NEWTON SEN

Polymer chemist | Material specialist

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Profile

Polymer chemist has an extensive background in synthesizing, analysing bio- and synthetic polymers as well as protein aggregation and peptide synthesis. My expertise extends to blending composites and nanocomposites, industrial materials processing, and process development, including polymer recycling.

Expertise

- HPLC, GPC, column chromatography, flash chromatography, NMR spectroscopy, mass spectrometry (ESI and MALDI-Tof) LC-MS, GC-MS, DSC, TGA, DMA
- FT-IR, UV-Vis, fluorescence, CD, picoseconds and nanoseconds laser flash spectroscopy, viscometry, DLS
- SEM, TEM, confocal fluorescence microscopy, EM
- Synthetic and analytical chemistry
- Processing techniques: Extrusion, injection molding, spinning, foaming, elastomer processing, blown film extrusion
- Tensile test, dynamic-mechanical analysis, bend test, ball indentation test, charpy impact test, drop weight test, tensile impact test, fracture mechanics, hardness measurement
- Material characterization
- Project management, process design and product optimization
- GMP

languages

English (fully professional, **C2**)

German (Independent user, **B1**)

Bengali (Native speaker)

Experience

Research associate as Phd student Mar. 2020 - Apr. 2024

Institute of Chemistry l Martin Luther University Halle-Wittenberg

- Synthesizing and characterizing materials and polymers, polymers incorporation into nanosized lipid-vesicle system.
- Investigate polymers, lipid membranes and polymer-lipid hybrid systems interactions on aggregating proteins.
- Presenting research outcomes in conferences, writing reports and publications, teaching and supervising students.

Graduate student research assistant Oct. 2018 - Feb. 2020

Institute of Chemistry l Martin Luther University Halle-Wittenberg

- Stimuli sensitive polymer synthesis and control polymers response by stimuli.
- Investigation of polymers interactions with amyloid proteins upon polymer´ responsiveness.

Graduate student research assistant May. 2016 - Feb. 2017

Institute of Biochemistry and Biotechnology l Martin Luther University Halle-Wittenberg

- Peptide synthesis using SPPS and purification of peptide.
- Intrachain loop formation rate constant determination to find kinetic signature resolving fundamental stages in protein folding or unfolding.

Graduate research associate Apr. 2011 - Dec. 2011

Department of Pharmacy l University of Science & Technology Chittagong

- Investigation drug-metal complexation influence on pharmacokinetic profile of drug

Retail pharmacist Sep. 2012 - Mar. 2014

Central Medico l Chattogram, Bangladesh

- Patient counselling and dispense medicine

Internship

Trainee Pharmacist Sep. 2009 - Oct. 2009

Orion Pharma Ltd., Dhaka, Bangladesh

Training on

- Manufacturing, quality assurance, packaging, storing pharmaceuticals according to GMP.
- Maintaining standard documentation of protocols, production batches, storage, and calibration records allowing to maintain requirement of regulatory authorities

Scholarship

STIBET scholarship awarded by **DAAD**

Certification

A-Grade Pharmacist (Registration No: **A-3327**), approved by Pharmacy Council of Bangladesh.

Workshop attended

- GUV: Preparation and confocal microscopy of giant membrane vesicles; organized by MLU
- FCCS: Fluorescence Cross-Correlation Spectroscopy; organized by MLU
- NMR spectroscopy for bimolecular and materials characterization; organized by MLU
- FCS: Fluorescence Correlation Spectroscopy; organized by MLU
- Project Management; organized by InGrA of MLU
- Introduction to chromatography; organized by IPB Halle
- Introduction to small and wide angle X-ray scattering; organized by MLU
- Effective visual communication of science; organized by InGrA of MLU
- Academic Writing; organized by InGrA of MLU

Education

Doctoral Student Apr. 2020 - Present

Institute of Chemistry | Martin Luther University Halle-Wittenberg

Research focus: Modification and modulation of aggregating proteins with molecules, membranes, and nanoparticles.

MSc. in Polymer Materials Science Oct. 2014 - Mar. 2020

Martin Luther University Halle-Wittenberg

Focused area:

- Polymer chemistry, engineering, processing, physics
- Materials science

Master research project: Intrachain loop formation kinetics of Polyglutamine-14

Master thesis: Synthesis of thermally responsive polymers and their influence on amyloid aggregation (**Grade point 1,1**).

Master of Pharmacy Jan. 2010 - Dec. 2011

University of Science & Technology Chittagong, Bangladesh

Focused area:

- Pharmaceutical manufacturing, engineering, quality assurance, biotechnology, analysis and regulatory affairs

Master of Pharmacy thesis: An in vitro study of Zidovudine-Zn (II) complexation and its influences on protein binding.

Bachelor of Pharmacy Jan. 2005 - Dec. 2009

University of Science & Technology Chittagong, Bangladesh

Focused area:

- Human anatomy, physiology
- Pharmacology, chemistry, biochemistry, biotechnology, microbiology, toxicology, biopharmaceutics
- Pharmaceutical technology, manufacturing, processing and quality control, GMP of pharmaceutical industry

Bachelor research project: Development and physiochemical and in vitro evaluation of diclofenac sodium containing transdermal patches.

Publications

- Inhibition of the fibrillation of amyloid Aβ1-40 by hybrid- lipid-polymer vesicles, Sen, N. et al., **Macromol. Biosci.**, 2023, 2200522.
- Bioinspired synthetic polymers-based inhibitors of Alzheimer's amyloid-β peptide aggregation, Sen, N. et al., **Polym. Chem.**, 2023,14, 392-411.
- Membrane Anchored Polymers Modulate Amyloid Fibrillation, Sen, N. et al., **Macromol. Rapid Comm.**, 2021,2100120.
- Submitted publication based on nucleation behaviour alteration of amyloid Aβ1-40 by lipid-polymer nanosized vesicles.

References

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