Overview:
Manipal, popularly known as international university town of today, made its beginning with the establishment of medical college in private sector, viz., Kasturba Medical College, Manipal that was established in the year 1953. It was the first self-financing medical college in the private sector in India, established in a barren hillock which has turned itself to be a green environmental city, with all modern amenities conducive to student learning. Today, Kasturba Medical College, Manipal, is a name synonymous with quality medical education which attracts people not only from India but also from other countries of the world. The college has consistently been ranked among the top ten medical colleges in the country. Students from over 30 countries graduate from the college every year and the degrees are recognized worldwide.

KMC has one of the finest learning environments in South Asia with infrastructure and faculty that support students to hone their skills to become outstanding medical professionals, true to its mission. KMC is recognized by the Medical Council of India and the General Medical Council of Great Britain, the Malaysian Medical Council and Australian Medical Council. KMC, Manipal celebrated Diamond Jubilee in the year 2013-14.

The institute has strong academic linkages with national and international universities of repute. Many students from countries like UK, Ireland, USA, New Zealand, Kenya, The Netherlands and Malaysia regularly opt for elective postings at Kasturba Medical College, Manipal that gives them great opportunities to learn.

Objectives:
Providing quality professional medical education to every student who joins KMC, Manipal to facilitate his overall growth is the prime objective of the institution.

The mission of KMC, Manipal is “to train competent, compassionate and carrying physicians through excellence in teaching and patient care”. The entire team of management, the faculty, staff and the support employees, with the best of the available infrastructure facilities, has been working towards achieving the same.

Thrust area of Research:
- Biochemistry - Newborn Screening lab
- Microbiology – Bacteriology, Parasitology, Virology
- Pharmacology, Medicine, Psychiatry - Drug trials
- Community medicine – Vaccine trial
- Medical Genetics
- Clinical embryology
State of the art of the facilities available/infrastructure:

- **Centralized Research facility** – state of the art facility for cellular, molecular, genetic and clinical research
- Individual **departmental research laboratories** with facilities to undertake subject specific undergraduate and postgraduate research
- **Interdisciplinary research facility** - between basic science, clinical, pharmacological, pharmaceutical and technical specialties
- **Central Animal facility** with experimental animal breeding, maintenance and surgical facilities

Achievements:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number Grants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1 crore 49 lakhs</td>
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<tr>
<td>2014</td>
<td>1 crore 69 lakhs</td>
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<tr>
<td>2015</td>
<td>1 crore 53 lakhs</td>
</tr>
<tr>
<td>2016</td>
<td></td>
</tr>
</tbody>
</table>

Contact Details:

Dr. Pragna Rao, Associate Dean Research, Kasturba Medical College, Manipal
Landline: 0820-2933527

Photographs:
Clinical Embryology

Overview:

The Department of Clinical Embryology is the only center in Asia and the third in the world which offers full time MSc in Clinical Embryology and PhD in Clinical Embryology. The department is a center for advanced research and training. The overall placement scenario is 100 percent for undergraduate, postgraduate and research level study.

The department is on its way to becoming a leading department for research in Clinical Embryology and Assisted Reproduction Technology (ART).

Manipal University was first to introduce Master of Clinical Embryology (M.Sc.) in 2005 aiming to provide thorough knowledge, research experience, ethics and skills related to human embryology.

Core Competencies are:

- In Vitro Fertilization (IVF)
- Intracytoplasmic Sperm Injection (ICSI)
- Gamete and Embryo Cryopreservation
- Laser hatching
- Semen analysis
- Research

Objectives:

Thrust area of Research:


Approved and ongoing research projects as follows:

<table>
<thead>
<tr>
<th>Funding Agency</th>
<th>Year</th>
<th>Funding (INR)</th>
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<tr>
<td>AvH Foundation, Germany</td>
<td>2015–18</td>
<td>Euro 54, 266</td>
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<tr>
<td>SERB (DST)</td>
<td>2013–16</td>
<td>23, 00, 000</td>
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<tr>
<td>ICMR</td>
<td>2013–16</td>
<td>18, 00, 000</td>
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<td>ICMR</td>
<td>2013–16</td>
<td>20, 00, 000</td>
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<tr>
<td>SERB (DST)</td>
<td>2016–19</td>
<td>49, 50, 000</td>
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<tr>
<td>ICMR (SRF)</td>
<td>2014–16</td>
<td>7, 89, 800</td>
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<tr>
<td>VGST</td>
<td>2015–17</td>
<td>4, 00, 000</td>
</tr>
<tr>
<td>DHR (WSF)</td>
<td>2015–18</td>
<td>35, 49, 000</td>
</tr>
<tr>
<td>Merck</td>
<td>2015–16</td>
<td>11, 50, 000</td>
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<tr>
<td>ICMR</td>
<td>2016–19</td>
<td>45, 57, 000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2, 12, 97, 000</strong></td>
<td></td>
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</table>
Completed research projects: 1, 02, 43, 000
Total publication 65
Scopus Indexed 63
Total IF 225
Average IF 3.57

Research areas:
- Pathophysiology of gametes and embryo
- Development of non-invasive markers for embryo selection
- Fertility preservation (Sperm/oocyte/embryo/tissue banking)

State of the art of the facilities available/infrastructure:
- Laboratory area (> 3000 sq. ft.)
- State of the art equipment
- Animal handling area
- Library/group discussion area
- Office room for faculty/research staff

Core Laboratories:
- Andrology and male reproductive laboratory
  - Sperm functional characteristics
  - Kinematics
  - Fertilizing ability
  - Chromatin integrity
  - Epigenetic integrity
- Micromanipulation Laboratory:
  - Intra Cytoplasmic Sperm Injection
  - IMSI
  - Laser Assisted Hatching
  - Embryo biopsy
- Embryology Laboratory:
  - Embryo Culture
  - Blastocyst culture
  - Imaging
- Gamete and Embryo Banking:
  - Testicular tissue cryopreservation
  - Ejaculated/epididymal sperm banking
  - Ovarian tissue preservation
  - Oocyte banking
  - Embryo banking
**Achievements:**

- Number of procedures approx. 12,000/year
- Started M.Sc. Clinical Embryology in 2005 with 100% placement with International Observership and Internship at reputed IVF centers
- Academic industry collaboration with Spain based IVF Service provider, ten state of the art centers in India, MoU signed in Feb 2015 with Nova IVF Fertility, Campus recruitment of Embryologists, internship of two months to students
- It has a Center for Fertility Preservation funded by the Alexander von Humboldt which provides clinical services (consortium of clinicians, surgeons and embryologists); aiming to serve as a national reference center by 2020; joint collaboration projects and publications etc.

**Contact details:**

Dr. Satish Kumar Adiga  
Professor and HOD  
Department of Clinical Embryology  
Email: satish.adiga@manipal.edu  
Landline: 0820-2922320

**Photographs:**
Kasturba Medical College, Mangalore

Overview:
Kasturba Medical College, Mangalore (a constituent college of Manipal University) was established in 1955. It is the First Public Private Partnership (PPP) model in Medical Education and Healthcare delivery in India. It is a member of Global Education in Medicine Exchange (GEMx), an ECFMG initiative. This self-financing medical college has 25 Departments with 31 programs. KMC, Mangalore offers MBBS, PG degrees in 16 specialties, DNB in 4 specialties, PG diploma in 8 specialties and M.Sc. in 5 specialties. It also provides full-time and part-time Ph.D. programs.

Objective:
To be a center of excellence in Medical Education and Medical College of choice for students and faculty. The mission includes excellence in academics, research and quality healthcare. To increase the quantity of quality publications and attract external funding for research.

Thrust area of research:
Research is a component of the vision. This includes core areas like Infectious diseases, non-infectious diseases, lifestyle diseases. The thrust is on Insulin resistance, diabetes mellitus and its complications, health system research, radiation induced cytotoxicity, cancer, neurophysiology, malaria, HIV/AIDS, tuberculosis, methicillin resistant Staphylococcus aureus, community-associated infections, healthcare-associated infections, antimicrobial resistance.

State of the art facilities:
Polymerase Chain Reaction (PCR), BacT Alert, Chemiluminiscence, MGIT, Vitek 2 system, Flow cytometry in addition to the standard research facilities.

Achievements:
Ranked 25th in The Week-Hansa research best colleges’ survey 2016: Part of 2 global medical student exchange programmes- Global Health Learning Opportunities (GHLO) and Global Education in Medicine Exchange (GEMx). KMC, Mangalore has the highest number of ICMR STS awards in the country. The SRL, attached to Microbiology has been awarded the prize for outstanding SRL by NACO.

Contact details:
Dr. M Venkatraya Prabhu
Dean
Landline: 0824-2422271;
Email: kmcmr@manipal.edu; venkatraya.prabhu@manipal.edu
Photographs:
Manipal College of Dental Sciences, Manipal

Overview:
Manipal College of Dental Sciences Manipal was established in the year 1965, as the first self-financing Dental College in private sector in the Country. Since then it has metamorphosed and is recognized nationally and internationally. Today MCODS, Manipal, is one of the best equipped dental colleges in the country, engaged in oral healthcare education, research, patient care and community services.

MCODS, Manipal has successfully met the global recognition as it is recognized as an esteemed training center for MFDS program of Royal College of Physicians and surgeons, International Qualifying examination from UK and is also recognized by the Malaysian Dental Council. This recognition has helped our alumni to achieve greater heights in their positions at various parts of the world. State of the art infra-structure, good academics and cutting edge skill has always been appreciated by various foreign universities, and students choose for externship programs at our institute.

Immense research opportunities are offered to students by highly experienced faculty. ‘Provenance’ a business plan competition; students of MCODS, Manipal are actively involved and are one of the winning teams transforming innovative ideas into viable business proposals. Institution offers an encouraging and purposeful environment inspiring young dentists to flourish and fully develop their skills and interests, which they possess.

Since its inception MCODS, Manipal, offers a complete and conducive environment to achieve excellence in academics, research and patient care.

Objectives:
- To inculcate the culture of research amongst students and faculty
- To disseminate the new knowledge/information to a larger community of researchers through publications and patent
- To provide assistance to students and faculty in developing Dental Innovations and to transform dental innovations into viable business plan

Thrust area of research:
- Prognostic markers in Oral cancer
- Cytotoxicity of root canal irrigating solvents
- Molecular studies in potentially malignant disorders
- Herbal products for plaque control
- Local drug delivery system

State of the art facilities:
MCODS Manipal, has the state of the art infrastructure comprising of centrally air conditioned lecture halls, laboratories, seminar rooms, and Library to support UG and PG teaching Program.
A world class Dental material museum, one of the best in the country with invaluable collection of several fabricated models and various materials that are used in dentistry. The pre-clinical phantom head laboratory, well equipped with 80 work stations for simulating the clinical dental treatment, for students to acquire the basic knowledge and skill of tooth preparation, material manipulation and restoration. The institution has state of the art dental Equipment including 316 dental chairs, surgical Microscope, soft tissue and hard tissue lasers, Piezo unit and newer generation dental materials providing an ideal environment for learning and research.

The quality of education it offers goes beyond the classroom success. MCODS, Manipal, is actively involved in conducting Community based Programs, through mobile dental clinic with two automated dental chairs; ‘dentistry to doorstep’ is our adage the aim of these programs is to take primary dental care to villages and to focus public attention on unmet Dental needs.

Achievements:
- MCODS Manipal, is placed at top three among 300 dental colleges in the Country
- Awarded Second place in Innovation among all the institutions of MU
- Faculty recognized as Lead Guest Editor for Biomed Research International Journal
- International research collaborations:
  - College of Dentistry, Wonkwang University, Republic of Korea
  - University of Colorado School of Dentistry, New Mexico USA,
  - University of Augusta, USA,
  - University of Granada, Spain
- It is worth mentioning that MCODS Manipal has filed 5 patents with one patent being granted for ‘improved dental luting cements’.
- MCODS, Manipal was also instrumental in the setup of Dental Innovation Private Limited Company by an alumnus of the college who is actively involved in research, development and marketing of these innovative products.

Innovation:
- Opticure, Portable dental chair,
- Tripartite, Oral cancer screening device, Dentogate
- Denta compressor
- Mouth opening devices, Occlusal Plan analyzer
- Head Phone Aided TMJ disorder detection, Deprograming Centric relation optimizing bite & Apnea Guard

Contact details:
Dean,
Manipal College of Dental Sciences, Manipal
Manipal University
Photographs:

Mobile Dental Van

Phantom head Lab
Operating Microscope

Mobile Dental Clinic:
Manipal College of Dental Sciences, Mangalore

Overview:

The Manipal College of Dental Sciences, Mangalore was founded in 1987 and has evolved into a multi-faceted institution recognized globally for excellence in its specializations.

The institution has excellent infrastructure facilities and state-of-the-art dental equipment. The undergraduate and postgraduate training programs for both pre-clinical and clinical aspects are imparted at the Light House Hill and Attavar Campus.

The clinical facilities for training in medical subjects are available at the Kasturba Medical College Hospital, Attavar, which is a 651-bedded hospital. We provide an excellent atmosphere for studies and recreation.

The college is recognized by the Dental Council of India and Malaysian Dental Council. It is also ISO 9001: 2000 certified.

