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Events Organized by
The Society of Polymer Science, India – Mumbai Chapter
&
S K Somaiya College, Somaiya Vidyavihar University

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One Hundred Years of Macromolecules Symposium

Organized by

The Society of Polymer Science, India & Somaiya Vidyavihar University on 2nd March'20. It was also the inauguration of Mumbai Chapter of Society for Polymer Science, India.

- The Society of Polymer Science, India (SPSI) in association with Somaiya Vidyavihar University on March 2nd, inaugurated the Mumbai chapter of SPSI and hosted a half-day symposium titled, **'One Hundred Years of Macromolecules'.**
- **Prof. M. M. Sharma,** Emeritus Professor—Eminence at ICT, Mumbai gave the key-note address in terms of the growth of the Polymer Science industry in India in the last 50 years.

The Welcome address was given by Prof VNR Pillai, Vice Chancellor SVU.

Shree Samir Somaiya, Chancellor of SVU, expressed views on the importance of Polymer Industry in societal development.

Prof. S. Ramakrishnan, President, Society of Polymer Science India delivered the Presidential Address and a lecture on **'Why The Excitement About Controlled Radical Polymerization**?',

Prof. S. Sivaram, IISER Pune delivered the lecture on the title '**One Hundred Years of Macromolecules'.**

- **Dr. Prakash D Trivedi** from Gharda Chemicals shared insight on '**Thermo Plastics—Industrial Perspectives'.**
- More than 100 attendees attended the symposium which was inclusive of visitors from like Reliance Industries Limited, Pidilite Industries, Institute of chemical Technology, Dept. of Chemistry—University of Mumbai and more.

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Webinar 1

Title : Science & Technology of Polyolefin Materials : Indian Success Story : An Innovation

Date of the event - 08 August 20, conducted by

Dr. Virendra Kumar Gupta

Head, R&D Polymer & Senior Vice-President ,

Reliance Industries Limited, Navi Mumbai

The talk presents successful developmental strategies of polyolefin products based on ethylene/ propylene monomers using Reliance proprietary RELCATTM- catalyst technology, the first of its kind in India. This technological capability has opened up varied opportunities and emerged as a game changer technology for engineering polyolefin. World Consumption share of polyolefins is 57% out of the 335 million-ton total plastics. Continued higher trend of consumption is attributed to increased demand in growth sectors such as health, agriculture, automobiles, infrastructure, retail, aerospace, and defence. Polyolefin materials are produced by homo and copolymerization of olefins catalyzed by transition metals.

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Webinar 2

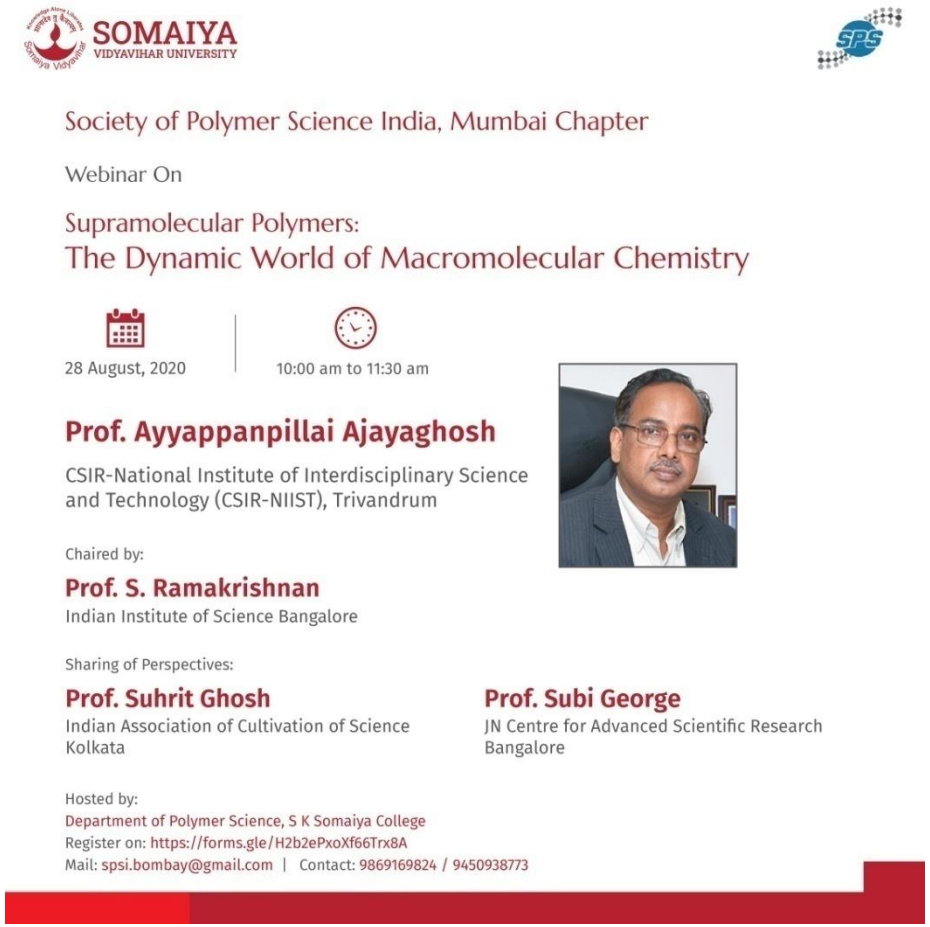
Title : Supramolecular Polymers:

The Dynamic World of Macromolecular Chemistry

Date of the event - 28 August 20, conducted by

Prof. Ayyappanpillai Ajayaghosh

CSIR-National Institute of Interdisciplinary Science and Technology (CSIR-NIIST), Trivandrum



The conventional polymers consist of long molecular chains formed of many monomer units connected by permanent covalent bonds. Supramolecular polymers are a class of nonconventional macromolecular architectures formed by the “bottom-up” self-assembly of molecules through non-covalent interactions such as hydrogen bonding. This topic, which is a rapidly developing interdisciplinary research area, originated by integrating polymer science and supramolecular chemistry. The strikingly dynamic properties of these materials arise from the reversibility of bonds that hold their chains together, and open up the window of many new applications. However, there are many challenges to be addressed, for example, the stability and structural control. While multiple hydrogen bonding has been explored for stability, living supramolecular polymerisation is emerging as a solution to structural control. In recent times, functional properties have been imparted to supramolecular polymers using p-systems as building blocks.

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Webinar 3

Title : Journey of Polymers to Plastics: The Polyolefins

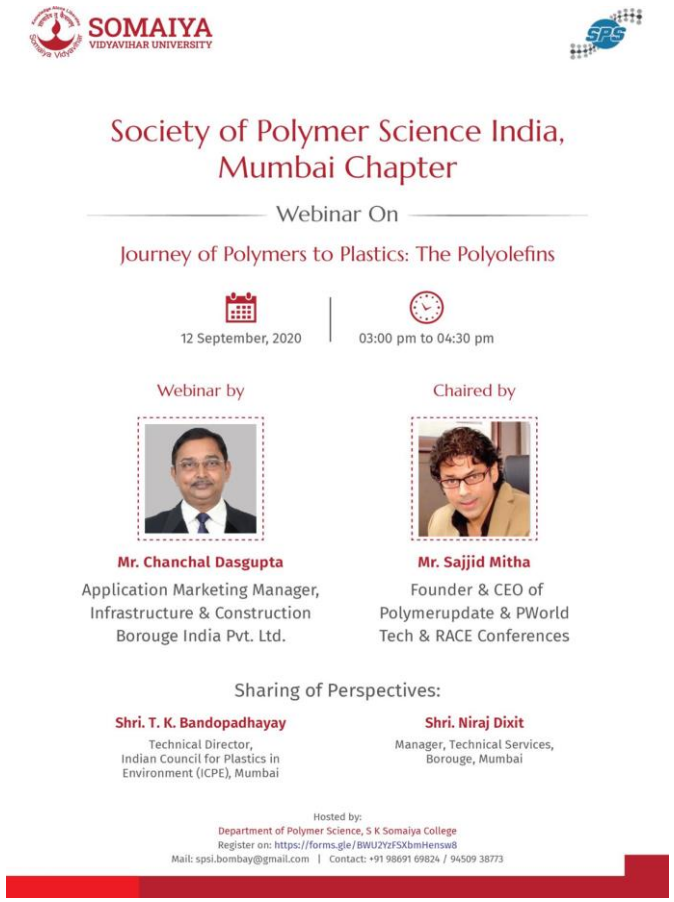
Date of the event - 12 September, 20, conducted by

Mr. Chanchal Dasgupta

Application Marketing Manager,

Infrastructure & Construction

Borouge India Pvt. Ltd.



