



**MAHATMA GANDHI INSTITUTE OF MEDICAL SCIENCES, SEVAGRAM**

## **Centre for Genetics & Genomics**

### **Introduction**

The Mahatma Gandhi Institute of Medical Sciences Sevagram has developed a separate research wing called the Centre for Genetics and Genomics. It serves as an incubation centre and facilitation centre for undertaking extramural research in multidisciplinary areas. The infrastructure present in this centre can be utilized by all departments of the institute to conduct research.

The Centre for Genetics and Genomics has facilities of a fully equipped cytogenetics and molecular cytogenetic laboratory, and advanced molecular biology set up for diagnosis of single gene disorders. In addition, we also have a tuberculosis research lab. The infrastructure includes: four capillary Sanger sequencer, 96 well thermo-cyclers for polymerase chain reaction, gel documentation unit, fluorescence microscope with karyotyping software and FISH software etc.

There is also a provision for office space and space for major research projects in the institute with the availability of necessary office equipment and assistance and secretarial staff. This can ease the process of research with necessary support in terms of physical space, human resources and equipment.

### **Research Work being conducted**

In 2020-21, one of our young researchers, Dr Prafulla Shriram Ambulkar has filed a patent on his research “A process for detecting microdeletions in Y chromosome”. This patent has been published in 2020. (Can be viewed at <https://drive.google.com/file/d/1GbxyNTBWNEquW0E64oBNAnM0ksrGFCrk/view>)

At present some PhD students who are doing their PhD work are also using this lab. Work on molecular genetics of breast cancer and cytogenetics is being conducted. The list of PhD candidates is as follows:

**PhD students working at the Centre for Genetics & Genomics**

<b>Sr. No.</b>	<b>PhD. Topic</b>	<b>Name of PhD student</b>	<b>Name of Guide</b>	<b>Academic year</b>	<b>Registered University</b>
1	Molecular genetic analysis of GATA4 gene in congenital heart disease at central Indian population.	Dr. Jwalant Waghmare	Prof. (Dr) Nitin Gangane	2021-2022	Maharashtra University of Health Sciences, Nashik.
2	Study of Association of Polymorphism of Interleukin 17F and Interleukin 17A Gene with the Causation and Severity of Rheumatoid Arthritis	Dr. Samir Yelwatkar	Prof. (Dr) Nitin Gangane	2021-2022	Maharashtra University of Health Sciences, Nashik.
3	Molecular genetic analysis of mitochondrial DNA D-loop region and their correlation with clinical severity in Sickle cell disorder patients.	Dr. Shweta Talhar	Prof. (Dr) Nitin Gangane	2021-2022	Maharashtra University of Health Sciences, Nashik.
4	Study of association of estrogen receptor 1 (ESR1) gene mutation with clinicopathological characters and overall survival in carcinoma breast patients	Dr Bharat Patil	Prof. (Dr) Nitin Gangane	2021-2022	Maharashtra University of Health Sciences, Nashik.

The Centre has been sanctioned a funded research project on new-born and rare genetic diseases screening under the DBT-UMMID Initiative for NIDAN Kendra

**Government funded Ongoing/ Approved research projects**

<b>Sr. No.</b>	<b>Name of the project</b>	<b>Principal Investigator</b>	<b>Duration (Years)</b>	<b>Cost (Rs)</b>	<b>Funding Agencies</b>
1	Study of mitochondrial DNA polymorphism, mutation and oxidative stress in relation to susceptibility and severity of type 2 Diabetes mellitus.	Dr. Jwalant Waghmare	3 yrs (2021-2025) Ongoing	36.00 lacs	ICMR, New Delhi
2	Establishment of DBT-NIDAN Kendra under UMMID initiative for rural population at Mahatma Gandhi Institute of Medical	Dr. Nitin M Gangane Dr. Asoke Pal Dr. Poonam Verma Dr. Manish Jain	3 yrs (2022-2025) Approved	2.25 crores	Department of Biotechnology, Govt. of India

	Sciences, Sevagram	Dr. Jwalant Waghmare Dr. Prafulla Ambulkar			
3	Genetic study of spermatogenesis specific controlling genes related to non-obstructive azoospermic human male infertility	Dr. Prafulla Ambulkar	2 yrs (2022-2024) Approved	28.54 lacs	SERB, New Delhi

### List of major equipment and instruments

Sr. No.	Generic Name of Equipment	Model, Make & year of purchase	Current usage of equipment
1	Four capillary Genetic Analyzer	(Seq-Studio, Applied Biosystem, USA) 2019	Fully working
2	96 well Thermal Cycler: 2 No.	(Veriti, Applied Biosystem, USA) 2010; 2019	Fully working
3	Fluorescence Research Microscope with Karyotype & FISH software	Carl Zeiss, GmbH, Germany	Fully working
4	Gel Documentation system with image analysis system	(Uvi-tec, Cambridge, UK), 2010	Fully working
5	Horizontal gel electrophoresis with power pack	(Hoffer. USA), 2010	Fully working
6	Inverted microscope with phase contrast	(Olympus), 2000	Fully working
7	CO <sub>2</sub> Incubator	(Forma Scientific), 1999	Fully working
8	CO <sub>2</sub> Incubator with oxygen control	(Thermo scientific), 2019	Fully working
9	Type I & II Ultra water purifier	Ion exchange, India, 2019	Fully working
10	Laminar flow clean air work station	(Klenzaid), 1999	Fully working
11	Double beam UV-spectrophotometer	(Elico), 2014	Fully working

<b>12</b>	Refrigerator No:3	LG, Haier, 2010 & 2019	Fully working
<b>13</b>	Deep freezer (-20°C)	Blue star, 2002 & 2010	Fully working