Objectives:

Thrust area of research:

- Surgical and nonsurgical periodontal therapy
- Biomarker detection in periodontal disease
- Implant dentistry
- Material characterization
- CBCT, Orofacial Pain and TMJ Disorders
- Biomarkers and prognostics in Squamous carcinoma
- Oral Cancer diagnostics

State of the art facilities:

- Centrifuge machine and armamentarium for PRF membrane preparation

Achievements:

- Top 3 among 300 dental colleges in the country
- Awarded 2nd place in Innovation
- Filed 5 patents with one patent being granted for ‘improved dental luting cements’

Contact details:

Dean
Dr. Dilip G Naik
Professor
Department of Periodontics
0824 – 2428716

dean.mcodsmrl@manipal.edu
Photographs:

Cone Beam Computed Tomography

Digital Panoramic Machine
Laser (Diode Laser AMD Picasso 810nm)
Surgical Loupes

Implant Kit (MIS System)

Centrifuge machine and armamentarium for PRF membrane preparation
Elements Obstructing System
Surgical Microscope

Variable Curing Light

X-mart Rotary System

Olympus CX 41 with attached camera (5 megapixel), micropublisher 3.3 RTV imaging, cellSense image analysis software, and attachments for fluorescence and polarizing microscopy
Department of Medical Genetics, Manipal

Overview:

Department of Medical Genetics at Kasturba Medical College strives to translate recent research in the field of genetics to patient care. The department offers consultation services for patients and families with diverse genetic conditions and birth defects. It also offers the much needed diagnostic services on its own and in collaboration with other laboratories in India and abroad. Patient care is supported by genetic counseling on reproductive options and prenatal diagnosis.

The department has regular teaching and training programs for medical students, genetic counsellors and PhD scholars in addition to continuing medical education programs.

The department has well established national and international collaborations with clinicians and scientists. The department has secured funding from various national agencies to carry out research in molecular basis of genetic disorders. Research activities are supported by excellent laboratory facilities within the campus.

Objectives:

- Clinical services
- Prenatal diagnosis
- Genetic counseling
- Laboratory facilities
- Fetal autopsy

Thrust area of research activities:

1) Total number of projects funded till date: 12

2) Total research grants till date: 3.94 crores
State of the art facilities:

- Clinical Services
- Prenatal diagnosis
- Genetic counselling
- Laboratory facilities
- Fetal autopsy

Achievements:

Contact details:
Dr. Girish K M
Professor and Head
Landline: 0820 – 2923149
URL: http://manipal.edu/kmc-manipal/department-faculty/department-list/medical-genetics.html

Photographs:
Department of Statistics

Overview:

The Department of Statistics was established in 2006 as an education and research department with a focus on Biostatistics. Biostatistics deals with the application of statistical techniques to scientific research in health-related fields, including medicine, dentistry, genetics, nursing & public health and the development of new tools to study these areas.

The department is focused on developing new quantitative methods and making innovative applications to substantiate and demanding scientific problems in the advancement of biomedical, pharmaceutical and public health research.

The Department offers ‘Master Program in Biostatistics’, ‘Certificate Program in Biostatistics, Epidemiology and Research Methodology’, ‘Executive Education Program in Biostatistics and ‘Doctoral Program’. The Department also offers consultancy in statistics to postgraduate and undergraduates of various health science courses. The Department has collaborative projects with various national and international agencies worth more than 26 million rupees (till date). Currently there are ten funded research projects, Seven faculty members and twelve research scholars. The faculty and research scholars of the Department has so far published 202 journal articles and 3 textbooks. The Department conducts regular workshops on statistical software like SAS, SPSS, STATA and R for industry ready training. For more details visit

http://www.manipal.edu/Institutions/UniversityDepartments/Statistics/Pages/Welcome.aspx

Objectives:

1. Develop a high level of satisfaction and maintain the same amongst:
   a) Students in
      (i) Teaching quality
      (ii) Method of delivery
      (iii) Content of curriculum
      (iv) Evaluation system
      (v) Placement
   b) Trainees in
      (i) Training quality
      (ii) Method of delivery
      (iii) Training content
   c) Consultancy recipient on quality of consultation and its procedures
   d) Industries towards
      (i) Academic and industrial quality of their recruits from the department and also towards
      (ii) Quality and novelty of training adopted to train the students.
   e) Faculty regarding
      (i) Self-contentment in teaching at department
      (ii) Opportunity provided for quality improvements
      (iii) Encouragement for their research activities
      (iv) Recognition and rewards from the organization

2. Engage in research promotion activities to enhance the
   a) Number and quality of publications
   b) Number and quality of collaborations
c) Number and quality of research consultations
d) Number and quality of research seminar/workshop/conference organized

3. Engage faculty in quality improvement through
   a) Attending/organizing training, conferences and workshops
   b) Involving local, regional, national and international academic and leadership initiatives

4. Attract and be recognized by
   a) Number of industries/organizations/institutions having world class recognition to recruit our students.
   b) Number of funding agencies to sponsor research projects and other activities related to research
   c) Number and quality of individual collaborators with department and faculty

**Thrust area of research:**

- Evidence based public health
- Epidemiology, Systematic review and meta-analysis
- Stochastic modeling for non-communicable diseases
- Biostatistics, Error analysis
- Public health modeling
- Microarray data analysis
- Matrix Methods
- Generalized Inverses
- Combinatorial Matrix Theory
- Measurement and evaluation in education
- Quality assessment in higher education
- Spatial Epidemiology

**State of the art of facilities:**

- The Department is equipped with state of the art computational facility and in possession of packages namely SAS, STATA, SYSTAT, SPSS, R, nMaster, MATLAB, Epi Info, Review Manager and EndNote.

- The Department has a statistical consultancy center to independently provide consultations for all levels of biomedical researchers of the University

**Achievements:**

The department managed to attract research grant of Rs.26 million from various national and international agencies namely:

**National Funding Agencies**

- ICSSR (Indian Council Of Social Science Research)
- BARC (Baba Atomic Research Centre)
- DBT (Department of Biotechnology)
- ICMR (Indian Council Of Medical Research)
- DST (Department Of Science and Technology)
- PHFI (Public Health Foundation Of India)
- Intel corporate technology group, Bangalore
**International Funding Agencies**

- WHO (World Health Organization)
- INCLEN (International Clinical Epidemiology Network)
- DFID (Department For International Development)

Currently there are ten funded research projects, seven faculty members and twelve research scholars. The faculty and research scholars of the Department has so far published **202** journal articles and **3** textbooks. The Department conducts regular workshops on statistical software like SAS, SPSS, STATA and R for industry ready training.

The department initiated joint Ph.D. program with Novartis Healthcare Pvt Ltd, Hyderabad and GSK, Bangalore.

**Publications**

**Research Article**

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<thead>
<tr>
<th>Sl. No</th>
<th>Year</th>
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<td>Chapters in Books</td>
<td>04</td>
<td>01</td>
<td>02</td>
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<td>Edited Books</td>
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</tbody>
</table>
Contact details:

Department email id : stats.mahe@manipal.edu
Phone Number : 0820 25 22407
URL : http://manipal.edu/dos.html

Photographs:
Manipur College of Nursing, Manipal

Overview:

Manipur College of Nursing, one of the leading institutions in India for nursing education and research, was established in 1990.

The college is certified by ISO 9001 : 14001 and also recognized by the National Assessment and Accreditation Council (NAAC). It is ranked third among top nursing colleges in India by The Week.

MCN has progressively grown in strength and scope over the years. It has highly qualified faculty, excellent infrastructure and the university’s teaching hospitals, which provide a wholesome experience in nursing education.

The institutions has six clinical nursing departments and each department has ongoing research projects.

For the first time in India, an Endowment chair to promote research in nursing has been established at MCON Manipal by the Manipal University in 2013.

The Manipal College of Nursing at Manipal is recognised by the Karnataka Nursing Council (KNC) and Indian Nursing Council (INC).

Milestones:

- Established in 1990; Basic BSc Nursing Program
- MSc Nursing (5 specialties)-1994
- Post Basic BSc Nursing -1995
- Master of Philosophy in Nursing – 1995
- Integrated Management System – 2010
- Structured PhD Program – 2011
- Post Basic Diploma in Nursing – 2011
- Silver Jubilee - 2015

Objectives:

Mission:

Excellence in nursing education, health care services, research and commitment to human development.

Vision:

To be a world class nursing institution with international standards and a hallmark of excellence in Nursing Education, Practice and Research.

Values:

- Quality
- Commitment
- Accountability
- Humane Touch
- Loyalty
- Integrity
- Teamwork
**Thrust area of research:**

Research Grants received and completed:

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Funding agency</th>
<th>National/ International</th>
<th>Total amount received</th>
<th>Name and designation of the faculty member(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INC GFATM (Round 7) – strengthening institutional capacity and training of nurses on HIV/ AIDS and ART from 2008 – 2015</td>
<td>Indian Nursing Council-General Fund for Aids, Tuberculosis and Malaria (INC-GFATM)</td>
<td>International through INC</td>
<td>Rs. 3,75,00,000/-</td>
<td>Manipal College of Nursing Manipal, Manipal University, Manipal</td>
</tr>
<tr>
<td>Project on tuberculosis infections and risk factors among healthcare trainees in South India</td>
<td>Dr. T.M.A Pai Endowment Chair on Translational Epidemiology and Implementation.</td>
<td>National</td>
<td></td>
<td>Co-investigator - Dr. Anice George, Manipal University, Manipal</td>
</tr>
<tr>
<td>Effectiveness of pranayama on cancer related fatigue among patients with breast cancer undergoing radiation therapy in Saibaba Cancer Centre, KMC, Manipal</td>
<td>Indian Council of Medical Research (ICMR), New Delhi</td>
<td>National</td>
<td></td>
<td>Co-investigator - Dr. Jyothi Chakrabarty, Associate Professor, Dept. of Medical-Surgical Nursing, Manipal</td>
</tr>
<tr>
<td>Effectiveness of Indian classical instrumental music therapy on developmental responses of preterm infants admitted to a tertiary level Neonatal Intensive Care Unit (NICU), KMC, Manipal’</td>
<td>Indian Council of Medical Research (ICMR), New Delhi</td>
<td>National</td>
<td></td>
<td>Co-investigator – Dr. Sonia R B D’Souza, Manipal University, Manipal</td>
</tr>
<tr>
<td>Identification, Diagnosis and Education and Empowerment of people with bleeding disorder in South India’</td>
<td>Novo Nordisk Haemophilia Foundation Andreasstrasse 15 CH-8050 Zurich Switzerland.</td>
<td>International</td>
<td></td>
<td>Co-investigator(s) – Mrs. Sulochana B, Manipal University, Manipal</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Project Title</th>
<th>Funding agency</th>
<th>National/ International</th>
<th>Total amount received</th>
<th>Name and designation of the faculty member(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness of breathing exercise on outcome of labour</td>
<td>MHYP (Maternal Health Young Researchers Project) St. Johns Research Institute &amp; St. Johns Medical College in collaboration with Maternal Health Task Force at Harvard School of Public Health Boston, USA</td>
<td>International</td>
<td>Rs. 3,00,000/-</td>
<td>Mrs. Sushmitha Karkada Asst. Professor-Sr. scale Dept. of OBG Nursing, MCON</td>
</tr>
<tr>
<td>Knowledge &amp; Practice on safety measures among fishermen of Udupi District</td>
<td>Fish Marketing Federation, Udupi and S.K. District</td>
<td>National</td>
<td>Rs. 10,000/-</td>
<td>Mrs. Anusuya Asst. Professor-Sr. scale Dept. of Community Health Nursing, MCON</td>
</tr>
<tr>
<td>Effectiveness of development care positioning aids on physiological parameters and health outcome of preterm infants admitted in Neonatal unit of KH Manipal</td>
<td>Philips Electronics India Limited, Bangalore</td>
<td>National</td>
<td>Rs. 1,00,000/-</td>
<td>Mrs. Yashoda S Asst. Professor-Sr. scale Dept. of Child Health Nursing, MCON</td>
</tr>
</tbody>
</table>

Research Grants received and ongoing:

<table>
<thead>
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<th>Project Title</th>
<th>Funding agency</th>
<th>National/ International</th>
<th>Total amount received</th>
<th>Name and designation of the faculty member(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Capacity Building for Nurse Educators to conduct multidisciplinary research in geriatric area.”</td>
<td>Indian Council of Medical Research (ICMR), New Delhi</td>
<td>National</td>
<td>Rs. 9,74,441(operating) Rs. 8, 10,000 (capital).</td>
<td>Principal Investigator: Dr. Anice George Professor and Dean, MCON</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>Co-PIs: Dr Judith A Noronha Prof. and Associate Dean, HoD Dept. of OBG Nursing MCON, Manipal Dr. Baby S Nayak Professor Dept. of Child Health Nursing, MCON Dr. Linu Sara George Professor and HoD Dept. of Fundamentals of Nursing, MCON Dr. Tessy Treesa Jose Professor and HoD</td>
</tr>
</tbody>
</table>
| Study on child abuse, and its relationship with attitude of adults and Socio-demographic variables | Indian Council of Medical Research (ICMR), New Delhi | National | Rs. 2,55,600 | Mrs. Sangeetha Priyadarshini  
Asst. Professor-selection grade  
Dept. of Child Health Nursing, MCON |
|---|---|---|---|---|
| A Randomized control trial to evaluate the impact of a nurse navigator programme on anxiety, psychological distress and quality of life of breast cancer patients in a tertiary care hospital, Karnataka, India. | Sigma Theta Tau International Honour Society of Nursing, USA | International | 2500 USD. | Mrs. Shejila  
Research Scholar  
Manipal College of Nursing, Manipal |
| Effectiveness of a mHealth (mobile/smartphone) based Preterm Home Care Program (mHealthPHCP) on the developmental outcomes of preterms | Department of Biotechnology, Government of India, New Delhi | National | Rs. 46,18,708 | Dr. Baby S Nayak  
Professor  
Dept. of Child Health Nursing, MCON  
Mrs. Binu Margaret E  
Asst. Professor-Selection grade  
Dept. of Child Health Nursing, MCON |

**Departmental wise details:**

**Department of Fundamentals of Nursing**

1. **Objectives of the department:**
   1. The main aim of the department is to mould the beginners with the right attitude towards the nursing profession
   2. To initiate departmental research projects
   3. To conduct interdisciplinary & collaborative research activities
   4. To implement evidence based research findings

