



Molecular medicine is an emerging area within biomedical sciences that aims to understand the molecular determinants of health and disease with the ultimate goal of applying this knowledge for the prevention, diagnosis and treatment of diseases. The Special Centre for Molecular Medicine (SCMM) at JNU has pioneered research and education in this field in India and is imparting Ph.D. level training in this field. The centre aims to accomplish its goal through innovative and collaborative basic and clinical research programs and has initiated many collaborative research activities with reputed national and international medical research institutes.

The objective of SCMM is to foster teaching and research activities in the study of human diseases using advanced tools of molecular and cell biology. SCMM conducts academic programs for the training of young scientists (clinical and non-clinical) who are keen to pursue a career in basic medical research. The academic programs have been designed for non-clinical biologists/chemists, with sufficient knowledge to deal with medical problems, to enable them to deliver product/processes to society and clinicians with a basic clinical degree, who understand modern biology and chemistry at the molecular level to enable them to apply this knowledge to drug development. For successful implementation of these objectives, SCMM offers the following programs of study.

To encourage students from basic sciences and medical graduates, the centre offers Ph.D. Programs in Molecular Medicine and is pursuing teaching & research activities in the following thrust areas:

- A. Metabolic Disorders:** Steroid/nuclear receptors in health and diseases, Drug metabolism and metabolic disruptors; diseases associated with epithelial and endothelial cell junctions, endocrine related cancers; Type 2 diabetes.
- B. Infectious and Non-infectious diseases:** Mechanisms of disruption of cellular junctions by enteropathogenic *E. coli*, Leishmaniasis, *Helicobacter* pathogenesis, Candidiasis, inflammatory bowel disease, pathobiology of innate immune dysfunctions using proteomics & metabolomics, DNA replication and cell cycle regulation of pathogens; genetically engineered biomolecules, codon-shuffling, pathogenesis of *M. tuberculosis* and drug resistance; Biology of *P. falciparum* infection, mechanism of anti-malarial drug-resistance.
- C. Drug Development, Chemical Biology and Radiation Biology:** Development of novel synthetic methods for new drug entities. To Study mechanism of action of Radioprotectors and Radiosensitizers for Radiotherapy in Cancer, Development of Antibiotics for Gyrase resistant strains targeting Topoisomerase IA Gene in Bacteria.

Selected students will have the option to choose their research area depending on their merit/aptitude and according to the vacancy available.

SCMM also offers **M.Sc. Programme in Molecular Medicine**. The goal of this program is to train students in modern areas and techniques of cell, molecular biology and organic chemistry in relation to human health and disease and the subsequent application of this training to identify new targets for the diagnosis and therapy of different diseases. The completion of the Human Genome project and various

other genomes including pathogenic organisms has opened new opportunities for the understanding of the molecular mechanisms of diseases both from the host as well as pathogen's perspectives. Students will be trained to use the tools of modern biology including bioinformatics so as to understand, retrieve and exploit the wealth of information provided in the Genome projects to design modern and personalized medicines.

PROGRAMMES OF STUDY

(i) Admission to Ph.D. Programme in "Molecular Medicine"

Students holding an M.Sc degree from a recognized institution who have a minimum of 2 years of laboratory experience and medical graduates who have an interest in basic sciences and are willing to pursue research as a career are encouraged to apply.

(ii) M.Sc. Programme in "Molecular Medicine":

Duration:

The course work leading to the award of M.Sc degree in 'Molecular Medicine' shall be for a period of four semesters (two Monsoon Semesters and two Winter Semesters) with a compulsory requirement for submission of a research-based dissertation at the end of the Winter Semester of the 2nd year.

Credit Requirements: A student will need to have a minimum of 65 credits including 10 credits for the dissertation at the end of two years in order to be eligible for the award of the M.Sc. degree.

Credit Distribution:

First Semester:	19 Credits (including practical)
Second Semester:	19 Credits (including practical)
Third Semester:	12 Credits
Fourth Semester:	15 Credits
One credit =	At least sixteen lectures per semester.

M.Sc. Programme

Sl. No.	Name of Centre	Sub. Code & Sub. Code Number	Intake	Eligibility	Viva/Non Viva	Course outline/guidelines	Paper will be subjective/objective/both
1	Centre for Molecular Medicine (SCMM)	Molecular Medicine-CMMM (233)	6	Bachelor's degree in any branch of Basic or Applied Sciences (including MBBS and BVSc.) from recognized Universities and Institutes with at least 55% marks.	Viva-Voce	<p>Part A: All the questions shall be of objective multiple choice type of relevant standard.</p> <p>Part B: All the questions shall be of multiple choice type of B.Sc. standard from subjects of Botany, Zoology, Chemistry, Physics and other related subjects.</p>	Objective

Ph.D. Programme

Sl. No.	Name of Centre	Sub. Code & Sub. Code Number	Eligibility	Additional information	Viva/Non Viva	Course outline/guidelines	Paper will be objective/subjective/Both
1	Centre for Molecular Medicine (SCMM)	Molecular Medicine- CMMH (905)	<p>Only those candidates shall be considered for Admission to the Ph.D. programme, who have either --</p> <p>a) Obtained MBBS/M.Pharm./BVSc degree (during 2011 or later) from a recognized University/Institution with one year experience or obtained MD /MVSc degree (during 2012 or later; experience is not essential).</p> <p style="text-align: center;">OR</p> <p>b) Obtained 2 years M.Phil. degree from a recognized University/Institution with minimum Final Grade Point Average (FGPA) of 6.00 in 10 point scale/comparable standard where the grading is based on system other than the 10 point scale. The candidates who have obtained M.Phil. degree from a University/Institution where the M.Phil dissertation is not graded or grading is not based on 10 point scale, are required to forward a copy of their M.Phil. dissertation along with the Application Form for the purpose of assessment of their credentials;</p> <p style="text-align: center;">OR</p> <p>c) At least 2 years research experience in reputed institutions with at least one research publication in peer-reviewed journals (included in PubMed; NOT review articles or popular articles or papers in the proceedings). In addition, they should have obtained a Master's Degree in Sciences (Not before the year 2011) with FGPA of 6.00 in the 10 point scale/comparable standard or equivalent percentage.</p>	For detail please check JNU website	Viva-voce	<p>Qualifying marks for the Entrance Test shall be 50%. The syllabus of the Entrance Test shall consist of 50% of research methodology and 50% shall be subject specific.</p> <p>The entrance exam question paper would be prepared as per UGC Regulations 2016</p> <p>For detail please check JNU website</p>	For detail please check JNU website