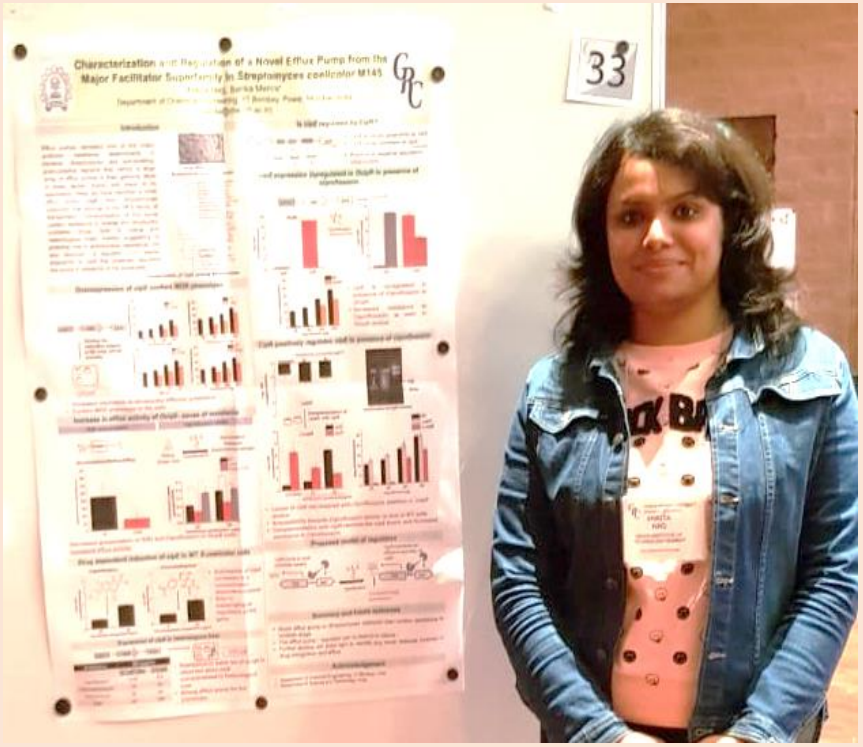
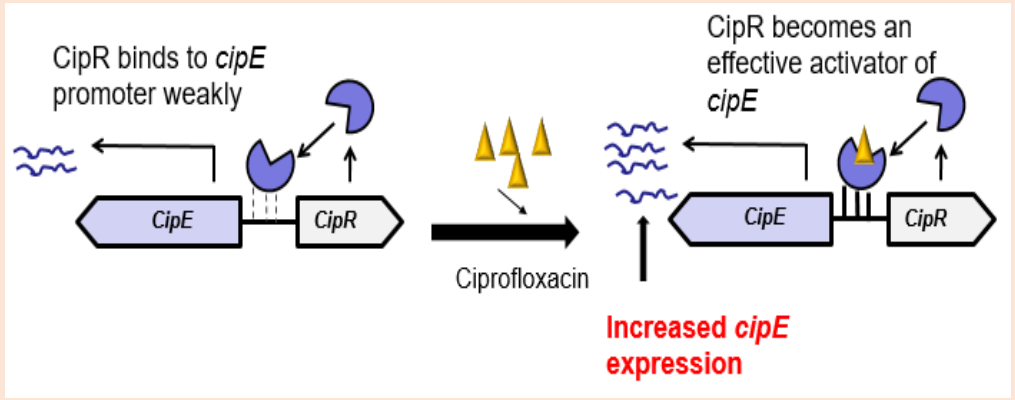
STUDENT ACCOMPLISHMENTS



Characterization and Regulation of a Novel Efflux Pump from the Major Facilitator Superfamily in *Streptomyces coelicolor* M145



Ankita Nag

Guide:
Prof. Sarika Mehra

3rd Best Oral Presentation

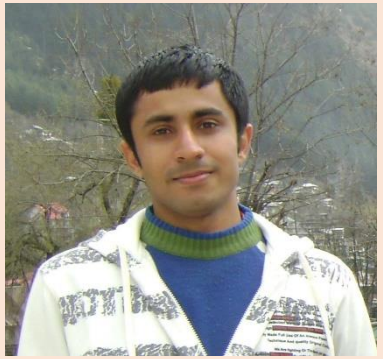
Gordon Research Conference & Gordon Research Seminar – Multidrug Efflux systems, 2019

Ms. Snehal Ganjave

Mr. Virmal Jain

Ms. Snehal Ganjave and Mr. Virmal Jain (PhD students under supervision of Prof. Pramod Wangikar) got selected for the prestigious scholarship *'Prime Minister's Fellowship for Doctoral Research'*.

