

Inflammation Pharmacology Division

Overview: The chronic inflammatory disease processes are poorly understood and there is no definite cure for such ailments. Our research is dedicated to development of new anti-inflammatory /anti-arthritic and immunomodulatory therapeutics that addresses inflammation and are devoid of any side effects. We are also involved in the development of new adjuvants for vaccines.

Mission and Goals:

- To develop cost effective drugs for the treatment of the chronic inflammatory disorders such as rheumatoid arthritis and other inflammatory diseases and understand their mechanism of action.
- To develop plant based immunomodulatory agents and establish their mode of action.
- Development of vaccine adjuvants for regulation of immune response.

Competencies:

- Evaluation of anti-inflammatory / anti-arthritic properties of lead molecules and their mechanism.
- Immunological activities of immunomodulating leads in arthritis and stress (*in vitro* and *in vivo*).
- Immunophenotyping of T and B cell surface markers, co-stimulatory markers and T cells mediated cytokine (Th1 and Th2) generation.
- Assessment on T cells and their intracellular and extracellular content of cytokines is carried out by flow cytometric analysis and ELISA.
- Innate immune response related pro-inflammatory cytokines, chemokines, growth factors and adhesion factor like TNF-alpha, IL-1beta , IL-6, GM-CSF, MAPs etc., expression in the neutrophils, macrophages and other cell types is carried out to see the effect of the test materials by flow cytometry and ELISA.
- General pharmacological assays related to inflammation
- Toxicology: acute, sub-acute, sub-chronic and chronic toxicity.
- Genotoxicity: chromosomal aberrations, sperm abnormalities and micronucleus assay.
- Study of cell mediated immune response(DTH) and Humoral immune response (primary and secondary).
- Plaque forming cell assay
- Graft rejection time

- MTT assay by lymphocyte proliferation (T –cells & B- cells)
- Mitogenic activity (LPS & CON-A)

People:

S. No	Name	Area of Research/Expertise	E-mail
1.	Anamika Khujuria	Immunopharmacology	akhajuria@iiim.res.in
2.	Surjeet Singh	Inflammation Pharmacology & Toxicology	ssingh@iiim.res.in
3.	Anpurna kaul	Immunomodulatory activity (<i>in-vivo/ in- vitro</i>)	akoul@iiim.res.in
4	Sarang Bani	Molecular mechanism of immunomodulation	sbani@iiim.res.in

Area of Research:

- Molecular mechanism of immunomodulation
- Immunology of arthritis and stress
- In-vivo Anti-inflammatory/ anti-arthritis
- Toxicity study: acute, sub-acute, sub-chronic and chronic toxicity
- Genotoxicity
- General pharmacology

Facilities:

- BD-LSR Flowcytometer
- Volume differential meter
- Hot plate
- Randall-selitto's apparatus
- Activity cage for CNS
- Polygraph
- Phase contrast microscope
- Refrigerated Centrifuge
- Digital Weighing Balance

Current Research:

Resourcing of biomolecules from plants, higher fungi and endotypes using non conventional extraction methods.

In vitro and *in vivo* screening of plant extracts, fractions and compounds for their immunomodulatory activity and their effect on pro-inflammatory cytokines.

Generation of data validating new and novel biological activities (immunomodulator in disease / drug induced immune suppression, adaptogen, anti-stress, hepato -protective, antiulcer etc) of different extracts of reputed Malaysian plant- Tongkat Ali.

Identification of the anti-inflammatory/ anti-arthritis drug like molecules and to evaluate them for genotoxicity using techniques like FISH .

Projects:

Resourcing of biomolecules from plants, higher fungi and endotypes using non conventional extraction methods like SCFE and ASE (CSIR).

Develop understanding and control of SK-II Pitera fractionation, bench marking Molecular bioactivities, Chemical characterization and potential synthetic Approaches for Skin care (Sponsor: P&G , Japan)

Exploring botanicals from Malaysia: Tongkat ali (Sponsor: Holista Biotech)

Newer Scientific Herbal Preparation for Global Positioning (CSIR Network Project)

Golden Triangle Project for development of standardized, safe drugs for the national and international herbal market (Sponsor: AYUSH).