Journey of Polymers to Plastics : The Polyolefins Polymers are the workhorse of modern economy due to their wide availability, versatility of properties, range of applications and
easy conversion to useful products with minimum need of assembly. Plastics, the
ready-to-use polymers, are virtually unrivaled in terms of great performance at low cost. Among the commodity plastics, polyolefins have the largest application areas and market
share worldwide. The lecture will focus on: contemporary production strategies of Polymers with particular reference to polyolefins; Important parameters to select materials for a special applications; major technologies for polyilefins; various additives attributing functionality to plastics; Major applications and growth areas; Circular economy.

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Webinar 4

Title : Electrospinning Polymer Nanofibers: Process Challenges and Innovation

Date of the event - 19 September, 20, conducted by

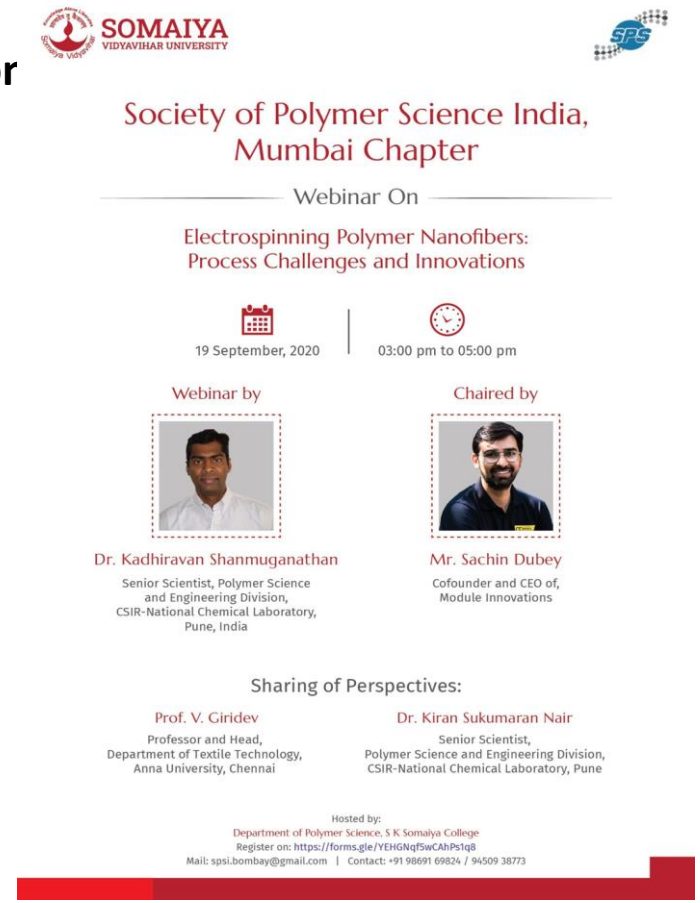
Dr. Kadhiravan Shanmuganathan

Senior Scientist, Polymer Science and Engineering Division,

CSIR-National Chemical Laboratory,

Pune, India

Polymer nanofibers with their large surface to volume ratio have attracted tremendous interest in many applications such as medical textiles and tissue engineering, filtration, reinforcements, etc. Electrospinning, a process invented by Formhals in 1934 stands out as the most prominent technique for manufacturing polymer nanofibers. Electrospinning of polymer solutions involves, to a first approximation, a rapid evaporation of the solvent in the presence of high electric field leaving behind ultrathin polymer fibers on a grounded collector. The deposition rate of the nanofibers could exceed several meters per second. The process is simple and versatile and can be used to obtain nanofibers with a wide range of structure and morphology. This webinar will touch upon some of the fundamental concepts governing the process, the various parameters available to control the fiber dimension and morphology, Intriguing process challenges, exciting innovations and finally potential applications



