

REPORT OF THE ACTIVITIES, SINCE ITS INCEPTION IN JANUARY 2021, OF THE NEWLY STARTED 'SCHOOL OF BIOLOGICAL SCIENCES' AND THE CENTRE FOR RESEARCH IN BIOLOGICAL SCIENCES CALLED 'JIVAN' (JIVA-VIJNAN-ANWESHAN-NIKETAN)

The Genesis:

Among the approved 'Off-Campus' Centres of Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI), Deemed University declared by the Ministry of Human Resource Development, Government of India, under University Grants Commission (UGC) Act, 1956, headquartered at Belur Math, the Narendrapur Centre has been successfully running postgraduate and research programmes leading to M.Sc. and Ph.D. degrees in the area of Agricultural Biotechnology since inception from 2006. During May 2020, when the Covid-19 pandemic had just set in and the importance of Biological Sciences with special emphasis on immunology, virology and Medical Biotechnology was keenly felt, RKMVERI Board of Management brainstormed on how best Swamiji's University can contribute to the knowledge resource in these areas through postgraduate and research programmes involving both biological scientists working in the laboratories on the one hand and the medical doctors working in the field on the other. It was decided to start Medical Biotechnology programmes at the postgraduate and research levels leading to M.Sc. and Ph.D. in Medical Biotechnology under 'School of Biological Sciences' jointly and in active collaboration with Ramakrishna Mission Sevapratishthan, our hospital in Kolkata. This would create a new synergy between a purely academic institution like RKMVERI and a vibrant service-oriented institution (with postgraduate and research units in 'Vivekananda Institute of Medical Sciences' attached) like Ramakrishna Mission Seva Pratishthan, with reputed biological scientists and renowned, experienced medical doctors coming together to create powerful synergy thus adding a new dimension to Ramakrishna Mission's efforts to serve in the field of higher medical education. The then Vice Chancellor, Swami Atmapriyananda, approached the Seva Pratishthan authorities to join this collaborative venture and the Managing Committee of the Seva Pratishthan gladly came forward to support this collaborative effort. The General Secretary of Ramakrishna Mission at Belur Math, Swami Suviranandaji, who is also the Chancellor of RKMVERI Deemed University, not only expressed his delight but gave great encouragement to this effort. The positive energy flowing from the Chancellor for this new venture which has gained enormous importance and urgency in the wake of the Covid-19 pandemic thus took concrete shape. The futuristic vision is that as the new School of Biological Sciences (to be based at Narendrapur Faculty Centre of the RKMVERI Deemed University as well as Ramakrishna Mission Seva Pratishthan) grows in strength, postgraduate and research will be started in other important areas in Biological Sciences like immunology,

microbiology, medical laboratory technology, etc. The revered Trustees of Ramakrishna Math who are also the members of the Governing Body were kind enough to approve the starting of the 'School of Biological Sciences' at their meeting on 13 May 2020 and later the starting of a Research Centre called 'JIVAN' at a meeting on 18 February 2021. These two resolutions are enclosed as **Annexures** herewith.

Annual Report of the Activities of the 'School of Biological Sciences' and its Research Centre 'JIVAN' since inception till November 2021:

January 2021:

On the sacred birthday of Holy Mother Sri Sarada Devi, 5 January 2021, the Research Centre on Biological Sciences, JIVAN (**J**iva-**V**ijnan-**A**nweshan-**N**iketan) was inaugurated at Ramakrishna Mission Seva Pratishthan Hospital Centre in the presence of Swami Atmapriyananda, Secretary and Pro-Chancellor of RKMVERI, Swami Nityakamananda, Secretary of the Seva Pratishthan, Swami Shaktipradananda, Asst. Secretary of the Seva Pratishthan, Swami Gunamayananda, Laboratory-in-Charge, Seva Pratishthan, other monks from RKMVERI and Seva Pratishthan, as well as Dr Debasis Banerjee, Coordinator (on behalf of the medical doctors) and Prof Subrata Banerjee, Coordinator (on behalf of the Biological Scientists), several other doctors of Seva Pratishthan, research scholars and faculty of RKMVERI under the School of Biological Sciences. This marked the auspicious beginning of the Research Centre JIVAN.

