotations should be performed in a laboratory that has indicated willingness to take on a new student trainee. Faculty research presentations will be scheduled on 9/4 and 9/5/14.

4. The Director of Graduate Studies (DGS) must approve all rotations. Students must schedule a meeting with the DGS before/after each rotation or communicate via e-mail.

5. Students should schedule a meeting with their student advisors before/after each rotation for advice on laboratory selections.

6. In making the important decision regarding mentors, you need to carefully consider which lab is the best fit with respect to scientific interest and training opportunities.

7. Schedule a meeting with the PI to discuss research opportunities. Do your homework and be prepared – read PI’s papers and website, talk to other students, etc. so that you are familiar with the research before you meet with the PI.

8. The mentor must be willing and able to take on the responsibility of guiding and funding a new graduate student.

9. Mentors must be a full Member of the UB Graduate Faculty as well as a member of the Immunology Graduate Program or the NRSA T32 Tumor Immunology Training Program. A list of full Members of the Immunology Graduate Program is provided in the Immunology Graduate Studies Handbook (pgs. 8-10). In certain extenuating circumstances (e.g., need to learn a particular technique), it may be possible to rotate in a non-Immunology graduate program faculty’s lab without plans to join the lab for your dissertation research.

   Process for joining lab of non-Immunology graduate program faculty: Only in rare instances can a non-Immunology faculty member be considered as a mentor. In this case, a student should first discuss the situation with the DGS. It then needs to be determined if the faculty member is a full Member of the UB Graduate Faculty. If a rotation is approved, at the time of the final laboratory selection, a student would need to formally petition in writing the Immunology program steering committee for permission to join a lab in which the mentor is not a member of the Immunology graduate program.

   Students need to provide a compelling reason for joining an outside laboratory and explain how the proposed project fits into the Immunology program. A CV must be provided for the mentor (outlining track-record for training graduate students; commitment to graduate education and research). The mentor would also need to provide assurance that they can support a graduate student for the full period leading up to graduation. After review of these materials, a final decision will be made by the Immunology graduate program steering committee.
GUIDELINES FOR LABORATORY ROTATIONS

10. After each rotation, students will present a brief (~10 min) summary of their research experience in student seminar.

11. Selection of a laboratory for dissertation research cannot be made until after the third rotation. However, it is appropriate to indicate whether you have a strong interest in joining a particular laboratory.

12. Final selection of a laboratory for dissertation research must be made by 06/05/15.
Guidelines for Immunology Student Seminar (MIR 503)

2014-2015

Administrative issues:

1. Attendance is required for all Immunology graduate students. 1st/2nd year students must register for credit. While upper level students do not need to register for this course, their attendance is required on the honor system. However, any student who has been granted sufficiency does not need to present a seminar. The student is still encouraged to attend as a senior student and participate but is not required to present.

2. 3rd year students must meet with Dr. Cao the week before their scheduled seminar date to review their presentation. Students are responsible for scheduling meeting with Dr. Cao.

3. Annual thesis committee meetings should be scheduled on the same day as the student seminar. Students should notify their thesis committee about the date of their seminar in advance; hardcopies of slides should be provided to thesis committee members at the seminar.

4. A student moderator/facilitator will be assigned for each seminar. In this capacity, the student moderator will introduce the student speaker and oversee the question/answer session following the seminar. Students will be invited first to ask questions. Thereafter, the comments of the faculty will be solicited.

5. Seminar titles should be submitted by Thursday the week before seminar to Natalie Brock at natalie.brock@roswellpark.org for inclusion in the Immunology Weekly Calendar of Events (“cc” [copy] your email to victoria.copeland@roswellpark.org and xuefang.cao@roswellpark.org).

6. Changes in the presentation schedule must be reviewed and approved in advance by Dr. Cao.

7. Students are responsible for loading their presentations at least 10 minutes before the seminar.

8. Evaluation sheets completed during seminar by students and faculty are to be submitted to Dr. Cao. Students should meet with Dr. Cao immediately following seminar to define a time within the next week to review the comments in the Evaluation Sheets.

9. All students are required to sign the Attendance Sheet. Dr. Cao and Dr. Abrams (“cc” to Natalie Brock) must be contacted in the event that a student is not able to attend seminar for an approved reason (attending national/regional meeting, severe illness, or family emergency).

