PREFACE

This manual is intended to be useful for both students and faculty in the Field of BMCB as a source of information on Field policies. In putting it together, we have drawn heavily on a similar manual for the Field of Genetics, Genomics and Development, most recently assembled by Eric Alani and Paul Soloway. We thank them for their efforts.

If you have corrections or suggestions for changes, please email them to Vic Shaff (ves3@cornell.edu), Casey Moore (kathleen.moore@cornell.edu) or Ginger Tomassini (glt38@cornell.edu).
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Program Overview

Viewed broadly, the research focus of the Graduate Field of Biochemistry, Molecular and Cell Biology is to uncover the fundamental chemical, biochemical, molecular biological, and cell biological principles that govern all forms of life. One hallmark of the Field of BMCB is its breadth of research areas and its interdisciplinary approach. A second hallmark of BMCB is the many productive interactions and collaborations across the entire spectrum represented by the Field. Cutting edge technologies in genomic, computational, structural and imaging, and nanobiotechnology are employed to study the fundamental processes such as: mitosis and membrane trafficking, transcriptional regulation and DNA replication, macromolecular machines and physiological responses in whole animals. The Field of BMCBs is one of the largest graduate programs in the biological sciences at Cornell University, and has enjoyed continuous support from the National Institutes of Health for over 30 years through its pre-doctoral student Training Grant in Cellular and Molecular Biology. The Field has a long tradition of providing a nurturing and supportive environment for the successful training of graduate students.

Faculty in the BMCB Field
(see http://bmcb.cornell.edu/faculty/index.html for more details)

A. Faculty Actively Training Graduate Students

Eric E. Alani: Genetic and biochemical studies in *Saccharomyces cerevisiae* aimed at understanding the role of DNA mismatch repair in maintaining genome stability

Yimon Aye: Biocompatible synthetic methodology; chemical biology; mechanistic biochemistry; mammalian cell biology

Barbara A. Baird: Structures and molecular mechanisms of cell surface receptors operative in immune responses

Daniel Barbash: Molecular evolution

Anthony P. Bretscher: Microfilament organization and function in animal and yeast cells

William J. Brown: Intracellular membrane trafficking and organelle biogenesis

Richard A. Cerione: Signal transduction; growth factor receptors

Joshua Chappie: Structure and function of nucleotide-driven molecular machines; bacterial pathogenesis and defense systems; protein-nucleic acid interactions; X-ray crystallography

Ruth Collins: Mechanism of action of Rab GTPases

Brian Crane: Research in the Crane Group is directed towards understanding interactions among proteins, electrons, and photons

Scott Emr: Cell signaling and membrane dynamics

Gerald W. Feigenson: Lipid-proteins interaction; membrane structure; cholesterol; Monte Carlo simulation

Thomas D. Fox: Mitochondrial genes; nuclear gene regulation

Chris Fromme: How cells maintain their internal organization through regulated protein transport and membrane trafficking events

Maria J. Garcia-Garcia: Regulation of cell motility during embryonic development in mice and flies

Michael L. Goldberg: Drosophila genetics; molecular analysis of transvection effects and mitotic mutants

Andrew Grimson: Eukaryotic gene regulation, post-transcriptional gene regulation, small RNAs, microRNA (miRNA), 3’ UTRs, evolution

Chun Han: Dendrite development; dendrite degeneration; dendrite/neuronal environment interaction; neural development
Maureen R. Hanson: RNA processing in plant organelles; cell biology of organelle interactions
John D. Helmann: Regulation of gene expression; enzymology of RNA polymerase
Fenghua Hu: Axon regeneration and neurodegeneration
Tim C. Huffaker: Microtubule assembly and function and yeast cells/mechanisms of chromosome segregation
Toshi Kawate: Molecular mechanisms of extracellular signaling; membrane receptors; ion channels; X-ray crystallography; electrophysiology; biochemistry
Ailong Ke: X-ray crystallography; structural biology and biochemistry focusing on RNA 3'-end formation and turnover and RNA-protein complexes
Kenneth Kemphues: Cell biology in early embryonic development in *C. elegans*
Natasza Kurpios: Tissue morphogenesis, cell shape & architecture; organ development; gut morphogenesis; mammary gland biology; breast cancer
Jan Lammerding: Cellular biomechanics; mechanotransduction signaling; nuclear envelope proteins; cancer; muscular dystrophy and heart disease; premature aging; stem cells
Siu Sylvia Lee: Molecular determinants of longevity and stress response
Sergiy Libert: Aging; longevity; sirtuins; behavior; neurodegeneration
David M. Lin: The Lin lab uses molecular, genetic and genomic tools to study the development and degeneration of the nervous system, focusing on the mouse olfactory system
Hening Lin: Enzyme function & regulation of metabolism
Maurine Linder: Regulation of signal transduction and protein trafficking by palmitoylation.
John T. Lis: Gene regulation and chromatin structure
Jun "Kelly" Liu: Mechanisms of signal transduction (BMP signaling); cell fate diversification and differentiation of pluripotent progenitor cells in the mesoderm
Jason Locasale: Cancer metabolism; systems biology; epigenetics; computational biology; metabolomics; cancer genomics
Julius Lucks: RNA biology; RNA folding; gene regulation; next generation sequencing
Yuxin Mao: Structural biology; membrane trafficking; phosphoinositide signalling
June B. Nasrallah: Cell-cell interactions in plants; molecular mechanisms underlying cell surface receptor action; signal transduction
Linda Nicholson: Structural and dynamics studies of phosphorylated and unphosphorylated pp60c-src; structural and dynamics studies of yeast MCM1
Alexander Nikitin: Cancer pathogenesis, stem cells, microRNAs, genetically modified mouse models, stem cell pathology
Jeffrey Pleiss: RNA biology
Ling Qi: Obesity; diabetes; inflammation; ER stress; gut homeostasis
Shu-Bing Qian: Protein synthesis and degradation, mRNA translation and aging research
David Russell: Interplay between *Mycobacterium tuberculosis* and its host cell, the macrophage
John Schimenti: Mammalian genetics; reproductive biology; maintenance of genome integrity and development
Frank Schroeder: Structures and biological functions of small molecular metabolites in *C. elegans* and other model organisms
Carolyn Sevier: Signaling of cellular oxidative stress; molecular mechanisms used by cellular pathways that sense and signal redox imbalances within the cell
Marcus Smolka: Proteomics; cell signaling; DNA damage response
Paul Soloway: Functional genomic analysis in mice; epigenetics; innate immunity
Holger Sondermann: Molecular mechanism and regulation of cellular signal transduction
David B. Stern: Gene expression in chloroplasts and mitochondria
Patrick Stover: Regulation of folic acid-mediated one-carbon metabolism; determination of the metabolic role of leucovorin/ elucidation of the factors that contribute to serine hydroxymethyltransferase gene expression; regulation of glycine synthesis

Tudorita Tumbar: Molecular control of tissue stem cells in the mouse; cell signaling; nuclear structure and function; skin morphogenesis and homeostasis

Volker M. Vogt: Structure and assembly of retroviruses

Michelle Wang: Studies of biological molecular motors using biophysical techniques

Robert Weiss: Molecular mechanisms for the maintenance of genomic stability; cellular responses to DNA damage; mouse models of human cancer

Gary Whittaker: Entry of influenza and coronaviruses into host cells

David Wilson: Genetic engineering of cellulose degradation; bioremediation of heavy metals.

Mariana Wolfner: Molecular genetics of insect reproductive proteins; molecular genetics of egg activation in Drosophila

Haiyuan Yu: Protein and gene networks

B. Faculty No Longer Training Graduate Students but Active in the BMCB Field

Andre Bensadoun: Molecular biology and biochemistry of lypolytic enzymes

Steven E. Ealick: X-ray crystallography; structure-based drug design; synchrotron radiation research

Susan A. Henry: Genetic regulation of membrane phospholipid synthesis in yeast

George P. Hess: Biochemical, chemical and physical studies of membrane-bound proteins regulating communication between cells of the nervous system

Peter C. Hinkle: Structure and function of membrane transporters

Sondra G. Lazarowitz: Virus-host interactions; nuclear shuttling in plant cells

Jeffrey W. Roberts: Procaryotic gene expression; transcription mechanisms; control of DNA repair

David I. Shalloway: Theoretical prediction of protein conformational changes; computer algorithms for structural biology; Src and other oncoproteins in the cell-cycle

Bik-Kwoon Tye: Cell cycle and developmental regulation of the initiation of DNA replication in eukaryotes

Watt W. Webb: Cellular and membrane biophysics; molecular mobility; channel molecules and transmembrane signaling; physical optics; biomedical instrumentation
1) REGISTRATION

New students should register on the first day of registration week; continuing students may register on any day of registration week except the first day of registration: http://www.gradschool.cornell.edu/requirements/registration.

All students must register at the beginning of each term including summer unless he or she withdraws, is granted a leave of absence, or completes the degree. Course enrollment can be completed any time during the first three weeks of classes, but should be done as soon as possible. Talk with your major professor, the Director of Graduate Studies (DGS), and committee about what courses to enroll in. Before you register each term, your bursar’s bill should acknowledge the receipt of your financial assistance. If not, check with a Field Assistant (107 Biotech Building) to rectify the situation.

You must also register for the summer semester by the end of May. This is necessary if you plan to use university facilities such as libraries, computer centers, and the Gannett Health Center. Note that you cannot receive a paycheck unless you are registered for the summer semester. If you register after May 31, FICA taxes will be withdrawn from your paycheck. You can now register for the summer online at the Graduate School web site: www.gradschool.cornell.edu.

If you are not going to be present for registration due to university business, you must notify the Field Assistant to avoid paying the late registration fee ($200). During August and January, the Graduate School asks the Graduate Field Assistants for the names of any graduate students who will have to register late because of an absence due to field research or conference attendance. Any student appearing on this list will not be charged the late registration fee. Please notify the Field Assistant and request that a waiver of the late registration fee be filed and provide her with the reason for your absence from campus. It is a good idea to put your name on this list even if there is only a slight possibility of missing registration. There is a three week grace period after registration before a late filing fee is charged.

2) SPECIAL COMMITTEES

One of the most important decisions you will make as a graduate student at Cornell is the selection of your Special Committee. The progress of each graduate student is guided and supervised by the Special Committee, which consists of the thesis research supervisor (the Chairperson of your committee and your major professor), a faculty member representing a minor subject (chosen by the student; see below), and another faculty member from the Field of BMCB. Occasionally, students include an extra faculty member on their Special Committee for additional expertise. Students assemble a Special Committee at the end of the first year, but are encouraged to begin seeking the advice of possible members earlier, since much of the student’s coursework is taken during the first year. The DGS serves as your Chairperson and adviser until you choose a Special Committee.

The Special Committee system offers great flexibility to the Ph.D. program since it permits tailoring of the program to your specific interests. We encourage you to talk to other graduate students and faculty and to seek as much information as possible before selecting your committee members. Make an appointment to meet with each of your potential committee members and bring relevant materials to the meeting (e.g., curriculum vitae, course records, and summary of research plans if possible). Be prepared to discuss why he or she would be an appropriate committee member. It is important that you both
understand each other’s expectations: what courses will they require, what assistance they can provide for certain experiments, etc.

As your research program develops, don’t panic if you realize that someone else might be more appropriate. Until your third semester, you can request Committee formation and change on-line in your Student Information Center (studentcenter.cornell.edu). After your third semester or enrollment or your A-Exam, you must ask the Graduate School for a paper copy of the form. (Changing your Committee after your A-exam also requires a general petition to the Graduate School to request a change in your Committee. All of your new Committee members must avow, in writing, that they accept the results of your A-Exam.

You are required to meet with your entire committee at least once a year to discuss progress and plans (see PROGRESS REPORTS). It is the student’s responsibility to arrange the meeting. This meeting should take place as soon as possible after your Monday seminar, and certainly within two weeks of the seminar. Regular meetings with the full committee (a minimum of once a year) will help keep your program on track and can help avoid those awful moments at your defense when a committee member asks why you did not do this control or that experiment. You can also meet with them individually along the way. Use your committee for guidance and feedback. That’s why they are there.

3) REQUIRED COURSEWORK IN THE MAJOR

FIRST YEAR STUDENTS

Laboratory research:
BIOMG 8310 Advanced Biochemical Methods I - Lab 01 (weeks 1-7) (Pleiss, Grimson, Smolka; fall)
BIOMG 8310 Advanced Biochemical Methods I - Lab 02 (weeks 8-14) (staff; 1st rotation; fall)
BIOMG 8320 Advanced Biochemical Methods II (staff; 2nd and 3rd rotations; spring)
BIOMG 8370 Problems in Biochemistry, Molecular and Cell Biology (Smolka, fall)

One protein course:
BIOMG 6310 Protein Structure, Dynamics, and Function (Nicholson; fall)

One cell biology course:
BIOMG 6360 Functional Organization of Eukaryotic Cells (Brown; spring)

One of the following courses in molecular biology:
BIOMG 6330 Biosynthesis of Macromolecules (Roberts/Wilson; fall)
BIOMG 6390 The Nucleus (Lis; spring)

One quantitative methods course:
BIOMG 8340 Quantitative Biology for Molecular Biology and Genetics (Pleiss, 2cr, spring)

[Elective course is not required for students entering Fall 2012 or later]

Please note that there is apparently a long break between the two semesters. However, graduate students are expected to be working on their first or second rotation (see Laboratory Rotations) during the intersession period.
SECOND YEAR STUDENTS
BIOMG 7510 Ethical Issues and Professional Responsibilities (Hinkle; spring)
BIOMG 8330 Research Seminar in Biochemistry (Mao/Vogt; 1cr, fall/spring)
BIOMG 8300 Friday afternoon BMCB/GD seminar
BIOMG 8380 Scientific Communication in BMCB (1 cr; Shalloway, spring)

THIRD AND FOURTH YEAR STUDENTS
BIOMG 8330 Research Seminar in Biochemistry (Mao/Vogt; 1cr, fall/spring)
BIOMG 8300 Friday afternoon BMCB/GD seminar

FIRST – FIFTH YEAR STUDENTS
BIOMG 7940, Current Topics in Biochemistry
(All students must take four of these 1/2 credit mini-courses in their first five years. For a list of upcoming mini-courses, please go to: [www.bmcb.cornell.edu/current/minicourses.html](http://www.bmcb.cornell.edu/current/minicourses.html).
** For all students entering 2012 or beyond, the fall Grant (NSF) Proposal Writing course counts as a mini-course requirement. Therefore, only 3 additional mini-courses are required. Among these, 1 or 2 may be a DGS-approved workshop offered on campus; e.g., from CBSU or Microscopy Facility. Students will be notified when approved workshops will be offered.