January-February 2021:

Two research scholars possessing UGC/CSIR-NET JRF (University Grants Commission/Council of Scientific and Industrial Research Junior Research Fellowship), Akash Kumar Halder and Debdatta Talukdar, were admitted in JIVAN under competent research faculty of RKMVERI working respectively on the following topics:

1. Debdatta Talukdar: Finding underlying cause of Idiopathic dilated cardiomyopathy (IDCM) an array of seemingly unrelated forms of cardiomyopathies in patients of West Bengal
2. Akash Halder: A study on genetic and epigenetic predispositions in the underlying pathogenesis of auto-immune thyroid disorders (AITD) among the patients in West Bengal

These two scholars have started their research work leading to Ph.D. as per the UGC Regulations and hope to be able to complete in 4-5 years.

February 2021:

At the first meeting of JIVAN held in face-to-face (offline) mode at Seva Pratishthan under the Chairmanship of Swami Atmapriyananda and the presence of Swami

Nityakamananda, Secretary, Seva Pratishthan and Swami Gunamayananda, Monk-in-charge, Laboratories at Seva Pratishthan, four research groups were formed under JIVAN. Each group had a harmonious blend of basic scientists in Biological Sciences and medical doctors/clinicians in order to create a synergy between clinical medicine and biological sciences as explained earlier. The objective is to successfully implement the “lab to bedside” (*See Note below) philosophy of medical research for societal benefits. The groups were formed keeping in view the expertise available and the clinical problems faced by medical fraternity in our society.

***NOTE ON THE
'LAB TO BEDSIDE' CONCEPT (ALSO CALLED 'TRANSLATIONAL RESEARCH')**

This Concept of 'Lab to Bedside', also called 'Translational Research' has emerged in recent times particularly in the field of biomedical research.

In science and technology, especially in biology and medical sciences, “translational research, is research aimed at translating (converting) results in basic research into results that directly benefit humans. As such, translational research forms a subset of applied research.

The term has been used most commonly in life-sciences and biotechnology but applies across the spectrum of science and humanities. In the context of biomedicine, translational research is also known as 'Lab to Bedside' or 'Bench to Bedside'. Note the similarity with Swami Vivekananda's idea of converting theoretical Vedanta into practical Vedanta – “the dry, abstract Advaita must become living, poetic in everyday life” as Swamiji said.

In biomedicine, translational research is divided into different stages. There are two-stage (T1 and T2), four-stage (T1, T2, T3, and T4), and five-stage (T1, T2, T3, T4, and T5) schemes. In a two-stage model, *T1 research*, refers to the "bench-to-bedside" enterprise of translating knowledge from the basic sciences into the development of new treatments and *T2 research* refers to translating the findings from clinical trials into everyday practice. In a five-stage scheme, T1 involves basic research, T2 involves pre-clinical research, T3 involves clinical research, T4 involves clinical implementation, and T5 involves implementation in the public health sphere.)

The Five 'Working Groups' involved in the above “lab to bedside” research in JIVAN, Research Centre in Biological Sciences under RKMVERI in collaboration with Ramakrishna Mission Seva Pratishthan are in the following major areas:

1. Microbiology
2. Haematology and Haemato-oncology
3. Cardiology and Metabolic Disorders
4. Neurology
5. Medical Statistics and Digital Image Analytics

Each of these Groups has two basic scientists in biological sciences from RKMVERI and two medical doctors from Seva Pratishtan and/or reputed hospitals in Kolkata. Of these the first four groups were initially formed in February 2021 and later on, at another meeting of JIVAN held during April 2021, one more Working Group was added in the area of 'Medical Statistics and Digital Data Analytics'. This fifth Group comprises reputed statisticians and digital analysis experts from the top-notch Institute, Indian Statistical Institute, Kolkata.

The details of the scientists and doctors comprising these five working groups are given are annexed herewith and marked as **Annexure 3**.

March 2021:

On 20 March 2021, a brainstorming session was conducted at Seva Pratishtan wherein the various Working Groups came up their Research Proposals. The Group Leaders of each of these Groups presented these proposals and there was a lively interaction and discussion. Swami Atmapriyananda chaired the session.

The following is a summary of the various Research Proposals.