Seminar issues: cont’d on next page
Guidelines for Immunology Student Seminar – cont’d

Seminar issues:

1. Seminars should be on thesis research, with the exception of the first year students who will present an overview of their rotations.

2. Avoid attempting to cover your entire research proposal. Focus on one aspect of the investigation. Present a cohesive, focused idea with data that either support your hypothesis or caused you to change your direction. Practice your seminar several times before your scheduled presentation (use your peers!). Slides should be designed to give the audience a clear conclusion and take-home message. Speak clearly and interact with the audience as you make your points. Avoid reading your talk from notes or computer monitor; develop eye contact with audience. Make the audience interested in you and your ideas! It should be evident that you enjoy your research. Remember to have fun – tell a story.

3. Seminars are to be ~ 30 to 40 minutes long. The seminar should include: (a) Introduction; (b) Hypothesis; (c) Significance/Impact; (d) Innovation; (e) Objectives; (f) Conclusions; (g) Pitfalls and solutions; (h) Overall significance; and (i) Future plans.

4. Students should provide thoughtful answers to questions. Higher level answers often are supported by relevant experimental evidence from the literature or from the student’s own data. Knowing the author of a pertinent publication is very impressive to your audience.

5. Students should always look professional for a seminar. Work-casual attire is appropriate.

6. Remember – this is your seminar – learning how to give a great seminar is one of the most important skills you will need to enhance your career. Any suggestions for changes to student seminar format are welcomed.
Qualifying Exam Timeline (I):

**Step 1: June (Year 1): Preparation 1**
Select research laboratory

**Step 2: July – September (end of Year 1): Preparation 2**
Student receives their Seminar date from the Department. Selection of thesis committee. Student is responsible for notifying thesis committee about seminar date.

**Step 3: January-March (Year 2): Thesis Committee Meeting (required)**
Broadly discuss scope of project and aims (further delineation of aims will occur after QE seminar). A member of the qualifying exam committee is assigned by the Department for each QE who will moderate the QE seminar and closed session.

**Step 3: March-June (Year 2): Qualifying Exam Seminar**
Student prepares a draft of a Specific Aims page and departmental seminar to present his/her thesis proposal. This page will be a single page and will contain a brief intro/background section and the specific aims. The Specific Aims page must be provided to the qualifying exam committee, including committee chair, 1 week prior to the scheduled seminar. The student will present a departmental seminar on their proposed research topic. This will be given to the entire department and will encompass background information and broadly-based specific aims (see guidelines in subsequent sections).

The student’s thesis committee and a member of the qualifying exam committee will meet following the seminar to discuss the student’s performance and will award a pass/fail for this stage. This meeting will also include a detailed evaluation of the Specific Aims with the goal of helping the student to improve and/or modify them. The committee will vote to accept or not accept the aims.

**Step 4: Revision of Specific Aims**
The student will be given 1 week from their seminar date to modify/finalize their specific aims (if requested by the committee) and will provide the thesis committee and chair with a revised Specific Aims page for approval. The committee will vote to accept or not accept the aims.

**Step 5: Proposal Preparation:**
Once the Specific Aims page is approved, the student will be given 4 weeks to prepare a proposal. The proposal will be written according to the NIH NSRA pre-doctoral fellowship guidelines (see subsequent sections for more details).
Step 6: Oral Examination (Completed by September of 3rd year):

The oral exam is scheduled by the student and chair of the QE at least 1 week, but no more than 2 weeks after the thesis committee and a member of the qualifying exam committee receive the final draft of the proposal. The exam is a closed session, chaired by the qualifying exam committee member, and will cover areas of general immunology and the proposal. This exam will not include a formal seminar; however, the student can present an abbreviated seminar (2-3 slides maximum) summarizing the overall scope of the project, rationale, impact, Specific Aims and how the aims are to be tested. The examination typically lasts for 2 hours but may be longer if additional time is required for full evaluation of the candidate. The committee will vote to pass or fail the student based on this exam. Pass/fail is decided by majority vote by all members of the examination committee including the mentor. The student must pass the qualifying exam to become a Ph.D. candidate. For passing students a recommendation might be made, in some instances, for additional assignments to address deficiencies in specific areas (e.g., presentations on a particular topic in lab meeting/student seminar) or to shorten the time to the next thesis committee meeting.

