

COVER SHEET

Vanderbilt University
Process for Approval for New Professional Degree

Program information: **Vanderbilt Genetic Counseling Program**
College/School: **School of Medicine**
Degree: **Master's Degree of Genetic Counseling**

	Signatory or Date anticipated	Date completed
Board of Trust	Anticipated November 3, 2017	
Chancellor	Anticipated October 2017	
Provost/Vice-Chancellor of Academic Affairs	Anticipated October 2017	
Dean Balser letter of endorsement	Dean Balser approved proposal 7/19/17. Letter to be signed after Faculty Senate review.	
Faculty Senate	Anticipated 10/4/17	
APS Committee of the Faculty Senate	Anticipated September 2017	
✓ Executive Faculty	Martha Dudek presented Executive Summary Motion passed with approval	July 19, 2017
✓ Planning Notice of Intent	Susan Wente, Provost	November 30, 2016
✓ Planning Notice of Intent	Jeffrey Balser, Dean, VUSOM	August 31, 2016

Degree program contact information:

Martha Dudek
615-343-1964



PROPOSAL FOR MASTER'S DEGREE PROGRAM IN GENETIC COUNSELING

8/28/17

Proposal for a Master's Degree in Genetic Counseling (MGC)

1. Executive Summary

This document outlines a proposed professional degree program for a Master of Genetic Counseling (MGC). The demand for genetic counselors has outpaced the capacity of the current accredited programs. Therefore, as an international leader in genetics, Vanderbilt University has the opportunity to build a program of excellence in clinical genetics and genetic counseling research. The current timeline for the development of the MGC would allow the first class to be admitted in fall of 2019 ([Appendix A](#)).

2. Introduction

The Planning Notice of Intent (PNOI) for the MGC was approved by the Dean of the School of Medicine and the Provost in November 2016 ([Appendix B](#)). Information from the PNOI has been updated in this proposal, and details are provided on the coursework and faculty for the Vanderbilt Genetic Counseling Program (VGCP).

The degree would be awarded by Vanderbilt University School of Medicine (VUSM), and academic administrative oversight will be provided by the VUSM Office of Health Sciences Education (OHSE) as illustrated in Figure 1. The proposed MGC has the support of a large group of Vanderbilt University Medical Center (VUMC) stakeholders: the Departments of Medicine, Obstetrics & Gynecology, and Pediatrics as well as the Vanderbilt Ingram Cancer Center, Vanderbilt Institute for Clinical and Translational Research, Vanderbilt Genetics Institute and Vanderbilt Center for Personalized Medicine. Letters of support and financial commitments from these stakeholders have been obtained ([Appendix C](#)). The Vanderbilt Genetics Institute will serve as the home institute for the program.

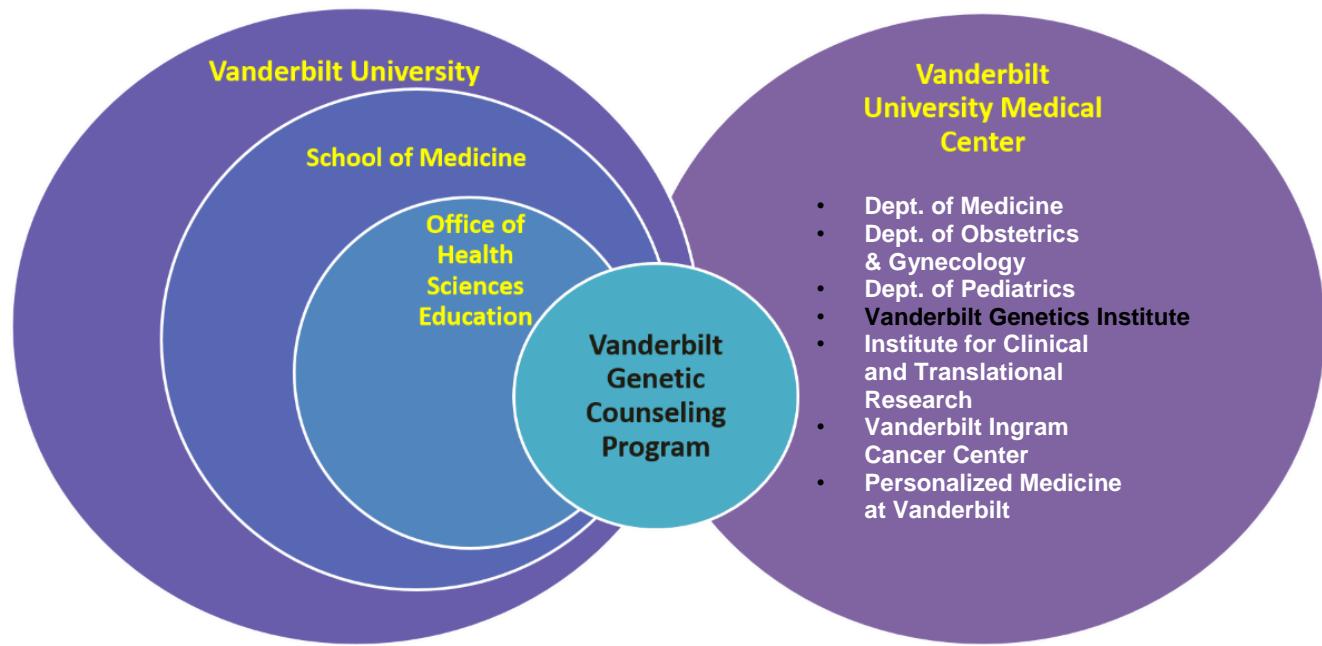


FIGURE 1 VGCP ORGANIZATIONAL STRUCTURE

3. Genetic Counseling Profession

Genetic counselors are medical professionals who work in a variety of settings, such as universities, hospitals, laboratories, non-for-profit organizations, governmental agencies, and commercial companies. In the clinical setting they are members of interprofessional teams who provide education about genetic concepts and conditions, provide risk assessment for family history of disease, facilitate genetic testing and interpret results. This highly desirable skill set has allowed genetic counselors to expand their areas of specialty to include cancer, neurology, cardiology, ophthalmology, immunology, pharmacogenetics and personalized medicine.

Program Accreditation

Training programs are accredited by the Accreditation Council for Genetic Counseling (ACGC). The VGCP will follow the ACGC's policy for attaining accreditation¹.

1. Submit letter of intent (LOI) with letters of support from degree granting institution.
2. If LOI is accepted, the application for a new program is submitted within 6 months.
3. ACGC grants "New Program" status when the application is approved which takes 9 months on average.
4. Site visit by the ACGC is required within one year of the graduation of the second class. This site visit is scheduled after application for "Full Accreditation," which is anticipated in 2022-23.

Several factors impact a new program's timing to accept its first class.

- First class of students may only be accepted after ACGC application is approved and the program has attained "New Program" status.
- The Genetic Counseling Admissions Match is administered through the National Matching services (NMS) under a contract with the Association of Genetic Counseling Program Directors (AGCPD)².
- To participate in the Match, programs must be granted "New Program" status by March 15th prior to the fall admission.³

Licensure

In Tennessee and other states which offer licensure for genetic counselors, genetic counselors must pass the American Board of Genetic Counseling (ABGC) certification exam. This exam is offered twice a year in February and September. Graduates of program with "New Program" accreditation from ACGC are eligible to take the certification exam.

4. Justification for Program

The number of genetic counselors has increased by 88% from 2006-2016⁴. Additionally, the US Department of Labor has projected 29% growth in employment opportunities for genetic counselors from 2014-2024⁵. This growth is more than four times the average for all occupations. The Genetic Counselor Workforce Working Group (WFWG) is a collaboration

¹ <http://gceducation.org>

² <https://natmatch.com/gcadmissions>

³ <https://www.agcpd.org/AdmissionsInfo>

⁴ <http://www.nsgc.org/p/cm/ld/fid=532>

⁵ <https://www.bls.gov/ooh/healthcare/genetic-counselors.htm>

between the five genetic professional organizations.⁶ They commissioned a consulting group to assess the workforce supply and demand for clinical Genetic Counselors over the next decade (2017-2026). The WFWG has projected the growth to be even greater (72%). With either projection the need for genetic counselors far outstrips the available supply. The current programs are not graduating enough genetic counselors to fill job postings (Figure 2). Employers locally and nationally report long waits to hire and/or the inability to fill positions.

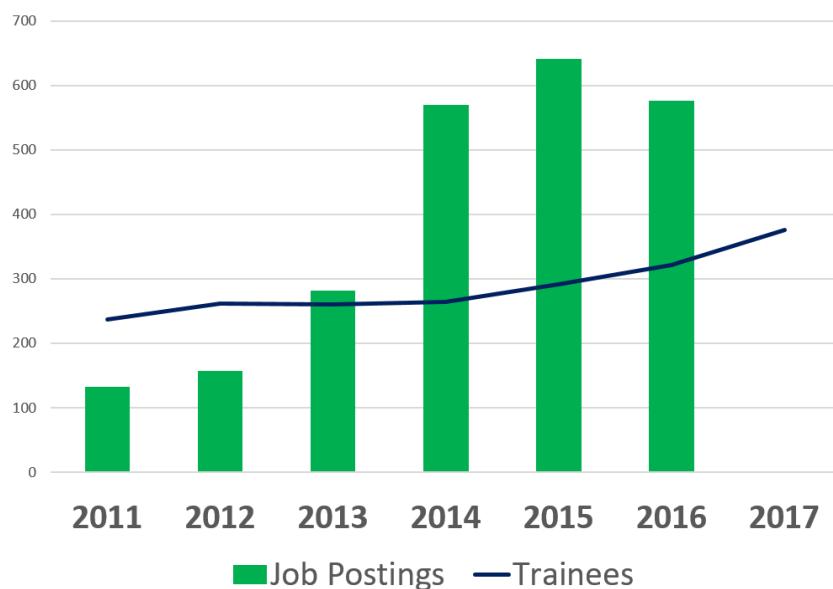


FIGURE 2 NSGC JOB POSTINGS AND TRAINEE POSITIONS

At the same time, program directors report the applicant pool is growing and there are highly qualified applicants to whom they are not able to offer admission. Nationally, program directors received applications from about 800 unique students for only 250-300 training slots, and they report that 70% of the applicants meet the minimal GRE and GPA requirements. Thus, there is a surplus of well-qualified, motivated students who desire to enter the field, and insufficient training slots to effectively address the shortage of genetic counselors.

In addition there are likely other excellent candidates who may not be aware of the field or choose not to apply due to the lack of a program in their state. Data from 2012-2015 graduates indicated that in the US, 76% (340/450) of the genetic counselors received a degree from an institution in a state with a genetic counseling program. Therefore students who graduated from the 26 states which do not have an accredited program (including Tennessee) may not be considering the field of genetic counseling due to lack of exposure or access.

⁶ Members of the WFWG include representatives from the American Board of Accreditation Council for Genetic Counseling (ACGC), American Board of Genetic Counselors (ABGC), American Society of Human Genetics (ASHG), Association of Genetic Counseling Program Directors (AGCPD), and National Society of Genetic Counselors (NSGC).

Vanderbilt is well positioned academically and geographically to invest in training future generations of genetic counselors. The VUSM has extensive experience in training medical students and other health care professionals, including audiologists, speech-language pathologists, and medical physicists. MGC degrees are often granted by renowned medical schools. In the 2016 *U.S. News and World Report* rankings of the top 25 medical schools, sixteen, including Vanderbilt at #14, are or will be graduating genetic counselors in the next 2 years.⁷ Thirty-seven graduate programs in twenty-four states are accredited; however, Tennessee does not have a genetic counseling training program. The closest program is approximately 200 miles from Nashville in Birmingham, Alabama (Figure 3).

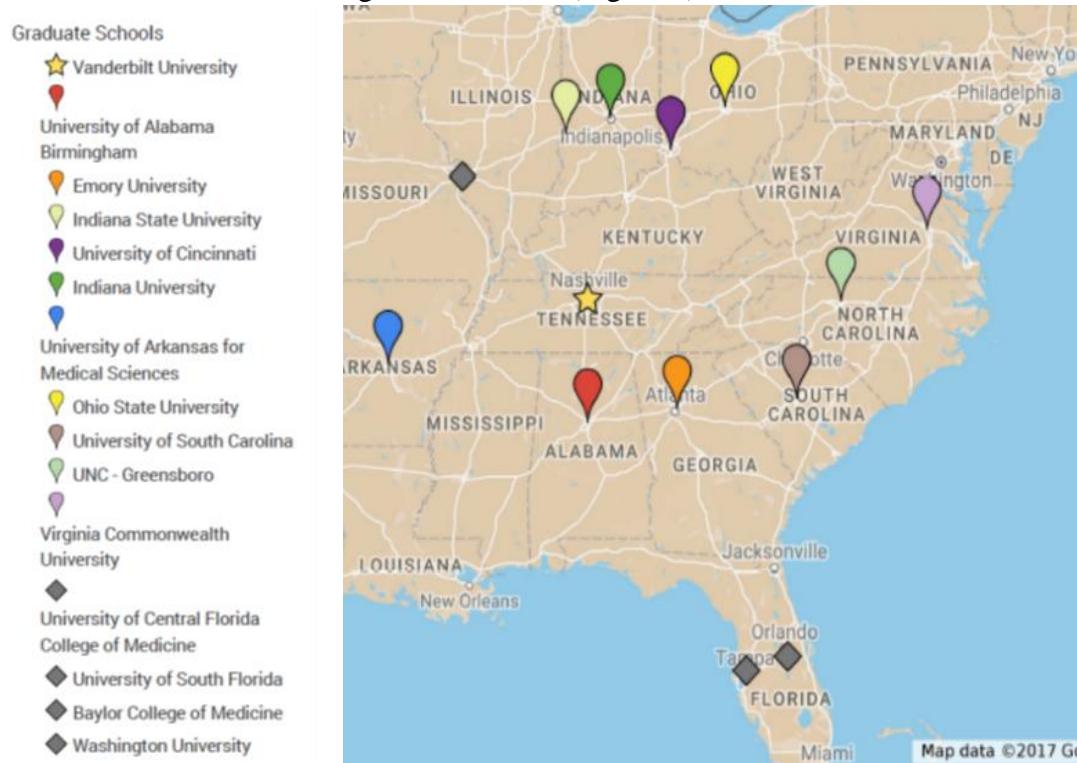


FIGURE 3 MAP OF SURROUNDING PROGRAMS

Though the number of genetic counselors employed in Tennessee has increased to 50, there remains limited access to genetic counseling services for Tennesseans with only one per every 140,000 residents and for every 824 miles. The recent WFWG has suggested a minimum of one certified genetic counselor per 75,000 U.S. population.

