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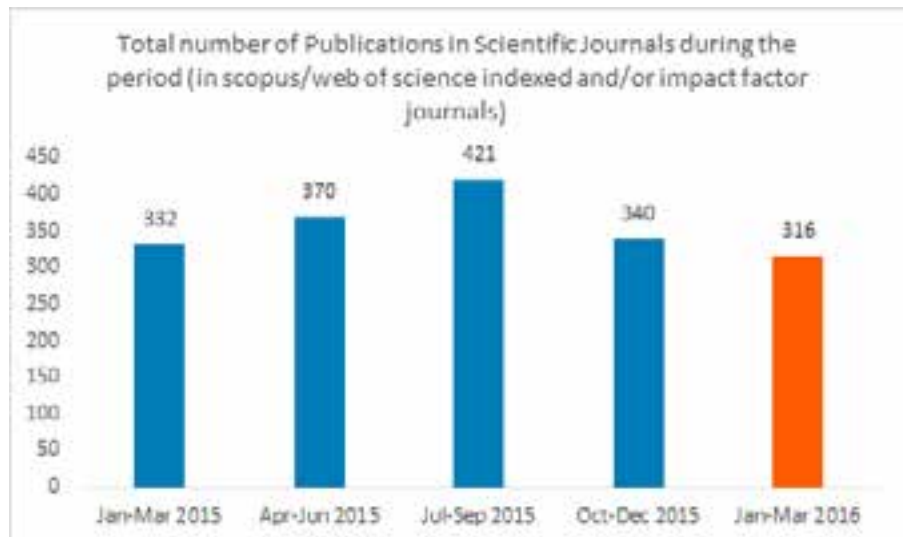
Activities of Manipal University Students' Research Forum (MUSRF)

Part I

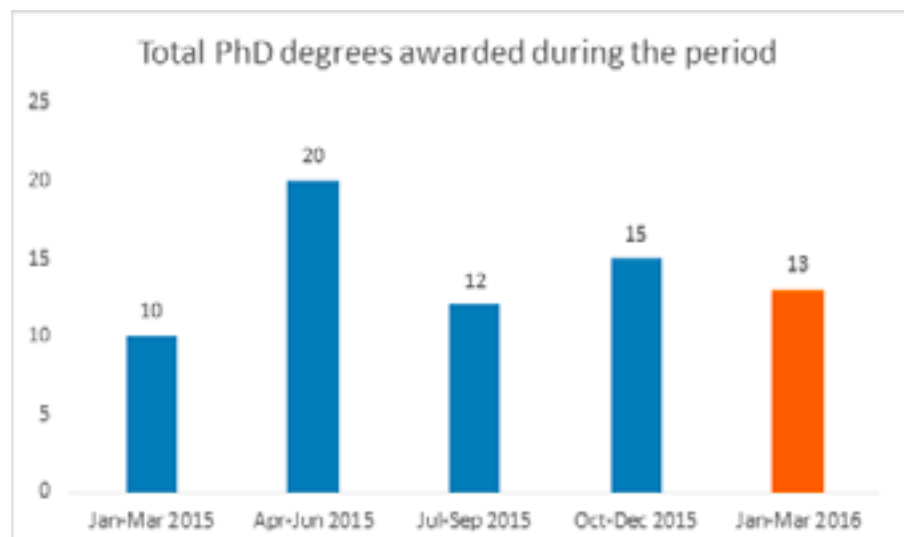
Manipal University (MU) is one of the premier universities in India. MU considers both academics and research equally important for the betterment of an institution. The faculty members and the research scholars at MU have embraced the research culture and publicize their research works in scientific publications, through presentations in various conferences and obtaining patents, research grants, etc. In this report, we present to you an overview of the research activities of Manipal University during Jan-Mar 2016.