Students who fail the oral examination will be required to take an oral retest. In some cases, students may also be requested to rewrite the proposal for the retest. An additional QE committee member will participate in the retest. The student must pass the retest to remain in the graduate program. Failure to pass the oral examination will result in the student receiving a terminal Master degree.

Basis for petition for reexamination: Should a student fail the retest, petitions for a reexamination will only be considered by the DGS based on irregularities in the process, not on the committee's decision per se. In the event that a reexamination is deemed justified, a newly constituted committee will be convened that includes members of the parent QE committee (chair of QE committee plus two members). The mentor will not be involved in the final reexamination.
General Comments:

The purpose of this presentation is two-fold: 1) to evaluate the student's ability to clearly present and defend the rationale, hypothesis and Specific Aims of their proposal in an oral format and 2) to enable the thesis committee and qualifying exam committee member to evaluate the proposed Specific Aims. The student's thesis committee and a member of the qualifying exam committee will meet following the seminar to discuss the student's performance and will award a pass/fail for this stage. This meeting will also include a detailed evaluation of the Specific Aims with the goal of helping the student to improve and/or modify them.

The week before your seminar, provide your committee and the Qualifying exam member with a Specific Aims page, which should be made up of a paragraph outlining the problem you are going to address, the hypotheses you are testing, the specific aims you are using to test these aims, and the broad long-term objectives of this research. This should not be more than a single page in length. It is important to get your message across clearly and succinctly. Additional guidelines on format/content of the Specific Aims are in the instructions for the written proposal in subsequent sections.

The Specific Aims page should:

1. cover the background to the question - it is important for someone to understand the significance of this area of investigation
2. highlight what information is lacking in the field (i.e. emphasize novelty of project)
3. elucidate a clear hypothesis of the proposed study
4. briefly mention preliminary data or supporting literature that led to the hypothesis (if this is pertinent)
5. focus aims to address the specific questions
6. state significance of proposed study to the field

Prior to the seminar, the proposed Specific Aims have not been approved; therefore, experimental designs to test the Specific Aims should not be presented in detail in the seminar.

Preliminary data is NOT required, but may be used to support the rationale for the proposed Aims. Presentation of supporting information from the literature is also permitted.
Additional Specific Comments for QE Seminar Presentation:

The seminar should include Background, Significance, Rationale, Hypotheses and Specific Aims.

The seminar should briefly sketch the background leading to the Specific Aims, critically evaluate existing knowledge, and specifically identify the gaps that the project is intended to fill.

How those gaps are to be filled by the current proposal should be provided in terms of hypotheses and rationale, which led to Specific Aims to test the hypotheses.

It is also important to state concisely the importance and health relevance of the research described in the proposed project by relating the specific aims to the broad, long-term objectives. If the aims of the application are achieved, state how scientific knowledge or clinical practice will be advanced, i.e., state the significance of the research proposal in order to provide the answer to the questions: “So what, who cares, why bother?”

The seminar should be ~45 minutes in length.

Slides should be numbered and copies of the slides should be provided to the committee before/at the seminar.
Preparation of QE Written Proposal (I)

The written proposal should follow the requirements for an NIH/NCI NRSA F30/F31 predoctoral fellowship application – see specific instructions below as well as the Department of Health and Human Services Instructions at http://grants.nih.gov/grants/guide/pa-files/PA-11-111.html for additional directions.

Additionally, information about what needs to go into each section and why this is so important is provided in the Basics in Grantsmanship course (MIR 510) taken by all Immunology predoctoral students in the Spring semester of their second year, preceding the qualifying exam. Natalie Brock also has on reserve a book from NIH, 'Grant Writers' Workbook' that discusses grantsmanship guidelines.

Format Specifications
Follow instructions for font and format specifications.

Font
Use an Arial, Helvetica, Palatino Linotype or Georgia typeface, a black font color, and a font size of 11 points or larger. A symbol font may be used to insert Greek letters or special characters; the font size requirement still applies.

Type density, including characters and spaces, must be no more than 15 characters per inch.

Type may be no more than six lines per inch.

Use black ink that can be clearly copied.

Print must be clear and legible.

Paper Size and Page Margins
Use standard size (8 ½ " x 11") sheets of paper.

Use at least one-half inch margins (top, bottom, left, and right) for all pages.

