

Biomaterials Research Centre (BRC)



Research Team

Faculty of dental sciences



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TBA

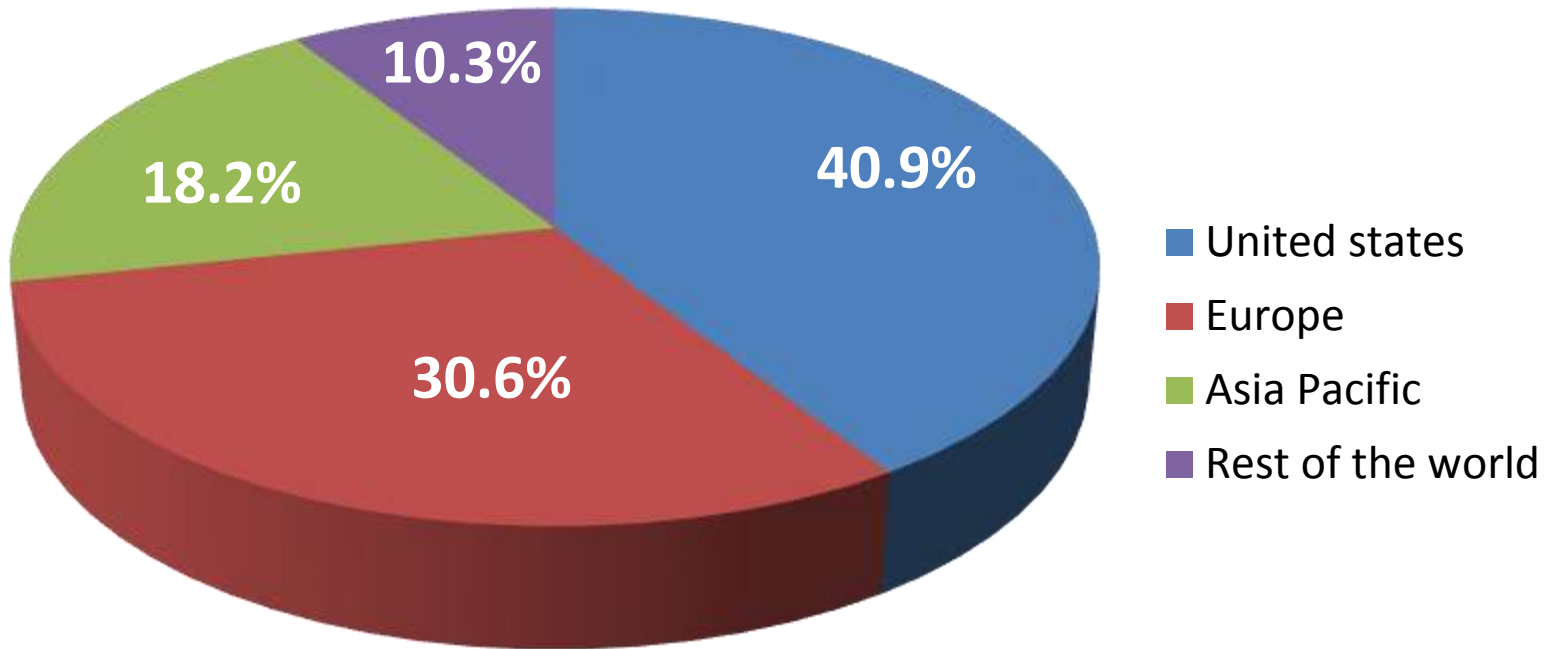


Need For Biomaterials Research Centre

- Biomaterials is a field of science in which there is a paradigm shift from materials engineering towards biological engineering
- Researchers caption it as“ Bench to Bedside” which is referred to as *Translational Research*
- Translational Research is the process by which basic scientific discoveries are transformed through clinical application into treatment modalities ; thus improving diagnosis ,treatment planning and developing cost effective products for community at large



