



SRI RAMACHANDRA
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Deemed to be University)

POSTGRADUATE AND DOCTORAL PROGRAM
HUMAN GENETICS

DEPARTMENT OF
HUMAN GENETICS



What is the Human Genetics Program About?

The Human Genetics program adopts a three pronged approach; integrating academics, research and diagnostics to maximize each student's learning experiences.



OVERVIEW

Human Genetics is one of the most vibrant, compelling, and relevant scientific disciplines of the 21st century and the department is proud to contribute to this constantly evolving science since 1998. The integrated academic, research and diagnostic activities housed within our department provides outstanding opportunities for students who wish to pursue a career in research, education, and service in this field.

In addition to didactic large group teaching sessions, the program is also delivered through small group teaching sessions (problem-based learning, laboratory practical, workshops, tutorials, seminars, and presentations). Such sessions will provide opportunities for the development of a range of skills necessary for a career in genetics. The projects in Semester 4 provide an opportunity for students to conduct studies in the field of human genetics and it is hoped that students will acquire critical thinking and analytical skills necessary for careers in research, academics and industry.

HIGHLIGHTS

- Integrated academic, research and diagnostic activities
- Innovative teaching and assessment
- Opportunities to explore independent research under a mentor
- Genetic diagnostic laboratory offers opportunities to evidence based learning.
- Excellent support and placement

ELIGIBILITY (M. Sc)

MBBS or B.Sc. [Allied Health Sciences / Biology / Biochemistry / Biomedical Sciences / Biotechnology / Botany / Emergency Trauma Care Technology / Genetics / Microbiology / Life Sciences / Zoology / Agriculture / Hons. / BDS / B.V.Sc. / B. Tech. (Biotechnology, Genetic Engineering) / degree examination of any University recognized by the University Grants Commission (UGC).

Duration: 2 years (4 semesters)

Commencement: July/August

Fee: INR 1,25,000

ELIGIBILITY (Ph. D)

Candidates applying for admission to Ph.D. program should have qualified with at least 55% marks in aggregate or its equivalent grade "B" in the UGC 7-point scale (or an equivalent grade in a point scale wherever grading system is followed) in a PG course.

Duration: 3-6 years

Commencement: April/October

Fee: * visit sriramachandra.edu.in

Word from the Department Authorities

“ The M. Sc and Ph. D program in Human Genetics aims to produce work-ready graduates well-equipped with knowledge and are competent in practical, as well as soft skills. The program enables the students to acquire current knowledge in the field, promotes their analytical and critical thinking and sharpens their communication abilities. The curriculum prepares the students well to serve in the profession, enabling them to be highly sought after both nationally and internationally.

PROF. SOLOMON F.D. PAUL
Principal, Faculty of Biomedical Science and Technology

The Department of Human Genetics is dedicated to the promotion, development and delivery of excellence in human genetics. We support our students through training, education and personal development, setting quality standards and supporting our profession.

PROF. P. VENKATACHALAM
Head, Department of Human Genetics
Faculty of Biomedical Science and Technology

Why Study Human Genetics at SRIHER?

1 An Established Private Healthcare Institution

SRIHER is an established private medical and healthcare institution with over 37 years of dedicated focus in healthcare education. SRIHER is accredited by NAAC with A++ Grade & Graded by UGC as a Category I University

2 Build Your Future Healthcare Professional Network

As SRIHER offers the widest range of healthcare program, our students are fully immersed in a vibrant community of students and practitioners from all fields. This allows for the development of strong friendship amongst peers that will be the foundation of an extensive professional network upon graduation.

3 Curriculum Benchmarked to International Standards

The Human Genetics curriculum has been developed to meet high international standards and is recognized by National and International Universities

4 Better Exposure to Practical Training

Students will have many hours of hands-on practical sessions where every student has the opportunity to hone his/her skills in the cytogenetic lab, molecular genetic lab, immunogenetics, etc. This will be an advantage to the students in their future careers.

5 Better Preparation to be a Researcher/Scientist

With exposure to independent research in the fourth semester, students will be better prepared to be a competent scientist.

6 Accreditations

The department of Human Genetics has been accredited by the prestigious agencies that add value and quality to the program and includes the Atomic Energy Regulatory Board (AERB) certification for Biodosimetry, NABL accreditation for genetic testing services, Government of Tamil Nadu authorization for prenatal diagnosis.

How Does the Program Work?

The Curriculum works on the internationally acknowledged choice-based credit system (CBCS). CBCS not only offers opportunities and avenues to learn core subjects but also exploring additional avenues of learning beyond the core subjects for holistic development of an individual.



