



## **Center of Excellence**

### **MGM Central Research Laboratory, MGM School of Biomedical Sciences (Center for Genomics and Integrative Health, ZEBCOG and Clinical Nutrition Lab)**

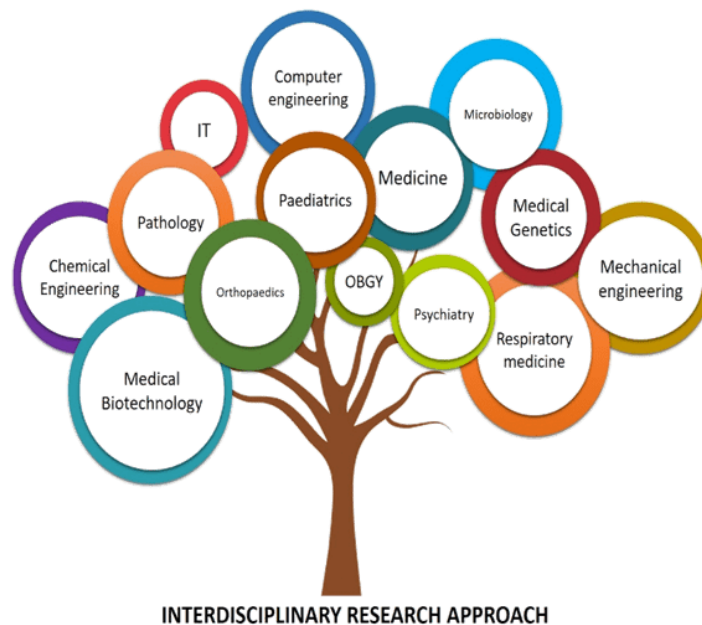
#### **Overview of the Center:**

The Central Research Laboratory established by MGM School of Biomedical Sciences offers exclusive facilities to undertake genetic, molecular and biotechnological applied research in synchronization with the thrust areas of research of the MGM Institute of Health Sciences, Navi Mumbai. The laboratory is well- equipped with high-throughput technique of PCR as well as technology for ELSIA, DNA/RNA extraction, electrophoresis (vertical/horizontal), microbiological assays NAAT, DNA hybridization assays, EVOS FL Auto microscope, immunological assays and Culture and Drug Susceptibility studies, and Zebra fishy cultivation (as animal model). These facilities have resulted in development of rational drug discovery, discovery of novel predictive biomarkers of diseases, affordable and rapid diagnostic kit for detection of TB and Malaria, Prediction of disease and prophylactic disease management and decoding infectious diseases at host genome level. These facilities will enable strengthening of development of robust algorithms for early identification of diseases and offering novel solutions for management.

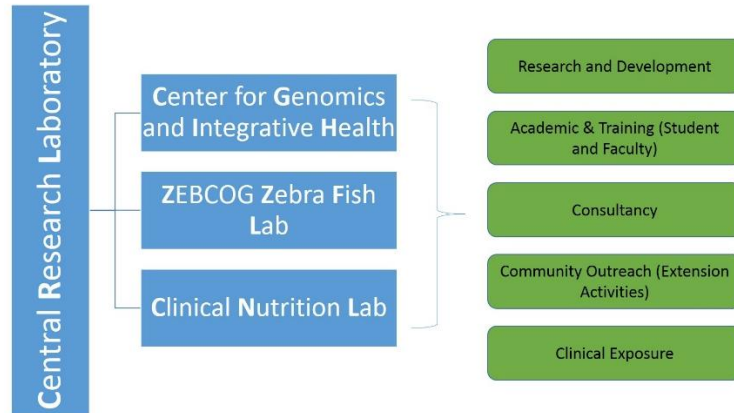
Research at Central Research Laboratory is concentrated in fields like Infectious Disease, Cancer, Molecular Diagnostics, Healthcare, toxicology, Zebra fish Behavioral Studies, Nanotechnology, Bioinformatics, and Computational Biology, Clinical Nutrition, Intervention studies, Community Outreach, Yoga and Meditation (for Physical & Mental Wellbeing) as a Secondary prevention to provide the scientific input, These fields are supported by a modern infrastructure that includes well-equipped molecular biology and ZEBCOG labs as well as a clinical nutrition lab. MGMSBS, NM is now developing up a well-equipped Common Research Laboratory (CRL), which will house important multi-user equipment. Furthermore, a future center of Physical and wellbeing, cutting-edge computer technology, promote research and consulting.