A. Details of Research Activities of Manipal University during Jan-Mar 2016

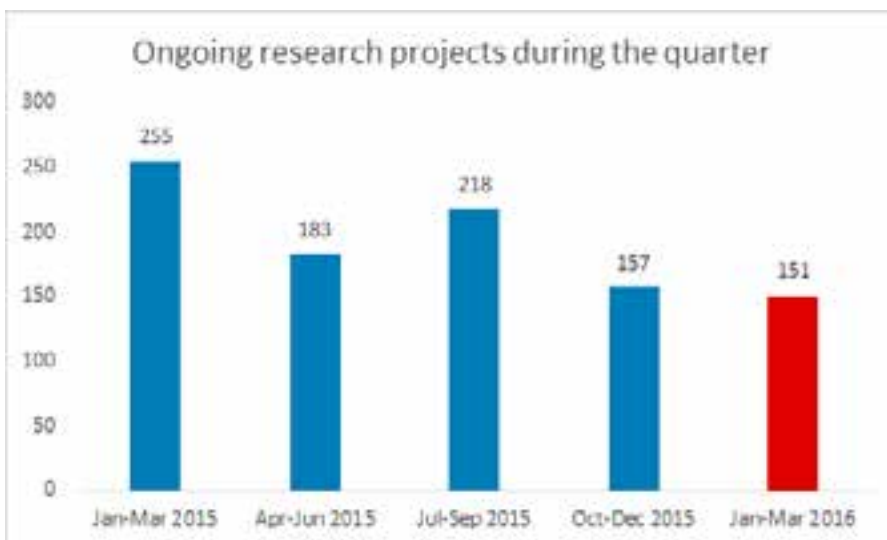
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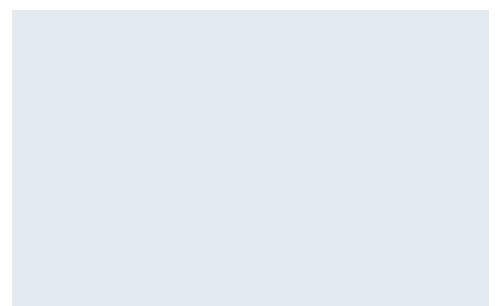
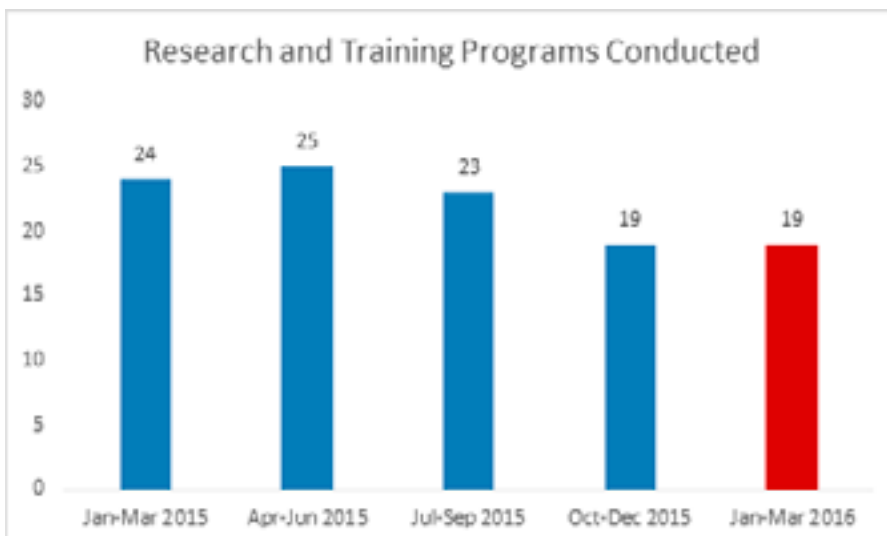
b. Total number of PhD degrees awarded