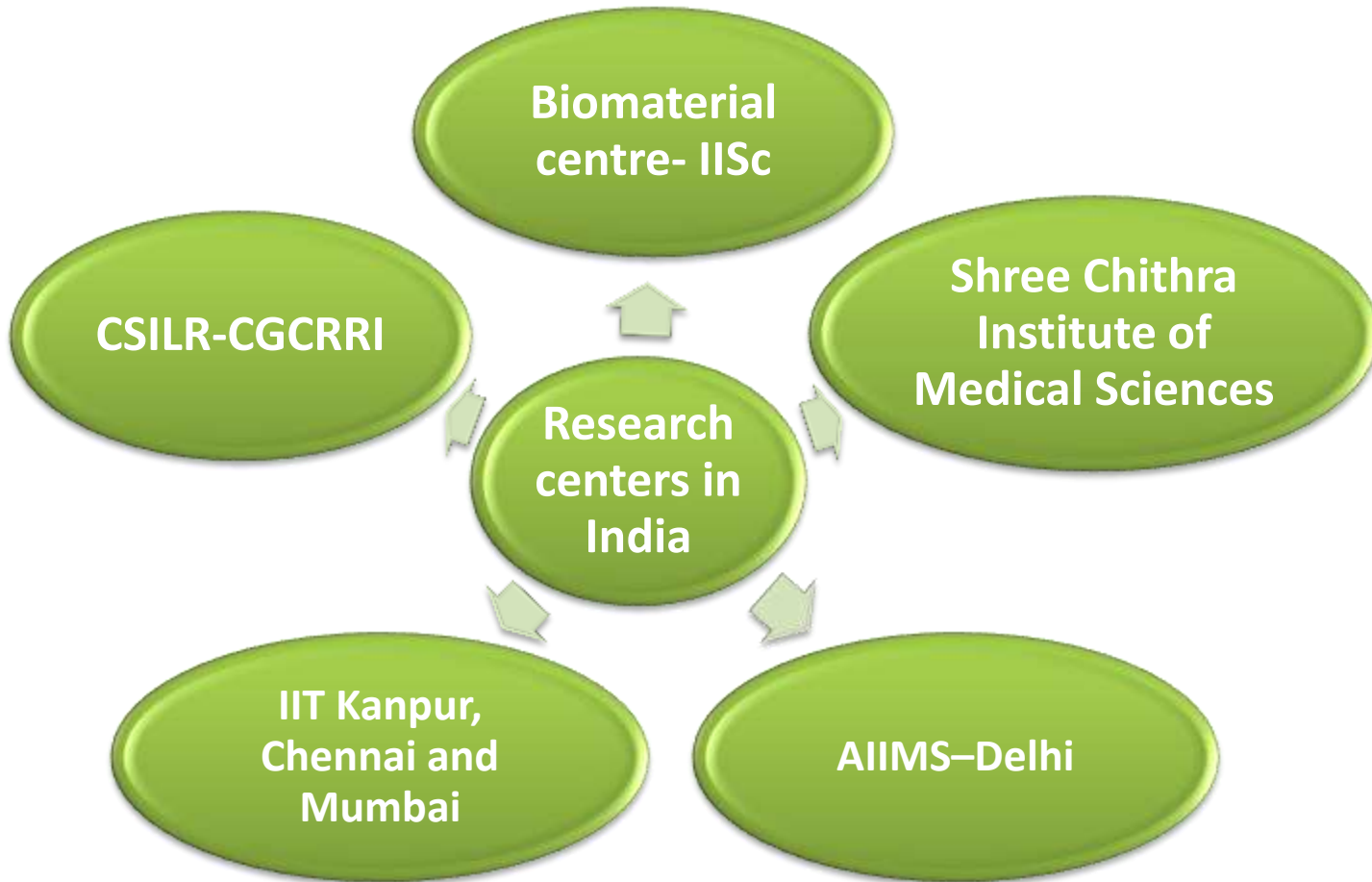
Global Scenario for Biomaterials



Huge sums are invested globally for research and development and with a good reason



