Van Andel Institute®

Graduate School

Academic Catalog and Student Manual 2011-2012

September 16, 2011

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INTRODUCTION

The Van Andel Institute (VAI) was founded by Jay and Betty Van Andel in 1996 with a vision to enrich and enhance the lives of this and future generations through medical research and education. VAI comprises the Van Andel Education Institute (VAEI) and the Van Andel Research Institute (VARI). Each organization has a trust agreement with the state of Michigan. The Van Andel Institute Graduate School (VAIGS) is a part of the Van Andel Education Institute (VAEI) and is incorporated in the state of Michigan with authority to grant PhD and MS degrees.

The Graduate School is supported by each of the three organizations. The VAI administrative offices provide finance, information technology, human resource, facilities services, fundraising (through grants and private philanthropy) and public awareness services. VARI, a biomedical research organization, has a mission to improve human health with current projects focused on cancer and Parkinson's disease. VARI conducts research in molecular biology and genetics to identify and understand the function of genes and their protein products (*functional genomics*) and the ways to apply this knowledge to diagnosis and therapeutics (*translational research*). VARI provides the facilities and the faculty for the Graduate School. VAEI, the home for the Graduate School, also provides complementary education through a guest student program as well as programs to enhance teaching and learning for K-12 students through the use of technology and science education. VAIGS brings together the expertise and resources of VARI and VAEI to prepare graduate students for careers in biomedical research.

MISSION

The mission of the Van Andel Institute Graduate School (VAIGS) is to prepare biomedical research scholars through a graduate program in cell and molecular genetics, with emphasis on translation of this knowledge and technology to improve human health and well-being. The graduate program is distinguished in the following ways:

- An emphasis on the application of basic cellular and molecular biology to clinical problems, i.e., from laboratory bench to clinic bedside;
- Exceptional facilities with core technology support;
- A distinguished faculty, and
- A culture of collaboration.

The educational goals of the Graduate School include general goals common to higher education and the scientific research community and specific goals that will distinguish the VAI graduate program. The graduates will know current biomedical science, its historical context, and clinical medicine related to genetics. They will be prepared to conduct original research: design appropriate experiments, be expert in techniques of the life sciences, and think scientifically and analytically. They will be able to translate basic science to address problems of health and society; work collegially; communicate effectively verbally, in writing, and graphically; and practice the highest ethical and professional standards. We expect to develop graduates who are creative and confident in exploring new areas and techniques.

PHILOSOPHY AND PRINCIPLES

The fundamental philosophy underlying the VAI graduate education program is that the students should act and think like scientists, and thus the activities undertaken by students should prepare them for the work they will do as professional scientists. Our goal is to foster their development as scholars whose work is to generate new knowledge, to conserve (and critique) the knowledge already gained within the field, and to apply the skills of the discipline to transform the world around us. We anticipate that our graduates will be the future stewards of this discipline, which implies that it is important not only to train them for their own career advancement but also for accepting responsibility for the future of this field of science.

Given that the PhD is inherently a research degree, VAIGS students will be engaged in doing science from their matriculation to graduation. The core curriculum has been shaped in a problem-based learning structure to reflect the approach that scientists take to new research questions. This approach places greater responsibility on the students for their intellectual development; that is, for determining what they need to learn in order to attack a particular research question. Through this approach, we expect the students will indeed learn the core concepts of genetics, cell biology, biochemistry, and bioinformatics. But they will also learn how to find key information when they need it; how to assess the quality and relevance of that information; how to structure that information into a coherent conceptual framework; and how to focus that information to address a new scientific problem or hypothesis.

Although the central tasks of a professional scientist are the design, execution and interpretation of experiments, other responsibilities and roles are also important. These include writing and reviewing grants and manuscripts, managing the financial support of the research program, and selecting and supervising members of the laboratory research team. VAIGS prepares its students for these cognate roles through classroom activities, seminars, and periodic workshops.

The program and curriculum built upon the learning goals enumerated under MISSION are under continual review and revision, emulating actual research practice to refine expectations based upon outcomes measures. This process is appropriate for scientific education because it mimics the daily work of scientists: gathering data, applying the new results to previous paradigms, and integrating the new with the old to determine a better model.

VAIGS further articulates the general learning goals for the program in cellular and molecular biology by establishing Core Competencies. These Core Competencies grew out of the need to explicitly state the phases through which graduate students progress on their path to independent research. VAIGS Core Competencies focus on the following areas central to developing leadership in translational research.

Students completing their doctoral degrees in VAIGS will be able to:

1) KNOW
   a) key concepts in biomedical science
   b) historical context for landmark discoveries in biomedical science
   c) clinical context for the diseases they study
   d) scientific literature relevant to their research project and field

2) RESEARCH
   a) design appropriate experiments
   b) execute experiments with technical skill
   c) demonstrate critical analysis and thinking
   d) integrate new results into models and concepts from the scientific field

3) TRANSLATE/INNOVATE
   a) seek and establish connections with clinical context/partners
   b) work collegially and effectively as a team/community member
   c) communicate with varied audiences in different forms

4) PRACTICE ETHICAL AND PROFESSIONAL STANDARDS
   a) define the process for addressing ethical problems in scientific research
   b) implement scientific integrity, particularly in data acquisition, manipulation, and storage
   c) identify appropriate standards in collaborative, animal, and human studies
   d) engage in best practices in authorship, mentoring, fiscal responsibility, employee management, and communication

These Core Competencies are elaborated further in a rubric for faculty and student use, discussion, and development. The VAIGS Core Competencies rubric is available in APPENDIX A.

Science is a human endeavor that occurs within a complex and fascinating intellectual community. VAIGS seeks to foster the effective integration of its students into that community. Students learn how to work effectively within local research teams and with external collaborators. Students learn how to effectively present the results of their work (in written and oral form), and how to effectively critique the work of others. Students are encouraged (and supported) to attend national and international conferences, even during their first years of the program. Students are mentored not only by their thesis advisor, but by other members of the community, and in turn their own skills as mentors are developed. VAIGS promotes a culture of freedom and creativity that encourages individuals to achieve their research goals with excellence and integrity.

ADMISSION

The graduate program is intended for students seeking a PhD in cell and molecular biology that prepares them for leadership positions in research or clinical laboratories. The Van Andel Institute Graduate School (VAIGS) is interested in matriculating persons with excellent academic preparation and performance, competence in skills important to scientific work (e.g., writing and critical thinking), and good moral character. The program is open to all applicants irrespective of race, gender, ethnic or national origin, religion, or age; although as of this writing we are only able to admit US citizens and permanent residents.

All applicants must have earned a Bachelor of Arts or Science (BA or BS) degree or equivalent, from an accredited college or university prior to enrolling at VAIGS. The usual preparation is in the natural sciences with required courses in chemistry, biochemistry, biology, physics, and mathematics. The Admissions Committee seeks to identify those students with the most promise for superior achievement in our program, using a comprehensive review of all credentials. Consideration is given for each applicant's overall qualifications, as demonstrated by academic record, test scores, research experience, and letters of recommendation.

VAIGS has not established minimum cut-off values for any of the required application materials but the following criteria will be considered. Advanced training in cell biology, molecular biology, genetics, and statistics is strongly recommended. A grade point average of 3.5 or better, during the last two full years of undergraduate study in courses pertinent to the pursuit of a career in science, is also recommended. Applicants with other academic backgrounds may be considered if they perform well on the Graduate Record Examination (GRE) and give appropriate evidence of excellent training, qualifications, and motivation. Applicants judged to have a deficient academic preparation will be required to successfully complete certain courses before enrolling in courses at VAIGS.

In order to ensure full consideration, applications for admission should be received by January 5 of the year the student will matriculate. The application should include:

- A completed application form (online)
- Official transcripts of academic record
- GRE results from the General Test and one Subject Test (biochemistry, cell and molecular biology; biology; chemistry; physics; or mathematics)
- Three letters of reference, including at least two from faculty members who know the applicant and the applicant's academic work and, if applicable, who supervised independent study or research
- A personal statement of purpose indicating area of interest, long-term goals, and research experience
- A personal resume or curriculum vitae
- A sample of scientific or academic writing (e.g., research report)
- A cover letter stating the applicant's interest in the VAI Graduate School

Applicants with the strongest credentials will be interviewed in person, typically during a visit to VAI.

Applications are reviewed on a rolling basis; however those applications completed by the deadline will receive most thorough and timely consideration. Interviews are scheduled usually for late January and February, and decisions are conveyed to applicants generally in March.

ACADEMIC PROGRAM

Academic Advisor and Oversight

The aim of the Van Andel Institute Graduate School (VAIGS) is students attain their doctoral degrees within five years. To facilitate the five year goal, student progress is monitored frequently throughout the program. Progress on fulfillment of requirements will be facilitated by the use of the Student Progress Check List (APPENDIX B). The Dean serves as the Academic Advisor for all Year One students to orient the student to the program and to monitor their progress through the core curriculum and laboratory rotations. Once a Thesis Advisor and Thesis Advisory Committee have been appointed, progress on fulfillment of all program requirements will be reviewed by the Thesis Advisory Committee at each semi-annual meeting. This review will be recorded using the Thesis Advisory Committee Meeting Report (APPENDIX C) filed after each meeting. These reports and other indicators of progress towards the degree are reviewed annually by the Student Performance Review Committee.

Graduation Requirements for the PhD Degree

Course requirements

The VAIGS Course list, with course numbers, can be found in APPENDIX D. VAIGS does allow its students to transfer a limited number of course credit hours from other institutions. (The Transfer Credits for VAIGS Courses policy is included in APPENDIX E.) This policy is limited to upper-level graduate seminar or special topics courses. This policy pertains most frequently when students identify a particular seminar or special topics course offered at another institution, with particular relevance to the student's dissertation research but for which VAIGS offers no equivalent experience. The problem-based core curriculum for Year One courses in VAIGS makes it unlikely that any other institution would have comparable courses, and therefore no transfer credits will be considered for Year One courses. Credit for the fulfillment of any of these requirements at other institutions will be determined on an individual basis by the Dean.

Strategic Approaches to Biomedical Research Problems (2 semesters = 18 credits)

In a progressive series of multi-week modules, students will develop research plans to address current hypotheses, questions or problems relevant to human disease. In the course of developing these plans, students will learn core and current concepts in biochemistry, cell biology, molecular biology, genetics, bioinformatics, and pathobiology. This "problem-based learning" approach best simulates how professional scientists attack new research

problems. Students will emerge with a strong foundation in core concepts in the relevant disciplines, an understanding of the principles of experimental design, and experience in crafting research plans. SABR final examinations comprise one credit each semester.

Historical Perspectives in Molecular Biology (1 semester = 2 credits)

The goal of this course is to place current molecular and cellular biology research in a historical context. Students study classic papers on biomedical research and the discussions focus on the prevailing thought and the contribution of this work to a changed way of thinking. Topics include foundations of modern biology, mechanisms of genetic change, genetic code, analysis of macromolecules (RNA, DNA, and protein), gene splicing and rearrangement, tumor viruses, and suppressor genes. In addition to presentations and weekly discussion, students participate in peer evaluation.

Translational Research (1 semester = 2 credits)

In order to best prepare students for a career in research that affects clinical medicine, this course lays the foundation for those topics in target discovery, drug development, and therapeutic outcomes. Students will be challenged by leaders in translational research to initiate projects where focus remains on relevant outcomes.