1. Working Group on Microbiology – Research Project Proposals

Project 1.1: Changes in Microbiome in Patients admitted in Intensive Care Unit (ICU)

Principal Investigator: Dr. Prabuddha Mukhopadhyay from Seva Pratishtan

Project 1.2: Prevalence of Lung Infections with Lung Flukes of the Paragonimus Species amongst Patients at a Tertiary Care Hospital in Eastern India

Principal Investigator: Dr. Poulomi Mukherjee, Seva Pratishtan

2. Working Group on Hematology & Hemato-Oncology – Research Project Proposals

Project 2.1: Effects of Metal Ions and Small Organic Molecules with Medicinal Values on Aggregation of Proteins of Clinical Importance

Investigators: Abhijit Chakrabarti, Debasis Banerjee, Kishore Sinha (RKMVERI professors in the School of Biological Sciences)

Project 2.2: Effects of Ayurvedic Substances on Aggregation of Platelets and Lectin-induced Hemagglutination of Red Blood Cells from Clinical Samples

Investigators: Abhijit Chakrabarti, Debasis Banerjee, Kishore Sinha (RKMVERI professors in the School of Biological Sciences)

Project 2.3: Multiple Myeloma and Drug Resistance

Investigators: Brahmachari Somnath, Dr Saran Chattopadhyaya, Prof Subrata Banerjee, Dr. Debashis Banerjee (Research scholars and professors of RKMVERI)

3. Working Group on Cardiology & Metabolic Disorder – Research Project Proposals

Project 3.1: Detection of cardiac autoantibodies (CAAs) as markers of duration and severity of cardiac damage in idiopathic dilated cardiomyopathy (IDCM) patients of West Bengal (Submitted to DST-SERB for funding)

Principal Investigator: Dr. Kunal Sikder, RKMVERI

Co-investigator: Dr. Soumitra Kumar, Seva Pratishtan

Project 3.2: Thymic intolerance to cardiac myosin: Finding underlying cause of idiopathic dilated cardiomyopathies (IDCMs), an array of seemingly unrelated forms of cardiomyopathy in Eastern India patients (will be submitted soon to VIMS for funding)

Principal Investigator: Dr. Kunal Sikder, RKMVERI

Co-investigators: Dr. Soumitra Kumar, Seva Pratishtan,

Dr. Manojit Lodha, VIMS, Seva Pratishtan, Dr. Rinini Dastidar, Dept. of Biochemistry, Seva Pratishtan

Project 3.3: A study on the role of genetic predisposition of HLA-II (Human Leucocyte Antigen -II) alleles in the underlying pathogenesis of auto- immune thyroid disorders (AITDs among the patients in Eastern India (Submitted for VIMS funding)

Principal Investigator: Dr. Rinini Dastidar, Dept. of Biochemistry, Seva Pratishtan

Project 3.4: Contribution of Vitamin D receptor (VDR) and cyp27b1 gene Polymorphism in progression of retinopathy in diabetic patients of West Bengal (Planning to submit to WB-DST for funding)

Principal Investigator: Dr. Kunal Sikder, RKMVERI

Co-investigators: Dr. Sanjit Dey, Professor of Physiology, University of Calcutta;

Dr. Subijoy Sinha, Assistant Prof., Retina-vitreous surgeon, Dristideep Eye Institute, Dankuni, West Bengal

Dr. Ajitesh Roy, Department of Endocrinology, Seva Pratishtan-VIMS

Dr. Rinini Dastidar, Dept. of Biochemistry, Seva Pratishtan

4. Working Group on Neuroscience – Research Project Proposals

Proposal 4.1: Yogic Management of Chronic Pain: Understanding the Underlying Neuro- Psychophysiological Mechanism

Investigators: Arkadeb Dutta, RKMVERI; Dr Subhadip Paul, RKMVERI; Dr. Jayanta Roy, Institute of Neurosciences, Kolkata; Dr. Sanjoy Mohan Bhattacharjee, Seva Pratishthan

Proposal 4.2: Topic: Diffusion Tensor imaging and MRI Tractography to Understand Stroke Recovery

Investigators: Dr. Jayanta Roy, Institute of Neurosciences, Kolkata; Arkadeb Dutta, RKMVERI; Dr Subhadip Paul, RKMVERI; Dr. Sanjoy Mohan Bhattacharjee, Seva Pratishthan

Proposal 4.3: Brain Iron Distribution in Thalassemia Patients and Relation to Cognition and Behaviour

Investigators: Dr Arkadeb Dutta, RKMVERI; Dr Subhadip Paul, RKMVERI; Dr Debasis Banerjee, Coordinator, RKMVERI faculty, also attached to Seva Pratishthan

5. Working Group on Medical Statistics and Digital Image Analytics – Research Project Proposals

Proposal 5.1: Redefining anemia, as the present definition of anemia by the World Health Organization (WHO) is under scanner for lack of strong statistical evidence behind its promulgation in 1968.