Research work of PhD student Abhishek Sharma from Prof. A. Malani,'s group has been published in Carbon

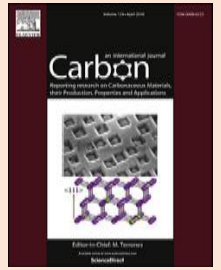


Carbon 152 (2019) 206–217

Contents lists available at ScienceDirect

Carbon

journal homepage: www.elsevier.com/locate/carbon



Abhishek Sharma

Computational design of multilayer frameworks to achieve DOE target for on-board methane delivery

Abhishek Sharma [a, b, c], Ravichandar Babarao [d, e, **], Nikhil V. Medhekar [c], Ateeque Malani [a, *]

[a] *Department of Chemical Engineering, Indian Institute of Technology Bombay, Mumbai, 400076, India*
[b] *IITB-Monash Research Academy, Indian Institute of Technology Bombay, Mumbai, 400076, India*
[c] *Department of Materials Science and Engineering, Monash University, Clayton, Victoria, 3168, Australia*
[d] *Commonwealth Scientific and Industrial Research Organisation (CSIRO) Manufacturing, Clayton, Victoria, 3169, Australia*
[e] *School of Science, RMIT University, Melbourne, Victoria, 3001, Australia*

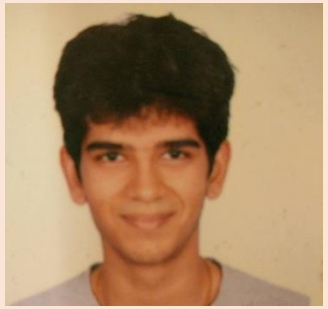
Prof. Ateeque Malani

CONGRATULATIONS!!!

Research work of Mr. Deepak Gupta, Phd Student and Prof. Jayesh Bellare published in *ACS Applied Materials & Interfaces*

DEEPAK GUPTA

DR ATUL SINGH



ASHWIN DRAVID

PROF. JAYESH BELLARE

ACS APPLIED MATERIALS & INTERFACES

Research Article

Cite This: *ACS Appl. Mater. Interfaces* XXXX, XXX, XXX−XXX

www.acsami.org

Multiscale Porosity in Compressible Cryogenically 3D Printed Gels for Bone Tissue Engineering

Deepak Gupta,[†] Atul Kumar Singh,[‡,§] Ashwin Dravid,[†,∥] and Jayesh Bellare*[,†,‡,⊥,#]

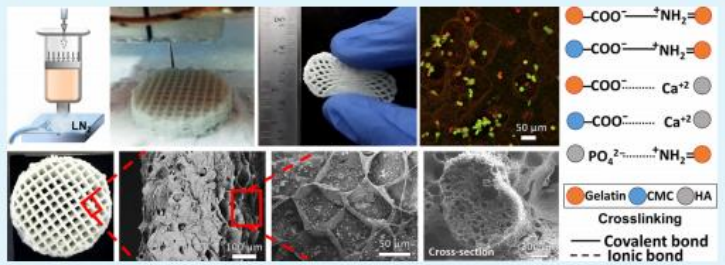
[†]Chemical Engineering Department and [‡]Centre for Research in Nanotechnology & Science, Indian Institute of Technology Bombay, Powai, Mumbai 400076, India

[§]Central Research Facility (CRF), Indian Institute of Technology Delhi, New Delhi 110016, India

[∥]Chemical and Biomolecular Engineering, Johns Hopkins University, 323 E 33rd Street, Baltimore, Maryland 21218, United States

[⊥]Tata Centre for Technology and Design and [#]Wadhwani Research Centre for Bioengineering (WRCB), Indian Institute of Technology Bombay, Mumbai 400076, India