Responsible and Effective Conduct of Research (1 semester = 1 credit)

The purpose of this course is to provide training and direction on how to recognize, address and prevent ethical dilemmas that arise during the course of conducting scientific research. The course material will also address effective laboratory management practices. Specific areas to be addressed include protection of human and animal subjects, scientific integrity, conflicts of interest, collaboration, authorship, peer review, data management, mentoring, communication, societal impacts, human resource management, grants and contracts, and fiscal responsibility.

Laboratory Rotations (3 rotations = 3 credits)

See description on next page.

Journal Club (8 semesters = 8 credits)

This course constitutes a weekly institute-wide discussion of current research articles. The purpose is for students to become familiar with the literature, to develop competence in critical analysis of research, and to develop effective oral presentation skills. After successfully passing preliminary exams, each student is required to give one presentation each year and to complete an evaluation form for ten Journal Clubs per semester.

Research in Progress (8 semesters = 8 credits)

This course constitutes a weekly institute-wide seminar on current work at VARI. Students are required to attend and complete online evaluations following ten presentations per semester. Once a student selects a thesis mentor, his/her work will be presented in this forum annually.

VARI Seminars (8 semesters = 8 credits)

The VARI Seminar Series offers invited research presentations by scientists external to VARI, typically weekly. Following the seminar, students submit a brief written reflection and evaluation on ten seminars per semester.

Special Topics Courses (6 credits)

These courses provide advanced study on a focused topic in basic or clinical research and are typically taken in Year Two through Year Four of the graduate program. The purpose of each course is to engage students in the study and discussion of the current literature and concepts of the topic selected. The topics vary and usually reflect the particular interests of the faculty member who leads the course.

Laboratory Rotations

As part of the orientation for incoming students, faculty will present their research interests to the new matriculates. Students are encouraged to visit the laboratories and become acquainted with VARI faculty, lab managers, research technicians, and others in order to see first-hand the collaborations that take place and how they do science. It is through these interactions that students gain a better understanding of each laboratory and its research. In addition, students learn about the availability of mentors and timeframes in which students may complete a seven (7) week rotation experience. Rotation I begins the second week of classes.

The rotations serve to familiarize the student with the research focus of various laboratories, including approaches and methodologies used by different research groups. These experiences also assist students in their choice of a thesis advisor. The specific activities in each rotation may vary among laboratories. The research project, goals and expectations should be defined at the outset by the laboratory head. Because of the importance of early laboratory experience in the development of the student, we encourage Year One students to spend as much time in the laboratory as their course work will allow (typically 25-30 hours per week). Following each rotation, students will summarize their findings and detail future directions for the rotation project by writing a short (1-2 page) Student Rotation Research Report (APPENDIX F). Copies of this report shall be provided to the rotation mentor and to the Enrollment and Records Administrator. In addition, the rotation mentor will complete the Faculty Evaluation of Student Performance (Rotation) (APPENDIX G).

Selection of Research Mentor

Any doctoral-level faculty member in the Van Andel Research Institute (VARI) may serve as a research mentor and thesis advisor. The laboratory should be engaged in research that is of specific interest to the student and should have an atmosphere that is conducive to student development and training. The relationship between the graduate student and thesis advisor is central for a successful research project, the intellectual development of the student, and completion of the degree. With this in mind, the student and mentor should strive to create a productive and ethical research environment with suitable rapport. The laboratory must have sufficient financial support and physical space for the student's research. The student may request assistance from the Academic Advisor in selecting a laboratory, particularly if difficulties in selecting a mentor are encountered. Although mentor selections are typically made after all three lab rotations have been completed, selections may be made after the second rotation period (i.e., in December of the first semester). After a mutual agreement is reached between a student and the faculty member, the student must notify the Dean in writing for approval and recording.

Overview of Graduate Program

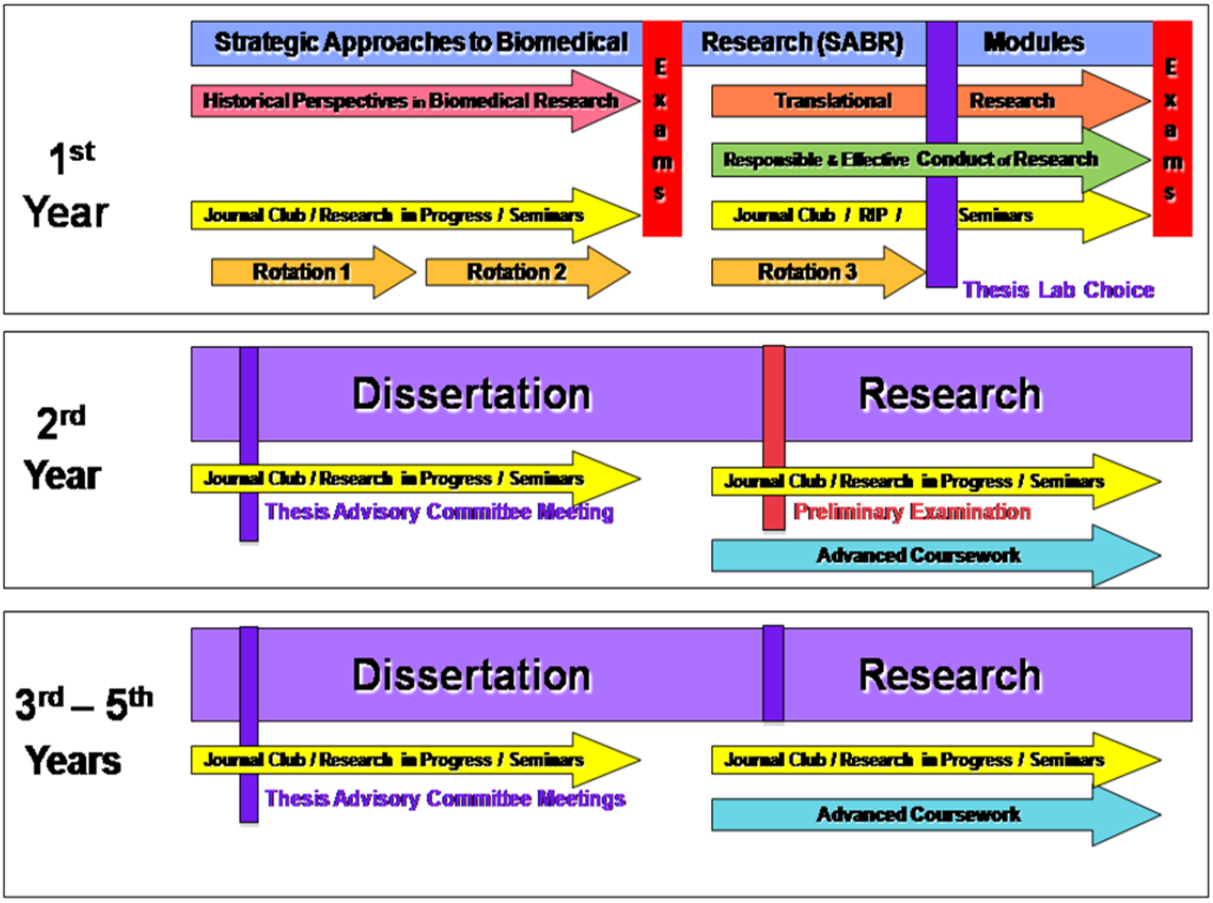

Figure 1

Thesis Advisory Committee

Assignment of Committee: Following selection of a thesis advisor, each student together with their research advisor, will examine topics for the thesis research. Concomitantly, the student must begin gathering data and write a thesis proposal (five to six pages). Construction of the thesis proposal will occur in the six months following selection of a thesis advisor (see Overview of Graduate Requirements, Figure 1). After consulting with the thesis advisor and student, the Dean will appoint a Thesis Advisory Committee near the end of the first year of study. The Thesis Advisory Committee should consist of four members selected by the student in consultation with the mentor, and must include (1) the student's thesis advisor, (2) two additional VAIGS faculty, and (3) one outside faculty member other than Van Andel Institute (VAI) faculty.

Student's Responsibilities: At the end of Year One (i.e., six months after selecting the thesis advisor), the student must submit a written Thesis Proposal of her/his research to members of the Thesis Advisory Committee. The student shall meet with the committee, present a formal oral presentation of the Thesis Proposal and with the committee discuss and refine the proposal. With the help of the committee, the student will outline a set of research objectives to be met in the next year. The proposal forms the basis of the Preliminary Exam. The initial thesis proposal must be submitted to the committee members at least 1 week prior the Thesis Advisory Committee meeting.

Committee's Responsibilities: The Thesis Advisory Committee has four principal duties. The TAC will review the initial thesis proposal to gauge whether the scope and focus of the project are appropriate for a doctoral dissertation. The TAC will meet with student and mentor on a semi-annual basis to evaluate progress towards the degree and to provide continuing advice on the dissertation research project. The TAC participates in the dissertation defense. TAC members may be asked to provide letters of recommendation when the student pursues subsequent positions.

To monitor and support student progress towards completion of their degree, students will meet with their Thesis Advisory Committee (TAC) every six months using two types of meetings: 1) Annual Summary and 2) Progress Report. The general timeframe is September and February; however specific dates for these meetings will be coordinated by the student in association with the Enrollment and Records Administrator. For both meetings, the TAC will make use of the Thesis Advisory Committee Meeting Report (APPENDIX C).

The Annual Summary meetings will be convened on or before each anniversary date of the Preliminary Exam, with the first meeting to take place one year after completion of the Preliminary Exam. For these meetings, the student must submit a written Annual Summary of her/his research to the Thesis Advisory Committee (TAC). The Annual Summary should be prepared in the style of a formal scientific report. The Annual Summary must be submitted to the committee members at least one week prior to the TAC meeting. The student

shall present a formal oral presentation of the Annual Summary. The committee, after review and discussion, will advise the student on her/his progress toward fulfilling the requirements of the program. These meetings shall be held annually until the thesis defense is scheduled (see Figure 1, page 12).

Progress Report meetings will be convened at the beginning of each academic year, with the first meeting occurring approximately six months after successful completion of the Preliminary Exam. For each Progress Report meeting, the student will submit to the TAC a brief report (1-2 pages) outlining the progress that has been made towards achieving the objectives established at prior committee meetings. This report must be submitted to the TAC members at least one week prior to the TAC meeting. During Progress Report meetings, the student shall meet informally with the committee to discuss his/her progress. If adequate progress toward the objectives has been met, a new set of objectives for the next year will be established. If the committee finds inadequate progression to date, the TAC will provide recommendations with a new set of objectives. Details should be captured in the Thesis Advisory Committee Meeting Report (APPENDIX C).

VAIGS's Responsibilities: Transcripts will be provided to students at the completion of each semester. The Student Performance Review Committee will evaluate overall yearly progress based on academics, research, conferences / workshops, papers and presentations in addition to the review submitted by the student's Thesis Advisory Committee. Based on evaluation by the Student Performance Review Committee, annual reports will be provided to students in the form of a letter by the Dean.

Preliminary Examination

The goal of the Preliminary Exam (also known as the "Comprehensive Exam" or "PhD Candidacy Exam") is to evaluate the student's potential and ability to explicitly identify and define a specific testable hypothesis. This will be based on evaluating the relevant literature; drafting a testable and important hypothesis; proposing critical experiments to rule out or prove the hypothesis; and interpreting the experimental outcome. The student will be expected to demonstrate their knowledge of basic concepts as well as current and relevant scientific literature.

