Department of Biochemical Engineering and Biotechnology
Minutes of DRC meeting
(DRC-06/2019-2020)

Dated: 17th March 2020

The sixth meeting of *Departmental Research Committee* (DRC) for the academic session 2019-2020 was held on 17th March 2020 at 9.30 am in the Committee Room (I-230) of the Department.

The following members were present:
Prof. Shilpi Sharma (*Chairperson & Acting Convenor*)
Prof. T. R. Sreekrishnan
Prof. D. Sundar
Prof. Ritu Kulshrestha
Prof. Preeti Srivastava
Prof. Rohan Jain

1. To confirm the minutes of the 5th meeting of the DRC for the session 2019-2020 held on 6th Feb 2020

The minutes of the 5th meeting of DRC for the session 2019-2020 held on 6th Feb 2020 were confirmed as circulated.

2. To report the matters arising from minutes of Meeting No. 05/2019-2020

None

3. New projects for allotment to Ph.D. and M.S.(Res) students

New projects by faculty members were approved. The complete list of DRC approved topics for Ph.D. and M.S.(Res) have been compiled as Annexures 1a and 1b, respectively. The topics available for Ph.D. and M.S.(Res) students for Entry Sem I, 2020-2021 have been compiled as Annexures 2a and 2b, respectively. The slots free with each faculty member for allotment to Ph.D. and M.S.(Res) students for Entry Sem I, 2020-2021 have been listed as Annexure 3.

4. Selection of students for departmental Ph.D. and M.S.(Res) programmes

In the context of COVID-19 spread, as there is uncertainity in planning the selection process the item was deferred for a later meeting.

5. Review of mid-sem marks of BTP and MTP students

The committee deliberated on the marks awarded to BTP and MTP students by the members of the respective evaluation committees in the mid-term evaluation. The marks have been compiled as Annexure 4.

6. Allotment of BTP and MTP topics

The committee approved the list of MTP topics for allotment to M.Tech students, Sem I, 2020-2021 (Annexure 5).

It was decided that an average of three projects will be made available by each faculty member for BTP allotment for Sem I, 2020-2021. BTP and MTP coordinators were requested to seek preferences from respective batches by 10th April 2020.

(Act: BTP and MTP Coordinators)

7. Request by Ph.D. student Shivani Khatri for availing UGC fellowship for the period September 2019 to February 2020

The request put forth by Ph.D. student Shivani Khatri (2017BEZ8287) for availing UGC fellowship from Sept 2019 to Feb 2020 during her stay at DTU, Denmark was recommended by the committee in view of the high cost of living in Denmark. However, students were advised to seek such approvals, with a request forwarded through their respective supervisors, well in advance of availing the ex-India leave.

8. Request for Early Doc fellowship for Divya Singhi (2015BEZ8501)

Based on the SRC's recommendation, DRC Chairperson was authorised to forward Divya Singhi's request for Early Doc fellowship to Dean (R&D).

9. To report the matters for ratification by the DRC

(a) Project proposals submitted by departmental faculty

S. No.	Project Title	Project Investigator	Funding Agency
1	Microbe-mediated enhancement of soil health status in forest fallows in *Jhum* lands in Mizoram	SS	DBT
2	Indo-Italian Workshop on Circular Economy (Waste to Wealth)	TRS	DST
3	Development of robust commercially viable protocol to isolate assemblysomes in order to study proteosis in cancer and other progressive disorders	IG	DST (Indo-Hungarian Cooperation programme)
4	Enhanced production of Desferrioxamine B by genetic manipulation	RJ	DST
5	An easy-to-use, compact, and economical system for decentralised enrichment of biogas	AM	DBT
6	Investigating the relationship between electroactivity and viruses in *Shewanella oneidensis*	LED	SERB
7	In vitro production of aleuritic acid	PS, AN	DST
8	microRNA nanotherapeutics for glioblastoma	RK	SERB
9	Dissecting pathogenicity and molecular heterogeneity during malaria liver stage infection using single cell RNA-sequencing	IG	SERB

The above projects were circulated to members, since no specific comments were received the projects were forwarded to Dean IRD and item was ratified.