For courses with a letter grade, students are expected to receive a “B” (3.0) or better in order to remain in good standing in the program. If a student receives a C+ or lower grade in any core BMCB course, no credit is given for that course, implying that the course must be retaken if it is a required course. If a student receives a grade below B- in two or more classes, he/she will be asked to leave the program (see First Year Evaluation below).

Mandatory Responsible Conduct FOR Research (RCR) Training
The integrity of research conducted at Cornell University is of the utmost importance to the institution as well as to our research sponsors. Cornell is committed to promoting and supporting the ethical and responsible conduct of research across all disciplines so that our researchers are provided an environment in which they may continue to conduct preeminent research, maintain the public's trust in the excellence of our research, and prepare current and future generations to similarly contribute to research discoveries that will address and advance national and global needs. As a result, all students are required to take the on-line RCR training in their first year of studies. For more information and to access the training, go to [http://www.oria.cornell.edu/rcr/index.html](http://www.oria.cornell.edu/rcr/index.html).

4) CHOOSING A MINOR
Students are required to designate at least one minor. When you submit your Special Committee request, you will be asked to identify the “major” and “minor” that each member of your committee represents. One practical impact is that your designated "major" & "minor" will be listed on your transcript.

To help you choose a minor subject, the Graduate School publishes a list of major and minor subjects and concentrations for all graduate fields at Cornell [https://www.gradschool.cornell.edu/academics/fields-of-study/fields](https://www.gradschool.cornell.edu/academics/fields-of-study/fields). Note that if a faculty member in BMCB is also a member of a field that you choose as a minor, you may choose that faculty member to represent the minor if you wish.
You can pick any areas of study listed on the PDF as your "minor". For example, as a BMCB student, you could select "Biochemistry" as the “major”, and select "Molecular Biology" as the minor (usually your PI represents the "major", the other committee members could represent the same "minor" or different "minors", OR one of them represent the "minor", whereas the other simply represents the "major" that your PI also represents). You could pick a minor that is right in the area of BMCB (example above), OR a minor that is more distantly related, depending on your interest / relevance to your research. “Minor” provides the student with an opportunity to delve with greater breadth and depth into a specific area. In general, students are expected to take an additional two courses to fulfill the minor requirement, which should be chosen in conjunction with their minor advisor to best suit their overall goals.

[A note on your transcript: Obviously, for your PhD degree, your research trumps any coursework you could possibly take. Depending on your future career goals, your transcript may or may not be very important. If you consider an alternate career, your future employees (or law school, business school) might want to see your transcripts. Some predoctoral and postdoctoral fellowship applications will need you to submit your transcripts. In general, if you go with a more traditional academic track of postdoctoral training / research, then your publications are far more important than your transcripts.]

Most minors that are chosen by BMCB graduate students require a couple of additional courses, which students are strongly encouraged to finish by the end of the second year. Fields often have guidelines, rather than strict requirements, for the number of courses needed to satisfy a minor. It is up to the faculty member who represents the minor to decide, in consultation with the student, how many courses and which courses are to be taken. You should discuss with potential committee members which courses they would want you to take, given your background and interests.

**BMCB Minor Requirement for Students Majoring in a Field Other than BMCB**

For Ph.D. candidates with a minor in BMCB, the suggested requirements are at least six credits of advanced lecture courses (usually at the 6000-level, but some 4000-level courses may be appropriate, e.g., BIOMG 4370, BIOMG 4380, BIOMG 4450. Appropriate courses in BMCB include: BIOMG 6310, 6330, 6360, and 6390. 6000- and 7000-level courses in other departments, i.e., Chemistry & Chemical Biology, Plant Biology, Vet Molecular Medicine, and Vet Microbiology & Immunology, may also be suitable, as determined by the Special Committee. If a student who wants to minor in BMCB has not been exposed to appropriate lab work in the general area of BMCB, then he/she should also take the lab course BIOMG 4400.

For MS candidates with a minor in BMCB, the suggested requirements are at least four credits of advanced lecture courses (and a lab if appropriate). Some suggestions for appropriate courses are indicated directly above.

Note that requirements are determined by Special Committees, and that the recommendations above are guidelines offered by the Field.

**5) LABORATORY ROTATIONS**

Rotations provide an opportunity to explore areas for possible Ph.D. thesis research. In addition, both students and faculty are able to test possible working relationships. Students are required to complete three rotations during their first year in the program. Occasional exception can be made for a student who has extensive previous research experience. If you think your previous experience merits a
waiver of a rotation, discuss the possibility with the DGS. All first year students are expected to have been accepted into a lab by August 15, i.e. by one year after they have enrolled. They may not continue rotations beyond that time.

Recommended Timing for Rotation Periods

First Period: mid-October – mid-December
Second Period: early January – early March
Third Period: early March – early May

Each rotation should be ~8 weeks in length. The exact timing is flexible and can be worked out between the faculty and student. During the first half of the Fall semester BMCB students meet as a group twice a week to hear each of the faculty in the Field discuss his/her research. These meetings are called "Rotation Talks." Detailed information on Field faculty is available on the web site: www.bmcb.cornell.edu. All first year students are expected to attend these talks. Except under special circumstances, all three rotations should be carried out with members of the Field of BMCB.

To arrange for laboratory rotations, students have the option to discuss with individual faculty and arrange to rotate in the interested lab at a mutually agree-upon time. Alternatively, students will discuss rotation possibilities with several faculty, and will submit to the DGS their top three choices for an upcoming rotation period. The DGS will then contact the first choice faculty (and if necessary the second and third choices) with the names of the students who are interested in rotating in their labs. If more than one student selects a particular lab, the faculty member in question is asked if he/she can take more than one student in the first period. If not, then the student gets their second choice (and most likely will want to rotate in the other lab in the second or third periods). Students may find this alternative option helpful if they are interested in labs that are “high in demand”.

Usually by the end of the third rotation, you should have discussed with your rotation faculty about the possibility of joining the laboratory for your thesis research. Please note in general faculty are not supposed to commit to accepting a student into his/her lab for thesis research until the last day of classes in Spring semester (usually early May). This is designed to ensure all students have the fair chance of completing their third rotation periods, before faculty make their final decisions. However, students are encouraged to have clear and honest discussion with interested faculty about the possibility of joining their labs ahead of time, so as to gauge the likelihood of joining a particular lab, and whether a summer rotation will be necessary. Students who want to initiate a fourth rotation in the summer months should consult with the DGS.

What is expected of a graduate student on rotation? While no one objects to a graduate student completing a project and writing a paper for publication during a rotation, no one expects it either! What is expected is self-motivated earnest effort, independent thinking, and the fullest participation possible in the intellectual life of the laboratory, culminating in a written description of the project and record of the progress made.

6) FIRST YEAR EVALUATION

The supervising faculty is required to meet with the student to discuss his/her rotation performance at the end of each rotation period and a Rotation Evaluation Form (see Appendix II) must be filled out by the faculty and turned into the DGS.
At the end of the 1st year, the MCB Training Grant Steering Committee will meet and evaluate each 1st year students. Their recommendations will be discussed by the entire BMCB Field faculty at the annual field meeting. Results of the evaluation are communicated to the first year students by a formal letter from the DGS. Anyone who is judged not to have made satisfactory progress is asked to leave the program.

In the absence of persuasive mitigating circumstances, students with the following performance in their first two semesters will be asked to leave the BMCB program:
*Two or more ‘failed’ rotations
OR *Two C grades in core courses
OR *One C grade in core courses AND one failed rotation
OR *Cumulative GPA < 3.0 in core courses AND one failed rotation**

Students are also expected to take a minimal of 4.5 credits of GRADED courses each semester during their 1st year in the program.

7) TEACHING

All graduate students in the Field of BMCB are required to participate in teaching. The minimum requirement is for each student to be a teaching assistant (TA) for one semester. Many BMCB students prefer to do two rather than only one semester of TAing, either because they would like more teaching experience or because student costs are then paid by the department who offers the TA position. Most students will be asked to teach during the fall and/or spring term of their second year, but students will teach in their third or later years. Most students will TA for a MBG course, but TA positions from other departments will equally fulfill the TA requirement of BMCB.

For a TA position at MBG, see the following guidelines:

The summer before teaching begins, students receive from the Associate Chairman of MBG (who makes the TA assignments) a list of courses that are given in the Department of MBG, and a list of the responsibilities of TAs in each course. Each student ranks the courses in order of TA preference. While the Assoc Chair tries to accommodate these preferences for teaching assignments, the teaching needs of the department take precedence over individual preferences.

Preference in TA assignment:
1. A student whose thesis research advisor is a member of the Department of Molecular Biology and Genetics
2. A student in the Field of GGD or BMCB who has not TAed previously.
3. Any other student.

Exceptions will be made pedagogical reasons. For example, if no student in the highest priority category is willing or able to TA a particular course, a student from a lower priority category will be chosen.

International TAs are required by the University to have an interview by the International TA Development Program (ITADP) to assess competency in English. (Students who receive a 28 or above on the TOEFL are exempt from assessment.) In some cases, students from non-English speaking countries are required to take an additional course, given by the ITADP, during their second year to
improve teaching skills. Occasionally, students may also be required by the ITADP to take an English-as-second language course.

Teaching offers an opportunity both to extend one's knowledge and to develop communication skills. The teaching performance of each student will be evaluated by the instructor in charge of the course and copies of that evaluation will be sent to the student, the DGS, and the student's major professor. In addition, students are urged to provide a written critique of their teaching experience, and of the course in which they served, written with the intention of helping to improve the course.

Each year, the Field of BMCB acknowledges outstanding teaching efforts by presenting TA awards. One award is given through the College of Agriculture and Life Sciences (CALS). Another award is given directly by the Dept. of MBG as the Joe and Rita Calvo Teaching Award.

8) MONDAY GRADUATE STUDENT SEMINARS (BIOMG 8330)

These seminars are held at 12:30 pm every Monday in Rm 226 Weill Hall. All graduate students in their 2nd, 3rd, and 4th year must register for this course (BioMG 8330, S/U, 1 credit). Older students do not register for this course. However, all graduate students must give a yearly seminar to present their research progress. Students will be exempt from this requirement only if they are officially scheduled to graduate during the semester that they would normally present a seminar. The most senior students present first, starting at the beginning of the fall semester. Any student who would like to change his/her seminar date (or cancel because of scheduled graduation) should contact the DGS or the faculty member in charge of the course. All 2nd, 3rd, and 4th year students are required to attend at least 2/3 of the seminars (averaged for the two semesters) in order to receive a passing grade. (Second year students who have a TA conflict, and occasionally other students with conflicts, as determined by the DGS, are exempted from this requirement). Students in their 5th year and beyond are not required to attend the seminars and DO NOT register for the course, even though they are required to make a presentation. First year students are encouraged to attend these seminars to gain perspective on the scope of research going on in the Field and to help them choose a lab in which to work.

At least 10 days before your seminar, email your seminar title and a one paragraph abstract, including a recent reference or two, to the GFAs. They will prepare a flyer to advertise your seminar.

You should remind your committee members a week beforehand about your seminar and again the Monday morning of the seminar. You may also wish to designate a faculty member outside your committee who will meet with you after the seminar specifically to critique the presentation itself. In addition, it is advisable to invite some other faculty who you think may give you some additional feedback on your work. If you extend them a personal invitation, they will likely attend.

More information and some useful guidelines for preparing and giving seminars are in Appendix I.

OTHER SEMINARS

The Friday MBG Seminar is held at 4:00-5:00pm every Friday during the Fall and Spring semesters, and occasionally during the Summer, in the G10 Biotechnology Building Conference Room. These talks are given by scientists visiting from other institutions and provide an opportunity to hear and meet some of the most distinguished researchers in the area of biochemistry, molecular and cell biology. Speakers are usually invited and hosted by faculty members, but one or two slots every semester are reserved for student-invited speakers. The student representatives typically solicit suggestions for names for possible
speakers. Students also often suggest names of speakers to their major professor. Coffee, tea and cookies are available at 3:45pm. If you are interested in talking individually with a speaker, see the host listed at the bottom of the seminar notice.

The bulletin board across from the first floor elevator in the Biotechnology Building or the BMCB web site (http://bmcb.cornell.edu/seminars/index.html) is the place to check for the times and topics of the many other related seminars on campus.

**JOURNAL CLUBS**

Participation is on a voluntary basis, but you are encouraged to attend the Journal Clubs in your area of interest. Below are some of the Journal Clubs that meet on a regular basis. Because they often change each semester, one or several contact names are provided. You can also check the BMCB web site (http://bmcb.cornell.edu/seminars/index.html) for more information.