Investigators: Dr Nachiketa Chattopadhyay, Indian Statistical Institute, Kolkata; Profs. Probal Chaudhuri, Debasis Sengupta, Dr Sarbani Palit (all of the three also from Indian Statistical Institute, Kolkata); Dr Debasis Banerjee, Coordinator, RKMVERI faculty, attached also to Seva Pratishthan;

Most of the discussions, meetings, interactive sessions, etc., were conducted online (in virtual mode) on account of the Covid-19 pandemic restrictions.

April 2021:

On 11 April, 2021, a presentation was made by Debdatta Talukdar, research scholar, JIVAN, regarding review and planning of PhD work. The plan of the project proposal was analysed by the members of the JIVAN groups and approved.

July-August 2021:

1. Multiple vendors and service agencies were contacted and the servicing and repairing works of the existing instruments of RKMSP/VIMS research units that were lying unused for a long time were undertaken.
2. Consumables and reagents required for research were ordered.
3. Sample collection and initial experiments on the research projects of the PhD scholars were started.

4. It was decided that one or two medical doctor(s) will be apportioned for counselling and collection of blood samples from the patients as part of the clinical research.

July 2021:

An M.Sc. student of Computer Science studying at Belur main campus successfully completed his M.Sc. dissertation in the Research Centre in Biological Sciences, JIVAN, under the guidance/supervision of Brahmachari Tamal, Asst. Professor in Computer Science, RKMVERI as an interdisciplinary project interfacing Computer Science and Biology. The following are the details:

Name of the Student: Jimut Bahan Pal (Reg. ID: B1930050)

Completed his MSc in Computer Science from Dept. of Computer Science, RKMVERI, Belur in July 2021.

Title of the Dissertation thesis: Instance Segmentation of Peripheral Blood Smear and Refining Classification via Domain Adaptation (submitted to RKMVERI in partial fulfilment of the requirements for the degree of MSc in Computer Science, 2021)

Advisor: Br. Tamal, Assistant Professor, Dept. of Computer Science, RKMVERI

Co-advisor: Dr. Debashish Banerjee, Visiting Professor, School of Biological Sciences

Abstract: Deep Learning models are data-dependent, i.e., they only perform well on unseen data from the same distribution on which they were trained. In the case of medical sectors, collecting and annotating data is a very costly process, in the sense, it requires expert annotators who can hardly give enough time for annotating and collecting data. For this reason, there are small repositories of data present everywhere which varies even if the number of classes is the same. In this work, we have built an automated process to annotate and mask cells of Peripheral Blood Smear, also classify the data using a closely related PBC dataset via domain adaptation to learn domain invariant features. This will help the process of counting and identifying different types of white blood cells present in smear to identify certain diseases according to some distribution. A novel demographic smear dataset is also built in the process which will further help researchers to do novel innovative tasks, e.g., generating new data synthetically via original dataset to suit any demography. In the process, we have also surpassed the state-of-the-art model for PBC dataset classification and explored several ingenious ways to perform masking.

August 2021:

On 1 August 2021, an intense discussion involving review of the work done so far by the 5 Working Groups of JIVAN was conducted in virtual mode via googlemeet. The Group Leaders of each of the Groups presented the progress of their respective Group.

Under the Microbiology Group, Dr. Prabuddha Mukherjee and Dr. Poulomi Mukherjee, both of them faculty members respectively of the Medicine and Microbiology Departments of Seva Pratishthan, expressed their desire to pursue research leading to Ph.D. degree to be awarded by RKMVERI on human microbiota under the guidance and supervision Prof. Rukhsana Chowdhury, a full-time faculty of the School of Biological Sciences of RKMVERI.

Under the Haematology and Haemato-Oncology Group, Brahmachari Somnath started working on multiple myeloma for his Ph.D. under the guidance and supervision of Prof. Subrata Banerjee. Apart from multiple myeloma, this Group proposes to carry out research also in the field of red blood cells and platelet membrane related issues. Dr. Kishor Kumar, a full-time faculty of Agricultural Biotechnology at the Narendrapur Campus of RKMVERI, was inducted in this Group for research on the effects of herbal elements/drugs on these two types of cell membranes.