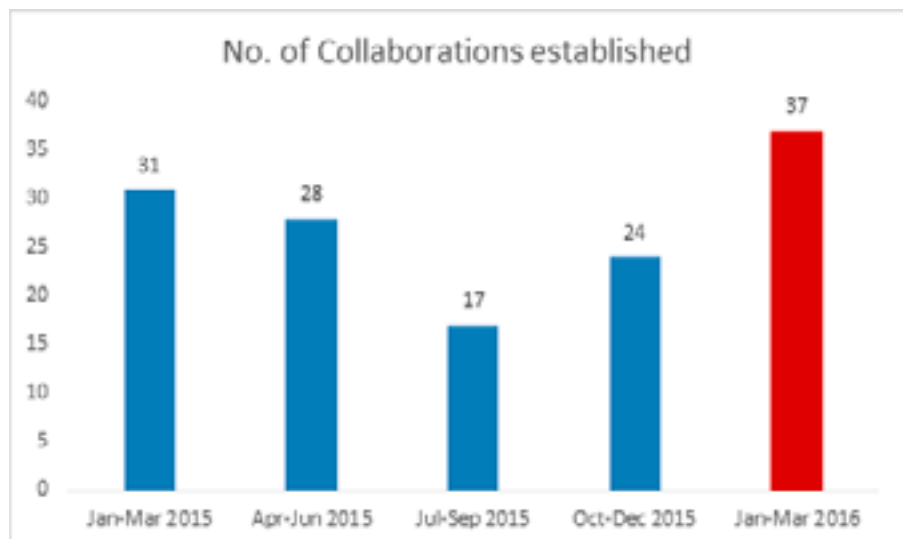
c. Ongoing research projects



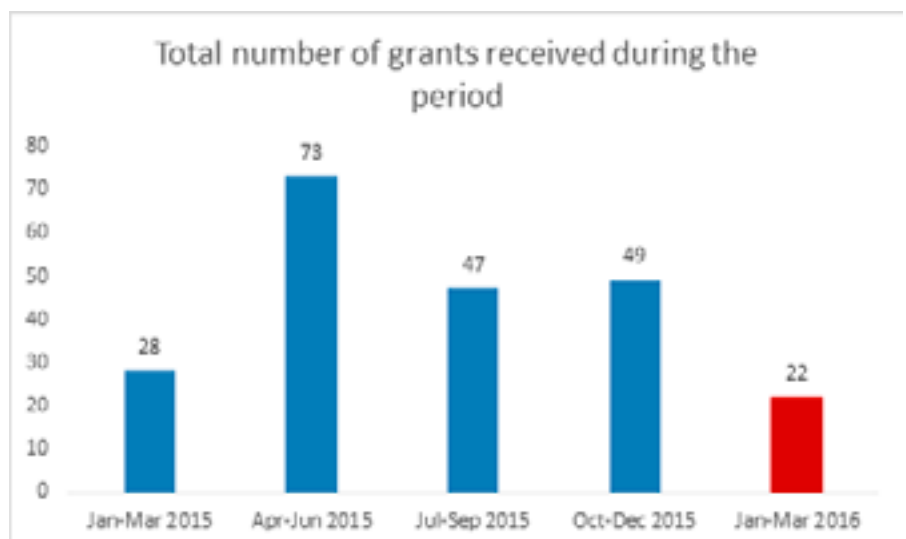
d. Research and Training Programmes Conducted



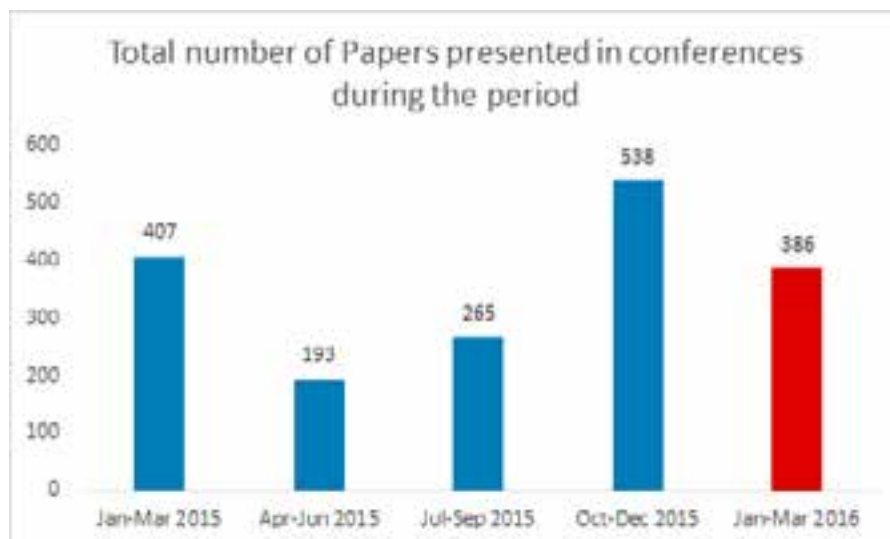
e. Number of Collaborations established



f. Total number of grants received



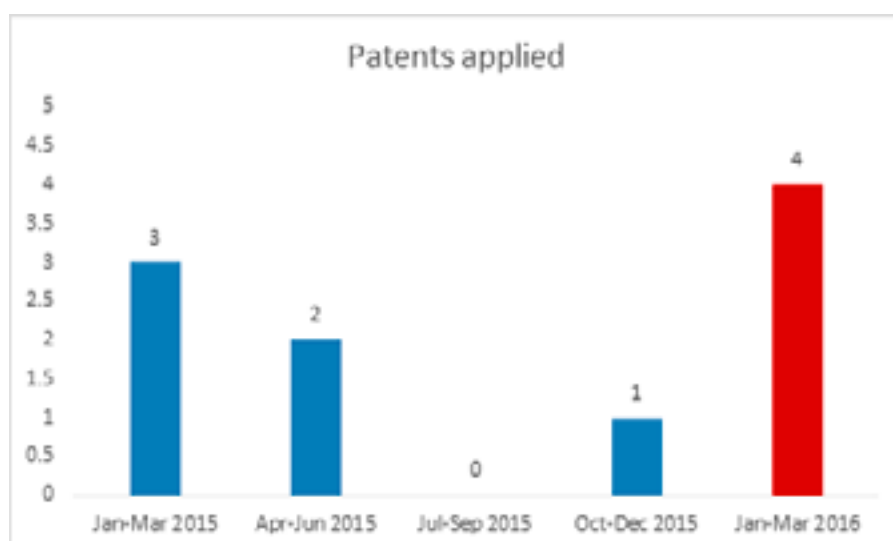
g. Total number of Papers presented in Conferences