5. Program's Guiding Principles

Mission and Vision

The mission of the VGCP is to graduate genetic counseling leaders in the field of genetics and genomic medicine.

⁷ <https://www.usnews.com/best-graduate-schools/top-medical-schools/research-rankings?int=af3309&int=b3b50a&int=b14409>

The vision of the VGCP is:

- Being on the forefront of genetics and genetic services research
- Creating a nurturing environment to foster genetic counseling training
- Nesting the program in a strong, connected academic and clinical community

Goals and Aims

The program goals are to:

- Matriculate diverse graduate students in genetic counseling who are empowered to succeed in the expanding field of genetics, genomics, and personalized medicine.
- Facilitate faculty and student collaboration with Vanderbilt researchers to enable significant contributions in the areas of genetics and genomics, genetic counseling, and personalized medicine.
- Improve access to genetic services, especially in Tennessee and the South, by increasing the number of providers and expanding awareness about the field.

Graduates of the VGCP will:

- Understand genetics and genomics and their application in medicine as set forth by the ACGC's standards.
- Develop skills to convey complex medical information to health care consumers and providers and with diverse background in a sensitive, evidence based way, as outlined in the ABGC competencies.
- Evaluate and analyze research to ask important questions while thinking critically and investigating the answers to those questions.

5. Course of Study

Students in the VGCP will enroll in coursework and clinical training to gain the knowledge and skills required to be successful genetics health professionals. Research skills will be attained through a mentored thesis project that will be publishable in a peer-reviewed journal.

The VGCP used Kern's Curriculum Development for Medical Education as the conceptual framework to organize our new curriculum. The ACGC's Standards of Accreditation for Graduate Programs in Genetic Counseling outline the Instructional Plan and Instructional content⁸. The Standards specify that a genetic counselor must be able to demonstrate the ACGC Practice-Based Competencies (PBC).⁹ These competencies fall into the four domains of Genetics Expertise and Analysis; Interpersonal, Psychosocial and Counseling Skills; Education; Professional Development and Practice.

⁸ <http://gceducation.org/Pages/Standards.aspx>

⁹ http://gceducation.org/Documents/ACGC%20Core%20Competencies%20Brochure_15_Web.pdf

Proposal for New Degree Program for Master's Degree in Genetic Counseling

MGC degree has 60 credit hours over 21-months including 5 consecutive semesters – two fall and two spring semesters with the intervening summer. A load of 8 credits will be considered fulltime for the purposes of loan eligibility and deferment. Forty-five credit hours for course work, six for thesis and six for clinical rotations. All required classes will be on the VU/VUMC campus. Overview of the sequence of the coursework, clinical rotations and thesis is diagramed in Figure 4. A more detailed timeline is in [Appendix D](#) with descriptions of the course.

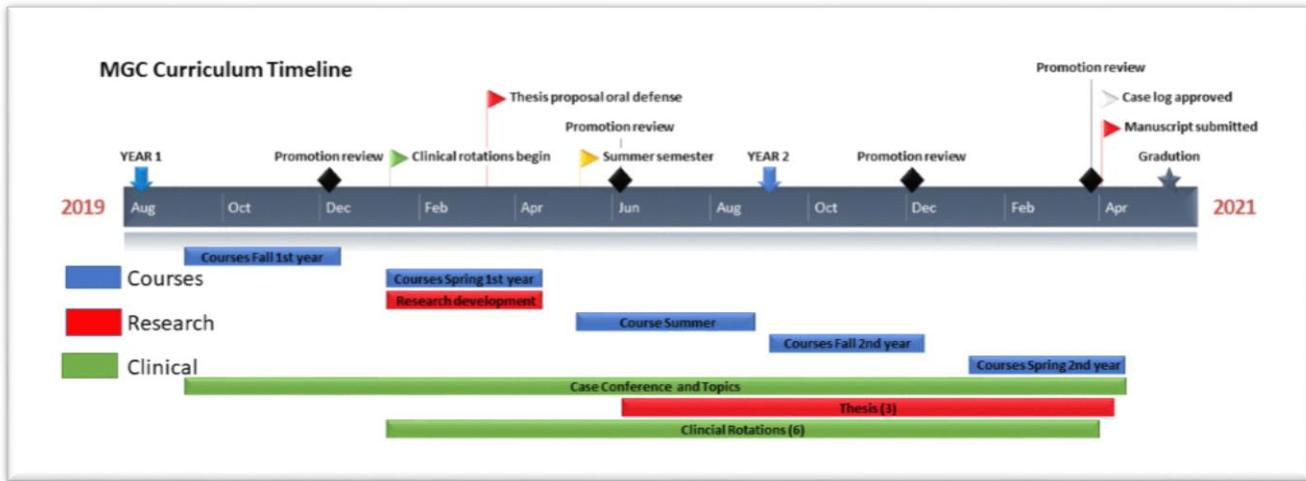


FIGURE 4 MGC TIMELINE

The first year builds a foundation of knowledge in relevant sciences and counseling theory. First, Human Genetics will provide a framework for the study of human genetics and genomics with clinical examples to illustrate the application of the main principles. This second course in Human Genetics will take the principles from first semester and build on them by using different genetic sub-specialties. This course is intended to familiarize the students with human developmental biology and embryology and the use of this knowledge to understand common human malformations and genetic syndromes. Counseling theory and the essential genetic counseling skills will be taught in Introduction to Genetic Counseling and Practical Genetic Counseling. The second year further develops counseling skills with course in summer Applied Genetic Counseling Theory and Professional Issues. Health Policy and Ethics in Medical Genetics are taught in the second year when learners will have more clinical experience from which to draw.

It is anticipated that all of these courses will be new and unique to the VGCP. Students from other programs will be able to enroll in the class with instructor approval. Different educational strategies including lecture, flipped classrooms, in-class and online discussions, critical reflections, small groups, problem-based learning, team-based learning and role play will be used to meet the educational objectives for each class. Students will have the opportunity to practice counseling skills using standardized patients with audio and video review as part of their counseling courses. The Vanderbilt SOM Center for experiential Learning (CELA) has agreed to be available to the VGCP. Faculty will work with the CELA team to integrate standardize patient experience to maximize student acquisition of counseling skills. These skills will be further

Proposal for New Degree Program for Master's Degree in Genetic Counseling

developed through the clinical rotations. BrightSpace¹⁰ will be used as the course management system.

Clinical Rotations

Each student will rotate in at least four core clinical areas: reproductive genetics, adult, pediatrics, and subspecialty. Five students will be in the inaugural class. Enrollment will increase annually until there are 10 students per cohort. VUMC has adequate clinical placement opportunities for a class of this size. Clinical rotations during the academic year will be at VUMC. Currently there are genetic counseling interns from outside programs being supervised in these clinics. VGCP learners will fill these openings within these departments. Partnering with an institution with an established program has allowed our faculty to build their supervision skills.

Student will have the opportunity to elect to spend one clinical rotation during the intervening summer at another institution. An institutional agreement between Vanderbilt and the proposed location will be required before approved by the program director.

Student experiences in clinical rotations will progress from observation to assuming additional roles until competency is attained. Students will be provided an on-line platform to track their cases and acquisition of skills to satisfy ABGC logbook requirements.

Thesis

Research knowledge and skills will be obtained throughout the program. Coursework in first year will introduce research design. Students will be paired with an experienced research mentor early in their course of study. Program leadership will work with the student in the first year to build a research committee with the appropriate expertise and advising experience. Through regularly scheduled meetings between research advisor and student, progress on the thesis will be tracked. Requirements and timeline for the development and completion of the thesis will be clearly outlined in the thesis manual. Thesis progression will be assessed and documented every six months by the promotion committee. Completion of the thesis project will be a prepared manuscript for publication.

6. Students

Recruitment

Students will be recruited locally and nationally. The Vanderbilt University Health Professions Advisory Office has enthusiastically agreed to assist the VGCP with recruitment of undergraduates. Vanderbilt's strong reputation will attract students nationally and internationally. A robust website for the program will be developed to allow potential applicants to find detailed information. The genetic counseling professional organizations (ABGC, ACGC, AGCPD) will list and link to the VGCP web site once it is accredited.

Recruitment of applicants from diverse backgrounds and perspectives will be a priority for the VGCP. The Program leadership will work with the VU SOM Office for Diversity Affairs, local efforts by the Tennessee Genetic Counselor Association and the national efforts

¹⁰ <https://www.vanderbilt.edu/brightspace/>

by the AGCPD and the NSGC to increase the diversity of candidates, graduates and professionals in the field of genetic counseling.

Admissions

The VGCP will utilize the same process for admission as other professional degrees in the VUSM OHSE including the application management platform (SLATE).¹¹ The University Registrar office and the Office of Financial Aid are aware of the proposal for the MGC program. They have committed to supporting the VGCP students. The VGCP admissions committee will oversee the admission process. Applicants will be required to submit an application and meet minimal requirements including:

- Undergraduate degree from an accredited institution
- Minimum GPA requirement of 3.0 with the provision to provide supplemental information, if less.
- General GRE scores taken within last 5 years
- One semester of college credit in the following biology courses, general or human genetics, chemistry, and psychology
- Experiences which demonstrate an understanding of the field of genetic counseling and an ability to communicate clearly and compassionately with others. This experience could be obtained through volunteer work, employment or observation in a clinical setting of a Boarded Genetic Counselor and/or Medical Geneticist

All international applicants will be required to provide scores from the Test of English as a Foreign Language (TOEFL), which is administered by the Educational Testing Service in Princeton, New Jersey.

Promotion and Graduation

The Promotions Committee will convene twice a year to evaluate student progress towards the program aims and graduation requirements.

To graduate students must have:

- Successfully completed required clinical rotations and attained approval of logbook by program director
- Completed 60 hours of indicated coursework with a grade no less than a B- in any course
- Progress on thesis project towards fulfillment of the thesis requirement

7. Faculty

The breadth of genetics expertise at Vanderbilt is represented in the Program faculty ([Appendix E](#)). The VGCP faculty have extensive experience to lead courses, provide instruction using multiple learner-centered modalities, mentor research, provide clinical supervision, and serve as a student advisor. All of the Vanderbilt genetic counselors are on the curriculum development committees. These committees have been meeting regularly to develop the curriculum. Admissions and promotions committees are currently being formed.

The program director will provide a significant amount of classroom teaching. Funding is available from stakeholders initially, then tuition will be given to Departments for significant effort that their faculty provide in classroom teaching and course direction. It will be at the Departments' discretion to distribute these funds either toward effort or faculty compensation in

¹¹ <https://medschool.vanderbilt.edu/admissions-and-education>

the form of salary or research/educational funds. Compensation to faculty for clinical supervision will come from education opportunities offered by the program (trainings), professional activities credit (PACs)¹², and scholarship towards promotion.

Diversity of the faculty is highly valued and VGCP will support the recruitment of faculty which reflect the community whom they serve and teach.

8. Administration/Leadership

The VGCP will be led by the Program Director, Director of the Vanderbilt Genetic Institute and the Medical Director with program administration support provided by the Program Manager. Assistant/Associate Program Directors/Clinical Rotation Coordinators will be included when appointed in the future. The ACGC sets minimum standards of effort required by the program director (1.0 FTE \leq 10 students; 1.5 FTE for \leq 20 students), and the board-certified geneticist who serves as the medical director (0.05% FTE). The ACGC outlines the qualifications and responsibilities for these individuals as well as other personnel, including programs co-director, assistant/associate director, and clinical rotation coordinator. The individuals identified for leadership in the VGCP are listed in [Appendix F](#).

Representatives from the stakeholders and leaders in genetics comprise the Advisory Board, and this Board will meet two to four times per year. The first meeting was held successfully on July 28th, 2017 and the next one is scheduled for October 30, 2017. The Mandate and Structure of the Board was approved at the first meeting ([Appendix G](#)). The overarching responsibility of the Board is to assist in the development and ongoing assessment of the program to ensure it is consistent with the program's mission and with ACGC's accreditation standards.

9. Financial

The Accreditation Council for Genetic Counseling requires evidence of adequate funding to achieve and maintain accreditation. The five-year balanced budget is in [Appendix H](#). It was drafted based on the needs of the program to meet educational standards and from data provided by Association of Genetic Counseling Program Directors.¹³ Initial estimates indicate the program will be profitable by the third class (Figure 5).

Funding

Investment from Stakeholders

The program has secured \$420,000 from seven equally contributing stakeholders at Vanderbilt over two years, including the Departments of Medicine, Obstetrics and Gynecology and Pediatrics as well as Vanderbilt Genetics Institute, Vanderbilt Personalized Medicine Initiative, Vanderbilt Ingram Cancer Center, and Vanderbilt Institute for Clinical and Translational Research. These funds will sustain the program until tuition will be adequate to support the program which is projected in year three of enrollment (FY2022). These funds will

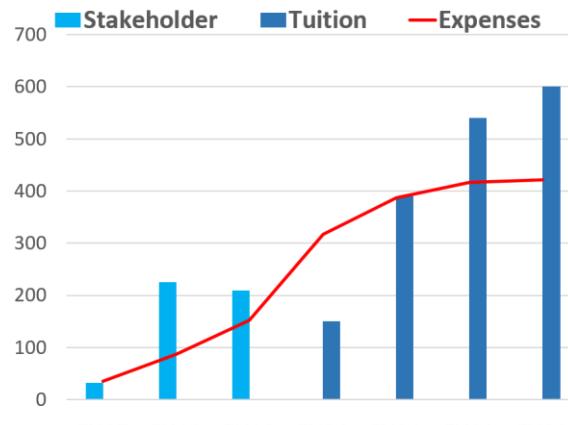


FIGURE 5 PROJECTED BUDGET

¹² http://www.abgc.net/abgc/media/documents/abgc-pac-table_2014-updates.pdf

¹³ <https://www.agcpd.org/NewProgram>

provide partial salary support for the Program Director and Program Manager during program development.