### **Central Research Laboratory Infrastructure & Facilities:**

Central Research Laboratory under MGMSBS, NM is intensely working to carry out Biotechnological, genetics, Molecular, clinical Nutrition & Applied Research. MGM CRL Molecular lab has state of the art molecular research facility for all interdisciplinary studies. The thrust area to run this lab is its own R&D programs in technology development, assay development and biomarker, stress biology, community-based intervention related to nutrition, drug discovery. The faculty, students of SBS and other departments are encouraged to take up research & developmental activities by utilizing the existing facility resources for research and development.

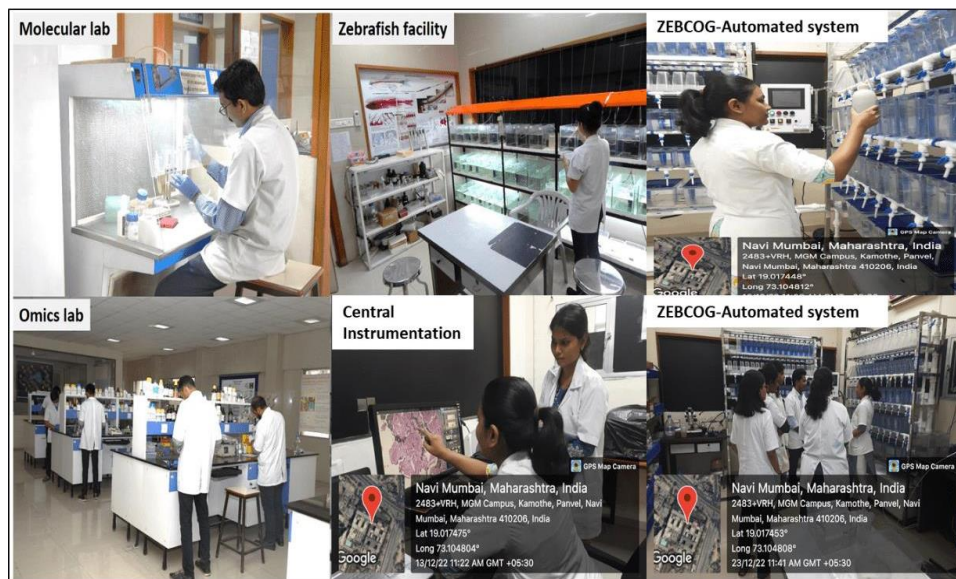


Our center of Excellences on ZEBCOG & Molecular Biology along with our well in house known Clinical nutritionLab have helped our students to develop necessary skills & develop innovative projects, intervention studies, and community outreach activities in various domains.



This lab is equipped with cutting edge technologies like Real Time PCR, NAAT, DNA Hybridization assays, EVOSFL Auto microscope, Immunological assays and Culture and Drug susceptibility studies. The central research laboratory is accredited by NABL for testing of various infectious diseases like HIV, SARS COV2, H1N1, TB and Dengue, Malaria etc. The laboratory till date has processed thousands of samples of each mentioned disease till date and filled nearly half dozens of patents on the name as well for development of low-cost biomedical devices for rapid testing of infectious diseases. The laboratory has also conducted various training programs to generate the competent manpower in the field of molecular diagnostics in order to bridge the gap between Conventional Diagnostics and Molecular Biology based assays.

