



PhD Project

Project Details	
Project Title	Biocompatible and Biodegradable Liquid crystals
Project Summary	<p>We intend to design and design peptide-based liquid crystalline (LC) materials. There are only very few LC materials reported with peptide origin. Although a multitude possibility exists for the LC design, successful designs are very limited. In this project, we plan to design bent-core LC materials. For this purpose, scaffolds with varying rigidity will be used and evaluated. The LC phase formation of the synthesized materials will be evaluated using polarizing optical microscopy (POM) and differential scanning calorimetry (DSC). The different physical properties and structure-property relationship of the LCs will be studied using various experimental techniques, such as, dielectric spectroscopy, electro-optic measurements, spontaneous polarization measurements. The effects of externally applied stimulus such electric or magnetic fields will be studied. The possible application of these LCs in energy harvesting devices will also be explored. The project is in the interface of Chemistry and Physics. Student will get excellent training in organic synthesis, spectroscopy techniques, molecular simulations and physical studies on liquid crystal systems.</p>

PhD Supervisors			
Role	Faculty	Academic Unit in IITD	Email ID
Supervisor 1	Aloka Sinha	Physics	aloka@physics.iitd.ac.in
Supervisor 2	V Haridas	Chemistry	haridasv@iitd.ac.in

Project requirements (Student qualifications, experience required, etc)
<input type="checkbox"/> M.Sc. Chemistry/ M.Sc. Physics/ B.Tech. in Chemical Engineering/ B.Tech. in Electrical Engineering

Source of funding (IRD/FITT Project details, if any)
Only student with fellowship or institute fellowship

Role of Faculty Members involved:

- Alok Sinha: Studies on the LC phase formation and experiments on the LCs physical properties.
- V. Haridas: Chemical synthesis and characterization