- **Bacterial Genetics Journal Club** – Steve Winans, scw2@cornell.edu
- **Cell Biology Journal Club**– Tony Bretscher, apb5@cornell.edu
- **Cellular and Molecular Neurobiology Journal Club** – Kathie Burdick, krb3@cornell.edu
- **Cornell Vertebrate Genomics Meeting**– Charlotte Williams, cw25@cornell.edu
- **Developmental Biology Journal Club**– Kelly Liu, jl53@cornell.edu
- **Environmental Microbiology Journal Club** – Esther Angert, era23@cornell.edu
- **Eukaryotic Gene Regulation Journal Club**– John Lis, jtl10@cornell.edu
- **Molecular Evolution Journal Club**– Aquadro Laboratory
- **Neuroethology Journal Club**– Carl D. Hopkins, cdh8@cornell.edu
- **Repair, Replication & Genetic Recombination Group**– see http://www.micro.cornell.edu/r3group/
- **Reproductive Biology journal club**– John Schimenti, jcs92@cornell.edu
- **Sexual Selection Journal Club**– Mariana Wolfner, mfw5@cornell.edu
- **Virology Journal Club**– Volker Vogt, vmv1@cornell.edu

Most labs also have their own weekly lab meetings or other joint group meetings which are also attended by students doing rotations in those labs.

9) **PROGRESS REPORTS**

An annual Progress Report and an Assessment Report (Appendix III) is required of all graduate students in the Field of Biochemistry, Molecular and Cell Biology. It is used by the Field to monitor progress of the student, as well as for purposes of award nominations, graduate school fellowships, department teaching assistantships, and selection for competitive slots on the NIH training grant. It is also used by the Graduate School to collect assessment data for submission to outside reviewers. The Graduate Field Assistant will give you the Progress Report form at the beginning of the Fall semester and again the month before your seminar. The Progress Report should be completed by the student and given to his/her Special Committee members one week PRIOR to the student's Monday seminar, as all BMCB students are required to meet with their Special Committee after their Monday seminar. This meeting should take place as soon as possible after the seminar, and certainly within two weeks. **All members of your Special Committee need to sign the Assessment Form at the committee meeting.** Your advisor will write a letter evaluating your progress and discuss it with you afterwards. You will then turn in the Evaluation Letter, the Progress Report, and the Assessment Form to the Graduate Field Assistant. **We take this very seriously and require 100% compliance.**
All 5th year and beyond students must attach a “Thesis Outline” to their annual progress reports. The Thesis Outline should be given to the Special Committee one week prior to the committee meeting (along with the Progress Report), so it can be thoroughly discussed at the committee meeting. The Thesis Outline will need to be turned into the GFAs along with the Evaluation Letter, Progress Report, and Assessment Form.

In the annual BMCB Faculty Field meeting, anyone who appears to be making slow progress toward the degree or to be having other problems will be discussed. Results of the evaluation are communicated to the students and their advisors. **For 6th year and beyond students, a formal vote by the Field faculty will be made to indicate whether the student is making satisfactory or unsatisfactory progress.** In the case of an unsatisfactory vote, the discussion will be communicated to the student and the advisor, and the DGS will convene a Special Committee meeting so the student and his/her committee can come together to discuss possible course of actions.

10) CONFLICT RESOLUTION

If you have any kind of issues with your major professor that you cannot resolve by talking with him/her, OR you hesitate to approach your major advisor directly, then you should discuss the problem with your other committee members and/or with the DGS. **Keep in mind the DGS formally acts as an advocate of the students, so feel free to get in touch!**

If you need further assistance, the Graduate School (Assistant Dean of Student Affair) and the Office of Ombudsman are good resources (5-4321).

11) VACATION

You are paid on a 12-month stipend, so if you plan on being gone for a significant period of time, you must have the approval of your advisor and notify the Graduate Field Assistant of your intentions.

12) ADMISSION TO CANDIDACY EXAMINATION (A Exam)

To qualify as a Ph.D. candidate, each graduate student must pass an A exam. The examiners for the A exam are the student's Special Committee and one other member of the Cornell University faculty (usually but not necessarily from the Field of BMCB) chosen by the student. This exam has both written and oral components.

Some procedural details

The A exam must be taken by **September 30 of your third year.** You must schedule your A exam and file a Schedule of Examination Form (available from the Graduate School web site at [http://www.gradschool.cornell.edu/?p=11](http://www.gradschool.cornell.edu/?p=11)) by June 15. This form must be signed by all of the members of the Special Committee, the Director of Graduate Studies, and the GFA. If the exam is not taken by September 15, your mentor must write a formal letter of explanation to the DGS, including the time when the exam will be taken. A copy of the letter will go into your permanent file. Not having obtained sufficient data is not an acceptable reason for delaying the A exam.

Course requirements for the major (including BioMG 7510 "Ethical Issues"), and all or most for the minor, should be finished by the time of the A exam. Occasionally, the student and the Special
Committee may feel an additional course is useful or important after the A exam and this may be recommended or required by the Special Committee.

You must ask a “field-appointed” faculty member to read the proposal and attend the examination. This person is NOT officially a member of your committee, and should NOT sign the Schedule of Examination form or the Results of Examination form.

You must choose the “field appointed” faculty from a committee designated by the field.

Current Members of the field-appoint A-exam committee:
Scott Emr, Yuxin Mao, Frank Schroeder, Patrick, Stover, Tom Fox, Volker Vogt, Maria Garcia-Garcia and Holger Sondermann

** Please note the fourth member for the purposes of the A exam is NOT on your thesis committee, but is an ad hoc member only for the purposes of the A exam. He/she should NOT be listed or sign either the scheduling form or the pass/fail form (even though he/she takes full part in the exam). This person takes part only in the A exam, not the B exam and not in any other thesis committee meetings. If you list and have your fourth person sign your forms, it will lead to confusion at the grad school.

If you have not filed a “Schedule of Exam” before June 15, you must submit the form at least 7 days prior to the exam. You should give a copy of the written proposal to each member of the examination committee at least a week before the oral exam.

The “Schedule of Exam” must be submitted at least 7 days prior to the exam. You should give a copy of the written proposal to each member of the examination committee at least a week before the oral exam.

You must turn in the Results of Examination form to the Graduate School and the Graduate Field Assistant within 3 business days after the oral exam. This form can be downloaded from the Graduate School web site at http://www.gradschool.cornell.edu/?p=11.

The written proposal

Your proposal will describe the research you intend to accomplish as a graduate student. The proposal should be well-formulated and presented in sufficient detail that it can be evaluated for its scientific merit. Include sufficient information to permit an effective review without readers having to refer to the literature. Brevity and clarity in the presentation will be considered indicative of an applicant's approach and ability to conduct a superior project. The proposal must be written following the format specified below.

1. Abstract. This is a summary of the proposed work, with enough of an introduction to allow someone not expert in the field to understand what is planned and to appreciate its importance. This should be on a separate page and not exceed three vertical inches (single spaced).

   Sections (2) through (4) are not to exceed 10 pages (single spaced), including all tables and figures.

2. Specific Aims. State the specific purposes of the research proposal and the hypotheses to be tested. (Typically no more than half a page)

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1 If you would prefer to write on a topic outside of your research area, discuss this with your major advisor and the DGS first. In this case, you will need to write a thesis proposal after completion of the A exam.
3. **Background and Significance.** Sketch briefly the background to the proposal. State concisely the importance of the research described in this application by relating the specific aims to field as a whole. Use this section to provide an account of any preliminary studies that might demonstrate the utility of the proposed project. (Typically about 3 pages)

4. **Research Design and Methods.** Provide an outline of (1) research design and the procedures to be used to accomplish the specific aims; (2) tentative sequence for the investigation; (3) statistical procedures by which the data will be analyzed; (4) potential experimental difficulties and alternative approaches that could achieve the desired aims. (Typically about 7 pages)

5. **Literature Cited.** List all literature references. Each reference must include the title, names of all authors, book or journal, volume number, page numbers, and year of publication. The reference 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.

**Formatting.** The application must be clear, readily legible, and conform to the following NIH requirements:

1. The height of the letters must not be smaller than 10 point; Helvetica or Arial 12 point is the suggested font (Arial 11 point will barely satisfy this requirement).
2. Type density, including characters and spaces, must be no more than 15 characters per inch (cpi). For proportional spacing, the average for any representative section of text must not exceed 15 cpi;
3. No more than 6 lines of type within a vertical inch;
4. Margins, in all directions, must be at least 1/2 inch.

Applicants should check the type size using a standard device for measuring type size rather than relying on the font selected for a particular word processing/printer combination. Figures, charts, tables, figure legends, and footnotes may be smaller in size but must be readily legible.

In preparing the application, use English and avoid jargon. If terms are not universally known, spell out the term the first time it is used, with the appropriate abbreviation in parentheses. The abbreviation may be used thereafter.

**NOTE:** Use the single spacing formatting above to make sure that your final proposal with figures meets the requirements. Send an electronic copy in this format to all your committee members. But then print out hard copies in double space format to give to the committee, since this makes it easier for them to read and write comments.

**The oral exam**

The oral component is a defense of this proposal and you can expect that the majority of questions will be directly related to your proposal and to areas that are considered off-shoots of it. The committee will likely ask you to explain, in more detail than the written format permits, background material and experimental protocols.
The committee will likely also ask broadly-based questions on basic concepts, to ensure you have strong command of foundational knowledge in BMCB and your minor areas. The committee member(s) representing the minor subject area(s) is particularly responsible to ascertain that you have achieved competency in that subject area.

In addition to the evaluation of your proposal, the A exam is the time when committee members will discuss and evaluate your course work as well as your performance in the laboratory. Please bring to the A-exam a summary of the courses you have taken and grades earned, either as hard copies to be distributed to the committee or as a projected slide. To help the committee members to have a more comprehensive grasp of your progress in the BMCB graduate program, members of the committee will receive a PDF file containing your transcript, your Progress Report, your 1st Rotation Evaluations, and your initial application to the BMCB program.

Note that the Field recommendation is that during the exam, the mentor (thesis advisor) should not ask questions or make comments except when asked by other committee members or when clarification is needed. The intended goal is to dissuade the mentor, who may have a vested interest in the outcome of the exam, from stepping in to justify the research or the particular experimental approach being used. The student is expected to fully defend the proposal by him/herself. However, the mentor should participate fully in the discussion of the student’s performance, after the student is asked to leave the room. In making this recommendation, the Field is aware that the Special Committee may run the A exam in whatever way it deems appropriate.

Please see more advice on writing the proposal in Appendix II.

**How much help can you receive in preparing your proposal?**

Connecting to others in the research community is essential in competitive research and evidence of your involvement in science. A factor in evaluating your proposal is whether you have made these interconnections. Although you should seek out as much information as you can find about your topic, the major ideas should be yours, as should all the writing, of course. The following guidelines were crafted with the idea of encouraging input from others while at the same time focusing attention on your efforts.

In meeting with a faculty member about your proposal, it is expected that you will describe the general nature of the problem under investigation, the specific questions that you are proposing, and an overview of the approaches that you plan to take. In addition to comments on importance and feasibility, some faculty may provide you with factual material or with references.

Once you have written a complete proposal that contains all of the questions that you expect to pose and all of the experimental approaches you intend to follow, give your proposal to several senior graduate students or postdoctoral fellows and ask them for criticism. If they provide you with ideas that you use, give them credit for those ideas. For example, "(latter two controls suggested by Chelsea Clinton)". The criticisms should be general (e.g. "this section is awkward", "this is unclear", "why not expand this section to include related studies?"). No one but you should be doing the actual writing. Faculty members should not be asked to provide detailed feedback on the written proposal, nor should they ever offer to do so. Many mentors make a policy of not reading A-exam proposals at all before the exam. Other mentors will quickly (maybe in 10 or 15 minutes) scan proposals of their students in an early draft form, and offer some general suggestions, which is acceptable if it is done only once. For example, the mentor may offer the following types of comments: (1) the specific aims are too few, too many, or
inadequate; (2) the methods are too detailed or not detailed enough; (3) sections on pitfalls and alternative approaches should expanded; or (4) more figures should be added or some figures should be deleted.

**Possible outcomes**

Some possible outcomes of the A exam are described below. While one of these outcomes will apply in most cases, it should be noted that the **final outcome is determined by the Special Committee** and they are not limited to the examples given below. Some factors that may be judged in evaluation of the A-exam are:

- importance of the problem chosen
- demonstrating a command of the field.
- evidence of creativity in formulating experimental approaches
- feasibility of the proposed experiments
- whether a range of different approaches are brought to bear on the problem
- whether the scope of the proposed experiments is feasible for a 3-4 year project
- adequacy of control experiments
- clarity of the proposal
- ability to deal with questions
- communication / presentation skills
- breadth of knowledge

1. **Unqualified pass.**

2. **Conditional Pass.** This option will be exercised when the committee judges that some aspect of the proposal / defense needs to be improved. In this case, the committee will specify the “condition” that must be reached, before the student can receive a pass.

Some options for Conditional Pass:

(a) The committee may specify that the entire proposal or that parts of it need to be revised within a certain time frame. *The extent to which the major professor wants to be involved in the rewriting is up to him/her.*

Some reasons for revision are:
- The writing needs to be improved (for example, grammar, clarity, or logical flow of ideas).
- Some aspect of the science needs to be rethought (for example, better controls, more cautious interpretation, or more detailed description).
- An additional section needs to be incorporated into the proposal.

The student is expected to rewrite the proposal within 2 weeks and resubmit it to the examination committee members for approval.

(b) The committee may specify that the student carry out additional literature review, e.g. weekly written report of a paper, participation in existing journal clubs. This might be particularly helpful when the student appears to have weak command of the literature surrounding an area.

(c) The committee may specify that the student complete a piece of research / a particular subaim within a certain time-frame. This is particularly relevant when the committee has some concerns about the ability and/or motivation of the student to complete the PhD program.
(d) Any other options that the committee deems to be helpful for the further training of the student.