Tuition

Tuition is proposed for \$60K for both years of the program. This rate is commensurate with other genetic counseling programs at comparable institutions. ([Appendix I](#)). Understanding a student's total cost of the degree will include fees and living expenses and should be weighed against earning potential. According to the National Society of Genetic Counselor Professional Status Survey from 2016, mean salary for genetic counselors in the United States is \$81K.

The Office of Financial Aid and the OHSE is aware that most VGCP students will apply for financial aid since it is a full-time program without significant time to work outside of the course of study. Vanderbilt's tuition for the program would need to balance operational cost with reasonable debt levels for graduates into a field in which compensation levels can be fairly moderate in comparison with compensation to other health professional.

Sustainability of program

With the current budget, approximately 7 students in each class (14 total) will be needed to cover program expenses. It is estimated that teaching and clinical supervision resources in the program could support 10 students per class for total of 20 students. This additional revenue could be used for scholarship to attract most highly sought applicants.

Reporting

For accreditation the Program Director will need to be able to provide documentation of financial stability. Towards this goal mutual monthly reporting will be required between VU and VUMC as well as an annual budget by both institutions which details expenses and income. This will provide the necessary transparency of funding sources and expenses including documentation of institutional support, tuition, and institutional fees.

10. Resources available

During the Program development we have reached out to resources on campus which will be available to support and design the program. This list is not comprehensive; however, it reflects the ones which will likely be the most beneficial.

University Registrar

Office of Financial Aid

Dean of Libraries at Vanderbilt and the Eskin Biomedical Library

VUSM Educator Development Core

Center for Teaching

Center for Experiential Learning and Assessment

Vanderbilt Institute for Clinical and Translational Research (VICTR)

The following resources will be contacted as program development continues:

Center for Professional Health

Vanderbilt Biostatistics Clinics

Vanderbilt Institutional Review Board (IRB)

11. Evaluation of the program

The program will use a cycle of review and improvement for the curriculum similar to the VUSM.¹⁴ Over time, this process will enhance the quality of the program. A self-study will be conducted following the graduation of the second class as required by ACGC. Through this process the participants in the program including stakeholders, faculty, staff and students will assess the programs strengths and areas for improvement. The Program should then demonstrate how it will address these areas. As part of the application for Full Accreditation, ACGC sends a team of three professionals to do a site visit over 2 days. The visitors verify information in the application and gain clarification as directed by the ACGC.

12. Summary

Vanderbilt's strategic plans and demand for more genetic counselors in the workforce have aligned to provide the ideal opportunity to build a genetic counseling training program at Vanderbilt University School of Medicine. The VGCP would directly contribute to Vanderbilt's initiative to be a leader in genomic medicine and to serve as a hub for cutting-edge clinical research in genetics and genomic medicine. Furthermore, Vanderbilt's commitment to be a leader in genomics and personalized medicine requires more genetic counselors locally, and a Vanderbilt University graduate program of excellence would ensure high-quality, employees for our ever-expanding initiatives in this field and at this institution.

Vanderbilt's strategic plan speaks to the importance of collaboration across disciplines. Training genetic counselors necessitates an interprofessional approach in order to achieve the standards and core competencies set forth by the ACGC. The commitment from different stakeholders is evidence to this approach and these relationships.

The program has letters of support from multiple key departments and institute partners at VUMC. With the support of Vanderbilt, the VGCP will contribute to advancements in genetic counseling practice and research, and graduate future leaders who are prepared to provide exceptional genetic counseling services within the rapidly evolving field of genetics and genomic medicine.

¹⁴ <https://medschool.vanderbilt.edu/ume/quality-improvement>

APPENDICES

APPENDIX A. MGC DEVELOPMENT TIMELINE

APPENDIX B. PLANNING NOTICE OF INTENT SIGNED COVER SHEETS

APPENDIX C. LETTERS OF SUPPORT FROM STAKEHOLDERS

APPENDIX D. CURRICULUM TIMELINE COURSEWORK, CLINICAL PRACTICUM AND THESIS

APPENDIX E. VANDERBILT GENETIC COUNSELING PROGRAM FACULTY LIST AND BIOGRAPHIES

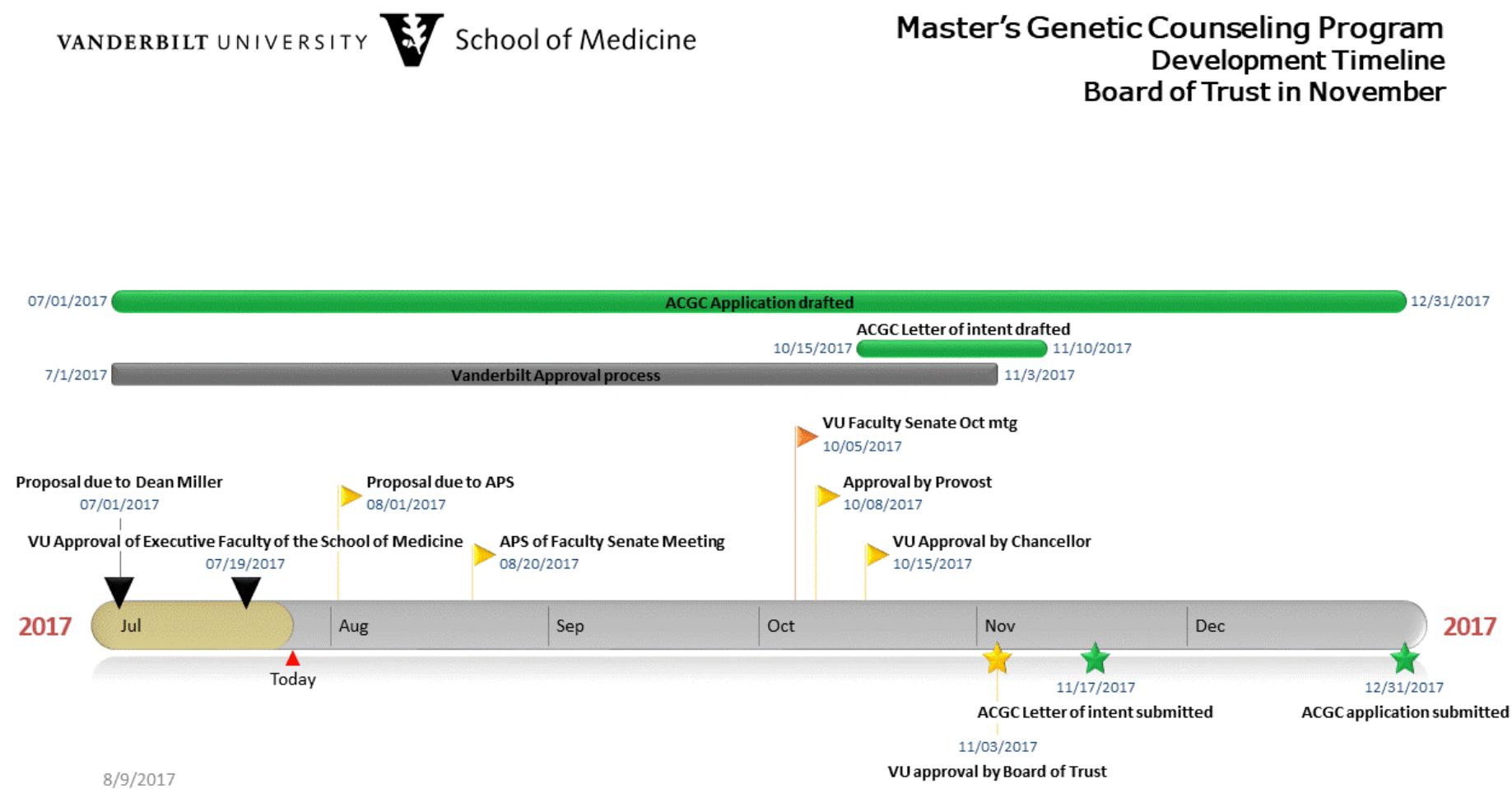
APPENDIX F. GENETIC COUNSELING PROGRAM LEADERSHIP

APPENDIX G. VGCP ADVISORY BOARD MANDATE AND STRUCTURE

APPENDIX H. FIVE YEAR BUDGET

APPENDIX I. TUITION – GENETIC COUNSELING PROGRAMS IN USA - 2017

APPENDIX A. MGC DEVELOPMENT TIMELINE



APPENDIX B. PLANNING NOTICE OF INTENT

Last revised: 11/17/2016

PLANNING NOTICE OF INTENT (PNOI) FOR NEW DEGREE PROGRAMS, NEW PROGRAM TRACKS IN DEGREES, or NEW CERTIFICATE PROGRAMS

Program Information

Academic Unit Name: Vanderbilt Genetic Counseling Program

College/School: School of Medicine

Proposed Degree, Track or Certificate Title: Master's Degree In Genetic Counseling

Proposed Start Date: Fall 2018 Total Credits: 60
(Semester and year)

Will courses offered in other VU schools/colleges be part of the proposed curriculum? Yes No

If Yes, do you have the approval of the Dean of the school/college? Yes No

Are additional financial resources required? Yes No

If Yes, what is the source of the funding? Tuition

Are additional faculty or staff required? Yes No

It is anticipated that existing personnel can teach in the program and serve as program/medical directors

If Yes, what additional positions are needed? _____

Projected Enrollment (FTE) in Year One: 5 Full Enrollment by Year: 2021-2022 ; 10-20
(#FTE) (Academic Year) ; (#FTE)

Mode of Delivery / Locations

Campus Delivery Off-site Clinical Rotations
(enter location(s))
 Distance Learning On-line learning (possible)
(enter formats) Other _____
(describe if applicable)

Scheduling

Day Classes Evening Classes
 Other (describe) Weekend Classes

Attendance Options

Full-time
 Part-time

Contact Information (Academic Department/Dean Representative)

Name: Donna Rosenstiel

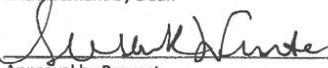
Title: Administrative Director, OSHE

Telephone: (615) 936 0918

Email: donna.rosenstiel@vanderbilt.edu

(see original PNOI cover sheet)

Endorsement by Dean



Date

11/30/15

Approval by Provost

COVER SHEET

**PLANNING NOTICE OF INTENT (PNOI) FOR
NEW DEGREE PROGRAMS NEW PROGRAM TRACKS IN DEGREES, or
NEW CERTIFICATE PROGRAMS**

Program Information

Academic Unit Name: Vanderbilt Genetic Counseling Program

College/School: School of Medicine

Proposed Degree, Track or
Certificate Title: Master's Degree in Genetic Counseling

Proposed Degree Option(s): If applicable n/a

Total Credits: 60

Proposed Start Date: Fall 2018
(Semester and year)

Projected Enrollment (FTE) in Year One: 5
(#FTE) Full Enrollment by Year: 2021-2022
(Academic Year) 10-20
(#FTE)

Mode of Delivery / Locations

Campus Delivery coursework/clinical rotations
(enter locations)

Off-site clinical rotations
(enter location(s))

Distance Learning on-line learning
(enter formats)

Other (describe if applicable)

Scheduling

Day Classes Evening Classes
 Other (describe) Weekend Classes

Attendance Options

Full-time
 Part-time

Contact Information (Academic Department/Dean Representative)

Name: Donna Rosenstiel, LCSW
Title: Administrative Director, Office of Health Science Education
Address: Light Hall 215
Telephone: 615-936-0918
Email: donna.rosenstiel@vanderbilt.edu

Endorsement by Dean

Date

8/31/14

APPENDIX C. LETTERS OF SUPPORT FROM STAKEHOLDERS

VANDERBILT UNIVERSITY



MEDICAL CENTER

May 24, 2017

Dr. Bonnie Miller
Senior Associate Dean for Health Sciences Ed
Executive Vice President Educational Affairs, VUMC
Medical School Office of the Dean
201 Light Hall, 0685

Ronald D. Alvarez, M.D., M.B.A.
Betty and Lonnie S. Burnett, Professor,
Chairman and Clinical Service Chief
Department of Obstetrics and Gynecology

Re: Genetic Counselors

Dear Dean Miller,

Thank you for the opportunity to be a stakeholder in the proposed Vanderbilt Genetic Counseling Program. Genetic Counselors are in demand locally, regionally and nationally, and Vanderbilt is perfectly positioned to train genetic counselors.

The Department of Obstetrics and Gynecology provides care to approximately 50,000 unique patients each year, and our department employs four genetic counselors who see over 1000 patients each year in our Division of Maternal-Fetal Medicine. Their contributions to the Department help us meet our clinical, research and educational goals. As we grow our mission to address women's health care issues across the lifecycle, we recognize the important role genetics plays in the delivery of evidence-based clinical care in multiple areas. Our gynecology program also works closely with the genetic counselors in the Cancer Center and the Division of Genetic Medicine. For example, our Fetal Center team collaborates with the genetic providers in Pediatrics who will be caring for the babies after delivery.

Recognizing the increasing role genetic counselors have in health care delivery and the limited number of graduates, we are excited about a graduate program of excellence in this field at Vanderbilt. As Vanderbilt is a leader in genetics and personalized medicine, it is natural that we have a training program.

Our Department stands with the other stakeholders at Vanderbilt who have pledged financial support of \$30,000 for the next two fiscal years as startup funds. In addition we are fully committed to our faculty being involved in multiple aspects of the program, including teaching, clinical supervision and research. The VGCP promotes the Vanderbilt vision to be a leading research university by contributing to the strategic initiatives of creating lifelong learners, investing in multi- and inter-disciplinary program, building distinctive program to address health care problems and transforming education models through technology. We look forward to working closely with the Vanderbilt Genetic Institute on this exciting venture.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ronald Alvarez'.