The implementation of the Preliminary Exam is described in detail in a document entitled "Van Andel Institute Graduate School Guidelines for Comprehensive Examination" (APPENDIX H). A brief summary is provided here. The Preliminary Exam must be taken prior to Feb 28th of academic Year Two.

The exam will have three principal components:

1) A written proposal of the thesis research project, prepared in the style of a National Institutes of Health (NIH) grant application complete with Abstract, Specific Aims, Background/Introduction, and Research Design and Methods sections.

2) A research proposal on a topic in an area different than the student's chosen field of research.
3) An oral defense of the two written proposals together with an examination on the underlying concepts, principles and research skills.

The Preliminary Exam Committee will consist of the Academic Advisor, one VARI faculty member from the student's Thesis Advisory Committee, one VARI faculty member not on the thesis committee, and one outside expert on the non-thesis proposal topic. The latter two members will be appointed by the Dean with advice from the Thesis Advisory Committee.

Preliminary Exam Outcomes

Passing the Preliminary Exam requires satisfactory completion of all three of the components. The committee will decide on one of three possible outcomes:

Pass - No further work is required on the Preliminary Exam. The committee may make recommendations for areas in which improvement should be sought or expected.

Failure with opportunity to remediate – If the Preliminary Exam Committee identifies weaknesses in a limited number of areas and believes that these deficiencies can be corrected with specific actions, the student may be offered the opportunity to remediate those portions of the examination. The committee will define explicitly the conditions for remediation (see policy, APPENDIX I). The remediation should be completed within three months of the initial examination date. If the remediation efforts are deemed satisfactory, the student will have passed the Preliminary Exam. If the remediation efforts are deemed unsatisfactory, the student will have failed the Preliminary Exam and the student will be asked to leave the doctoral program.

Failure – If the student fails one or more components of the Preliminary Examination, with deficiencies beyond the scope deemed remediable within three months, the student will not be offered the opportunity to remediate, and the student will be asked to leave the doctoral program.

Upon successful completion of both the written and oral exams, the student works full-time in the laboratory on their thesis project. A predoctoral grant application must be submitted to an external agency to be considered for funding (typically as a predoctoral fellowship) within one year from the date of their Preliminary Exam.

Teaching Opportunities

Opportunities are available for giving lectures, and/or teaching classes or laboratories outside of the Van Andel Institute (VAI). Interested students should discuss these opportunities with their prospective mentors during laboratory

rotations. VAIGS has established no formal requirement to participate in outside teaching opportunities. However, VAIGS and/or the graduate student's mentor reserves the right to institute such a requirement. A decision as to whether or not a student will utilize these opportunities will be decided on a case by case basis, by mutual agreement of the student and mentor with final approval by the Dean.

Additional Required Training

Chemical Safety / Biosafety / Radiation Safety

All new students will be required to complete basic chemical, biological, and radiation safety training during Orientation Week. This training is required and must be completed before actively working with these hazards in the lab.

Community Service

All students will be required to give a minimum of four hours of community service to VAI during their time in the program. This can take the form of assisting in the VAI education program, service at a local school, hospital, or other medical-related facility, or working at an institutional-sponsored event. Documentation of community service should be submitted by the student to the Enrollment and Records Administrator.

Oral Presentations

Beginning in Year Two, following successful completion of their Preliminary Exam, students are required to make two oral presentations to the VAI community each year. One will be a report on the progress of their research project, presented at a session in the weekly Research in Progress series. The second will be presentation of a selected journal article from the current literature, in the weekly institute-wide Journal Club. Students will be given training on presentation skills prior to their presentations, and will be evaluated by VAIGS faculty and student peers.

Poster Presentations

Also beginning in Year Two, all students are required to present a poster at the annual VARI retreat.

Attendance at scientific meetings

All students will attend an annual national scientific meeting. Advanced students (Year Three and beyond) are expected to present their work at the meeting. VAIGS will provide financial support up to $2000 per student per academic year to attend this type of meeting.

Other Learning Opportunities

Host a student-sponsored speaker

Each year, as a group, the graduate students will have the opportunity - to invite, host, and interact with an outside seminar speaker of their choice. In

conjunction with the VARI seminar series, students have an opportunity to attend a postdoctoral fellow-sponsored luncheon with an outside seminar speaker hosted by VARI.

Career Development

VAIGS collaborates with VARI and the PostDoctoral Association to provide workshops and seminars on career development for successful scientists. These include manuscript writing, grant writing, lab management, manuscript/ grant reviewing, and conflict resolution. In addition, the VAIGS faculty has developed a set of expectations to clarify the transition from Graduate School to postdoctoral fellowship. These expectations will be presented to each senior level student mid-way through Year Four.

Membership in a scientific society

All students will be encouraged to join a scientific society of their choice.

Dissertation Preparation and Defense

THIS SECTION IS UNDER REVISION AS OF FALL 2011.

In their Fifth Year, students are required to prepare a detailed written thesis (also known as a dissertation) conforming to VAIGS requirements as outlined in the Dissertation Preparation Manual. Prior to preparing the thesis, each graduate student must meet with their Thesis Advisory Committee to discuss future career plans and obtain permission to begin writing the thesis. At this time, a Thesis Defense Committee will be formed to evaluate the graduate student's doctoral thesis. The committee will consist of all members of the Thesis Advisory Committee except for the committee chairperson (the mentor). In lieu of the chairperson, an outside investigator with expertise in the student's field of study will be appointed.

The student will deliver the written dissertation to all members of the Thesis Advisory Committee and the Thesis Defense Committee at least two weeks prior to the scheduled defense date. The thesis defense will consist of an oral presentation and an oral examination. The oral presentation will serve as the public defense and will be open to all whom wish to attend. The student will prepare and deliver a 40-45 minute presentation of his or her research project and then field questions from the audience. The oral presentation will be followed by the oral examination. The Thesis Defense Committee will evaluate the student's performance during this presentation.

The oral examination will be administered by the Thesis Defense Committee and will be closed to the public. The Thesis Advisory Committee chairperson (the mentor) may attend this examination but the mentor is not allowed to participate in the examination. Throughout the defense, the Thesis Defense Committee may decide to require additional refinement to the written dissertation. Any such requirements must be completed to be granted a PhD

degree. Upon completion of the oral presentation and oral exam, the Thesis Defense Committee will make a recommendation to the Dean of whether or not to grant the PhD degree.

The thesis submitted for the PhD degree must be based on original research that makes a significant contribution to our understanding of cellular, molecular, or genetic biology relevant to human disease. The design, execution and presentation of the thesis research must demonstrate that the candidate can perform independent research of a quality consistent with that published in refereed journals of the relevant disciplines. In most circumstances, it is expected that substantial portions of the thesis research will have been published or submitted for publication. The thesis and the oral defense should provide clear evidence of the candidate's capacity to function as a professional scientist, including broad knowledge of the research topic; ability to draft hypotheses and design effective tests of those hypotheses; ability to execute experiments accurately; ability to interpret results critically; and ability to communicate the research project effectively.

Typical Program of Study

Year One

- First semester (September to mid-December – 16 weeks)
  - Strategic Approaches to Biomedical Research and SABR exams (9 credits)
  - Historical Perspectives in Molecular Biology (2 credits)
  - 2 Laboratory Rotations (1 credit each - 2 credits)
  - Research in Progress (1 credit)
  - Journal Club (1 credit)
  - VARI Seminar Series (1 credit)
- Second semester (January to May, 16 weeks)
  - Strategic Approaches to Biomedical Research and SABR exam (9 credits)
  - Translational Research (2 credits)
  - Responsible and Effective Conduct of Research (1 credit)
  - 1 Laboratory Rotations (1 credit)
  - Research in Progress (1 credit)
  - Journal Club (1 credit)
  - VARI Seminar Series (1 credit)
  - Select a Research Advisor at the end of 3rd Rotation.

Year Two

- Initial Thesis Advisory Committee meeting
- Thesis Research (3 credits)
- Preliminary Exam (February)
- Journal Club (1 credit)
- VARI Seminar Series (1 credit)
- Research in Progress (1 credit)
- Special Topics Course(s) (2 credits each)

Year Three and Year Four

- Thesis Research (3 credits)
- Teaching Experience, if desired
- Semi-annual Meetings with Thesis Advisory Committee
- Journal Club (1 credit)
- VARI Seminar Series (1 credit)
- Research in Progress (1 credit)
- Special Topics Course(s) (typically 2 credits each)

Year Five

- Thesis Research
- Final Thesis Advisory Committee meeting(s)
- Thesis Preparation
- Thesis Defense

Students enrolled in the program are expected to complete the requirements for the PhD degree within five years.

Graduation Requirements for the MS Degree

Students whose primary objective is to obtain the MS degree will not be accepted into the graduate program. However, students who choose to discontinue the PhD program will be awarded the MS degree if they have completed the course work defined above. In this case, the requirements for Special Topics courses will be waived, and only four credits each for the Journal Club, Research in Progress, and VARI Seminar Series will be required. The student should have passed the Preliminary Exam.

Instruction

VAIGS students are integral members of the research community both within the Institute and beyond. Together, the faculty and students are engaged in research and study. The students actively learn the characteristic tasks of investigators: experimental design, problem-solving, literature review, critical analysis, technique development, and laboratory research. The instruction format includes lectures, seminars, discussions, laboratory rotations, clinical rotations, and research, all of which are led by the faculty. The faculty members advise, support, evaluate, and encourage the students.

As members of the learning community at the Van Andel Institute (VAI), students are required to attend scheduled class sessions and credit seminars. Students are expected to contribute to the classes and seminars as well as learn from other students.

It is expected that students will complete their degrees in five years and every effort will be made to assist students in meeting appropriate milestones. Failure to make sufficient progress in the program is grounds for dismissal. As of this writing, detailed policies on remediation, incompletes, and dismissal are under final revision by the faculty. These policies will be included in APPENDICES I, J, and K. Extension beyond five years will be allowed if the Dean determines there are extenuating

circumstances (comparable to those defined for employees under the Family Medical Leave Act). Rarely will there be an extension beyond six years.

Students whose native language is not English must show fluency in oral and written English by satisfactory performance in courses, seminars and scientific writing. Failure to achieve fluency by the end of the second year may result in dismissal.

Assessment

Student work is evaluated for progress toward fulfilling the goals of the graduate program and also to assist the student in measuring progress toward fulfilling the graduation requirements. The faculty expects the students to make satisfactory progress and will assist them toward that goal. Satisfactory progress includes passing all courses and completing the graduation requirements on a schedule that aims toward completion of all requirements for the degree within five years. Each student will be provided a Student Progress Check List (APPENDIX B) to track their progress through the program. Students will be evaluated in the following ways:

1. **Courses:** The instructors evaluate student performance in courses, provide written evaluation of the work, and assess students on a 4.0 grade scale (for most courses) or a Pass/Fail decision (for certain specified courses). A grade of 3.0 or better is considered a passing grade. A grade of 2.5 or below will be considered a failing grade. Only grades of 2.5 are considered for potential remediation (see policy, APPENDIX I). The accumulation of two failing grades in the graduate program provides grounds for dismissal (see policy, APPENDIX K).

2. **Rotations:** Following each laboratory rotation, students will summarize their findings and suggest further directions for the rotation project by writing a short 1-2 page Student Rotation Research Report (APPENDIX F). Simultaneously, rotation mentors will complete the Faculty Evaluation of Student Performance (Rotation) (APPENDIX G).