3. Fail. The student can fail the exam because either the written proposal or the oral defense is judged inadequate. In that case, the committee will usually recommend one of two actions. If the committee has confidence in the overall ability of the student to complete the Ph.D. program, then they may recommend that the student retake the A exam. In this case, they will specify whether an entirely new proposal on a different topic is to be written or whether they expect a major rewriting of the original proposal. Note that the rules of the Graduate School specify that a second A exam cannot be scheduled earlier than 3 months after the first.

If the committee has serious concern about the motivation or ability of the student to complete the Ph.D. program, it could recommend that the student complete a piece of research, write a Masters-level thesis based on that work, and then defend that thesis. If the student wants to continue for a Ph.D. degree, and his or her committee judges that the Masters-level work and thesis defense demonstrates qualification, then the thesis defense may be accepted in lieu of an A exam. In some cases, the Special Committee may specify that reentering the Ph.D. program requires retaking the A exam.

Typically a few students in each class fail the A-exam on the first try. If you are one of these, don’t take it as the end of the world. If your committee approves, just knuckle down and gear up for a re-take in three months. There are plenty of students who easily passed on the second try and who did very well afterwards.

What can I do to ensure that I pass my A exam?

We have three suggestions:

1. Read several proposals written by former students. Copies of these can be obtained from the Graduate Field Assistant.

2. Read carefully the specifics on writing the proposal.

3. If you are worried about being nervous, and having to think on your feet while being nervous, it may help you to have a practice run. You can do this by asking several students to read your proposal and then act as examiners during a mock 2-hour exam.

Remember this: everyone in this field wants you to succeed.

13) THESIS & B-EXAM

DEFENDING A THESIS SUCCESSFULLY REQUIRES AT A MINIMUM THAT THE STUDENT HAS OBTAINED SUFFICIENT DATA TO MAKE A SIGNIFICANT CONTRIBUTION TO AT LEAST ONE RESEARCH PAPER THAT HAS BEEN SUBMITTED OR PUBLISHED IN A PEER-REVIEWED JOURNAL.

IF THE EXPECTATIONS ARE NOT MET, THE THESIS ADVISOR, WITH HELP FROM THE THESIS COMMITTEE, MUST DETERMINE THAT CIRCUMSTANCES BEYOND THE STUDENT’S CONTROL THAT PREVENTED THE STUDENT FROM MEETING THESE EXPECTATIONS.
At least 7 days before the examination be sure to bring to the Graduate School and GFA the Schedule of Final Examination form (signed by your committee members and the DGS) and the 5x8 Degree Information card.

THESIS FORMAT

It is instructive to quote here the advice that appears on the cover of the Graduate School publication, “Thesis and Advanced Degree Requirements”: “It is the responsibility of the candidate to become familiar with the various requirements that apply and to satisfy them in the proper way.” The Graduate School presents seminars three times a year to advise students writing theses and dissertations. These meetings are well advertised and offer the opportunity to obtain authoritative answers to questions about your thesis, registration, fees, commencement, etc.

Theses may be organized either as a single work (traditional thesis) or as a series of relatively independent chapters (independent chapter thesis). In the latter case, there may be a unified introduction and bibliography or separate introductions and bibliographies. There may be a unified summary, or the two-page abstract (required of all theses) can serve as a summary statement for all chapters. Some examples of thesis formats are shown below.

<table>
<thead>
<tr>
<th>Traditional Thesis</th>
<th>Independent Chapter Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature Review</td>
<td>Chapter 1: General Introduction and Literature Review</td>
</tr>
<tr>
<td>Material and Methods</td>
<td>Chapter 2: Introduction</td>
</tr>
<tr>
<td>Results</td>
<td>Materials and Methods</td>
</tr>
<tr>
<td>Discussion</td>
<td>Results</td>
</tr>
<tr>
<td>Conclusions</td>
<td>Discussion</td>
</tr>
<tr>
<td>Literature Cited</td>
<td>Literature Cited</td>
</tr>
<tr>
<td>Appendices</td>
<td>Chapter 3: (as above)</td>
</tr>
<tr>
<td></td>
<td>Final Chapter including</td>
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<td></td>
<td>General Discussion,</td>
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<td></td>
<td>Speculations and</td>
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<tr>
<td></td>
<td>Conclusions</td>
</tr>
<tr>
<td></td>
<td>Appendices</td>
</tr>
</tbody>
</table>

The independent chapter option allows you to prepare your thesis as a series of papers in a format ready for publication, and chapters can be published before the thesis defense. If your published work includes co-author(s), you may cite the work of your co-author(s) in your thesis with appropriate acknowledgment, but you should not include the data of your co-author(s) in your thesis. An exception could be if data from a co-author are needed for clarity. In that case, the legend to the figure should explain this. The work in your thesis must be primarily, if not entirely, your own. You should acknowledge in the publication that the research is part of a thesis, and the Graduate School requires written permission from the publisher to include it in your thesis.

Located on the ground floor of the Biotechnology Building, Room G09 (formerly the Elizabeth Keller Reading Room) contains a collection of theses completed by graduates in the Fields of Genetics, Genomics and Development and Biochemistry, Molecular and Cell Biology. If you wish to access this
room, please stop by 107 Biotech and sign out the key. Note that materials are NEVER to be taken from this room. Full collections of dissertations are maintained in Mann Library.

**FINAL THESIS SEMINAR**

The final thesis seminar usually is given immediately before or on the same day as the thesis defense, i.e. the “B” exam. However, in some cases students may want to present the thesis seminar up to six months before the B exam, in order to allow input from the special committee about final experiments.

**THESIS DEFENSE (“B”) EXAM**

To schedule the oral defense of the Ph.D. thesis (or “B” exam): at least seven days before the exam you must distribute the thesis to the Special Committee, have the scheduling form signed by all the Special Committee members and the DGS, and present this signed form to the Graduate School. The GFA should also receive a copy of the schedule form at this time along with the title and abstract for the thesis seminar, and a publication list including all manuscripts you have published / submitted / in preparation.

**NOTE:** Once the final thesis is submitted and approved, your status as a registered student expires, which also means your stipend and your health insurance will stop. So plan accordingly. For International students, your F1 visa will also expire. Talk to ISSO about OPT and other visa status.

**MASTERS DEGREE**

The Field of BMCB does not have a formal Master’s degree program. In cases in which a student decides that the BMCB Ph.D. program does not meet his or her needs, or in which a student is judged to be unqualified for the Ph.D. program, the Special Committee typically recommends that the student write up and defend the research work he/she has done for a Masters degree. The requirements for a Masters degree include the coursework normally taken by first-year students, at least two rotations, one semester of teaching, and a research-based thesis (including a thesis defense). At a minimum, the Special Committee of a Masters degree candidate is composed of a chairperson and a faculty member representing a minor subject. The student may invite a third faculty member to be on the committee if he or she chooses. To take the Masters degree path, the student must submit a Change of Program form to the Graduate School, requesting transfer from the PhD program to a Masters program. This form will then be sent to the DGS for approval.

Some students have switched to a Masters degree program, successfully defended the thesis, and then switched back to the PhD program (also requiring DGS approval). This is a workable arrangement if the thesis advisor agrees that the student may continue. If the student wants to switch to a different lab after the Masters, then the new thesis advisor must approve and sign a new Special Committee form, and agree to support the student. Occasionally students want to take a leave of absence after completing the Masters degree, with the option of later returning to the PhD program in a new lab. This path is NOT recommended. Historically, without other knowledge faculty assume that students who take a Masters degree are weak (in motivation, independence, intellectual or research ability, etc). Once the student is away on leave, he/she cannot return to the PhD program without financial support, and faculty are unlikely to commit to supporting a student who has not rotated in the lab. Therefore, if a student plans to take a leave of absence after completing a Masters degree, he/she should make any arrangements to return to the PhD program before leaving.
GRAD STUDENT LIFE

Two student representatives are selected each year from the first year class mid-way through the first year. While the DGS may coordinate this process, the students are entirely responsible for picking their reps. The same student reps continue to represent that particular class as the class move on to upper years. The reps coordinate grad student help during the recruitment of new graduate students, communicate directly about curricular issues with the DGS on behalf of all BMCB grad students, and attend BMCB faculty Field meetings (except for discussions about individual students in the spring meeting).

MBG Annual Picnic is held at the beginning of the fall semester and is a good way to meet the students, staff and faculty. Information will be provided at BMCB orientation or look for flyers posted in MBG.

There is a social hour every Friday afternoon after the seminar hosted by various labs in the Biotech Building. Come and meet other students, faculty and staff and wind-down from the busy week.

Intramural sports are a great way to get to know people. There are many sports activities, softball, volleyball and basketball are possibilities, and several students and faculty play ice hockey with graduate student teams. Look for sign-up sheets on bulletin boards around the building and ask your fellow students.

There are also many running clubs. One that is particularly enjoyable is the Ithaca Hash House Harriers, whose members engage in running over rivers and through woods, and at times, even through shopping malls. Finally, there's a strong interest in Ultimate Frisbee - both casual and competitive.

The Big Red Barn is a place to eat, socialize and meet other graduate students. You can reserve space there at no cost for professional or social activities. Also, be aware that the Student Life Union at Willard Straight Hall will provide money to student groups who want to sponsor activities involving students.

The Graduate and Professional Student Assembly is a major forum for discussing and implementing actions that affect graduate students.

Grads for Grads is a student-run organization that works to create a social and community atmosphere among the entire graduate student population. They sponsor occasional parties and dances.

The Graduate Advocacy Organization (GAO) is an organization of graduate students that concern themselves with being a voice for graduate student rights on campus. You can make contact with this organization at PO Box 57, Willard Straight Hall.

A Women in Math, Science and Engineering Conference is usually held every year on campus. The conference, organized for girls in the 6th- 8th grades, is organized and staffed by women graduate student volunteers. Watch for notices. This activity provides a good way to meet other women in math and science and to share experiences with others interested in education and teaching.

Cornell Women in Agriculture and Life Sciences has informal meetings once a month at which issues are discussed such as getting a job, mentoring, dealing with a family and a job, etc.

An Expanding Your Horizons Workshop is usually held every year on campus. The conference,
for girls in the 6th-8th grades, is organized and staffed by women graduate students, postdoctoral, and faculty volunteers. Watch for notices. This activity provides a good way to meet other women in math and science, and to share experiences with others interested in education and teaching. See: http://www.ccmr.cornell.edu/education/eyh/Workshop_Leaders.php.

For a complete list of the graduate student organizations on campus, go to http://orgsync.rso.cornell.edu/ or http://www.gradschool.cornell.edu/.

FINANCIAL INFORMATION

FIELD SUPPORT

Students making satisfactory progress receive financial support, including tuition fellowships or waivers. Senior students who would normally be supported on a research grant but find that their research group is temporarily low in funding might be asked to teach additional semesters in order to receive stipend and tuition support from the Department of MBG.

The Immigration Reform and Control Act of 1986 requires that Form I-9 be filed with the University for ALL graduate students. The Graduate Field Assistant will distribute and collect forms for all students. An I-9 form must be on file before a student’s first check can be released. International students are also required to complete a Foreign National Questionnaire.

All stipends (assistantships and fellowships) are considered taxable income. State and Federal income tax is withheld from all assistantship paychecks that are processed semi-monthly through Cornell’s payroll system. Fellowships are processed through the Graduate School and taxes are not withheld. However, these awards are taxable and students are responsible for filing a tax return and for paying taxes. Estimated taxes are paid quarterly. You must obtain the forms (local library has them and available at the IRS web site) and submit them to the IRS. You may be fined if you don't pay the estimated taxes. Tuition is not considered taxable income unless provided directly for “services rendered.” Books and supplies are deductible and receipts should be kept (consult your tax advisor).

METHODS OF PAYMENT TO GRADUATE STUDENTS

Method A

As a Graduate Research Assistant or a Teaching Assistant a student is considered an employee of the university. Student payment is processed through the payroll system. The student is paid semi-monthly a fixed amount based on the annual stipend rate. Timecards are not required or collected. Taxes are withheld from the student check – the amount will vary depending on how the student fills out the W-4 form. The W-4 form can be changed anytime during the year. The student will receive a W-2 from the university to the address listed on your paycheck. You are strongly encouraged to use direct deposit; forms can be obtained from www.dfa.cornell.edu/dfa/payrollservices/services/directdeposit.cfm or from the GFA in 107. Checks are mailed to student’s local address of record. The first check should be available on August 31. Students must be registered and have a completed I-9 form to receive a check.

Method B

The student is on a fellowship, either university fellowship or supported by a departmental fellowship (the BCMB and Genetics training grant support is considered a fellowship payment). Students are paid once per semester for fellowship support. This check is issued at the beginning of each
Most stipend checks should be available at the Bursar’s Office in Day Hall after registration. Checks are released to registered Cornell students presenting a valid Cornell ID. Taxes ARE NOT withheld from fellowship checks and you are responsible for paying estimated taxes on your taxable income. If you are supported during the summer months from a fellowship, you will receive a check in mid-June and early July. You are strongly encouraged to sign up for direct deposit. Forms can be obtained at www.dfa.cornell.edu/dfa/treasurer/bursar/services/directdeposit.cfm or from the GFA.

**Tuition Payments**

Tuition payments are made through the PeopleSoft financial system. Fall tuition is credited by August and Spring tuition is credited by January to your bursar bill. The tuition payment should be taken care of automatically for most students. If you have questions regarding your bursar bill, please see the GFA in 107 Biotech.

**Health Insurance**

All registered grad students are automatically enrolled in the Student Health Insurance Plan (SHIP), an accident/illness policy that meets the health insurance standards developed by the American College Health Association. The yearly premium is paid by your source of financial support and should be taken care of automatically. Please contact the GFA if there remains a charge on your bursar bill. Additional family coverage and/or optional dental and vision insurance is available at a cost to the student. More information can be found on Gannett's Web site, www.studentinsurance.cornell.edu.