Ronald D. Alvarez, M.D., M.B.A.
Betty & Lonnie S. Burnett, Professor
Chairman & Clinical Service Chief
Department of Obstetrics & Gynecology

1161 21st Avenue South
R 1217 Medical Center North
Nashville, TN 37232-2521

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Proposal for New Degree Program for Master's Degree in Genetic Counseling



Gordon R. Bernard, M.D.
T-1208 MCN
Nashville, TN 37232-2650

May 25, 2017

Re: Vanderbilt Genetic Counseling Program

Dear Dean Miller,

Thank you for the opportunity to be a stakeholder in the proposed Vanderbilt Genetic Counseling Program. Genetic Counselors are in demand locally, regionally and nationally, and Vanderbilt is perfectly positioned to train genetic counselors.

As the Director of the Vanderbilt Institute for Clinical and Translational Research, I have been involved in the genetic test review process as part of their test utilization efforts. This project was spearheaded by a team including our genetic counselor, Laura Fairbrother. As the awareness and number of genetic testing options increases, we are anticipating increasing need of genetic counselors in the utilization setting. Since the program was initiated in January of 2016, there have been over 2000 reviews yielding a cost savings of approximately half a million dollars for the institution. Genetic counselor involvement has helped our institution order the right test for the right patient at the right time leading to cost-effective, appropriate genetic testing for our patient population.

Recognizing the increasing role genetic counselors have in health care delivery and the limited number of graduates, we are excited about a graduate program of excellence in this field at Vanderbilt. We expect to need additional genetic counselors as we expand the program. Having a Master's program at Vanderbilt would provide us with graduates who have the skills we need for lab utilization.

This program will benefit from the resources available through VICTR to complete research projects that impact the genetics and genomic community. In turn, there is tremendous potential for their projects to further the mission of VICTR and contribute to the CTSA initiatives.

Our Institute stands with the other stakeholders at Vanderbilt who have pledged financial support of \$30,000 for FY 18 and FY 19 as startup funds. In addition we are fully committed to our faculty being involved in multiple aspects of the program, including teaching, clinical supervision and research.

The VGCP promotes the Vanderbilt vision to be a leading research university by contributing to the strategic initiatives of creating lifelong learners, investing in multi- and inter-disciplinary programs, building distinctive programs to address health care problems and transforming education models through technology. We look forward to working closely with the Vanderbilt Genetic Institute on this exciting venture.

Sincerely,

A handwritten signature in black ink that reads "Gordon R. Bernard MD".

Gordon R. Bernard MD
Melinda Owen Bass Professor of Medicine
Executive Vice President for Research
Senior Associate Dean for Clinical Sciences
Director, Vanderbilt Institute for Clinical and Translational Research

Phone: 615-343-0077 / Fax: 615-343-4479

Proposal for New Degree Program for Master's Degree in Genetic Counseling

VANDERBILT UNIVERSITY



MEDICAL CENTER

June 20, 2017

Department of Medicine

Dear Dr. Miller and Dr. Balser:

Thank you for the opportunity to be a stakeholder in the proposed Vanderbilt Genetic Counseling Program (VGCP). Genetic Counselors are in demand locally, regionally and nationally, and Vanderbilt is perfectly positioned to train genetic counselors. Indeed, we see this as just the next initiative in our ongoing effort to provide training and education in next generation medical care, in which genetics is firmly embedded.

In the Department of Medicine, we have two Divisions whose missions are carried out in part by faculty members who are Genetic Counselors.

The Division of Cardiovascular Medicine employs a genetic counselor who sees over 200 patients each year in our Vanderbilt Heart & Vascular Institute. She is in high demand as the only Cardiovascular Genetic Counselor in the state. The genetic counselor's contributions to the Division help us meet our clinical, research and educational goals. As we grow our mission to address cardiovascular health care issues across the lifecycle, we recognize the important role genetics plays in the delivery of evidence-based clinical care.

The Division of Genetic Medicine has four genetic counselors, two nurse practitioners in Genetics and two physician geneticists. This Division sees ~1500 patients annually of which ~900 are seen by the genetic counselors. The Genetic Counselors are currently involved with learners from the medical students to graduate programs. In addition, they are growing the access of genetic services through another planned location in Cool Springs and through a telemedicine program.

Tennessee does not have a genetic counseling training program. There are only five genetic counseling training programs in the Southeast with the closest program 200 miles away from Nashville. A national taskforce concluded that there is a tremendous deficit of counselors nationally and internationally. Dr. Cox serves on this committee in her capacity as President of the American Society of Human Genetics. Our application for credentialing is particularly timely since this national workforce has encouraged more programs and wants to streamline the credentialing process for new programs.

Recognizing the increasing role genetic counselors have in health care delivery and the limited number of graduates, we are excited about a graduate program of excellence in this field at Vanderbilt. This will also help fill vacant positions at Vanderbilt as some of the experienced genetic counseling faculty has been recruited to industry and other academic medical centers.

For Vanderbilt to remain competitive, we will need more genetic counselors with a strong foundation in research and personalized medicine. The research Vanderbilt leads in precision medicine makes it a particularly good place to pioneer education and research in genetic

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Proposal for New Degree Program for Master's Degree in Genetic Counseling

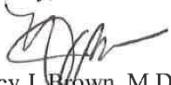
counseling. Although we plan to begin the Master's degree program first, the intent will be to expand the program to allow for a clinical research that leads to a PhD in genetic counseling.

The Master's degree program in genetic counseling will be an important start to a more ambitious agenda for educating other health professionals in genetics. There are at least three residencies/fellowships which have expressed interest in working with the VGI and VGCP to expand the physician training in genetics. In addition, we are discussing collaborations with the School of Nursing to build a sub-specialty program in genetics within the nurse practitioner program.

Our Department and the Vanderbilt Genetic Institute stand with the other stakeholders at Vanderbilt who have each pledged financial support of \$30,000 for FY18 and FY19 as startup funds. In addition, we are fully committed to our faculty being involved in multiple aspects of the program, including teaching, clinical supervision and research.

The VGCP promotes the Vanderbilt vision to be a leading research university by contributing to the strategic initiatives of creating lifelong learners, investing in multi- and inter-disciplinary programs, building distinctive programs to address health care problems and transforming education models through technology. We look forward to working closely with the Vanderbilt Genetic Institute on this exciting venture.

Sincerely,



Nancy J. Brown, M.D.
Hugh Jackson Morgan Professor
Medicine and Pharmacology
Chair, Department of Medicine
Physician-in-Chief



Nancy J. Cox, PhD
Professor of Medicine
Mary Phillips Edmonds Gray Chair
Director of Division of Genetic Medicine and Vanderbilt Genetic Institute

Proposal for New Degree Program for Master's Degree in Genetic Counseling



*Jennifer A. Pietenpol, Ph.D.
Executive Vice President for Research
Vanderbilt University Medical Center
Director, Vanderbilt-Ingram Cancer Center
B.F. Byrd Jr. Professor of Oncology
Professor of Biochemistry*

June 19, 2017

Jeffrey R. Balser, M.D., Ph.D.
Dean of Vanderbilt University School of Medicine
President and CEO, Vanderbilt University Medical Center

Bonnie Miller, M.D., M.M.H.C.
Senior Associate Dean for Health Sciences Education
Executive Vice President Educational Affairs
Vanderbilt University Medical Center

Dear Dean Miller and Dean Balser:

Thank you for the opportunity to be a stakeholder in the proposed Vanderbilt Genetic Counseling Program (VGCP). Genetic counselors are in demand locally, regionally and nationally, and Vanderbilt is well positioned to provide cutting-edge training to fulfill this critical and unmet need. In fact, the Vanderbilt-Ingram Cancer Center (VICC) see this as the next initiative in our ongoing effort to provide training and education in next generation medical care, in which genetics is firmly embedded.

As the only NCI-designated comprehensive cancer center in the state of Tennessee treating both adults and children, and one of 47 in the United States, VICC recognizes the critical importance of genetic counselors to our mission. Genetic counselors, working within the VICC Hereditary Cancer Program, are integral and essential members of this team. The VICC Hereditary Program, which consists of the genetic counselors, nurse practitioners and physician geneticists, see roughly 1500 patients annually of which around 900 are seen by the genetic counselors. In addition to providing care for patients, these counselors are currently involved with learners at all levels, from medical students to fellows. The services provided by the genetic counselors has become so essential that Vanderbilt University Medical Center (VUMC) and VICC are growing access to genetic services through an additional planned location in Cool Springs, TN and through a telemedicine program.

Currently, the state of Tennessee does not have a genetic counseling training program. There are only five genetic counseling training programs in the Southeast with the closest program roughly 200 miles away from Nashville. A national taskforce concluded that there is a tremendous deficit of counselors nationally and internationally. Nancy Cox, PhD, serves on this committee in her capacity as President of the American Society of Human Genetics. VUMC's application for credentialing is particularly timely since this national workforce has encouraged more programs and wants to streamline the credentialing process for new programs. Recognizing the increasing role genetic counselors have in health care delivery and the limited number of graduates, VICC is enthusiastic about a graduate program of excellence in this field at Vanderbilt. This will also help fill vacant positions at Vanderbilt as some of the experienced genetic counseling faculty have been recruited to industry and other academic medical centers.

For Vanderbilt to remain competitive, it will need more genetic counselors with a strong foundation in research and personalized medicine. The research Vanderbilt leads in precision medicine makes it a particularly suitable place to pioneer education and research in genetic

A Comprehensive Cancer Center Designated by the National Cancer Institute

2220 Pierce Avenue
691 Preston Research Building
Nashville, TN 37232-6838

tel 615.936.1512
fax 615.936.1790
www.vicc.org

Proposal for New Degree Program for Master's Degree in Genetic Counseling

counseling. Although VUMC plans to begin with the Master's degree program, the intent will be to expand the program to allow for a clinical research track that leads to a PhD in genetic counseling. The Master's degree program in genetic counseling will be an important start to a more ambitious agenda for educating other health professionals in genetics, with at least three residencies/fellowships having expressed interest in working with the Vanderbilt Genetics Institute (VGI) and VGCP to expand physician training in genetics. In addition, potential collaborations with the School of Nursing to build a sub-specialty program in genetics within the nurse practitioner program will further increase the reach and genetics knowledge base in health care professionals.

On behalf of the VICC, I am pleased to contribute \$60,000 (\$30,000 for both Fiscal Years 2018 and 2019) to support the VGCP new Master's degree of Genetic Counseling. In addition, as the Director of the VICC, I am fully committed to supporting VICC members' involvement in multiple aspects of the program, including teaching, clinical supervision and research.

The VGCP promotes the Vanderbilt's vision to be a leading research university by contributing to the strategic initiatives of creating lifelong learners, investing in multi- and inter-disciplinary programs, building distinctive programs to address health care problems and transforming education models through technology. I look forward to working closely with the VGI towards advancing this exciting training program at Vanderbilt and look forward to its' many accomplishments and successes.

Sincerely,

A handwritten signature in blue ink that reads "Jennifer Pietenpol". The signature is fluid and cursive, with "Jennifer" on the top line and "Pietenpol" on the bottom line.

Jennifer Pietenpol, Ph.D.

Proposal for New Degree Program for Master's Degree in Genetic Counseling

Senior Vice President
for Personalized Medicine



June 14, 2017

Bonnie Miller, MD
Senior Associate Dean for Health Sciences Ed
Executive Vice President Educational Affairs, VUMC
Medical School Office of the Dean
201 Light Hall
Nashville, TN 37232-0685

Dear Dean Miller,

Thank you for the opportunity to be a stakeholder in the proposed Vanderbilt Genetic Counseling Program (VGCP). As we think about how to develop and deploy an increasingly personalized and genomic focus to care, Genetic Counsellors are becoming an indispensable part of our teams. The demand for these services are growing rapidly locally, regionally and nationally. Given our commitment to Personalized Medicine, a robust training program at Vanderbilt is well-aligned with other institutional commitments and therefore extremely timely.

I see the need for and the value of genetic counsellors not only from my VUMC leadership role in Personalized Medicine broadly, but also with my work in the Genetic Arrhythmia Clinic and as a principal investigator for the Electronic Medical Records and Genomics (eMERGE) Network project, where we are beginning to return pathogenic variant information in key disease genes (e.g. cancer and cardiovascular disease susceptibility genes) to patients and providers. Andrea Murad, our genetic counselor in the Vanderbilt Heart & Vascular Institute, has been an extraordinarily valuable addition to our team, consulting with families about genetic testing. She has also been a contributor to the eMERGE project by reviewing return of results protocols for research participants. Her contributions are helping us meet our clinical, research and educational goals, and it is clear to me (and the national genomic medicine community) that the demand for such individuals is rapidly growing. Recognizing the increasing role genetic counselors have in health care delivery and the limited number of graduates, I am excited about a graduate program of excellence in this field at Vanderbilt.

The Personalized Medicine initiative at VUMC stands with the other stakeholders at Vanderbilt who have pledged financial support of \$30,000 for FY18 and FY19 as startup funds. In addition we are fully committed to our faculty being involved in multiple aspects of the program, including teaching, clinical supervision and research.

The VGCP promotes the Vanderbilt vision to be a leading research university by contributing to the strategic initiatives of creating lifelong learners, investing in multi- and inter-disciplinary programs, building distinctive programs to address health care problems and transforming education models through technology. We look forward to working closely with the Vanderbilt Genetic Institute on this exciting venture.

Sincerely,

A handwritten signature in black ink that reads "Dan Roden".

Dan M. Roden, M.D.
Professor of Medicine, Pharmacology, and Biomedical Informatics
William Stokes Professor of Experimental Therapeutics
Vanderbilt University School of Medicine

Senior Vice President for Personalized Medicine
Vanderbilt University Medical Center

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dan.roden@vanderbilt.edu

Proposal for New Degree Program for Master's Degree in Genetic Counseling



Steven A. Webber, M.B.Ch.B., MRCP
James C. Overall Professor and Chair, Department of Pediatrics
Vanderbilt University School of Medicine
Pediatrician-in-Chief, Monroe Carell Jr. Children's Hospital at Vanderbilt

June 22, 2017

Jeffrey R. Balser, MD, PhD
Dean of Vanderbilt University School of Medicine
President and CEO, Vanderbilt University Medical Center

Bonnie Miller, MD, MMHC
Senior Associate Dean for Health Sciences Education
Executive Vice President for Educational Affairs
Vanderbilt University Medical Center

Dear Dean Balser and Dean Miller:

It is my privilege to offer my enthusiastic and strong support as a key stakeholder in the proposed Vanderbilt Genetic Counseling Program.