PROGRAM STRUCTURE

SEMESTER 1	SEMESTER 2	SEMESTER 3	SEMESTER 4
Molecular Cell Biology and Physiology	Advanced Molecular Genetics	Radiation Genetics and Toxicology	Practice Of Genetic Testing and Accreditation
Biochemical Genetics	Cancer Genetics	Immunogenetics	Clinical Rotation - I
Medical Genetics	Human Development and Prenatal Genetics	Population Genetics and Genetic Epidemiology	Dissertation And Viva-Voce
Biophysics and Instrumentation	Genetic Counseling	Stem Cell Genetics and Regenerative Medicine	
Biostatistics	Genetic Research Skills Development	Research Methodology	
Bio-Analytical Techniques (Practical)	Molecular Biology Techniques (Practical)	Immuno-techniques (Practical)	
Cytogenetic Techniques (Practical)	Development Genetics and Prenatal Diagnosis (Practical)	Biomarkers And Genetic Toxicity (Practical)	
	Electives (GE and SE)	Electives (GE and SE)	



The curriculum is reviewed periodically and is subject to change.

PROGRAM STRENGTHS

1

Multidisciplinary Research

There is a diverse range of research happening throughout the program, and opportunities to get involved are available to both undergraduate and graduate students.

2

Genetic Diagnostics

The genetic diagnostic laboratory offers opportunities for students to learn about genetic testing strategies and their application in the clinical setting. These services also enable us to provide “teach by example”, using real cases for teaching.

3

Intra- and Inter-Institution Learning Processes for research and training

The department extends its expertise and facilities to students of other faculties, department and institutions for training (do-it-yourself, internships) and research (UICLIC). This provide the students with the opportunity to learn from one another, share their diverse experiences and perspectives and develop a learning community of students.

ASSESSMENT

Students will be assessed (formative and summative) through their class tests, practical reports, workshops, projects, logbooks, written reports, presentations, dissertations with an end-of-semester examination.

RECOGNITION

M.Sc and Ph.D Human Genetics students have made significant achievements in their academic and research portfolios. A notable recognition being the positive feedback from external supervisors on the performance of our students who have found employment or a research career in pan-India, United States, Singapore, United Kingdom, Australia, China, Canada and New Zealand, to name a few. Such positive feedback reinforces the department reputation of its graduates' quality.

CAREERS

As the details of the human genome unfolded, the variety of opportunities for people with degrees and training in human genetics is continuing to expand. There are opportunities in basic and clinical research, in medical professions, and in interdisciplinary fields, such as patent law.

The genetics workforce is not sufficient even now, and demand continues to increase. For example, as genetic testing becomes more commonplace, and a part of many routine medical evaluations, more laboratory geneticists will be needed to perform the tests, and counselors will be needed to interpret and explain the results to individuals and families. Genetic counseling is a career attracting graduates with an interest in medical genetics and face-to-face patient interaction.

As genetics is recognized to be a basic part of all biological sciences, more and more teachers with expertise in genetics will also be needed. These are just a few examples of the growing demand for professions trained in genetics.

CAREER PATHS

A human genetics degree can lead to a career in health, scientific research or industry and also provides a range of skills that can be used in many other sectors

KEY AREA	WORKSCOPE
Healthcare Public & private hospital laboratories, public health laboratories, private laboratories	<ul style="list-style-type: none">• Analysis and reporting in cytogenomics, molecular genetics and FISH• Variant analysis of NGS data• Genetic Counselors• Scientific Assistants•
Academia	<ul style="list-style-type: none">• Teaching
Research Universities, Research / Health institutions	<ul style="list-style-type: none">• Biomedical research• Basic Research• Translational Research
Industry Pharmaceutical, Biotechnology, Direct-to-consumer genetic testing companies	<ul style="list-style-type: none">• Research and development of new products• Vaccine development• Genome analysts• Entrepreneurs

DESTINATIONS OF OUR ALUMNI (1999-2020)

Employment	42%
Higher Studies (Ph.D/Post Doc)*	53%
Academics	5%

*International

- Baylor School of Medicine
- University of Houston (USA)
- University of Dayton (USA)
- Max Planck (Germany)
- University of Ontago (New Zealand)
- Louis Pasteur University (France)
- National University of Singapore

*National

- IIT (Chennai)
- KIIT(Orissa)
- University of Delhi (New Delhi Madurai)
- Kamaraj University
- Sri Ramachandra University of Higher Education and Research (Chennai)

Learn from Our Experienced Faculty

Dr. P. Venkatachalam

I have 23 years of teaching and research experience in the areas of Radiation Genetics, Radiobiology. Our group uses in-vitro and in-vivo models to experiment on the cellular effects of ionizing radiation and low-dose medical radiation exposure and relate it with health effects. We have established a network for national and international proficiency in the management of an exposed population during any nuclear emergency