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Webinar 5

Title : Making High Performance Polymers Greener via Monomers Derived from Cashew Nut Shell Liquid (CNSL) and Lignin

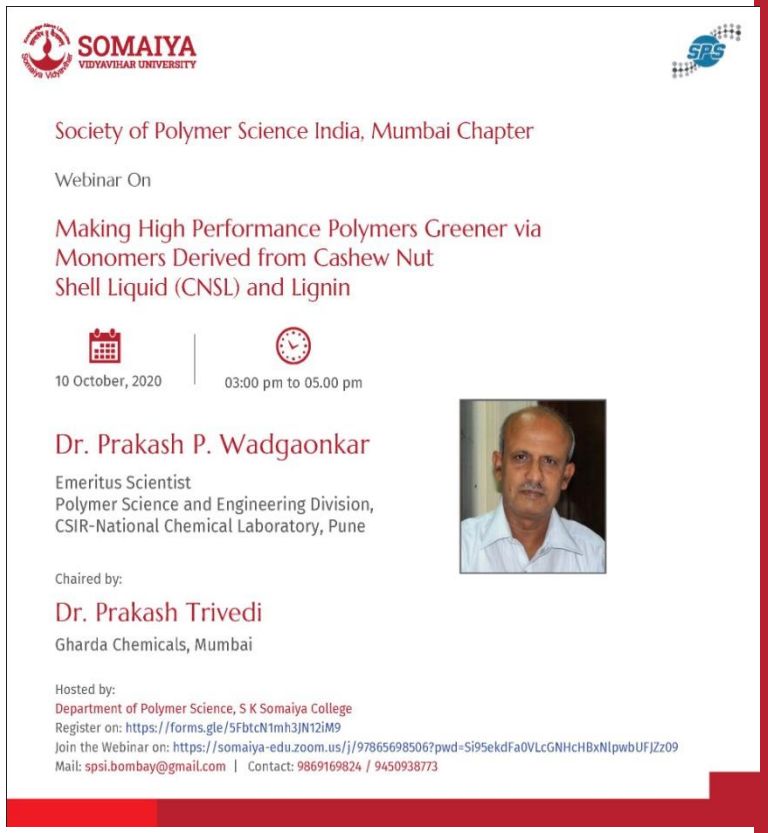
Date of the event - 10th October ,20, , conducted by

Dr. Prakash P. Wadgaonkar

Emeritus Scientist

Polymer Science and Engineering Division,

CSIR-National Chemical Laboratory, Pune



Sustainable materials are defined as materials that can be produced without depletion of non-renewable resources and without disturbing the equilibrium between the environment and key natural resource systems. The range of these materials is huge – from natural rubber, bio-derived monomers and polymers to recyclable materials, etc. How the future polymeric materials could be developed using scientific principles would be discussed in this presentation. In this context, cashew nut shell liquid (CNSL) and lignin-derived aromatic chemicals were explored as renewable starting materials to generate a library of difunctional monomers suitable for preparation of high performance polymers. The emphasis of the presentation will be on how chemistries of monomers and polymers improve materials properties in conjunction with processing methods.

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Webinar 6

Title : Surface functionalization of nanoparticles for their compatibilization with different solvent media/polymer matrices