The Department of Pediatrics and Monroe Carell Jr. Children's Hospital at Vanderbilt offers medical care to patients of all ages who have genetic and metabolic disorders, and genetic counselors offer critical contributions to this important clinical service line. In addition, genetic counselors have an increasingly important role in health-care delivery throughout the health care system. They are in demand locally, regionally and nationally, and Vanderbilt is perfectly positioned to train the future generation of genetic counselors given its unique position and resources.

There is no doubt that our institution would benefit greatly from a graduate program in Genetic Counseling. This program would have the added benefit of supporting the education and training of our students, resident physicians and subspecialty fellows who currently do not get enough exposure to genetics.

Our Department will provide monetary support for this program with startup funds of \$30,000 for FY18 and FY19. The FY18 allocation has already been transferred, so the next transfer will be early in FY19. Furthermore, our faculty will commit time and effort towards clinical teaching and supervision of the genetic counseling students.

We look forward to working closely with the Vanderbilt Genetic Institute on this exciting venture.

Sincerely,

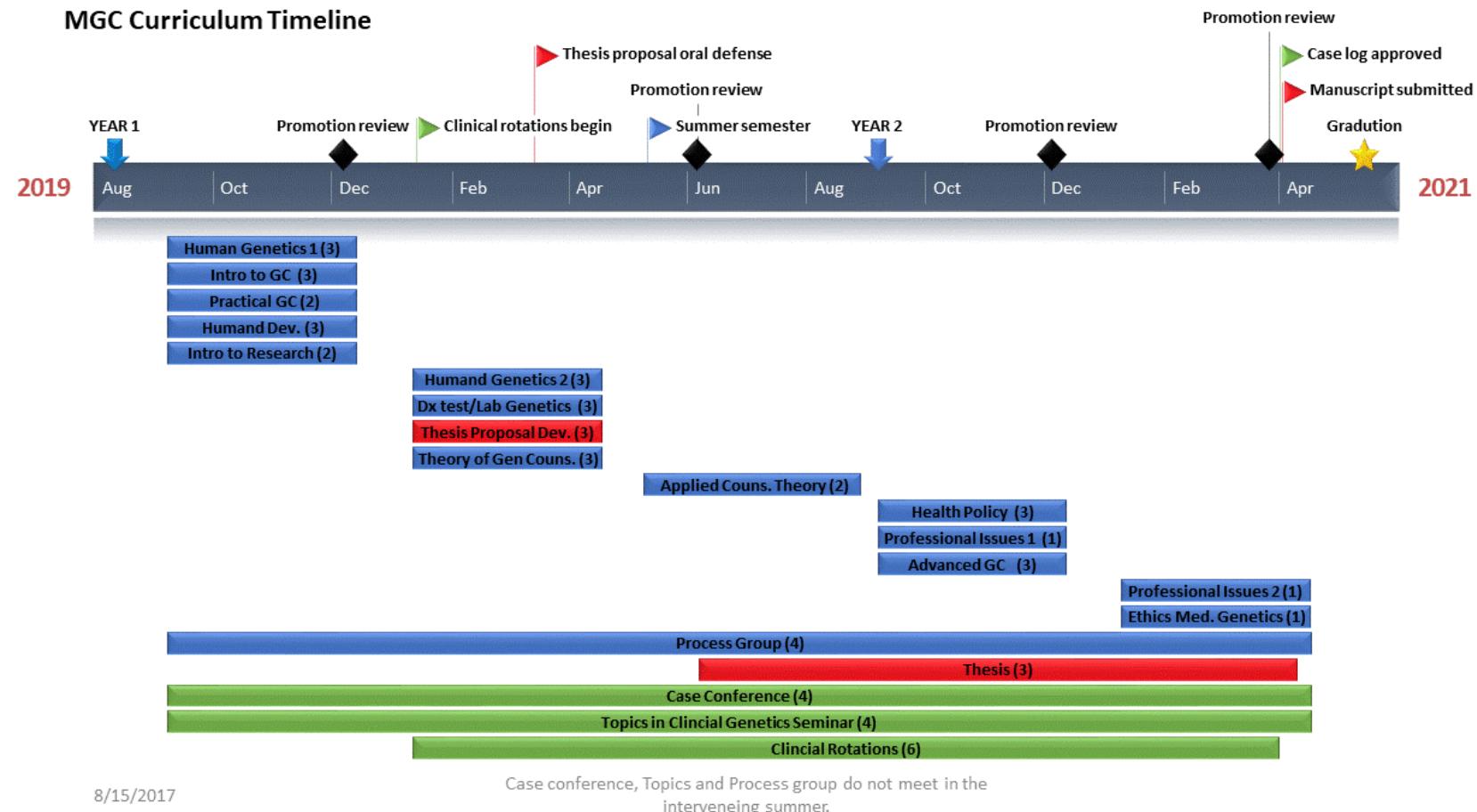
A handwritten signature of Steven A. Webber.

Steven A. Webber, M.B.Ch.B., MRCP
James C. Overall Professor and Chair, Department of Pediatrics
Vanderbilt University School of Medicine
Pediatrician-in-Chief, Monroe Carell Jr. Children's Hospital at Vanderbilt



Monroe Carell Jr. Children's Hospital at Vanderbilt
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steve.a.webber@vanderbilt.edu

APPENDIX D. CURRICULUM TIMELINE COURSEWORK, CLINICAL PRACTICUM AND THESIS



MGC REQUIRED COURSES

Year 1 Fall semester

Human Genetics 1

3 credits

This course will provide a framework for the study of human genetics and genomics with clinical examples to illustrate the application of the main principles. Topics will include: gene structure and function, genetic diversity, chromosomal disorders, single gene inheritance, population genetics, molecular cellular and biochemical basis of genetic disease, complex and multifactorial inheritance. Genetic analysis techniques will be introduced.

Introduction to Genetic Counseling

3 credits

This course will be taught in two modules. Module 1 will cover the history and definitions of genetic counseling. These topics will be explored in the context of practice goals, objectives, and outcomes, as well as practice standards and the NSGC code of ethics. Genetic counseling values will be explored as they relate to roles and responsibilities toward clients. Ethical, legal and policy issues specific to genetic counseling will be introduced. Module 2 will introduce philosophies and theories of genetic counseling and their application to practice. We will draw on the Reciprocal Engagement Model of genetic counseling to discuss the therapeutic alliance, contracting, basic empathic interviewing and client assessment. The class format will include case discussion, verbal critiquing of primary literature, role-playing, and semi-formal debates.

Practical Genetic Counseling

2 credits

This course is intended to equip students with essential genetic counseling skills needed to enter their clinical rotations, including medical history review, pedigree construction, and review of the major genetic counseling subspecialties (prenatal, pediatrics, metabolic, cardiac, neurology and cancer) and common patient indications for each. The class format will be very hands on, using standardized patients to practice medical interviewing techniques, role-play and flipped classroom strategies.

Human Development

3 credits

This course is intended to familiarize the students with human developmental biology and embryology, and the use of this knowledge to understand common human malformations and genetic syndromes. The course will include lectures on human reproduction and pre- and postnatal development, taking a systems-based approach (e.g., central nervous system, cardiovascular, limb, urogenital, gut/respiratory, and craniofacial).

Introduction to Research

2 credits

This course will introduce students to research, focusing mainly on genetic counseling research and critical reading of the evidence-base to inform genetic counseling practice. Topics will include quantitative research vs. qualitative research, basic principles of study design, common data sources, research ethics and Institutional Review Boards. This course will be heavily discussion-based, and is intended to provide students an early foundation upon which to start building topic ideas for the master's thesis.

MGC REQUIRED COURSES

Year 1 Spring semester

Human Genetics 2 **3 credits**

This second course in human genetics will take the principles from HG1 and build on them by using different genetic sub-specialties including: Epigenetics, Personalized Genomic Medicine, Psychiatric genetics, Pharmacogenetics, Biochemical genetics, Cancer genetics, Neurogenetics. For example, inherited cancer syndromes will be discussed as well as how to provide a risk assessment, discussion of medical management options, genetic testing for inherited cancer syndromes and how to run risk models. Course will emphasize risk assessment for genetic disease (pedigree analysis, Bayes, Hardy-Weinberg) and susceptibility. Use of large genetic datasets in precision medicine will be introduced.

Diagnostic Testing and Lab Genetics **3 credits**

Exposure to the clinical laboratory including ordering, lab utilization management, techniques, and reporting in the areas of molecular genetics, cytogenetics, biochemical genetics, genomics, personalized medicine, pharmacogenetics, genetic tumor screening will be provided. There will be extensive review of gene variant analysis and reporting for clinical relevancy.

Thesis Proposal Development **3 credits**

This course will be the forum for the student to develop a research question, practice literature search techniques and develop a thesis proposal. Thesis proposals will then be presented at the end of the class to thesis committee. Through this course students will have an introduction to epidemiology. Statistics needed for thesis will be reviewed including [Univariate (descriptive statistics); Bivariate (correlations, associations); Multivariate (Linear/logistic regression)].

Theories of Genetic Counseling and Human Experience **3 credits**

Applying counseling and educational theories to facilitating adaptation to disease will be discussed including the following theories of Self-Psychology, Self in Relation, Family Systems, Stress and Coping, Health Behavior and Human Motivation. Counseling approaches grounded in these theoretical frameworks will be practiced.

Early Summer (between 1st and 2nd year)

Applied Genetic Counseling Theory **2 credits**

This course augments clinical rotations during the summer in between the two years of the Master's degree program. Identification of psychosocial issues in cases from clinical rotations and application of counseling approaches to address issues will be discussed and practiced. Students will also build on their clinical skills of how to approach and work-up genetic counseling cases.

MGC REQUIRED COURSES

Year 2 Fall semester

Health Policy (HP) 3 credits

This introductory course will focus on demonstrating the use of epidemiology and population-based screening to create health policy. Exploration of how genetic counselors can use their clinical and research skills to critically review and impact health policy will be covered especially as it relates to healthcare delivery and access, and patient and provider education. The importance of metrics will be emphasized and use of community, regional, and national health resources. This course will review health policy and legislation which relate to medical genetics as well as influential legal cases. Small group projects will be assigned.

Professional Issues I 1 credits

This course will focus on professional development for genetic counselors. Literature demonstrating the importance of self-care to be healthy as a professional and a person will be discussed. Topics related to practice as a genetic counselor will be addressed, including ABGC certification, licensure, resume writing, job searching and job negotiation techniques, financial and reimbursement issues, and expanding roles for genetic counselors.

Advanced Genetic Counseling 3 credits

This skills-based class will utilize standardized patients, role play, and discussion to practice advanced genetic counseling techniques. This course will encourage exploration of techniques grounded in counseling theory to gain confidence in the counseling process, including dynamics of grief and bereavement, crisis intervention, and multicultural sensitivity. Students will develop a sophisticated understanding of content and process and will be able to formulate a comprehensive biopsychosocial assessment and counseling approach.

Year 2 Spring semester

Professional Issues 2 1 credit

This course will explore in more depth the role of the health professional in education, research, and leadership. Students will conduct a needs assessment and develop, implement, and evaluate an educational tool or course. Further exploration of research teams and roles will be discussed and observed. Clinical supervision skills and leadership skills will be practiced.

Ethics Medical Genetics 1 credit

Ethical principles will be explored in depth as they relate to medical genetics. Historical and current student cases will be used to illustrate, explore, discuss, and analyze ethical dilemmas. Topics will include: informed consent; right to referral; full disclosure; protection of confidentiality; and respect for children, adolescents, pregnant women, individuals with disabilities, and the elderly in the context of genetic testing.

MGC REQUIRED COURSES

Course 1st and 2nd years both enroll each Fall and Spring semester

Topics in Clinical Genetic/Journal Club (Topics) 1 credit

1st and 2nd years both enroll each Fall and Spring semester

Students, faculty, and guests participate in the presentation of and critical review of current topics and interests in the field of human genetics and genetic counseling. Students will develop skills in critical evaluation of medical literature, assessment of emerging interests and topics, and presentation of original research.

Case conference 1 credit

1st and 2nd years both enroll each Fall and Spring semester

Through case presentation, group discussion, and role-playing with first year VGCP students and faculty, 2nd year students evaluate their role and improve his/her skills in the genetic counseling process. The medical, psychosocial, and ethical issues encountered in concurrent clinical rotations will be thoroughly explored. Students will use relevant literature to illustrate evidence-based care and new and emerging areas in clinical genetics.

Clinical Reflection and Self-Awareness 1 credit

1st and 2nd years will meet by class in Fall and Spring semester

The structure of peer group supervision will be modeled during the four semesters. The groups will meet as first or second year students. The group sessions will be led by a counseling professional who is not otherwise involved in the program. Sessions will be confidential and attendance will be the only requirement for this pass/fail class. First year meetings will be more heavily lead by moderator. Transition to more peer-directed conversations will be encouraged as students advance through the program.