### Central Research Laboratory



Another unique feature of the central research lab facility proposed at Dept of Medical Biotechnology, MGMSBSB, MGMIHS, Navi Mumbai will be the first college in Navi Mumbai area to provide training with sophisticated recent instruments used in industry / diagnostic/ research through which we can generate revenue and research output by providing training / skill development / consultancy etc. The basic Zebrafish facility was established in 2015 under the BRNS funded project at MGMCR L ZEBRAFISH FACILITY which is located at the MGM Medical College Building at the Central Research Laboratory. In the past two decades, zebrafish (*Danio rerio*)-based research has contributed to significant scientific advances. Still, husbandry and health programs did not evolve at the same pace, as evidenced by the absence of adequate awareness and training. In particular two teleost species, zebrafish (*Danio rerio*) and medaka (*Oryzias latipes*) have become essential model systems for analyzing gene function in vertebrates due to their application in genetics. Zebrafish are well established for their contribution to developmental biology and have now emerged as a powerful preclinical model for human disease, as their disease characteristics, aetiology and progression, and molecular mechanisms are clinically relevant and highly conserved. They have an advantage of small size; transparency of the embryos and the extra-uterine development make them ideal systems for systematic studies of developmental processes. These animal models also provided many disease models to study various pathophysiological processes in real time. The thrust area of our zebra fish laboratory is • Nanotoxicity, • Model for toxicological, environmental & compound screening • Behavioral studies • screens for different disease model. Our all research are interdisciplinary and related involving the various departments of Medical college so as to provide the better solution to the society.

Nutrition is paramount for health, it is one of the fields which is interrelated to every life sciences stream. A nutritionist can involve in lot many innovations and research work related to life science. It will be really helpful to strengthen the Clinical Nutrition department academically and for research purpose. Apart from that MGMIHS has running post graduate program in Clinical Nutrition consisting of Clinical Nutrition Lab, which includes advance nutrition, food safety, medical nutrition therapy, applied Biochemistry and biostatistics. The students are getting exposure of extension activities, clinical exposure and research exposure. The additional trainings, workshops, field work and laboratory work would be helpful to empower the department and students.

## Clinical Nutrition Lab



### Faculty Profile at MGM Central Research Laboratory, MGM SBS, Kamothe, Navi Mumbai.

| Name and Designation of Faculty                                                                      | Thrust areas of research                                                                                                     |
|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Dr. Mansee Thakur<br>HOD and Professor – Dept of Medical Biotechnology, MGMSBS, MGMIHS               | Molecular Biology and Genetics, Infectious disease biology and Stress Biology                                                |
| Dr. Chandramani Pathak<br>Professor, Dept of Medical Biotechnology, MGMSBS, MGMIHS                   | Molecular basis of the disease, pain, inflammation cancer biology and nanoparticle-based drug delivery                       |
| Dr. Himanshu Gupta<br>Assistant Professor - Dept of Medical Biotechnology & Genetics, MGMSBS, MGMIHS | Molecular research and developmental genetics and toxicological assessment related to Zebrafish (danio rerio).               |
| Dr. Priyanka Prateek<br>Assistant Professor and HOD of Clinical Nutrition, MGMSBS, MGMIHS            | Clinical nutrition, Community nutrition, non-communicable disease, micronutrient deficiency, maternal and child health care. |
| Dr. Yogesh Patil<br>Assistant Professor, MGMSBS, MGMIHS                                              | India Specific Medical Device Development, Infectious disease diagnostics, Molecular biology                                 |
| Dr Neelam Yeram<br>Assistant Professor, MGMSBS, MGMIHS                                               | Neurobiology and Biochemistry                                                                                                |