Under the 'Medical Statistics and Digital Data Analytics' Group, Dr. Nachiketa Chattopadhyay's presentation on the urgent need to redefine anemia cut-off as the WHO's definition promulgated in 1968 forms the basis of which the Government policies, was felt to be a priority project as WHO's definition has been made have been facing serious challenges particularly in the Indian context. It was decided that initiating research in this area should be accorded the priority that it deserves.

On 8 August 2021, an in-depth discussion on the anemia project and cardiovascular risk factors was taken up. Hemoglobin cut-off level for defining anemia was discussed.

On 30 August 2021, the Research Projects of the 'Microbiology' Working Group were received, the investigators of these projects being Dr. Pradip Chakraborty, Dr. Prabuddha Mukhopadhyay, and Dr. Poulami Mukherjee—all the three from Seva Pratishthan, Prof. Rukhsana Chowdhury, a full-time faculty of RKMVERI.

The following Projects were proposed, with a collaborator who is an expert from the field of Bioinformatics:

1. Changes in microbiota in patients admitted to ICU:

The human body is host to a large conglomerate of microorganisms that occupy different niches and outnumber human cells by ten-fold. Collectively known as the 'human microbiome', the resident microbiota have co-evolved and co-adapted with the human race, such that the human-microflora symbiosis makes us what we are, through subtle effects on our nutrition, metabolism, health and disease. In recent

years, important correlations between microbiome dysbiosis and several disease have emerged.

Patients in ICU are routinely subjected to certain conditions that may impact the normal microbiota. These include exposure to nosocomial infections, antibiotic treatments, morbidity related stresses, weakened immunity and others. The project aims to analyse the microbiota profile in ICU patients in order to ascertain the effect of the above conditions on the microbiota and correlate the changes with prognosis, if possible. Furthermore, nosocomial pathogens are often resistant to multiple antibiotics. Experiments will be designed to investigate whether the resistance genes are transferred to the resident microbiota during nosocomial infections.

2. Microbiome associated with bedsores

The project aims to analyse the microbiota associated with bedsores and examine if the microbiome profile can be correlated with prognosis.

September 2021:

On 5 September 2021, Dr Nachiketa Chattopadhyay, Group Leader of the Working Group on 'Medical Statistics and Digital Data Analytics' presented a review of the literature on their project on 'Hemoglobin cut-off level for redefining anemia' and it was decided Dr. Chattopadhyay would make take the issue to deeper levels and make further presentations on the justifications for carrying out a study on this topic in our population.

Dr. Tanmoy Mahapatra, an epidemiologist, who has been inducted into our Working Group on 'Cardiology and Metabolic Disorder', made a presentation on a cohort that he was nurturing for more than a decade and highlighted the importance of cohorts in pursuing research in public health domain. Dr. Soumitra Kumar from Seva Pratishthan, Group Leader, also apprised the members about his experience with similar studies and expressed deep interest in doing a study on cardiovascular risk evaluation in a cohort like the one Dr. Mahapatra has been nurturing.

Dr Gour Das, Founder-Secretary of Vivekananda Swasthya Seva Sangha, Kolkata, who has also been taking keen interest in JIVAN's research initiatives, shared his experience of community-based health care activities that his organization has been actively engaged in for several decades in rural Bengal.

While the usual activities of the JIVAN Centre at Seva Pratishthan, namely, repairing and refurbishing of the laboratories, the equipment and instruments, procurement of consumables and chemicals needed for research, etc., continued apace, another important development in terms of procuring research faculty capable of high quality research was the recruitment of Dr Arnab Basu who joined the JIVAN Centre of RKMVERI at Seva Pratishthan **on 23 September 2021**. Dr Arnab Basu is the recipient

of the prestigious Ramalingaswamy Re-entry Fellowship awarded by the Department of Biotechnology, Government of India, to young research faculty eager to return to India and to encourage such brilliant young research scientists engaged in doctoral and postdoctoral research in various reputed Institutes/Universities abroad, to return to India. Under this Scheme a handsome monthly fellowship is awarded for 5 years, with an academic status at par with an Asst. Professor of any recognized University in India, together with a substantial contingency grant for 5 years for purchase of equipment, instruments, apparatus, books and journals, etc. for carrying out research. The recipients of this Fellowship need to be attached/affiliated to a recognized Indian University/Institute. Dr Arnab Basu is therefore affiliated to RKMVERI's 'School of Biological Sciences' and that he has been able to compete with several such applicants and achieve this unique honour of being awarded the Ramalingaswamy Fellowship award is praiseworthy. He is sure to prove an asset in JIVAN's research endeavour.

