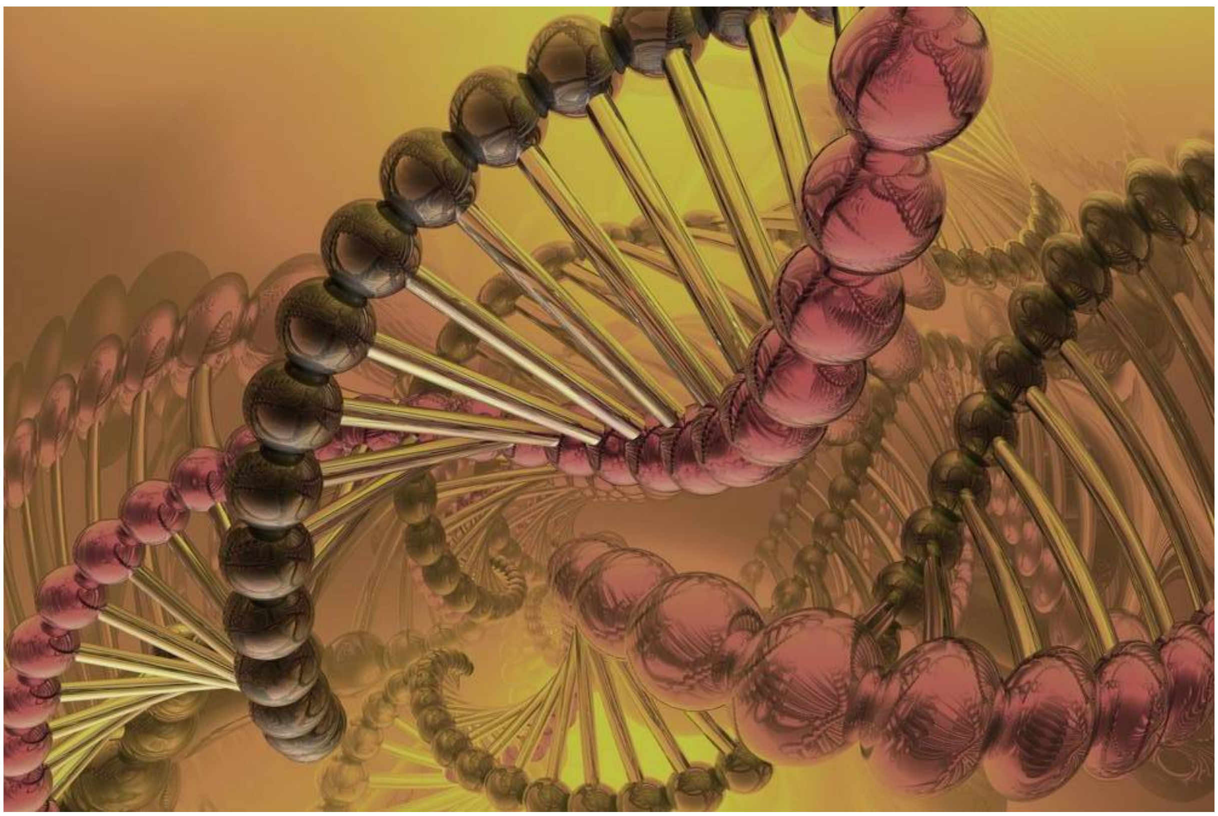
Wayne State University School of Medicine Genetic Counseling Program Information



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School of Medicine

Center for Molecular Medicine and Genetics

Division of Clinical Genetics

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Program Overview and Requirements

"Genetic counseling is the process of helping people understand and adapt to the medical, psychological, and familial implications of genetic contributions to disease. The process integrates the following:

- Interpretation of family and medical histories to assess the chance of disease occurrence or recurrence.
- Education about inheritance, testing, management, prevention, resources, and research.
- Counseling to promote informed choices and adaptation to the risk or condition.*"

**National Society of Genetic Counselors Definition Task Force. Journal of Genetic Counseling (2006); 15(2):77-83.*

Mission

The Wayne State Genetic Counseling Graduate Program mission is, "*to train a highly qualified, competent and culturally diverse genetic counseling workforce to increase access to services for the citizens of Detroit, the State of Michigan and beyond."*

The program provides students with rich clinical experiences working with diverse patient populations to prepare them for competent practice in a wide variety of settings. In addition, the program provides students a strong foundation in genomics that prepares them to integrate current and future genomic technologies into evidence-based practice.

The University

The program is housed in the Center for Molecular Medicine and Genetics at the Wayne State School of Medicine. The School of Medicine is the largest single campus medical school in the United States. In addition to undergraduate medical education, the School offers Master's, PhD, and MD-PhD program in 14 different subject areas. This affords genetic counseling students an opportunity to interact and take courses with a variety of learners and to be instructed by faculty with diverse areas of expertise.

The Detroit Medical Center, Wayne States' partner in education, and surrounding metropolitan hospitals offer a variety of clinical sites for hands on experience through which students can apply the knowledge gained from didactic course work to real people and situations. The culturally diverse population found within the Detroit metropolitan community provides a unique opportunity to explore the influence of ethnic and cultural differences on the provision of effective clinical genetic services and the genetic counseling process.

The genetic counseling program has over 70 individuals involved in the education and clinical training of students. The program faculty is a close-knit group representing a wealth of knowledge and experience. As a result, WSU graduates leave the program well positioned to function as entry level genetic counseling professionals and well- prepared to sit for their genetic counseling board certification examination. Evidence of the quality of the program includes the overall graduation rate (96.5%), certification examination pass rate (95.8% first attempt pass rate over the last three years in comparison to the national rate of ~82%), and an excellent record of job placement. Graduates also leave the program with a strong network of mentors.

Requirements

Forty-five credits are required to earn a master's degree in genetic counseling. These credits consist of the following:

- 35 credits from core courses
- 6 credits from the clinical internships
- 4 credits from research project-related coursework and independent study. The genetic counseling program requirements include a clinical research project which is a modified version of the Graduate School's Plan B requirements for a master's degree.

Clinical Internships

Students take part in three different types of clinical internships: observation, introductory, and formal internships. The formal internships include experiences in reproductive, pediatric, adult, metabolic, and cancer genetics clinics, the clinical genetics laboratories (biochemical, cytogenetics, and molecular), and in specialty clinics/settings (e.g., lab-based genetic counseling, neurogenetics, pediatric neurology). Internships start in the first semester of training and extend into the last semester.

Other Activities

Students are expected to participate in a variety of supplemental activities as part of their training.

Program Attributes

- Accessible faculty with a wealth of clinical and research experience
- A learning environment that values teamwork and collaboration over competition
- Clinical training with a culturally, ethnically, and socio-economically diverse patient population
- Opportunity to take courses with a variety of learners
- Dedicated program leadership each with 20+ years of experience in medical genetics
- Record of high achievement in program completion, graduate certification and job placement

The information contained in this booklet highlights the curriculum, experiences, and expectations for the successful completion of a Master's of Science degree in genetic counseling from Wayne State University.

Wayne State University School of Medicine
Graduate Program in Genetic Counseling Curriculum Overview

	Year 1			Year 2	
	Fall	**Winter**	**Spring/Summer**	**Fall***	**Winter**
Course Work	Principles of Genetic Counseling **MGG 7640, 4 crs.**	Theory & Practice of Genetic Counseling **MGG 7740, 3 crs.**		Advanced Theory & Practice of Genetic Counseling **MGG 7741, 3 crs.**	Optional Elective
	Introductory Molecular Biology **MGG 7010, 4 crs.**	Advanced Human Genetics **MGG 7600, 3 crs.**		Advanced Medical Genetics **MGG 7800, 3crs.**	
	Human Development and Teratology **MGG 7830, 1 cr.**	Genetic Counseling Seminar **MGG 7880, 1 cr.**			Genetic Counseling Seminar **MGG 7880, 1 cr.**
	Epidemiology **FPH 7240, 3 crs.**	Practical Applications of Genetic Counseling, **MGG 7660, 3 crs.**			Senior Seminar in Genetic Counseling **MGG 7881, 2 cr.**
	Introduction to Promoting Health Equity in Genetic Counseling **MGG 7730, 1 cr.**	Evaluating the Health Care Literature **MGG 7860, 1 cr.**			
		Introduction to Medical Genetics **MGG 7710, 2 crs.**			
Research Project	Research Project Seminar, **MGG 7999, Section 003, 2 cr.**			Research Project **MGG 7999, Section 002, 1 cr.**	Research Project **MGG 7999, Section 002, 1 cr.**
Clinical Activities	**Observational Experiences** Observe in various clinical settings	**Clinical Internship (Introductory)** Participation genetics clinics *14 wks.* **MGG 8998, 1 cr.**	**Clinical Internship** Participation genetics Clinics *2 rotations (14 wks.)* **MGG 8998, 1 cr.**	**Clinical Internship** Participation genetics clinics/laboratories *2 rotations (14 wks.)* **MGG 8998, 2 crs.**	**Clinical Internship** Participation genetics clinics/specialty internships *2 rotations (14 wks.)* **MGG 8998, 2 crs.**
Other Activities	Attend relevant seminars, conferences, grand rounds, process group, journal clubs, and supplemental activities. * Second year students attend NSGC Annual Education Conference				