**Dr. Mansee Thakur (Office In-charge MGM Central Research Laboratory):**

She has an accomplished Scientific and Academic experience with over 15 years field of Allied Sciences & Biotechnology. In addition to her scientific pursuits, Dr. Thakur is involved in spirituality and is a certified International Heartfulness Meditation Trainer associated with various initiatives of the Heartfulness Institute. Through these initiatives, including V-Connect, S-Connect, C-Connect, plantation, and meditation drives, her aim is to help individuals understand the biological mechanisms behind meditation and how it can contribute to overall well-being. Dr. Thakur in biotechnology enables her to study the biological mechanisms behind Meditation. Her research involves studying the effects of heartfulness meditation on the brain, immune system, and other physiological processes. By understanding how meditation affects the body at a molecular level, she hopes to develop new ways to enhance its benefits and improve the overall health of individuals. Overall, Dr. Thakur's programs and research represent a unique approach to meditation that combines scientific inquiry with spiritual practice. Her work aims to serve as a bridge between traditional meditation practices and modern scientific methods, offering a deeper understanding of the benefits of meditation and its potential to transform lives. She has been instrumental in supervising PG and PhD students, creating facilities of their research work. During this period guided 65 PG students and 8 PhD students. Her passion along with academic research also have received extramural grant of 1.5 cr. 3 major extra mural research grant BRNS has successfully completed as an Independent PI. 2 Patents granted and 2 Patents Published, 24 copyrights to her credit and has over 55 publications in peer reviewed National and International journals namely few are Int. J. Nano Biotech (2023; 2020; IF 9.4), Journal of Nanoparticle research (2022; IF 2.5); Journal of oral and maxillofacial pathology (2022; IF 1.5), Journal of Pharmacopuncture (2022; IF 2.0), 8 Chapters in Springer Nature and 2 Book Published. During course of her PhD course work, she was awarded as a young scientist by Chhattisgarh state. On the occasion of international day women Dr. Mansee was recognized for her contribution in Science, Research and Spiruatlity as a recipient of Kamala Bhagwat Sohoni Science, Shiksha 2022 by rethink India.

**Dr. Chandramani Pathak (Director Research and Development, MGM IHS):**

Professor has more than 15 years of research and teaching experience and well documented expertise in cellular signaling on molecular basis of the disease, pain, inflammation, osteoporosis and cancer. Dr Pathak research involves unravelling the molecular mechanism and cross talk between multiple cellular cross talk including oxidative stress, metabolism, inflammation and programmed cell death signaling in cancer as well as drug design and drug delivery using nanocarrier for therapeutic intervention. Dr Pathak was awarded prestigious research fellowship and several extramural major research grants 6 major extra mural research grant DBT (2010; DBT-RGYI), DST (2010; Young Scientist), DBT (2011, NNT), DBT (2015 Cancer Biology Pilot project), 2015 (DST-GSBTM) and SERB-CRG (2016) and has successfully completed as an Independent PI. Dr Pathak has good team leading and mentoring capabilities with vast academic and administrative experiences worked at many academic and research institutes at national importance. He guided 05 PhD students and successfully awarded the PhD degree.

All students are well placed and continuing scientific careers as post-doctoral fellow at international research institutes and some of them holding faculty positions. Seamless Dr Pathak has published more than 62 research articles in Scopus indexed peer reviewed international journals namely few are Int. J. Mol. Sci (2023; 2020; IF 6.2), Journal of Molecular Liquids (2022; IF 6.1); Apoptosis (2022; IF 5.5), Cell Biochemistry & function (2020; IF 3.6), Biochemistry-Moscow (2020; IF 2.5), Cancer Reports (2020), Chemico- Biological interaction (2020; IF 5.1), Molecular and Cellular Biochemistry (2020; 2016 IF 3.8), International Journal of Biological Macromolecules (2019; 2020 IF 8.0), Bone (2019 IF 4.4); J. Biomolecular Structure & Dynamics (2018; IF 3.3 ), Scientific Reports (2018; 2016 IF 4.9), , Journal of Cellular Biochemistry (2016; 4.4), IUBMB life (2015; IF 4.7), PLOS one (2015; IF 3.2 ), Biofactors (2014; IF 6.4), Journal of cell communication and signaling (2012; IF 5.9), Cancer Biology and Therapy (2008 IF 4.8); RNA Biology (2005 IF 5.4) etc., 05 book chapters and 2 Indian patents were filed. The quantitative matrices of research has H index 19 & i1027 in his credit.

