

HARSHIT AGARWAL

har09876@gmail.com • +1 608 622 2571 • www.linkedin.com/in/h-agarwal

SUMMARY

- Trained researcher in bioprocessing and bioseparations, colloids and surfactant science, and polymer chemistry
- Experienced in managing and leading teams to solve interdisciplinary problems
- Knowledgeable in technology commercialization, including patenting, market research, and lean development

PROFESSIONAL EXPERIENCE

Scientist, Downstream Process Development, Catalent Pharma Solutions, Aug 2021 – Present

- Developed and characterized downstream purification processes for various biotherapeutics, including monoclonal antibodies and Fc-Fusion proteins, at all stages of clinical development
- Provided downstream process development-related client-facing support for multiple drug development programs, including presenting development updates, defining and spearheading project-related activities, and solving process development and technology-transfer-related problems, under accelerated timelines and budget constraints
- Led various technology development and onboarding initiatives, in collaboration with both external and internal teams, related to continuous bioprocessing, process analytical technology, digital twins, and process intensification
- Managed, mentored, and trained junior staff to perform various bioprocessing-related activities; defined career-development plans and generated personal development opportunities

Summer Research Intern, Biocon, India, May 2015 – July 2015

- Analyzed historical manufacturing process data and constructed neural network-based machine learning models for decision-making in the manufacturing
- Demonstrated positive revenue outcomes, leading to the start of a new research area in the company

EDUCATION

University of Wisconsin-Madison, Madison, Wisconsin

Ph.D. in Chemical Engineering, August 2021, GPA- 3.78/4

Graduate Certificate in Entrepreneurship from the Wisconsin School of Business, MEB '19

Thesis title: *Design, synthesis, and characterization of liquid-infused antifouling materials*

Advisor: *Prof. David M. Lynn*

Indian Institute of Technology Delhi, New Delhi, India

B.S. in Chemical Engineering, May 2016, GPA- 8.701/10 (Institute Director's merit award)

Minor in Biochemical Engineering and Biotechnology

ACHIEVEMENTS

- Awarded PPG Industries Summer 2019 Fellowship for developing polymer-based antifouling coatings
- Received second prize in 2019 Transcend UW Innovation Competition and awarded prize money of \$10,000
- Semi-finalist (in top 50 among more than 200 entries) in 2019 Wisconsin Governor's Business Plan Competition
- Winner of 2014 GE Edison Challenge and awarded a research grant of \$15,000

RESEARCH EXPERIENCE

Graduate Research Assistant, UW-Madison, Aug 2016 – August 2021

Advisor: *Prof. David M. Lynn*

- Designed and fabricated 'active' multifunctional materials by the infusion of complex fluids into nano and microporous polymer-based films for antifouling and smart-wetting applications
- Developed scalable and continuous methods for the fabrication of polymeric films and optimized various method parameters to create films with a range of topography and chemical functionality
- Modified material fabrication process to incorporate environmentally conscious and sustainable design principles
- Mentored 3 undergraduates with emphasis on lab safety, experimental design, and crafting effective presentations
- Created and delivered discussion lectures to ~ 80 students and provided personalized 1-1 learning assistance

Undergraduate Researcher, IIT-Delhi, May 2014 – May 2016

Advisor: *Prof. Anurag S. Rathore*

- Developed continuous biotherapeutics downstream processing platform; resulting in 3 peer-reviewed publications
- Designed a novel flow reactor (Coiled Flow Inverter Reactor) for continuous operation of various bioprocessing operations such as protein refolding, precipitation, and viral inactivation; patented

VOLUNTARY ACTIVITIES

Wisconsin Idea STEM Fellow, UW-Madison, Jan 2019 – Aug 2021

- Developed a hands-on science exploration station on molecular self-assembly & bioinspiration for general public
- Engaged with the public in multiple outreach events; won 2nd prize in UW-Madison CoE Expo 2019

Lab Safety Officer, Lynn Research Group, UW-Madison, June 2019 – Aug 2021

- Implemented a system to organize lab inventory; ensured safe lab shutdown and reopening during COVID-19
- Provided safety training, coordinated lab clean-up and safety inspections, and delegated lab maintenance duties

Consultant, WiSolve, Madison, May 2017 – Aug 2021

- Determined primary customers and validated value proposition, estimated market size, and developed a launch strategy for an early-stage bio-instrumentation company
- Facilitated collaboration between customers & a biomedical device start-up on technology development