Graduate Program in Genetic Counseling Course List
Required/Core Courses

Course	Credits
MGG 7010 **Introductory Molecular Biology** *Basic aspects of molecular biology and genetics.*	4
MGG 7640 **Principles of Genetic Counseling** *History and evolution of profession as it relates to the provision of clinical services within the healthcare delivery system; introduction to basic genetic counseling skills including case preparation, the interview, family history, risk assessment, and adult education. Introduction to ethical decision making.*	4
MGG 7730 **Introduction to Promoting Health Equity in Genetic Counseling** *This course aims to help learners begin to recognize how diversity influences access to, the experience with, and utilization of health care, leading to health disparities in under-represented people and what they can do as future genetic counselors to provide inclusive practice and promote health equity.*	1
MGG 7740 **Theory and Practice of Genetic Counseling** *Overview of the counseling models currently utilized in genetic counseling. Introduction to and preliminary development of the communication, interpersonal, and psychosocial assessment skills needed to conduct a comprehensive genetic consultation. Ethical, legal and social issues.*	3
MGG 7660 **Practical Applications of Genetic Counseling** *Through a variety of instructional methods, students gain a foundation for understanding and applying the practical aspects of genetic counseling to clinical settings in reproductive, pediatric, adult, and cancer genetics.*	3
MGG 7600 **Advanced Human Genetics** *Concepts, problems and methods of human genetics including population genetics.*	3
MGG 7830 **Human Development and Teratology** *Through lecture, self-study, exam, and oral presentation, students learn key aspects of fetal development, the embryological basis of birth defects and genetic dysmorphology syndromes, clinical teratology, and the associated medical terminology.*	1
MGG 7860 **Evaluating the Health Research Literature** *Reading and analysis of health care literature with focus on research articles. Principles of health research design and analysis; skills for critical assessment of medical literature.*	1

MGG 7710 Introduction to Medical Genetics *Introduction to key principles of genetics and genomics as they relate to medical genetics.*	2
MGG 7741 **Advanced Genetic Counseling Theory and Practice** *Further examination of the major theories of human behavior and how they can be applied to evaluate psychosocial responses to genetic information and how they guide short-term client centered counseling in clinical practice. Ethical, legal, and social issues of practice.*	3
MGG 7800 **Advanced Medical Genetics** *A comprehensive review of advanced topics in medical genetics geared towards those who will be specialists in the field.*	3
MGG 7880 **Genetic Counseling Seminar** *A lecture/discussion format seminar for first and second year students combined focusing on issues relevant to medical genetics and the genetic counseling profession. Includes emerging issues, personal genomics and public health genomics. Presentations by students, faculty, and invited speakers. (1 credit per semester, 2 semesters)*	2
MGG 7881 **Senior Seminar in Genetic Counseling** *Through lecture, small group discussion, self-study, and oral presentation, students hone the skills needed to successfully make the transition to practicing professional.*	2
FPH 7240 **Epidemiology** *Epidemiologist's task list; research of problems without known etiology; infectious and noninfectious disease models; examination of current problems. Previously an elective but now strongly recommended/required for genetic counseling students.*	3
MGG 7999 **Research Project** *Student Plan B research project. Includes one semester of research project seminar with biostatistics. Students who do not complete their research project by the end of the Winter 2 semester may have to register for a 4th credit in Spring/Summer 2.*	4
MGG 8998 **Genetic Counseling Internship** *Students work under the supervision of a genetic counselor/geneticist or other healthcare professional in a variety of genetic and subspecialty clinics and laboratories.* **Clinical Internship 1 - Winter Semester, First Year (1 credit)** Introductory Rotations – attend various clinics (genetics, non-genetics) **Clinical Internship 2 – Beginning Spring/Summer Semester Y2** ***(5 credits)*** (4 seven-week traditional internships, 1seven-week specialty clinic internship + laboratory internship at a combination of the following sites)	6

Metropolitan Detroit Internship Sites • *Cancer Genetic Counseling Service-Karmanos Cancer Institute* • *Division of Genetic, Genomic and Metabolic Disorders-Children's Hospital of Michigan (Pediatric Genetics, Adult Genetics, Metabolic Clinic)* • *Women's Health-Henry Ford Hospital System (Reproductive and Cancer)* • *Department of Cytogenetics, Corewell Health East-Dearborn (Reproductive, Cancer, Adult Genetics)* • *Cancer Genetics Service at Corewell Health East-Royal Oak* • *Reproductive Genetics Service at Corewell Health East-Royal Oak* • *St. John Hospital Ascension Cancer Genetics* • *Trinity Health-Oakland Cancer and Reproductive Genetics-Pontiac* • *Windsor Regional Hospital Cancer Genetics-Windsor, ON* • *Clinical Genetics Laboratories- Cytogenetics, Molecular Diagnostic, Biochemical Genetics service laboratories at the Detroit Medical Center and Henry Ford Health System* *Additional Internship Sites Available** • *Corewell Health West-Medical Genetics-Grand Rapids, Michigan* **With the consent of the program directors, students may arrange to do a rotation at another site during the first and/or second half of the summer semester* *Specialty Clinic Sites (Not all inclusive, subject to availability)* • *Adult Neurogenetics (WSU Department of Neurology)* • *Cystic Fibrosis Clinic (Adult at Harper University Hospital; Pediatric at Children's Hospital of Michigan)* • *Cystic Fibrosis Newborn Screening Follow Up Clinic (Children's Hospital of Michigan)* • *Huntington Disease Clinic (Henry Ford Hospital System)* • *Multidisciplinary Colon Cancer Clinic (Corewell Health East-Royal Oak)* • *Muscular Dystrophy Clinic (Children's Hospital of Michigan; Corewell Health East-Royal Oak)* • *Pediatric Cancer Genetics Clinic (Children's Hospital of Michigan)* • *Pediatric Cardiology and Neurology (Children's Hospital of Michigan)* • *Pediatric Neurology (Corewell Health East-Royal Oak)* • *NxGen MDx (genetic testing laboratory)*	

First Year Clinical Experiences

First Year Observational Experiences- Fall

Beginning in October of the first semester, students are scheduled to attend a variety of clinics, many of them which are multidisciplinary clinics, to begin to observe how genetics is integrated into healthcare. Some of these clinics do not have genetics professionals staffing them but are an excellent opportunity to observe a team approach to the care of an individual with a chronic condition and to learn about the psychosocial aspects of the various conditions.

Observational Experiences for Fall 2024:
Craniofacial Clinic, Cystic Fibrosis Clinic, Myelomeningocele Clinic, Sickle Cell Anemia Clinic, Genetics Hospital In-patient Consultations

First Year Introductory Internship-Winter

The purpose of the internship during the first year is for students to begin to apply what they have learned during their course work to the clinical setting. Students will be required to spend approximately 8 hours each week at a variety of clinical sites. Students will spend approximately 5-6 weeks at one genetics clinic (reproductive, pediatric or cancer site). During this experience, students will typically be assigned certain case preparation duties as well as begin practicing some aspects of face to face genetic counseling. Students will also observe other clinical experiences such as telephone genetic counseling and multidisciplinary clinics in pediatrics and cancer. Students will also share and discuss the medical, genetics and genetic counseling issues surrounding the cases they have observed in clinic through case presentations in MGG 7880, Genetic Counseling Seminar and in discussions in MGG 7740, Theory and Practice of Genetic Counseling.

During the Introductory Internship, each student will also gain experience in a research rotation. The objectives of this rotation are to describe the role of genetic counselors in research, to recognize how to use and develop a database, to define informed consent in a research setting, and to recognize the importance of responsible conduct in research. Finally, each student will gain experience in a laboratory genetic counseling workshop where they will meet and work with genetic counselors working in variant classification and interpretation.

Introductory Internships for Winter 2025:
- Cooper Genomics (Preimplantation Genetic Diagnosis/Telephonic Clinic)
- Corewell Health East-Center for Exceptional Families
- Corewell Health East -Royal Oak Children's Hospital
- Corewell Health East -Royal Oak Multidisciplinary Breast Cancer Clinic
- Corewell Health West- Cancer Genetics
- Henry Ford Hospital System-Cancer and Reproductive Genetics
- Karmanos Cancer Institute
- Pediatric Cardiology, Children's Hospital of Michigan
- Trinity Health-Ann Arbor-Cancer Genetics
- Trinity Health-Oakland-Cancer Genetics

Second Year Clinical Internships

The purpose of the internship during the second year is for students to function, with supervision, as the primary genetic counselor in a variety of clinical settings. During this second-year internship, students acquire cases for their logbooks for program accreditation purposes.

For all students regardless of which clinical internship track they follow:

- Students are required to complete 6 seven-week rotations (2 during the spring/summer semester, 2 during the fall and 2 during the winter semester). All students must complete one reproductive genetics, cancer genetics and pediatric genetics rotation. Students also must see some adult genetics cases.
- One of 6 rotations is the laboratory rotation (in the fall). Students will rotate through three clinical genetics service laboratories (cytogenetics, molecular genetics, and biochemical genetics) to learn test indications, methodology & limitations. The goals and objectives of the laboratory rotations are described below.
- One of the 6 rotations is a specialty internship (in the winter). Students will have the opportunity to attend a variety of clinical settings to expand their knowledge of genetic conditions and non-traditional service delivery models. See below for more information.
- With the permission of the program directors, students may elect to do one or two rotations as an elected away rotation during the summer between their first and second years.
- Students will spend at least 24 hours/week at the clinical site during the fall and winter semesters and 35 hours/week at the clinical site during the spring/summer semester.

Genetics Service Laboratory Internship

Genetic counseling students will spend approximately 3 weeks each in a cytogenetics laboratory and a molecular genetics laboratory and 1 week in a biochemical genetics laboratory. During each rotation, the student is expected to perform relevant background reading, work through a case book containing typical examples of normal and abnormal test results, participate in ongoing laboratory testing, participate in laboratory meetings, and assist in interpreting laboratory results under the supervision of the laboratory director. Students also gain valuable exposure to the following:

- The role of the laboratory genetic counselor including utilization management of genetic testing.
- Clinical next generation sequencing technologies and results interpretation during the molecular laboratory experience.