Page Formatting
The application must be single-sided and single-spaced.

Consecutively number pages throughout the application.
Preparation of QE Written Proposal (II)

Figures, Graphs, Diagrams, Charts, Tables, Figure Legends, and Footnotes
A smaller type size is acceptable, but it must be in black ink, readily legible, and follow the font typeface requirement.

Grantsmanship
Use English and avoid jargon.

If terms are not universally known, spell out the term the first time it is used and note the appropriate abbreviation in parentheses. The abbreviation may be used thereafter.

Page Limits
All proposals must follow the page limits described in table below. All tables, graphs, figures, diagrams, and charts must be included within the Research Strategy page limit. Suggestions for Suggested lengths of subsections within the Research Strategy are also indicated on table.

<table>
<thead>
<tr>
<th>Section of application</th>
<th>Page limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>1 page</td>
</tr>
<tr>
<td>Specific Aims</td>
<td>1 page</td>
</tr>
<tr>
<td>Research Strategy (excluding references)</td>
<td>6 pages</td>
</tr>
<tr>
<td>• Significance (1-2 pages)</td>
<td></td>
</tr>
<tr>
<td>• Approach (3-4 pages)</td>
<td></td>
</tr>
</tbody>
</table>

Title of Project
Do not exceed 81 characters, including the spaces between words and punctuation. Choose a descriptive title that is specifically appropriate.

Research Plan Format
The Research Plan should be self-contained and include sufficient information to evaluate the project, independent of any other document. Be specific and informative, and avoid redundancies. For grant writing tips, see http://grants.nih.gov/grants/grant_tips.htm. Carefully follow all instructions.
Preparation of QE Written Proposal (III)

Content of Research Plan
The Research Plan consists of the following items. Begin each section of the Research Plan with the following section headers:

1. Specific Aims (1 page)

2. Research Strategy (6 pages)

The Research Strategy Section is composed of three distinct sections – Significance, Innovation, and Approach. Note the Approach section also includes Preliminary Studies (optional).

Detailed description of components of Research Plan:

Specific Aims (1 page limit)
State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved.

List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.

Research Strategy (6 page limit)
Organize the Research Strategy in the specified order and using the instructions provided below. Start each section with the appropriate section heading—Significance, Innovation, Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the Bibliography and References Cited section.

(a) Significance
Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.

Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.

Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.
Preparation of QE Written Proposal (IV)

For NIH F30/F31 predoctoral applications a separate *Innovation section* should not be included. However, it can be powerful to include concepts related to innovation within the Significance section, i.e., explain how the application challenges and seeks to shift current research or clinical practice paradigms.

Describe any novel theoretical concepts, approaches or methodologies, instrumentation or intervention(s) to be developed or used, and any advantage over existing methodologies, instrumentation or intervention(s).

Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation or interventions.

(c) **Approach**

Describe the overall strategy, methodology, and analyses to be used to accomplish the Specific Aims of the project. Include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate.

Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.

If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.

(d) **Preliminary Studies**

Discuss the preliminary studies and/or data pertinent to this application if appropriate. Remember that preliminary data are **NOT** required for the qualifying exam proposal. However, preliminary data can be an essential part of a research grant application and help to establish the likelihood of success of the proposed project.

**Bibliography and References Cited**

Provide a bibliography of any references cited in the Research Plan. Each reference must include names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Follow scholarly practices in providing citations for source materials relied upon in preparing any section of the application. *The references should be limited to relevant and current literature.* While there is not a page limitation, it is important to be concise and to select only those literature references pertinent to the proposed research.
Guidelines for Submission of the Application To Candidacy (ATC)

- **Time-line:** Being approved to candidacy is an important milestone that indicates your progression into the final, research-focused phase of your training. According to UB regulations, doctoral students must have their ATC submitted prior to registering for fewer than nine credit hours per semester. For Roswell students this is typically the beginning of the fifth semester. Therefore, we will require that PhD students submit the ATC form prior to the semester in which they submit the Certification of Full-Time Status form. Note that completion of the Prelim/Qualifying Exam is not a prerequisite for submission of the ATC.

- Students must be in good academic standing (GPA > 3.0) and have a minimum of 36 credits to submit ATC.

The ATC form can be downloaded from UB Graduate Program website (http://grad.buffalo.edu/content/dam/www/graduate/documents/students/atc.pdf).