h. Conferences/Seminars/Workshops conducted



i. Patents applied



A. Faculty Achievements

1. Dr Kamalesh Mumbrekar, Lecturer, Department of Radiation Biology and Toxicology, SLS, Manipal University has received the Young Scientist Award (Career Based Achievement Award) for his contribution in the field of Translational Radiobiological research on the “Understanding and Prediction of Normal Tissue Toxicity in Breast Cancer Patients by Cellular and Molecular Analysis” at the International Conference on Radiation Research: Impact on Human Health and Environment (ICRR-HHE 2016) held at BARC, Mumbai during Feb 11-13, 2016. He received the award from Prof Michael J Atkinson, Director, Institute of Radiation Biology, Helmholtz Zentrum München, Germany. This work was carried out as PhD thesis under the guidance of Dr B S Satish Rao Professor & Head, Department of Radiation Biology and Toxicology at School of Life Sciences, Manipal University, Manipal.

2. 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 during Feb 16- 18, 2016.

3. Book on Pharmaceutical Marketing and Management titled “Pharmaceutical Marketing Management” Edited by Dr N Udupa, Director Research (Health Sciences), MU and coedited by Dr D Sreedhar, Associate Professor, MCOPS, Manipal University was released by Dr Raveendranath Nayak, Director, School of Management, Manipal University on Jan 14, 2016. Dr H Vinod Bhat, Vice Chancellor, Manipal University presided the function.

4. Dr K R Pillai, Professor, School of Management, Manipal University, Manipal, has bagged an award in the Global Case Summit held at IIM Raipur on 5- 6 February, 2016. The research outcome was a co-authored case study with his student, Ms. Shobana Shivaraman of MBA Healthcare (2014 – 2016 batch). The case study entitled “WOSCA: An Emulative Saga of Social Enterprise,” recounts the proactive interventions of an NGO in a remote and inaccessible terrains of Odisha and their laudable achievements in ensuring livelihood security, community empowerment and environmental safeguards.

B. Achievement by Research Scholars

1. Ms Suma Prabhu won the Best Poster Award for her presentation entitled “Radio Labeled Polymeric Magnetite Nanoparticles Targeted against Human Glioma in Mouse Orthotopic Xenograft Model” at the International Conference on Radiation Research: Impact on Human Health and Environment (ICRR-HHE 2016) held at BARC, Mumbai during Feb 11-13, 2016. She received the award from Prof K P Mishra,



Founder President, Society for Radiation Research. She is a Structured PhD. Research Fellow at the Department of Radiation Biology and Toxicology, School of Life Sciences, Manipal University, Manipal and working under the guidance of Dr B S Satish Rao, Professor and Head, Department of Radiation Biology and Toxicology, School of Life Sciences, Manipal University, Manipal.

2. Mr Abdul Mueed Bidchol, Senior Research Fellow, has been awarded a European Molecular Biology Organization (EMBO) Short-term fellowship for research under the guidance of Prof Bill Newman and Dr Siddharth Banka, Manchester Centre for Genomic Medicine, St Mary's Hospital, University of Manchester, Manchester M13 9WL, UK. He is working on the project titled 'Unraveling the genetic etiology of Melkersson-Rosenthal syndrome and Teebi hypertelorism syndrome by exome sequencing'. He is also working in areas where the molecular basis of the diseases are not known. Mr Abdul is pursuing his PhD under the guidance of Dr Girisha KM, Professor and Head, Department of Medical Genetics, Kasturba Medical College, Manipal University, Manipal.