Supporting Information



ABSTRACT: Three-dimensional (3D) printing technology has seen several refinements when introduced in the field of medical devices and regenerative medicines. However, it is still a challenge to 3D print gels for building complex constructs as per the desired shape and size. Here, we present a novel method to 3D print gelatin/carboxymethylchitin/hydroxyapatite composite gel constructs of a complex shape. The objective of this study is to fabricate a bioactive gel scaffold with a controlled hierarchical structure. The hierarchy ranges from 3D outer shape to macroporosity to microporosity and rough surface. The fabrication process developed here uses 3D printing in a local cryogenic atmosphere, followed by lyophilization and cross-linking. The gel instantly freezes after extrusion on the cold plate. The cooling action is not limited to the build plate, but the

Jyoti Tomar

Prof. Venkat Gundabala

Ms. Jyoti Tomar

(PhD students under supervision of Prof. Venkat Gundabala)

got selected for the prestigious

“Indo-U.S. Fellowship for Women in STEMM (WISTEMM)”

Research Work of Prof. Devang Khakhar published in Soft Matter Journal

Soft Matter

PAPER

View Article Online
View Journal | View Issue

Cite this: *Soft Matter*, 2019, **15**, 1979

Breakage of vesicles in a simple shear flow

Ankush Pal† and D. V. Khakhar *

The breakage of micron-size SOPC lipid vesicles in an aqueous suspension was studied in a simple shear flow over a range of shear rates (1000 s^{-1} to 4000 s^{-1}). Evolution of the vesicle size distribution with time was determined using optical microscopy. The number average vesicle diameter was found to reduce continuously with time; at the highest shear rate (4000 s^{-1}), the reduction was 38% after 6 h of shearing. The distributions indicated the existence of a critical diameter such that the number of vesicles larger than the critical diameter decreased and vesicles smaller than the critical diameter increased. The capillary number for the system (ratio of the characteristic viscous stress to the characteristic stress for stretching the lipid membrane) was two orders of magnitude lower than the values reported for breakage in an ultrasonically generated flow, indicating that vesicles do not rupture due to lysis of the membrane. Direct observation of the process in a shear cell fitted in a microscope stage revealed the mechanism of rupture. Measurements of the vesicle dimensions indicated an increase in aspect ratio with time as a result of leakage of fluid from inside vesicles. Once the aspect ratio increased above a threshold value, the vesicles elongated into long thread-like shapes, which broke into small daughter vesicles by pearling.

Received 22nd July 2018,
Accepted 25th January 2019

DOI: 10.1039/c8sm01501e

rsc.li/soft-matter-journal

Bhawna Singh Tomar

Prof. Mahesh T.

Ms. Bhawna Singh Tomar

(PhD student under supervision of Prof. Mahesh T.)

got selected for the prestigious

"BASF International Summer Course 2019"

R. S. Prabhuraj

won second prize for poster presentation in Nano India 2019 conference, the flagship scientific event of nanomission programme by the Department of Science and Technology, India hosted by Mahatma Gandhi University, Kottayam, Kerala on April 26 & 27th, 2019. He presented on the topic "Targeted PEGylated mesoporous silica nanoparticles reduce the toxicity of doxorubicin and inhibit the tumor growth in animal model of breast cancer". Hearty congratulations to him and his team members.

Prof. Rajdip Bandyopadhyaya, Department of Chemical Engg., IIT Bombay (Guide)

Prof. Rohit Srivastava IIT Bombay, BSBE (Co-guide)

Arijit Mal PhD student, ACTREC (Collaborator)

Dr. Abhijit De ACTREC (Collaborator)

Cytometry PART A
ISAC Journal of Quantitative Cell Science

Volume 95, Issue 2, February 2019

MIFlowCyt

Combining Fluorescent Cell Barcoding and Flow Cytometry-based Phospho-ERK1/2 Detection at Short Time Scales in Adherent Cells

Sonal Manohar,† Prachi Shah,† Sharmila Biswas,† Anam Mukadam, Madhura Joshi, Ganesh Viswanathan*