Biomaterials Research Centres In India



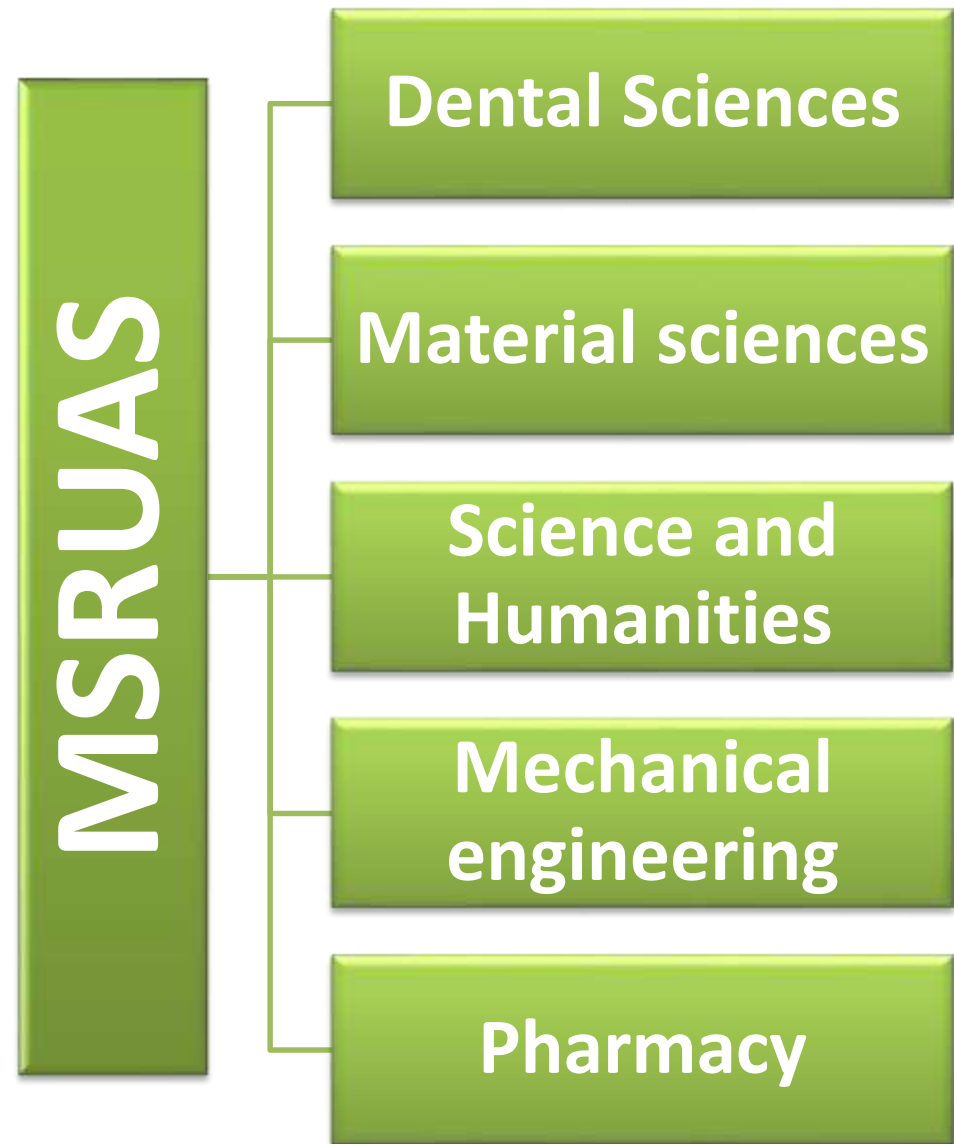
Although newer biomaterials are discovered in the research centers, lack of clinical application for the same has been a lacuna



Why MSRUAS???

The biomaterials research centre at MSRUAS is an ideal platform for research in this field as :

- Driven by clinicians
- Interdisciplinary faculty facility available
- Ample availability of patient for “ Bench to Bedside” research.