3. Ms Mallika Priya, a structured PhD student of Manipal University, Manipal was awarded International Travel Support from the Science and Engineering Research Board (SERB), Department of Science and Technology (DST), Government of India (covering travel, registration and accommodation expenses) towards attending and presenting



research paper entitled, "Photoacoustic spectroscopy based investigatory approach to discriminate breast cancer from normal: a pilot study" at the prestigious international conference "Diagnosis and Treatment of Diseases in the Breast and Reproductive System II" at SPIE BiOS Photonics West - 2016 held at the Moscone Center, San Francisco, California, United States during Feb 13-18, 2016 organized by the International Society for Optical Engineering (SPIE). Ms Mallika has completed her PhD thesis under the guidance of Dr K K Mahato, Professor and Head, Department of Biophysics, School of Life Sciences, Manipal University, Manipal.

4. Mr Manjunath, Research Scholar in School of Life Sciences, Manipal University, Manipal received Travel grant from Department of Biotechnology (DBT-CTEP Management Cell), Government of India and fellowship from Center for International Cooperation in Science (CICS) to attend and present research paper entitled "Fluorescence based assessment of SDS induced hydrophobic collapse in globular proteins" at the prestigious "SPIE BIOS- Biophysics, Biology and Biophotonics: the Crossroads 2016" conference held at the Moscone Center, San Francisco, California, United States during Feb, 13-18, 2016 which was organized by International Society for Optical Engineering (SPIE). Mr Manjunath is a Manipal University structured PhD student carrying out research under the guidance of Dr K K Mahato, Professor and Head, Department of Biophysics, School of Life Sciences, Manipal University, Manipal

Part II



A. Featured Scientists of Manipal University

*I. Dr Srinivas Mutalik, Professor,
Department of Pharmaceutics,
Manipal College of Pharmaceutical Sciences,
Manipal University, Manipal*



Dr Srinivas Mutalik is a prolific researcher and has extensive experience as well as expertise in the area of novel drug delivery including nano-pharmaceuticals. He completed his PhD under the guidance of Dr N Udupa, currently Director Research (Health Sciences), Manipal University in 2004. His research experiences span industrial R&D and academics. He carried out his postdoctoral research at the University of Queensland, Australia. Dr Mutalik has published more than 80 research papers in peer reviewed high impact journals, 4 patents, more than 25 conference presentations and Scopus h index of 22 to his credit. Along with Dr N Udupa, he edited a book "Novel Drug Delivery Systems" and has contributed many chapters in a few other textbooks.

Besides development of the pharmaceutical formulations at lab-scale, Dr Mutalik attempts to scale up the products to commercial level and few products have been successfully launched by companies. He strongly believes that teamwork leads to success. He has extensive collaborations with researchers within the institute, with researchers from the constituent institutions of Manipal University and with researchers/institutions at national and international level. Dr Mutalik is of firm opinion that Manipal University is a unique organization providing conducive environment to conduct research involving multidisciplinary areas. He considers that the combination of drug (delivery) scientist/pharmacist, clinician and engineer is a unique blend to achieve a



technology or product that will be helpful in treating or diagnosing diseases.

With the strong support from Manipal University, he is involved in beginning a Centre of Excellence in Extrusion Technology at MCOPS in collaboration with Steer Engineering Ltd., Bengaluru.

Novel drug delivery systems and technologies is his prime research area. By understanding the importance of nanotechnology in developing newer and more effective formulations, Professor Srinivas has taken up several projects in this area along with his team members, collaborators and students. He is involved in developing novel pharmaceutical formulations which can be delivered via different routes. Targeted drug delivery via nano-carriers is his other interest area. Dr Srinivas Mutalik humbly acknowledges the kind support and help of authorities of Manipal University, MCOPS and Research Directorate, his collaborators, students and family members for the achievements.

He has received research grants from various government agencies including funding from Department of Science and Technology (DST), Department of Biotechnology (DBT), Indian Council of Medical Research (ICMR), All India Council for Technical Education (AICTE), BIRAC and pharmaceutical companies. Dr Mutalik is a recipient of several honours and awards such as STARS Award for Teachers, Dr TMA Pai Gold Medal Award, VGST Award for Best Research Paper, CSIR Senior Research Fellowship, MCOPS Good Teacher Award, University Gold Medal, to mention a few. The School of Pharmacy, the University of Queensland, Australia has appointed Dr Srinivas Mutalik as Adjunct Professor. He is also a Visiting Professor for NUS and A-star, Singapore.