3. **Preliminary Exam:** The Preliminary Exam shall be completed before February 28 of the second year. The format and potential outcomes for the Preliminary Exam are defined in a prior section of this catalog and in the Guidelines for Comprehensive Exam (APPENDIX H).

4. **Research reports (copies of all reports must be submitted to the Enrollment and Records Administrator):** The student must submit a brief research progress report six months after successfully completing the Preliminary Exam and annually thereafter, at the beginning of each academic year, until the Thesis Defense is scheduled. In addition, the student must submit a written Annual Summary, in the style of a formal scientific report, to members of the Thesis Advisory Committee within one year of completion of the Preliminary Exam and annually thereafter, until the Thesis Defense is scheduled. All written reports must be submitted to the committee members at

least one week prior the Thesis Advisory Committee meeting. The student shall meet with the committee semi-annually to discuss results and define future directions and objectives which are captured in the Thesis Advisory Committee Meeting Report (see APPENDIX C). These meetings shall continue until the Thesis Defense is scheduled.

5. **Student Performance Review Committee:** A standing committee of faculty members will conduct an annual review of the progress of each student. The composition and mandate of this committee is defined in the Faculty Bylaws. This committee will consider course grades, thesis committee reports, oral presentations by the student, and other relevant information. The committee will make recommendations to the Dean regarding continued participation of each student including, where appropriate, recommendations for remediation of any deficiencies (see policy, APPENDIX I). A copy of this report will be provided to the student and their thesis advisor.

6. **Thesis Defense:** Students are required to make a public presentation of their research results and thesis and also successfully defend the thesis before the Thesis Defense Committee. The process for the thesis defense is detailed in a prior section of this catalog.

When students are not making adequate progress toward completion of courses or graduation requirements, as determined by their Academic Advisor and the Dean, they may be placed on academic probation. Students and their thesis advisor will be given written notification of probation and written guidelines for removal of the probationary status. Should a student desire to withdraw from the program or take a leave of absence, it is arranged in consultation with the Academic Advisor and Dean. At the time of approval of the withdrawal or leave of absence, the student will be advised regarding the criteria for reinstatement.

Academic Dishonesty

Scientific work requires honesty and integrity, and the scientific community has strict standards for the conduct of research. The graduate students are governed by the VARI policy on scientific misconduct, which extends to research and coursework. Students will be asked to read and sign the honor code governing academic honesty and behavior at VARI. The VAIGS Honor Code can be found in APPENDIX L. Academic dishonesty in coursework or in fulfillment of other requirements will result in failure on that specific requirement and is grounds for dismissal from the graduate program (see policy, APPENDIX K).

ACADEMIC SUPPORT

The Van Andel Graduate School (VAIGS) Directors, faculty, and administrators know that the quality of a program is directly related to the quality of the students. For that reason, there will be efforts to recruit talented persons and provide excellent support for the students when they are enrolled. The Institute has a supportive culture expressed in the collaboration among investigators and students. The students will be considered full participants in the life of the Institute, contributing both to the present and the shaping of the future of the Institute; as such, they will be required to uphold the policies and values of the Institute, as do the investigators and others.

Orientation and Registration

New students begin the academic year with an orientation scheduled the week prior to the start of the semester. The Graduate School must have received final official transcripts from all prior academic work confirming that the course of study was completed and the degree was awarded, before orientation.

The new student orientation includes an introduction to the research community at the Van Andel Institute (VAI), the general policies of VAI, and the academic policies and procedures of VAIGS. Official enrollment and registration is also done at this time. Students are orientated to the general requirements and policies of VAI by the Human Resources, Compliance, Safety, Security, Information Technology, and Research Administration Departments. Topics include, but are not limited to, the following policies: safety and security, drug-free workplace, harassment and sexual harassment, confidentiality and intellectual property, workplace violence, information technology, scientific misconduct, animal use policies, and conflict of interest. All policies are available on VAI's SharePoint site. The Dean presents the academic policies and procedures, will provide an overview of the requirements for the PhD degree, and discuss the benchmarks for good progress toward fulfilling the requirements.

Academic Records

The official academic records and transcripts for graduate students are kept by the Enrollment and Records Administrator. Course evaluation reports and reports of fulfillment of graduation requirements will be part of the student academic record. Students are responsible for reporting changes in personal information (name, address, etc.) to the Enrollment & Records Administrator and Human Resources. The academic record is a permanent record and not subject to change except by the Dean.

VAIGS makes the academic record available to the student upon request. It is also available to the academic and research advisors for use in counseling the student. The School will furnish an official academic transcript upon the written request or approval of the student.

VAIGS complies with the Family Educational Rights and Privacy Act (FERPA), which assures the student the right 1) to inspect and review his/her education records,

2) to amend parts of the student's education record that are shown to be inaccurate, 3) to consent to all disclosure of personally identifiable information in the record except that which is authorized for school officials with legitimate educational interests, 4) to review letters of recommendation written for the student's file unless the student has signed a waiver, and 5) to file a complaint to the U.S. Department of Education concerning alleged failures of the Graduate School to comply with requirements of FERPA. The Act also permits the Graduate School to release certain information upon request under the guidelines of FERPA. The text of FERPA is available at www.ed.gov./policy/gen/guid/fpco/ferpa.

Advisors, Academic and Research

A congenial and respectful student relationship with the faculty is vital to the hospitality of VAIGS and the continuing development of the student as a research scientist. In order to ensure that students' goals are achieved (as well as those of the Institute) students will be guided in their work by academic and research advisors.

While the students will become acquainted with the entire faculty, the formal responsibility of advising the students resides with the designated advisors. The Dean serves as the students' Year One academic advisor. This advisor will be an intellectual mentor who advises the student regarding academic work and progress toward fulfilling the requirements, serves as a liaison between the student and the faculty and administration, recommends the student for a degree, and is a colleague in the life of the Institute.

The research advisor is selected in the first year following completion of three laboratory rotations. The research advisor guides the student in her/his research from thesis proposal to thesis defense.

In addition to the appointed advisers, the Human Resources office provides resources for personal counseling: psychological, medical, and legal.

Peer Support

Students have many opportunities to interact and form relationships with one another and the faculty through courses, seminars, informal discussions, social events, and personal friendship, all of which contribute to desired collegiality. The collegiality among graduate students provides support for the students and also provides a resource of advice for the Graduate School faculty and administration.

Library

The Hope Library of VARI holds subscriptions to a number of core journals in cancer biology, biochemistry, genetics, cell biology, and molecular biology. Most journals are available online, although there are a few titles available in print only. The library also houses a small book collection. VARI contracts with Grand Valley State University (GVSU) for library services, and the VARI book collection is searchable in the

GVSU library catalog at www.gvsu.edu/library. Lists of VARI books and online and print journals, along with other pertinent information, can be accessed from the library's SharePoint site.

GVSU provides VAI with a part-time (25 hours a week) library manager who has a deep understanding of the biomedical literature and is available to assist with developing literature search strategies. The library manager also facilitates access to GVSU's book and journal collection, both in print and online, as well as GVSU's licensed databases. Interlibrary loans for journal articles and books not owned by VARI or GVSU are obtained through Docline or OCLC.

Additionally, VARI researchers can utilize resources at Spectrum Health's Amberg Health Sciences Library, across Bostwick Avenue from the Institute. That library is located on level A of the hospital's west wing. For more information about their collection and access, see http://www.spectrumhealth.org/spectrumhealthlibraries.

Information Technology

VAI provides a computing infrastructure to support teaching, learning, and research. Graduate students will be provided with a laptop computer, office productivity tools (e.g., Microsoft Office Suite), an e-mail account, personal file storage space, local printing services, and an institute-wide wireless network. The VAI Information Technology Department supports and provides services to the entire institute and has policies that protect the IT infrastructure. Orientation to VAI's infrastructure and of IT policies is provided during the student's first week at the Institute. Failure to follow the IT policies can result in disciplinary action up to and including possible dismissal (see policy, APPENDIX K).

STUDENT SERVICES

Financial Assistance

Applications for regular admission to VAIGS include application for financial assistance. Students who are accepted into the graduate program and do not have an external fellowship receive a fellowship from VAIGS that is competitive with those of regional universities. The VAIGS fellowship includes a stipend for living expenses, health and life insurance, and a tuition waiver. The Graduate School fellowships will be conferred for five years. The thesis advisor will be responsible for continuing financial support beyond the fifth year; potential sources include external fellowships or the thesis advisor's research funds. Continuing financial support is assured if the student is making satisfactory progress and fully engaged in graduate work.

Tuition

The tuition for a full academic year and subsequent summer is $25,000. The tuition rate is based on a full year of 32 to 36 credits. If fewer credits are taken, the tuition will be prorated. Tuition will be waived for students supported by VAIGS fellowships.

Benefits

Students who are enrolled in the PhD program and who are recipients of a VAIGS fellowship or comparable support will participate in a VAI health and life insurance plan, administered through the Human Resources office. Students may opt out of the VAI health insurance plan if they demonstrate to HR staff that the student is adequately covered by other insurance plans. Students receive no payment in lieu of participation in the health insurance program.

Immigration

Presently, VAIGS may only accept applications from domestic students (U.S. citizens or permanent residents) due to Federal visa restrictions. VAIGS anticipates acceptance of international applications in the future.

Facilities

VAIGS is located in the Van Andel Institute, an exceptional facility with state of the art equipment. The open-concept research space fosters collegiality, and core technology laboratories provide exceptional support for research. Space is available for study and socializing.

GSA

In Fall 2010, the MSU and VAIGS graduate students, working in labs at the VAI, organized a Graduate Student Association (GSA). The focus of the GSA is to provide a platform for professional development, as well as, a medium through which graduate

students can communicate with one another on both personal and scientific levels. This group has the opportunity to invite external speakers as part of the ongoing VARI Seminar Series program. The students organize a monthly "chalk talk" evening for informal but structured discussions of their research progress. Calendar and contact information is communicated through a GSA-specific page at the Graduate School SharePoint site. The establishment of this association was approved by the VAIGS Graduate Program Committee. Financial support is provided through the Dean's budget and thus is subject to the same reporting and audit procedures as other aspects of VAIGS.

Fitness Center

VAI provides a fitness center for its employees. Graduate students are invited to use the center under the same guidelines as employees. A signed "Waiver of Liability and Covenant Not to Sue Agreement" is required from all persons using the Fitness Center. Please see Security to attain a copy of this form.

Childcare

On-site daycare is not provided. More information about local licensed daycare is available from the local 4-C's Organization (Community Child Care Connection).

Lactation Rooms

Lactation rooms are located within the lounges located in Phase 2 on Levels 1, 2, and 5. The lactation room provides a private, lockable space for lactating mothers. These spaces are equipped with a comfortable chair, a small table, an electrical outlet and a mini-refrigerator intended for milk storage (refrigerators in the employee break areas are for lunches). Use the signage available to indicate when the rooms are "In Use".

Housing

VAIGS does not provide housing for the graduate students. However, housing information is available through the Human Resources office.

Personal Support

The Human Resources office provides resources and/or advice on community resources for personal issues, e.g., child care, fitness, physical health, and legal services.

Outside Employment and Concurrent Degrees

Students enrolled in VAIGS' doctoral program are presumed to be devoting their full professional effort towards the pursuit of their PhD. Therefore, outside employment or concurrent pursuit of other degrees may be undertaken only with explicit permission from the thesis advisor and the Dean.