- Students are required to attach a copy of their unofficial UB graduate transcript as described in the form instructions.
- A copy of the completed ATC must be submitted to the Graduate Program Administrator, Natalie Brock, prior to submission to Dr. Norm Karin’s office in the Education Department for final signature before being sent to UB.

The following signatures are required:
Student
Major Professor
Committee Member(s)
Chair or Director of Graduate Studies
Academic Dean – Dr. Hershberger
*No Divisional Committee signature is required!*

On a related issue, the Certification of Full-Time Status form (http://grad.buffalo.edu/content/dam/www/graduate/documents/students/certfts.pdf) only needs to be submitted once unless the degree conferral date changes. In that event, a new Full-Time form should accompany the Amendment to the ATC (http://grad.buffalo.edu/content/dam/www/graduate/documents/students/pet_amend.pdf).
GUIDELINES & CHECKLIST FOR THESIS DEFENSE
DEPARTMENT OF IMMUNOLOGY

The following is a guideline in preparation for a thesis defense. It is recommended that this form be used by both the mentor and student. Check the corresponding box as you move along in your planning. You are responsible for obtaining appropriate signoff by the DGS or Program Chair.

1. Sufficiency meeting (DGS or Chair signature: _________________)

2. Publication requirement fulfilled (DGS/Chair signature: _________________)

3. Mentor and student identify outsider reader (Outside Reader Form can be obtained from Natalie Brock)

4. Get outside reader approval from the Thesis Committee, Director of Graduate Studies, and Dean of RPCI Graduate Division

5. Outside reader must agree to review and attend seminar

6. Establish a defense date

7. Check availability of members who must be in attendance on the day of your defense
   • Chair
   • Outside Reader
   • Committee Members
   • Director of Graduate Studies
   • Dean, RPCI Graduate Division

8. Notify Natalie of outside reader – she will arrange travel (flights), hotel, honorarium, itinerary (meals, conference rooms)

9. Copy of thesis given to Chair, DGS, Outside Reader, and Committee Members
   3-4 weeks prior to tentatively scheduled defense date

10. Student responsible for providing outside reader with Outside reader approval form and following up so form submitted to RPCI Dean’s office one week prior to defense

11. Thesis defense announcement must be sent out one week prior to defense.

12. M-Form - is a fillable online form that should be completed, printed, and signatures obtained on the day of Defense.
    http://www.grad.buffalo.edu/forms/faculty/MForm.pdf

13. Submit signed M-Form to Natalie Brock to be held until final completion of requested revisions to thesis are completed.
New Student Information
Thursday, August 21, 2014

7:30 am - 12:30 pm  Roswell Park Cancer Institute orientation hosted by Dr. Norman Karin (Associate Dean) and Dr. Richard Hershberger (Chief Academic Officer)

12:30 pm  Graduate program Administrator, Natalie Brock, will meet new students at the Gaylord/Cary Room, Research Studies Center (RSC) and escort to the Center for Genetics and Pharmacology (CGP), Team Meeting Room, L5-130

12:45 - 1:30 pm  Lunch with graduate students

1:45 - 3:30 pm  Immunology Graduate Program Orientation, CGP L5-130
   Dr. Scott Abrams, Director, Immunology Graduate Program
   Ms. Natalie Brock, Administrator of Graduate Studies, Immunology Graduate Program

3:30 pm  Campus Tour (Adaobi Amobi and Danielle Twum) - Main Office; Drs. Lee & Abrams offices; Java lab, cafeteria, flow facility, employee health clinic, DLAR, Core facilities

Free Time

Friday, August 22, 2014

All New Students:  UB orientation at the North Campus; refer to the schedule you received from UB

Sunday, August 24, 2014

Last day for all new students to register for Fall 2014 classes without $40 late fee

Tuesday, August 26, 2014

9:00 am  Organizational meeting and first class for Molecular Immunology MIR 511 (Gollnick) Grossberg Library, Cancer Cell Center (CCC), Rm. 314

12:00 pm - 1:00 pm  Organizational meeting for Student Seminar MIR 503 (Cao)
   Zebro Conference Rm. – first floor of the CGP – Rm. M1-306