*II. Dr Anujith Kumar,
Associate Professor, School of
Regenerative Medicine (SORM),
Manipal University,
Bangalore Campus*



The concept of plasticity in adult cells fascinated Dr Anujith Kumar, eventually leading him to focus his research on re-programming and disease modelling. Understanding the protein turnover in a cell, biochemistry influenced him in his early career. This compelled him to pursue his research in Department of Biochemistry, Indian Institute of Science, a premier institute in India. Dr Anujith's doctoral program focused on how cells managed to cleanse its garbage, highly articulated process mediated by ATP dependent proteases and peptidases. Later, after getting an in-depth of the basic cellular physiology, Anujith got influenced by the magnificent artwork of generating induced pluripotent stem cells (iPSCs), the cells that mimicked the embryonic stem cells. To nurture his desire of studying the concept of reprogramming, he joined Katholieke University, Leuven, Brussels. During his post-doctoral period, for the first time he demonstrated that a combination of few transcription factors can drive the direct conversion of fibroblast to neural progenitors without visiting iPSCs stage, a process called trans-differentiation.

When asked about his journey in teaching and research, he feels that School of Regenerative Medicine, Manipal University, is one of the best platforms in the country where research has been prioritized and enough freedom is provided to researchers. SORM is a pioneer institute in the country to conduct highly specialized post-graduation course in stem cells. His laboratory has drawn attention of major funding agencies and was successful to attract ample number of grants. He has publications in high impact journals like JMCB, Nature scientific report, Molecular psychiatry, Differentiation etc.


According to him, two major promoters driving research are a) self-

initiated curiosity to understand the unknown facts and b) the motto of delivering the findings that are beneficial to the society. To fulfil these two facets, his laboratory is devoted to a) understanding different stages of human neurogenesis by using embryonic stem cell model system, a curiosity satisfying project and b) Drug designing and disease modelling of monogenetic disorders using iPSCs, a project destined for therapeutic application. In the coming years, his strategy is to focus on different aspects of intracellular protein degradation in self-renewal and differentiation of ESCs. Using iPSCs disease model system, he plans to emphasize his studies on discerning the role of proteasome in several neurological disorders. Understanding the underlying mechanism of these diseases would further be beaconing in expediting the identification of the drug target.

For young scientists his favourite motto is Churchill's saying: "We make a living by what we get; we make a life by what we give." Therefore don't dampen your curiosity of understanding the unknown facts, in fact the curiosity that paves the way for human benefit.

b. Initiatives of Directorate of Research, Manipal University

Directorate of Research (DOR), in consultation with the Executives of Manipal University, appointed five eminent scholars from both the industry and academia to constitute the Research Advisory Council (RAC). As per their recommendation, DOR is in the process of preparing a catalogue of young faculty members, based on their research expertise. Additionally, the office is considering setting up the office of Research Grants for effective management of grants. Periodic inputs about the various research activities at the institutional level are provided by the Institutional Research Coordinators. Besides being instrumental in overseeing the research activities at the institutional level, the research coordinator would take cognizance of some of the top research performers for their advice and expertise. To identify thrust areas of research and competencies in each of the constituent institutions of Manipal University and foster greater inter institutional collaboration, Interdisciplinary Research Advisory Group (IRAG) is



established. This group act in liaison with the DOR to facilitate outcome based collaborations. To promote research among undergraduate and postgraduate students and to inspire them to take up research as a career and create a network, two of the institutions were successful in forming Student Research Forum (SRF) in 2015. The SRF organized the 1st International Conference in Healthcare and Technical Research (ICHTR) in December, 2015.

Newer Operations

A Unique Tracking Number (UTN) is generated for each research grant at the proposal stage at the institutional level. This allows tracking of the proposal and the smooth management of grant award process from granting stage till completion. For greater dissemination of research and to improve the quantum of research publication, Manipal University, upon recommendation from the DOR revised the research incentive policy. A fillip for high quality publication in Scopus or Web of Science indexed journals with high impact factor underlies this policy. To enable smooth facilitation of the researchers' activities, an in house web based interface, Research Management System (RMS) is made operational. A portfolio with reference to the filing of patents, award of grants and publication matters including the impact factor of the journal are some of the main features of RMS.

Newer Centres

To improve potential for commercializing research activities carried out within Manipal University Technology Transfer Office (TTO) was established. Also, the Centre for Integrative Medicine and Research (CIMR) was established to nurture research in the field of Integrative medicine using conventional medical options along with complementary and alternative medicine. The centre which is majorly involved in conducting researches in Phase II, Phase III and Phase IV trials is the Manipal Centre for Clinical Research (MCCR). Centre for Community Oncology (CCO) is an established Centre of excellence for the prevention and control of cancer in the community and to bring about cancer control by primary, secondary and tertiary

prevention activities. MU instates bursary schemes, promotes student projects and entrepreneurship, helps incubate start-ups and renders skill based certification programme.