2. **Thrust areas of Research:**
   - Identification, Diagnosis, Education and Empowerment of people with bleeding disorders in South India. IDEEA (Identification, diagnosis, education and empowerment for action)
   - Oral care protocol for cancer patients receiving chemotherapy and radiation therapy
   - Depression among post stroke survivors: Systematic review
   - Lived experiences of patients with bleeding disorder
   - Menstrual blood banking: Knowledge and attitude
   - Factors influencing examination anxiety among undergraduate students
   - Factors influencing learning among nursing students
3. Achievements:

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Achievement(s)</th>
<th>Name and designation of the faculty member(s)</th>
</tr>
</thead>
</table>
| 1      | -International Hemophilia training Centre (IHTC) fellowship program at Melbourne, Australia, May 2012; Sponsored by World Federation of Haemophilia -Project of the year award 2014 is been awarded for the IDEEA (Identification Diagnosis Education Empowerment for Action Improve the quality of life of persons with bleeding disorders in South India) -Project at World Congress Hemophilia, Melbourne Australia 2014. -Travel scholarship to attend the 22nd Preventive Cardiovascular Nursing Association Annual Symposium at Florida, USA, May 2016. -Travel grant to attend and participate at the “Nurses Debate” at Hemophilia World Congress at Orlando, Florida July 2016 | Mrs. Sulochana B  
Associate Professor |

4. Contact details (Department email id, phone number, URL)

Dr. Linu Sara George  
Professor and HOD  
Department of Fundamentals of Nursing  
Manipal College of Nursing Manipal  
Manipal University, Manipal -576104  
Email id: linu.j@manipal.edu  
Contact no: 9845602400  
URL: http://manipal.edu/mcon-manipal/department-faculty/faculty-list/linu-sara-george.html

Research Core Committee Representative:

Mrs. Sulochana B  
Associate professor  
Manipal College of Nursing Manipal  
Manipal University, Manipal -576104  
Email id: sulochana.k@manipal.edu  
Contact no: 9945676981
DEPARTMENT OF MEDICAL-SURGICAL NURSING

1. Overview of the department:

The department of Medical-Surgical Nursing undertakes training of undergraduate and post graduate nursing students in the field of medical surgical nursing. Theory classes are taken the classrooms and students gain practical experience in the medical surgical wards of hospital. Faculty incorporates clinical teaching, individual case discussion, case studies and clinical conferences so that the students can apply theory knowledge in clinical setting and attain a higher understanding and skill. During the academic year 2014-15, postgraduate students have opted for neuroscience nursing and Nephrology nursing and during the academic year 2015-16, they have opted for critical care nursing for specialty training. In addition to this, faculty members take classes on Emergency and first-aid, and Basic Life Support for external students.

2. Objectives of the department:

1. To prepare the students to provide nursing care to patients suffering from medical and surgical conditions
2. To conduct monthly continuing education programme for the department faculty
3. To organize and conduct health awareness programmes
4. To conduct departmental researches
5. To guide researches of post graduate, MPhil and PhD students
6. To apply for funded research projects from various funding agencies
7. To participate in conducting diabetic clinic at Kasturba Hospital

3. Thrust areas of Research:

- Drug Studies
- Hypertension
- Infection control
- Cancer, Cancer treatment and side effects
- Yoga and pranayama as complementary therapy
- Diabetes Mellitus
- Dialysis

4. Achievements:

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Achievement(s)</th>
<th>Name and designation of the faculty member(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Advanced Concepts In Nursing – Psychosocial Aspects Of Critically Ill Patient Book published in September 2015, Published By CBS Publishers &amp; Distributors, Pvt. Ltd.</td>
<td>Dr. Elsa Santombi Professor and HoD</td>
</tr>
<tr>
<td>2</td>
<td>Best paper award for the paper “Effectiveness of Pranayama on cancer related fatigue among breast cancer patients receiving radiotherapy” in the International Conference on transcultural research November, 2011 organized by Manipal College of Nursing, Manipal.</td>
<td>Dr. Jyothi Chakrabarty Associate Professor</td>
</tr>
</tbody>
</table>
3. - Secured third prize for the paper presentation on “a survey on risk assessment of renal failure among hypertensive and diabetics in Udupi district, India” - 2014 17th & 18th August
- Secured First prize for the paper presentation on “A study to assess the reference range of estimated Glomerular Filtration Rate (eGFR) in Healthy South Indian Males – and identify clients with Chronic Renal Failure (stage I and above) with hypertension and diabetes or both - A pilot study” - 2013 Oct 25th - 27th

Mrs. Leena Sequira
Assistant Professor-senior scale

4. - International Federation of Infection Control (IFIC), UK awarded Scholarship for presenting oral research paper on ‘MRSA: The leading pathogen of Orthopedic infection’ at the 15th Congress of International Federation of Infection Control in conjunction with XIII HISICON, the National Conference of Hospital Infection Society India from 21st to 24th March 2015 at New Delhi
- Best Scientific Paper Award in the National Conference on “Redesigning Clinical teaching Role of a Clinical Teacher” organized by MIMS College of Nursing, Calicut, Kerala on 04th and 05th January 2011

Ms. Latha T Assistant Professor

5. Contact details (Department email id, phone number)

Dr Elsa Sanatombi Devi
Professor & Head,
Medical Surgical Nursing Department
Manipur College of Nursing Manipal, MU
Madhava Nagar, Manipal - 576104
Phone: 0820 2922471
Email: elsanana@manipal.edu
URL: http://manipal.edu/mcon-manipal/department-faculty/faculty-list/elsa-sanatombi-devi.html

Research Core Committee Representative:
Dr Jyothi Chakrarahthy
Asst. Professor, Medical Surgical Nursing
Manipur College of Nursing Manipal, MU
Madhava Nagar, Manipal - 576104
Phone: 0820 2923122
Email: jyothi.r@manipal.edu
1. **Overview of the department:**
   The department of Child Health Nursing provides courses related to child health nursing within the framework of the curriculum of Manipal College of Nursing and the Indian Nursing council (INC). The department provides student-centered teaching and learning in conducive atmosphere that helps the students to gain confidence in their nursing knowledge and skills. The department is concerned with training the students in developing the knowledge and skills required to respond to health care needs of infants and children and their family in a variety of settings. Importance is given to the evidence based practice and safeguarding the health of child and the family. The courses offer the students the opportunity to identify the needs of children and provide comprehensive care.

2. **Objectives of the department:**
   1. To prepare undergraduate and post graduate students to provide nursing care to children
   2. To organize continuing nursing education for the department faculty
   3. To conduct research in the area of child health
   4. To conduct awareness programme on health related topics at various settings

3. **Thrust areas of Research:**
   - Childhood obesity,
   - Newborn Care,
   - Child Abuse,
   - Hemophilia,
   - Non communicable diseases of children,
   - Adolescent Health,
   - Child Health Nursing
   - Diseases of childhood including HIV/AIDS
   - Qualitative research
   - Hemophilia in children

4. **Achievements:**

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Achievement(s)</th>
<th>Name and designation of the faculty member(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Best Poster award in poster presentation at the International Conference on Evidence Informed Practice: An Approach to Healthcare Reform held at MCON Manipal on 25th January 2015</td>
<td>Mrs. Sheela Shetty Asst.Professor-Sr.scale Mrs. Anjalin D'Souza, Asst. Professor-Selection grade</td>
</tr>
</tbody>
</table>

5. **Contact details (Department email id, phone number, URL)**
   Dr Mamatha S Pai
   Professor & Head, Child Health (Pediatric) Nursing
   Manipal College of Nursing Manipal, MU
   Madhava Nagar, Manipal - 576104
   Phone: 0820 2923129
   Email: mamatha.spai@manipal.edu
   URL: [http://manipal.edu/mcon-manipal/department-faculty/faculty-list/mamatha-shivananda-pai.html](http://manipal.edu/mcon-manipal/department-faculty/faculty-list/mamatha-shivananda-pai.html)
DEPARTMENT OF OBSTETRICAL AND GYNECOLOGICAL NURSING

1. Overview of the department:
The department of Obstetrical and Gynecological Nursing takes pride in quality teaching. It provides courses in Obstetrical and Gynecological nursing with theoretical and practical elements to undergraduate and postgraduate students. The department prepares graduates and postgraduates with necessary skills and knowledge to provide comprehensive maternal and child-care. The department encourages student research in the core areas of women’s health, reproductive health, High-risk pregnancy, neonatal care and related health areas pertaining to women, newborn and their families. The department also ensures effective and efficient services to the student community and enables them to function as educators, managers and researchers in the field of Obstetrical and Gynecological nursing.

2. Objectives of the department:

1. To provide need based care to women during antenatal, intranatal and postnatal period
2. To provide MCH services in rural health centers
3. To conduct departmental research
4. To conduct outreach program on Women’s day
5. To conduct lactation counseling for antenatal mothers
6. To observe Newborn Week
7. To conduct CNE for staff nurses along with 2nd year MSc. Nursing students

3. Thrust areas of Research:

- Women’s health issues (obesity, menopause, adolescent nutrition)
- Obesity in antenatal women
- Gestational Diabetes
- Preeclampsia and hypertensive disorders in pregnancy
- NCDs in women and preventive care
- Neonatal care
- Premature and sick infants
- Reproductive health
- Postnatal and newborn Care
- Breast feeding
- Infertility issues
4. Achievements:

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Achievement(s)</th>
<th>Name and designation of the faculty member(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Most accomplished Faculty Award January 2016 by Manipal College of Nursing, Manipal University. In recognition for the overall excellence in: Leadership responsibilities, publications, conference presentations, research grants, student evaluation and performance appraisal for the academic year (2014-2015) Dr. TMA Pai Gold medal for the best research publication, January 2015</td>
<td>Dr Judith A Noronha Professor, Associate Dean, HoD</td>
</tr>
<tr>
<td>2</td>
<td>- Best Scientific paper award for the paper titled “Efficacy of ‘nesting’ on cardio-respiratory stability of preterm infants on assisted ventilation using a reliable ‘SCRIP score’” among the oral paper presentation category during Regional conference on Recent trends in MCH care by PSG college of Nursing, Coimbatore, Tamilnadu in October, 2010 - Smt. &amp; Sri. K.V. Raman Nair memorial prize sponsored by the Founder Dean of Manipal College of Nursing, Manipal for the best published Research paper in an indexed journal during the Annual day of Manipal College of Nursing, Manipal for the year 2009 - Second Rank in M.A Sociology by Karnataka State Open University (KSOU), Mysore, Karnataka in the examination held during June 2004 - First place in Handwriting (Kannada) competition- ‘Kalasangam 2002’ by Mangalore Musical and Cultural Association (Regd.), Mangalore held in November 2002 - Best Health education puppet show titled “Safe blood saves lives” health education using puppetry for the theme “Safe Blood” in the health education competition held by the SNA State branch in Moodbidri, Karnataka in 2001-2002</td>
<td>Dr. Sonia R B D’Souza Associate Professor</td>
</tr>
</tbody>
</table>

Contact details
Dr Judith A Noronha (Associate Dean)
Professor & Head, OBG Nursing
Manipal College of Nursing Manipal, MU
Madhava Nagar, Manipal - 576104
Phone: 0820 2923123
Email: judith.n@manipal.edu
URL: http://manipal.edu/mcon-manipal/department-faculty/faculty-list/judith-angelitta-noronha.html

Research Core Committee Representative:
Dr Sonia R B D’Souza
Associate Professor
DEPARTMENT OF MENTAL HEALTH NURSING

1. Overview of the department:
Department of Psychiatric (Mental Health) Nursing, provides academic services and conducts research to promote mental health and prevent mental health problems of people, their families and communities as well as continuously intervene and rehabilitate patients with psychiatric problems and their families. It uses theories of human behavior as its scientific framework and requires the use of the self as its art or expression in nursing practice. The department with experienced and dedicated faculty render quality education to undergraduate and post graduate students, assisting them in developing expertise and an in-depth understanding of the field. It helps students appreciate clients as individuals and develop skills to function as psychiatric nurses, enabling them to function as educator, manager and researcher in the field of psychiatric nursing. The Department is also committed to provide opportunities for professional growth, including a fully individualized orientation, support for participation in professional development activities and various in-service programs for the faculty.

2. Objectives of the department:

1. To enhance the learning of undergraduate and post graduate students in the class room and clinical area
2. To provide need based care to the mentally challenged adults
3. To conduct department research
4. To organize continuing education programme for the department faculty
5. To observe World Mental Health Day, World Alzheimer’s Day and World Suicide Prevention Day
6. To conduct outreach programme

3. Thrust areas of Research:

- Forensic psychiatry
- Sexual abuse of Children
- Child and Adolescent Mental Health Promotion
- Aggression management
- Postnatal depression, Child psychiatry
- Forensic psychiatry and rehabilitation services, PLHIV etc.

4. Achievements:
<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Achievement(s)</th>
<th>Name and designation of the faculty member(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Best faculty research article award 2003</td>
<td>Dr. Tessy Treesa Jose</td>
</tr>
<tr>
<td></td>
<td>Contributed towards writing and publishing a book on Patient care in</td>
<td>Professor and HoD</td>
</tr>
<tr>
<td></td>
<td>medical imaging technology (2003).</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Best Teacher Award 2012</td>
<td>Dr. Blessy Prabha Valsaraj</td>
</tr>
<tr>
<td></td>
<td>Most accomplished faculty award 2014</td>
<td>Associate Professor</td>
</tr>
</tbody>
</table>

5. **Contact details (Department email id, phone number, URL)**

The HoD, Psychiatric (Mental Health Nursing)
Manipal College of Nursing Manipal, MU
Madhava Nagar, Manipal – 576104
Phone: 0820 2922863
Email: tressy.j@manipal.edu

**Research Core Committee Representative:**

**Dr Blessy Prabha Valsaraj**
Associate Professor
Dept. of Mental Health Nursing
Madhava Nagar, Manipal – 576104
Phone: 0820 2922462
Email: blessy.v@manipal.edu

**DEPARTMENT OF COMMUNITY HEALTH NURSING**

1. **Overview of the department:**
The department undertakes training of undergraduate and post graduate nursing students in the field of Community Health Nursing. Students are trained in the areas of assessment and identification of health problems of people living in the community. Students are further trained to make referrals for people identified to have problems and to give health education with emphasis on the preventive aspects. Students are also regularly participating in the morbidity clinics conducted by the department. Students of Community health Nursing have rated the faculty members in the department at 4.07 on a five point scale.