(b)Request for ex-India leave by Ph.D. student

Name of student	Host Institution and scheme	Period of stay
Swati Varshney (2016BEZ8325)	University of Lille, France, through Raman Charpak Fellowship	March - August 2020
Dhvani Vora (2017BEZ8293)	University of Edinburgh through Newton Bhabha Ph.D. Placement Programme	Two months during March to Dec 2020 (not decided due to recent travel advisory)

The ex-India leave applications for the Ph.D. students were recommended to be forwarded to Dean Academics.

(c) RETA and RSTA applications by Ph.D. students

S. No	Name	Entry Number	Conference / Meeting
1	Rishabh Shukla	2015BEZ8351	RSTA: SETAC Europe 30th Annual meeting Dublin, 3-7 May 2020
2	Soumya Rajpal	2017BEZ8291	RSTA: Biosensors 2020, Korea, 23-30 May 2020
3	Rohit Khandelwal	2015BEZ8355	RSTA: ASM Microbe 2020, Chicago, 18-22 June 2020
4	Swati Varshney	2016BEZ8325	RETA (approved in 2nd DRC meeting, 2019-20): ASM Microbe 2020, Chicago, 18-22 June 2020

Applications for travel award by the Ph.D. students were recommended to be forwarded to Dean (R&D)

10. Any other item with the permission of Chair
    (a) SRCs of Ph.D. students of entry year 2019-20, Sem II, were constituted as per Annexure 6.
    (b) Issue of due approvals from Institutional Biosafety Committee (IBSC) and Institutional Ethics Committee (IEC) for Ph.D. and M.S.(Res) projects floated by faculty members was discussed. It was decided to include the declarations in the template for submission of new Ph.D. and M.S.(Res) proposals. Ph.D. Coordinator was requested to seek the details for newly approved projects as well.
    Prof Preeti Srivastava (Member Secretary, IBSC) and Prof. R. Elangovan (Member Secretary, IEC) were requested to maintain a record of the status of such approvals. They were also authorised to bring it to the notice of concerned faculty member in case they feel an approval is required for a particular project put up for DRC's approval.

(Act: Ph.D. Coordinator, and Member Secretaries of IBSC and IEC)

The meeting ended with thanks to all members.

Shilpi Sharma
Acting Convenor, DRC

Distribution

DBEB faculty (by email)

Annexure 1a

List of DRC approved Ph.D. topics

S. No.	Supervisor 1	Supervisor 2	Ph.D. Topic
1	**AN**		Kinetics of recombinant protein synthesis on mixtures of carbon sources in *Komagataella phaffi*
2	**AN**		Kinetics of ethanol production in *Pichia stipitis*
3	**AM**		Experimental and computational techniques for metabolic analysis and engineering of microbes
4	**IG**		DADI: Deciphering Allelic Dosage Imbalance associated with genomic variation
5	**IG**		FailureOme: Dissecting molecular mechanism of human organ degeneration during Aging through high precision genomics
6	**IG**		LoCoGen: Development of Low Cost single cell and single molecule Genomics
7	**LED**		Eating electrons: investigating microbial cathodic extracellular electron transfer
8	**LED**		Electroactive India: profiling electrochemically-active microorganisms from across the subcontinent
9	**LED**	M. Banerjee, KSBS, IITD	Investigating the relationship between electroactivity and viruses in *Shewanella oneidensis*
10	**PM**		Carbon nanodots for anticancer drug delivery and bioimaging
11	**PM**		Fabrication of bioactive peptide loaded multifunctional mesoporous silica nanoparticles for cancer treatment
12	**PS**		Deciphering the mechanism of regulation of the dsz operon for biodesulfurization of organosulfurs
13	**PS**		Enhanced biodesulfurization through enzyme co-localisation in bacterial microcompartments
14	**RE**		Single cell imaging for rapid susceptibility assay
15	**RE**		Study of microRNA expression profile in exosomes derived from lung cells
16	**RE**		Molecular source tracking of AMR pathogens based on Whole Genome Sequencing
17	**RE**		Optimization of light sheet microscopy for large clinical specimen analysis
18	**RJ**		Development of siderophores immobilized magnetic material for the recovery of germanium from industrial wastewater and solid waste
19	**RJ**		Development of algae based slow release fertilizer
20	**RK**		Investigating the role of non-coding RNAs in meningioma pathogenesis
21	**SS**		Designing a synthetic microbial community for biocontrol of pathogen
22	**ZA**	Brejesh Lal, EE, IITD	Development of IoT enabled system for water quality surveillance in water bodies
23	**ZA**		Understanding the auto-healing capability of Ganga river (in view of the reduction efficacy of AMR burden)
24	**TRS**		AD doctor: Development of tools to assess health of anaerobic digester (AD)