Research Publications

An overview of various research activities at MU are presented every quarter in the Manipal Research e-bulletin. A biannual publication at various centres carrying out research activities is highlighted in the Manipal Research Review. In-house publication of Manipal University Press in the 8 specialties was launched this year.

Research Output

Manipal University received several extramural research grants in the academic year 2015. The university has collaborations with corporates (45 research centres and 18 industry). A total of 919 publications in Scopus indexed journals, with an average of 0.4 citations per Publication and an average Journal Impact Factor of 0.4, was recorded.

Research Events

The DOR organizes events like Manipal Research Colloquium, Interdisciplinary research conferences through MUSRF, IP quiz etc.

Centres of Excellence

MU has over 10 state-of-the-art research facility, which includes, Manipal University Technology Business Incubator (MUTBI), Innovation Centre, MIT, Manipal Assisted Reproductive Centre (MARC), KMC Central Research Lab, Department of Atomic and Molecular Physics (DAMP), School of Regenerative Medicine (SORM), Manipal Centre for Natural Sciences (MCNS), School of Life Sciences (SOLS), Manipal College of Pharmaceutical Sciences (MCOPS), Department of Virus Research (DVR). MU also has partnerships with 18 multinational companies, 104 premier institutes, 45 research centres and 141 international Universities.

c. Top Publications during Jan-Mar 2016

No.	Title of Publication	Authors	Department/ Institution/ University	Journal	Journal Impact Factor
1	Altered neuronal network and rescue in a human MECP2 duplication model	Nageshappa S ¹ , Carromeu C ^{2,3} , Trujillo CA ^{2,3} , Mesci P ^{2,3} , Espuny-Camacho I ^{4,5} , Pasciuto E ^{5,6} , Vanderhaeghen P ^{4,5,7} , Verfaillie CM ^{8,9} , Raitano S ^{8,9} , Kumar A ^{8,9,10} , Carvalho CM ^{11,12} , Bagni C ^{5,6,13} , Ramocki MB ¹⁴ , Araujo BH ^{2,3} , Torres LB ^{2,3} , Lupski JR ¹⁵ , Van Esch H ^{1,16} , Muotri AR ^{2,3} .	<ol style="list-style-type: none"> 1. Department of Human Genetics, Laboratory for the Genetics of Cognition, Center for Human Genetics, KU Leuven, Leuven, Belgium. 2. Department of Pediatrics, Rady Children's Hospital San Diego, School of Medicine, University of California San Diego, La Jolla, CA, USA. 3. Department of Cellular and Molecular Medicine, Stem Cell Program, School of Medicine, University of California San Diego, La Jolla, CA, USA. 4. Institut de Recherches en Biologie Humaine et Moléculaire, Université Libre de Bruxelles, Brussels, Belgium. 5. VIB Center for the Biology of Disease, Leuven, Belgium. 6. KU Leuven Center for Human Genetics and Leuven Institute for Neurodegenerative Diseases, KU Leuven, Leuven, Belgium. 7. WELBIO, Brussels, Belgium. 8. Department of Development and Regeneration, Cluster Stem Cell Biology and Embryology, Stem Cell Institute Leuven, KU Leuven Medical School, Leuven, Belgium. 9. VIB Center for the Biology of Disease KU Leuven, Center for Human Genetics, Laboratory of Neuronal Communication, Leuven, Belgium. 10. Manipal Institute of Regenerative Medicine, Bangalore, India. 11. Department of Molecular and Human Genetics, Baylor College of Medicine, Houston, TX, USA. 12. Centro de Pesquisas René Rachou-FIOCRUZ, Belo Horizonte, MG, Brazil. 13. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy. 	Molecular Psychiatry	14.496

No.	Title of Publication	Authors	Department/ Institution/ University	Journal	Journal Impact Factor
			14. Developmental Neuroscience, Department of Pediatrics, Baylor College of Medicine, Houston, TX, USA. 15. Human Genome Sequencing Center, Baylor College of Medicine, Houston, TX, USA. 16. Department of Clinical Genetics, Center for Human Genetics, University Hospitals Leuven, Leuven, Belgium.		
2	Dysregulation of Wnt-Signaling and a Candidate Set of miRNAs Underlie the Effect of Metformin on Neural Crest Cell Development	Banerjee P ¹ , Dutta S ² , Pal R ¹	1. School of Regenerative Medicine, Manipal University, Yelahanka, Bangalore, India. 2. Ophthalmic Genetics and Visual Function Branch, National Eye Institute, National Institutes of Health, Bethesda, Maryland, USA.	Stem Cells	6.523
3	The current landscape of the mesenchymal stromal cell secretome: A new paradigm for cell-free regeneration	Konala VB ¹ , Mamidi MK ² , Bhonde R ² , Das AK ³ , Pochampally R ⁴ , Pal R ⁵ .	1. Department of Marine Biotechnology, AMET University, Kanathur, Chennai, India; Genes & Life Health Care Pvt. Ltd, Punjagutta, Hyderabad, India. 2. School of Regenerative Medicine, Manipal University, Bangalore, India. 3. Department of Surgery, Taylor's University School of Medicine, Sungai Buloh Hospital, Selangor, Malaysia. 4. Department of Biochemistry, Cancer Institute, University of Mississippi Medical Center, Jackson, Mississippi, USA. 5. School of Regenerative Medicine, Manipal University, Bangalore, India.	Cytotherapy	3.293