2. **Objectives of the department:**

1. Providing need based care to the individual, family and community at adopted villages.
2. Providing MCH services in Urban and Rural health centers.
3. Conducting morbidity clinic in adopted villages such as Marne/ Patla & Athrady every month.
4. Participating and observing in National Health Programmes.
5. Carrying out School Health Programme and Nutrition Projects.
6. Organizing eye and dental camps.
7. Conducting departmental research.
8. Coordination of International students.

3. **Thrust areas of Research:**
   - Problems of migrants, Malnutrition,
   - Cancer, palliative care,
   - Obesity, Maternal and child health including adolescent, Vector borne diseases, Geriatric, mental health
   - DM, Geriatric problems, cancer, vector borne diseases, obesity
   - Geriatric health, reproductive, child health, women empowerment
   - Rehabilitation, Geriatrics, adolescent health, malnutrition
   - Waste Management
   - Communicable and Non communicable diseases.

4. **Achievements:**

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Achievement(s)</th>
<th>Name and designation of the faculty member(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Best published research paper in the indexed journal award in the year 2015</td>
<td>Mrs. Malathi G Nayak Asst. Professor</td>
</tr>
<tr>
<td>2</td>
<td>Received Good Teacher Award for the year 2013- 2014</td>
<td>Mrs. Manjula Asst. Professor</td>
</tr>
</tbody>
</table>

5. **Contact details (Department email id, phone number, URL)**
   **Dr Shashidhara Y N**
   HoD, Community Health Nursing
   Manipal College of Nursing Manipal, MU
   Madhava Nagar, Manipal - 576104
   Phone: 0820 2922902
   Email: shashidhara.yn@manipal.edu
   url: [http://manipal.edu/mcon-manipal/department-faculty/faculty-list/shashidhara-y-n.html](http://manipal.edu/mcon-manipal/department-faculty/faculty-list/shashidhara-y-n.html)

   **Research Core Committee Representative:**
   Mrs. Manjula
   Assistant Professor
   Dept. Community Health Nursing
   Manipal College of Nursing Manipal, MU
   Madhava Nagar, Manipal - 576104
   Phone: 0820 2922822
   Email: manju.uppi@manipal.edu

**State of the art of facilities:**

**Achievements:**

1. The first nursing institution in the Country to be certified by ISO 9001:2000
2. Only institution offering MPhil Nursing Program in India
3. Ranked 3rd in the most preferred Nursing Colleges in Recruiter’s Choice (The week survey 2012)
4. One of the best Nursing Reference Libraries in India
5. One of the four Nursing institutions in India whose degree is approved by Singapore Nursing Board
6. Only Nursing institution having only 79% MSc (N) qualified faculty members and 21% PhD qualified faculty
7. Endowment chair for Action Research in Nursing in 2014
8. Adjunct faculty members from MGH Institute of Health Professions, Massachusetts and McMaster University, Canada

Faculty/Student Exchange programs:
- Ngee Ann Polytechnic, Singapore
- Middlesex University, UK
- Mc. Master University, Canada
- Hochschule Bremen University, Germany
- University of Nottingham, UK
- Auckland University of Technology, Auckland, New Zealand
- MGH institute of Health Professions, Boston, USA
- Federation University, Australia
- University of Miami, USA

Participation in courses offered by other department/ institution
- First aid orientation classes for MBBS students of KMC Manipal.
- Manipal University-FAIMER International Institute for Leadership in Interprofessional Education (MUFIILIPE) fellowship program.
- Bioethics certificate course organized by Centre for Bioethics, MAHE.
- Guidance and counseling program run by MAHE.
- Advance Cardiac Life Support (ACLS) program organized by Medical Simulation Centre of MAHE.

Contact:
Dr. Anice George
MCON, Manipal
Landline 0820 – 2922443
Email: office.con@manipal.edu

Dr. Judith A Noronha
Obstetrics and Gynecological Nursing
Landline: 0820 – 2923123
Email: judith.n@manipal.edu
Manipal College of Pharmaceutical Sciences, Manipal

Overview:

Manipal College of Pharmaceutical Sciences (MCOPS) of today owes its origin to the vision and enterprise of Late Dr TMA Pai, who ushered in an era of self-financed education, an event that changed the Indian landscape of tertiary education. A college that started offering diploma in pharmacy (DPharm) education in 1963, became a degree college for bachelor of pharmacy (BPharm) program in 1965. Eventually, MCOPS became the first college to offer post-graduate course (MPharm) in Karnataka in 1970 and the doctor of pharmacy (PharmD) program in 2008 in India.

In MCOPS research plays an important role apart from academic activities. To facility the research activities at MCOPS eight departments had been created to perform various aspect of Pharmaceutical research. Today these department had developed state of art facilities to perform various Drug discovery and Development programs.

Objectives:

To provide excellence in Pharmaceutical Education and Research and to March with the Times. In order to meet the vision MCOPS tries to enhance the research potential and promote research collaborations in drug design and discovery.

Thrust area of Research:
In research activities at MCOPS stands on 8 Department pillars:

a. Department of Pharmaceutical Biotechnology:

Current Areas of Research

- DNA based vaccine delivery systems.
- Screening, isolation, characterization and scale-up of microbial products (enzymes, antibiotics and other secondary metabolites) from microorganisms of commercial interest and its pharmacological evaluation.
- Microbial synthesis of nanoparticles: Biosynthesis, isolation and characterization.
- Understanding signaling pathways in cancer pathogenesis and therapy.
- Gene expression studies.
- Immunoproliferators: Isolation, characterization and evaluation of cytokine like molecules from microbial source.
- Development and evaluation of novel Nano-formulations, identification of synergistic combinations to overcome microbial antibiotic resistance.
- Peptide therapeutics: Design, evaluation and formulation of peptides for therapeutics.
• Development and analysis of Nano-formulation for brain delivery.
• Drug discovery: Screening of drug candidates for their antimicrobial, antioxidant, hepatoprotective, nephroprotective, antiobesity, anticancer, antiviral and antidiabetic activities.

Expertise / Collaborations/ Consultancy
• Screening of drug candidates for their antimicrobial, antioxidant, hepatoprotective, nephroprotective, antiobesity, anticancer, antiviral and antidiabetic activities using in vitro cell culture based techniques.
• Sterility tests, antimicrobial assays, microbial limit tests of drug formulations.
• PCR, gene and protein expression studies.
• The department also imparts training for students and academicians from sister and other institutions in the latest microbial screening and molecular biology techniques used in biochemistry and biotechnology specializations.

b. Department of Pharmaceutical Quality Assurance

Core competencies
• Drug Metabolism and Pharmacokinetic studies.
• Pharmaceutical materials science including Crystal engineering and crystal structure manipulations of drug molecules.
• Stability studies of drug substances and formulations.
• Analytical and bio-analytical method development and validation.
• Quality management of pharmaceutical industry.
• Expertise in preparation and submission of dossiers.

c. Department of Pharmaceutical Chemistry

CORE COMPETENCIES
• Molecular modelling based drug design
• Advanced organic synthesis
• In-vitro safety studies
• Analytical method development
• Metabolic stability studies
• Screening of drug candidates for antimicrobial, antioxidant, anticancer activity

d. Department of Pharmacy practice

Core competencies:
• Pharmaceutical care services
• Drug and poison information services
e. **Department of Pharmaceutical Management:**

**Core Competencies:**
- Consumer Behavior
- Market Research
- Entrepreneurship development
- International Marketing
- Pharmaceutical Advertisements
- Intellectual Property Rights
- Drug Regulations
- Professional Skill Development
- Pharmaceutical Marketing
- Pharmacoeconomics and Outcomes Research

**Salient Features:**
- Digital management lab
- Consultancy services
- Marketing research lab

f. **Department of Pharmacognosy**

**Core competence**
- Herbal drug standardization
- Development of Nano-herbal formulation
- Medicinal Plant Tissue Culture
- Evaluation of traditional herbal formulation
- Isolation and purification of phytoconstituents
• Development of nutraceuticals and cosmeceuticals
• Biological screening of herbs/herbal/ traditional product

g. Department of Pharmacology

Core Competencies

• Tissue based experiments
• Animal handling
• In-vivo and invtro pharmacological experimentation
• Academic pre-requisites of clinical research

Key Features

• Finest infrastructure with sophisticated and well-equipped laboratories.
• Hands-on training in vitro and in vivo experimental pharmacology.
• Full-fledged cell culture lab (Western blotting, flow cytometry, cell analyser).
• Technical skills in instrument handling (HPLC, Electrophoresis, Fluorescent imaging,).
• Industry sponsored projects to provide rich experience to research scholars and MPharm students.

h. Department of Pharmaceutics:

Core competencies

Development and evaluation of -

• Multi-particulate Drug Delivery Systems
• Sustained Release Dosage Forms
• Immediate release dosage forms
• Ocular Drug Delivery Systems
• Transdermal Drug Delivery Systems (including iontophoresis and sonophoresis)
• Implants
• Semisolid dosage forms
• Dental preparations
• Microspheres
• Nanopharmaceuticals (nanoparticles, liposomes, solid lipid nanoparticles, dendrimers, etc.).

State of the art of facilities:

Following Infra-structure facility has been established at various Departments of MCOPS

• Market Research: Business development, Market survey, Pharmaco-epidemiology survey, marketing research lab.
• For Development of lead molecules from Synthetic origin:
  Sci-finder, Schrodinger Drug Discovery Suite, Parallel synthesizer, Flash Chromatography
• For Development of lead molecules from natural origin:
HPTLC, HPLC, Herbarium, Plant tissue culture lab, Protein identification and purification facilities, Bioreactor

- For Pre-formulation and formulation development:
  High pressure homogenizer, HPLC, Brookfield viscometer, Tableting machines, Capsule filling equipment, Equipment for tablet evaluation, Malvern zeta sizer, Scatteroscope, Fluid bed processor, Fluid bed dryer, supercritical particle sizer, Freeze-dryer.

- For Pre-clinical testing of lead molecules:
  Efficacy testing in animal models:
  Central Animal house Facility (shared with other institutes of the University), Analgesiometers, Plethysmometer, Convulsimeters, mazes for behavioral study etc.
  In-vitro testing in cell lines and molecules aspects:
  Cell culture lab, fluorescence microscope, Flow cytometer (Accuri), Western blot apparatus, Real time PCR, ELISA plate reader, Fluorescence plate reader, Protein identification and purification facilities, Cryopreservation facility
  Toxicity study in animals:
  Non-GLP toxicity studies: Acute, subacute and subchronic in rodent species, Hemocytometer, Semi-autoanalyser

- Quality assurance and quality control: Various instruments like HPLC, HPTLC, LC-MS-MS, IR, GC-MS etc. are available to check the quality of the products developed at various stages of drug development.

- Clinical Development of drug: The department of Pharmacy practice is actively involved in reporting of adverse drug reaction and monitoring they are supported with various software’s like: SPSS-20, WinNonlin /Phoenix 1.4 and MedCal, Drug information resources like Micromedex.

Achievements:

- Ranked number one pharmacy college in India
- Has high Research output in the form of Publications and Patents
- MCOPS could develop formulations for the industry “Befresh” mouthwash for Sagar Pharmaceuticals (formerly, BPRL), Bangalore and “Leuprolide depot injection” for Svengenotech, Hyderabad which are currently available for patient use or to public.

Contact details:
Dr. C. Mallikarjuna Rao, Principal, MCOPS, Manipal- 576104.
Ph.: 0820-2922482, Fax: 0820-2571998, mallik.rao@manipal.edu, office.cops@manipal.edu.
School of Life Science

Overview:

Vision:

To be the centre of excellence in basic and biomedical research, education and diagnostics

Mission:

To engage in cutting edge research, training, education and offer help to the community in the field of human health

School of Life Sciences (SLS), Manipal University was established as an independent school of Manipal University in the year 2006. The School is associated with three major activities: research, education and diagnostics. SLS prepares students for productive careers in the versatile, dynamic, evolving discipline of Biotechnology. Upon graduation, students will have learned skills in critical thinking, problem solving and communication necessary for success as practising biotechnologists or in post-graduate studies. The School conducts BSc program in Biotechnology, MSc programs in Medical Biotechnology, Molecular Biology & Human Genetics, Bioinformatics, and Life Sciences (by research), PG Diploma Program in Cellular and Molecular Diagnostics and a short-term Certificate course in Bioinformatics. The general aim of the programs is to provide the atmosphere and opportunities for students and researchers to become biotechnologists, geneticists and/or bioinformaticians equipped with knowledge, competence and commitment, who will be self-directed individuals and responsible citizens. With state-of-the-art laboratory, teaching facilities and qualified teachers, it is one of the leading institutions in India imparting quality education. The college has twinning programs with Universities in Australia, UK and Europe, as a part of international linkage, and offers fellowships for meritorious students for further study.

To facilitate its research, education and diagnostic activities the school has the following departments:

- Department of Biotechnology
- Department of Radiation Biology & Toxicology
- Department of Biophysics
- Department of Ageing Research
- Department of Plant Sciences
- Department of Bioinformatics
- Department of Cell and Molecular Biology
- Department of Public Health Genomics

The Department of Biotechnology conducts state-of-the-art research and developmental activities in the area of human health. The Department of Cell and Molecular Biology performs genetic and molecular diagnosis of human diseases. Department of Radiation Biology and Toxicology undertakes radiogenomic studies and investigates toxic effects of radiation and other xenobiotics, while the Department of Biophysics tests lasers for biomedical applications such as diagnosis of cancer. The Department of Ageing Research looks at DNA repair mechanisms and their alterations in age-related human diseases. The focus of research at Department of Plant Sciences is to translate research outcome on economically important plants for human health. The big data acquired from genomics, proteomics and metabolomics research
programs related to human health are dealt with by the Department of Bioinformatics. The School offers specialized diagnostic services in molecular genetics and cytogenetics (including molecular cytogenetics). The facility is being used not only by the hospitals attached to Kasturba Medical College at Manipal and Mangalore but also by various hospitals in nearby districts.