Student Grievances

Student grievances regarding coursework, grading, academic progress, and VAIGS policies or practices should be directed to the Academic Advisor, if they cannot be resolved directly with the person responsible. If the grievance is still not resolved, the student should consult the Ombudsman (in most circumstances, the Director of Human Resources), who will advise the student and serve as a liaison with the faculty and administration. Unresolved issues or appeals should be presented to the Dean, in writing.

Grievances regarding research should first be directed to the research advisor. Should further resolution be necessary, the student can appeal to the Thesis Advisory Committee and the Dean.

Students who experience sexual harassment, racial or ethnic discrimination, or scientific misconduct are expected to follow the VAI employment policies and procedures.

Vacation and Personal Time

Graduate students are entitled to 20 days of vacation and / or personal time, beginning September 1 of each academic year, in addition to the official holidays announced by the Institute. Students should schedule vacations in consultation with their research mentor or in the case of Year One students, the Dean. Students should also report days taken as personal time off to their Year One academic advisor or mentor. Unused vacation / PTO days cannot be carried over into the next academic year.

Disability Policy

Students who are unable to continue in their educational and research activities due to illness, personal condition or injury will continue to receive their stipend and benefits for up to thirteen weeks of absence. After an absence of one week, a written medical certificate may be required to verify that any continuing condition prevents a return to normal student activities. The Institute retains the right to request third-party review or confirmation, at the Institute's expense. After thirteen weeks, the student will be placed in inactive status with respect to the Graduate School. The student's placement in the Graduate School will be assured for an additional twenty-six weeks (without stipend or benefits). If the student is unable to return to normal student activities after this time, the student will be withdrawn from the program. Such students may request re-admission to the program by written appeal to the Dean.

LEGAL STATUS

Governance

The corporate name of the school is the Van Andel Institute Graduate School. A Board of Directors appointed by the Van Andel Education Institute Trustees governs the school. The Directors include persons with distinguished careers in biomedical research, higher education, and clinical training. The Dean of the Graduate School administers the school with advice from faculty committees. The Board normally meets in the spring and fall.

Authorization and Accreditation

The Van Andel Institute Graduate School is incorporated in the state of Michigan and is authorized to award the MS and PhD degrees. The graduate school has also begun the process for accreditation by the Higher Learning Commission of the North Central Association of Colleges and Schools. This process cannot be completed until the first students graduate. We plan to vigorously pursue accreditation once we are eligible.

Compliance with Legal Requirements

The Van Andel Institute Graduate School operates in a nondiscriminatory manner with regard to race, religion, color, age, or national origin per Title VI of the Civil Rights Act of 1964. The Graduate School also provides equal opportunity for qualified persons with disabilities in accordance with the requirements of the Rehabilitation Act of 1973, Section 504, and the Americans with Disabilities Act of 1990. The Graduate School does not discriminate on the basis of gender in its academic, student, or employment policies. Allegations of failure to comply with these laws should be presented to the Director of Human Resources.

AMENDING AND REVISING THIS CATALOG/MANUAL

Any faculty member or graduate student may submit proposals to amend or revise the *VAI Graduate School (VAIGS) Catalog*. Amendments to be considered must be written and circulated to the faculty and graduate students not less than 14 days prior to the faculty meeting at which they are to be voted upon. Amendments must be passed by a majority of the "voting faculty". The manual should be reviewed and re-approved at periodic intervals no greater than five years.

This document was originally approved by vote of the faculty on Feb. 23, 2007, and has been revised on the following dates:

December 14, 2007
June 23, 2009
September 16, 2011

FACULTY

The primary faculty members for the Van Andel Institute Graduate School (VAIGS) are the Van Andel Research Institute (VARI) Faculty. Appointment to the Institute as a faculty member typically requires a PhD, MD, or equivalent academic degree plus a distinguished record of scholarship and contributions to the scientific community. Faculty appointment to VAIGS for non-VARI faculty is made by nomination to the Graduate Program Committee and vote of the full VAIGS faculty.

Adjunct faculty members of VAIGS supplement the permanent faculty. The adjunct faculty members participate in the life of VAIGS as cooperating instructors for VAIGS courses, as members of VAIGS Thesis Advisory or Defense Committees, or as facilitators of professional development programs. Typically, they are practicing professionals or faculty members from local colleges/universities.

Following are the VAIGS faculty (as listed by VARI faculty level) as of September, 2011:

Arthur S. Alberts, Professor, Center for Cancer and Cell Biology; Head, Laboratory of Cell Structure and Signal Integration; Director, Flow Cytometry. PhD (1993), University of California, San Diego.

John F. Bender, Clinical Operations Director. PharmD (1987), University of Utah.

Ting-Tung Anthony Chang, Research Assistant Professor, Scientific Shared Services; Director, Small Animal Imaging Facility. PhD (2009), University of Texas Health Sciences Center at San Antonio.

Nicholas S. Duesbery, Associate Professor, Center for Cancer and Cell Biology; Head, Laboratory of Cancer and Developmental Cell Biology. MS (1990) and PhD (1996), University of Toronto, Canada.

Kyle A. Furge, Assistant Professor, Center for Cancer Genomics and Computational Biology; Head, Laboratory of Computational Biology; Co-head, Kidney Cancer Research Program. PhD (2000), Vanderbilt University School of Medicine.

Carrie Graveel, Senior Research Scientist and Instructor. PhD (2002), University of Wisconsin-Madison.)

Giovanna Guerrero, Head, Science Policy and Special Populations Research Branch. PhD (2004), University of California, Berkeley.

Brian B. Haab, Associate Professor, Center for Cancer Genomics and Computational Biology; Head, Laboratory of Cancer Immunodiagnostics. PhD (1998), University of California, Berkeley.

Galen Hostetter, Assistant Professor, Program for Biospecimen Science; Head, Laboratory of Analytical Pathology. MD (1993), University of Pennsylvania, Philadelphia.

Scott D. Jewell, Deputy Director for Research Resources; Professor and Director, Program for Biospecimen Science. MS (1980), Ohio State University, PhD (1993), Ohio State University.

Jeffrey P. MacKeigan, Associate Professor and Interim Director, Center for Neurodegenerative Science; Head, Laboratory of Systems Biology. PhD (2002), University of North Carolina.

James Mason, Associate Professor, Center for Skeletal Disease Research; Head, Laboratory of Orthopedic Cell and Tissue Mechanics. MS (1988), University of California, Berkeley, and PhD (1993), California Institute of Technology.

Karsten Melcher, Assistant Professor, Center for Structural Biology and Drug Discovery; Head, Laboratory of Structural Biology and Biochemistry. PhD (1990), Eberhardt-Karls University.

Cindy K. Miranti, Associate Professor, Center for Cancer and Cell Biology; Head, Laboratory of Integrin Signaling and Tumorigenesis. MS (1982), Colorado State University and PhD (1995), Harvard Medical School.

Mark Neff, Director, Program for Canine Health and Performance; Associate Professor, Center for Cancer Genomics and Computational Biology; Head, Laboratory of Neurogenetics and Canine Behavior. PhD (1993), University of Virginia.

James H. Resau, Adjunct Professor, Program for Biospecimen Science. MS (1977), and PhD (1985), University of Maryland.

Giselle Sholler, Associate Professor, Center for Cancer Genomics and Computational Biology; Head, Laboratory of Neuroblastoma Translational Research; Co-Director, Pediatric Cancer Translational Research Program; Chair, Neuroblastoma and Medulloblastoma Translational Research Consortium. MD (1999), New York Medical College.

Matthew Steensma, Assistant Professor, Center for Skeletal Disease Research; Head, Laboratory of Musculoskeletal Oncology. MD (2002), Wayne State University School of Medicine.

Bin Tean Teh, Professor, Center for Cancer Genomics and Computational Biology; Head, Laboratory of Cancer Genetics; Co-head, Kidney Cancer Research Program. MD (1992), University of Queensland, Australia, and PhD (1997), Karolinska Institute, Sweden.

Jeff Trent, President and Research Director, VARI/TGen; Professor and Interim Director, Center for Cancer Genomics and Computational Biology; Head, Laboratory of Genome Biology. PhD (1979), University of Arizona.

Steven J. Triezenberg, Director, Van Andel Education Institute; Dean, Van Andel Institute Graduate School; Professor, Center for Cancer and Cell Biology; Head, Laboratory of Transcriptional Regulation. PhD (1984), University of Michigan.

Julie Davis Turner, Assistant Dean of the Graduate School. PhD (2000), University of Pennsylvania.

George F. Vande Woude, Distinguished Scientific Fellow and Professor, Center for Cancer and Cell Biology; Head, Laboratory of Molecular Oncology. MS (1962) and PhD (1964), Rutgers University.

Craig P. Webb, Co-Director, Pediatric Cancer Translational Research Program; Professor, Center for Cancer Genomics and Computational Biology; Director, Program for Translational Medicine. PhD (1995), University of East Anglia, England.

Michael Weinreich, Associate Professor, Center for Cancer and Cell Biology; Head, Laboratory of Chromosome Replication. PhD (1993), University of Wisconsin–Madison.

Bart O. Williams, Associate Professor and Director, Center for Skeletal Disease Research; Head, Laboratory of Cell Signaling and Carcinogenesis. PhD (1996), Massachusetts Institute of Technology.

H. Eric Xu, Professor and Director, Center for Structural Biology and Drug Discovery; Head, Laboratory of Structural Sciences; Primary Investigator and Distinguished Director, VARI/SIMM Research Center. M.S. (1988), Tsinghua University, and PhD (1994), University of Texas Southwestern Medical Center.

Jianfeng Xu, Director, Program for Genetic Epidemiology; Professor and Director, Center for Genetic Epidemiology and Prevention; Head, Laboratory of Genomics and Prevention; Director, Fudan-VARI Center for Genetic Epidemiology. MD (1992), Shanghai Medical University, and Dr PH (1997), Johns Hopkins.

Faculty Committees

Faculty members are involved in the governance of the Graduate School through appointed committees as defined in the Faculty Bylaws and described briefly as follows. Committee members will be appointed by the Dean to two-year terms, staggered to ensure continuity of experience.

Admissions Committee: Composed of four faculty members and one graduate student member, this committee oversees the student recruitment process, reviews all applications, and makes recommendations to the Dean.

Comprehensive Examination Organizing Committee: Composed of two faculty members, this committee supervises the preparation and administration of

the comprehensive examinations as outlined in the Graduate Program Manual and any associated policies.

Curriculum Committee: Composed of four faculty members and one postdoctoral associate or graduate student member, this committee oversees the design, implementation and evaluation of the degree requirements, coursework, and grading policies of VAIGS. The committee will assess whether the course offerings provide adequate instruction in the core disciplines for the VAIGS. The committee will approve special topics courses (graduate seminar courses).

Graduate Program Committee: Composed of four faculty members, this committee recommends policy on graduation requirements, curriculum, admissions, and faculty. This committee also monitors the program and advises the Dean on administrative matters.

Student Performance Review Committee: Composed of three faculty members, this committee assesses the progress of each student with respect to the requirements for completing the intended degree. These evaluations will be conducted on an annual basis. These reviews will be based on reports from course coordinators, thesis advisors and thesis advisory committees, and the student being evaluated. The Student Performance Review Committee will report to the Dean with recommendations regarding the continued participation of the student in the graduate program.