1:30 pm – 2:30 pm  Organizational meeting for Journal Club MIR507/521 (Abrams/Jiang/Nemeth)
   Grossberg Library, Cancer Cell Center (CCC), Rm. 314
Tuesday, September 2, 2014

Last day to drop/add courses without financial penalty

1:30 pm - 2:30 pm  First Journal Club MIR507/521 (Jiang/Nemeth)
Grossberg Library, Cancer Cell Center (CCC), Rm. 314

Thursday, September 4, 2014

1:00 pm - 3:00 pm  Individual Faculty Research Presentations for Rotation Selection
CGP, Team Meeting Room L5-130

Friday, September 5, 2014

11:00 am - 3:00 pm  Individual Faculty Research Presentations for Rotation Selection
CGP, Team Meeting Room L5-130

Tuesday, September 9, 2014

12:00 pm - 1:00 pm  First Student Seminar MIR 503
Zebro Conference Rm. – first floor of the CGP – Rm. M1-306

Monday, September 15, 2014

First lab rotation begins

Sunday, October 21, 2014 - Tuesday, October 22, 2014

Notes for New Students

Natalie Brock is the Graduate Program Administrator for Immunology. She is located in the Center for Genetics and Pharmacology (CGP), Rm. L5-309, and can be reached by phone in-house at extension 3257.

The Director of Graduate Studies is Dr. Scott Abrams, CGP Rm. L5-314, x4375. He should be contacted for academic guidance and any problems that you have with the Program.

The Chair of the Immunology Graduate Program is Dr. Kelvin Lee, CGP Rm L5-318A, 845-4106.

Dr. Norman Karin the Associate Dean of Education at Roswell Park Cancer Institute. He can also answer your questions. His number is 845-4630.

Please notify Natalie of any address changes. Inform her of classes for which you have registered each semester, as this information is kept on file. When you switch labs (there are three rotations), let her know where you are (room number and phone extension). Also, you need to go online to the UB website and print your grades and current GPA at the end of each semester and give it to Natalie for your file. You must maintain a GPA of 3.0 or better to remain in good academic standing for our Program.

Payroll is processed on a bi-weekly basis. On the Tuesday at the end of the pay period, your timecard must be signed electronically in eTime in order for Payroll to release your paycheck to us for distribution. An email will be sent to stop by Natalie to sign off on your eTime. There is an Institute policy in place stating if you fail to sign off on your time in eTime three (3) times in a one year period your direct deposit will be suspended. Remember that you can complete a direct deposit form and have your pay automatically deposited into your bank account; a First Niagara ATM is located on the first floor of the main hospital building.

You are required to request time off approval from the Director of Graduate Studies (DGS) during your lab rotation period. After you have selected a thesis advisor, approval requests should be addressed to your advisor and the DGS. An Institute required Administrative Leave Form (A+ request) must be utilized in advance of attendance at all out-of-town conferences, followed by the timely filing of your expenses. Do not presume you are authorized to attend conferences. There is a Immunology Program specific mandatory Student Travel Approval Request Form that must be completed and given to Natalie prior to the anticipated date of travel. Please provide Natalie with this completed and signed form and she will generate the A+ request. This form is a fillable PDF that can be downloaded from the internal website and can only be accessed on campus at https://i2.roswellpark.org/#/pages/read/9a5790d0-4337-4c43-a1ec-ffbf03839f7f

Most of the Graduate School information, as well as course registration, can be found online. Please use the online system to register and check your grades. The UB Graduate School Website address is http://www.grad.buffalo.edu. You will find required forms and links to required forms specific to the Immunology PhD program and for the Graduate Program (UB requirements) on the Immunology Graduate Program Page on i2 on the internal website at (can only be accessed on campus) https://i2.roswellpark.org/#/pages/read/9a5790d0-4337-4c43-a1ec-ffbf03839f7f

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STUDENT TRAVEL APPROVAL REQUEST

THIS FORM MUST BE COMPLETED BY THE STUDENT AND SIGNED BY STUDENT’S MENTOR PRIOR TO ANY TRAVEL. RETURN THE SIGNED FORM TO NATALIE BROCK. RECEIPT OF THIS FORM WILL INDICATE APPROVAL OF STUDENT’S TRAVEL AND/OR TRAVEL RELATED EXPENSES. ONCE RECEIVED, A+ WILL BE COMPLETED.