**TRAVEL**

**Travel Grants:** The **Graduate Student Travel Fund** provides money to enable full time students to present papers or posters or to perform an equivalent function at professional meetings. The maximum award is $600, but the amount of the award is based on geographic location and will not necessarily cover the full cost of the student’s transportation expenses. For specific information and application materials, contact the Fellowship Office in Caldwell Hall. Applications must be made by the first day of the month before the date of the conference (see deadlines on application) to allow review by the Graduate Student Screening Committee. The form requesting conference travel support must be signed by the DGS.

**AWARDS**

The **Fuertes Memorial Prize**, sponsored by the Cornell Chapter of Sigma Xi, is awarded for a 10-15 page essay on a scientific or technical topic presented in a popular manner that will be comprehensible to the nonscientific reader ($350 first prize, $150 second prize; deadline is usually in February — watch for announcements).

**Graduate Women in Science Award for Excellence.** Sponsored by the Cornell Chapter of GWIS, it is for scientific research by female graduate students at Cornell. Abstract deadlines are in early Spring. The winner is chosen from 5 finalists after they present short talks on their research at a meeting in late April. Watch for posted announcements.

**The Liu Memorial Award and The Hsien Wu and Daisy Yen Wu Scholarship Endowment Fund** are open to students in any field who have completed at least three semesters of graduate study. Preference will be given to graduate students beyond the second year of study who are of Chinese descent irrespective of citizenship. Previous awardees are ineligible. Awards are based on demonstrated academic ability and performance with some consideration given to character and financial need. The
Director of Graduate Studies submits a nominating letter, several supporting letters from other faculty members familiar with the student, and any other information which would be helpful to the selection committee in evaluating the student. A student may be asked to compose a brief statement summarizing her/his graduate progress, career plans, etc. Only one nomination per field will be accepted. These nominations are due April 1 and awarded May 1 each year. Although the final dollar amount is decided by a selection committee, past awards have ranged from $1,000 to $3,000.

Both the College of Agriculture and Life Sciences and the Department of MBG Calvo Teaching Award each make one award annually to a graduate student for excellence in teaching in a MBG related course. The Associate Chair of MBG solicits nominations from faculty of their top teaching assistant of the past year.

The LPS Award was established by Frank Meleca, founder of the Laboratory Product Sales company, which sells a variety of products to research labs like those in BMCB. This award is given each year to a BMCB student (and a similar award to a G&D student) who is first author on what is judged to be the “best” paper published in the previous calendar year. All BMCB grad students are eligible, including those who have finished their PhD and left Cornell. The award is $500 in cash, and the winner has his/her name engraved on a plaque in the front office. Next to the plaque is a framed list of all papers first-authored by BMCB students in that year.

OTHER IMPORTANT INFORMATION

BIOTECHNOLOGY RESOURCE CENTER (BRC) (ROOM 170, Biotechnology Building)
http://www.biotech.cornell.edu/

The Institute of Biotechnology, one of 13 NYS Centers for Advanced Technology, operates a Core Facility in the Biotechnology Building.

The **Biotechnology Resource Center (BRC)** consists of state-of-the-art integrated facilities:
- Genomics Facility
- Proteomics & Mass Spectrometry Facility
- Imaging Facility
- Bioinformatics Facility – offers useful workshops, as well as office hours.
- BIO-IT Facility
- Advanced Technology Assessment Facility

For more information please see the BRC web site: http://www.biotech.cornell.edu/biotechnology-resource-center-brc

BIOMEDICAL SCIENCES FLOW CYTOMETRY CORE LAB (VET RES TOWER TB-018)

The Biomedical Sciences Flow Cytometry Core Laboratory at Cornell University provides a wide variety of cytometry services for investigators at Cornell University as well as external investigators. They currently have access to a hi-speed FACSaria cell sorter and an LSR II. For more information, please see: http://www.vet.cornell.edu/labs/cytometry/index.cfm
STATISTIC CONSULTING SERVICES
Offers very useful, free statistical consulting services – walk-in hours available as well.
Also host useful workshops.
http://www.cseu.cornell.edu/index.php

CORNELL LIBRARIES
Offer useful workshops: http://www.library.cornell.edu/svcs/serve/classinst

THESES FROM FORMER STUDENTS
Full collections are maintained in Mann Library.

CAREERS INFORMATION

Graduate School offers Career Development Services.
Also see: http://bmcb.cornell.edu/current/career-development.html

The BMCB field also offers various career oriented seminars / workshops yearly – look out for announcements!

A collection of books focused on managing careers in the biological sciences can be found in the main office of the Biotechnology Building (Room 107). Students should feel free to sign these books out.

At the Bench: A Laboratory Navigator by Kathy Barker
At the Helm: A Laboratory Navigator by Kathy Barker
Academic Scientists at Work by J. Boss and S. Eckert
Making the Right Moves, organized by the HHMI and BBWF
Alternative Careers in Science, edited by Cynthia Robbins-Roth
Careers in Biotech and Pharmaceuticals by Wet Feet, Inc.

PROPER DISPOSAL OF LABORATORY WASTES

We remind all lab workers of the following policies regarding proper disposal of laboratory wastes. These policies are based on local, state, and federal laws, and are discussed in detail in Chapter 7 of the Cornell Chemical Hygiene Plan. A three ring notebook containing the Plan is in every laboratory.

Chemicals: Chemicals should not be discarded in the trash containers. This ban includes such substances as detergents. A few chemicals (e.g. sugars), securely packaged, may be disposed of directly into building dumpsters. A list of appropriate dumpster disposals may be found on p. 7.7 of the Chemical Hygiene Plan. In general, chemical wastes should be bottled, labeled, and disposed of by calling Life Safety Services at 5-8200.

A list of chemicals that can be safely disposed through the drains is given in the Chemical Hygiene Plan. If in doubt about a particular disposal, call the Office of Environmental Health (5-4862) to request advice.

Medical wastes: Syringes and other sharps must be disposed as Regulated Medical Waste in rigid, leak-proof, and puncture resistant labeled containers. Arrangements for disposal are made through Dr. Larry Thompson by calling 3-3900.
• Labeled biohazard bags of any color or description cannot be discarded in the normal trash, regular waste dumpster, or any other waste collection device on campus regardless of content.

• Biohazard bags may not be placed within regular trash bags for disposal.

Use one of the following three methods to dispose of medical wastes (other than syringes)

1) Use clear autoclavable bags without the biohazard symbol or related signage. These are available from various approved L-Order vendors such as: Krackeler Scientific (autoclavable polypropylene bags; 8-H13185-2430 [size 24”X30”@ $54.24/case of 100 bags]; Lab Products [size 22”X30”@ $54/case of 100 bags; Cole Parmer; PGC, etc.

2) Use autoclavable (reusable) buckets or bins. After autoclaving, their contents can be placed in regular plastic bags for normal trash disposal (Note: this method does not apply to syringes or sharps).

3) If you continue to use labeled biohazard bags of any color, after autoclaving they must be disposed of through Dr. Larry Thompson by calling 3-3900.

Glass: No glass should be discarded in normal garbage. Each lab is responsible for the collecting of waste glass. Waste glass boxes are available in Receiving. When the container is full and sealed, it should be placed opposite the freight elevator for disposal. It is essential that empty chemical bottles be triply rinsed before disposal.

Radioactive Materials: Any material with radioactive contamination should be discarded in the specially labeled radioactive waste container, and not in the ordinary trash container.

Be especially careful in disposing of laboratory wastes. Improper disposal may endanger the health and safety of service and maintenance personnel who handle the waste containers. Improper drain disposal may endanger our local environment.

Odor Complaints: Safe work practices in the lab will help avoid “odor complaints” from your neighbors in the building. Many complaints can be traced back to someone not following safe and approved work procedures in their lab. Things you can do to help reduce odor complaints are:
1. Use your hood when working with substances that could become the source of odor complaints.
2. Make sure that your hood is working properly. Is the sash at the correct height?
3. Dispose of chemicals properly. Do not flush down the drain substances that should be disposed of by the chemical waste pickup program. Remember that most organic solvents should not be disposed of down the drain.
4. For sinks that are not used for extended periods, periodically run water into them to insure that the traps in the drains have an adequate amount of water. The addition of two tablespoons of vegetable oil will extend this protection up to a year. This will prevent noxious volatile substances in the drains from entering your lab.

BUS TRANSPORTATION

The bus lines that serve Cornell University and the surrounding counties (Chemung, Cortland, Schuyler, Tioga and Tompkins) are: TCAT and Chemung Transit. There is also a Blue Light bus service operated by TCAT that runs from 5:45 p.m. to 1:25 a.m. Monday through Sunday. Students can also purchase an OMNI pass from Transportation Services (5-4600). Schedules for all TCAT bus
BUILDING SECURITY

Biotechnology is a secured building. It is locked at 5:00pm Monday-Thursday, 4:00pm on Friday, and all day on the weekend. Please help keep the building secure in the following ways:

1. If anyone sees or hears anything suspicious (no matter how minor) please take the time to report it to Public Safety (5-1111).
2. If you see someone in the facility who may not belong — report it.
3. Public Safety can be reached by dialing 5-1111, or directly via one of the 19 emergency phones mounted in the hallways and elevators within our building.
4. Take the time to lock and double check any doors you use.
5. Arrange your office/lab so that vulnerable items are not in plain view from hallways.
6. Permanently mark your vulnerable items. Dick Clark (Building Coordinator, Rm. G40, 4-4583) has an engraver he will loan you and he will explain to you how to mark items to deter theft.
7. Report any building security or safety issues to Dick Clark.

KEYS

You will need to get keys for the building and lab in which you work. Please see Steve Sparling in Rm B90 Weill Hall to get your keys. The exterior door key unlocks the entrances to the Biotechnology Building and the Keller Reading Room on the ground floor (Rm. G09). Talk to your faculty advisor if you need additional keys as only he or she may request them. You will also need to have your Cornell ID card’s proximity chip activated to access the interior doors of the Biotech Bldg. Please help with building security by keeping all outside doors locked after hours and inside doors locked when the room or lab is not occupied (see BUILDING SECURITY). Keys must be returned to Steve Sparling before you leave Cornell. Note that there is a $5 fee to replace a lost key.

MAIL

Mailboxes are provided for all students in the Mailroom adjacent to 107 Biotechnology Building (see the GFA in room 107 for more information). All incoming mail addressed to you at the department should indicate “Biotechnology Building” and use the zip code 14853-2703. Mail without the building name may be delayed. The mailroom is intended for University and “business” mail only — please use your residential address for personal mail.

Report all address changes immediately to the GFA. This includes your forwarding addresses when you leave Ithaca. It is your responsibility to file appropriate change of address forms with journals, etc. when you relocate.

Outgoing US and Campus mail are processed in the Mailroom. Campus mail is a campus-wide distribution system that uses small and large brown envelopes. Ask other students or staff where to get them and how to use them.

Mail pickup and delivery schedule for the Biotechnology Building:

<table>
<thead>
<tr>
<th></th>
<th>Approx. Pickup Time</th>
<th>Approx. Delivery Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campus Mail</td>
<td>9:00am</td>
<td>10:45am</td>
</tr>
<tr>
<td>US Mail</td>
<td>11:30am</td>
<td>2:30pm</td>
</tr>
</tbody>
</table>

There is a US Post Office Substation at the Cornell Book Store.
PARKING

Information about parking may be obtained from the Traffic Bureau (116 Maple Avenue, 5-4600) but the permits are expensive. Some people prefer to park in nearby residential areas and walk to campus or to purchase a TCAT bus pass. With some exceptions, parking after 5:00pm is unrestricted and free.

PAYCHECKS

Graduate students who are paid from the BMCB Training Grant and Graduate School Fellowships pick up their paychecks on the first working day of each semester from the Bursar’s Office in Day Hall. GRAs and TAs are paid semi-monthly and checks are mailed to their home address. Check with the GFA your first payday. You are strongly encouraged to use direct deposit for each method of payment.

PHOTOCOPYING

There are photocopiers on the 2nd, 3rd and 4th floors and a larger and faster machine is available during working hours in the 107 Biotech mailroom. You will need an access code to operate these copiers. All copiers accept the same access code. Your major professor will provide the code for your lab. First year students should get a number from the GFA to use until they settle into a lab.

If you have a problem with a copier that you can’t resolve, please report the problem to the Administrative Assistants in Room 304 Biotech or to Rita Stucky in 107 Biotech.

SUPPLIES

Students should obtain general office and lab supplies (3-ring binders, scotch tape, pens, etc.) from their lab managers or department supply room. First year BMCB students can obtain them from the supply cabinets in the 107 Biotech Mail Room between the hours of 8 am and 4 pm. All supplies must be signed out. Lab notebooks can be obtained from Rita Stucky in 107 Biotech.
INFORMATION FOR FACULTY

BMCB MISSION STATEMENT

Introduction to life sciences Fields at Cornell, and to the Field of BMCB. Graduate education at Cornell is organized by Fields. Almost all Fields have an administrative home in a department. In some cases the faculty comprising the Field are virtually the same as those comprising the department. In other cases, including the Field of BMCB, not all the departmental faculty are members of a Field with a home in that department, and many outside-departmental faculty are members. Generally each Field acts independently in graduate student admissions, e.g. recruiting, selecting, financing, and interviewing prospective students who visit Cornell, although in some cases Fields recruit together. A second purpose of Fields, apart from graduate education, is to bring together faculty with similar research interests and thereby to promote collaborations and exchange of ideas.