Specialty Internship

Genetic counseling students will attend a variety of specialty clinics for 6 weeks and one week doing additional clinic-related activities. Students will attend two 3-week mini clinical rotations focused on a particular specialty area of genetics with a variety of clinical opportunities depending on the specialty. Student will have some patient-related genetic counseling responsibilities as well as some observational experiences. In addition, students will be expected to present a synthesis of medical literature to make evidence-based recommendations for practice on a topic relevant to one of their specialty internship experiences.

SAMPLE WAYNE STATE CLINICAL INTERNSHIP SCHEDULE						
	Summer I May-mid June	Summer II July-mid August	Fall I Late August-mid October	Fall II Mid-October-early December	Winter I January-third week of February	Winter II Fourth week of February-April
Student A	Trinity Health-Oakland (Cancer)	Away (Repro)	Laboratory Internship	CHM-Peds and Metabolic (Peds/Adult)	Specialty Rotation (Neuro & Women's Health)	Corewell Health East-Cancer (Cancer)
Student B	Corewell Health West (Repro)	Corewell Health West (Peds/Adult)	Laboratory Internship	Karmanos (Cancer)	Specialty Rotation (Neuro & Peds)	Henry Ford Hospital (Repro and Cancer)
Student C	Karmanos (Cancer)	CHM-Peds and Metabolic (Peds/Adult)	Trinity Health-Oakland (Repro)	Laboratory Internship	Corewell Health East-Dearborn (Repro and Cancer)	Specialty Rotation (Neuro & Peds)
Student D	Henry Ford Hospital (Repro)	Away (Cancer)	CHM-Peds and Metabolic (Peds/Adult)	Laboratory Internship	Trinity Health-Oakland (Repro and Cancer)	Specialty Rotation (Neuro & Peds)
Student E	Corewell Health East-Peds (Peds/Adult)	Corewell Health East-Cancer (Cancer)	Laboratory Internship	Corewell Health East-Dearborn (Repro)	Specialty Rotation (Neuro & Peds)	CHM-Metabolic (Peds/Adult)
Student F	CHM-Peds and Metabolic (Peds/Adult)	Away (Cancer)	Laboratory Internship	Henry Ford Hospital (Repro and Cancer)	Specialty Rotation (Neuro & Peds)	Trinity Health-Oakland (Repro)
Student G	St. Joseph Mercy-Ypsilanti (Cancer)	Away (Repro)	Henry Ford Hospital (Repro and Cancer)	Laboratory Internship	CHM-Peds and Metabolic (Peds/Adult)	Specialty Rotation (Neuro & Women's Health)

RESEARCH PROJECT

The purpose of the research requirement is for students to gain experience in study design, research methods, professional writing, and self-directed education in order to promote their personal professional growth. This requirement is meant to be an introduction to the area of research in genetic counseling and is not a formal Master's thesis requirement. Students are required to complete a research project, develop a manuscript, and present their project results at Medical Genetics Grand Rounds. It is also expected that students will submit an abstract of their research project to a national meeting (e.g., NSGC, ASHG, ACMG, other) and submit the manuscript for publication when appropriate.

The research project falls under the University's Plan B for Master's students. The genetic counseling program stipulates that the project should involve formulating and testing a research question or hypothesis (modified Plan B). Examples of student projects might include the following: a report on a small series of cases which illustrates a novel concept or answers a specific question; the evaluation of an innovative educational tool, screening tool, or counseling strategy; analysis and interpretation of data from an existing research project or database to answer a new question; or generation of new data followed by analysis and interpretation to answer an original question. A comprehensive literature review might also be appropriate if it is hypothesis driven (such as a meta-analysis of existing research on a topic).

Students get instruction on how to conduct research, including biostatistics, in MGG 7999 (Genetic Counseling Research Project Seminar) in the Fall Y1 semester. Students select their topic and identify project mentors (with guidance from the program directors) in the fall of Y1, begin to develop their specific aims and methods in Winter Y1, and work on various aspects of implementation from Spring Summer Y1 through Winter Y2. Students who are unable to complete their research project by the end of W2 can stay for the Spring Summer semester of Y2. Below is a sample list of completed projects.

Select Plan B Project Titles	**Outcomes**
An Evaluation of the Impact of Genetic Counseling on Adherence to the 2011 American Academy of Pediatrics Health Supervision Guidelines for Children with Down Syndrome	Published American Journal of Medical Genetics, Part A 2025.
Identifying potential genetic counseling program applicant competencies	Published Journal of Genetic Counseling 2025.
Identifying potential LGBTQIA+ competencies for genetic counseling student training	Published Journal of Genetic Counseling 2024.
Parent-reported genetic counselor adherence to guidelines for giving a prenatal diagnosis of Down syndrome: Impact on the diagnosis experience.	Published Journal of Genetic Counseling 2024.
Medical students' self-perceived knowledge and clinical comfort with genetics in Pakistan	Published Journal of Genetic Counseling 2023.

The feasibility and impact of a computer-aided genetics education module in an obstetrics clinic: A randomized control trial	Published American Journal of Health Education 2023.
Characterization of Variant Reclassification and Patient Re-contact in a Cancer Genetics Clinic	Published Journal of Genetic Counseling, June 2022.
Investigating factors that influence genetic counselors' decisions to refer patients to mental health providers	Published in Journal of Genetic Counseling, 2022.
Clinical outcomes of preimplantation genetic testing for hereditary cancer predisposition syndromes: A systematic review	Published in Prenatal Diagnosis, 2022.
Characterization of hypodontia, hypohidrosis and hypotrichosis associated with X-linked hypohidrotic ectodermal dysplasia: A systematic review	Published in American Journal of Medical Genetics, Part A, 2020.
Comparing the quality of Spanish and English genetics resources on the internet	Published Journal of Genetic Counseling, 2020.
Teaching medical students how to deliver diagnoses of Down syndrome: Utility of an educational tool	Published in Patient Education and Counseling, 2019.
Genetic counselor workflow study: The times are they a-changin'?	Published Journal of Genetic Counseling, 2018.
Referrals to Mental Health Services: Exploring the Referral Process in Genetic Counseling	Published Journal of Genetic Counseling, 2017.
Assessment of current practices in post-visit patient communication amongst genetic counselors	Published Journal of Genetic Counseling, 2017.
Utilizing state registry data to increase cancer genetic access & evaluation of an interactive educational tool: HBOC: Is your patient at high risk?	Published in Healthcare, 2016.
Genetic counseling clients' views on religious and spiritual assessment in genetic counseling	Published Journal of Genetic Counseling, 2016.
What are the differences between telephone and in person genetic counseling from the genetic counselors' perspective?	Published, Journal of Genetic Counseling 2016.
Information preferences regarding informed consent models for genetic carrier screening	Published Journal of Genetic Counseling, 2015.

Investigation of how parents help their child with PKU cope with feeling different	Published, American Journal of Medical Genetics, 2015.
Reaching the next generation of scientists and consumers: What do high school textbooks say about genomics and genetic counseling?	Published in American Biology Teacher 2014.

Examples of Supplemental Activities

Genetic Counseling Journal Club – As scheduled

The Genetic Counseling Journal Club is designed to introduce students to new topics in the literature related to clinical genetic services and genetic counseling. Students also gain experience in critical thinking, organizing and presenting a presentation, and facilitating discussion. They also gain exposure to new applications of genomic medicine. All genetic counseling students are required to attend and present at journal club. May include a book club as well in select years.

Genetic Counseling Process Group – As scheduled, every 3-4 weeks

Throughout both years of training, first and second year students will participate in a peer process group. This group is meant to be a forum for discussion of issues related to being a graduate student in a professional training program and to developing professionalism. Group discussions are confidential. Information discussed in the process group is not shared with the program directors or program faculty without the consent of the group members. The process group meets for 30-45 minutes. We set the ground rules for the group the first time a new group of 1st and 2nd year students meets. A facilitator is available for consultation if concerns or questions arise. Special topic presentations are scheduled on occasion and as requested.

Cancer Genetic Counseling Seminar Series – 4th Monday

The Cancer Genetic Counseling Seminar Series is a monthly seminar series that covers topics related to cancer genetic counseling and risk assessment, cancer biology, and the treatment and management of patients with inherited cancer syndromes. Invited speakers typically include WSU/DMC/KCI faculty, faculty from neighboring institutions such as the University of Michigan, and nationally recognized experts. This is a requirement for genetic counseling students unless there is a conflict with a course or other clinical responsibility.

Medical Genetics and Genomics Grand Rounds – Fridays as scheduled

Medical Genetics and Genomics Grand Rounds is held approximately two times a month and is a forum for presentations on a variety of topics in Genetic Counseling and Medical Genetics. Presenters will be encouraged to integrate diversity, equity, inclusion, and justice into their presentations as is relevant. Presenters include attending physicians, genetic counselors, fellows, residents, students and invited outside speakers. Genetic counseling students will present at least twice, once based on a clinical case and once as a requirement of the laboratory internship. Attendance is required unless there is a conflict with a course or other clinical responsibility.

CMMG Departmental Seminar Series

This seminar series, which is generally held bimonthly, covers topics related to molecular biology and genetics. The focus of the series is more research based than clinical. Students are expected to attend select seminars as instructed by program directors.