**Dr. Himanshu R Gupta (Assistant Professor, Medical Biotechnology):**

She is an expert in using zebrafish as an animal model for research, especially in the areas of toxicology, pharmacology, and disease modelling. She has experience in conducting fish embryo toxicity studies for various homeopathy and Ayurvedic formulations, as well as in characterizing traditional herbal medicines and synthesized nanoparticles through pharmacology and toxicology studies. Additionally, Dr. Gupta has expertise in genotoxicity, homeopathy, and medicinal plant studies. As an assistant professor at the Department of Medical Biotechnology and Genetics at MGMSBS, MGMIHS, Navi Mumbai, Dr. Gupta leads the ZEBCOG Zebrafish research facility, where her team focuses on validating alternative medicines and creating disease models in zebrafish for drug discovery. She has recently received Rs.30 lakh rupees funds from DHR.

**Dr Priyanka Pareek (Head and Assistant Professor Clinical Nutrition):**

She has more than ten years of experience in research and academics. She is having expertise in various streams of Nutrition. She had worked on non-communicable diseases i.e., obesity, type 2 diabetes, cardiovascular diseases, liver, and kidney diseases. Her studies involve the sociodemographic, biochemical, and clinical exploration of risk factors of non-communicable diseases and impact of multicomponent comprehensive interventions to control and prevent the diseases. She had worked as ICMR research fellow at National Institute of Nutrition, Hyderabad, there she had worked on the project related to micronutrient deficiency and interactions. She has received two extramural grants as an Independent PI, one from DBT (2022) to conduct the food intervention to combat anemia among school going kids and another from ICMR (2022) to see the impact of nutrition intervention on micronutrients deficiency among adolescent girls. She has been instrumental in supervising PG and PhD students, creating facilities of their research work. During this period guided 30+ PG students and guiding Ph D students. She is having 15 +publications in peer reviewed national and international journals and more than five copyrights in her credit. She is having good leading and mentoring capabilities. Besides all these she is passionate to learn more, has completed PG diploma in epidemiology from Public Health Foundation of India (PHFI) to get more insight about the epidemiological studies of communicable and non-communicable diseases and completed certificate course from Wageningen University, Netherlands on Exercise sports and Nutrition to get more insight about the lifestyle patterns and nutrition.



**Dr. Yogesh Patil (Assistant Professor, Medical Biotechnology):**

He has completed Ph.D in Medical Biotechnology, with key expertise in the field of molecular biology and Medical Biotechnology. On his credit he has registered one design patent and filled two Indian patents which are in the final round of evaluation. He has wide experience in the PCR based diagnosis of Infectious diseases like, HIV, TB, Covid 19, H1N1 and Plenty of them and conducting the Gene Expression analysis of human and animal samples. Till date he has seven publication and five copyrights to his name. His special interest is in development of low cost India specific Biomedical Devices, especially deployable at the rural setup and till date he has worked on development of Low cost biosafety cabinet, Low cost Electrophoresis system, Low cost NPWT system, Low cost DNA detection system with continuous mentoring support from the Mentors at MGM Central Research Laboratory.

**Dr. Neelam Yeram ( Assistant Professor, MGM SBS):**

She has completed her Ph.D. in Medical Biochemistry from the Maharashtra University of Health Sciences (MUHS), Nashik, with her project focusing on the status of biochemical markers in Alzheimer's disease before and during treatment. In addition to her academic qualifications, she has completed several additional courses in her field. She has a vast array of laboratory techniques under her belt, including ELISA, PCR, HPLC, and DNA extraction, and is proficient in software skills, including Microsoft Office and IBM SPSS Statistics software.

## **Achievements of the Center till date**

### **PATENTS**

#### **Granted**

1. **Patent No: 415484 (Application no: 3620/MUM/2015)** Thakur Mansee, Joshi DS, Suri VK Pai Girish ,Srinkhala ,Shivam, Bhand Sunil, Pal Souvik. Joint Patent with Department of Atomic Energy, MGM Institute of Health Sciences and Birla Institute of Technology and Science, Pilani. Micro-trench based biochip device for screening of infectious diseases using metal nano particles / nano coating: 2022 Dec 26.
2. **Published no: 98915 (Application no: 318667-001).** Dept of Medical Biotechnology, MGM School of Biomedical Sciences MGMIHS Kamothe and SVERI Pandharpur. Design patents for Custom-built Electrophoresis system. 2021 June 16.