Dr. Solomon F.D. Paul

I have 24 years of teaching and research experience in the areas of Biophysics, Radiation Genetics, Developmental Genetics, Medical Genetics and Stem Cell and Regenerative Biology, Radiobiology and Ecogenomics. My group is interested in understanding the signatures left behind by ionising radiation on the DNA and chromosome. We also explore the basis of complex diseases like Type 2 diabetes and associated cardiometabolic traits and their heritability estimates in endogamous ethnic groups of India, funded by Indo-US ICMR-NIH



Dr. M. Ravi

I have 18 years of teaching and research experience in the areas of Immunology, Chromatin condensation dynamics, 3D cell cultures and using spheroid chips (microfluidic devices) for studying 3D spheroids/aggregates of human cancer cell lines and blood group antigen mutations and their association to carcinogenesis. My research is a combination of knowledge in the immune system functioning and developing relevant in vitro experimental models which closely mimic natural physiological conditions for applications in tissue engineering, cancer research and personalized cancer therapy.



Dr. Ganesh V

I have 18 years of teaching and research experience in the areas of Cancer Biology and Nanomedicine. Our group is interested in understanding the molecular pathophysiology of cancers and exploiting them to develop targeted therapeutics



Dr. Rajesh Kumar Gandhirajan

I have 15 years of teaching and research experience in the areas of Cancer biology and metabolism, Radiation genetics and Stem cell genetics, Inflammation and Plasma medicine. I am focused on using traditional and modern scientific methods to understand pathogenesis of various cancers and develop novel pre-clinical treatment strategies.



Dr. V. Vетtrisselvi

I have 21 years of teaching and research experience in the area of Genomics of complex disorders. My research team is mainly involved with understanding the molecular mechanisms underlying common complex diseases, for comprehensive identification of risk and protective variants



Dr. Vijayalakshmi J

I have 21 years of teaching and research experience in the area of Radiation Biology, Cytogenetics, Molecular Biology and Reproductive Genetics. My research team is interdisciplinary with research links in radiation Biology, cytogenetics, molecular biology and reproductive genetics. My current research is being funded by DAE-BRNS.



Dr. Teena Koshy

I have 19 years of teaching and research experience in the area of Human Genetics and Genomics, relevant to health and disease. My wide range of interests covering many areas of human genetics including genetic testing, leukemia cytogenetics, genetic counseling, cardiovascular genetics, paediatric genetics and reproductive genetics.



Dr. Andrea Mary F

I have 18 years of teaching and research experience in the area of Biochemistry, Molecular Biology, Cancer Biology, Cytogenetics. I have a long-standing interest in research in biochemistry, molecular genetics and cancer genetics. My funded research on ovarian and breast cancer susceptibility genes in a south Indian population has been published in peer reviewed international and national journals



Mrs. Nandhini B

I have 17 years of teaching and research experience in the area of Cancer cytogenetics, prenatal genetics, molecular genetics and molecular cytogenetics. I have completed a small term research project in the field of molecular genetics of ale infertility and won a best poster award for the same.



Alumni Profiles



Dr. Srirangan Sampath, Ph.D.,
Clinical cytogeneticist & Microarray
Lab Director, Prevention Genetics
Wisconsin, USA



Dr. Surabi Veeraragavan, Ph.D.,
Co-Director IDDRR/TCH Neurobehavioral core,
Assistant Professor, Department of Molecular and
Human Genetics, Baylor College of Medicine
Houston, USA



Dr. Asha Balakrishnan, Ph.D.,
Researcher, Hannover Medical School
Hannover, GERMANY



Dr. Birendranath Banerjee, Ph.D.,
Director, Indna Life Sciences Pvt Ltd,
Bhubaneswar, INDIA



Dr. N. Venkateswaran, Ph.D.,
Research Fellow,
Yong Loo Lin School of Medicine
SINGAPORE



Dr. Merlin Nithya, Ph.D.,
Assistant Professor at Cleveland State University
New York, USA



Dr. Pavithra Narashima, Ph.D.,
Senior Scientist, Stokes Therapeutics
Greater Boston, USA



Dr. Shyam Ramachandran, Ph.D.,
Program Lead Gene Therapy, Editas Medicine
Greater Boston, USA



Ms. Shoma Sanjay Raj, M.Sc.,
Biomedical Scientist, Sultan Qaboos
University & hospital
Masqat, OMAN



Dr. Amrita Nair, Ph.D.,
Industry Partnerships and Commercialization Team
Faculty of Medicine, Imperial College
London, UK



Dr. Ganga Baskar, Ph.D.,
Commercialization Program Director,
Texas Tech University
Texas, USA



Dr. Chinna Durai M, Ph.D.,
Research Instructor, Texas Tech University Health
Sciences Center
Texas, USA



Dr. Sumedha Sudhaman, Ph.D.,
Postdoctoral research fellow, The
Hospital for Sick Children
Toronto, CANADA



Mr. Arun Kiran Patnam, M.Sc.,
Lead Genetic Counsellor, Prenetics
Hong Kong, CHINA