STUDENT’S NAME: ______________________________________________

DESTINATION: ______________________________________________

PURPOSE OF TRIP: ______________________________________________

DATE OF DEPARTURE: _________________________________ DATE OF RETURN: _________________________________

ESTIMATED TRAVEL COST $: _________________________________

TRAVEL TO BE PAID BY MENTOR? YES NO PARTIAL

By indicating YES, the mentor is agreeing to reimburse student for all travel related expenses.

PROJECT/GRANT#: _________________________________

PRESENTING A POSTER/ABSTRACT? YES NO N/A

GIVING ORAL PRESENTATION? YES NO N/A

TRAVEL AWARD RECEIVED? YES NO N/A

IF YES, SPONSOR AND AMOUNT: _________________________________

ABSTRACT/POSTER AWARD RECEIVED? YES NO N/A

Please inform Natalie Brock upon your return of any award received at the conference.

IF PRESENTING A POSTER/ABSTRACT OR GIVING AN ORAL PRESENTATION PLEASE PROVIDE COMPLETE TITLE, AUTHORS, ETC.

________________________________________________________________________________

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________________________________________________________________________________

SIGNATURE OF TRAVELER: ______________________________________________

APPROVED NOT APPROVED

SIGNATURE OF MENTOR: ______________________________________________

DATE: _________________________________
What To Do When You Arrive

1. Enroll with a new local bank (First Niagara, Key Bank, M & T, Citibank) – ask for graduate student banking - consider setting up direct deposit.

2. Parking at RPCI campus – Human Resources will provide you with the current parking details. RPCI has a parking ramp, several surface lots. Depending on your choice of parking location, wait lists may be applicable. Monthly deductions can be made from your pay check. Also, 2 hr. free parking and metered parking are available on the side streets outside the hospital. Refer to the UB website for information concerning their shuttle service between campuses.*

3. RPCI Education provided you with a form for your RPCI ID badge. If you lose your ID you will have to pay a replacement fee.

Forms to complete:

Lab coats - Please see Tonia Copeland, Department Secretary, for information regarding acquiring a lab coat.

Lockers - Please see Tonia Copeland, Department Secretary, for a locker assignment.

Personal Information sheet - Return completed form to Natalie (form in folder).
University at Buffalo
General Information

1. UB Orientation is held on the North campus on Friday, August 22, 2014.

2. Sign up with UB Micro for free computer software, internet access and UB email; extracurricular activities.

3. Get UB ID card at UB North, 101 Commons (645-6344) or UB South – necessary for class registration (gives you your person #) – refer to the UB website for applicable fee.


5. Submit your tuition bill to Natalie as soon as you receive it. The Program is not responsible for payment of late payment fees.
First Year Students & Graduate Advisory Committee 2014-2015

Faculty advisor and committee chair: Scott Abrams, PhD.

<table>
<thead>
<tr>
<th>1st Year Student</th>
<th>1st Year Graduate Advisor</th>
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<tbody>
<tr>
<td>Sean Colligan</td>
<td>Nick Leigh</td>
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<tr>
<td><a href="mailto:seanc07991@gmail.com">seanc07991@gmail.com</a></td>
<td><a href="mailto:Nicholas.Leigh@RoswellPark.org">Nicholas.Leigh@RoswellPark.org</a></td>
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<td>(BS, SUNY at Geneseo)</td>
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<td>Tiffany Emmons</td>
<td>Colleen Netherby</td>
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<td><a href="mailto:tiffany.emmons@umontana.edu">tiffany.emmons@umontana.edu</a></td>
<td><a href="mailto:Colleen.Netherby@RoswellPark.org">Colleen.Netherby@RoswellPark.org</a></td>
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<tr>
<td>(MS, Univ of Montana)</td>
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<tr>
<td>Shivana Maharaj</td>
<td>Adaobi Amobi</td>
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<td>Guanxi Qiao</td>
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<td><a href="mailto:Wei.Du@RoswellPark.org">Wei.Du@RoswellPark.org</a></td>
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<tr>
<td>Riddhi Mahapatra</td>
<td>Danielle Twum</td>
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<td><a href="mailto:riddhi.mahapatra@gmail.com">riddhi.mahapatra@gmail.com</a></td>
<td><a href="mailto:Danielle.Twum@RoswellPark.org">Danielle.Twum@RoswellPark.org</a></td>
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