Annexure 1b

List of DRC approved M.S.(Res) topics

S. No.	Supervisor 1	Supervisor 2	MSR topic
1	**AN**		Kinetics of recombinant protein synthesis on mixtures of carbon sources in *Komagataella phaffi*
2	**AN**		Kinetics of ethanol production in *Pichia stipitis*
3	**AM**		Experimental and computational techniques for metabolic analysis and engineering of microbes
4	**IG**		Optimize the isolation of non-membrane bound organelles: Assemblysomes
5	**IG**		Optimize the carboxylated magentic bead based protocols for inexpensive purification of nucleic acids and proteins
6	**IG**		Development of in-house kit for inexpensive DNA sequencing
7	**LED**		Electroactive India: profiling electrochemically-active microorganisms from across the subcontinent
8	**PS**		Spatial localization of biodesulfurization enzymes in *Gordonia* sp. ITTR100
9	**RE**		Liquid Biopsy: Exosome based diagnostics for lung cancer
10	**RE**		Single cell imaging for rapid susceptibility assay
11	**RJ**		Identification of siderophophores that can bind to rare earth elements using DFT calculations
12	**RJ**		Development of algae based slow release fertilizer
13	**SS**		Soil metabolome as indicator of soil health
14	**SS**		Transfer of microbial load from fabric to other surfaces
15	**SS**		Bioremediation of heavy metals from indigenous strains
16	**ZA**		Understanding the auto-healing capability of Ganga river (in view of the reduction efficacy of AMR burden)

Annexure 2a

List of topics available for Ph.D. students (Entry: Sem I, 2020-2021)

S. No.	Supervisor 1	Supervisor 2	Ph.D. topic
1	**AN**		Kinetics of recombinant protein synthesis on mixtures of carbon sources in *Komagataella phaffi*
2	**AN**		Kinetics of ethanol production in *Pichia stipitis*
3	**AM**		Experimental and computational techniques for metabolic analysis and engineering of microbes
4	**IG**		DADI: Deciphering Allelic Dosage Imbalance associated with genomic variation
5	**IG**		FailureOme: Dissecting molecular mechanism of human organ degeneration during Aging through high precision genomics
6	**IG**		LoCoGen: Development of Low Cost single cell and single molecule Genomics
7	**LED**		Electroactive India: profiling electrochemically-active microorganisms from across the subcontinent
8	**LED**	M. Banerjee, KSBS, IITD	Investigating the relationship between electroactivity and viruses in *Shewanella oneidensis*
9	**PM**		Carbon nanodots for anticancer drug delivery and bioimaging
10	**PM**		Fabrication of bioactive peptide loaded multifunctional mesoporous silica nanoparticles for cancer treatment
11	**PS**		Deciphering the mechanism of regulation of the dsz operon for biodesulfurization of organosulfurs
12	**PS**		Enhanced biodesulfurization through enzyme co-localisation in bacterial microcompartments
13	**RJ**		Development of siderophores immobilized magnetic material for the recovery of germanium from industrial wastewater and solid waste
14	**RJ**		Development of algae based slow release fertilizer
15	**RK**		Investigating the role of non-coding RNAs in meningioma pathogenesis
16	**SS**		Designing a synthetic microbial community for biocontrol of pathogen
17	**ZA**	Brejesh Lal, EE, IITD	Development of IoT enabled system for water quality surveillance in water bodies
18	**ZA**		Understanding the auto-healing capability of Ganga river (in view of the reduction efficacy of AMR burden)
19	**TRS**		AD doctor: Development of tools to assess health of anaerobic digester (AD)