**Objectives:**
To engage in cutting edge research to help the community in the field of human health

**Thrust area of research:**
- Targeting of transcription factors as suppressor elements in cancer
- Epigenetics and cancer
- Genomics of human variations in cancers
- Radiation biology and toxicology
- Laser and photoacoustic applications in biology
- Growth factors and signal transduction
- Neuronal human stem cells
- Chemo-response modifications in human leukaemia
- Pharmacogenomics in human diseases
- Microbiome in diabetic ulcers
- Clinical proteomics
- Cell and molecular biology of medicinal plants
- Development and translation of genetic testing to clinical environment
- Genetic studies of human diseases
- Mitochondrial biology

**State of the art of facilities:**

1. **Molecular biology laboratory:** Facilities necessary for all molecular biology related work is available in five separate laboratories, with routine instrumentations such as PCR thermocyclers (>10), Gel documentation systems (#5), Western blots, PFGE-SSCP apparatus, electrophoresis units, deep freezers, centrifuges etc.

2. **Genetics Laboratory:** Genetics laboratory equipped with tissue culture hoods, carbon dioxide incubators, microscope with karyotype/FISH software, water-baths, incubators, gel apparatus, large databank of genetic disorders and different of karyotypes abnormalities for various diseases, expertise available.

3. **Mammalian cell culture laboratory:** Well-equipped tissue culture facilities for the maintenance of human normal and tumour cell lines, mouse tumour cells lines, and repository for experimentation. There are more than twenty fully equipped microscopes (including fluorescence) in tissue culture laboratories available for research, diagnostic and teaching purposes.

4. **Microarray laboratory:** Has Agilent microarray 2 micron scanner with bioanalyser and hybridization ovens to undertake microarray array analysis for high throughput gene expression, epigenetics and SNP analysis.
5. **DNA Sequencing laboratory:** A Next Generation sequencer (Ion Torrent) and automated conventional sequencer (ABI-3130 Genetic Analyser with 16 capillaries) are available for sequence and fragment analysis purposes. In addition, it also hosts a Real-Time PCR thermocycler.

6. **Flow Cytometry laboratory:** Two Flow cytometers (BD FACS Calibur) are available for Teaching, Research and Diagnostic purposes.

7. **Mass Spectrometry and HPLC laboratory:** ESI-QTOF with HPLC for proteomics analysis is present. Three separate HPLC machines with UV, visible, fluorescence, electrochemical and PD detectors are available.

8. **Imaging laboratory:** Confocal microscopy, fluorescent scanner and high resolution image capture microscopy among other systems.

9. **Microbiology laboratory:** State of the art microbiology laboratory with level II biosafety cabinet, BacTec® incubator, centrifuges, and shaker-incubator is available.

10. **Atomic Absorption spectrometry laboratory:** Used for elemental analysis (Lead, Mercury etc.) of clinical, environmental and biological samples.

11. **Radioisotope laboratory:** Separate radioactive material handling facility with liquid scintillation counter, scanners etc. is available.

12. **Biophysics laboratory:** The Biophysics laboratory conducts experiments on biological/ pre-clinical/ clinical samples applying Laser Induced Fluorescence and Photoacoustic Spectroscopy to evaluate their spectral information related to diseased and non-diseased conditions. Experiments of Low Level Laser Therapy (LLLT) for tissue regeneration are also conducted in this laboratory.

13. **Common Instrumentation facility:** It consists of large scale bacterial incubator/shaker, high-speed and ultra-high speed centrifuges, frozen and paraffin block preparation microtomes.

14. **Animal house facility:** The centralized, state-of-the-art, air-conditioned animal house with separate breeding, experimentation and sterilization rooms with relevant instrumentations, mainly houses mice of various strains (Balb/c, Swiss albino, C57BL6) as well as rats.

15. **Animal tumour facility:** Routine transplantable tumour maintenance for experimentation in the form of both solid (fibrosarcoma and melanoma), ascites form (Ehrlich, P388, Daltons lymphoma etc.) and nude mouse facility for growing xenograft tumours are available.

16. **Irradiation facilities:** In-house: Faxitron CP160 X-ray machine

17. **Genetic toxicology and Analytical facility:** With fluorescence (Olympus, Carl Zeiss) & light microscopes and image analysis systems, spectrophotometers (Shimadzu) for routine biochemical and cytotoxicity assays

18. **Bioinformatics lab:** Well equipped Computers with Linux/Windows Operating System, and Sun Server system for data analysis (including microarray data) with a good storage capacity.

    (a) **Computer Lab:** Computers inbuilt with Linux (Ubuntu, CentOS) and Windows operating systems are dedicated for student purposes.

    (b) **Cluster facility:** To analyse bulk data generated from the genomic, proteomic platforms and to host in-house bioinformatics tools bioinformatics department has a cluster of SunFire X4100 servers.

    (c) **Manipal Computational Biology Interface (MCBI):** Bioinformatics department has developed an in-house tool which connects Life Science content management system (LS-CMS), Local Blast programs, Post-epigenomic Analysis Pipeline and Mass spectrometry search engines etc. to analyse data locally. We use Python, Java, C++ as tool development programming and R, MatLab as statistical programming language.

19. **Plant Biotechnology lab:** Well-equipped culture room for the plant cell, tissue and organ culture for different experiments.

20. **Green House facility:** SLS has state of the art independent green house of 40×80 feet in size for plant hardening of in vitro raised plantletts and for further experiments. Green house also has 100 important medicinal plants for research purpose.
### High-end Equipment

<table>
<thead>
<tr>
<th>Name of the Equipment</th>
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</thead>
<tbody>
<tr>
<td>Flow Cytometer Units</td>
</tr>
<tr>
<td>Genetic Analyzer (3100)</td>
</tr>
<tr>
<td>HPLC Systems</td>
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<tr>
<td>Liquid Scintillation Counter</td>
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<tr>
<td>Real Time PCR Systems</td>
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<tr>
<td>DNA Microarray Scanner System</td>
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<tr>
<td>Ultra-Centrifuge</td>
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<tr>
<td>High Speed Centrifuges</td>
</tr>
<tr>
<td>Cryostat</td>
</tr>
<tr>
<td>Q-TOF LCMS System</td>
</tr>
<tr>
<td>BacTec Incubator</td>
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<tr>
<td>Gel Documentation Systems</td>
</tr>
<tr>
<td>Portable Photosynthesis System</td>
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<tr>
<td>Stereotaxic Instrument</td>
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<tr>
<td>Hypoxia Chamber</td>
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<tr>
<td>2-D Electrophoresis System</td>
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<tr>
<td>Multimode Plate Readers</td>
</tr>
<tr>
<td>Personal Genome Machine</td>
</tr>
<tr>
<td>Tissue Dissociator with tube rotator</td>
</tr>
<tr>
<td>CO₂ Incubators</td>
</tr>
<tr>
<td>Zeta Sizer</td>
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<tr>
<td>Fuji Image Analyser</td>
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<tr>
<td>Atomic Absorption Spectrophotometer</td>
</tr>
<tr>
<td>Liquid handling System</td>
</tr>
<tr>
<td>Spectrometer, Oscilloscope, Xenon Light Source HPX-2000, 185-2000 nm</td>
</tr>
<tr>
<td>Shamrock Imaging Spectrograph</td>
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<tr>
<td>Pulsed Dye Laser-Pulsarre Pro</td>
</tr>
<tr>
<td>LPY707G-10 Nd:YAG Laser System</td>
</tr>
<tr>
<td>Raman Spectrometer</td>
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<tr>
<td>Nude Mice Facility</td>
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<tr>
<td>CP 160 Radiation Source System (X-Ray Machine)</td>
</tr>
<tr>
<td>EMF Exposure set up</td>
</tr>
<tr>
<td>Confocal Microscope &amp; other types</td>
</tr>
</tbody>
</table>

### Achievements:

School of Life Sciences is identified as Technology Information, Forecasting & Assessment Council Centres of Relevance & Excellence (TIFAC-CORE) in the area of Pharmacogenomics by the Govt. of India. Recently, SLS has been recognized as a DST- AST International Laboratory for Advanced Biomedicine (DAILAB@MU-MANIPAL), since 4th August 2016. Research at SLS is funded by several agencies of the Government of India such as Department of Biotechnology, Department of Science and Technology, Department of Atomic Energy, Indian Council of Medical Research, Government of Karnataka etc. In addition and more crucially, research is also supported by industrial partners such as Johnson & Johnson, Natural Remedies, Bhat Biotech, Juggat Pharma, Piramal, Achira Laboratories, Advinus Pharma, Stempeutics etc. Students and research scholars at SLS are encouraged to obtain fellowships and scholarships by clearing national level
entrance examinations. Students are also given the opportunity to work on a research project of their own, as part of their undergraduate or postgraduate curriculum. In a decade of its independent existence, SLS has provided a good number of outputs in terms of capable students, researchers, publications in indexed journals, conferences etc. More than 300 peer-reviewed publications including books have been published based on the research work that is being carried out in the various departments and units of SLS. Over the years, the School has also conducted almost one international conference per year facilitating scientific discussions and collaborations between various researchers. Students graduating with various degrees from the School have either been absorbed by industries such as Advinus Pharma, Biocon India, Piramal Life Sciences, Astra Zeneca, etc. or have pursued higher education through research at various Universities/Institutions in India and abroad. The School also prides itself in giving back to the community by conducting various workshops and seminars to teachers/students and also hosts school students for a week-long stay and participation in the scientific activities of the university as part of the National Science Day celebrations and ‘INSPIRE’ science camps.

Publications details (till 2015)

![Graph showing cumulative number of publications from 2006 to 2015.]

Achievements at a glance:

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publications</td>
<td>&gt;300</td>
</tr>
<tr>
<td>Patent Applications</td>
<td>13</td>
</tr>
<tr>
<td>Research Grants</td>
<td>110 (65 + ~ 45-industry)</td>
</tr>
<tr>
<td>Fellowships &amp; travel grants</td>
<td>50</td>
</tr>
<tr>
<td>Conferences / Workshops / Symposia organized</td>
<td>37</td>
</tr>
<tr>
<td>Refresher courses &amp; Training programs conducted</td>
<td>42</td>
</tr>
<tr>
<td>Research awards received</td>
<td>~ 40</td>
</tr>
</tbody>
</table>
Industry Collaborations (representative)

Academic & Research Collaborations – International (representative)
Academic & Research Collaborations – National (representative)

Awardees (selected ones):

1. Suma Prabhu, structured Ph.D. Scholar of School of Life Sciences presented her paper entitled “Polymeric Magnetite Nanocomposite Targeted against Human Glioma in Intracerebral Murine Xenograft Model” at the prestigious CLINAM9-2016, European & Global Summit for Cutting-Edge Clinical Nanomedicine and Targeted Medicine International Conference held at Basel, Switzerland, during 2016. She was supported by CLINAM Foundation and a partial International travel grant from International Co-operation in Science (CICS), Govt. of India.

2. Suma Prabhu, structured Ph.D. Scholar of School of Life Sciences bagged “Best Poster Award” for her presentation entitled “Radio Labelled Polymeric Magnetite Nanoparticles Targeted against Human Glioma in Mouse Orthotopic Xenograft Model” at International Conference on Radiation Research: Impact on Human Health and Environment (ICRR-HHE 2016) held at BARC, Mumbai.

3. Mr Vaibhav Shukla, research scholar of School of Life Sciences, Manipal University was selected to participate in the 3rd AIST International Imaging Workshop & PIKNIKH Series VIII “Bio-imaging with Beauty: Teachings, Tools and Technologies” held at Higashi, Tsukuba, Japan from January 18-23, 2016 and also he presented his research work. He was also awarded the Best Presentation Award.

4. Young Scientist Award to Dr. Shama Prasada: Centre for Advanced Research and Design, Venus International Foundation, Chennai, conferred "VIFRA 2015, Young Scientist " Award to Dr. Shama Prasada K, Assistant Professor, Department of Biotechnology, School of Life Sciences, Manipal University, Manipal for his contribution and achievement in the field of Biotechnology on 19 December 2015 at GRT Grand, Chennai, India.

5. Dr. Himanshu Gupta, alumnus of School of life Sciences has been selected to receive “Overseas Post-doctoral Fellowship” from The Science and Engineering Research Board (SERB), Department of Science and Technology, Govt. of India to pursue Research in the “Instituto de Salud Global de Barcelona” (The Barcelona Institute for Global Health) Spain.

6. Monica Shirley wins first prize in Oral presentation in ICHRT conference. Ms Monica Shirley Mani, a structured Ph.D. research scholar in the School of Life Sciences won the first prize in the oral presentation (Health Sciences category)entitled “Influence of ALAD polymorphism on lead toxicity” in
7. Mr Manik Vohra, structured PhD Scholar at School of Life Sciences won 2nd prize in the recently held National Conference on "Clinical Research and Personalized Therapy", organized by JIPMER, Pondicherry during 30-31 December, 2015. His poster entitled, " TCF7L2 rs7903146: A Common Variant for Disease Predisposition and Oral Hypoglycemic Drug Response in Type 2 Diabetes" was adjudged second best under the category, Pharmacogenomics, Personalized Therapy, Biomarkers And Molecular Genetics.