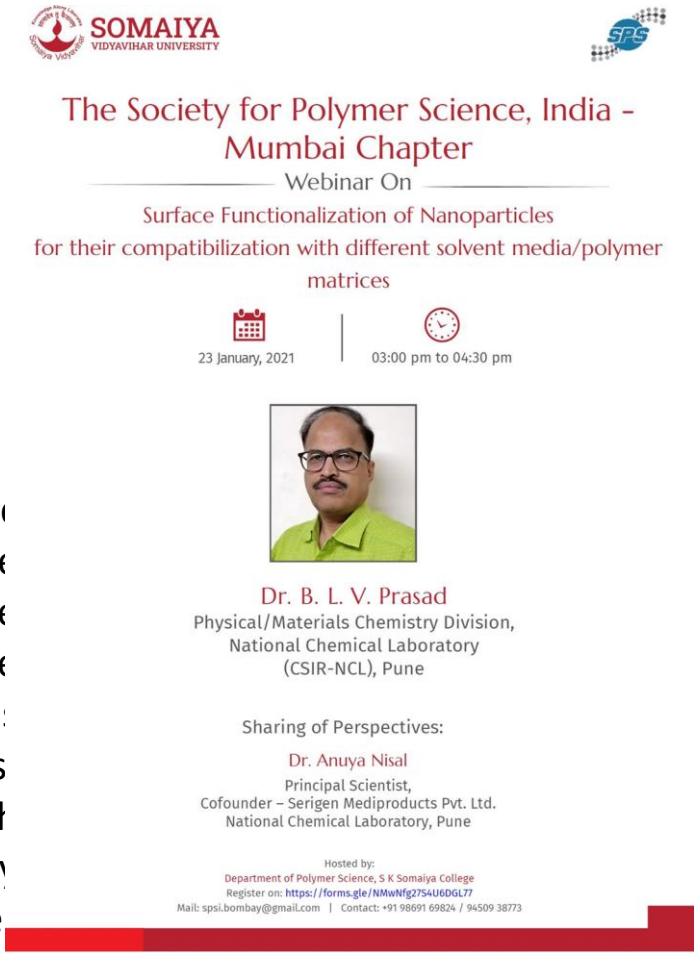
Date of the event - 23rd January 21,conducted by

Dr. B. L. V. Prasad,

Chair, Physical/Materials Chemistry Division,

National Chemical Laboratory (CSIR-NCL), Pune, India

The compatibility of the nanoparticles with different solvent media or polymeri matrices is crucially governed by the type of capping agent used. In this context we have been working on developing various methods to prepare stable and water dispersible metal nanoparticles like Au, Ag and magnetic Co and Ni. Such water dispersible nanoparticles play an important role in the surface modification of polymeric scaffolds and bio-implants to make the latter suitable for various tissue engineering applications Surface modification leading to certain superficial changes while retaining the strengt and durability of the scaffolds, is suggested as a solution to this problem. This strateg (termed P-LbL) involves the plasma treatment of the scaffold followed by layer-by-laye assembly of citrate stabilized AuNP coating on the plasma treated scaffold. This P-LbL strategy turned out to be an expedient tool for the surface modification of hydrophobic polymers. We found that PLbL method allows the attachment of a wide variety of molecules to the surface of hydrophobic polymer so that they become suitable for different tissue engineering applications.



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Webinar 7

Title : Sustainable Polymeric Nanocomposites for Multifaceted Applications

Date of the event - 27th February 2021,conducted by

Prof.(Dr.) Niranjan Karak,

Dean Research and Development

Professor of Polymer Science and Nanomaterials of

Chemical Sciences Department (former HoD),

Former Head, Sophisticated and Analytical Instrument Center (SAIC) of Tezpur University

The nanocomposites have been fabricated by in-situ and solution polymerization processes and state of dispersion of the nanomaterials in the matrices was evaluated microscopically using TEM and HRTEM. The studies revealed that the mechanical, thermal, and chemical properties of the pristine polymers improved significantly through the formation of nanocomposites. Even in a few cases, the nanocomposites with carbon-based nanomaterials like graphene oxide, reduced graphene oxide, carbon dot, reduced carbon dot, graphitic carbon nitride and their nanohybrid showed excellent photocatalytic activity, shape memory, self-cleaning, self-healing, and superhydrophobic behaviors. Furthermore, a few such nanocomposites also exhibited excellent photocatalytic, and anti-reflecting, delaying of ice formation properties, outstanding ability to separate crude oil from its water mixture as polymeric membrane, etc. These nanocomposites have great potential for applications as structural materials, smart materials biomaterials, heterogeneous catalyst, heavy metal ions removers, etc. Thus, an overview of all these studies from synthesis to applications will be presented in this webinar.