On 26 September 2021, as proposed earlier, Dr Nachiketa Chattopadhyay, Group Leader of the Working Group on 'Medical Statistics and Digital Data Analytics', along with his other Group members from the Indian Statistical Institute, Kolkata, made a detailed presentation on "A multi-centre study to redefine appropriate haemoglobin cut-off values for detecting prevalence of anemia in different age groups in India: scope and feasibility". The members of the other Working groups on "Cardiology and Metabolic Disorders", "Haematology and Haemato-Oncology", were also present.

October 2021:

On 1 October 2021, a meeting of the 'Haematology and Haemato-Oncology Group' was held and Prof. Abhijit Chakrabarti and Dr. Kishor Kumar presented two research proposals on 'In-vitro study of interaction between cell membranes and protein aggregates'.

On 3 October 2021, another meeting of the 'Haematology and Haemato-Oncology Group' was held with Dr. Debasis Banerjee making a presentation on the following two research proposals:

1. Study on the effect of herbal ingredients on platelet function
2. Exploring the molecular mechanisms of some hitherto unidentified platelet function defect.

On 30 October 2021, online written test was conducted for 9 research scholars who had applied for PhD programme in JIVAN.

On 31 October 2021, an intense discussion (via virtual meet) was conducted to finalize the curriculum and syllabus of the contemplated M.Sc. programme on 'Medical Laboratory Science and Technology (MLST)', which is in great demand as the

laboratory equipment and instruments have become highly sophisticated, being fully automated and computerized, digital machines replacing the old-fashioned ones. Artificial intelligence techniques are being used in the medical field in a big way and India can ill afford to wait any longer without catching up on training human resource and creating a pool of highly trained professionals in the area of Medical Laboratory Science and Technology. Hence our effort to launch this programme which will be a 5-year Integrated M.Sc. programme (10 + 1 semesters) with provision for lateral exit at the end of the B.Sc. programme. There will be a half-semester internship for hands-on and on-the-job training at the end of the 3-year B.Sc. and another half-semester training at the end of the M.Sc. final, thus making it (10+1) semester programme. No such programme exists anywhere in India and therefore this will be a unique and much-needed programme in the field of Medical Laboratory Science and Technology in the emerging higher medical education scenario.

November 2021:

Upon evaluation of the answer-scripts of Research Eligibility Test (RET) conducted online for the 9 applicants for Ph.D. programme conducted as per UGC Regulations, there were 7 candidates who could be shortlisted for interview cum viva-voce. These candidates were subjected to a rigorous interview cum viva-voce on 12 November 2021 in the virtual (online) mode by JIVAN faculty professors of RKMVERI and finally, 4 candidates were selected (of which 2 candidates possess Junior Research Fellowships from UGC/CSIR, Government of India) and 3 of the selected candidates have already taken admission and will be pursuing their research leading to Ph.D. under the research faculty of RKMVERI at Seva Pratishthan JIVAN Centre.

Brahmachari Somnath who is pursuing research leading to PhD under JIVAN Research Centre in the 'School of Biological Sciences', presented a paper of his research findings in the 62nd Annual Conference of the 'Indian Society Haematology and Blood Transfusion' held during **11 – 13 November 2021**.

Thus, the JIVAN Centre at Seva Pratishthan now has 3 full-time faculty at Asst. Professor's level and 5 research scholars (2 scholars joined earlier and 3 more joined recently) – no mean achievement within this short period of hardly ten months since the inception of this Research Centre and that too in the midst of the raging Covid-19 pandemic situation.

On 16 November 2021, the sacred *janma-tithi* of Swami Subodhanandaji Maharaj, we conducted a simple inaugural ceremony on the occasion of the beginning of the offline (in face-to-face mode), of the 3rd semester M.Sc. Medical Biotechnology, the first two semesters having been conducted online (virtually) for the most part with a 40-day intense practical classes conducted in between at our Narendrapur Campus. Swami Atmapriyananda, Secretary and Pro-Chancellor of RKMVERI, chaired this inaugural