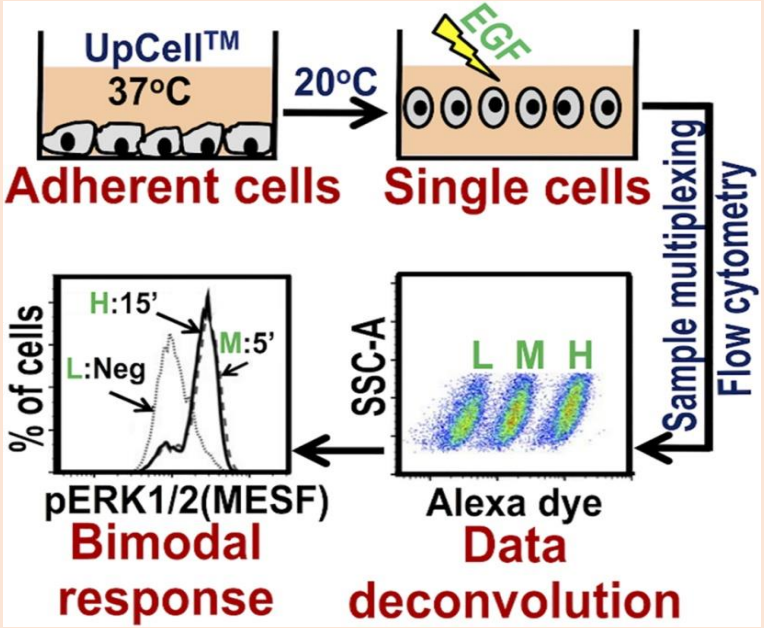
†These authors contributed equally

Sonal

Sharmila

Prachi

Journal Editor's choice for the front highlights



High-throughput flow cytometry for measuring precise protein levels in an ensemble of adherent cells isolated by cell-health preserving temperature sensitive cell detachment and stimulated thereafter.

Conference on Polymer Processing

Prize in Poster Presentation awarded to

Deepak Gupta

Ph.D. Student of Prof. Jayesh Bellare

Organized by Polymer Processing Academy

POLY PROCESS ACADEMY

Title of the presentation: Customized Multiscale Porosity in Grafts for Bone Tissue Engineering

Deepak Gupta

Dr. Atul Singh

Prof. Jayesh Bellare

FACULTY AWARDS

I & EC research published a Festschrift issue honoring Prof. Vinay Juvekar

Indian Chemical Council has conferred

DM Trivedi Lifetime Achievement award on

Director of IIT Bombay **Prof. Devang Khakhar**

for his contributions to Indian chemical industry (education and research).

Congratulations to Prof. Khakhar for this well deserved recognition.

Research work of **Prof. Jayesh Bellare** *, published in newspaper*

आयआयटी मुंबईतील संशोधन

इन्सुलीन तयार करणाऱ्या जैवकृत्रिम स्वादुपिंडाची निर्मिती

प्रतिनिधी, मुंबई

इन्सुलिनचे इंजेक्शन घ्यावे लागणाऱ्या मधुमेही रुग्णांना दिलासा वाटावा असा शोध भारतीय तंत्रज्ञान संस्था (आयआयटी) मुंबईतील संशोधक जयेश बेल्लारे यांनी लावला आहे. इन्सुलीन तयार करणाऱ्या जैवकृत्रिम स्वादुपिंडाची निर्मिती या संशोधकांनी केली असून त्याचे प्रत्यारोपण करणेही शक्य आहे.

मधुमेही रुग्णांच्या रक्तातील साखरेचे प्रमाण जास्त असते. शरीरातील कर्बोदकांचे विघटन होण्यासाठी आवश्यक असलेले इन्सुलिन हे संप्रेरक मधुमेही रुग्णांच्या स्वादुपिंडात तयार होत नाही किंवा तयार झालेल इन्सुलिन वापरता येत नाही. अशा रुग्णांना इन्सुलिनचे इंजेक्शन घ्यावे लागते. गंभीर परिस्थिती असणाऱ्या रुग्णांना स्वादुपिंडाचे प्रत्यारोपण करण्याची वेळ येते. मात्र कृत्रिम स्वादुपिंड शरीराने न स्वीकारल्यास त्याचे काही दुष्परिणाम होत असल्याचे समोर आले आहे. मात्र यावर आयआयटीतील संशोधक जयेश बेल्लारे यांनी उत्तर शोधले आहे. त्यांनी बहुलकाच्या तंतूंचे (पॉलिमर) पटल वापरून जैवकृत्रिम स्वादुपिंड विकसित केले आहे. या स्वादुपिंडाला शरीराची रोगप्रतिकार शक्ती स्वीकारते आणि इन्सुलिनची निर्मिती होते.