Biomaterial Research Centre

Vision :

Biomaterials Research Centre (**BRC**) aspires to design and develop quality and affordable new materials for dental applications



Biomaterial Research Centre

Objectives

- To develop quality and affordable newer biomaterials using natural /synthetic compounds for dental applications
- To evaluate the new biomaterials through in vitro ,in vivo studies and clinical trials
- To design and develop patient specific prototypes
- To establish partnerships and collaborations nationally and internationally to facilitate biomaterial research
- To ensure adequate commercialization of biomaterial products and patents
- To disseminate research findings through quality publications



Commonly used Dental Materials

Metals	Polymers	Cements	Impression Materials	Ceramics
Base Metal Alloys(Co-Cr and Ni-Cr)	Acrylic Resins	Zinc Oxide Eugenol Cement	Irreversible Hydrocolloids	Glass ceramics
Noble Metal Alloys	PGA,PLA,PCL	Zinc Polycarboxylate	Reversible Hydrocolloids	Aluminous porcelain
Titanium	Composites	Zinc Phosphate	Inelastic Impression Materials	Zirconia
Stainless Steel	Resin Cements	Glass Ionomer Cement	Elastic Impression Materials	Dicor
Amalgam	Silicone		Gypsum	

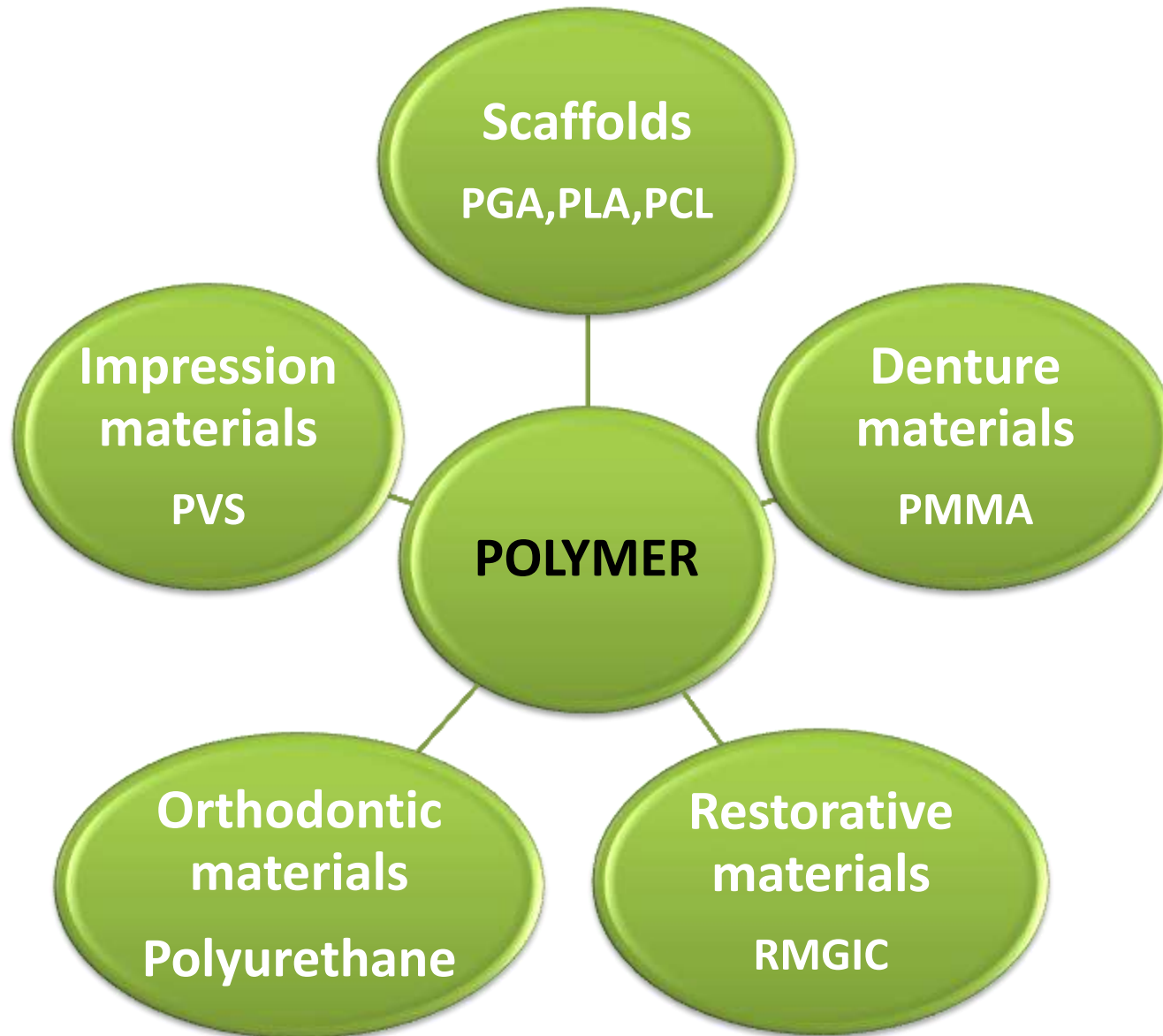


Limitations Of Available Dental Materials

- **Expensive**
- **Release of by-products**