Annexure 2b

List of topics available for M.S.(Res) students (Entry: Sem I, 2020-2021)

S. No.	Supervisor 1	Supervisor 2	MSR topic
1	**AN**		Kinetics of recombinant protein synthesis on mixtures of carbon sources in *Komagataella phaffi*
2	**AN**		Kinetics of ethanol production in *Pichia stipitis*
3	**AM**		Experimental and computational techniques for metabolic analysis and engineering of microbes
4	**IG**		Optimize the isolation of non-membrane bound organelles: Assemblysomes
5	**IG**		Optimize the carboxylated magentic bead based protocols for inexpensive purification of nucleic acids and proteins
6	**IG**		Development of in-house kit for inexpensive DNA sequencing
7	**LED**		Electroactive India: profiling electrochemically-active microorganisms from across the subcontinent
8	**PS**		Spatial localization of biodesulfurization enzymes in *Gordonia* sp. ITTR100
9	**RJ**		Identification of siderophophores that can bind to rare earth elements using DFT calculations
10	**RJ**		Development of algae based slow release fertilizer
11	**RE**		Liquid Biopsy: Exosome based diagnostics for lung cancer
12	**RE**		Single cell imaging for rapid susceptibility assay
13	**SS**		Soil metabolome as indicator of soil health
14	**SS**		Transfer of microbial load from fabric to other surfaces
15	**SS**		Bioremediation of heavy metals from indigenous strains
16	**ZA**		Understanding the auto-healing capability of Ganga river (in view of the reduction efficacy of AMR burden)

Annexure 3

Slots open with each faculty member for Ph.D. and M.S.(Res) students

(for Entry: Sem I, 2020-2021)

Sl.	Faculty	Ph.D.	M.S.(Res)
1	AN	1	1 (Either PhD or MSR)
2	AM	1	1 (Either PhD or MSR)
3	IG	2	3
4	LED	1	1 (Either PhD or MSR)
5	PM	2	0
6	PS	2	1
7	RE	0	2
8	RJ	1	1
9	RK	1	0
10	SS	1	2
11	TRS	1	0
12	ZA	1	1

Annexure 4

Average marks awarded to BTP students in the mid-term evaluation, Sem II, 2019-2020

S. No	Name	Entry No	Average marks (Max 10)
BBD451			
1	Sanjay Singh Poonia	2016BB10045	0
2	Puneet Lagoo	2015BB10052	0
3	Suyash Kumar Tak	2016BB10061	4.17
4	Satyam Nathani	2015BB10058	5.67
5	Vikas Kumar	2016BB10055	5.50
BBD452			
6	Varuni Sarwal	2016BB10035	8.00

Average marks awarded to MTP students in the mid-term evaluation, Sem II, 2019-20

S. No	Name	Entry No	Average marks (Max 10)
1	Malla Parmesh	2013BB50021	*Absent*
2	Indhana Divya Jayasree	2015BB50005	8.92
3	Kancharana Preeti Raj	2015BB50007	8.00
4	Patnana Mounica	2015BB50011	7.14
5	Yugesh Verma	2015BB50015	7.80
6	T R K Saran	2010BB50042	*Absent*
7	A R Shubham	2015BB50001	6.40
8	Bharti Meena	2015BB50003	7.26
9	Divya Garg	2015BB50004	6.86
10	Jashan Singh Suri	2015BB50006	7.46
11	Dhaval Rakesh Narwani	2015BB50009	5.92
12	Nitesh Chaudhary	2015BB50010	7.61
13	Prarthana Jain	2015BB50012	8.75
14	Sashi Kalan	2015BB50013	8.00