The Field of BMCB has existed for over 30 years, in the recent past enrolling about 12 – 22 PhD students per year. There are about 59 faculty in BMCB, somewhat over one half of whom are in the Dept of Molecular Biology and Genetics (MBG), with the rest from the following departments or units: Chemistry and Chemical Biology (College of Arts and Sciences); Applied and Engineering Physics (College of Engineering); Physics (College of Arts and Sciences); Division of Nutritional Sciences (College of Agriculture and Life Sciences and College of Human Ecology); Microbiology (College of Agriculture and Life Sciences); Boyce Thompson Institute; Molecular Medicine (College of Veterinary Medicine), Microbiology and Immunology (College of Veterinary Medicine), and Biomedical Science (College of Veterinary Medicine).

Outline of research areas. Viewed broadly, the research focus of the Field of BMCB is to uncover the fundamental chemical, biochemical, molecular biological, and cell biological principles that govern all forms of life. While the techniques and principles of “biochemistry”, “molecular biology”, and “cell biology” underlie much of the basic and applied research in modern biology and in medicine, research in BMCB labs goes beyond the methodologies implied by these terms. BMCB research typically is devoted to understanding the processes common to all cells, such as transcription, translation, DNA replication and repair, protein-nucleic acid interactions, biological pathways including signal transduction and metabolism, cell-cell communication, organelle function, macromolecular machines, protein structure and dynamics, membrane and cytoskeleton structure and function, and enzyme mechanisms. The research in the Field of BMCB focuses on quantitative and mechanistic types of analysis, as opposed to those that are qualitative and descriptive.

APPLICATION FOR FIELD MEMBERSHIP

General. The Field of BMCB welcomes faculty members who are strong scientists and are capable trainers of students, who do research and train in an area broadly relevant to BMCB, and who are willing to commit time and effort to the Field.

The Field of BMCB has its traditional and administrative home in the Department of Molecular and Cell Biology (MBG) and most of the courses for BMCB grad students are taught by MBG faculty. However, the Field is open to applicants from any department at Cornell. For applicants from outside the MBG Department, they will already have a “primary” Field, and thus BMCB would be a “secondary” Field. Primary and secondary BMCB Field members have exactly the same rights and responsibilities. All BMCB faculty have equal access to grad students and to competitive slots for BMCB students on the NIH Training Grant in Cellular and Molecular Biology. All faculty are expected to participate equally in
administrative activities, Field committees, and graduate student recruitment and mentoring. All faculty are expected to give a 0.5 credit, 700-level “minicourse” ca. every 8 years.

Membership in the BMCB Field implies a commitment to participate in Field activities. Those who already have multiple Field associations should make a convincing argument in their application that they will devote time and energy to BMCB.

**Publications and invited talks.** Applicants are expected to have an outstanding publication record in their research area, which should fall under the rubrics of biochemistry, molecular or cell biology, as sketched above. Publications should include first authored papers (or for senior faculty, corresponding authorship) in the most highly respected journals with wide readership in BMCB. Publications that are not in journals with a wide readership but are relevant to an application should be in the top ranked specialty journals that have editorial boards with expertise in BMCB. Applicants also should have been invited regularly to present their work at other universities and major conferences. The Field of BMCB is looking to raise the stature of the Field by recruiting faculty with research programs that surpass in excellence the present average of the Field membership.

**Research funding.** Applicants in their first year as independent investigators are expected to have a detailed plan for seeking research support from the NIH or other agencies, and the outlook for such support should be excellent. Applicants in their second year are expected to have received at least minor grant support and to have pending applications for major funding. Applicants in their third or later years should have a fully funded research program, with at least one major grant.

**Training record.** If they come from an academic background, senior faculty applicants to the Field are expected to have a record of training grad students and post docs who have been very successful in the next step in their careers.

**Engagement with the BMCB community at Cornell.** All applicants to the Field of BMCB are expected to be engaged with the Cornell community of research scientists in biochemistry, molecular and/or cell biology. Evidence for such engagement could include regular attendance at relevant seminars (for example the Friday 4pm series in the Biotech Bldg, sponsored in part by the Field of BMCB), or existing or planned collaborations with BMCB labs. For applicants who have recently arrived at Cornell, the probability of active engagement will be evaluated by the BMCB advisory committee.

**Mechanism of application.** Applicants should submit the following to the BMCB Director of Graduate Studies: a letter of intent including research plans for the future, a CV, and two letters of support from BMCB Field faculty (at least one of which should be from someone outside the applicant’s department). The letter of intent and letters of support should discuss (a) what significant contributions the candidate has made and (b) how their research fits the BMCB training program.

The BMCB advisory committee will review the application in an expeditious manner. If the committee judges the research area and qualifications of the applicant to be suitable, the DGS will arrange for a Field seminar (normally in the Friday 4pm seminar series), and the CV will be circulated to all the Field members. Immediately after the seminar the Field will vote. The Graduate School requires that 2/3 of all Field members must vote “yes” for the applicant to be admitted to the Field. In cases where an application is submitted by a newly-arrived faculty member at a time that does not permit a Field seminar to be scheduled immediately, the DGS may nevertheless make special arrangements for that person to give a “rotation talk” to the first year BMCB class, before the applicant has been formally admitted to the Field.

For faculty new to Cornell who gave a job seminar within a year of applying for membership in the Field of BMCB, the requirement for presenting a seminar may be waived at the discretion of the DGS, if approximately two thirds or more of the Field is likely to have attended that seminar.
Financial commitment implied by Field membership. BMCB faculty members have agreed to share the costs for recruiting the first year BMCB class, and for supplementing the first year stipends to the university-mandated level. Those faculty who take a BMCB student at the end of the student’s first year are asked to contribute this amount to the Field of BMCB account. The costs may be reimbursed either by the individual faculty member or by his/her department. Until reimbursement is made, the faculty member in question will not be able to take further BMCB students.

RENEWAL OF MEMBERSHIP

The BMCB Advisory Committee will evaluate each Field member every seven years. A non-participating field faculty will be asked to resign. Criteria for non-participation: (1) the faculty has not mentored a student for thesis research or rotation, or served on a student special committee in the previous seven years; and (2) has not participated in any Field related committee nor taught a mini-course in the previous 7 years; and (3) has not participated in voting at least 50% of the time in the previous 7 years.

BMCB ADVISORY COMMITTEE

The DGS appoints an advisory committee to provide advice in Field matters. The committee is broadly representative of research areas and departments. Current Advisory Committee members are: Tony Bretscher, Brian Crane, Maureen Hanson, John Lis, Holger Sondermann, Marcus Smolka.

APPROVAL OF FIELD PROPOSALS

A majority of all Field members must vote in favor of a measure involving Field policy in order for it to take effect.

POLICY ON PARTICIPATION IN THE TRAINING PROGRAM SUPPORTED BY NIH

Field membership does not automatically qualify faculty members to participate in the training program funded by NIH. Participation as a trainer requires active status as a member of the Field of BMCB and requires that the trainer will have had external research support within the past three years. The training grant PI (Anthony Bretscher) and the BMCB Advisory committee will evaluate past performance of trainers at the time of application for competing renewal of the grant and remove inactive trainers from the program roster.

TRAINING GRANT AND STUDENT SUPPORT COMMITMENT

Admissions offers to students entering the Field of BMCB contain the phrase “...support based on satisfactory progress.” The only resource available to the Field itself is the Cellular and Molecular Biology training grant and a few fellowships funded by the Graduate School for entering students. These are used to provide first-year support and a number of competitively awarded slots. Additional resource is needed to support recruitment cost for the interview weekends, and to supplement some fellowships so all students receive the same stipend. The BMCB Field has developed a finance model in which the faculty who accept students into their labs at the end of the academic year are required to share the cost for supporting the stipend supplement of the incoming class and the recruitment cost in the upcoming Spring. Depending on the projected recruitment cost, as well as the supplement cost required, faculty (or their home department) are requested to contribute ~4-10K for each student they accept into the lab.
It is important to note that the Department of Molecular Biology and Genetics is unable to guarantee subsequent support for students who choose to work with faculty outside the department. The commitment for continuing financial support given to students must be accepted by the Field faculty member at the time that he/she accepts a student into his/her research group. In addition, a commitment on the part of the department to assume financial responsibility for the student, in the event that the mentor is unable to maintain sufficient grant support, also is required.

In general, training grant eligible BMCB students are put on the MCB training grant during their first year in the program. This usually uses up ~2/3 of the available training grant slots. The remaining slots will be used to fund 3rd and 4th year BMCB students on a competitive basis. The decision to appoint upper class students onto the MCB training grant is made each year by an ad hoc committee.

In general, students who have been funded by the MCB training grant cannot be appointed on other training grants. At a previous review cycle, the NIH reviewing committee raised serious concerns about students being supported by different training grants without strong justifications of additional training needs.

On rare occasions that a BMCB student will benefit from additional training programs beyond the scope of the MCB training grant, the student can be put on a different training grant if appropriate justifications are provided and permission is given by the MCB training grant PI. Prior to appointing any BMCB students who has previously been supported by the MCB training grant onto a different training grant, the PI of this student must send a letter/email to the MCB training grant PI (currently Anthony Bretscher) to describe the additional training needs, and how putting this student onto a different training grant will enable additional training activities (e.g. additional course work, participation in specialized journal clubs, conferences, etc.)

OTHER COMMITMENTS IMPLIED BY FIELD MEMBERSHIP

All Field members are expected to serve as advisors on student's Special Committee representing BMCB, to teach one of the Current Topics in Biochemistry minicourses at least once every ca. ~7 years, to occasionally participate in other teaching responsibilities specifically targeting BMCB students, to serve on BMCB field-related committees (such as the Admissions or Recruitment Committee), and to occasionally host a speaker for the Friday Seminars.

Field members must meet annually with every BMCB student whom they advise, along with the rest of the student's Special Committee. This meeting usually takes place immediately after the student’s seminar (or soon thereafter). The student completes a Progress Report (Appendix V) before the meeting. The major professor should go over this report with the student and then write an independent letter evaluating the student’s progress. This letter becomes part of the student’s file.

REQUIREMENTS FOR STUDENTS MINORING IN BMCB

For Ph.D. candidates with a minor in BMCB, the suggested requirements are at least six credits of advanced lecture courses (usually at the 6000-level, but some 4000-level courses may be appropriate, e.g., BIOMG 4370, BIOMG 4380, BIOMG 4450. Appropriate courses in BMCB include: BIOMG 6310, 6330, 6360, and 6390. 6000- and 7000-level courses in other departments, i.e., Chemistry & Chemical Biology, Plant Biology, Vet Molecular Medicine, and Vet Microbiology & Immunology, may also be suitable, as determined by the Special Committee. If a student who wants to minor in BMCB
has not been exposed to appropriate lab work in the general area of BMCB, then he/she should also take
the lab course BIOMG 4400.

For MS candidates with a minor in BMCB, the suggested requirements are at least four credits of
advanced lecture courses (and a lab if appropriate). Some suggestions for appropriate courses are
indicated directly above.

Note that requirements are determined by Special Committees, and that the recommendations above
are guidelines offered by the Field.

**ROTATIONS**

First year students are required to do three lab rotations with BMCB faculty during their first
academic year. Faculty members who are interested in recruiting students give a 20 minute rotation talk
to new students. These talks are scheduled on Tuesday and Thursday afternoons during the first half of
the fall semester. Faculty should prepare a two-page handout summarizing their lab and their research,
to hand out to the first year students one week before the rotation talk. At the end of a rotation period,
the mentor must fill out a Rotation Evaluation Form (Appendix II), which must be signed by mentor and
student, and which becomes part of the student’s file.

May students do a rotation in the lab of someone who is on sabbatical leave? In general, this is not
advised unless the student plans also to do a fourth rotation. In rare cases, and where special provisions
are made (including oversight by another faculty member), such rotations are acceptable with the
approval of the DGS.

It is important to note that faculty should not commit to accepting a student into his/her lab for thesis
research until the last day of classes in Spring semester (usually the first week in May). This is to ensure
all students have a fair chance of completing their third rotations before faculty make a final decision.

**STUDENTS WHO ENTER BMCB THROUGH AN UNTRADITIONAL ROUTE**

Occasionally, graduate students who come from other institutions or from other Cornell departments
inquire about transferring to BMCB. If those students are early in their career, they are encouraged to
apply through the regular admissions procedures. If they are accepted, then they are treated like all of
our students. In rare cases students may enter the program through a route other than the normal
admissions procedure. Admission through this route requires approval by the DGS and the Chair of the
Admissions Committee. In such cases, the Field member who takes the student accepts full financial
responsibility for that student. The student may not be required to do all rotations, or to take the BIOMG
8310 laboratory course, but still must fulfill the teaching requirement. Other course requirements are
established by the student's special committee.

**TEACHING REQUIREMENT**

It is a requirement that all students in the Field teach at least one semester, which they fulfill usually
in their second year (see page 4 for details). In some cases, students enter the PhD program who already
have extensive teaching experience. Very rarely the teaching requirement may be waived in such cases,
with the approval of both the DGS and the Chairman of MBG.
ATTENDANCE AT STUDENT SEMINARS

Field faculty are required to attend the yearly student seminar (BIOMG 8330) as well as the thesis seminar of students on whose special committees they serve. In addition, Field faculty are expected to attend at least some of these seminars for other students.

A-exam & B-exam standard, A-exam assessment form
Annual Progress Report – assessment form
Accurate reporting & evaluation
THE ROOM: Seminars are held in G10 Biotech, the large conference room on the ground floor. It is the student's responsibility to make sure that the room is open, the microphone is working, the LCD projector is set up, and the chairs are in place. Make sure you have ample time to set things up before your seminar. If this is your first seminar, get help from veteran students.

TIME: For a full-period presentation, plan to talk for 45-50 minutes, leaving ten minutes for questions and discussion. For a half-period presentation, plan your talk for 20 minutes (25 minutes at the most). Sometimes unexpected questions will throw you behind schedule; even so, make sure you don't talk beyond the limit. Students giving their first talk often think that because they don’t have enough data to fill the allotted time that they should abbreviate their talk. This is usually a mistake. Good speakers devote large portions of their talks to explaining why and how they are doing their analysis. Why is your research interesting? What questions have other people in the field asked? Thus, if you haven't had much time to develop your project, you can provide your audience with a fuller appreciation for the background of your project.