#### **Applied**

1. **Application no: 201721023794.**Suri V K, Thakur Mansee, Khedkar Sanotsh, Singh Indra Vijay, Rao MuralidharaNakka, Patil Yogesh, Kadam Sudhirchandra, Gupta Himanshu, Shriram Prajyot P, Dogga Bharadwaj S, Chhabra S Harpreet, Chavan Prashant R, (MGM CET, MGMIHS). A Biological Safety Cabinet and A Kit Thereof: 2019 Nov 01.
2. **Application no: 201721023124 A.** Dr.V.K.Suri, Dr.Mansee Thakur, Dr. Santosh Narayan Khedkar, Mr.Indra Vijay Singh , Dr.Nakka Muralidhara Rao, Mr.Yogesh Patil, Dr. Sudhirchandra Kadam (MGMIHS, MGM CET). Sensor Based Inflatable Device: 2019 may 04.

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### 2023

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### Facilities available in terms of High End Instruments at MGM Central Research Laboratory

1. Real Time PCR System (96 Sample Capacity):



Make & Model: Himedia, LA1012-Insta Q96

2. Real Time PCR System (48 Sample Capacity):



Make & Model: Himedia, LA1023 -Insta Q48

3. Conventional PCR System - Wee 16 (16 Sample Capacity):



Make & Model: Himedia, Wee 16

4. Conventional PCR System - (96 Sample Capacity):



Make Model: PeqLab, 96 Universal Peqstar

5. Automated Nucleic Acid Extraction System (96 Sample capacity):



Make Model: Zzybio, EXM 6000

5. Automated Nucleic Acid Extraction System (32 Sample capacity):



Make Model: Himedia , Insta NX Mag 32

6. Inverted Fluorescence Microscope:



Make Model: Evos Life technologies, FL Auto

7. Inverted Light Microscope:



Make Model: Zeiss, Inverted microscope

8. -80 °C Refrigerator:



Make Model: Hair, -80 °C



9. -20 °C Refrigerator:



Make Model: Hair, -20 °C

10. Zebra fish Housing System:



Make Model: Gendanio India, five tier Recirculating aquaculture system (RAS) System.

## Other Minor Equipments

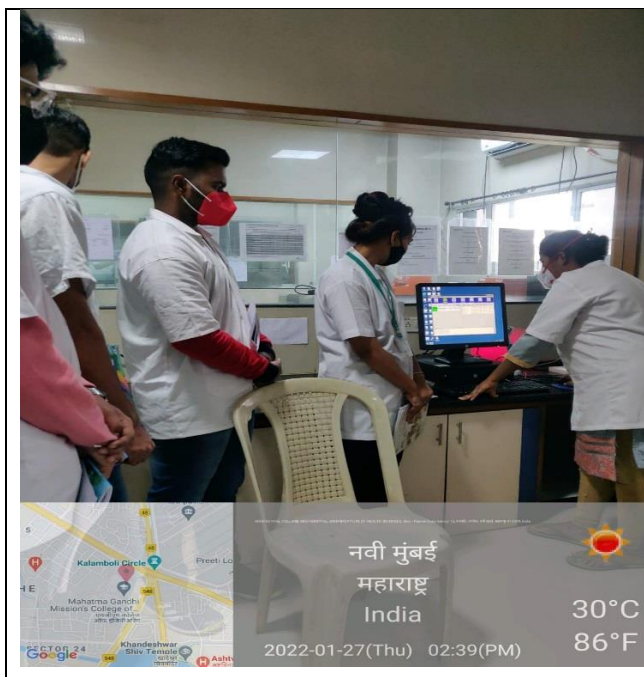
| <b>Name Of The Instrument</b>  | <b>Model No / Sr No.</b>                              | <b>Company Made</b>             |
|--------------------------------|-------------------------------------------------------|---------------------------------|
| Table Top Centrifuge           | TC 650 D                                              | Eltek company                   |
| Table Top Centrifuge           | ZFLN-42377                                            | Remi R-8C                       |
| Table Top Centrifuge           | ZEDN 13990                                            | Remi R-8C                       |
| Cooling Centrifuge             | TGL16                                                 | Yingtai Instrument              |
| Dry Bath                       | Model MK 10, Sr No AS- MK-10-1032E, Mgf Date Dec 2011 | Biochem Life Sciences           |
| Mini Dry Bath                  | Itherm D150-1 Sr No QJ050260                          | Benchmark Scientific (Neuation) |
| Water Bath                     |                                                       | Metalab Scientific Industries   |
| Horizontal Gel Electrophoresis |                                                       | Bio Bee tech                    |
| Vertical Gel Electrophoresis   |                                                       | Chromas Biotech                 |
| Hot air oven                   | AI 7981 Sr No 29181                                   | Labline                         |
| Hot air oven                   | Sr no : 25688 Model No : MSI -5                       | Met Lab                         |
| Lamiar Airflow                 | AC - 07102, Sr no- 1694                               | Amarchand & Company             |
| Lamiar Airflow                 | Model no- 2294, Sr no- 296                            | Clean air systems & Devices     |
| Biosafety cabinet level II     | AB2-451, 2013-79183                                   | ESCO Biotech PVT. LTD           |
| Biosafety cabinet              | 7760                                                  | MF India                        |
| Myfuge 12 Micro centrifuge     | 20181113346                                           | Benchmark Scientific            |