**APPENDIX E. VANDERBILT GENETIC COUNSELING PROGRAM
FACULTY LIST AND BIOGRAPHIES**

Department of Medicine

Division of Genetic Medicine

Laurie Connors, DNP APNG FNP-BC
AGN-BC

Nancy J. Cox, PhD

Lea K. Davis, PhD

Heather Herrmann, MS LCGC

Kate McReynolds, APRN, MSc, MSN,
ANP-BC, AGN-BC

Tuya Pal, MD

Smita Rao, MS LCGC

Douglas Ruderfer, PhD

Kelly Taylor, MS, LCGC

Georgia Wiesner, MD

Division of Cardiovascular Medicine

Andrea Murad, MS, LCGC

Division of Clinical Pharmacology

Dan Roden, MD

Division of Dermatology

Shirley B. Russell, PhD

Division of Epidemiology

Todd Edwards, PhD

**Department of Molecular Physiology and
Biophysics**

David Samuels, PhD

Department of Obstetrics and Gynecology

Division of Maternal Fetal Medicine

Martha Dudek, MS LCGC

Caitlin Grabarits, MGC LCGC

Randa Newman, MS LCGC

Jill Slamon, MA MS LCGC

Digna Velez Edwards, PhD, MS

Department of Pathology

Cindy Vnencak-Jones, PhD

Ferrin Courtney Wheeler, PhD FACMG
Ashwini Yenamandra, PhD FACMG MS

Department of Pediatrics

Division of Medical Genetics and Genomics

Jennifer Ann Brault, MS MS MD FACMG

Elly Brokamp, MS, LCGC

Anna Childers, MS, CGC

Joy Cogan, PhD

Jessica Duis, MD, MS

Laura Fairbrother, MS, LCGC

Rizwan Hamid, MD PhD FAAP FACMG

Vickie Hannig, MS LCGC

Natalie Nicole Owen, MSN RN CPNP

Jean Pfotenhauer, MS LCGC

John A. Phillips III, MD

Tyler Reimschisel, MD MHPE

Faculty Biographies

JENNIFER BRAULT, MS, MS, MD, FACMG Assistant Professor of Pediatrics, Division of Child Neurology and Division of Medical Genetics and Genomic Medicine. Board certified in Clinical Genetics and Neurology with Special Qualifications in Child Neurology. Clinical interests include: Neuro-genetics, neurofibromatosis, and general child neurology. Dr. Brault has been involved in the neurology and genetic education of medical students, genetic counselors (students and counselors), other graduate students, and residents and fellows through lectures, small group studies and clinical rotations.

ELLY BROKAMP, MS, LCGC Pediatric and Research Genetic Counselor. Clinical focus includes general pediatric and adult genetics along with pediatric neurogenetics. Elly is also lead genetic counselor at Vanderbilt for The Undiagnosed Diseases Network, which is a national research study funded by the NIH to solve the most challenging medical mysteries through team science. She volunteers as a member of the Outreach Committee for the Tennessee Genetic Counselor Association. Elly is also serving as the primary pediatric supervisor for genetic counseling students doing clinical rotations at Vanderbilt.

ANNA CHILDERS, MS, CGC Genetic Counselor in the Division of Medical Genetics and Genomic Medicine in the Department of Pediatrics. Ms. Childers is a recent graduate of the University of South Carolina. She has completed research involving adoptees' use of direct-to-consumer genetic testing, and she will be involved in helping to develop a genetic counseling curriculum for Vanderbilt. While at USC, Ms. Childers completed volunteer work with Family Connection, an organization that provides assistance to youth and families with special healthcare needs.

JOY COGAN, PHD Director of the Undiagnosed Disease Network Central Biorepository and Research Professor in the Division of Medical Genetics and Genomic Medicine Department of Pediatrics. Dr. Cogan research focuses on the molecular basis of heritable disease with particular emphasis on pulmonary arterial hypertension and pulmonary fibrosis. Presently she is using next-generation sequencing (NGS), exomic and genomic, in families with pulmonary disease and undiagnosed disease to identify previously unknown disease causing genes. Dr. Cogan gives an annual NGS lecture on rare variants and genomics to the MSCI students and provides individual instruction to faculty and students.

LAURIE CONNORS, DNP, APNG, FNP-BC, AGN-BC Assistant Professor, Vanderbilt University School of Nursing. She brings nearly twenty years of experience in oncology and genetics as a family nurse practitioner. Dr. Connors has maintained certification by the American Nursing Credentialing Center (ANCC) as a Family Nurse Practitioner since 1998. She is also credentialed as an Advanced Practice Nurse in Genetics, issued by the Genetic Nursing Credentialing Commission, and served on the ANCC's Content Expert Panel for development of the Advanced Genetic Nurse certification. In 2012, Connors earned a Doctorate of Nursing Practice degree with a project focusing on patient decision making after genetic testing for hereditary breast and ovarian cancer. Her research interests include the interpretation, delivery, and application of genetic/genomic data to clinical care and quality care of cancer survivors. Dr. Connors completed genetic training at the National Institute of Health in 2015 having been granted

a National Institute of Nursing Research intramural research training award. She is a member of the American Society of Clinical Oncology, International Society of Nurses in Genetics, the Oncology Nursing Society, and the Nurse Practitioner Association of New York State. Dr. Connors is also an adjunct Assistant Professor in the University at Buffalo, Jacobs School of Medicine and Biomedical Sciences, Department of Biomedical Informatics.

NANCY J. COX, PHD Founding director of the Vanderbilt Genetics Institute and director of the Division of Genetic Medicine in the Department of Medicine. Throughout her career as a quantitative geneticist, Dr. Cox has sought to identify and characterize the genetic component to common human diseases and clinical phenotypes like pharmacogenomics traits. Her work has advanced methods for analyzing genetic and genomic data from a wide range of complex traits and diseases. Currently, she is generating content for the Accelerating Medicine Partnership between the NIH, USFDA, biopharmaceutical companies and non-profit organizations to identify and validate promising biological targets, increase the number of new diagnostics and therapies for patients, and reduce the cost and time to develop them. Dr. Cox is the author or co-author of more than 300 peer-reviewed scientific articles and the current president of the American Society of Human Genetics.

LEA DAVIS, PHD Assistant Professor of Genetic Medicine and Psychiatry and Behavioral Sciences. Dr. Davis' work takes a population level approach to understanding the genetic basis of a wide range of complex phenotypes. Her research aims to discover how polygenic risk, rare variant risk, and environment interact to result in common neuropsychiatric phenotypes such as autism spectrum disorders, obsessive-compulsive disorder, and Tourette Syndrome. To accomplish this goal, she applies a variety of approaches including genome-wide association studies (GWAS), polygenic analyses, and bioinformatic analysis to large data sets. In addition to these research areas, Dr. Davis has a long-standing interest in research ethics, genomic privacy, and data sharing.

MARTHA DUDEK, MS, LCGC Interim Director of Vanderbilt Genetic Counseling Program, Director of Obstetrical Genetic Counseling and Senior Associate in the Division of Maternal-Fetal Medicine of the Department of Obstetrics and Gynecology. Clinical focus is reproductive genetic counseling with special interest in fetal anomalies and telemedicine. Ms. Dudek is involved medical genetics education for learners at all levels and has mentored genetic counseling graduate students with their thesis projects and clinical rotations. Research interest include patient information needs, perinatal palliative care and genetic counseling service delivery. She has served as a site visitor for the ABGC and has volunteered for Tennessee Genetic Counselor Association as well as NSGC serving on Membership, Practice Guideline, Genetic Access and Service Delivery Committees.

JESSICA DUIS, MD, MS Assistant Professor in the Division of Medical Genetics and Genomic Medicine in the Department of Pediatrics at Vanderbilt University Medical Center. She recently came to Vanderbilt from the Johns Hopkins Hospital in Baltimore, Maryland. She completed her training in pediatrics as well as in genetics during which time she saw adults and children with genetic disorders. She focused her work on imprinting disorders and in particular, Prader-Willi and Angelman syndromes. Dr. Duis dedicated her research to the field of epigenetics, which

studies changes in gene expression without detectable changes in the sequence of the gene. Specifically, she has focused on the hyperphagia and the sleep abnormalities that occur in individuals with PWS. She has developed a multidisciplinary team at Vanderbilt to focus on the comprehensive and evidenced-based care of persons with Prader-Willi syndrome.

TODD EDWARDS, PHD Trained genetic epidemiologist and statistician, and also has experience developing novel statistical methods for genetic association and next-generation resequencing studies. His research program is focused on the genetics of trait disparities. He has published extensively in these areas including studies of the genetic and epidemiologic determinants of blood pressure, body mass index, keloids, uterine fibroids, diabetes, and colorectal cancer in African and European ancestry populations, with a focus on utilizing the BioVU electronic health records database and DNA biobank. He is familiar with best practices and methods for conducting association studies in diverse populations with medical records resources, and is the Vice-Chair of the BioVU biospecimen and data use committee.

Dr. Edwards is also involved in leadership of the Vanderbilt Genetics Institute as the Associate Director, and is involved in education leadership as the Associate Director of Graduate Studies for the Epidemiology PhD Program. He directs a course, EPID 8333: Analytic techniques in Genetic Epidemiology, and is a member of the curriculum committee for the Human Genetics PhD Program. In addition, he has trained a PhD student and two postdocs here, and is on the mentor committee for several active K awards and Dissertations.

LAURA FAIRBROTHER, MS, LCGC Assistant in Pediatrics, Division of Genetics and Genomic Medicine, is primarily housed in the Department of Pediatrics as a clinical pediatric genetic counselor. She works in a general genetics clinic, genetic counseling clinic, and neurogenetics clinic evaluating children and adults with or at-risk for genetic conditions. In addition to her clinical role, she serves as the coordinator for rotating learners in the division and as the lead genetic counselor for the Genetic Test Utilization Team, reviewing all send-out genetic tests for the institution. She also works with the Undiagnosed Disease Network (UDN) consenting families, analyzing data, and counseling applicants. Laura has served two years leading the Tennessee Genetic Counselor Association (TGCA) Educational conference committee and heads the TGCA Outreach committee. She also volunteers her time working with individuals with chronic medical conditions in the community through Make-A-Wish and TRIAD and is a member of the Junior League of Nashville.

CAITLIN GRABARITS, MGC, LCGC Associate in Obstetrics and Gynecology, Division of Maternal Fetal Medicine, has a primary clinical focus in reproductive genetic counseling with a special interest in fetal anomalies and assisted reproductive technologies. She works in the MFM outpatient clinics, the Fetal Center at Vanderbilt Children's Hospital, and the Tennessee Fertility Institute. Caitlin is involved in medical genetics education with students and learners at all levels, including multiple genetic counseling interns throughout the year. Her research interests include patient information needs, direct student supervision in genetic counseling, and genetic counseling outcomes. In addition to this, Caitlin is currently serving a term as the Middle TN representative on the Executive Committee of the Tennessee Genetic Counselors Association (TGCA) and has previously served on the TGCA Educational Conference committee. She also volunteers with the

NSGC serving on the Membership and Abstract Workgroup committees, as well as within multiple special interest groups.

RIZWAN HAMID, MD, PHD, FAAP, FACMG Pediatric geneticist and a long-term member of the Vanderbilt Pulmonary Circulation Research Program, a combined laboratory and patient oriented translational research program that studies pulmonary hypertension (PH). The research focus of our laboratory is to understand the person-to-person variation in complex human disease. Why for example a gene mutation causes disease in one individual and not in another or why there are differences in disease severity amongst individuals. He models these intriguing questions in two human diseases, hereditary pulmonary arterial hypertension (HPAH) and acute myelogenous leukemia (AML). Their studies have shown that these apparently different diseases have a common cellular thread in that they both involve dysregulation of the TGFβ/BMP pathway in hematopoietic stem cells (HSC). Our work further shows that at a molecular level, disease severity/risk is due to differences in alternative splicing.

He is also a Co-PI of the Vanderbilt Undiagnosed Disease Network site (UDN). As a PI he is involved in evaluating patients and supervising all aspects of data analyses, including next-generation genomic data. As a PI he is involved in evaluating patients and supervising all aspects of data analyses, including next-generation genomic data. Most patients in UDN do get genomic sequencing and proper Genetic Variant Classification is a common issue with many of the UDN patients as well. They have devised data analysis pipelines to help them with this common problem with next generation genomic data.

VICKIE HANNIG MS, LCGC Lead genetic counselor in the Division of Genetics and Genomic Medicine in the Department of Pediatrics. Clinical focus is pediatric and general genetic counseling with special interest in predictive testing for Huntington disease and other adult onset neurological conditions. Ms. Hannig has been involved in medical genetics education for a variety of learners in clinic and via didactic teaching. She has mentored several genetic counseling graduate students during clinical internships. Research interests include improving access to genetic counseling, expansion of the role of genetic counselors and participation in the Undiagnosed Disease Network research study. She has served as a regional representative for the NSGC, participated on several NSGC committees, served on the Southeastern Regional Genetics Group Board of Directors and volunteered as a site visitor for ABGC.

HEATHER HERRMANN, MS, LCGC Assistant in Medicine, Division of Genetic Medicine, Clinical and Translational Hereditary Cancer Program. Her clinical focus is hereditary cancer genetic counseling and hereditary cancer risk assessment with special interest in hereditary breast cancer and high risk breast care. Ms. Herrmann is involved medical genetics education for learners at all levels and has mentored genetic counselors and students at various levels. Her interest includes genetic counseling service delivery and expanded access to hereditary cancer risk assessment and genetic counseling services. She is a member of the National Society of Genetic Counselors and the Tennessee Society of Genetic Counselors.

KATE MCREYNOLDS, APRN, MSC, MSN, ANP-BC, AGN-BC Kate is an expert in clinical cancer genetics. After completing her MS in cancer genetics at London University; she went on to earn her master of science in nursing from Vanderbilt. She is board certified as an Adult Nurse

Practitioner and in Advanced Genetics Nursing from the American Nurses Credentialing Center (ANCC). She is the Vice Chair for the (ANCC) Content Expert Panel for Genetics Nursing Advanced Certification. Kate has worked in the hereditary cancer field for the past 15 years, and has been at Vanderbilt since 2004 in both clinical and research roles in genetics. In her current clinical role as Nurse Practitioner in the Vanderbilt Hereditary Cancer Clinic she does cancer risk assessment, genetic counseling and testing and manages 'high risk' patients. Kate has co-authored 24 peer reviewed genetics articles.