Community Outreach Opportunities – As scheduled

The genetic counseling program recognizes the tremendous value of having students interact with members of genetics advocacy organizations. These interactions promote awareness of the impact of genetic conditions on individuals and families

and enhance cultural competency. Interactions can occur by attending support group meetings or advocacy organization conferences, and meeting with families who have genetic conditions. Students are expected to select an advocacy organization with which to volunteer and then participate in organization activities a minimum of 2-3 times over the course of each year. The student will work with the organization to decide how to best use their volunteer time. The genetic counseling program can provide recommendations of organizations willing to accept genetic counseling student volunteers if desired.
Educational Outreach Opportunities – As scheduled The genetic counseling program provides opportunities for students to educate lay and professional audiences about genetics in order to help students develop teaching and presentation skills. Students typically take part in the School of Medicine's Future Docs program (for 6-12 year old children) and one or more other opportunities (e.g., secondary school presentations, career days, English language institute presentations). Students are also given opportunities to do formal presentations in class and at Medical Genetics Grand Rounds. Students are expected to do a minimum of 2-3 presentations a year, at least one of which must be to a lay community.
CMMG Departmental Scientific Retreat – Periodic Periodically CMMG hosts scientific retreats, which included departmental faculty and students (PhD and MS genetic counseling). Local and/or nationally recognized experts in the area of molecular biology and genetics are often invited to attend. All attendees have an opportunity to present either orally or as a poster their research and/or clinical activities. The genetic counseling students are included in this retreat.
Michigan Association of Genetic Counselors (MAGC)– Annual This is an annual meeting of all the genetic counselors in the State of Michigan. The format of the meeting typically includes a morning educational session and afternoon networking session. Student members of MAGC can also attend professional development activities as scheduled throughout the year.
NSGC Annual Education Conference This national NSGC meeting is usually attended by second year students. The program covers up to~$600 of expenses related to registration, travel, lodging and food expenses (subject to budget approval). It is expected that students will attend this meeting.
Other Grand Rounds/Seminars Grand round presentations or seminars in other departments often provide excellent educational opportunities. When relevant topics are to be presented in such venues, student attendance may be required or recommended. Students will be given as much notice as possible.

Genetic Counseling Program Admissions

Getting started

The first step is to look at the list of genetic counseling programs available, review their websites, and if you have questions, contact the program directors/staff. Programs should be accredited by the Accreditation Council for Genetic Counseling. For a listing of accredited programs, go to https://www.gceducation.org/students-volunteers/#program

Because many qualified applicants apply to each program and each program has a limited number of training slots, it is important to apply to several programs. If you are a qualified applicant, this will improve your chances of admission the first time you apply.

Only apply to those programs that you would consider attending. Keep an open mind when choosing a program. Look at the websites to see what each has to offer. You may want to consider tuition costs.

Preparing a competitive application

On each program's websites, you will probably find a section that details the program's admission requirements. These generally include the following:

- Prerequisite courses:
  - Since genetic counseling students will be taking graduate level coursework in molecular biology and human and medical genetics, it is important that applicants have a strong foundation in the biological sciences. Visit each program's site for information about their prerequisites.
  - Students also need coursework in psychology (at least one class).
  - The prerequisites for the WSU program are:
    - 2 semesters of biology
    - 2 semesters of inorganic/general chemistry
    - 1 semester of organic chemistry
    - 1 semester of genetics
    - 1 semester of biochemistry
    - 1 semester of statistics/biostatistics
    - 1 semester of psychology
- Insight into the Genetic Counseling Profession: Successful applicants should be able to show that they have investigated the genetic counseling profession and can describe their reasons for wanting to become a genetic counselor. There are many ways to learn about the profession. Shadowing and/or meeting with genetic counselors are effective ways to learn more about the profession, when possible. There are many other ways to learn about the profession. These include watching podcasts about genetic counseling and patient experiences with genetic conditions, watching videos of mock genetic counseling sessions, attending open houses/seminars hosted by genetic counseling programs (many of which are now virtual), attending genetic

counseling conferences (again, many of which may be virtual), reading about genetic counselor, and/or taking a course on genetic counseling. To find genetic counselors in your area that are willing to meet with prospective applicants, use the [NSGC Find a Counselor Tool](#).

- Advocacy/volunteer work ideally where you have training in counseling/interpersonal communication skills and then volunteering in a setting where you can use these skills to help people cope with an issue or problem. Examples include but are not limited to crisis counseling hotlines (including crisis text hotlines), domestic violence hotlines/shelters, sexual assault hotlines/advocacy, grief and loss support organizations, peer counseling experiences, and resident assistant positions.
- GRE scores
    - Programs may require the general exam; some may also require a subject test scores in addition to the general exam.
    - Wayne State does not require the Graduate Record Examination for admission. Further, any scores submitted will not be taken into consideration.
- Applicants whose native language is other than English may be required to take an English proficiency test such as the TOEFL, Duolingo English Test, MET, IELTS, or PTE. See https://gradschool.wayne.edu/admissions/international/english-proficiency for additional information about the WSU requirements.
- Academic transcripts from all institutions attended.
- An essay (called personal statement/statement of purpose) describing why you want to be a genetic counselor
    - This is your opportunity to demonstrate your familiarity with the profession and what is driving you to become a part of it.
    - At WSU, the essay should be limited to 1000 words describing
        - Your reasons for pursuing a career in genetic counseling
        - The skills, personal qualities, and professional and personal experiences you have that demonstrate your motivation to become a genetic counselor
        - Your personal experiences and/or attributes that would prepare you to provide inclusive genetic counseling to a diverse patient population.
- Three letters of recommendation
    - Make sure that you get these from people who know you well and who you think will write a good letter of recommendation.
    - Seek recommendations from those familiar with your academic abilities, work ethic, and/or interpersonal skills such as a professor, research mentor, advisor, volunteer coordinator, or employer. At least one should speak to your academic ability.
    - Personal references (from a friend or neighbor) are less helpful in evaluating your application.
- Graduate school application
    - At Wayne State, all graduate applications and most application materials must be submitted electronically.

- Go to http://www.gradadmissions.wayne.edu/apply.php to apply the WSU Graduate School.

Applying

First, the Wayne State Program, like all accredited programs in the U.S. and Canada, participates in the Genetic Counseling Admissions Match. You must register to be part of the match to be considered by a program. For more information about the match and to register, go to https://natmatch.com/gcadmissions/ There is also more detailed information provided below. Registration for the match usually opens in late August or September and closes after match day which is in late April of each admission year.

Next, develop your Wayne State application. The web-based application usually opens in late August or early September. Make sure all materials are uploaded and submitted by the deadline! For the WSU program, the deadline is January 5th.

Tips

- Give those writing your letters of recommendation ample time to get their letters submitted.
- During peak times, it can take graduate school admissions offices more time to process applications, so try to get your application in before the deadline date to ensure that the program has access to this information by their deadline date.
- Make sure when you order your original transcripts you know how long it will take for them to be sent in to the admissions office and plan accordingly. You can submit an unofficial transcript while you are waiting for the official one to be posted.
- If it is required at a particular institution, make sure the university is listed as a recipient on your GRE scores/ that the scores are sent to that specific institution.
- Review your application for errors and typos.
- Have someone read your essay to check for typos and to make sure it says what you intended it to say.
- Be truthful! If the admissions committee detects inaccuracies in your application, that reduces your chance of admission.

There is generally no advantage to applying early (e.g., in the fall) because programs do not have rolling admissions. We do not start looking at applications until the day after the admissions deadline. But it is really important that all your admissions materials are submitted by the deadline. If we are missing materials we cannot fully evaluate your application.

Interviewing

- An interview (by invitation only) is a mandatory part of most programs' admission process. Depending on the institution, these interviews may be in person or virtual. Most interviews occur in mid-February through early April.

- Dress appropriately (look professional). Do not wear jeans, tennis shoes, or other casual attire. Remember, you are applying for a professional program. Dress the part.
- If interviewing virtually:
    - Make sure your computer is charged and you have a reliable internet connection.
    - Limit distractions by finding a quiet interview spot, considering a neutral background and having good lighting
- Prepare for the interview. The career offices of many universities have interview tips on their websites. Some may even offer classes on interviewing. You can also find tips online like those provided at the following URL. http://www.petersons.com/graduate-schools/graduate-admission-tips-interview.aspx
- Don't be late!
- Be courteous to everyone you come in contact with that day. You never know who may be evaluating you or who may provide feedback to the admissions committee
- Come prepared to talk. Admissions committees want to get to know you to determine if you are a good fit for the program.
- Come prepared with questions. The admissions committee wants to know that you are really evaluating whether this is a good program for you.
- Come prepared to talk about your strengths. This is your opportunity to show the admissions committee why you should be offered a position in the program.
- If there are parts of your application that are weaker than others, be prepared to discuss these in a non-defensive way.
- If the program does not give you information about what the interview process will entail, ask, so that you can be adequately prepared.
- Write thank you notes to those who interviewed you, especially if you are interested in attending the program. These can be on note cards or by email.
- Be prepared that no matter how much you like a program on paper, sometimes you may change your mind after the interview. The reverse is true as well. You may actually like some programs that on paper were not as appealing to you.

Genetic Counseling Match Program

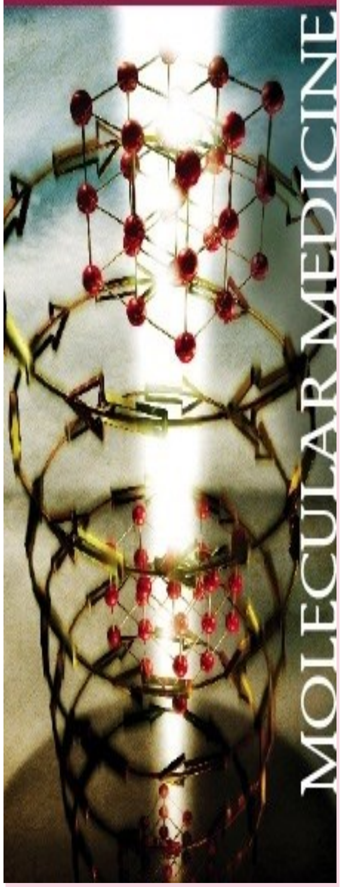
- Genetic counseling programs participate in a Match program through an organization called NMS. When you apply for programs, please visit the NMS website at (https://natmatch.com/gcadmissions) to register for the match, review detailed information about the matching process, and to view a demonstration of how the matching algorithm works. You must apply to the Match program in order to be eligible for admission. You only have to sign up for the Match program one time regardless of how many programs you apply to.
- If you interview with at least one program, after all interviews are complete you will rank each program in order preference through the Match service. If there are programs that you would not consider attending, you will not list (rank) them at all. This information is private. Programs will not know how you ranked them or if you ranked them.