No.	Title of Publication	Authors	Department/ Institution/ University	Journal	Journal Impact Factor
4	Biological activity of a small molecule indole analog, 1-[(1H-indol-3-yl)methylene]-2-phenylhydrazine (HMPH), in chronic inflammation	Misra CS ¹ , Gejjalagere Honnappa C ¹ , Jitta SR ² , Gourishetti K ³ , Daram P ² , Singh MP ⁴ , Hosur Shrungeswara A ¹ , Nayak Y ³ , Unnikrishnan MK ⁵ .	<ol style="list-style-type: none"> 1. Department of Pharmacy Practice, Manipal College of Pharmaceutical Sciences, Manipal University, Karnataka, Manipal, 576104, India. 2. Department of Pharmacognosy, Manipal College of Pharmaceutical Sciences, Manipal University, Karnataka, Manipal, 576104, India. 3. Department of Pharmacology, Manipal College of Pharmaceutical Sciences, Manipal University, Karnataka, Manipal, 576104, India. 4. Department of Pharmacology, Life Science Research Centre in India, Daiichi Sankyo India Pharma Private Limited, Gurgaon, 122015, India. 5. Department of Pharmacy Practice, Manipal College of Pharmaceutical Sciences, Manipal University, Karnataka, Manipal, 576104, India. 	Chemico-Biological Interactions	2.577
5	Modulation of genetic clusters for synthesis of bioactive molecules in fungal endophytes: A review	V B Deepika, T S Murali, K Satyamoorthy	Division of Biotechnology, School of Life Sciences, Manipal University, Manipal 576104, India	Microbiological Research	2.561
6	Four ring achiral ferroelectric liquid crystals of 1,2,4-oxadiazoles: synthesis and characterisation	Mahabaleshwara S. ^{a,b} , Poornima Bhagavath ^a , Sangeetha G Bhat ^a , S R Girish ^a , D M Potukuchi ^c and Srinivasulu Maddasani ^a	<ol style="list-style-type: none"> a. Department of Chemistry, Manipal Institute of Technology, Manipal University, Manipal – 576 104, India b. Syngene International Ltd., Biocon Park, Bommasandra, Bangalore 560 099. c. Department of Physics, University College of Engineering, Jawaharlal Nehru Technological University: Kakinada, Kakinada – 533 003, India 	Liquid Crystals	2.486

Part III

Manipal University Students' Research Forum (MUSRF)

Manipal University Student Research Forum (MUSRF), a student body under the aegis of Directorate of Research, Manipal University inducted the new council members on February 26, 2016. The event also marked the launch of MUSRF website (<http://musrf.manipal.edu/>) which was inaugurated by Dr H Vinod Bhat, Vice Chancellor, Manipal University.

The features of the newly launched website include

- a. Online membership registration for faculty and students
- b. List of events organized by MUSRF
- c. List of forthcoming events

As on March 1, 2016 the total membership of MUSRF include registration by 3900 students and 330 faculty members.

On March 10, 2016 MUSRF organized a guest talk by Dr Sanjay Singh, Professor, Manipal Institute of Technology on undergraduate research.





Editorial Team

1. Dr N Udupa Director Research (Health Sciences) – Manipal University, Manipal
2. Dr Satish Shenoy Director Research (Technical) – Manipal University, Manipal
3. Dr Raghu A R Deputy Director Research (Health Sciences) – Manipal University, Manipal
4. Dr Rekha R Shenoy Associate Professor, Department of Pharmacology, Manipal College of Pharmaceutical Sciences, Manipal University, Manipal
5. Dr Manthan D Janodia Associate Professor, Department of Pharmacy Management, Manipal College of Pharmaceutical Sciences, Manipal University, Manipal