SELECTED PUBLICATIONS (280+ citations, 11+ papers)

- **Agarwal, H.**, Thwin, C., and Thangaraj, B. (2023). Single-use centrifugal separator enables intensification of the clarification process in biomanufacturing of recombinant proteins. *Journal of Chemical & Biotechnology*. (accepted)
- **Agarwal, H.**, Breining, W. M., and Lynn, D. M. (2021). Continuous fabrication of slippery liquid-infused coatings on rolls of flexible materials. *ACS Applied Polymer Materials*, 4(2).
- **Agarwal, H.**, Nyffeler, K. E., Blackwell, H. E., Hacker, T. A., & Lynn, D. M. (2021). Slippery nanoemulsion-infused porous surfaces (SNIPS): antifouling coatings that can host and sustain the release of water-soluble agents. *Chemical Communications*, 57.
- **Agarwal, H.**, Nyffeler, K. E., Blackwell, H. E., Hacker, T. A., & Lynn, D. M. (2021). Fabrication of slippery liquid-infused coatings in flexible narrow-bore tubing. *ACS Applied Materials & Interfaces*, 13(46).
- **Agarwal, H.**, Nyffeler, K. E., Blackwell, H. E., & Lynn, D. M. (2021). Liquid crystal-infused porous polymer surfaces: a “slippery” soft material platform for the naked-eye detection and discrimination of amphiphilic species. *ACS Applied Materials & Interfaces*, 13(28).
- Kateja, N., **Agarwal, H.**, Hebhi, V., & Rathore, A. S. (2017). Integrated continuous processing of proteins expressed as inclusion bodies: GCSF as a case study. *Biotechnology Progress*, 33(4).
- Sharma, A. K., **Agarwal, H.**, Pathak, M., Nigam, K. D. P., & Rathore, A. S. (2016). Continuous refolding of a biotech therapeutic in a novel coiled flow inverter reactor. *Chemical Engineering Science*, 140.
- **Agarwal, H.**, Rathore, A. S., Hadpe, S. R. and Alva, S. J. (2016), Artificial neural network (ANN)-based prediction of depth filter loading capacity for filter sizing. *Biotechnology Progress*, 32(6).
- Kateja, N., **Agarwal, H.**, Saraswat, A., Bhat, M., & Rathore, A. S. (2016). Continuous precipitation of process related impurities from clarified cell culture supernatant using a novel coiled flow inversion reactor (CFIR). *Biotechnology Journal*, 11(10).
- Rathore, A. S., **Agarwal, H.**, Sharma, A. K., Pathak, M., & Muthukumar, S. (2015). Continuous processing for production of biopharmaceuticals. *Preparative Biochemistry and Biotechnology*, 45(8).

PATENTS

- Rathore, A. S., Nigam, K.D.P., Pathak, M., **Agarwal, H.**, & Sharma, A. K. (2015). An innovative coiled flow inverter reactor for continuous refolding of denatured recombinant proteins. (WO2016116947A1)
- Lynn, D.M., & **Agarwal, H.** (2021). Slippery liquid-infused porous surfaces that release hydrophilic and hydrophobic agents. (*PCT 17/390,568*)
- Lynn, D.M., & **Agarwal, H.** (2021). Fabrication of crosslinked and reactive nanoporous polymer coatings using spray-based methods. (*PCT 17/390,559*)
- Lynn, D.M., & **Agarwal, H.** (2022). Slippery antifouling polymer coatings fabricated entirely from biodegradable and biocompatible components. (*PCT 63/323,752*)

TECHNICAL SKILLS

- Design, characterization, technology transfer of clarification, chromatography, and tangential flow filtration
- Schlenk (air-free) techniques, electrospinning, coating techniques (dipping, spraying, and spinning)
- Fluorescence, confocal and cross-polarized microscopy, UV-Vis, FT-IR (ATR, IRRAS), SEM, GPC/SEC, DLS, NMR, TGA, Langmuir–Blodgett trough; competent in MATLAB, ImageJ, Power BI, JMP, Adobe Illustrator

Other Activities: Reviewer (Langmuir, AAPS PharmSciTech, J. Pharm. Innov.); Chair (various sessions, ACS, BIOT 2023); Marathon Runner (DC, Chicago, SF, and Madison)