|                                   |                                                    |                                    |
|-----------------------------------|----------------------------------------------------|------------------------------------|
| Microcentrifuge                   | (Velocity 13 ul centrifuge) Sr No<br>6522611030330 | Dynamica (Hain)                    |
| Microcentrifuge                   | ZFEN-14923                                         | Remi                               |
| Microcentrifuge                   | Ifuge M15K Sr No :<br>QG044219                     | Neuation                           |
| Microscope                        | 90323330                                           | Labomed                            |
| Microscope                        | 160691300                                          | Labomed                            |
| Microscope                        | 11F589                                             | Magnus                             |
| Electronic Microscope             | Stemi 2000C                                        | Carl Zeiss (Piramal)               |
| Microwave oven                    | Model No BMO700T, Sr No 976-<br>726856             | BPL Sanyo                          |
| Nucleic Acid Purification System  | LA1096-Insta NX Mag 32                             | Himedia                            |
| Automated Nucleic Acid Extraction | 1056EC062                                          | Himedia                            |
| Ultracentrifuge                   | RC18005                                            | Eltek company                      |
| Stereomicroscope                  | SMZ168 series                                      | Motic                              |
| Electronic Balance                | CA-123 Sr No 1101815                               | Contech                            |
| Electronic Balance                | Model no HPB220 Sr No<br>41390                     | Wenser Weighing<br>scales ltd      |
| Vortex – Genie                    | Model No.: G-560 E                                 | Scientific Industries<br>(Piramal) |
| Vortex                            | 8.71951E+11                                        | Thermo                             |
| Power Pack Basic                  | AB139                                              | BioTech R & D<br>Lab               |
| Power Pack Basic                  |                                                    | Electrophoresis<br>Power Supply    |
| CO <sub>2</sub> Incubators        | Heracell 240                                       | Thermo Scientific<br>(Piramal)     |
| Magnetic stirrer                  |                                                    | Remi equipments<br>(Piramal)       |

|                                              |                                          |          |                             |
|----------------------------------------------|------------------------------------------|----------|-----------------------------|
| Magnetic stirrer                             | Sr No 27307010007<br>H 3770HSE           | Model no | Benchmark<br>Scientific Ins |
| Digital micro plate shaker                   | 52020-p4-cor-EU (12032378)               |          | Corning/LSE<br>(Piramal)    |
| Rocker-35                                    | 11M0608A                                 |          | Labnet                      |
| Rocker                                       | Sr 73497                                 |          | Neolab instrument           |
| Microplate Spectrophotometer                 | 141215F                                  |          | Epoch                       |
| EVOS Microscope                              | FL - Auto                                |          | Thermo Fisher<br>Scientific |
| Gel Documentation System with Basic software | OG/2020/08/01 , Sr No :                  |          | OPRL Bioscience<br>PVT Ltd  |
| Digital pH Meter                             | Model no : DPH 500<br>155000881          | Sr No    | Global Pvt Ltd              |
| Lapiz Colony Counter Digital                 | Model No: #0671M<br>0671M.BJL.001542.A.X | Sr No :  | Equitron Medica<br>Pvt Ltd  |
| $\mu$ P Photocolorimeter                     | Model : 1311<br>21080161                 | Sr No :  | ESICO                       |
| Soxhlet                                      |                                          |          | Borosil                     |
| Refrigerator                                 | GNF 220x                                 |          | Whirpool                    |
| Stereomicroscope (ZEISS)                     | 3943033954                               |          | Carl Zeiss Suzhou<br>co ltd |