- **Not indigenous**
- **Dimensional instability**
- **Micro- leakage**
- **Reduced strength**
- **Rapid degradation**



Material of Interest



Research problem 1

Aim:

- To develop newer polymer based scaffolds using natural/synthetic products and study their properties for use in dentistry.

Objectives:

- To identify the specific polymer for conjugation with specific natural/synthetic products
- To develop new polymer and study its material characterization through in vitro study
- To evaluate the new biomaterials through in vivo and clinical trials
- To publish quality research work



Location of BRC

Faculty Of Dental Sciences MSRUAS



Available facilities at MSRUAS

**Material Design and
Development**

**Material
Characterization
In vitro studies**

In Vivo Studies

**Patient Prototype
Development and
Clinical Trials**



Material Design and Development

- MIMICS
- CATIA/PRO/E
- Hypermesh
- ANSYS
- LS Dyna
- Cambridge Materials Selection

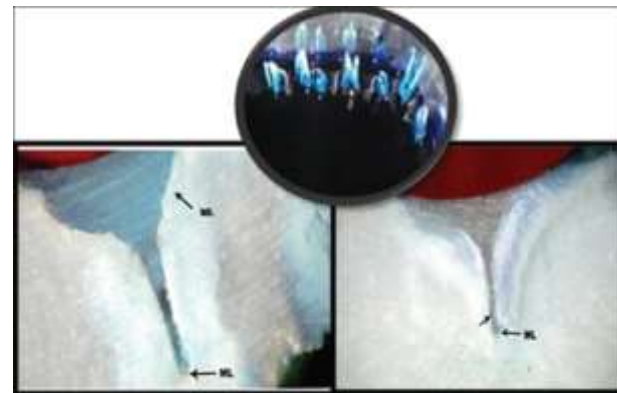
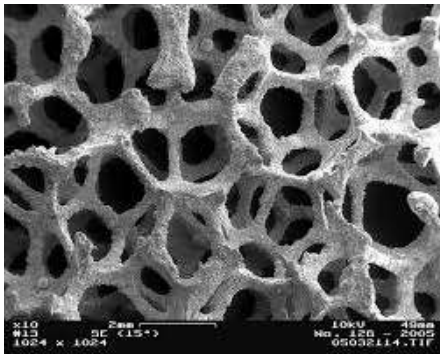


MATERIAL CHARACTERISATION

In Vitro studies

Scanning Electron microscopy
Stereo-microscopy
Spectro-photometry
Microscope with image analyzer
Fluorescence microscopy

Profilometer
Micro tensile machine
Thermocycling unit
Fatigue testing machine
Dehumidifier
Microleakage testing device