ANDREA MURAD, MS, LCGC Assistant in Medicine and Genetic Counselor in the Division of Cardiovascular Medicine of the Department of Medicine. Andrea's clinical focus is genetic counseling for inherited cardiovascular conditions with a special interest in variant interpretation and personalized medicine. Ms. Murad has provided education on inherited cardiovascular genetic conditions to learners of all levels and has mentored genetic counseling graduate students in their clinical rotations. Her research interests include the delivery of genetic testing results including returning secondary or incidental genetic test results, understanding the impact of genetics in inherited cardiovascular conditions, and the impact genetic counseling has on patient reported outcomes. She is currently a member of the Cardiovascular and Research Special Interest Groups of the National Society of Genetic Counselors (NSGC), was selected as an author for the Hypertrophic Cardiomyopathy Guideline Systematic Review group for the NSGC, and is an active member of the Tennessee Genetic Counselor's Association.

RANDA NEWMAN, MS, LCGC Assistant in the Division of Maternal Fetal Medicine in the Department of Obstetrics and Gynecology. Ms. Newman's clinical focus is reproductive genetic counseling with a special interest in prenatal diagnosis of fetal skeletal dysplasias. Ms. Newman has experience with pediatric and adult genetics including mitochondrial disorders, connective tissue disease, and hereditary cancer. She has experience in medical genetics education, including supervision of genetic counseling graduate students, residents, and fellows. Ms. Newman is involved in the LEND Genetics Workgroup and is a member of the National Society of Genetic Counselors.

NATALIE N. OWEN, MSN, RN, CPNP Pediatric Nurse Practitioner and Newborn Screening Coordinator in Division of Medical Genetics and Genomic Medicine and a Clinical Instructor at Vanderbilt University School of Nursing. Her clinical focus is newborn screening and diagnosis and treatment of disorders of metabolism. Her research interests include phenylketonuria, fatty acid oxidation disorders, and achondroplasia. She serves as a Clinical Instructor teaching in the Pediatric Nurse Practitioner program at the School of Nursing and educates students and residents who rotate in genetics.

TUYA PAL, MD Board-certified clinical geneticist who recently joined Vanderbilt University Medical Center/ Vanderbilt-Ingram Cancer Center as the Associate Director of Cancer Health Disparities. Her research is focused on identifying genetic risk factors that place individuals at a higher risk for cancer, as well as strategies to reduce this risk, including efforts focused in underserved populations. She launched the Inherited Cancer Registry (ICARE) initiative in 2010 (inheritedcancer.net), to which over 2000 participants (including 1000 BRCA carriers) have been recruited, making it amongst the largest inherited cancer registries in the country. She has also led

multiple studies focused on inherited breast cancer among young women across diverse and underserved populations. These studies encompass broader engagement and outreach efforts at both the patient and healthcare provider level, and have been transitioned to Vanderbilt for continued growth and expansion.

JEAN PFOTENHAUER, MS, LCGC Genetic Counselor at Vanderbilt University Medical Center, Associate in Pediatrics - Division of Medical Genetics and Genomic Medicine. Primary clinical focus is seeing pediatric and adult clients in genetic clinics, genetic counseling clinics, and in-house for a wide range of referrals. She provides medical genetic training for learners at all levels including genetic counseling interns. Current research focus is with the Undiagnosed Disease Network to identify new genetic disorders. Previously, she was involved with other research studies. She has experience with prenatal, metabolic, cardio, and cancer genetics. Her special interest is families with IEMs. She is a founding member of the TN PKU Foundation.

JOHN A. PHILLIPS, III, MD As a Clinical, Biochemical and Molecular Geneticist at Vanderbilt from 1984-2017, Dr. Phillips has diagnosed, treated and cared for many children and adults with many genetic diseases including congenital malformations, chromosomal, Mendelian, and metabolic disorders. His past research has focused on disorders that have heterogeneous causes, reduced penetrance and variable expression (Familial Growth Hormone Deficiency, Heritable Pulmonary Arterial Hypertension, and Familial Pulmonary Fibrosis (FPF). He is Co-I on Dr Blackwell's PO1HL092870 and leader of Project 2 entitled " "Genetic Basis of Pulmonary Fibrosis." In these studies they have identified multiple genes and rare variants that cause FPF using WES/WGS and functional assays. He is a Co-PI of the Vanderbilt Center for Undiagnosed Diseases that is a part of the NIH Undiagnosed Disease Network (UDN). To date they have made multiple diagnoses including a case of Riboflavin (B2) Transporter Deficiency that responded to high dose B2 and the third known case of NADK2 Deficiency. They analyze WES or WGS results using PhenoDB, SimulConsult; Baylor, Hudson Alpha, Omicia and Vanderbilt pipelines and GTEx, PrediXcan and Structural Biology analyses are reviewed in combination to prioritize candidate variants. Finally he has been a Co-Director and taught in the ACMG Genetics Review Course since 2007 and he has taught in the Short Course in Human and Mammalian Genetics and Genomics at the Jackson Lab for 40 years.

SMITA RAO, MS, LCGC Certified, licensed genetic counselor practicing since the last 15 years. She has worked in adult genetics clinics in University settings as well as on the Industry front as a Lab genetic counselor. Ms. Rao current clinical focus is cancer genetic counseling. She sees patients in the Hereditary Cancer Clinic at the Vanderbilt Ingram Cancer Center with varied cancer histories including breast/ovarian cancer syndromes, colon cancer syndromes and other rare genetic cancer syndromes. Her research interests focus on identifying counseling-related core competencies in cancer specific counseling. She is also involved with teaching in the medical genetic program and internationally placed genetic counseling programs.

TYLER REIMSCHISEL, MD, MHPE Associate Professor of Pediatrics and Neurology at Vanderbilt University Medical Center, serves as Vice Chair for Education in the Department of Pediatrics, Director of the Division of Developmental Medicine and the Center for Child Development, Director of the Vanderbilt Consortium LEND Program, and Associate Director of the Pediatric Residency Program. He is board-certified in Neurology with Special Qualifications

in Child Neurology, Clinical Biochemical Genetics, and Clinical Genetics. His primary clinical interests include the evaluation and management of children with inborn metabolic diseases and other genetic conditions that cause neurodevelopmental disabilities, such as global developmental delay, intellectual disability, autism, epilepsy, and cerebral palsy. He also teaches medical students, residents, and other health care professionals about genetics, metabolism, and neurology. His primary interests in the field of health professions education include working-learning health systems, interprofessional practice, team-based learning, problem-based learning, the quiet learner, and leadership skills.

DAN RODEN, MD Trained in Clinical Pharmacology and Cardiology, and has been a Vanderbilt faculty member since 1981. He is recognized internationally for his studies of the clinical, genetic, cellular, and molecular basis of arrhythmia susceptibility, and of variability in response to drug therapies more broadly. Dr. Roden has led Vanderbilt's efforts in pharmacogenomics discovery and implementation and Personalized Medicine since 2006. He is principal investigator for the Vanderbilt sites of the National Institutes of Health's Pharmacogenomics Research Network (PGRN) and the National Human Genome Research Institute's Electronic Medical Records and Genomics (eMERGE) Network. He directs the Vanderbilt DNA databank BioVU, a discovery resource that as of spring 2017 includes >240,000 samples linked to deidentified electronic medical records. He is a leader in Vanderbilt's PREDICT project that since 2010 has been preemptively embedded pharmacogenomic variant data in the electronic medical records of >14,000 Vanderbilt patients.

DOUGLAS RUDERFER, PHD Assistant Professor in the Division of Genetic Medicine in the Department of Medicine at Vanderbilt University Medical Center. He has secondary appointments in the Department of Biomedical Informatics and Psychiatry. His research focuses on developing and applying analytical tools to understand the genetic architecture of disease and treatment response in behavioral health and psychiatry. He is formally trained in computer science and genetics and has over 10 years of experience applying computational approaches to answering fundamental questions in genetics. He has significant experience analyzing many types of large-scale genetic datasets including copy number variation, genome-wide association studies (GWAS), family-based studies, sequencing studies and transcriptome studies.

SHIRLEY B. RUSSELL, PHD Assistant Professor in the Division of Dermatology, Department of Medicine and member of the Vanderbilt Genetics Institute. Dr. Russell has a Ph.D. in Medical Genetics from the University of Wisconsin and did postdoctoral training in somatic cell genetics at Harvard University. She taught Medical Genetics at Meharry Medical College for more than 30 years and also contributed to the human genetics teaching programs for Ph.D. and nurse practitioner trainees at Meharry. She currently contributes to the Human Genetics Course for Ph.D. students at Vanderbilt. The major research focus in her laboratory is the elucidation of the pathogenesis of keloids and the genetic basis of this connective tissue disorder and other fibroproliferative diseases that disproportionately occur in individuals of African ancestry.

DAVID SAMUELS, PHD Director of Graduate Studies for Human Genetics PhD program at VU, Associate Professor in Molecular Physiology and Biophysics. Research focus is on analysis

of electronic medical records, and on mitochondrial genetics. Dr. Samuels is in charge of graduate education in human genetics at Vanderbilt University.

JILL SLAMON, MA, MS, LCGC Associate in the Division of Maternal Fetal Medicine in the Department of Obstetrics and Gynecology. Ms. Slamon's clinical specialty is reproductive genetic counseling with particular interest in infertility and fetal anomalies. Ms. Slamon's research interests include patient education and informed consent, patient information needs and genetic counseling service delivery. Ms. Slamon had a previous career in public education and has extended this interest through clinical supervision roles and classroom instruction for various medical education training programs for physicians and genetic counselors. She is a member of the National Society of Genetic Counselors serving on the Abstract Workgroup and has additional memberships in the Prenatal Special Interest Group and the Assisted Reproductive Technology Interest Group.

KELLY TAYLOR, MS, LCGC. Associate in the Division of Genetic Medicine of the Department of Medicine. Ms. Taylor's clinical focus is cancer genetic counseling. Ms. Taylor is involved in teaching of graduate students, medical students and fellows. She was the course director for the VU Master of Science in Clinical Investigation Human Genetics, a course she developed, from 2006-2010. She lectures for the VU Human Genetics PhD Program and supervises genetic counseling students, medical students and fellows rotating through the Vanderbilt Hereditary Cancer Clinic. Kelly is active in the National Society of Genetic Counselors and is the past chair of the NSGC Research Subcommittee and Research Special Interest Group. She is particularly interested in ethical and legal issues in genetic research and clinical genetics and was a member of the working groups that drafted 3 NSGC position statements, including statements on DNA-sequence patenting, somatic cell nuclear transfer (SCNT) and stem cell research.

DIGNA R. VELEZ EDWARDS, PHD, MS Associate Professor in the Department of Obstetrics and Gynecology, Associate Director, Women's Health Research in the Institute of Medicine and Public Health, and a genetic epidemiologist as an Investigator at the Vanderbilt Genetics Institute. Dr. Velez Edwards received her PhD in Human Genetics (2008) and Masters in Applied Statistics at Vanderbilt University (2007) with subsequent postdoctoral training in human genetics at the University of Miami (2008-2009). She has established a research program focused on genetic and environment risk factors associated with women's health and reproductive outcomes. Since the start of her faculty appointment Dr. Velez Edwards has developed and coordinated a repository of biospecimens from participants in the Right from the Start pregnancy cohort to be used for genetic epidemiology studies examining reproductive health complications and risk for adverse pregnancy outcomes. She has several ongoing research projects utilizing this resource, as well as large clinical databases that link clinical information to DNA. These studies focus on understanding the racial and/or ethnic disparities in genetic risk for several complex diseases including preterm birth, miscarriage, uterine fibroids, and pelvic organ prolapse.

CINDY VNENCAK-JONES, PHD ABMGG certified Clinical Molecular Geneticist (1993) and the Medical Director of the Molecular Diagnostics (MD) lab at Vanderbilt University Medical Center. As such, Dr. Vnencak-Jones oversees all operations of this high complexity/ high volume CLIA laboratory. The MD lab is staffed by 10 medical technologists, receives >10,000 specimens annually and has an extensive test repertoire for DNA and RNA based testing for inherited and

acquired diseases utilizing a variety of methodologies and testing platforms. As an educator, Dr. Vnencak-Jones oversees the training of ABMGG-Clinical Molecular Genetics fellows and is a former board member of ABMGG where she served as chair of the accreditation committee for ABMGG fellowship training programs. As a researcher, Dr. Vnencak-Jones works closely with her clinical colleagues to utilize molecular tools to understand and diagnose human diseases with >100 publications describing these collaborative projects.

FERRIN COURTNEY WHEELER, PHD, FACMG Assistant Professor, Pathology, Microbiology and Immunology, Co-Medical Director of the Cytogenetics Laboratory and associate director of the Molecular Diagnostics Laboratory. She has board certification by the American Board of Medical Genetics and Genomics in both Clinical Cytogenetics and Clinical Molecular Genetics. Her clinical focus is in the analysis, interpretation and reporting of cytogenetics and molecular genetics results for both oncology and constitutional disorders, with a special interest in the interpretation of copy number variation in children with developmental delay and other neurocognitive disorders. She is involved in medical genetics education for undergraduate and medical students with interests in pathology and genetics, pathology residents, and fellows from multiple disciplines, as well as medical technologists.

GEORGIA WIESNER, MD Professor of Medicine at Vanderbilt University Medical Center and serves as the founding Director of the Clinical and Translational Hereditary Cancer Program in the Vanderbilt-Ingram Cancer Center. Established in 2012, this program is devoted to the care of patients and families with an increased risk for cancer. Dr. Wiesner is board-certified in both Internal Medicine and Medical Genetics and has spent the majority of her career in the fast evolving area of cancer genetics. She has also been involved in medical and genetics education, including past Medical Director for the Case Western Reserve University Genetic counseling Program, and Lead for “The Human Blueprint” block for Case Western Reserve Medical School.

ASHWINI YENAMANDRA, PHD, FACMG, MS Medical Director of Clinical Cytogenetics and Assistant Professor in the Department of Pathology, Microbiology and Immunology. Clinical focus is in the diagnostic area of genetics and genomics of Cancer and Constitutional study. Dr. Yenamandra is involved in the medical genetics education for learners at all levels and has mentored under graduate students in shadowing programs and mentored residents and fellows in their clinical rotations. She is a member of ACMG, ASHG, CGC and Children’s Oncology Group study. She also serves as a CAP inspector and CAP team Leader. Research interests include in depth analysis and publication of interesting genetic results.