सध्या प्राथमिक पातळीवर या स्वादुपिंडाचे कार्य सिद्ध झाले असले तरी त्याचा माणसाच्या शरीरात प्रत्यक्ष वापर करण्यासाठी अजून थोडा कालावधी लागणार आहे, अशी माहिती बेल्लारे यांनी दिली.

संशोधन काय?

बाळाच्या नाळेतून घेतलेल्या मानवी स्टेम पेशी आणि डुकराच्या स्वादुपिंडातून घेतलेल्या आयलेट पेशी वापरून हे स्वादुपिंड तयार करण्यात आले. उंदराच्या शरीरात त्याचे प्रत्यारोपण केल्यानंतर उंदराच्या इतर अवयवांना त्याचा काहीच त्रास झाला नाही. या स्वादुपिंडाच्या पेशींवर रक्तवाहिन्या तयार झाल्या. या स्वादुपिंडासाठी घेण्यात आलेले तंतूंचे पोकळ पटल म्हणजे एक मिलिमीटर व्यासाची एक बारीक नलिका असते. ज्याच्या भिंतींमध्ये सूक्ष्म रंध्रे असतात. या नलिकेतून जेव्हा द्रव पदार्थ वाहतो तेव्हा रंध्रातून काही घटक बाहेर पडतात. पॉलिसल्फोन या बहुलकापासून निर्माण केलेल्या पोकळ तंतूंचे पटल हे पेशींची वाढ होण्यास मदत करते आणि रुग्णाला इन्सुलिन उपलब्ध करून देते.

लोकसत्ता Tue, 26 March 2019
https://epaper.loksatta.com/c/37929353

Prof Jayesh Bellare awarded with AAYUSH Puraskar

(Life Time Achievement Award)

आयुष मंत्रालय, भारत सरकार के अधीन केन्द्रीय आयुर्वेदीय विज्ञान अनुसंधान परिषद् (सीसीआरएएस) द्वारा प्रस्तुत आयुष पुरस्कारों में, प्राध्यापक जयेश बेल्लारे, भारतीय प्रौद्योगिकी संस्थान, मुंबई को, दो शीर्ष प्रतिष्ठित पुरस्कार से सम्मानित किया गया है। भारत के उपराष्ट्रपति श्री वेंकैया नायडू ने विश्व होम्योपैथी दिवस को चिह्नित करने के लिए आयोजित एक कार्यक्रम में प्राध्यापक जयेश बेल्लारे को 'लाइफटाइम अचीवमेंट' पुरस्कार प्रदान किया।

Prof. Sharad Bhartiya

has been appointed as

Head – Computer Centre

Congratulations to Prof. Bhartiya

Institute Chair Professors

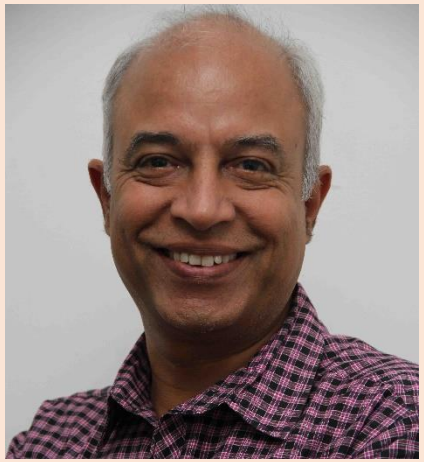
Prof. A. K. Suresh

Prof. Anurag Mehra

Prof. Jayesh Bellare

Prof. K. V. Venkatesh

Prof. Ravindra Gudi
(AI & ML Chair)



Prof. Kannan Moudgalya
(ET Chair)