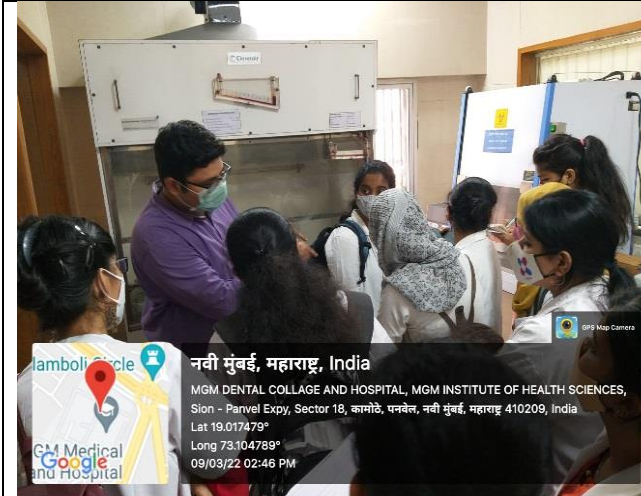
**Teaching and Training events conducted by the center for Value addition of faculties and students inside and outside the campus:**

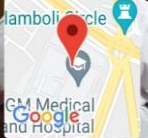
The center has developed the integrative teaching and learning programs such as 16 hours value added courses and internship training programs of one, three and six months to train the aspirant staffs and students for various skill developments related to molecular biology, genomics, microbiology, animal model development and nutraceutical aspects related to the healthcare. Some of the glimpses of the training programs are listed in the following section.



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नवी मुंबई  
महाराष्ट्र  
India  
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**नवी मुंबई, महाराष्ट्र, India**  
 MGM DENTAL COLLEGE AND HOSPITAL, MGM INSTITUTE OF HEALTH SCIENCES,  
 Sion - Panvel Expy, Sector 18, कामोठे, पनवेल, नवी मुंबई, महाराष्ट्र 410209, India  
 Lat 19.017479°  
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**नवी मुंबई, महाराष्ट्र, India**  
 MGM DENTAL COLLEGE AND HOSPITAL, MGM INSTITUTE OF HEALTH SCIENCES,  
 Sion - Panvel Expy, Sector 18, कामोठे, पनवेल, नवी मुंबई, महाराष्ट्र 410209, India  
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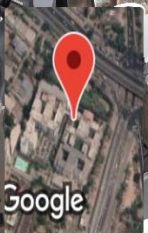



**Navi Mumbai, Maharashtra, India**  
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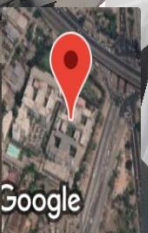



**Navi Mumbai, Maharashtra, India**  
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 Mumbai, Maharashtra 410206, India  
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 15/06/23 10:57 AM GMT +05:30




**Navi Mumbai, Maharashtra, India**  
 2483+VRH, MGM Campus, Kamothe, Panvel, Navi  
 Mumbai, Maharashtra 410206, India  
 Lat 19.017435°  
 Long 73.104916°  
 25/07/23 11:49 AM GMT +05:30




**Navi Mumbai, Maharashtra, India**  
 2483+VRH, MGM Campus, Kamothe, Panvel, Navi  
 Mumbai, Maharashtra 410206, India  
 Lat 19.017182°  
 Long 73.105071°  
 17/07/23 02:45 PM GMT +05:30