PRACTICE: Rehearse the talk beforehand! Most people practice at least twice in front of their regular lab group. Those who are not native English speakers are encouraged to add an extra practice session. When you rehearse, it is important to have someone in the audience who does not already know what you are talking about, who can tell you if everything is intelligible to the non-specialist. Perhaps the most frequent problem in the student seminars is that speakers assume the audience already knows the background and the techniques used.

VISUAL AIDS: PowerPoint “slides” are usually best here. Plan to use no more than about twenty slides (25 at most if some are very simple), with maybe half of these containing data (graphs, pictures of gels, etc.). Good quality slides are extremely important, especially for presentation of data. A common mistake in preparation of slides is to include too much information, or to make the lettering too small. Check beforehand to make sure that someone sitting in the back of the room can read everything. As an example, for Times font, titles should be 28pt (or 24pt at the smallest), and other lettering should be at least 20pt. Do not use complex color schemes for your slides. Put a simple title on each slide. "Cue" slides are especially useful to help keep the audience with you. Examples: flow charts; schematic pictures of gels; sentences giving the conclusions from what has been presented, or the next topic, or restating the question you are asking. Insufficient use of cue slides is perhaps the most frequent problem with student seminars. For data slides, it is helpful to write a one-phrase or one-sentence conclusion at the bottom of the slide, using PowerPoint animation. For complex data, such as tables of numbers, or gels with several lanes and bands, highlight the features that you want the audience to see, for example by enclosing in a red box (also animated as you point out different features). Use the laser pointer sparingly. Do NOT wave it around wildly, as this is extremely distracting. Do not circle the object you want the audience to see. Instead, point to the object on the screen, and then turn the pointer off again. Remember to face the audience and make some eye contact. Don’t talk to the screen.

INTRODUCTION: Ten to fifteen minutes should be allotted to giving the background for your project. Do not assume, just because you have spoken in previous years, that people will remember the background for your project. Every seminar should be self-contained. State precisely what questions
you want to answer, the hypotheses to be tested, and why they are interesting. Remember that part of the task of the seminar speaker is to convince the audience that it is worth listening!

YOUR RESULTS: As you talk, remember to say clearly what you did and what was done by others in the lab before you or in publications. A common mistake in writing, and sometimes also in talking, is to use the passive voice ("a gel was run . . .", "a gene was sequenced . . ."). If you did it, say so. If not, say who did. When you are referring to published papers with multiple authors, don't describe the results by saying that the senior author did the work. You won't like it either when the project on which you have slaved for years is referred to as the work of your thesis advisor!

Don't confuse data with interpretation of the data. Usually there are several ways to interpret the results of an experiment. Tell the audience which are strong inferences and which are weak. If it is your result, tell what needs to be done to make it more convincing. Don't use jargon! Don't just say, for example, you did "S1 mapping". Explain succinctly what the method is and why it is being used. Another common mistake is to switch from one slide to the next, presenting each as an isolated experiment. This is seldom the case. Usually there is some reason for doing the next experiment, so try to provide transitional sentences when changing slides. Example: "Having purified this new protein which we believe to be associated with the cytoskeleton, I wanted to see more precisely where in cells it is located. To do this, antibodies were prepared against the purified protein and used for immunofluorescence . . ."

CONCLUSIONS: A summation should be part of every seminar. What have you shown? What do you conclude from the results? What are your plans to further bolster your conclusions? What are your plans for the future?

CREDITS: It has become a convention to show a final slide with the names of those who helped you. Keep it brief – no more than one-half minute. Unless there are exceptional circumstances, do NOT recite the names and ways in which each person helped you. For example, it is quite sufficient just to acknowledge your mentor, thesis committee and lab members with one spoken sentence.
APPENDIX II
MORE GUIDELINES ON WRITING THE A-EXAM PROPOSAL & ORAL EXAM PRESENTATION

Scope of the proposal. The proposed work should be limited in scope, so that a postdoctoral fellow (perhaps with the help of a technician) could accomplish the bulk of the work in three years. Study sections that review grants are very critical of proposals that describe five times as much work as could actually be done, even if very good descriptions of experiments are given.

Once you have narrowed the topic, develop a few (say three) specific questions you want to answer. Don't write down questions that are too general. By being specific, the questions will keep your proposal focused on the topic. After you have come up with a few specific questions, sketch in outline form what experiments you might do to answer them. Then work through the details to flesh your ideas out as a real proposal.

Your proposal will be judged for its innovation, quality and organization. Your thoughts should be developed logically and should represent some real insight in the field. The exam is meant to challenge your thinking and provoke discussion between you and your examiners. The format does not serve a useful purpose if the proposal and the exam:

1. Simply espouses "the party line" and echoes common themes in the lab.
2. Does not address interesting issues in the field.
3. Proposes only a small incremental advance in research.
4. Offers only pedestrian solutions to problems.
5. Fails to evoke dialectics and debate.

Preliminary data. An important section of all grant proposals is the progress report or preliminary data. However, this section is not a deciding element in the A exam, and students may not put off taking an A exam for want of more data. Preliminary data are useful in charting the future course of research; however, the A exam is not intended to judge research accomplishments, but to assess the prospects for research based on the student's ability to conceive, investigate and defend a research proposal.

Specific aims. This section states crisply the hypothesis you are testing, or the questions you will try to answer. It also provides a list of each separate approach (aim) you will use to reach the overall goal. Use subheadings if appropriate.

Research designs and methods. This is the meat of your proposal and should be organized according to the specific aims and presented clearly. Critical experiments should be described so that examiners appreciate your mastery of the subject. Experiments, important controls and contingency plans need to be fully described.

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2 A method of argument or exposition that systematically weighs contradictory facts or ideas with a view to the resolution of their real or apparent contradictions.

3 One format might be: "The overall aim is to..." or "The long term goal is to.....", followed by one or a few sentences. Then the actual specific aims could simply be listed, perhaps with subheadings 1. [1a,1b]; 2. [2a,2b,2c]; 3. Often the best way to phrase your aims is in terms of an hypothesis: "The hypothesis to be tested is that......"
Outline for each of the specific aims (use the same headings and subheadings) how you will proceed to test the hypothesis or answer the question posed. Give enough detail so the reviewer can judge if the experiment is likely to work. You don't need to give details about common procedures since these can be referenced. For example, molecular biological methods that are described in a manual such as Current Protocols in Molecular Biology needn't be repeated (buffers, times of incubation, etc.). But if there is a basic protocol you rely on for a large fraction of the work, you should lay it out for the reader. The reviewer is looking for indications that you have carefully thought out every step in the proposed procedure. If you are not sure every step is feasible, then indicate and describe what you will do if the step doesn't work.

There are several types of design problems that occur frequently, both in exam proposals and in real grant proposals.

1. **Achieving the goal requires finding something.** A favorite criticism of some kinds of proposals is that they are nothing but "fishing expeditions" (by implication, with little chance of catching a big one). Don't plan to spend more than a fraction of your research time seeking something that you may not find. Even if the payoff looks large, and if the chances look good, you won't get grant money (at least not at the beginning of your career) if a search is the main thing the proposal is about. Build into the proposal experiments that will yield results no matter how they come out.

2. **Too many contingencies.** If achieving a major goal Z requires you first to achieve Y, and Y requires X, and so forth, the probability of reaching the end goal Z may not be high.

3. **Limitation of starting material.** Know how much starting material is available, how much this costs to obtain (money or labor), and what size of an operation you would need to work it up to achieve your goal.

An important part of the "Experimental Design and Methods" section is a description of how data will be interpreted. This is especially true for quantitative data. No one obtains funding just to make measurements! Grant proposals are frequently criticized because the results obtained will be "purely

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4 For example, don't draw up a proposal with the major aim to identify by differential display a cDNA representing a messenger RNA that is produced in mammalian cells in response to growth factor stimulation. That is truly a fishing expedition and there is not much to say about the cDNA until it is found. Or as another example: suppose you want to study what proteins interact with a yeast cytoskeletal protein, by mutating the gene for that protein, and then cloning second site suppressor genes. This is an excellent approach and has many precedents. But even so, the second site suppressors may not be obtainable. Hence, in the absence of direct evidence that this approach is workable in your system, don't put all your eggs in this basket.

5 For example, if you are studying a particular protein that is available in pure form, do some enzymological characterization that will answer an important question, or map functional domains of the protein by mutagenesis—in such cases whatever you find or measure may be useful.

6 For example, suppose you want to study the properties of a very minor cellular protein, say the protein product of the mos oncogene. Your plan is to purify the protein, make monoclonal antibodies, use the antibodies to fish out the right gene from a cDNA expression library, hook up the gene to strong inducible promoter, insert this construct into an E. coli expression system, induce and finally purify the protein. All these are standard steps, but the chances of success, starting with no knowledge about the protein, are slim. Purifying minor proteins may be difficult (suppose this one is membrane bound and inactivated by detergents). Maybe the protein is not very antigenic in mice. The monoclonals may well not work in the western blot screening procedure. The expressed protein may be toxic even low doses, or it may well precipitate in the cell. Don't base too much of the proposal on such a series.

7 For example, don't propose to grow primary animal cells in culture as a source for a minor protein you want to purify in milligram amounts. Think ahead that one plate of cells, costing roughly a dollar in plastic plus growth medium, contains only a milligram of total protein. Since you would need thousands of plates to obtain enough starting material, this strategy would not be workable.
descriptive" (a favorite phrase of criticism often levied by reviewers). What is the meaning of the data you hope to collect? Being explicit about your interpretations is a key element in convincing the reviewer that the papers you write will make a significant contribution to the field (instead of confusing the field so that others will need to clean up afterwards, as so often happens).

At the end of the "Experimental" section, it is wise to put in a paragraph or two about possible pitfalls. Nothing is guaranteed to work. If you let the reviewer know what you think the major limitations are, then you make clear the fact that you have thought about them. If you anticipate a potential problem, then you should indicate what alternative procedures you will use to get around it.8

**Figures and tables.** Figures and tables are often useful as an aid to the text. It is quite appropriate to reproduce figures from a review or other important article (state clearly from where taken). Figures may also be useful to show the reader what data you expect and how the data will be interpreted. Key figures and tables should be placed in the appropriate positions in the text and they count toward the page limits.

**Writing style.** Finally, matters of writing style and impeccable grammar are absolutely essential for successful proposals. Simple flaws can mar an otherwise perfect proposal. The A exam proposal is an exercise in meeting the highest standards of style and presentation. Good writing is an essential component in your quest for funding! If you are famous, you may get a poorly written grant proposal funded. However, most of us have seen funding denied to very well established investigators who have submitted carelessly or poorly written proposals. On the other hand, if you are not well known, given the competition for research funds that exists today, your proposal will almost certainly remain without financial support if it is poorly thought out or poorly written. In a well-written proposal, the eye of the reader moves down the page in an unbroken manner, from sentence to sentence and paragraph to paragraph. The logic of the presentation is so clear, and the writing so free of distractions, that he/she almost never has to read a sentence twice. This requires good use of transitions, between sentences9 and between paragraphs.10 A particularly important principle of good writing that is often neglected is paragraph structure. Each paragraph should have a topic sentence (usually the first sentence) that tells what the paragraph is about. Another principle is to use uniform tense.11 Yet another principle (often mis-taught by teachers of scientific writing) is to avoid overuse of the passive voice.12 Keep in mind that

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8 For example, suppose you plan to overexpress a certain foreign protein by introducing the gene into CHO cells along with the gene for dihydrofolate reductase, and then selecting for gene amplification with methotrexate. This is a reasonable procedure, but it might turn out that the protein is toxic to the cells, and thus production will not be high, or the protein may become mutated to a less toxic form, or the clone may simply not be obtainable. You should anticipate these problems, and indicate if troubles arise, a different eucaryotic expression system (for example baculovirus) will be used instead.

9 A transition can be a word or a phrase or clause showing how what follows relates logically to what came before. For example: "However,..."; "Nevertheless,..."; "In addition,..."; "By contrast,..."; "In order to..."; or "Based on these results,..."; etc.

10 For example, "To generalize these observations,..."; "With the aim of elucidating the molecular biology of this phenomenon,..."; etc.

11 There is a lot of confusion about usage of tense in scientific writing, and also some leeway. In general, if you are describing particular experiments that were done in the past (either yours or those of others), use the past tense. "Optimal conditions for cell growth were established"; "The blot was hybridized with nick-translated probe from clone X"; "Smith et al. cloned the receptor gene." By contrast, if you are describing generalizations, or making a statement that had validity and still has validity, use the present tense. "Smith et al. showed that the fms oncogene has a protein kinase activity." No matter what convention you use, do not switch between tenses without good reason.

12 There is nothing wrong with saying, "Harris and Jones investigated the relationship,...", or "We investigated...", or (for example, in the context of a proposal) "I will investigate..." To the contrary, active voice is much preferable to the passive "The relationship was investigated by Harris and Jones..." In this latter case at least the identity of the actors (H and J) is clear. But if you say, "The relationship was investigated..." (meaning "we" did), the reader may well be confused who did it.
a well-written proposal requires multiple revisions. Each word and sentence should say exactly what you want to say—no more and no less.

**Time required to prepare the proposal.** You should plan to spend about one month of full time work to prepare your proposal. Some students can do the background research and then write a thoughtful proposal in three weeks, while some take six weeks. Two months is definitely too long!

**Oral defense.** Students generally prepare a PowerPoint presentation. The presentation generally contains a few slides to cover the background of the proposal briefly, then a few slides that list / explain each Specific Aim. Relevant preliminary results will also be shown.