ADMINISTRATION

The Van Andel Graduate School (VAIGS) is a wholly owned subsidiary of the Van Andel Education Institute (VAEI), which works in close association with the Van Andel Institute (VAI) and the Van Andel Research Institute (VARI). The Dean, Dr. Steven J. Triezenberg, is the chief administrator of VAIGS, which is supported by the other partner institutes. The full administration includes the following persons:

David Van Andel, Chief Executive Officer
Jeff Trent, PhD, VARI President and Research Director
Steve Triezenberg, PhD, VAEI Director, Dean of VAIGS
R. Jack Frick, Chief Administrative Officer
Joseph Gavan, VP, Communications and External Relations
Timothy Myers, VP and Chief Financial Officer
Linda Zarzecki, VP, Human Resources
David Whitescarver, JD, VP and Chief Legal Officer
Love Collins III, VP, Development
Jerry Callahan, PhD, VP, Extramural Administration and Business Development
Bryon Campbell, PhD, Chief Information Officer
David Ross, Associate Director of Grants and Contracts
Kevin Denhof, Physical Security Director
Richard Disbrow, Materials Management Director
Sam Pinto, Facilities Director

VAI GRADUATE SCHOOL BOARD OF DIRECTORS

David D. Baumgartner, M.D., Vice President of Medical Affairs, Saint Mary's Health Care.

Sally Camper, PhD, James V. Neel Collegiate Professor and Chair of the Department of Human Genetics in the University of Michigan Medical School, Director of the Center for Genetics in Health and Medicine at University of Michigan.

Thomas J. Haas, PhD, President of Grand Valley State University, Allendale, Michigan.

Fritz M. Rottman, PhD, Emeritus Professor and Chairman of Molecular Biology and Microbiology at Case Western Reserve University, Cleveland, Ohio. Member of the Van Andel Research Institute Board of Trustees.

Gordon L. Van Harn, PhD, Member of the Van Andel Education Institute Board of Trustees and Emeritus Provost and Professor of Biology at Calvin College, Grand Rapids, Michigan.

APPENDICES

APPENDIX A: VAIGS Core Competencies

APPENDIX B: Student Progress Check List

APPENDIX C: Thesis Advisory Committee Meeting Report

APPENDIX D: VAIGS Course List

APPENDIX E: Transfer Credits for VAIGS Courses Policy

APPENDIX F: Student Rotation Research Report

APPENDIX G: Faculty Evaluation of Student Performance (Rotation)

APPENDIX H: Guidelines for Comprehensive Exam

APPENDIX I: Remediation Policy

APPENDIX J: Incomplete Policy

APPENDIX K: Dismissal Policy

APPENDIX L: VAIGS Honor Code

Appendix A: VAIGS Core Competencies

Van Andel Institute Graduate School
Statement of Core Competencies for VAIGS Graduate Students

Core Competencies Assessment Tool

The following table provides examples of ways in which students may evolve to fulfill these competencies. It should be noted that fulfillment of the competencies is a continuum and performance will vary over time depending on the background, experiences, education, and individual maturity of the student. Different students will exhibit different baseline performance and rates of progress through this continuum. VAIGS will provide opportunity at several stages, from applicant interviews, to thesis committee meetings, to assess students' performance on these competencies and identify areas for improvement.

Potential uses of the Core Competencies

If performance is not satisfactory or progress has not been exhibited → need to identify strategies for improvement

If student has not been able to test their performance in a competency → need to identify opportunities to exhibit performance

Definitions

- Exceptional – Ideal performance of an individual who could be a top postdoctoral candidate in any lab of their choosing
- Heightened – Ideal performance of a competent graduate student, who might still have some lessons to learn, but who is nevertheless above average compared to other graduate students. Students graduating from VAIGS are expected to at minimum perform at this level for the majority of competencies.
- Advancing – Satisfactory performance that shows promise and opportunity for improvement.
- Intermediate – Performance that shows a good baseline level from which to develop further.
- Beginning – Non-satisfactory performance that requires focused attention and mentoring. Ideal first years students will probably exhibit intermediate performance for a majority of competencies but may exhibit beginning performance for others.
- N/A – Student has not been given the opportunity to test or exhibit their competency

VAIGS Core Competencies

Students in the VAIGS PhD Program will attain the following objectives:

1. KNOWLEDGE

- Identify key concepts in biomedical science
- Correlate historical context for land-mark discoveries in biomedical science
- Compare the clinical context with molecular / cell biological mechanisms for studied diseases
- Possess functional knowledge of scientific literature relevant to the research area

2. RESEARCH

- Design effective experiments:
    a. Exhibit creativity in experimental design
    b. Use controls appropriately
    c. Use logical approach to answering research questions
    d. Demonstrate sound rationale to justify experiments
- Execute experiments with technical skill
- Demonstrate critical analysis and thinking
- Integrate new results into models and concepts from the scientific field

3. TRANSLATION / INNOVATION

- Seek and establish connections with clinical context / partners
- Work collegially and effectively as a team / community member
- Communicate science effectively to varied audiences (scientists, clinicians, lay)
- Communicate effectively in oral, written, and graphic presentation

4. ETHICAL AND PROFESSIONAL STANDARDS

- Address ethical problems in scientific research
- Treat data with scientific integrity, particularly in acquisition, management, and storage
- Exhibit appropriate behavior in animal and/or human studies
- Engage in best practices in authorship, mentoring, data sharing, collaboration, fiscal responsibility, and employee management

Core Competencies Assessment Tool

KNOWLEDGE	Exceptional	Heightened	Advancing	Intermediate	Beginning
Identify key concepts in biomedical science	Comprehensive knowledge is used to create/devise experiments to test novel hypotheses	Comprehension is extensive, allowing analysis and extension.	Information is understood and explained in complete manner.	Descriptions are correct and clear.	Knowledge is incomplete or errant.
Correlate historical context for land-mark discoveries in biomedical science	Historical background triggers new hypotheses.	Historical con-text provides foundation upon which discussion and analysis form.	Historical context is accurate, complete, and correlations are presented.	Historical context is presented, but comparisons to modern work are lacking.	Historical context is not appreciated.
Compare the clinical context with molecular / cell biological mechanisms for studied diseases	Clinical data are reconstructed to justify new molecular approaches.	Evaluation of clinical outcomes justifies molecular approaches.	Comparisons between clinical and molecular mechanisms are accurate & broad.	Clinical context is mentioned in light of molecular mechanisms.	Clinical relevance is either missing or errant.
Possess functional knowledge of scientific literature relevant to the research area	Encyclopedic knowledge of the literature liberates the students thoughts, informing answers	Contradictory publications are compared to answer or justify scientific tactics.	Literature review affects student answers and flavors discussion.	Clear evidence of reading is apparent.	Significant gaps in literature review are evident.
RESEARCH	**Exceptional**	**Heightened**	**Advancing**	**Intermediate**	**Beginning**
Design effective experiments: (in general)	Conduct appropriate experiments to test hypotheses or formulate models	Experimental approaches and data are weighed for cost / benefit ratio.	New methods or concepts are used for addressing hypotheses.	Conservative use of methods generates incremental advances.	Experiments and approaches are misunderstood.
1. Exhibit creativity in experimental design	Multiple approaches are reasoned, employed, and interpreted	Rational evaluation of different approaches is considered.	Novel approaches are gleaned from literature and applied.	Multiple approaches are proposed and understood.	Limited ideas are presented to test the hypothesis.
2. Use controls appropriately	Critical analysis of unexpected results form new platform for discovery.	Rigorous controls redirect the experimental path.	Controls are understood and consistently used.	Controls are present for most approaches.	Vital controls are missing.
3. Use logical approach to answering research questions	Logical interpretation permeates design, implementation and conclusions.	Unexpected findings are uncovered by careful attention to results.	Logical coordination among findings directs future experiments.	Logical progression directs experimental direction.	Experiments are not logically linked.
4. Demonstrate sound rationale to justify experiments	Rationale justifies and extends approaches to scientific problem.	Rationale pushes work forward.	Rationale focuses proposed experiments.	Rationale is present in work.	Need for rationale is recognized.

RESEARCH (cont.)	Exceptional	Heightened	Advancing	Intermediate	Beginning
Execute experiments with technical skill	Significant technical ability and confidence yields high productivity, critical hypothesis testing, and publication-quality figures.	Experiment approaches are successful, employing independent trouble-shooting.	Experimental outcomes are anticipated, repeated, and explained, with further questioning.	Exhibits appropriate experimental technique. When experiments fail, reasons are sought and corrected.	Protocols and appropriate laboratory technique are not always successfully followed.
Demonstrate critical analysis and thinking	Hypothesis-driven experiments expand the field of study.	Experiments derive from hypotheses based upon gaps in knowledge.	Questions about dogma identify gaps in knowledge.	Student questions dogma.	Student understands data in the field.
Integrate new results into models and concepts from the scientific field	Experimental findings are integrated with data from external laboratories to create multiple models of the data.	Public data consistently fuels the experimental drive to build data-driven models.	Logical flaws are found in current models based on data.	Multiple, (possibly opposing) models are contrasted.	Theoretical models drive current thought.
TRANSLATION / INNOVATION	**Exceptional**	**Heightened**	**Advancing**	**Intermediate**	**Beginning**
Capability to seek and establish connections with clinical context / partners	Astute observation of clinical findings and needs heightens experi-mental approach.	Possible clinical impact drives hypothesis generation and investigation.	Clinical context is accurately explained and forms a strong project basis.	Clinical insights are sought out independently from various sources.	Clinical context is recognized in the project.
Work collegially and effectively as a team / community member	Coordination of collaborative efforts is managed effectively with professionalism and openness.	Co-ownership of joint projects is welcomed and individual contributions appreciated.	Student values each team member's KSAs, including each in team discussions.	Collaboration with team members is frequent and positive.	Team members are identified, particularly strengths of each.
Communicate science effectively to varied audiences (scientists, clinicians, lay)	Elegant communication invites enthusiasm and inquiry while fostering constructive dialog.	Significance presented in a compelling fashion with gracious responses to questions	Level of presentation is appropriate for the audience.	Varied levels of presentation are evident.	Presentations are accurate and well organized.
Communication: Oral, written, graphic presentation	Cohesive organization and visual presentation is superb .	Language and visual content convey results in a comprehensive way and invite discussion.	Language carries clear imagery and completeness.	Language is concise and descriptive.	English language rules are followed.

ETHICAL AND PROFESSIONAL STANDARDS	Exceptional	Heightened	Advancing	Intermediate	Beginning
Address ethical problems in scientific research	Can counsel others on ways to identify, work through, and resolve ethical problems	Uses effective approach for addressing ethical problems and utilizes support structures to best advantage	Can identify the various stake holders in an ethical dilemma and appreciate how they could be affected	Can identify ethical problems and has basic knowledge of structures that can help discuss, advise, or resolve dilemmas	Is aware that ethical problems are present in science
Treat data with scientific integrity, particularly in acquisition, management, and storage	As "heightened" plus mentors others and communicates importance of scientific integrity	Demonstrates high levels of integrity when acquiring, storing, and presenting data	Can identify cases where data are not handled or reported appropriately	Understands problems can arise if data are not handled properly and exhibits responsibility in data acquisition and management	Exhibits some flaws in organization, laboratory technique, and record keeping
Exhibit appropriate behavior in animal and/or human studies	Has extensive knowledge of the legal and social background for studies with animals and humans	Modifies research protocols to improve the responsible use of animals or participation of humans	Makes use of the regulatory bodies that oversee animal and human studies and seeks counsel for how to improve studies	Can identify the regulatory bodies and process to oversee responsible animal and/or human research	Communicates ethical respect for the use of animals in research or the participation of human subjects
Engage in best practices in authorship, mentoring, data sharing, and collaboration fiscal responsibility, and employee management	Establishes proactive strategies to engage in and communicate exemplary practice in these areas	Understands ethical role and responsibility to colleagues, institution, government, and society	Seeks counsel from peers and mentors with regard to best practices and conflict resolution	Understands implications of poor behavior in any of these areas	Treats others with respect

Appendix B: Student Progress Check List

Student Name: First and Last Name Date: August 17, 2011 Academic year: 2011-2012

Thesis Research

Thesis Advisory Committee (TAC) meeting / date:	***TAC signed report submitted to Enrollment and Records Administrator / date:***
Year two / fall:	Progress report:
Year two / winter: PRELIM	Annual summary:
Year three / fall:	Progress report:
Year three / winter:	Annual summary:
Year four / fall:	Progress report:
Year four / winter:	Annual summary:
Year five / fall:	Progress report:
Year five /winter:	Annual summary:
Year five / winter:	Dissertation prep and defense:

Professional Development – you are required to submit a two page summary highlighting the strengths and weaknesses for each conference and workshop you attend.