session with Swami Sarvottamanandaji, Vice Chancellor and Swami Nityakamanandaji, Secretary of Seva Pratishthan present on the dais. **As many as 8 medical doctors, 6 from Seva Pratishthan and 2 from other reputed hospitals in Kolkata, were given letters of Appointment as Adjunct Faculty.** They will teach the M.Sc. students as well as help in research at the JIVAN Centre. Given the high profile of these doctors (all of them are MBBS, MD with most of them having DM super-specialization) with their wide range specializations—Medicine, Haematology, Microbiology, Biochemistry, Cardiology, Neurology, Endocrinology, along with the full-Biological Scientists of RKMVERI, the JIVAN Research Centre is now a vibrant hub of research activity in the basic bioscience and the biomedical fields. That Swamiji's University's new baby Department, the fledging 'School of Biological Sciences', has grown to such gigantic proportions in such a short time of hardly ten months of its existence, that too during the peak of the Covid-19 pandemic period, is absolutely thanks to Sri Ramakrishna's exceptional grace and the blessings and support of the Hon'ble members of the Ramakrishna Mission Governing Body, the Sponsoring Society of the University, reinforced by the unstinted support of all the faculty—biological scientists, medical doctors and all the other stakeholders. We thank all of them profusely and seek their continued support and cooperation.

Place: Belur main campus of RKMVERI

Date: 18 November 2021

Swami Atmapriyananda
Secretary & Pro-Chancellor
RKMVERI

ANNEXURE

JIVAN (Jiva-Vijnan-Anweshan-Niketan)— Centre for Research in Biological Sciences in collaboration with Ramakrishna Mission Seva Pratishthan

JIVAN is a research initiative of the School of Biological Sciences of RKMVERI Deemed University, in collaboration with Ramakrishna Mission Sevapratishthan (a 600-bed General Hospital nearly 90 years old located in Kolkata). Its objective is to bring together biological scientists with vast research experience in laboratories of reputed Institutes and the medical doctors working in the field in order to create a synergy, taking on board eminent statisticians and computer scientists also to explore the fascinating emerging areas like the use of digital image analysis and artificial intelligence techniques in the medical field. The following Five Working Groups have been formed to work out the details of the research, teaching-training, extension programmes that could be taken up under JIVAN.

1. Working Group on Microbiology

Prof Ruksana Choudhury (scientist, RKMVERI full-time professor) **(Group Leader)**
 Dr Prabuddha Mukhopadhyay (doctor from Seva Pratishthan-VIMS)
 Dr Poulami Mukherjee (doctor from Seva Pratishthan-VIMS)
 Dr Pradeep Chakraborty (doctor from Seva Pratishthan-VIMS)

2. Working Group on Cardiology & Metabolic Disorder

Dr Soumitra Kumar (doctor from Seva Pratishthan-VIMS) **(Group Leader)**
 Dr Kunal Sikder (full-time Asst. Prof., RKMVERI)
 Dr Ajitesh Roy (doctor from Seva Pratishthan-VIMS)
 Dr Rinini Dastidar (professor-scientist, Seva Pratishthan-VIMS)
 Dr Amit Kumar Mandal (doctor from Indian Inst of Sc. Education and Research, Kolkata)
 Dr Tanmay Mahapatra (reputed doctor running a cohort and engaged in public health)

3. Working Group on Hematology & Hemato-Oncology

Dr Debasis Banerjee (Professor, RKMVERI, Seva Pratishthan-VIMS) **(Group Leader)**
 Dr Kunal Ray (scientist, RKMVERI full-time professor)
 Prof Subrata Banerjee (scientist, RKMVERI full-time professor)
 Prof Abhijit Chakrabarti (Professor, Saha Inst. Nuclear Physics, adjunct RKMVERI)
 Dr H. Sudarshan (doctor-philanthropist engaged in public health)
 Dr Debapriya Ghosh (full-time Asst. Prof., RKMVERI)

4. Working Group on Neuroscience

Dr Arkadeb Dutta (full-time Asst. Prof., RKMVERI) **(Group Leader)**
 Dr Subhadip Paul (full-time Asst. Prof., RKMVERI)
 Dr Sanjay Mohan Bhattacharya (doctor from Seva Pratishthan-VIMS)
 Dr Jayanta Roy (doctor, neuroscientist from Inst. of Neurosciences, Kolkata)

5. Working Group on Medical Statistics and Digital Data Analytics

Dr Nachiketa Chattopadhyay (Professor, Indian Stat Inst. Kolkata) **(Group Leader)**
 Prof Probal Chaudhuri (Professor from Indian Statistical Inst., Kolkata)
 Prof Debasis Sengupta (Professor from Indian Statistical Inst., Kolkata)
 Prof Sarbani Palit (Professor from Indian Statistical Inst., Kolkata)