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Overuse of the passive voice is a common hallmark of poor scientific writing, and is frequently accompanied by this sort of confusion. Get in the habit of using active voice, at least at the start of a paragraph or description, to identify authorship absolutely clearly. Then in continuations of the descriptions, if no ambiguities arise, you may use passive, in order to emphasize the results instead of the authorship.
APPENDIX III

ROTATION EVALUATION FORM

Field of Biochemistry, Molecular and Cell Biology

TO: Rotation Mentors  
FROM: Sylvia Lee, DGS  
RE: Rotation Evaluation Request

Please fill out the attached rotation form and discuss with the student, and return the form signed by both you and the student to GFAs (Vic, Casey, Ginger) at 107 Biotech Bldg immediately after the rotation period. NOTE THAT THIS FORM IS REVISED FROM PREVIOUS YEARS. If the student is no longer in your lab, please return the form and we will obtain the signature.

If you have any confidential comments, use the space below or send an email directly to the DGS.

Careful evaluation of our first year students is an essential component of our graduate program. These materials are critical for their evaluation at our annual meeting.

Field of BMBC ROTATION EVALUATION FORM

Confidential comments:
Field of BMBC ROTATION EVALUATION FORM

Rotation Student: ___________________  Professor: ___________________

Rotation Period Dates: _____________

The following categories are designed to help you in the evaluation of this student. Use a letter grade, A-F, for each quality that you are able to evaluate based upon your observation during the rotation period.

Use the grading scale appropriate for graduate level courses: i.e. an A grade represents outstanding performance, a B grade should be the average grade for our rotation students, an acceptable grade for good performance, C or lower grade indicate unacceptable performance and will be considered as a “failed” rotation.

_____ Effort to learn the background and read the literature in project area.
_____ Effort to master the necessary techniques in project area.
_____ Proficiency and accuracy in lab work.
_____ Analytical skill in interpreting data obtained during rotation.
_____ Independent critical thinking about the project (evidence of creativity).
_____ Maintenance of a careful and well organized lab notebook.
_____ Motivation and enthusiasm for research.

_____ Overall letter grade for rotation.

Please indicate in a 1-5 scale whether you would be willing to take this student into your lab and explain your choice:
(“5” I would definitely be willing to take this student into my lab, assuming he/she were interested and assuming I had space and sufficient financial support. “1” I would NOT be willing to take this student into my lab, even if I had space and sufficient financial support.)

Comments (use separate page if needed):

Faculty Signature ___________________  Student Signature ___________________

Date: ______________
APPENDIX IV

2014-2015 Progress Report
for the
Field of Biochemistry, Molecular and Cell Biology

(This section is to be completed by Student, and a copy should be distributed to each committee member PRIOR to the annual committee meeting.)

Student's Name: ________________________
Date of First Cornell Registration: ___________
Date "A" Exam Scheduled or Passed (circle one): ___________

Describe your research using the following headings. Use continuation pages if necessary.

1. Dissertation project description: 1 paragraph
2. Status of research as of last report: in bullet points, ~half page
3. Progress since last report (to present): ~1 page
4. Research goals for this year: in bullet points, ~half page

Publications since last report:

Total publications to date:

Titles and dates of talks, seminars and posters presented last year (since last report):

Awards/Honors received last year (since last report):

Other professional activities (outreach, etc.)

Please express in a few sentences your current career plans. In your answer please indicate the steps that you have taken in the current year to explore these plans. Include seminars/courses that you attended and contacts that you have made (e.g. Cornell Career Services). Have you discussed your career plans with your advisor? What was the outcome?

For Students in or beyond their 4th year:

Planned graduation date: ___________
Date of Thesis Seminar: ___________
Post-graduation plans, if known:

** Students in their 5th year or beyond must also submit a Thesis Outline.
2014-2015 Evaluation of Student Progress by the Special Committee
for the
Field of Biochemistry, Molecular and Cell Biology
(to be discussed & filled out during the annual committee meeting)

** It is essential that the Special Committee provides honest and constructive critiques, so the student can benefit from them. (Use continuation page if necessary.)

| Foundational knowledge in the field (e.g. student’s ability to field questions etc) | Please make brief comments (e.g. Outstanding; Need improvements;), and also try to be as specific as possible (e.g. concrete time-lines to improve knowledge in specific areas, to complete a set of experiments, etc.) |
| Critical thinking skills (e.g. student’s ability to critically evaluate own or others’ data etc) |
| Plan and execute original research (e.g. student’s ability to make substantial progress in research) |
| Written communication skills (e.g. based on written Progress Report, manuscripts, etc) |
| Oral communication skill (e.g. based on seminar presentation etc) |
| Responsible conduct of research (in compliance of yearly training in CRC?) |

** The Committee has the obligation to uphold the standard of the BMCB Field. If a student is NOT making satisfactory progress towards timely completion of his/her dissertation research, the committee must make clear & specific recommendations. E.g. the student can be suggested to complete a Master thesis, so the Committee can re-evaluate whether continuation in the PhD track is warranted.
(To be completed by Special Committee Chair)

Please provide a general assessment of the student’s progress in the past year, listing any recommendations made by the Special Committee to the student, and detailing any problem areas.
*Please also indicate how the student committee responded to the Student Career Plan Outline. Did the committee offer any suggestions/advice to help the student with his/her career plan? If so, please outline what this involved.

**This report is due within 30 days of the annual student seminar.** Use additional pages if necessary. Student must sign the completed form to acknowledge its contents.
(For confidential comments, please email the DGS directly.)

Student’s Name _______________________________
Chair’s Name _______________________________

______________________________________________
Chair’s Signature   Date

______________________________________________
Student’s Signature   Date

Please return to GFAs at 107 Biotechnology Building
There are many ways to succeed as a graduate student. Here is an article I like, and I hope it gives some tips to help you fulfill your potential as a successful and independent scientist. (Sylvia Lee, July 2011)

What makes a good PhD Student?

Doing a PhD should be fun and rewarding, because you can spend all your working time discovering things and pursuing ideas — and getting paid for it, without any administrative responsibilities. Those who stick with a career in science do so because, despite the relatively poor pay, long hours and lack of security, it is all we want to do. Unfortunately most new PhD students are ill-prepared, and as a consequence very few will fulfill their aspirations to be independent scientists. The main reasons for this are the ‘grade creep’ inherent at most universities, making it difficult to identify the really talented first-class graduates from the rest, and the pressure on universities to graduate as many PhD students as possible. The consequence is that we enroll far too many of them without telling them clearly what doing a doctorate should entail. We therefore set ourselves, and the students, on a path of frustration and disappointment.

So what should we be telling prospective PhD students?

● Choose a supervisor whose work you admire and who is well supported by grants and departmental infrastructure.
● Take responsibility for your project.
● Work hard — long days all week and part of most weekends. If research is your passion this should be easy, and if it isn’t, you are probably in the wrong field. Note who goes home with a full briefcase to work on at the end of the day. This is a cause of success, not a consequence.
● Take some weekends off, and decent holidays, so you don’t burn out.
● Read the literature in your immediate area, both current and past, and around it. You can’t possibly make an original contribution to the literature unless you know what is already there.
● Plan your days and weeks carefully to dovetail experiments so that you have a minimum amount of downtime.
● Keep a good lab book and write it up every day.
● Be creative. Think about what you are doing and why, and look for better ways to go. Don’t see your PhD as just a road map laid out by your supervisor.
● Develop good writing skills: they will make your scientific career immeasurably easier.
● To be successful you must be at least four of the following: smart, motivated, creative, hard-working, skilful and lucky.

You can’t depend on luck, so you had better focus on the others!

Georgia Chenevix-Trench is principal research fellow at the Queensland Institute of Medical Research, Royal Brisbane Hospital, Herston, Australia.

✈ www.qimr.edu.au/research/labs/georgiat/Guideforphds.doc
APPENDIX VI

Fellowships
Many graduate students apply for research fellowships for the prestige and to help supplement their stipend and support other resources that will enhance their research.

Cornell University Internal Fellowships
- Center of Vertebrate Genomics Scholars
  - http://www.vertebrategenomics.cornell.edu/ScholarsPast.html

National Competitive Fellowships
- HHMI Medical Research Fellows Program
  - http://www.hhmi.org/grants/individuals/medical-fellows/
- HHMI International Student Research Fellowships
- National Science Foundation Graduate Research Fellowship
- American Heart Association Predoctoral Fellowship
  - http://my.americanheart.org/professional/Councils/AwardsandLectures/Undergraduate-and-Graduate-Student-Research-Funding-Opportunities_UCM_322758_Article.jsp
- Department of Defense Graduate Fellowship
  - http://ndseg.asee.org/
- National Institutes of Health Individual Predoctoral Kirschstein Fellowships
- Cornell Graduate School Fellowship Database
  - http://www.gradschool.cornell.edu/fellowships
APPENDIX VII

PLANNING FOR A POSTDOCTORAL POSITION

1. **Timing:**
   - Begin looking a year or more before you are ready to graduate; remember, it often takes more than a year to find the right lab and to secure funding.

2. **Finding a lab:**
   - There is a listing of available postdoctoral positions posted on the 1st floor bulletin board; read it frequently.
   - Read the journals and look for labs that are doing interesting work, contact the P.I.
   - Ask the advice of your advisor, other faculty members, etc.
   - Attend seminars and talk to the speakers.

3. **Selecting a lab:**
   - Pick the 3-4 labs that are your top choices for a postdoctoral.
   - Write a letter to the P.I. Describe the work you’ve done and why you’d like to join their lab.
   - Enclose a CV.
   - Ask your major professor and 2 others to write recommendation letters for you.
     (Arrange to have these letters arrive shortly after your own.)
   - Follow up with a phone call after a reasonable amount of time if you haven’t had a response.
   - VISIT THE LAB! Plan to give a seminar, or at least explain what you’re doing; talk to P.I. and lab members about projects they are working on.
   - The best way to know your fit in a lab is to find out from lab members; also check track record of previous lab members and find out if P.I. is supportive of lab members moving on (e.g. post docs taking projects to start their own labs).

4. **Sources of postdoctoral funding:**
   - In addition to a list of postdoctoral positions, the Reading Room has a file containing information about fellowships and other sources of funding.
   - The Sponsored Programs Library can search for specialized fellowships (115 Day Hall, 5-2949).
   - Write applications with the help of your postdoctoral advisor. Be sure to allow enough time; remember how long the A-exam took? Give a copy of your proposal to your major professor and several others asking for their comments and suggestions.
APPENDIX VIII

SOME FOUNDATIONS THAT AWARD POSTDOCTORAL FELLOWSHIPS

Consult the websites of these foundations for details about fellowship applications.

1) American Cancer Society
2) Damon Runyon-Walter Winchell Cancer Fund
3) The Jane Coffin Childs Memorial Fund for Medical Research
4) Life Sciences Research Foundation
5) The Helen Hay Whitney Foundation
6) NIH, NRSA
7) Arthritis Foundation
8) Juvenile Diabetes Research Foundation
9) American Diabetes Association
9) Leukemia Society of America
10) Muscular Dystrophy Association
11) American Heart Association
IMPORTANT CONTACT INFORMATION

Field Matters:

Siu Sylvia Lee        William J. Brown
Director of Graduate Studies   Director of Graduate Studies
339 Biotechnology Building    359 Biotechnology Building
Telephone: 255-8015     Telephone: 255-2444
E-mail: sylvia.lee@cornell.edu  E-mail: wjb5@cornell.edu

Vicki (Vic) Shaff, Kathleen (Casey) Moore, and Ginger Tomassini
Graduate Field Assistants
107 Biotechnology Building
Telephone: 255-2313 (Vic), 255-2100 (Casey), 254-8272 (Ginger)
E-mail: ves3@cornell.edu, kathleen.moore@cornell.edu; glt38@cornell.edu

Graduate School Forms
Graduate School
143 Caldwell Hall
Telephone: 255-5820
http://www.gradschool.cornell.edu/?p=11

Housing Services:
Campus Life Housing Office
119 Robert Purcell Community Center Telephone: 255-5368
http://campuslife.cornell.edu/graduate_housing/GPSH@cornell.edu

Medical Services:
University Health Service
Gannett Medical Clinic
10 Central Avenue
Telephone: 255-5155 (24 hours, 7 days a week)
http://www.gannett.cornell.edu/

Let’s Talk:
Problems with stress, academic problems, anxiety, relationships, adjustment to a new culture, family problems, depression, financial difficulties and other concerns.
No appointment necessary; walk in at any one of the locations: Olin, Carol Tatkon Center, Rockefeller, Caldwell (ISSO), Myron Taylor, Sage, Goldwin Smith, Ujamaa, CCC and more.
Telephone: 255-5208;
www.gannett.cornell.edu/CAPS/offsiteSupport.html

Employment for Spouses:
Office of Human Resources
http://www.ohr.cornell.edu/
OHRWEB-L@cornell.edu

Please see the Student Advocacy Resource List for more information:
## EMERGENCY NUMBERS

<table>
<thead>
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<th>Resource</th>
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<td>Fire, Police, Ambulance</td>
<td>911</td>
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<tr>
<td>Non-Emergency Public Safety, Security</td>
<td>255-1111</td>
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<tr>
<td><strong>Building Emergencies</strong></td>
<td><strong>Dick Clark, Building Coordinator</strong></td>
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<td></td>
<td>After Hours Mechanic (5-5777)</td>
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<td><strong>Medical Problems</strong></td>
<td><strong>Gannett Clinic (5-5155)</strong></td>
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<tr>
<td>Chemical Questions</td>
<td><strong>Environmental Health &amp; Safety (5-8200)</strong></td>
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<tr>
<td>Radiation Spills or Problems</td>
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<tr>
<td>Respiratory Protection</td>
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<tr>
<td>Right-to-Know (Toxic substances)</td>
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<tr>
<td>Toxic Waste Disposal Problems</td>
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