8. Dr. T.S. Murali, Associate Professor, Department of Biotechnology, School of Life Sciences, Manipal University, Manipal was awarded one among 5 best oral presentations by young faculty for his paper entitled “Secondary metabolites from fungal endophytes: Major challenges or opportunities?” at the National Conference on Emerging Trends in Fungal Biology and Plant Protection (ETFPP-2016) organized by Mycological Society of India at Banaras Hindu University Varanasi from February 16-18, 2016.

9. Indira Gandhi Fellowship SLS students, Five M.Sc. students, Ms Namrata Iyengar and Ms Kruti S (Molecular Biology and Human Genetics); Ms Arpitha Prasad, Ms Deesha Roy and Ms Mahashweta Bordoloi (Medical Biotechnology) of School of Life Sciences, Manipal University Manipal have been selected to receive Indira Gandhi Scholarship from the University Grants Commission, Government of India. These students will get monthly stipend during the period of post-graduation study.

10. Ms Freeda Elleria of MSc (Medical Biotechnology) has received “Post-Matric Scholarship for Students” and “Gagan Bharari Shiksha Yojana” from the Department of Tribal Welfare of the Government of Goa for the year 2015-2016.

11. Balakrishnan A, Satyamoorthy K, Joshi MB. Investigation of epigenetic mechanisms during inflammation induced vascular insulin resistance. Manipal research colloquium - 2015, Manipal University, Manipal. April 6-8 2015 (Oral presentation-Second Prize)

12. Bharath HR, Prabhu V, Chandra S, Rao BSS, Mahato KK. Assessing the enhancement in tissue regeneration upon low power laser irradiation in burn injured mice, India International Science Festival, IISF-2015, IIT Delhi, 4 - 8 December, 2015. (Best Presentation Award)


16. Dr. Shama Prasada K awarded the Dr. TMA Pai Gold medal for Research-2014 by Manipal University.

17. Dr. Manjunath Joshi received the Best poster award at the Indo-US symposium on “Mass spectrometry based metabolomics in disease biology” Trivandrum, India. January 23-24, 2014 for his poster titled “Investigation of Plasma Metabolomics of Bipolar Disorder Patients”.

18. Mr. Phani NM received the Best poster award for the work entitled “Impact of KCNJ11, TCF7L2, SLC30A8, IGF2BP2, PPARG, SLC47A1, STK11, HHEX, KCNQ1, CDKAL1, FTO, CYP2C9, ADIPOQ, CAPN10 Gene Polymorphisms on Risk of Type 2 Diabetes and Therapeutic Response to Sulfonylurea and Metformin Therapy” at the International Conference of Human Genetics and 39th Annual conference of Indian Society of Human Genetics (ISHG) Ahemedabad (India), January 22-25, 2014.

19. Mr. Phani NM, received a Certificate of Appreciation for the award of young scientist for the work entitled “Population specific risk association of potassium channel gene (KCNJ11) polymorphisms for type 2 diabetes” (Oral presentation) at the International conference of human genetics and 39th

20. Dr. Sanjiban Chakrabarty won the Best Paper (oral) Presentation award for his research paper titled “TFAM and its role in mitochondrial regulation in naive and transformed B-cells” in the Manipal University Research Colloquium held at Manipal on April 11-12, 2014. This research work is funded by DST and TIFAC-CORE, Govt. of India.

21. Mr. Akshay Kumar Nayak received the Best Poster award for the work “γ-H2AX Foci Analysis in Human Lymphocytes: A Biological Tool for Assessment of Early Triage During Mass Exposure of Radiation “at the International Conference on Radiation Biology 2014, New Delhi (photo)

22. Mr. Puspendu Paladhi won Second Prize in Poster Presentation award at the 1st International Congress of the Society for Ethnopharmacology (ICSE-2014) held at Sri Ramachandra University, Chennai March 7-9, 2014 for his poster titled "Effect of Shankhpushpi Rasayana on Metabolic Stress-Induced Autophagy and Anti-oxidant Enzyme Activities in Rat Brain.

23. Dr. K Satyamoorthy (Director, SOLS) was honoured with the P.A. Kurup Endowment Award for the year 2013 given by Society of Biological Chemists (India)

24. Ms Smitha Bhat from School of Life Sciences, Manipal University won the top award for her poster titled “Influence of Inflammation on DNA Methylation in Asthma” at the “Amrita Bioquest 2013” International Conference on Biotechnology for Innovative Applications, held on August 10-14, 2013 at Amritapuri, Kollam, and Kerala. She completed BSc (2004-07) and MSc Medical Biotechnology (2007-09) from School of Life Sciences and is currently pursuing doctoral research under the guidance of Dr. Saadi Abdul Vahab, Associate Professor at the School of Life Sciences. This research work is funded by the Department of Science and Technology, Government of India.

25. Mr. Himanshu Gupta, structured PhD scholar of Manipal University, won first prize for his poster titled “Variants of ADORA2A and GRK5 Genes modulate Susceptibility of Malaria in a South Indian Population” at the 6th Annual KSTA Conference: Science and Technology for Promoting Innovative Research and Development held at Christ University, Bangalore, 20-21 December, 2013. His poster was adjudged the best among 150 posters presented at the meeting. His research work is guided by Dr. Saadi Abdul Vahab, Associate Professor, at School of Life Sciences.

26. Mrs Samatha Bhat won the Young Investigator Award in the 10th Asia Pacific Conference on Human Genetics held at Kuala Lumpur, Malaysia from 5th to 8th December 2012 for her paper entitled “Double C2-Like Domains, beta (DOC2B) is down regulated through promoter hypermethylation and acts as a tumour suppressor in cervical carcinoma”.


Photographs:

Contact details:

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Email: mlsclab@manipal.edu

Any other details:

1) Photographs on the high-end facilities at the School of life Sciences
2) Inauguration of DST- AST International Laboratory for Advanced Biomedicine (DAILAB@MU-MANIPAL) – Since 4th August 2016.
Department of Atomic and Molecular Physics

Overview:

The Centre for Atomic and Molecular Physics (DAMP), Manipal University is a center for advanced research and teaching in photonics. The center is on its way to becoming a leading center for research in a vast area of atomic and molecular physics consisting of ultra-fast phenomena in atoms and molecules, light matter interactions, optics and quantum electronics, condensed matter physics, nanomaterial syntheses, nanobiophotonics, protein crystallization, structural biology, biophysics.

The Centre which initially focused exclusively on research has made its mark in the academic arena with the M.Sc. Photonics course that got launched in September 2009. Two more post graduate programmes M.Sc. Nano science and Technology and M.Sc. Biophysics were started in the years 2012 and 2013 respectively. This being the first step towards meeting the national and international needs of expertise in these booming areas of science and technology, the center also conducts two certificate courses viz Laser Applications in Medicine and Biology and Nano science and Technology. Short courses of this kind which are application-oriented are conducted regularly round the year.

The center is located in the floor LG-1 of Academic Block 5 in MIT DAPMUs. Apart from the 7 permanent and one adjunct faculty, scientists from Tata Institute of Fundamental Research, Raman Research Institute (RRI), Bangalore, and Centre for Excellence in Basic Sciences (CBS), Mumbai visit DAMP throughout the year and teach advanced postgraduate courses. Manipal University has signed an MoU with TIFR for joint research collaboration to promote basic research in the DAPMUs.

Over these years DAMP has had active collaboration with many research institutes across India which includes the Raja Ramanna Centre for Technology, Indore, IIT Delhi, IIT Bombay, IIT Guwahati and IIT Kharagpur.

Currently the department has collaborations with the following research centers:

- Tata Institute of Fundamental Research, Mumbai
- UM-DAE Centre for Excellence in Basic Sciences, Mumbai University
- Bhabha Atomic Research Centre, Mumbai
- Raman Research Institute, Bangalore

In addition there is an international collaboration with the University of Texas. The department has signed a Federation agreement with the International Centre for Theoretical Physics (ICTP), Trieste.

Milestones

1. 1997- The Centre for Laser Spectroscopy established
2. 2005- MoU with Tata Institute of Fundamental Research
3. 2005- University – Industry Collaboration
4. 2008- CLS got transformed to Centre for Atomic and Molecular Physics
5. 2009- Post Graduate Programme in Photonics
6. 2012- Post Graduate Programme in Nano science and Technology
7. 2013- Post Graduate Programme in Biophysics
8. 2014- Renamed as Department of Atomic and Molecular Physics
Objectives:

Thrust area of research:

Research and development programmes in the area of Laser and Spectroscopy, has been gaining momentum in DAMP ever since the day of its inception. Special emphasis is laid on the development of new and improved techniques for studying the dynamics at atomic and molecular levels with a keen eye on practical applications, thus making the fruits of the research here instrumental in making life easier for the common man.

The major research activities, all funded by the Central Government, are in the following areas:

- Spectroscopy of biological systems at cellular level using Optical Tweezers combined with Raman spectroscopy
- Remote Trace Element Analysis of Biological, Environmental and Radioactive samples using Laser Induced Breakdown Spectroscopy
- Protein profile analysis of clinical samples for early detection of cancer using High Performance Liquid Chromatography – Laser Induced Fluorescence Technique
- Laser Induced Fluorescence studies of soft matter (e.g. tissues, bones etc.)
- Development of cancer screening biomedical devices
- Applications of femto second pulses in micromachining and white light generation
- Bimolecular detection using surface Plasmon resonance
- Synthesis of nanoparticles and Nano films for photocatalytic and white light generation applications
- Development of Nanobiophotonics imaging facility

The active research collaboration that DAMP has with the many research institutes across India makes it possible to ensure maximum support from the best names in the field of photonics.

The center has got avant-garde research facilities like

(i) Nd-YAG MOPO Nano-second pulsed laser based Fluorescence laboratory for cancer detection
(ii) Laser Induced Break down Spectroscopy lab for multi elemental analysis
(iii) Raman spectroscopy laboratory for soft material characterization
(iv) Optical Tweezers combined with Raman Spectroscopy laboratory for live single cell spectroscopy
(v) Proteomic laboratory for tumor marker detection and
(vi) Femto-second laser laboratory with necessary facilities for Photonics device fabrication.
(vii) Fluorescence microscopy facility for biological studies.
All the above research facilities are accessible to our PG students to develop research capabilities in the area of photonics and biophotonics.

**State of the art of facilities:**

1. **Raman Spectroscopy Lab**

   Raman Spectroscopy, is a vibrational spectroscopic method, used for biomedical applications including cancer diagnosis. Use of less harmful near IR radiation, along with efficient detection devices and advanced, versatile techniques makes this method most congenial for the purpose.

   Researchers at DAMP use Raman spectroscopy method for diagnosis of malignant, premalignant and inflammatory conditions of oral malignancy in oral, cervical, breast, colon and bladder tissues.

2. **Raman Tweezer Lab**

   The research work in the Raman Tweezer lab involves Fabrication and Development of Optical Tweezers set up and coupling of Raman Spectroscopy with Optical Tweezers for recording and studying the Raman signal from trapped micro beads, Nano particles and cells. This is the first set up in India which coupled Raman Spectroscopy with Optical Tweezers.

   Raman spectra of single cells including RBCs, WBCs, Yeast cells and human mesenchymal stem cells have been recorded and studied with this setup. The setup has been effectively used to study and characterize the chemically induced oxidative stress in Erythrocytes (RBCs).

   The funding agency of Raman tweezers work was "Department of Biotechnology (DBT)" under the project entitled "Biomedical engineering of single cells with a combination of Raman spectroscopy and Optical tweezers". This work is being carried out in collaboration with TIFR.

3. **HPLC-LIF Lab**

   The efficacious studies with the High Performance Liquid Chromatography- Laser Induced Fluorescence system has made possible the early detection of enzymes and surface molecules associated with tumor cells, thus enabling successful therapy in all types of malignancy. The studies also include analyses of body fluids to detect any kind of disease making use of biological markers.

   1. **Laser Induced Fluorescence Spectroscopy Lab**

      With the aid of funds from *Philips Research India, Bangalore* the DAMP team has developed a portable Laser Induced Fluorescence system for the early detection of oral cancer. The technique can detect and discriminate not only malignancy but also potential malignant cases from the normal with good specificity and sensitivity.

      The LIF system, designed, developed and tested in our laboratory uses a very sensitive spectroscopic concept of fluorescence, which looks out for the natural fluorescence from the tissue which will be different for normal, malignant and pre-malignant tissues.
With proper modification, the system can be a robust tool for the future, detecting of all types of malignancy.

4. **Femtosecond Laser Lab**

The Femtosecond laboratory at DAMP has two ultrashort laser oscillators. **Femtosource scientific XL** is delivering pulses as short as 50 fs with maximum pulse energy of 200 nJ at 5.2 MHz repetition rate. **KM Lab Kit** is another femtosecond oscillator delivering pulses of 1-2 nJ energy with 80 MHz repetition rate. Both lasers are operating at 800 nm central wavelength. Laboratory is equipped with a photonic crystal fiber for white light generation experiments, high precision three dimensional motorized translational stages, high resolution optical microscope etc.

The on-going project in the femto lab is titled “Fabrication and submicron tailoring of materials for photonics applications with ultrafast lasers” and is funded by Office of Principle Scientific Advisor, Government of India. The project work focuses on the fabrication of active and passive waveguides inside transparent glasses for the telecommunication window using femtosecond lasers. Laser Induced Forward Transfer of thin films is another experiment being conducted here. This technique involves the transfer of metal from a donor thin film to acceptor substrate that is kept sufficiently close to it. Micro patterns of metals, which have numerous applications in the field of microelectronics can be deposited by this technique.

With these works the femto team at DAMP seeks to develop integrated photonic circuits and devices.