- Just as you will rank (or not rank) each program with whom you interviewed, each program will also rank (or not rank) in order of preference each applicant they interview.
- On the designated Match Day (in mid/late April), NMS's computerized algorithm will match each applicant with their preferred program (and program with their top ranked applicants).
    - For example, say you rank Program A as your top choice and Program B as your second choice. The computer will match you with Program A if that program puts you on their accept list and they haven't filled all of their spots before they get to your name on their list. If Program A fills all of their spots before they get to your name, then the computer will try to place you in Program B, as your second choice. If Program B has put you on their accept list and they have a spot open, you would get a position in Program B, and that's where you would go.
- You will receive an email notifying you if you matched to a program and, if so, which one. By participating in the match, you are agreeing to attend the program you matched with. For this reason, it is important that you only rank schools you would be willing and able to attend and make your ranking decisions carefully.
- There is a possibility that an applicant will not match with any programs. If this happens, the applicant would be notified that s/he did not match. If after the Match you were not placed in a program, there is typically an Unmatched Applicant process where unmatched applicants can connect with any programs that did not fill all of their spots. In any given year, there may only be a few unmatched spots, if any.

Good luck with the application and admissions process!

CENTER FOR
MOLECULAR MEDICINE AND GENETICS

Fall 2024



Inside this issue:

Faculty Spotlight — Audrey Fu, PhD

Dr. Audrey Fu Brings Expertise in Statistical Genetics


Audrey Fu, PhD

Dr. Audrey Fu, Associate Professor of Family Medicine and Public Health Sciences and of Molecular Medicine and Genetics, our newest faculty addition, is a statistician who aims to connect statistical methods with real-world biomedical challenges.

A graduate of the University of Washington, she received a PhD in statistics with a concentration in statistical genetics. Dr. Fu comes from the University of Idaho, where she most recently was an Associate Professor of Statistics and of Bioinformatics and Computational Biology in the Department of Mathematics and Statistical Science.

One factor that really stuck out to Dr. Fu about Wayne State's School of Medicine was that it offers a dynamic environment for interdisciplinary collaboration.

"I am excited to be at Wayne State and was really looking forward to working in a place where I could have close collaborators," Dr. Fu said. "At some places, research can often feel like a solo endeavor, especially in math and

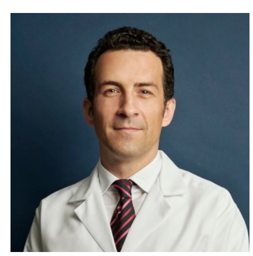
Fu article continued on page 3

Faculty Spotlight — Adi Tarca, PhD

Data Challenge Seeks to Advance Research on Placenta Aging

Dr. Adi Tarca, Professor of Molecular Medicine and Genetics and of Obstetrics and Gynecology, recently kicked off a research project called the Placental Clock DREAM (Dialogue on Reverse Engineering and Assessment Methods) Challenge. In this initiative, machine learning experts from around the world were tasked with creating models to predict the biological age of placentas using epigenetic data.

"The DREAM Challenge is all about bringing together the best minds to solve complex problems in biomedical research," said Dr. Tarca, who was recently appointed to the board of directors of the DREAM Challenge. "We provide participants with epigenetic data from placentas and challenge them to create models that accurately predict the age of these tissues. Gaining insights into how placentas age can help


Adi Tarca, PhD

Tarca article continued on page 2

Data Challenge cont.

from page 1

us better understand obstetrical syndromes."

More than 70 participants from around the world joined the DREAM Challenge, with data generated by the Perinatology Research Branch (NICHD) previously at Wayne State University / Detroit Medical Center being used to test the accuracy of their models. The top models were presented at the annual RECOMB/ISCB Conference on Regulatory & Systems Genomics with DREAM Challenges in October.

A key goal of the research is to explore the link between accelerated placental aging and pregnancy issues like preeclampsia and pre-term birth.

"We aim to see how the predicted age from the epigenetic profile relates to the actual age," Dr. Tarca said. "By identifying any discrepancies, we can better understand the role of placental aging in these diseases."

In addition to the DREAM Challenge, Dr. Tarca's lab is collaborating with Dr. Nardhy Gomez-Lopez's lab at Washington University in St. Louis as well as Wayne State's Dr. Roger Pique-Regi, Professor of Molecular Medicine and Genetics and of Obstetrics and Gynecology, on a project funded by the Burroughs Wellcome Fund to find biomarkers of obstetrical diseases in blood samples using single-cell placenta data. Dr. Gomez-Lopez is a former Center faculty member. The group plans to create machine learning models of pre-term birth by using blood omics data guided by single-cell biology of the placenta.

Single-cell placental data refers to a technique that allows researchers to study gene expression within individual cells in the placenta. This provides more insight into how each type of cell contributes to the overall health of the placenta and helps identify which cells are associated with certain pregnancy complications such as pre-term birth.

"By focusing on biomarkers identified through placenta data, we hope to refine our search and create more reliable models that can be validated across different cohorts," Dr. Tarca said. His studies also include grant proposals that focus on proteomics and machine learning to improve maternal-fetal medicine and omics data analysis. In collaboration with Dr. Kevin Theis, Associate Professor of Biochemistry, Microbiology and Immunology at Wayne State, and Dr. Gomez-Lopez, Dr. Tarca published a paper in *eLife* that highlighted how the vaginal immune proteome could help predict pre-term birth.

He is also working with Wayne State's Office of Women's Health on several clinical studies, which have led to new publications with researchers across Michigan.

Dr. Tarca's work showcases the Center's role in Wayne State's commitment to advancing medical science and improving patient care through data-driven research. His studies address some of the most pressing challenges in obstetrics and contribute to broader fields of medical research.

Faculty Spotlight—Dr. Maik Hüttemann

Adding Precision to Spinal Cord Treatment

Dr. Maik Hüttemann, Professor of Molecular Medicine and Genetics and of Biochemistry, Microbiology, and Immunology, is leading a collaborative effort that could transform how spinal cord injuries are most effectively treated. His team is exploring the ability of innovative, non-invasive technology based on near-infrared light to target the mitochondria – the cell's energy centers but also the main producers of toxic "free radicals," especially under conditions of stress – in the injured spinal cord.

The team's research is driven by a discovery that challenges conventional thinking. Previously, scientists believed that near infrared light activates mitochondrial function, helping cells generate energy. However, Dr. Hüttemann's team found specific wavelengths, particularly at 750 and 950 nanometers, that actually slow down the key mitochondrial enzyme cytochrome c oxidase in mitochondria. This counterintuitive approach might be a game-changer in treating spinal cord injuries.

"The idea with our therapy is that we want to get the patient treated as quickly as we can because, when someone suffers a spinal cord injury, the mitochondria go into overdrive, creating harmful free radicals that cause cells to die," said Dr. Hüttemann. "Our goal is to use infrared light to calm those mitochondria down and prevent further damage."

The non-invasive nature of Dr. Hüttemann's method could be a key advantage for the more than 300,000 people estimated to live with a spinal cord injury in the United States. The light can be applied directly to the site of injury through a special device and deliver immediate results. Unlike traditional drugs that need time to circulate through the bloodstream, this method works on the spot, offering a potentially faster and more targeted response.

Maik Hüttemann, PhD

"Picture a first responder arriving at the scene of a car accident, using this light therapy to treat a spinal cord injury right away," Dr. Hüttemann said. "The sooner we can apply the treatment, the better the chances of minimizing damage."

continued on page 4

Fu Spotlight

from page 1

statistics. But here at Wayne State, I have the chance to work alongside experts in family medicine, genetics, and biomedical sciences, which makes my work more impactful and relevant."

At Wayne State, Dr. Fu's research will focus on causal inference and deep learning, two fields that are changing how researchers deal with complex biomedical data.

In causal inference, Dr. Fu is creating new methods to find causal relationships between genes without using traditional experiments, which can be expensive and take a long time. Her work with Mendelian randomization, which uses genetic data to mimic experimental conditions, could give key insights into the genetic causes of diseases like high blood pressure, providing a new way to look at complex biological interactions.

In deep learning, Dr. Fu is building algorithms specifically for genomic data, aiming to map gene regulatory networks as hierarchies of multiple levels. Her method uses graph neural networks to examine these networks at different levels with an increasing resolution, from broad big-picture views down to single genes. She uses the analogy of zooming in on a map from a country's borders to the streets of a city.

Dr. Fu's move to Wayne State also highlights a growing trend in biomedical research: collaboration. Unlike in theoretical mathematics or statistics, where assumptions can be made without real-world data, biomedical research needs people in different fields to work together to ensure that models and algorithms are correct.

"Collaboration is essential in biomedical sciences because the problems are very real and complex," Dr. Fu said. "What seems crucial from a statistical standpoint might not matter as much in a biomedical context, and vice versa. That's why it's so important to work closely with researchers from different disciplines."

Please welcome our incoming Fall 2024 Graduate Students!

MS Genetic Counseling Students

- Chad Adkins (University of Toledo)
- Nikki Coleman-Glasser (Ohio State University)
- Susanna Hagan (University of Michigan)
- Zahra Jaffar (University of Western Ontario)
- Lucy Jennings (Clemson University)
- Jaclyn Melasi (Michigan State University)
- Erica Schafer (Michigan State University)
- Aleksandra Srbovska (University of Guelph)

PhD Molecular Genetics and Genomics Students

- Nevil Khurana, MS (Georgetown University)
- Celestina Klaye, MS (Virginia Commonwealth University)
- Carson Moen (Saginaw Valley State University)
- Kristen Tran (Michigan State University)

MS Molecular Genetics and Genomics Students

- Christina Diez (Lawrence Technical University)
- Courtney Fillmore (Wayne State University)
- Sebastian Morales-Bermudez Espinel (Universidad Peruana Cayetano Heredia)
- Sydney Rudolph (Wayne State University)
- Eboni Sawyer (University of Michigan)

Faculty and Student Honors

Erin Carmany, MS, CGC was awarded the Wayne State University President's Award for Excellence in Teaching.