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Webinar 8

Title : BIOENGINEERED HUMAN TISSUES & ORGANS: THE WAY FORWARD

Date of the event - 27th March 2021 ,conducted by

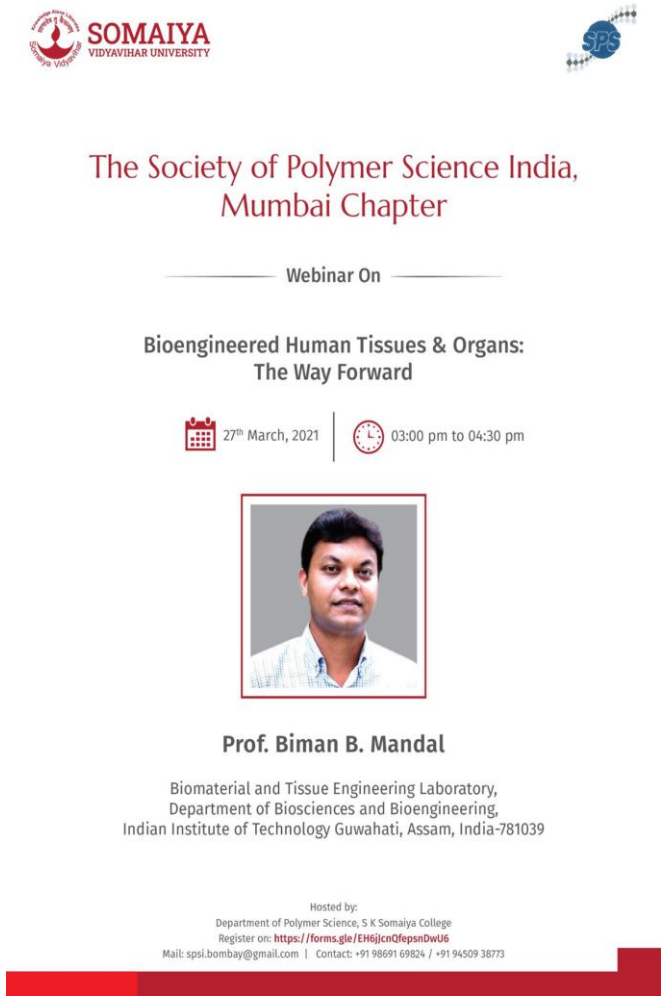
Dr.Biman B. Mandal

Associate Dean, Academics (UG) and Professor at Department of Biosciences and Bioengineering and Centre for Nanotechnology, Indian Institute of Technology Guwahati(IITG).

Tissue or organ transplantation is a commonly accepted norm under these circumstances. However, constant shortage of donor tissue and organ transplants coupled with high morbidity and mortality has spurred great interest for lab grown bioengineered tissues/organs as promising substitute.

Mandal sir presented very well how their team works together to developed methods using conventional and latest 3D bioprinting techniques to intricately mimic the architecture of organs/tissues in great details in an attempt to understand the underlying cell-material crosstalk and its role in tissue regeneration.

These include smart wound dressings for diabetic foot ulcers, skin grafts for burn injuries, vascular grafts for by-pass surgery, vascularised bone grafts as orthopaedic implants, beating cardiac patch for myocardial infarction, bioartificial pancreas releasing insulin for type-1 diabetes, 3D printed intervertebral disc and knee meniscus as orthopaedic grafts and minimally invasive anti-cancer drug eluting injectable gels for cancer treatment.



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Webinar 9

Title : Polymeric biomaterials for tackling bacterial, fungal and viral infections-Objectives, obstacles and opportunities!

Date of the event - 10th April 2021 ,conducted by

Prof. Jayanta Haldar

Biomaterials, Medicinal Chemistry, Chemical Biology,

Drug discovery Antimicrobial Research Laboratory, New Chemistry Unit and School of Advanced Materials, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India

Goal of work is developing antimicrobial biomaterials, the polymeric hydrogels have been developed in our laboratory bearing the potential to combat infections caused by drug-resistant superbugs. 6-9 In one of our up-to-the-minute inventions, we have engineered an injectable antimicrobial sealant with superior adhesive strength, haemostatic ability and cure corneal infections. The membrane-active macromolecules demonstrated excellent activity against multidrug resistant pathogenic bacteria and fungi in in-vitro as well as in-vivo without any detectable resistance development. The macromolecular agents showed potentiation of obsolete antibiotics.11 Overall, the aforementioned polymeric biomaterials hold promise to tackle multidrug-resistant infections and antimicrobial resistance in a multipronged approach of antimicrobial resistance and infections. During this lecture I will talk about some of our recent inventions on polymeric biomaterials.