Conferences: Event – date: month and year // Did you present a Poster or Platform talk?

Workshops: Event – date: month and year
1.
2.
3.

Committees on which you have served (VAI or externally) during your graduate school program:

1.
2.
3.

Other: include volunteer hours / event during your graduate school program:

1.
2.
3.

Grants / Fellowships:
Sponsor:
Co-authors:
Title of project:
Budget:
Project period:
Current status:
Sponsor:
Co-authors:
Title of project:
Budget:
Project period:
Current status:

VAIGS Student Publications:
TITLE / DATE / SENT TO:
In preparation / submitted:
In press / accepted:
Published:
TITLE / DATE / SENT TO:
In preparation / submitted:
In press / accepted:
Published:

Student Performance Review Committee:
Commendation:
Remediation:
Probation:
Dismissal
Grounds and proposed plan:

Appendix C: Thesis Advisory Committee Meeting Report

Van Andel Institute®
Graduate School

Thesis Advisory Committee Meeting Report

This report should be completed by the committee chairperson (typically, the student's thesis advisor) and signed by committee members and student. Additional pages may be attached if necessary. The completed form should be submitted to the Enrollment and Records Administrator along with a copy of the student's written report.

Student: _____ Meeting date: _____

Course work: The committee should review the student's transcript to ensure that course requirements have been completed. Note any courses that remain to be taken or remediated.

SABR modules: VAI8010___VAI8020____VAI8030____VAI8040_____ VAI8050___
VAI8061___VAI8070____VAI8080____VAI8091____ VAI8100 ___

VAI8210: Historical Perspectives_____
VAI8221: Translational Research _____
VAI8230 Responsible and Effective Conduct of Research _____

Graduate Seminar Courses: (list by title, semester, year):

Research: Describe the student's progress on his/her research. Identify any specific aspects that warrant development or improvement and any specific plans for addressing those needs.

Presentation: Comment on the written report and oral presentation by the student.

List any publications published, in press, submitted or in preparation.

List conferences attended (or planned), indicating poster or platform presentations.

List other professional development activities (workshops, teaching experiences, seminars)

Define a prospective timeline for completion of dissertation.

Other comments, concerns or suggestions from the committee:

Mentor: _____ Date: _____

Member: _____ Date: _____

Member: _____ Date: _____

External member: _____ Date: _____

Student: _____ Date: _____

Appendix D: VAIGS Course List

Course Number	Course Title	Credits	Grading	2011-12
VAI 8000	***Modules***			
8010	SABR – Cervical Cancer	2	P/F	Fall
8020	SABR – Retinoblastoma	2	4.0	Fall
8030	SABR – Leukemia	2	4.0	Winter
8040	SABR – Pancreatic Cancer	2	4.0	Fall
8050	SABR – Skin Cancer & Melanoma	2	4.0	Winter
8061	SABR – Breast & Prostate Cancer	2	4.0	Winter
8080	SABR – Kidney Cancer	2	4.0	Fall
8091	SABR – Brain Cancer	2	4.0	Winter
VAI 8100	***Cumulative Exams***			
8111	SABR – Fall Integration Exam	1	4.0	Fall
8121	SABR – Winter Integration Exam	1	4.0	Winter
VAI 8200	***Semester long courses***			
8210	Historical Perspectives in Molecular Biology	2	4.0	Fall
8221*	Translational Research	2	4.0	Winter
8230	Responsible/Effective Conduct of Research	1	4.0	Winter
VAI 8500	***Research Rotations***			
8501	Research Rotation I	1	4.0	Fall
8502	Research Rotation II	1	4.0	Fall
8503	Research Rotation III	1	4.0	Winter
VAI 9000	***Graduate Special Topic courses***			
9005	Current Issues in Childhood Cancers – N. Duesbery	1	4.0	Fall/Win
9007	Gene Regulation – Triezenberg/Miranti with MSU	2	4.0	Winter
VAI 9500	***Research in Progress***			
9500	Research in Progress	1	P/F	Fall
9500	Research in Progress	1	P/F	Winter

Course Number	Course Title	Credits	Grading	2011-12
VAI 9600	***Journal Club***			
9600	Journal Club	1	P/F	Fall
9600	Journal Club	1	P/F	Winter
VAI 9700	***VARI Seminar Series***			
9700	VARI Seminar Series	1	P/F	Fall
9700	VARI Seminar Series	1	P/F	Winter
VAI 9800	***Pre-candidacy Thesis Research***			
9800	Pre-candidacy Thesis Research	3	4.0	Summer
9800	Pre-candidacy Thesis Research	3	4.0	Fall
9800	Pre-candidacy Thesis Research	3	4.0	Winter
VAI 9900	***Doctoral Candidate Thesis Research***			
9900	Doctoral Candidate Thesis Research	3	4.0	Summer
9900	Doctoral Candidate Thesis Research	3	4.0	Fall
9900	Doctoral Candidate Thesis Research	3	4.0	Winter

Appendix E: Transfer Credits for VAIGS Courses Policy

Van Andel Institute Policy	Number:	GS-POL-006
	Issuing Office:	Graduate School
	Effective Date:	April 15, 2011
TITLE: Transfer Credits for VAIGS courses	Approved By:	Grad Program Comm
	Page:	Page 49 of 2

1. PURPOSE
   1.1 This policy is to define if and how credits obtained at other accredited institutions are evaluated for fulfillment of the VAIGS Ph.D. degree requirements.

2. HISTORY / REVISIONS FROM PREVIOUS VERSIONS
   2.1 Initial policy drafted April 2011. Approved by Graduate Program Committee (April 15, 2011). Introduced to VAIGS faculty (date).

3. POLICY STATEMENT
   3.1 VAIGS does not accept transfer students.

   3.2 VAIGS students may take graduate courses offered at other universities as special topic electives, Research in Progress, Journal Club, and / or Seminar Series courses and apply up to a maximum of four credit hours to the VAIGS Ph.D. degree.

   3.3 **Transfer Credits**:
   - 3.3.1 The maximum number of graduate credits that can be transferred is four.
   - 3.3.2 Transfer credits will only be accepted from accredited institutions. Credit hours must clearly be graduate level. A course listed as both graduate and / or undergraduate level will not be considered for transfer.
   - 3.3.3 Transferred credit hours must have not been used toward the satisfaction of any degree requirements elsewhere.
   - 3.3.4 Determination of graduate transfer credits will only be at the discretion of the VAIGS special topics course director and meet advanced approval of the Graduate School dean. (Students are required to share a copy of the graduate course description / syllabus from the visiting institution for advanced review.)
   - 3.3.5 Credits must carry the grades of A or B. "Pass" or "Satisfactory" grades are not transferable unless these grades can be substantiated by the former institution as actually B or better.
   - 3.3.6 Grades earned in transferred courses are not counted as part of the overall grade point average.

   3.4 **Core Courses**:
   The following VAIGS core courses cannot be taken at another institution due to the foundation and design of each VAIGS class to complete the courses:
   - Strategic Approaches to Biomedical Research (8) modules
   - Historical Perspectives in Molecular Biology
   - Translational Research
   - Responsible and Effective Conduct of Research

   Therefore, students must complete year one with VAIGS before consideration will be given for transfer of credit hours.

3.5 **Cognate and Elective Courses**:
Upper level graduate courses provide advanced study on a focused topic in basic or clinical research. The purpose is to engage students in the study and discussion of current literature and concepts of current topics. VAIGS requires a total of 6 credit hours of special topic graduate courses (3 classes) typically taken between year 2-4. As an option, students may take up to 4 elective graduate credit hours at another institution.

4. APPLICABILITY
   4.1 This policy applies to Van Andel Institute Graduate School.

5. DEFINITIONS
   5.1 VAIGS: Van Andel Institute Graduate School
   5.2 VAIGS: persons officially registered and enrolled in the Van Andel Institute Graduate School Ph.D. program.

6. MATERIALS – PROCEDURES, FORMS
   6.1 Persons seeking to graduate transfer credits to VAIGS Ph.D. degree requirements must complete a Transfer of Credit Hours form available from the VAIGS Enrollment and Records Administrator. The form will identify
   - the student, research lab, dates for course
   - the off-site location and contact information;
   - the off-site course title / course number and credit hours,
   - the VAIGS course equivalency: title / course number and credit hours
   - space for indication of approval by VAIGS course instructor, VAIGS thesis mentor, and VAIGS dean of VAIGS.

   6.2 The Transfer of Credit Hours form can be found at the VAIGS SharePoint site.

7. REFERENCES
   7.1 None.

Appendix F: Student Rotation Research Report

Van Andel Institute Graduate School
Student Rotation Research Report

Student Name: _____

Mentor Name: _____

Rotation Period: 1 2 3 Academic Year: _____ Evaluation date: _____

Students: please provide a description of the activities undertaken during your rotation and your assessment of that experience. When completed, please submit to the Enrollment and Records Administrator.

1. Briefly describe the project or research activities undertaken during this rotation.

2. In what ways did this experience foster your development as a scientist?

3. What were the most valuable aspects of this rotation experience?

4. In what ways could this rotation experience have been more useful?

Appendix G: Faculty Evaluation of Student Performance (Rotation)

Student Name: _____ Signature: _____

Mentor Name: _____ Signature: _____

Rotation Period: 1 2 3 Academic Year: _____ Evaluation date: _____

Mentors: please provide an evaluation of the student's performance during the rotation in your laboratory by completing this form. To enable the student to gain maximum benefit, please discuss this evaluation with the student and sign the form before submitting to the Enrollment and Records Administrator. .

1. Briefly describe the project or research activities undertaken during this rotation.

2. Particular strengths displayed by the student during this rotation:

3. Areas in which the student might seek further development or improvement:

4. Overall summary comments:

5. Recommended grade for this rotation: (on scale from 0.0 to 4.0): _____
4.0 = Outstanding; as good as one might ever expect.
3.5 = Excellent, with some room for improvement
3.0 = Good, with several areas for development
2.5 = Adequate, but significant weaknesses are evident
2.0 = Substantial weaknesses; future success uncertain
1.0 = Minimal effort put forth; continuation in program uncertain
0.0 = No effort or very serious deficiencies; should discontinue program

Appendix H: Guidelines for Comprehensive Examination

Van Andel Institute Graduate School
Guidelines for Comprehensive Examination

Document date: November 2, 2009

PREAMBLE – The Comprehensive Examination is the first true step towards the goal of earning the degree of Doctor of Philosophy, abbreviated Ph.D. or PhD for the Latin *Philosophiæ Doctor*, meaning "teacher of philosophy." The PhD is the highest academic degree granted and the dissertation is the distinctive mark of doctoral education. Before conducting dissertation research, the applicant should first demonstrate potential and ability to identify and define explicitly a specific testable hypothesis to pursue for her/his dissertation research as a doctoral *candidate*. The candidate will be expected to critically evaluate the relevant literature, present a testable and important hypothesis and propose critical experiments to rule out or prove the hypothesis, including a plan to interpret potential outcomes. These qualities will be assessed through a process termed the Comprehensive Examination (sometimes referred to as the Preliminary Examination).