Ren Zhang, PhD was awarded the 2024 School of Medicine Teaching Award.

Allison Jay, MD was promoted to Adjunct Clinical Professor in March 2024. Dr. Jay is the Director of Cancer Genetics at the Van Elslander Cancer Center in Grosse Pointe.

Maik Hüttemann, PhD was awarded the 2024 Wayne State University Board of Governors Award.

Claire McCarthy-Leo, PhD successfully defended her PhD on June 6, 2024. Dr. McCarthy-Leo was mentored by Dr. Michael Tainsky.

Have an accomplishment to share?

Please contact us at

info@genetics.wayne.edu

Spinal Cord Treatment Innovation cont.

from page 2

Collaboration is also a big part of this project, described as a co-principal investigator grant application and currently supported by a $2.76 million grant from the National Institutes of Health. Leading the grant with Dr. Hüttemann is Dr. Moh Malek of Wayne State, and they are also joined by WSU colleagues Dr. Dragana Komnenov and Dr. Dennis Goebel. Outside of Detroit, the Wayne State team is also collaborating with experts from the University of Michigan and the University of Texas.

The team's ambitions aren't limited to spinal cord injuries, either. They're also developing medical devices for brain injuries, targeting conditions like strokes and cardiac arrest, where brain cells are starved of oxygen. Through the startup company Mitovation that Dr. Hüttemann co-founded, they hope to translate their lab work into real-world treatments that could benefit patients.

"We're thrilled to start this next phase. It's been a long journey, but we believe this technology has the potential to make a real difference," Dr. Hüttemann said.

As the research progresses, there's a growing sense of anticipation about how this new approach could transform the way spinal cord injuries and other medical conditions are treated.

Congratulations to

Warlley Cunha, a Molecular Genetics and Genomics PhD student in Dr. Espinosa-Diez's lab, was recently awarded a Histochemical Society 2024 Cornerstone Grant that will support his project, *"Investigating the Role of CASC15 in Vascular Health and CKD Progression."* This project has the potential to uncover critical insights into the mechanisms driving microvascular remodeling and senescence in CKD and to identify novel therapeutic targets for preventing or mitigating the vascular damage associated with this disease.

Faculty Spotlight—Alexander Gow, PhD

A New Approach to Multiple Sclerosis Research

Dr. Alexander Gow, Professor of Molecular Medicine and Genetics, and of Pediatrics, and of Neurology, believes that the early onset of MS may begin in patients years, or potentially decades, before the symptoms become noticeable.

"We know of disease processes in oligodendrocytes from MS patients that are not directly linked to autoimmunity," Dr. Gow said. "Could these processes contribute to the disease? That is our question."

Dr. Gow is studying the disease's effects on oligodendrocytes, a type of neuroglia that play an important role in the central nervous system by providing support and insulation to axons. By studying oligodendrocyte metabolism and the stress it causes, Dr. Gow aims to provide new insight on the origins and development of MS within patients.

A promising aspect of Dr. Gow's research has been the identification of a protein in oligodendrocytes called Trb3, which might be a potential target for new drug treatments. Dr. Gow's team will test whether Trb3 can reduce disease in oligodendrocytes and will characterize two other proteins that interact with Trb3, known to control metabolism in cells.

"We have identified a protein in oligodendrocytes, called Trb3, that might be a good drug target for this," said Dr. Gow. "In this project, we will test whether Trb3 can reduce disease in oligodendrocytes. We will also characterize two other proteins that interact with Trb3 because they are known to control metabolism in cells."

Dr. Gow will focus on processes involved with oligodendrocyte metabolism and how it may cause a type of damaging stress in the cells. This stress can also be associated indirectly to the activation of inflammatory cells in the brain and, by looking at MS from this new perspective, Dr. Gow and his team may develop a better understanding of how MS begins and advances as well as improved treatments for the disease, thereby improving the lives of people affected by this chronic condition.

Dr. Gow's work is being funded by an award from the National Multiple Sclerosis (MS) Society – part of his ongoing commitment to transforming the medical community's understanding of neurological diseases. The three-year, $644,827 grant, supports Dr. Gow's study on metabolic stress and oligodendrocyte pathophysiology. Dr. Gow, who has been studying genetic diseases since 1990, views this grant as a significant step forward in uncovering the early roots of MS.

Alexander Gow, PhD

Faculty Spotlight—James Granneman, PhD

Collaborative Approach Seeking Breakthroughs in Fat Metabolism


James Granneman, PhD

James Granneman, Professor of Molecular Medicine and Genetics and of Internal Medicine, is leading a group of researchers across multiple Wayne State University departments, to make significant strides in understanding fat metabolism, with potential therapeutic applications for major health issues such as diabetes, obesity, and cancer. He and the other team members are part of the Barber Integrative Metabolic Research Program that is leading innovative projects aimed at harnessing the power of fat tissue for better health outcomes.

The Barber Program, established in December 2023, brings together a diverse team of around 30 PIs, postdocs, and students from multiple institutions. A key feature of these projects is their transdisciplinary nature. "It's university-wide, not just the School of Medicine. I think it's somewhat of a rare beast at Wayne State that we actually have a truly organic collaboration that spans the School of Medicine and College of Liberal Arts and Sciences at Wayne State, and Henry Ford Health System," said Dr. Granneman.

Supported by a philanthropic donation from the late Richard Barber, the program includes cell biologists, physicists, computational biologists, and cancer researchers. Dr. Christopher Kelly, Associate Professor, and Dr. Mindy Huang, Assistant Profesor, from the Department of Physics study the membrane biophysics and molecular dynamics of ABHD5, while Dr. Hyeong-Reh Kim, Professor, and Dr. Jian Wang, Associate Professor, from the Department of Pathology explore its cancer therapy implications. Additionally, Dr. Emilio Mottillo, Associate Scientist of Henry Ford Health and Associate Professor of Physiology at Wayne State University investigates fat metabolism in the liver, with potential applications for treating fatty liver disease.

Currently, the Granneman lab is focused on two NIH-funded projects related to lipid metabolism. The first project investigates the biology of adipose tissue and addresses how new fat cells are formed. Contrary to popular belief, fat tissue plays a crucial role in protecting the body from diabetes by safely storing excess energy. However, when this storage capacity is exceeded, as occurs in obesity, additional fat spills into other tissues, which triggers insulin resistance and diabetes. The importance of fat tissue in metabolic health is highlighted by the fact that individuals who lack fat tissue for genetic reasons cannot store fat energy and are highly prone to developing diabetes.

The Granneman lab aims to identify and understand the different cell types within adipose tissue, especially progenitor cells that can transform into fat cells. These progenitor cells constantly monitor the body for metabolic imbalances and are poised to become new fat cells when needed. Using cutting-edge techniques like single-cell RNA sequencing, genetic tracing, and 3D histochemical analysis, Dr. Granneman's team can study the microscopic signaling processes within fat tissue. This research provides valuable insights into how new fat cells form and function.

The second project focuses on characterizing lipolysis, the process by which cells break down stored fat to release energy. The team discovered that the protein ABHD5 is a master regulator of lipolysis. Interestingly, ABHD5 lost its enzymatic activity around 500 million years ago but retained its ability to bind lipids, evolving into a receptor that regulates other enzymes.

By conducting chemical screening and computational analyses, the team developed synthetic activators and inhibitors of ABHD5. These compounds can regulate lipolysis in fat tissue as well as other tissues, offering potential therapeutic applications. One exciting element of this research is targeting cancer cell survival pathways, suggesting that these ligands might have anti-cancer properties. Additionally, these synthetic ligands show promise for treating various metabolic disorders.

As Dr. Granneman's collaborative team continues to unravel the complexities of fat metabolism, their work shows great potential for developing new treatments beyond diabetes and obesity, for instance extending to cancer and liver disease, while demonstrating the power of collaborative research.

Come join us for one of the Center's 2024-2025 seminars.

