## Project Details

<table>
<thead>
<tr>
<th><strong>Project Title</strong></th>
<th>Theranostic systems for misfolded proteins in neurodegenerative diseases</th>
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### Project Summary

(Minimum 500 and maximum 2000 characters)

The accumulation of misfolded proteins in the brain is responsible for a number of neurodegenerative disorders such as Parkinson's disease, Alzheimer's disease, and other disorders causing neuronal damage and cognitive decline. Theranostic systems for the management of misfolded proteins in neurodegenerative diseases are promising at both diagnosing and treating these devastating conditions.

Systems would be developed that could early detect and diagnose the accumulation before the clinical symptoms. Natural and laboratory synthesized ligands would explored for the targeted detection using imaging techniques based on nuclear radiation viz. SPECT and PET. To enhance the efficacy, multimeric approach would be tested. Development of drug delivery systems to facilitate the targeted delivery of therapeutic agents to the affected regions would be carried out. Both organic and inorganic nanoparticle-based drug delivery systems would be used to carry drugs across the blood-brain barrier and release them specifically at sites of protein aggregation. This would minimize off-target effects and enhances the therapeutic efficacy. Real time monitoring of the treatment response would be carried out using invitro and in vivo experiments.

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## Ph.D. Supervisors

<table>
<thead>
<tr>
<th>Role</th>
<th>Name of Faculty</th>
<th>Academic Unit in IITD/Institute/University</th>
<th>Email ID (Official)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor 1</td>
<td>Dr. Anupama Datta</td>
<td>Institute of Nuclear Medicine and Allied Sciences</td>
<td><a href="mailto:anupama.inmas@gov.in">anupama.inmas@gov.in</a></td>
</tr>
<tr>
<td>Supervisor 2</td>
<td>Dr. Shashank Deep</td>
<td>Indian Institute of Technology Delhi</td>
<td><a href="mailto:sdeep@chemistry.iitd.ac.in">sdeep@chemistry.iitd.ac.in</a></td>
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### Project requirements (Student qualifications, experience required, etc)

*The candidate will be shortlisted based on common shortlisting criteria decided by ScRC (SIRe)*

MSc in Chemistry/Biochemistry/Biotechnology

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### Source of fellowship/funding

(CSIR/UGC/DBT/ICMR/ICAR/NEET-PG/DST-INSPIRE/IRD/FITT Project details, if any)

Own Fellowship
<table>
<thead>
<tr>
<th>Role of Faculty Members involved:</th>
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<tbody>
<tr>
<td><strong>Supervisor-1</strong></td>
</tr>
<tr>
<td>Synthesis of therapeutic ligands and theranostic system, blood-brain barrier studies</td>
</tr>
<tr>
<td><strong>Supervisor-2</strong></td>
</tr>
<tr>
<td>Kinetics of aggregation, cell based aggregation experiment</td>
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