Overview – This document specifies how the Comprehensive Examination will be conducted. Because the prospective candidate will be qualitatively assessed by human judges, the goal is to explicitly describe what is expected and detail how the prospective candidate will be judged.

A. The Comprehensive Exam Committees – A standing committee of the faculty will oversee the organization and conduct Comprehensive Examination process, including these guidelines. A separate Comprehensive Examination Committee will be established for each student. The four members of each committee will consist of the

- Academic (Thesis) Advisor,
- one VARI faculty member from the student's Thesis Committee,
- one VARI faculty member not on the thesis committee and
- one outside expert on the non-thesis proposal topic.

The latter two members will be appointed by the Graduate School Dean with advice from the thesis advisory committee. The examination session will be chaired by the VARI faculty member who is not on the thesis committee. These appointments shall be made in December prior to the February date of the comprehensive exam.

B. Timeline – Students must take the Comprehensive Examination prior to February 28th of their second year of study. Exceptions will be made only with the approval of the Comprehensive Examination Committee and the Dean of the Graduate School. Prospective candidates are encouraged to consult with advisors (including thesis advisor, Comprehensive Exam committee members, or the Dean) regarding preparation and planning for this exam.

The written thesis and non-thesis proposals shall be submitted to the student's comprehensive examination committee at least two weeks prior to the scheduled examination date.

The topic for the non-thesis proposal should be approved by the Faculty Comprehensive Examination Committee by December 15.

C. The **Examination** will comprise three parts:

Part I. Written Thesis Proposal – The first component is a written thesis research proposal prepared in the style of a National Institutes of Health (NIH) grant application complete with Abstract, Specific Aims, Background/Introduction, Preliminary Data, Research Design and Methods, and Bibliography sections. See Appendix 1 for further guidelines about the contents of each section. After lab rotations, students are encouraged to work closely with their thesis advisor to develop specific aims and begin generating preliminary data to support their Preliminary Exam thesis proposal. The written proposal (exclusive of references and figures) should not exceed 20 pages, double-spaced, 12 point font, with 1 inch margins. The students are required to submit their proposals to their Comprehensive Exam Committee two weeks prior to the scheduled preliminary oral exam date.

Part II. Non-thesis Preliminary Exam Topic – The second part consists of a research proposal on a topic non-contiguous with the student's chosen field of research. A student will first propose a non-thesis Preliminary Exam topic by writing a brief one page description in November of the second year. This topic submission must clearly state the hypothesis to be addressed in the proposal and briefly describe the experimental systems proposed to test the hypothesis. This topic selection must be approved by the Faculty Comprehensive Examination Committee by December 15. The non-thesis proposal is due two weeks prior to the scheduled preliminary oral exam date. The scope of the project should be such that it could be realistically carried out by a single person with only part-time technical help in three years. The non-thesis proposal should be written using the same NIH proposal format, with the exception that Preliminary Data are not expected. The non-thesis proposal should not exceed 10 pages, double-spaced, 12 point font, with one inch margins.

Part III. Oral Examination – After the two written portions of the Preliminary Exam have been submitted, the third phase involves an oral defense of the two written proposals together with an examination on related topics. The oral exam is a 2-hour defense of the written proposals administered by the same thesis faculty from the written exam. The exam session will begin with a short formal presentation by the student (approximately 15-20 minutes). This presentation should provide an overview of the thesis proposal, including the biological context for the work, the central question of the project, a statement of the hypothesis and specific aims, a sketch of the approaches proposed, and a consideration of expected or potential outcomes.

Following the initial presentation, the committee will pose questions to probe whether the student has a fund of knowledge and critical thinking skill sufficient to conduct the proposed research with a reasonable likelihood of success. Questions should be posed in a professional manner without intent to embarrass, harass or browbeat the student. The goal of the questioning is to define the boundaries of the student's knowledge, and thus it is likely that eventually questions will be raised to which the student has no ready answer. The task of the committee is then to decide whether the boundary of knowledge is appropriate for a student at this stage of development. Approximately one hour will be devoted to questions on the thesis proposal. That portion will be followed by a period of approximately one-half hour for questions on the non-thesis proposal topic.

At the discretion of the committee, the student will be asked to leave the room for deliberations at the beginning and end of the exam.

D. Role of Thesis Advisor and other consultants. The Preliminary Exam should represent the student's individual efforts and abilities. During the preparation of the proposal, students are encouraged to consult with other students, postdoctoral fellows, and faculty for clarification of ideas. Students should not solicit suggestions for the proposal's specific aims nor should they ask anyone else to provide the specific experimental design.

The thesis advisor should not directly participate in the preparation, writing or editing of either the written or oral exam, but may and should offer instruction or advice on proposal planning and writing in general terms.

E. Scoring Criteria – Parts I-III will be scored on using adjectives (Outstanding, Excellent, Good, Fair and Poor) and a numerical score comparable to the NIH grant scoring system. Scores are assigned on a scale from 1 to 5, with low numbers BEST.

Criterion	**Standard**	**Adjectival Rating**	**Numerical Rating**
Background, Rationale & Significance	Does the applicant understand the underlying concepts necessary to proceed with proposed research? Has the applicant critically assessed the previously published research?		
Preliminary Results	Is there sufficient preliminary data to support the pursuit of the proposed research? Does the applicant critically assess the quality and relevance of the preliminary results?		
Theory/Guiding Hypothesis	Has the applicant devised an important and testable overarching hypothesis? Are the specific aims well-defined and relevant for testing that hypothesis?		
Research Design	Are the proposed methods appropriate and necessary for testing the hypotheses? Does the applicant understand the conceptual and technical basis of the proposed methods? Are alternative approaches (and their advantages or disadvantages) considered? If new approaches are necessary, is the applicant equipped to develop them? Is the timeline for completion of the work reasonable and appropriate?		
Predicted Outcomes	Has the applicant adequately considered experimental outcomes, how they will be interpreted and considered changes in strategy if problems are encountered?		
Presentation Clarity	Has the applicant presented a clear working knowledge of the proposed research? Does the applicant respond directly and concisely to questions?		
Creativity	Has the applicant identified a new and interesting question? Has the applicant designed a novel approach to addressing their hypothesis? Has the applicant brought together principles or methods from several areas or fields?		
Critical Thinking	Does the applicant critically assess: the current state of knowledge; the quality and limitations of previously published work; the quality and limitations of their own preliminary results; the alternative approaches or outcomes.		

F. Summary - Passing the Preliminary Exam requires satisfactory completion of all three of the component parts. To pass any component, the composite score (averaged across all criteria) must be less than 3.0. The committee will decide upon one of three possible outcomes:

a) Pass - No further work is required on the Preliminary Exam itself. The committee may make recommendations for areas in which improvement should be sought or expected.

b) Failure with opportunity to remediate – If the Preliminary Exam committee identifies weaknesses in a limited number of areas and believes that these deficiencies can be corrected with specific actions, the student may be offered the opportunity to remediate those portions of the examination. The committee will define explicitly the conditions for remediation. The remediation should be completed within three months of the initial examination date. In the remediation efforts are deemed satisfactory, the student will have passed the preliminary exam. If the remediation efforts are deemed unsatisfactory, the student will have failed the Preliminary Exam and the student will be asked to leave the doctoral program.

c) Failure – If the student fails one or more portions of the Preliminary Exam, with deficiencies beyond the scope deemed remediable within three months, the student will not be offered the opportunity to remediate and the student may be required to leave the doctoral program.

G. Submission of proposal for external fellowship application. The thesis proposal must be submitted as a predoctoral grant application (typically as a predoctoral fellowship) to an external agency within one year of the successful completion of the comprehensive examination. The candidate should work closely with the thesis advisor and the Grants and Contracts administrators to identify suitable funding sources and in the preparation of the application itself. Success in obtaining external fellowship support is NOT a requirement for passing the comprehensive examination.

Appendix 1.: Research Plan [Excerpted from NIH publication "Individual Fellowship Application Guide for NIH and AHRQ". The full document can be found at: http://grants.nih.gov/grants/funding/424/SF424_RR_Guide_Fellowship_VerB.pdf

1. Specific Aims

Attach a list of the broad, long-term objectives and the goal of the specific research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.

2. Background and Significance

Attach a brief sketch of the background leading to the present application. Critically evaluate existing knowledge and specifically identify the gaps that the project is intended to fill. State concisely the importance and health relevance of the research described in this application by relating the specific aims to broad, long-term objectives and to the mission of the NIH IC or AHRQ.

3. Preliminary Studies/Progress Report

Preliminary Studies. Attach information to provide an account of preliminary studies, if any that are pertinent to this application. This information will help reviewers and NIH staff evaluate your experience and determine your competence to pursue the proposed project. It will also help demonstrate the utility of the proposed project as a training experience but preliminary studies are not necessary, particularly for a predoctoral application. When applicable, provide a succinct account of published and unpublished results, indicating progress toward their achievement.

4. Research Design and Methods

Attach a description of the research design conceptual or clinical framework, procedures, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted. Describe any new methodology and its advantage over existing methodologies. Describe any novel concepts, approaches, tools, or technologies for the proposed studies. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. As part of this section, provide a tentative sequence or timetable for the project. Point out any procedures, situations, or materials that may be hazardous to personnel and the precautions to be exercised.

5. Bibliography and References Cited [excerpted from NIH Form 398 application guide]

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

Appendix I: Remediation Policy

Final policy pending Faculty approval, Sept. 2011

Appendix J: Incomplete Policy

Final policy pending Faculty approval, Sept. 2011

Appendix K: Dismissal Policy

Final policy pending Faculty approval, Sept. 2011

Appendix L: VAIGS Honor Code

Van Andel Institute Graduate School

Honor Code Pledge

The values of academic honesty, integrity and responsibility are central to the healthy life of an intellectual community. Likewise, the productive pursuit of scientific research requires honesty and integrity, and the scientific community has strict standards for the conduct of research. Graduate students, as members of both academic and scientific communities, are expected to demonstrate honesty, integrity, and professional behavior in all activities relevant to their learning and research.

To clearly declare their intention and obligation to live up to these standards of academic and scientific conduct, matriculating graduate students of VAIGS are asked to read and sign the following Honor Code statement. Violations of this pledge may have consequences ranging from failing grades on the relevant assignments or courses to dismissal from the VAIGS doctoral program.

"On my honor, as a student and scientist, I pledge to uphold the values of academic and scientific honesty and integrity. In my academic work, I will neither give nor receive any unauthorized assistance in completing my work. In my scientific work, I will adhere to the highest standards of scientific conduct and specifically with the provisions of the Van Andel Research Institute policy on scientific misconduct."

Printed name: _____ Date: _____

Signature: _____ Dean or representative: _____

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