APPENDIX F. GENETIC COUNSELING PROGRAM LEADERSHIP

Vanderbilt Genetic Counseling Program Leadership

July 1, 2017 – June 30, 2020

Nancy Cox, Ph.D.
Director, Vanderbilt Genetic Institute

Martha Dudek, M.S. L.C.G.C.
Interim Program Director

Tyler Reimschisel, M.D., MHPE
Medical Director

Rita Burchett
Program Manager

CURRICULUM DEVELOPMENT COMMITTEES		
Clinical Rotation Workgroup	Research Workgroup	Curriculum Leaders
Elly Brokamp, M.S., L.C.G.C. Heather Hermann, M.S., L.C.G.C. *Andrea Murad, M.S., L.C.G.C. Jean Pfotenhauer, M.S., L.C.G.C. Jill Slamon, M.A., M.S., L.C.G.C.	Vickie Hannig, M.S., L.C.G.C. Gillian Hooker, Ph.D., ScM, L.C.G.C. Smita Rao, M.S., L.C.G.C. *Kelly Taylor, M.S., L.C.G.C.	*Caitlin Grabarits, M.G.C., L.C.G.C. Heather Hermann, M.S., L.C.G.C. Andrea Murad, M.S., L.C.G.C. Kelly Taylor, M.S., L.C.G.C.
1st year workgroup		2nd year workgroup
Laura, Jill, Andrea, Heather*, Gillian, Jean		Caitlin,* Kelly, Vickie, Smita, Jill, Elly
Advisory Board		
Martha Dudek, M.S., L.C.G.C., Chair Tyler Reimschisel, M.D., MHPE Laura Fairbrother, M.S., C.G.C. Rizwan Hamid, M.D., Ph.D. Gillian Hooker, Ph.D., ScM, L.C.G.C. Melinda New, M.D. Tuya Pal, M.D. Tabby Perry, M.S., Former Student Dan Roden, M.D.C.M. Donna Rosenstiel, L.C.S.W. Samantha Smith, Advocate Georgia Wiesner, M.D., M.S. Dean Bonnie Miller, M.D., M.M.H.C., ex officio Nancy Cox, Ph.D., ex officio		
COMMITTEES STARTING WITH FIRST APPLICATIONS (September, 2018)		
Admissions committee	Promotions	Curriculum Evaluation
TBD	TBD	TBD

* group leaders

APPENDIX G. VGCP ADVISORY BOARD MANDATE AND STRUCTURE

MGC Advisory Board Mandate and Structure

MANDATE:

The Vanderbilt Genetic Counseling Program's (VGCP) Advisory Board (henceforth referred to as the Advisory Board) overarching responsibility will be to assist in the development and ongoing assessment of the graduate program. The board will be responsible for ensuring that the curriculum is in line with the Graduate Program's mission and with the ACGC accreditation standards for the genetic counseling profession.

Responsibilities will include, but not be limited to:

- Development and maintenance of an ability-based curriculum map that documents and assesses appropriate learning of ability-based outcomes and the curriculum sequence to develop critical thinking skills.
- Monitoring the assessment (outcomes) of learning objectives and competencies to be achieved in didactic, problem-based, and clinical/laboratory/advocacy placements.
- Establishment of objective measures and assessment tools for evaluating students, both academically and clinically.
- Development of an ongoing system utilizing internal and external validations to review and subsequently enhance the effectiveness of the curriculum.
- Involvement in strategic planning and future-visioning for the graduate program.
- Reviewing and providing recommendations regarding the program's mission, vision, and curricular objectives.
- Provide expertise and support as needed in areas of recruitment, marketing and fundraising.

MEMBERSHIP:

1. Composition:

- The board will be comprised of a minimum of 6 members, with a maximum of 16 members, and will be chaired by the Graduate Program Director. Members of the board will be appointed by the VGCP Program Director. The Program Director will seek names of potential Advisory Board Members from the current members VGCP Faculty and Stakeholders.
- Representation on the board must encompass experience in medical genetics, teaching, clinical supervision, and other related subjects. In addition, the overall expertise of the board should represent a cross-section of the genetic counseling profession, advocacy community, and the student/alumni population.
- Members must also have appropriate knowledge of the ABGC practice-based competencies, ACGC accreditation standards, as well as the missions of Vanderbilt University and Vanderbilt University Medical Center as well as the Program's stakeholders.

2. Term:

- The founding board will have terms of either 3 or 5 years.

Proposal for New Degree Program for Master's Degree in Genetic Counseling

- After the initial stagger of the founding board members, board members will have three (3) year terms.
- A term will begin on July 1st.
- A term will end on June 30th.
- After completion of a three year term, members are eligible for reappointment.
- Members cannot serve for more than three (3) consecutive terms; however, after a break the length of one term, they are eligible for reappointment.

RELATIONSHIP TO VANDERBILT UNIVERSITY

The Advisory Board is expected to offer recommendations to the VGCP leadership (Directors and Medical Director). The VGCP leadership will take the Advisory Board recommendations under advisement and use them in discussions with Program faculty and the Dean of Office of health Science Education when considering changes to the program curriculum. The final decision on whether recommendations will be implemented will be determined by the VGCP Program Leadership.

PROCEDURAL RULES

1. **Meetings:**

- The Advisory Board will meet formally two (2) times per year.
- Additional ad hoc meetings may be requested to address unforeseen programmatic issues that require advisory board input. Written notice of upcoming meetings will be sent to members at least thirty (30) days before a meeting.
- Meetings will be held by conference call or in-person depending on the issues being addressed.

2. **Minutes:**

- Minutes of each meeting will be retained by the Program.
- Minutes will be sent to Advisory Board members with the agenda for the upcoming meeting.

3. **Resignation:**

- Members who wish to tender their resignation prior to fulfillment of their term from the Advisory Board should do so in writing to the Program Director.
- The VGCP requests that members who wish to resign give a minimum of 2 weeks' notice.
- In the event that a member resigns from the Advisory Board prior to completing their term, the Program Director will appoint a new board member to fulfill the remainder of their term.

4. **Dismissal:**

- Members who are absent without reasonable cause from three successive meetings will be considered to have resigned their seat.
- In the event that a member is dismissed from the Advisory Board, the Program Director will appoint a new board member to fulfill the remainder of their term.

Approved 7/28/17

Proposal for New Degree Program for Master's Degree in Genetic Counseling

APPENDIX H. BUDGET

Vanderbilt Genetic Counseling Program								
	1/1/17-6/30/17	7/1/17-6/30/18	7/1/18-6/30/19	7/1/19-6/30/20	7/1/20-6/30/21	7/1/21-6/30/22	7/1/22-6/30/23	7/1/23-6/30/24
	Pre-Phase 1	Phase 1 Planning	Phase 2 Planning	Year 1	Year 2	Year 3	Year 4	Year 5
Salaries - Program Director/Associate Director	24,612	65,000	104,000	142,000	187,000	187,000	187,000	187,000
Salaries - Administration	6,250	12,500	25,000	25,000	25,000	50,000	50,000	50,000
Salaries - Instruction	-	-	-	100,000	100,000	100,000	100,000	100,000
Per student per course instruction	-	-	-	2,500	5,700	8,200	9,000	9,000
Salaries - Clinical Supervisors	-	-	-	-	5,000	8,000	10,000	10,000
Salaries - Medical Director	-	-	-	10,000	10,000	10,000	10,000	10,000
ACGC Annual Report	-	500	4,000	4,500	4,500	4,500	4,500	4,500
Per Student Costs	-	-	-	5,560	14,456	20,016	22,240	22,240
Student scholarships	-	-	-	7,500	7,500	7,500	7,500	7,500
Leadership Travel/Meetings	3,500	3,500	7,668	7,668	7,668	7,668	7,668	7,668
Membership Professional Fees	100	550	1,588	1,588	1,588	1,588	1,588	1,588
Recruitment/Interviews	-	-	2,000	2,000	2,000	2,000	2,000	2,000
Alumnae events	-	-	-	-	-	2,000	2,000	2,000
Professional Development Events (Advisory Board)	-	1,750	3,500	3,500	3,500	3,500	3,500	3,500
Computers/Support	1,200	2,800	2,000	2,000	1,500	1,500	1,500	1,500
Books/Electronic Subscriptions	-	-	1,213	1,213	1,213	1,213	1,213	1,213
Student IT Services (logbook software, exam software)	-	-	1,675	1,675	1,675	1,675	1,675	1,675
Total Budget	35,662	86,600	152,644	316,704	378,300	416,360	421,384	421,384
Number of Students	0	0	0	5	13	18	20	20
Program Income:								
Tuition	-	-	-	150,000	390,000	540,000	600,000	600,000
Tuition Recovery (90%)	-	-	-	135,000	351,000	486,000	540,000	540,000
Contributions In Kind:								
Genetic Medicine Administrative Support	7,450	15,300						
VGI Contribution (Cox)	24,612	30,000	30,000					
Dan Roden	-	30,000	30,000					
Gordon Bernard	-	30,000	30,000					
Jennifer Pietenpol	-	30,000	30,000					
Ronald Alvarez	-	30,000	30,000					
Nancy Brown	-	30,000	30,000					
Steve Webber	-	30,000	30,000					
Surplus Prior	-	(138,700)	(57,356)	181,704	14,352			
Income/Loss	\$ (3,600)	\$ -	\$ -	\$ -	\$ (12,948)	\$ 69,640	\$ 118,616	\$ 118,616

Vanderbilt Genetic Counseling Program

Expense Detail	Average Cost
Student Travel and Related Conference Expenses (per student)	445
Student Research (per student)	350
Student Events (per student)	128
Standardized Patients (per student)	189
Total	1,112
Annual Costs/Student	1,112

Proposal for New Degree Program for Master's Degree in Genetic Counseling

APPENDIX I. TUITION – GENETIC COUNSELING PROGRAMS IN USA - 2017

Program Name	State			Tuition					Total Hours	Term		
		Accreditation			Resident		Non-Resident					
		Full	New	Year	Year 1	Year 2	Year 1	Year 2				
University of Alabama at Birmingham Master of Science in Genetic Counseling	AL	X		2019	20,070	11,170	20,070	11,170	59			
University of Arkansas Medical Sciences Master of Science in Genetic Counseling	AR	X		2023	1,140	11,040	24,645	23,850	61	Year 1 (Fall-Summer); Year 2 (Fall-Spring)		
Stanford University Master of Science in Genetic Counseling	CA	X		2025					84	Year 1 (Fall-Summer); Year 2 (Fall-Spring)		
University of South Florida Genetic Counseling Training Program	FL		X	2021	7840*	7,840	15,864	15,864	42	21 months		
Emory University School of Medicine Master of Medical Science in Human Genetics and Genetic Counseling	GA	X		2021	29,100	29,100	n/a	n/a	75	summer through spring		
Northwestern University Medical School Graduate Program in Genetic Counseling	IL	X		2023	50,424	50	n/a	n/a		18 months (6-ten wk qtrs.) Year one - fall-spring; Year 2 fall-winter-graduate in mid-March.		
Johns Hopkins University/National Human Genome Research Institute Genetic Counseling Training Program	MD	X		2024	52,368	52,368	52,368	52,368	80	2 1/2 years		
Boston University School of Medicine Masters in Genetic Counseling Training Program	MA	X		2022	37,200	37,200	n/a	n/a	48	2 years		
Brandeis University Master of Science Program in Genetic Counseling	MA	X		2024	36,540	36,540	n/a	n/a		2 years; Year 1 - fall-spring; Year 2 fall-spring		
University of Michigan Genetic Counseling Program	MI	X		2021	10,340	10,340	20,885	20,885	50	5 consecutive semesters-enter in fall and graduate 20 months later in April.		
University of Minnesota Graduate Program of Study in Genetic Counseling	MN	X		2022	21,270	21,270	30,760	30,760	52	2 years		

*Fla - includes fees

** Based on 9 hrs per semester

***Expect a 3% annual increase

Proposal for New Degree Program for Master's Degree in Genetic Counseling

APPENDIX I. TUITION – GENETIC COUNSELING PROGRAMS IN USA - 2017

Program Name	State			Tuition				Total Hours	Term		
		Accreditation			Resident		Non-Resident				
		Full	New	Year	Year 1	Year 2	Year 1	Year 2			
Rutgers University Genetic Counseling Master's Program	NJ		X	2021	8,268	8,268	14,064	14,064	56	22 months; Year 1 fall-summer; Year 2 - fall-spring	
Mt. Sinai School of Medicine Master of Science Program in Genetic Counseling	NY	X		2024	19,400	19,400	n/a	n/a		21 months	
Sarah Lawrence College Joan H. Marks Graduate Program in Human Genetics	NY	X		2025	36,075	21,645	36,075	21,645	70	21 months; Year 1 (fall-summer); Year 2 fall-summer	
Case Western Reserve University Genetic Counseling Training Program	OH	X		2019	51,446	19,514	51,446	19,514	40	based on best calculations; no totals per semesters	
Ohio State University Genetic Counseling Graduate Program	OH		X	2018	19,100	29,000	39,100	58,000	69	Year 1 Two semesters; Year 2 Three semesters	
University of Cincinnati College of Medicine Genetic Counseling Program	OH	X		2021	14,468	14,468	26,210	26,210	70		
Arcadia University Genetic Counseling Program	PA	X		2024	33,250	33,250	33,250	33,250	88	21 months	
Thomas Jefferson University MS in Human Genetics and Genetic Counseling	PA		X	2021	32,000**	32,000**	32,000**	32,000**	45	19 months; Year 1 (fall-summer); Year 2 (fall-spring)	
University of Pittsburgh Genetic Counseling Program	PA	X		2019	12,750	4,156	21,065	6,904	36	2 years	
Augustana University Augustana-Sanford Genetic Counseling Graduate Program	SD		X	2020	24,720	24,720	25,462***	25,462***	62	2 years;	
University of Texas Graduate School of Biomedical Sciences at Houston Program in Genetic Counseling	TX	X		2022	4,914	3,276	14,742	9,828	45	2 years	

*Fla - includes fees

** Based on 9 hrs per semester

***Expect a 3% annual increase