In Vivo Studies

Clinical Trials

PETA
Animal house

Ethical
committee
Research clinic



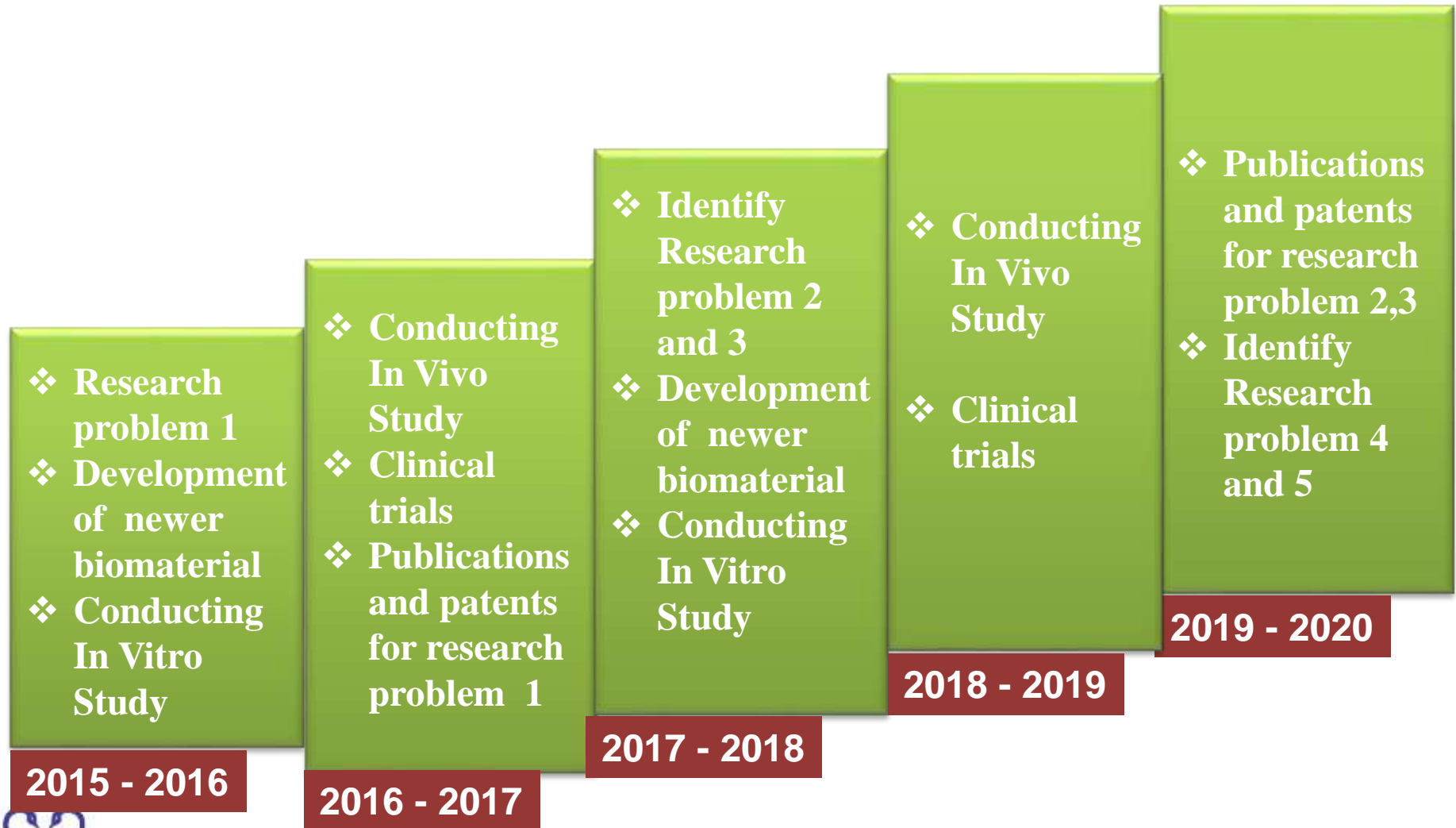
Research Grants

- **UGC Grants**
- **Indian Council of Medical Research**
- **Department of Science and Technology**
- **Department of Biotechnology**
- **Corporate Agencies – Corporate social responsibility**
- **Charitable funds**



Road Map

TIME HORIZON 5 years



Thank you