5 **Laser Induced Breakdown Spectroscopy Lab**

An experimental set up has been developed for Laser Induced Breakdown Spectroscopy technique for the Board of Research in Nuclear Sciences (BRNS), DAE, Govt. of India funded project on “Trace Element Analysis for Environmental and Biomedical Applications-Development of Laser Induced Breakdown Spectroscopy (LIBS) Technique”. The project mainly focuses on trace element detection and quantification using Laser Induced Breakdown Spectroscopy (LIBS) Technique in environmental, clinical and radioactive waste samples. Specifically, it is proposed to quantify the trace elements in tissues, blood, serum etc. from patients with cancer, diseases arising from elemental deficiencies, and heavy metal influences in therapy. Remote detection of hazardous samples using LIBS is the ultimate goal of the project.

The Department has initiated a Nano science programme with the following research facilities.

**DST-FIST Nanobiophotonics Laboratory**

The Department of Science and Technology, Government of India has recognized the department as a center for Nanobiophotonics by funding through the DST-FIST program. This lab is focused on the preparation and characterization of novel materials that include nanoparticles and up/down conversion Nano crystals, with an aim towards future in-vitro as well as in-vivo imaging applications. The prepared nanoparticles of low toxicity allow imaging in the first and second biological window. Apart from this, the lab is also preparing Nano porous alumina as well as metal oxide nanoparticles and exploiting their applications in the field of photonics as well as bio/environmental sensing. The experimental equipment’s that form a part of this lab include an X-ray Powder Diffractometer, a microwave synthesiser and a plasma polymerization unit.
Biophysics and structural biology facilities

Structural studies of biological molecules include several steps such as cloning, transformation, expression, purification, crystallization, structure determination, molecular modelling, docking and dynamics. Our department is highly equipped to carry out the complete biophysical analysis of small and macromolecules. The biophysics lab is equipped with Millipore water purification system, incubator shaker, water bath and pH meter. With these instruments we can clone, transform and express the desired proteins. Once the proteins are expressed the purification is carried out using BIO-RAD Low pressure Chromatography followed by analysis using Bio-Rad protein electrophoresis system. The protein crystallization is done using Hampton crystallization facilities and it is analyzed using stereo microscope. The structure determination and drug identification are carried out with fast computing systems and software including CCP4, Phoenix, Shelex, WinGX, AMBER, PYMOL, CHIMERA, VMD, SWISS-MODEL, GAMESS, RESP and RED.

Achievements:

- A Raman spectroscopy method has been developed for diagnosis of malignant, premalignant and inflammatory conditions in oral malignancy. Similar studies on breast, cervix and ovarian cancer have also been taken up.
- The Bio photonics laboratory of DAMP has developed a variety of techniques for early detection of cancer.
- Medicos can now detect enzymes and surface molecules associated with tumor cells very early with High Performance Liquid Chromatography – Laser Induced Fluorescence (HPLC-LIF) system. The new system can detect various components of body fluids at sub Nano gram levels, at high speed and with a high degree of accuracy, thanks to the completion of research programmes funded by DST, ICMR and DAE at Manipal.
- A portable oral cancer screening device was also designed and fabricated at the center through an industry funded project. Fabrication of a miniature oral cancer screening device is also successively completed recently.
- A Raman Tweezers setup, combination of Raman spectrometer with an Optical Tweezers, first of its kind in India, is designed and assembled to study spectroscopy of live single cell. The laboratory has also developed a method to quantify the stress level from a swab of saliva. Saliva contains a protein called alpha-amylase, that identifies stress level, is estimated using a novel technique in which the ultra-fast light is shot through water and its frequency spectrum is recorded. On increase of this protein’s quantity the light spectrum narrows. Narrower the spectrum, higher the stress level. We are the first to propose this technique using intense-laser technology to detect stress from saliva.
- We are in the finalization of a laser based device for remote detection and analysis of trace elements.
- The femto-second laser laboratory in our center is dedicated for the development of optical wave guides, generation of white light and fabrication of photonics devices. Currently efforts are going on to generate the supercontinuum light by coupling the fs pulses into the Photonics Crystal Fiber

Contact details:

Dr. Santhosh Chidangil  
HOD  
Landline: 0820-2925071  
Email: santhosh.cls@manipal.edu
Photographs:

M.Sc. Students working with the FTIR Spectrometer and UV-Vis Spectrophotometer:

Academic Lab:
Chromatography setup and stereo microscope for protein purification and analysis:
Interactive poster session at NLS-22:

Inaugural session of the theme meeting on Ultrafast Sciences:
Any other details:

Career Opportunities

Photonics, being a multidisciplinary technology, finds application in innumerable fields ranging from barcode reading in supermarkets to data interfacing in space stations. Energy conservation being the need of the hour, photonics based smart techniques for lighting and energy harvesting is acquiring greater relevance than ever before. With the advent of optical sensors, LEDs, LASERS and other optoelectronic components, photonics has become the lifeline of communication, networking and microelectronics. High-paced application-oriented research in this field is now making photonics inevitable in industry, defense, entertainment and healthcare sectors.

Nanotechnology involves the development of smart materials which are lighter and stronger. This finds application in varied fields ranging from material science to medicine and drug delivery to biotechnology and optoelectronics. Since biophysics is also an emerging field specialized training in which has application in x-ray crystallography, biotechnology, pharmaceutics, NMR laboratories in addition to the potential career prospects of the experts in government regulatory agencies, science education, science journalism. Not surprisingly, this neo-technologies presents unending career opportunities to experts specialized in the field. The research and training provided by the department in the field of biological macro-molecular structure and X-ray crystallography brighten the future with various opportunities to postgraduates and research scholars for inter-disciplinary research.

As well as enhancing their prospects for scientific positions in government, non-government agencies, industries where knowledge of biophysics, X-ray crystallographic techniques and applications is required.

With the widespread application of these three fields of science as a versatile technology, the demand for skilled professionals is on the rise. DAMP attempts to develop experts in these promising field of the future. The M.Sc. programmes in Photonics, Nano science and Technology, and Biophysics, a means to meet this goal. Apart from prospective careers in academics, industry, research and development, an overwhelming number of opportunities await the students once they venture into entrepreneurship in photonics or nanomaterial market.

Projects

DAMP has already undertaken several government and industry funded research programmes in the area of laser spectroscopy and its applications in photonics and bio photonics. Out of the 11 projects completed so far, 3were funded by the Board of Research in Nuclear Sciences, Department of Atomic Energy (DAE-BRNS), 3 by the Department of Science and Technology (DST), 1 by the Department of Biotechnology (DBT)
and 1 by the Indian Council for Medical Research (ICMR). 2 industry-funded projects financed by Philips have also been completed and one is funded by the Principal Scientific Advisor’s office, GOI.

Out of the 8 major on-going projects, 1 is funded by the DBT, 1 is funded by the Vision Group for Science and Technology (VGST), 3 by the Department of Science and Technology (DST), 2 by the Science and Engineering Research Board (SERB) and 1 by BRNS, DAE.

Publications and Presentations

Over the years, DAMP has made its presence known in the scientific world through numerous publications and conference presentations. During the last five years DAMP has published 55 research papers in various renowned national and international journals. The center has to its credit over 180 national and international presentations.

PhDs and Projects from DAMP

DAMP has produced 9 PhDs in the last 10 years, in the field of biomedical optics. Currently there are 12 registered candidates pursuing PhD in addition to 4 project associates.

DAMP is a preferred center for project work for students from different streams. Over 30 students, pursuing different courses have already benefitted from the infrastructure and faculty expertise at DAMP.

DAMP is the oft-chosen destination for internship by many foreign students who come here under the IAESTE India MIT scheme. The department also offers projects to students coming under the Summer Research Fellowship Programme of the Indian Academy of Sciences.

Events at DAMP

The department is at the forefront in organizing scientific meetings of different kind. A One Day Symposium on Recent Advances in Photonics is held every year. Over the last five years the department has successfully organized two symposia on Recent Trends in Nano science and Technology and one symposium on Biophysics and protein crystallography.

The other prestigious events hosted by the department over the period of the last 5 years include

1. A workshop on Use of the Instrumentation in Physical Sciences for Archaeology in March 2012
2. One Day Symposium on Recent Trends in Nanoscience and Technology in March 2012
3. A workshop on Biology in Medicine in August 2012
4. One Day Symposium on Recent Trends in Nanoscience and Technology in February 2013
5. One Day Symposium in Biophysics in February 2013
6. A workshop on crystallography in February 2013

In addition to these the department regularly organizes Outreach Programmes for the students of neighboring colleges. A science quiz is conducted every year in association with the National Science Day.

National Laser Symposium-22
The 22nd National Laser Symposium (NLS-22) was organized at Manipal University by the Department of Atomic and Molecular Physics from 8th to 11th January 2014. This is an all-India scientific conference jointly organized by the Department of Atomic Energy (DAE) and the Board of Research in Nuclear Science (BRNS). The conference has nation-wide participation of scientists and engineers working in the field of lasers and their applications. The event witnessed the participation of over 350 men and women of science. Some of the topics of interest in NLS-22 included Physics and Technology of Lasers, Lasers in Nuclear Science and Technology, Laser Materials, Quantum Optics and Atomic Optics, Ultrafast Lasers and Applications, Nonlinear Optics, Lasers in Material Science, Laser Plasma Interaction, Lasers in Industry and Defense, Laser Spectroscopy and Applications, Lasers in Chemistry, Biology and Medicine. Apart from organizing the meet, the staff and students of the Department of Atomic and Molecular Physics actively participated in the event with two of the faculty members being invited speakers and a total of nineteen contributory papers from the department. The Symposium was inaugurated by the Prof. P.D.Gupta, Director of RRCAT and the keynote address was given by Prof.V.B.Kartha.
School of Allied Health Sciences, Manipal

Overview:

School of Allied health sciences is the first and the largest institution for allied health professionals in India. It consists of various health professional working towards the health needs of people both in hospital as well as in community. The research activities focusses on measurements and treatment methods for various health issues and also projects on development of innovative affordable healthcare products.

The institute fosters various postgraduate research projects as well as PhDs. Funded projects from both national and international agencies are being carried out with international standards. Research projects at SOAHS are predominantly interdisciplinary in nature bring together professionals across various fields to develop solutions for health care needs. All research projects are approved and monitored by the Institutional Research Committee, SOAHS.

Objectives:

1. To conduct high quality research in the area of health care
2. To provide conducive environment to develop innovative technologies and support in obtaining intellectual property rights
3. To publish in high quality peer reviewed journals and disseminate knowledge
4. Obtain funds both nationally and internationally to support research
5. To foster young minds to develop interest and skill towards research

Thrust area of research:

1. Diabetic foot care, women’s health, neuro-rehabilitation
2. Auditory evoked potentials, child & adult language disorders
3. Voice restoration in Head and Neck Cancers
4. Primary eye care and vision science
5. Measurement of Physical Activity
6. Disability management
7. Non-Communicable diseases
8. Geriatrics
9. Technology development

State of the art of facilities:
Achievements:

Research chairs:

Dr. B. Rajashekhar – CARF and Prof. Bellur Rajashekhar Chair in Head & Neck Cancer Research and Voice Restoration

Dr. Arun Maiya - Dr. TMA Pai Endowment Chair in Exercise Science & Health Promotion
Dr. Sabu K M – Chair, Global Health Workforce Council, South East Asia

Fellowship programs:

Endeavour Fellowship:

Mr. Abraham Babu, Assistant Professor- Senior grade, Department of Physiotherapy and Mrs. Krithica, Assistant Professor- Senior grade, Department of Optometry obtained the prestigious Endeavour fellowship and visited Melbourne University for their respective research work.

Public Health Foundation of India Research Fellowship

Dr. Ramesh S. Ve, Associate Professor, Department of Optometry received the Indo-US Public health Research fellowship- 2024 and completed his post-doctoral fellowship at Wilmer Eye Institute, john Hopkins University, Baltimore, USA.
Publications:

Scopus Indexed Publication at SOAHS (2012-2015)

<table>
<thead>
<tr>
<th>Scopus Index Publication at SOAHS</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Scopus indexed</td>
<td>114</td>
<td>1.9</td>
<td>10</td>
</tr>
</tbody>
</table>

Research Output:

<table>
<thead>
<tr>
<th>Completed funded research projects</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed non funded research projects</td>
<td>-</td>
<td>-</td>
<td>01</td>
<td>-</td>
</tr>
<tr>
<td>Completed PhD research projects</td>
<td>04</td>
<td>02</td>
<td>06</td>
<td>07</td>
</tr>
<tr>
<td>Completed PG research projects</td>
<td>81</td>
<td>76</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>Completed UG research projects</td>
<td>54</td>
<td>35</td>
<td>62</td>
<td>49</td>
</tr>
<tr>
<td>Publications National</td>
<td>28</td>
<td>41</td>
<td>33</td>
<td>23</td>
</tr>
<tr>
<td>Publications International</td>
<td>93</td>
<td>35</td>
<td>26</td>
<td>60</td>
</tr>
<tr>
<td>Chapters in Books</td>
<td>-</td>
<td>-</td>
<td>01</td>
<td>04</td>
</tr>
<tr>
<td>Books</td>
<td>03</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Conference Presentations National</td>
<td>49</td>
<td>22</td>
<td>26</td>
<td>67</td>
</tr>
<tr>
<td>Conference Presentations Internntional</td>
<td>21</td>
<td>24</td>
<td>13</td>
<td>25</td>
</tr>
</tbody>
</table>

Grants Received:

- Grant Amount: Total 1060.34 Lakh INR (8.34 crores)
- Year 2012: 154.76 Lakh
- Year 2013: 106.69 Lakh
- Year 2014: 153.49 Lakh
- Year 2015: 422 Lakh
<table>
<thead>
<tr>
<th>Principal Investigator</th>
<th>Funding Agency</th>
<th>Sanctioned Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Arun Maiya</td>
<td>ICMR</td>
<td>Rs. 15,50,000</td>
</tr>
<tr>
<td>Dr. Arun Maiya</td>
<td>World Diabetic Foundation</td>
<td>Rs. 1,40,00,000</td>
</tr>
<tr>
<td>Dr. John Solomon</td>
<td>Canadian Institute of Health Research and Israel Science Foundation</td>
<td>Rs. 65,07,504</td>
</tr>
<tr>
<td>Mr. Hari Prakash</td>
<td>DST, Govt. of India</td>
<td>Rs. 40,28,000</td>
</tr>
<tr>
<td>Dr. Gopee Krishnan</td>
<td>DST, Govt. of India</td>
<td>Rs. 73,17,200</td>
</tr>
<tr>
<td>Dr. Usha Devadas</td>
<td>All India Institute of Speech and Hearing, Mysore</td>
<td>Rs. 4,33,000</td>
</tr>
<tr>
<td>Dr. Shivani Tiwari</td>
<td>ICMR</td>
<td>Rs. 23,44,316</td>
</tr>
<tr>
<td>Dr. Veena K D</td>
<td>ICSSR</td>
<td>Rs. 5,00,000</td>
</tr>
<tr>
<td>Ms. Banumathe</td>
<td>DST, Govt. of India</td>
<td>Rs. 9,91,000</td>
</tr>
<tr>
<td>Mr. Rahul P Kotian</td>
<td>Bombay Scientific, Mumbai</td>
<td>Rs. 1,00,000</td>
</tr>
<tr>
<td>Dr. Ramesh S Ve</td>
<td>Icare Oy, Finland</td>
<td>Rs. 44,67,000</td>
</tr>
<tr>
<td>Dr. Ramesh S Ve</td>
<td>DBT, Govt. of India</td>
<td>Rs. 46,87,000</td>
</tr>
<tr>
<td><strong>Dr G Arun Maiya</strong></td>
<td>DBT-BIRAC Government of India</td>
<td>Rs. 49,50,000</td>
</tr>
</tbody>
</table>

**Awards:**

Dr. Ramesh – Gold medal for Best Innovation at DST-Lockheed Martin India Innovation Growth Programme 2013
Mr. Stephen S, Research Scholar, Dept. of Physiotherapy received - Young Investigator Award at the Awards, Multinational Association of Supportive Care in Cancer (MASCC) and International Society of Oral Oncology (ISOO)

**Innovation, patent & commercialization:**

<table>
<thead>
<tr>
<th>Intellectual Property (Patent or copyright or TM)</th>
<th>Patent No</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain relieving instrument- Patent, Dept of Physiotherapy</td>
<td>#373/CHE/2010</td>
<td>Reviewed &amp; awaiting IP</td>
</tr>
<tr>
<td>Wearable tie sensor- Patent, Dept of optometry</td>
<td>3291/CHE/2014</td>
<td>Filed</td>
</tr>
<tr>
<td>Manipal E Amsler- Copyrights, Dept of optometry</td>
<td>L-58352/2014</td>
<td>Received</td>
</tr>
</tbody>
</table>

**Entrepreneurship**

SOAHS focusses on technology development in affordable healthcare through Interdisciplinary Engineering & Health Professionals. The institution has received grants from Biotechnology Industry Research Association Council (BIRAC) and has initiated startup companies to facilitate commercialization of these technologies.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Department</th>
<th>Technology POC</th>
<th>Agency</th>
<th>Startup company*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Optometry</td>
<td>Smart Phone based eye imaging</td>
<td>BIG BIRAC</td>
<td>Visint healthcare Pvt Ltd</td>
</tr>
<tr>
<td>2.</td>
<td>Physiotherapy</td>
<td>Sensor based Sole for Diabetic foot</td>
<td>BIG BIRAC</td>
<td>PetaVista healthcare and IT solutions Pvt Ltd</td>
</tr>
<tr>
<td>3.</td>
<td>Speech and Language pathology</td>
<td>Wearable &amp; Hands free electrolarynx</td>
<td>IIPME BIRAC</td>
<td>Anahera Health Tech Pvt. Ltd</td>
</tr>
</tbody>
</table>

*These startup companies are incubated at Manipal University Technology & Business Incubator (MUTBI), MIT campus, Manipal
Contact details:
Dr. Arun G Maiya, IRC- Chairperson & Professor, Department of Physiotherapy, SOAHS, Manipal. Email: research.soahs@manipal.edu
Phone number: 08202922705

Photograph:
Manipal Melaka Medical College, Manipal

Overview:

The faculty members at MMMC, in addition to imparting quality education to its stakeholders, also contribute to the enhancement of knowledge of medical practice by undertaking research studies pertaining to basic sciences, medical education, traditional and clinical medicine.

Objectives:

1. To promote research by undertaking interdisciplinary/interinstitutional (Regional, National& International) collaborative research activities by faculty members of MMMC
2. To disseminate the research findings among peers, in the form of publications as well as in the community, for health literacy and health policy purposes
3. To conduct capacity building programs for the advancement and sustainability of research activities
4. To nurture innovative research ideas of faculty
5. To improve the infrastructure and research facilities for conducting advanced research studies

Thrust area of research:

Educational research, which is the thrust area at MMMC, focusses on research that enhances theoretical and/or conceptual understanding of:

- Curriculum mapping
- Curricular integration
- Teaching and learning processes in medical and health professions education
- Teacher and learner experiences in medical education
- Educational environment or contexts in which teaching and learning take place
- Teaching and learning outcomes
- Assessment methods
- Student engagement
- Academic leadership
- Medical Humanities
- Inter-professional education

Clinical research focusses on:

- Haemophilia and Thrombosis
- Rickettsial Diseases -Update towards establishment of IRRL (Indian Rickettsial Reference Laboratory) at Manipal University
- Traditional& Integrative medicine- Oncology, dermatology & App development as well as Drug Discovery for natural products
- Cadaveric and Clinical anatomy studies

Basic science research focusses on:

- Neuroscience studies on rodents, Role of dietary nutrients, stress, herbal extracts-
  Electromagnetic radiation studies on learning, memory & behavioral studies, Neurohistology-
  Staining & analysis, Immunohistochemistry
- Radiation induced toxicity & Heavy metal toxicity studies on rodents
State of the art of facilities:

- Thrombelastograph analyzer
- Biological Incubator
- Autoclave
- Hot air oven
- -80°C Deep Freezer
- Bio Safety Cabinet Level -2
- ELISA Reader
- ELISA Washer
- Horizontal gel electrophoresis unit
- Thermo cycler 7 m
- Gel documentation system
- Refrigerated micro centrifuge
- Mini distilled water plant
- Spectrofluorometer
- Spectrophotometer
- Compound Light Microscope
- Olympus Microscope with Camera
- Compound Microscope with Camera Lucida
- Leica Dissection microscope
- Histology-tissue sectioning equipment
- Sledge microtome
- Compound Light Microscope
- Radial arm maze with video tracking device and software
- T-Maze
- Passive avoidance setup
- Vibrator stress studies
- Restrainer-rest studies
- Rotarod-muscle grip strength studies

Achievements:

A. List of grants sanctioned during 2015-2017

Projects and Funds received-Year 2015

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Project Name</th>
<th>Principal Investigator</th>
<th>Funding Agencies</th>
<th>Total Grants Received (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IDEEA: Identification, Diagnosis, Education &amp; Empowerment for Action of people with bleeding disorders in South India (2012-2015)</td>
<td>Dr. Annamma Kurien</td>
<td>Nova Nordisk Hemophilia Foundation, Switzerland</td>
<td>57 lakhs</td>
</tr>
</tbody>
</table>
# Ongoing Funded Inter-institutional Research Collaborations - Period: 2015-2017

<table>
<thead>
<tr>
<th>MMMMC Faculty Name</th>
<th>Research collaborations during 2015-2016</th>
<th>Name of the faculty and collaborating institute</th>
<th>Grant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof.K.Ramnarayan Dr.Ciraj AM</td>
<td>International (European) multidisciplinary research study in collaboration with Department of Optometry, SOAHS, Manipal University</td>
<td>Erasmus KA02 grant (574067-EPP-1-2016-1-NO-EPPKA2-CBHE-JP)</td>
<td>The overall grant amount is INR 7,06,16,013 (Euro 946218) Amount allocated for MU: INR 74,84,214/-</td>
</tr>
<tr>
<td>Dr. Annamma Kurien</td>
<td>EMB (Excessive menstrual bleeding ) Fund to test and empower girls and women with underlying bleeding disorders</td>
<td>My Girls Blood, Washington - USA</td>
<td>3.2 Lakhs</td>
</tr>
<tr>
<td>Mr. Shreevatsa Bhat &amp; Prof.Kiranmai S Rai</td>
<td>Strategies to attenuate age-associated hippocampal dysfunctions and cognitive impairment in mice-A comparative study</td>
<td>Dr.Anand D, MSORM, MU, Bengaluru</td>
<td>ICMR funded-Rs 32 lakhs</td>
</tr>
<tr>
<td>Dr. Shiny Jasphine (Post doc Research Scholar) &amp; Dr. Archana PR</td>
<td>Radiation induced toxicity and Heavy metal toxicity studies</td>
<td>Dr.Satish Rao, SOLS, MU</td>
<td>DST SERB funded project-Rs 20 Lakhs (2016-2017)</td>
</tr>
</tbody>
</table>
### B. Other Achievements

- **Achievements in medical education research**

<table>
<thead>
<tr>
<th>Name of the faculty</th>
<th>Professional development/Awards/Fellowships</th>
<th>Contact details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. K. Ramnarayan</td>
<td>Facilitator for faculty development across different universities in India</td>
<td>Prof. K. Ramnarayan MBBS, MD (Pathology), PG Diploma in Higher Education, Vice President-Faculty Development &amp; Alumni Relations Manipal University, Manipal 576 104, Karnataka, INDIA Email: <a href="mailto:kram@manipal.edu">kram@manipal.edu</a> Phone: 91-820-2922004, 2571201 Fax: 91-820-2570062</td>
</tr>
<tr>
<td>Dr. Shyamala Hande</td>
<td>Endeavour executive fellowship in professional development in Medical education; Invited to FAIMER Institute, Philadelphia, USA for a week as FAIMER faculty</td>
<td>Dr Shyamala Hande Deputy Registrar-Academics (Health Sciences), Manipal University Professor of Histology, Melaka Manipal Medical College Manipal Campus, Manipal University, Karnataka, India Email: <a href="mailto:shyamala.hande@manipal.edu">shyamala.hande@manipal.edu</a></td>
</tr>
<tr>
<td>Dr. Ciraj AM</td>
<td>Fullbright Visiting Scholarship</td>
<td>Dr.Ciraj AM Deputy Director-MCPD, Professor of Microbiology, Melaka Manipal Medical College Manipal Campus, Manipal University, Karnataka, India Email: <a href="mailto:cirajam@gmail.com">cirajam@gmail.com</a></td>
</tr>
<tr>
<td>Dr. Yeshwant Rao</td>
<td>Endeavour executive fellowship in professional development in Medical education</td>
<td>Dr. Yeshwant Rao, Deputy Controller of Examinations, Manipal University Professor of Pharmacology, Melaka Manipal Medical College Manipal Campus, Manipal University, Karnataka, India Email: <a href="mailto:yashwanthrao2000@gmail.com">yashwanthrao2000@gmail.com</a></td>
</tr>
<tr>
<td>Dr. Vasudha Devi</td>
<td>Best poster award during International Medical Education Conference held at Malaysia</td>
<td>Dr. Vasudha Devi Professor of Pharmacology, Melaka Manipal Medical College Manipal Campus, Manipal University, Karnataka, India- 576104 Email: <a href="mailto:v21devi@gmail.com">v21devi@gmail.com</a>, <a href="mailto:vasudha_manipal@yahoo.co.in">vasudha_manipal@yahoo.co.in</a></td>
</tr>
</tbody>
</table>
Dr. Reem Rachel Abraham
Educator Development Group (EDG) award by Association for the Study of Medical Education (ASME). First person from emergent countries to receive an ASME award
Dr. Reem Rachel Abraham, Professor of Physiology, Melaka Manipal Medical College, Manipal Campus, Manipal University, Karnataka, India- 576104
Email: reemabraham@gmail.com

- **Achievements in clinical medicine research**

Dr. Arul Amuthan
Drug Discovery for natural products, Traditional & Integrative medicine-Clinical research
Dr. Arul Amuthan
Department of Pharmacology, Melaka Manipal Medical College, Manipal Campus, Manipal University, Karnataka, India- 576104
Email: dramuthanmd@yahoo.co.in

Dr. Sushmita
Sponsorship grant for 9th Asia Pacific Intenational Academy of Pathology Congress held at Brisbane, Australia
Dr. Sushmita, Department of Pharmacology, Melaka Manipal Medical College, Manipal Campus, Manipal University, Karnataka, India- 576104
Email: drsushmithamg@gmail.com

- **Achievements in basic science research**

Prof. Kiranmai S Rai
Best paper award during the 4th World Conference on Applied Sciences, Engineering and Technology held at Kumamoto University, JAPAN
Prof. Kiranmai S Rai, HOD, Dept of Physiology, Melaka Manipal Medical College, Manipal Campus, Manipal University, Karnataka, India- 576104
Email: hod.physio@gmail.com

Ms. Rituparna Chakraborty
International Visiting Fellowship at the School of Graduate Entry Medicine, University of Nottingham, UK
Ms. Rituparna Chakraborty
Dept of Microbiology, Melaka Manipal Medical College, Manipal Campus, Manipal University, Karnataka, India- 576104
Email: rituparna2k7@gmail.com

Dr. Sateesha Nayak
Dr. Prakash HS Gold medal constituted by Karnataka Chapter, Anatomical Society of India
Dr. Sateesha Nayak, Dept of Anatomy, Melaka Manipal Medical College, Manipal Campus, Manipal University, Karnataka, India- 576104

Dr. Sareesh NN
Dr. TMA Gold medal constituted by MMC, for best research paper
Dr. Sareesh NN, Department of Physiology, Melaka Manipal Medical College, Manipal Campus, Manipal University, Karnataka, India- 576104
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