The schedule can be found at *https://genetics.wayne.edu/news-events*

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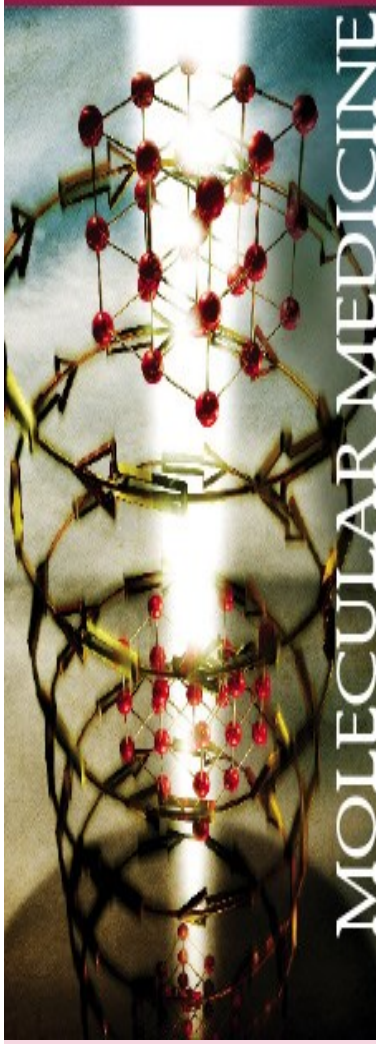

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Graduate Programs:

PhD in Molecular Genetics and Genomics

MS in Molecular Genetics and Genomics

MD/PhD in Molecular Genetics and Genomics

MS in Genetic Counseling

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Associate Director: Alexander Gow, PhD

Division Directors

Basic Science Research: Maik Hüttemann, PhD
Clinical Genetics: Angela Trepanier, MS, CGC
Education: Russell L. Finley, Jr., PhD

Primary Faculty:

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Erin Carmany, MS, CGC
Cristina Espinosa-Diez, PhD
Russell L. Finley, Jr., PhD
Alexander Gow, PhD
James G. Granneman, PhD
Lawrence I. Grossman, PhD
Henry H.Q. Heng, PhD
Maik Hüttemann, PhD
Hyunbae Kim, PhD
Roger Pique-Regi, PhD
Adi Tarca, PhD
Angela Trepanier, MS, CGC
Yan Yuan “Jeffrey” Tseng, PhD
Kezhong Zhang, PhD
Ren Zhang, PhD

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Stephen A. Krawetz, PhD
Li Li, PhD
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Pam Sims, MBA

Newsletter Written and Edited by:
Brad Pettiford

Tuition Estimate

Current Tuition Rate Year: 2025-2026

FIRST YEAR FALL SEMESTER-IN STATE/GOOD NEIGHBOR (OH counties: Fulton, Lucas, Ottawa, Williams or Ontario, Canada)

Selected Options

- Number of Credits: 15
- Education Level: Graduate
- College: School of Medicine
- Residency: In-State

Itemized Fees

Item	Fee
Tuition - Per Credit Fee	$1,037.28
Student Services Fee - Per Credit	$66.95
Registration Fee	$387.41

Tuition Estimate

Item		Total
Tuition	$1,037.28 x 15 Credits	$15,559.20
Student Services Fee	$66.95/credit x 15 Credits	$1,004.25
Registration Fee		$387.41
	Total Estimate	**$16,950.86**

Tuition Estimate

Current Tuition Rate Year: 2025-2026

FIRST YEAR WINTER SEMESTER-IN STATE/GOOD NEIGHBOR (OH counties: Fulton, Lucas, Ottawa, Williams or Ontario, Canada)

Selected Options

- Number of Credits: 14
- Education Level: Graduate
- College: School of Medicine
- Residency: In-State

Itemized Fees

Item	Fee
Tuition - Per Credit Fee	$1,037.28
Student Services Fee - Per Credit	$66.95
Registration Fee	$387.41

Tuition Estimate

Item		Total
Tuition	$1,037.28 x 14 Credits	$14,521.92
Student Services Fee	$66.95/credit x 14 Credits	$937.30
Registration Fee		$387.41
	Total Estimate	**$15,846.63**

Tuition Estimate

Current Tuition Rate Year: 2025-2026

SECOND YEAR-SUMMER, FALL & WINTER SEMESTERS-IN STATE/GOOD NEIGHBOR (OH counties: Fulton, Lucas, Ottawa, Williams or Ontario, Canada)

Selected Options

- Number of Credits: 16
- Education Level: Graduate
- College: School of Medicine
- Residency: In-State

Itemized Fees

Item	Fee
Tuition - Per Credit Fee	$1,037.28
Student Services Fee - Per Credit	$66.95
Registration Fee	$387.41

Tuition Estimate

Item		Total
Tuition	$1,037.28 x 16 Credits	$16,596.48
Student Services Fee	$66.95/credit x 16 Credits	$1,071.20
Registration Fee		$387.41
	Total Estimate	**$18,055.09**

TOTAL ESTIMATED TUITION IN STATE/GOOD NEIGHBOR: $50,852.58

Tuition Estimate

Current Tuition Rate Year: 2025-2026

FIRST YEAR-FALL SEMESTER-OUT OF STATE/INTERNATIONAL (aside from Ontario, Canada)

Selected Options

- Number of Credits: 15
- Education Level: Graduate
- College: School of Medicine
- Residency: Out of State

Itemized Fees

Item	Fee
Tuition - Per Credit Fee	$1,958.20
Student Services Fee - Per Credit	$66.95
Registration Fee	$387.41

Tuition Estimate

Item		Total
Tuition	$1,958.20 x 15 Credits	$29,373.00
Student Services Fee	$66.95/credit x 15 Credits	$1,004.25
Registration Fee		$387.41
	Total Estimate	**$30,764.66**

Tuition Estimate

Current Tuition Rate Year: 2025-2026

FIRST YEAR-WINTER SEMESTER-OUT OF STATE/INTERNATIONAL (aside from Ontario, Canada)

Selected Options

- Number of Credits: 14
- Education Level: Graduate
- College: School of Medicine
- Residency: Out of State

Itemized Fees

Item	Fee
Tuition - Per Credit Fee	$1,958.20
Student Services Fee - Per Credit	$66.95
Registration Fee	$387.41

Tuition Estimate

Item		Total
Tuition	$1,958.20 x 14 Credits	$27,414.80
Student Services Fee	$66.95/credit x 14 Credits	$937.30
Registration Fee		$387.41
	Total Estimate	**$28,739.51**

Tuition Estimate

Current Tuition Rate Year: 2025-2026

SECOND YEAR-SUMMER, FALL & WINTER SEMESTERS-OUT OF STATE/INTERNATIONAL (aside from Ontario, Canada)

Selected Options

- Number of Credits: 16
- Education Level: Graduate
- College: School of Medicine
- Residency: Out of State

Itemized Fees

Item	Fee
Tuition - Per Credit Fee	$1,958.20
Student Services Fee - Per Credit	$66.95
Registration Fee	$387.41

Tuition Estimate

Item		Total
Tuition	$1,958.20 x 16 Credits	$31,331.20
Student Services Fee	$66.95/credit x 16 Credits	$1,071.20
Registration Fee		$387.41
	Total Estimate	**$32,789.81**

TOTAL ESTIMATED TUITION OUT OF STATE/INTERNATIONAL (aside from Ontario, Canada): $92,293.98

Wayne State University and Detroit Information:

Wayne State University-learn about our great campus and community

https://wayne.edu/campus

https://vr.wayne.edu/about/

Photo Tour of Wayne State Campus

https://www.flickr.com/people/waynestateuniversity/

Virtual Tour of WSU School of Medicine Campus

https://www.massinteract.com/wayne-state-university-med-school/#30753338p&1.15h&96.55t

Visit Detroit-discover great things to see and do in Detroit

https://visitdetroit.com/

Pure Michigan-learn more about our beautiful Great Lakes state.

https://www.michigan.org/

Advocacy Opportunities

Advocacy experience is a requirement for admission into the Wayne State University Genetic Counseling Program and most other genetic counseling programs. The Wayne State program recommends advocacy experiences that include training in interpersonal communication/counseling skills and the opportunity to use these skills with clients. We prefer that applicants have at least 6 months of advocacy experience. Below is a list of some opportunities most of which are in Southeast/Mid-Michigan but in other areas as well. This is not an all-inclusive list. If you have questions about whether your advocacy experience fits the WSU program's requirement, please contact us at 313-577-6298 or geneticcounseling@med.wayne.edu.

Ozone House, Ann Arbor Michigan. Crisis Hotline Volunteer

Ozone House is always seeking compassionate volunteers to become Crisis Line counselors. Crisis Line volunteers listen and provide critical information, referrals, and crisis intervention to youth and families struggling with such issues as family conflict, runaway episodes, homelessness, suicide, abuse and neglect, domestic violence, sexual orientation and gender identity, and other crises. Crisis Line Counselors complete 40-hours of training on two Wednesday evenings and two consecutive weekends. Once completed, volunteers commit to one 4-hour shift per week for 6+ months. To apply, go to https://ozonehouse.org/support-us/volunteer/.

Common Ground Crisis & Resource Hotline, Crisis Chat and Text Program (Bloomfield Hills and Royal Oak)

Common Ground is a 24-hour crisis services agency dedicated to helping youths, adults, and families in crisis. Through the crisis line, text line, online chat, and in person services, the organization provides professional and compassionate service to more than 80,000 people each year. Common Ground is dedicated to the core purpose of helping people move from crisis to hope through the core values of empowerment, collaboration, innovation, and diversity and inclusion. Common Ground is a nationally recognized crisis services organization and it aims to attract and retain highly qualified staff, volunteers, and board members to achieve its purpose.

For the Crisis & Resource Hotline, Crisis Chat and Text programs, volunteers receive more than 70-hours of professional training to prepare them for crisis calls. The training program, offered three times a year, includes in-depth sessions on domestic violence, sexual assault, mental illness, suicide, substance abuse, codependency and youth issues, as well as communication skills.

For more information, prospective volunteers go to https://commongroundhelps.org/get-involved/.

The Listening Ear Crisis Hotline, Lansing Michigan

The all-volunteer staff provides free crisis counseling to telephone and walk in clients 24 hours a day, 7 days a week. Volunteers also offer sexual assault counseling free of charge. All services offered are anonymous and confidential. Volunteers receive 1000 calls a month from people of all ages, social backgrounds, and ethnic groups, and are trained to deal with a wide variety of crises, including: Drugs and alcohol, sexual assault, suicide, depression, information or referrals. The Listening Ear's training program has been called one of the most effective programs in the country for teaching empathy, crisis intervention skills, and active listening. Many volunteers describe training as the most powerful life-changing experience they've ever been through. The 60+ hour program, spread over two weekends, consists of: lectures, exercises, small group interactions, role plays. To volunteer, you must first attend an orientation. Check the orientation schedule http://theear.org/volunteering/ or email ContactUs@TheEar.org

SandCastles Grief and Support for Children and Families (Henry Ford Hospice, Detroit MI)

SandCastles is looking for caring individuals who are interested in helping grieving children and teens. Many opportunities are available at program, camp and in the office. A SandCastles Orientation will provide you with all the details and requirements of the roles. The Facilitator Training is a four- session course, with additional mentorship at program sites. No experience or degree is required, simply a kind and willing heart. Training covers child development, grief and loss education, group facilitation techniques and personal awareness plus much more. It is required for both program and camp facilitators. For information go to https://aboutsandcastles.org/get_involved/volunteer/.