Annexure 5

List of topics available for MTP students, Sem I, 2020-2021

S. No.	MTP Topic	Faculty
1.	Computational analysis of 13 C labelling data.	Ashish Misra
2.	Effect of oxygen availability on end product metabolites of *Bacillus subtilis*	Ashish Misra
3.	Kinetics of ethanol production in continuous cultures of *Pichia stipitis.*	Atul Narang
4.	Recombinant protein production in formate-limited cultures of *Pichia pastoris.*	Atul Narang
5.	Computational approach for drug discovery	D. Sundar
6.	Bioinformatics tools for genome editing	D. Sundar
7.	Non-random distribution of tri-nucleotides in proteins: Towards a theoretical understanding of Protein 3D structure ***Skills required:*** Basic understanding of Molecular Biology, Protein structure function relationship, working with amino acid sequences in fasta files and PDB structure files using Bash scripting (required) or R/Python (Recommended) in Linux	Ishaan Gupta
8.	Development of low-cost solution for bio-separation of nucleic acids using phase, charge and diffusion based methods ***Skills required:*** Basic Molecular biology lab skills, Good practices for working with bacterial cell culture, cloning, handling DNA/RNA, Gel electrophoresis (Casting, Loading and running gels), PCR, qPCR	Ishaan Gupta
9.	Electroactive Delhi: Growth of electrochemically-active microorganisms from local sediments.	Lucinda E. Doyle
10.	Investigating the impact of temperature on the electroactivity of *Shewanella*.	Lucinda E. Doyle
11.	To be announced	Prashant Mishra
12.	To be announced	Prashant Mishra
13.	Characterization of CHAP domain containing proteins and their role in cell morphogenesis in *Rhodococcus erythropolis* PR4.	Preeti Srivastava
14.	Cloning and expression of the enzyme responsible for asphaltene biotransformation.	Preeti Srivastava
15.	To study the role of genes in regulation of immune repsonse in cancer	Ritu Kulshreshtha
16.	To investigate the role of miRNAs in meningioma	Ritu Kulshreshtha
17.	Development of Digital ELISA	R. Elangovan
18.	To be announced	R. Elangovan
19.	Bioproduction and purification of desferrioxamine B	Rohan Jain
20.	Production of algal based phosphate fertilizer.	Rohan Jain
21.	Storage of microbiome for agricultural amendment	Shilpi Sharma
22.	Generation of Synthetic Microbial Communtity for stress mitigation in arable land	Shilpi Sharma
23.	To be announced	Sunil Nath
24.	To be announced	Sunil Nath
25.	Performance assessment of 20 KLD MTF in removing emerging contaminants from sewage Prerequisite: Minimum B grade in Biological Waste Treatment	Z. Ahammad
26.	To be announced	Z. Ahammad
27.	To be announced	T.R. Sreekrishnan
28.	To be announced	T.R. Sreekrishnan

Annexure 6

SRC composition of Ph.D. students (Entry Sem II, 2019-2020)

Student Name	Entry No.	Chairperson	Internal Expert	External Expert	Supervisor
Nidhi Nitin Patil	2019BEZ8669	D. Sundar	R. Kulshreshtha	Ashok Patel, KSBS, IITD	P. Srivastava
Debasa Mukherjee	2019BEZ8667	P. Srivastava	R. Jain	Jayati Sarkar, Chem Engg, IITD	L. E. Doyle
Debjani Das	2019BEZ8668	TR Sreekrishnan	P. Srivastava	V. Perumal, KSBS, IITD	R. Jain