Ele's Place, Bereavement Peer Support Groups - Ann Arbor, Grand Rapids, and Lansing

Ele's Place is a healing center for grieving children and teens. Each week, peer support group programs help hundreds of children, ages 3-18, learn how to cope and begin to heal after the death of a parent, sibling or other close family member or friend. Before coming to Ele's Place, many grieving children feel alone and keep their feelings inside, not wanting to burden their parents or other family members. Often, friends don't seem to understand if they haven't had a similar experience. But each week at Ele's Place, hundreds of grieving children and teens find a warm and welcoming place to meet new friends who really understand how they feel, while they begin to heal after the death of a loved one. For more information go to https://www.elesplace.org/about/get-involved/volunteer-opportunities

Turning Point, Mt. Clemens, MI

Domestic violence and sexual assault rob an individual of their sense of safety, power, and dignity. Domestic and sexual violence are acts of power and control and are not caused by the victim/survivor. Turning Point provides emergency and support services to meet both the immediate and long-term needs of survivors of domestic and sexual violence. We strive to provide a safe non-judgmental place for survivors to explore their feelings and options, and regain control of their lives. We recognize the enormous strengths survivors possess and value your experiences and input into our service delivery. Turning Point has a number of volunteer opportunities. For more information go to https://turningpointmacomb.org/help-us/volunteer/

Crisis Text Line

Crisis Text Line is the free, 24/7 text line for people in crisis in the United States. The service is powered by volunteer Crisis Counselors who work remotely anywhere with a computer and secure internet connection. Crisis Counselors answer texts from people in crisis, bringing them from a hot moment to a cool calm through active listening, collaborative problem solving, and safety planning.

Volunteers commit to 200 total hours, serving a recommended 4 hours/wk. to meet this requirement.

Crisis Counselors must be 18 or older and have a US Social Security Number. This training is free for you, but it costs Crisis Text Line $1,008 to train each Crisis Counselor. We therefore need volunteers to see training through to the end and serve out their 200-hour commitment. Volunteers do 30 hours of web-based training before being eligible to take crisis text calls. For more information, go to https://www.crisistextline.org/volunteer/

Michigan State University Center for Survivors
The MSU Center for Survivors works with sexual assault survivors and all others who are impacted by sexual violence. The Center provides counseling, advocacy, and support groups to MSU students. The 24-hour crisis line and advocacy services are offered to anyone in the greater Lansing community. Services include immediate crisis intervention and advocacy services to individuals impacted by rape or sexual violence. Crisis Intervention & Advocacy Services available include: a 24-hour hotline, institutional and legal advocacy. These services are available to survivors of sexual assault and their non-offending significant others. The Center provides free and confidential individual counseling and support groups to MSU students who are survivors of adult sexual assault or childhood sexual abuse. We offer a variety of groups for all gender identities.

The MSU Center for Survivors has volunteer positions that will help you develop practical, work-related skills while providing essential services to people in need and reducing violence in the campus community. Service areas include: 24-hour crisis line, crisis chat, and peer education and outreach. Sexual assault crisis intervention advocates (SACI) must complete a 45-hour mandatory training and a 5-hour medical training. For more information, please go to https://centerforsurvivors.msu.edu/volunteer/index.html

Opportunities in Other Parts of Michigan

There are many other advocacy opportunities in other parts of Michigan and in other states. Below are some other Michigan opportunities. If you decide to look into one of these, once you have the details about what training/volunteering will entail, we would be happy to discuss whether this meets our advocacy requirement.

- Dial Help: Includes victim service unit volunteer, helpline volunteer, sexual assault response team volunteer, and others. In Houghton, MI. For more information go to https://dialhelp.org/volunteer
- Central Michigan University Sexual Aggression Peer Advocates. Must be a CMU student. For more information go to: https://www.cmich.edu/offices-departments/sexual-aggression-peer-advocates/get-involved
- RAINN is a national sexual assault hotline that partners with organizations across the country that provide sexual assault crisis counseling services. Go to https://volopps.rainn.org/ to find out if there are opportunities in your area.

Opportunity in Windsor

- Distress Centre of Windsor. Offers a crisis line, text line, and online chat service. For information about volunteer opportunities go to https://www.downtownmission.com/getinvolved/volunteer/

National Opportunities

- Hospice Foundation of America. Website that provides background information on how to find volunteer opportunities with hospice organizations and general requirements https://hospicefoundation.org/Volunteer

- Crisis Text Hotline (see details listed under Michigan opportunities) https://www.crisistextline.org/volunteer/

- Suicide Prevention Lifeline. Network of crisis centers across the U.S. A crisis center is a resource for individuals going through mental health crises. They provide mental health services and emotional support for their state or local communities. Most crisis centers are non-profit and many utilize trained volunteers as well as mental health professionals. Search by zip code to see if there is a center in your area and then look for volunteer opportunities. https://suicidepreventionlifeline.org/our-crisis-centers/

Genetic Counseling Resource List

Information for Applicants

Accreditation Council of Genetic Counseling's List of Accredited Programs
https://www.gceducation.org/find-a-program/

National Society of Genetic Counselors Become a Genetic Counselor Resources
https://www.nsgc.org/BecomeaGC

Genetic Counselor Educators Association https://educategc.org/prospective-students/

My Gene Counsel Genetic Counseling Toolkit For Students
https://www.mygenecounsel.com/genetic-counseling-toolkit-for-students/

Information about the Career

Article and Newscast: Genetic Counseling Field to Rapidly Expand:
https://www.cnbc.com/2017/08/02/genetic-counseling-field-to-rapidly-expand.html

Article: Genetic Counseling Growing Area of Opportunity
http://www.sciencemag.org/careers/2016/06/genetic-counseling-growing-area-opportunity

Article: Genetic Counselor Interview (with Nancie Petrucelli, a WSU Genetic Counseling Program faculty member) https://www.jyi.org/2017-april/2017/5/2/a-marriage-of-psychology-and-genetics-the-field-of-genetic-counseling?rq=nancie%20petrucelli

Article: Genetic Counseling 2.0. https://www.clinicalomics.com/magazine-editions/volume-6-issue-number-6-november-december-2019/genetic-counseling-2-0/

Web Resource: Bureau of Labor Statistics Occupational Outlook Handbook, Genetic Counselors https://www.bls.gov/ooh/healthcare/genetic-counselors.htm

Web Resource: About Genetic Counselors (from the National Society of Genetic Counselors) http://www.aboutgeneticcounselors.com/

Video: All about Genetic Counseling. What it is, how to get into a program, average salary. https://www.youtube.com/watch?v=0QND1JjT55U

Video: What is a Genetic Counselor? (from the National Society of Genetic Counselors)
https://www.youtube.com/watch?v=GDjLazXGV0s

Video: What is Genetic Counseling? Jaclyn Haven, TEDxHelena (TED talk)
https://www.youtube.com/watch?v=7yIW0L9dLCQ

Video: Career Story- Genetic Counselor.
https://www.youtube.com/watch?v=LQRXB2ZcmXc

American Board of Genetic Counselors Spotlights (series of short, personal stories about being a certified genetic counselor) https://www.abgc.net/ABOUT-ABGC/ABGC-Updates

Patient /Genetic Testing Stories in the News and Personal Stories

Video: Navigating Genetic Disease Testing: A Personal Story.
https://www.youtube.com/watch?v=5_O5TfMVqD8

Article: What Your Doctor Isn't Telling You about 23andMe and Other Genetic Tests.
http://www.rd.com/health/conditions/genetic-tests-worth-it/

Article and Newscast: Two Women, Two Results: The Agonizing Wait for Cancer Gene Tests http://www.nbcnews.com/nightly-news/two-women-two-results-agonizing-wait-cancer-gene-tests-n361451

Series of Articles: Special Report: Genetic Testing Goes Mainstream. Series of articles on different aspects of genetic testing. https://www.sciencenews.org/article/consumer-genetic-testing-ancestry-dna

Newscast: Forward Focus: Genetic testing inspires local mother's voluntary double mastectomy
https://wwmt.com/news/forward-focus/genetic-testing-inspires-local-mothers-voluntary-double-mastectomy

Article: Meet Your New Genetic Counselor
https://www.forbes.com/sites/insights-intelai/2019/02/11/meet-your-new-genetic-counselor/#6e94b4d6667c

Articles/Personal Stories Children's Hospital of Philadelphia
https://www.chop.edu/centers-programs/division-human-genetics/patient-stories

National Society of Genetic Counselors Educational Webinars for Consumers

Genetic Testing and Pregnancy: A Genetic Counselor Guides you through your Testing Options https://www.youtube.com/watch?v=sLuloVWuoZQ

Taking Heredity to Heart: The Role of Genetics in Cardiovascular Disease
https://www.youtube.com/watch?v=QH_OUdqJKoY

Ancestry and Other Direct-to-Consumer Genetic Testing
https://www.youtube.com/watch?v=hVnkChjgBEk&t=49s

Genetic Counseling Training and Practice Resources

Accreditation Council of Genetic Counseling Practice-Based Competencies (Knowledge, skills and attitudes students must have upon completion of a genetic counseling program) https://www.gceducation.org/forms-resources/

National Society of Genetic Counselors' Code of Ethics (Document that clarifies and guides the conduct of genetic counselors so that the goals of the profession might be best served) and Conflict of Interest https://www.nsgc.org/Policy-Research-and-Publications/Code-of-Ethics-Conflict-of-Interest