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National Biofilms Innovation Centre

Going with the Flow: A Journey Through Careers, Continents, and Wastewater Biofilms

Women in Science: Building Careers, Shaping Futures

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Dr Asma Ahmed

Associate Professor – Chemical and Environmental Engineering

University of Nottingham

Flowing through Careers, Continents, and Change

Oklahoma State University
First encounter with microbial processes

PhD + Research Professional
USA

Industry leadership – cell culture process development
India

Dr Reddy's Laboratories
Led **biosimilar bioprocess development**
Products now in market
Development → Technology Transfer→ Scale-up

Entrepreneurial detour
Equipment manufacturing
India

Family Manufacturing Business
Took over, turned around & sold company
Learned operations, management, resilience and leadership

BITS Pilani
Returned to academia
Biofilms journey begins here!
First academic research group
Teaching and pedagogy

Academia return
BITS Pilani
India

Consolidation and Integration in a new land
UK

Canterbury Christ Church University
Biofilm-based industrial wastewater treatment
Academic and industrial collaborations
Teaching, EDI initiatives

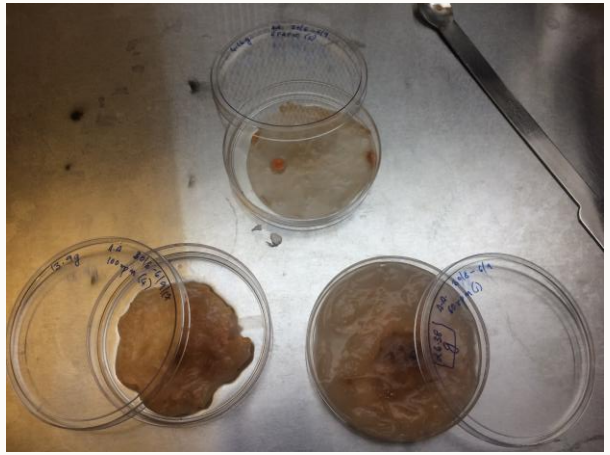
Integration and Impact – Flowing forward
UK

University of Nottingham
Fungal biofilms for diverse waste streams
Interdisciplinary collaborations
Integrating all flows of experience

The Flow of Science: Microbial waste valorisation

A new fungal isolate for lignin degradation – *Neurospora discreta*

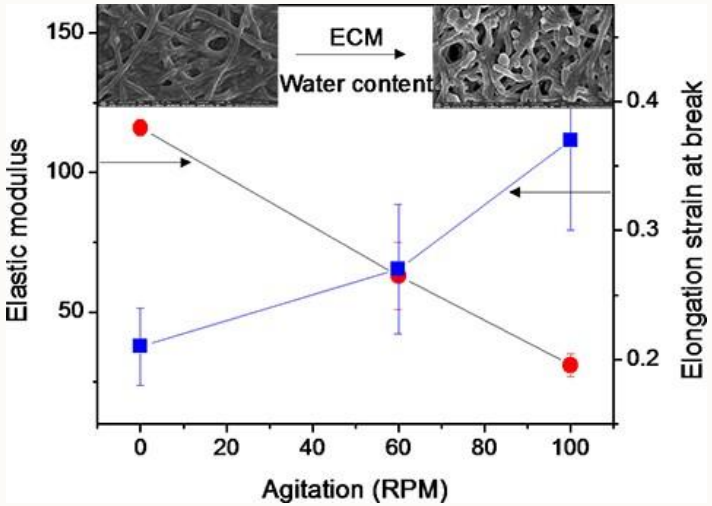
Air-liquid interface biofilms grown on diverse substrates



Robust viscoelastic and porous biofilms

Serendipitous discovery of biofilm-forming fungus

- Unusually robust *useful* biofilms
- Ability to grow on diverse complex substrates
- Structure-function understanding
- Tunability

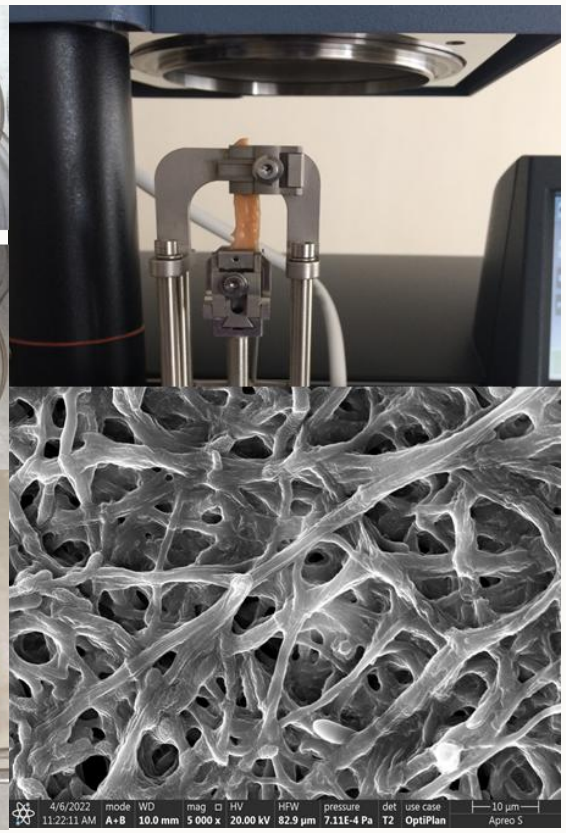


Pamidipati & Ahmed (2017). 10.1007/s12010-016-2302-6; Ahmed et al (2020) 10.1111/jam.14539; Narayanan & Ahmed (2019) 10.1140/epje/i2019-11899-2

The Flow of Science: Biofilm-based wastewater treatment

Treatment of pulp mill effluent

Simultaneous C, N, P removal



Tunable structure and mechanics

Flowing Forward

🔬 Continuing to expand biofilm research in creative directions (biofilm structure-function relationships, AI-enabled sensing, novel materials, new fungal species)

♻️ Contributing to a circular future for biofilm innovation in waste valorisation

Tabraiz et al (2022) 10.1016/j.jenvman.2022.116363; Taneja et al (2025) 10.1016/j.wse.2025.02.001

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The Flow of Challenges and Opportunities

Challenges along the way

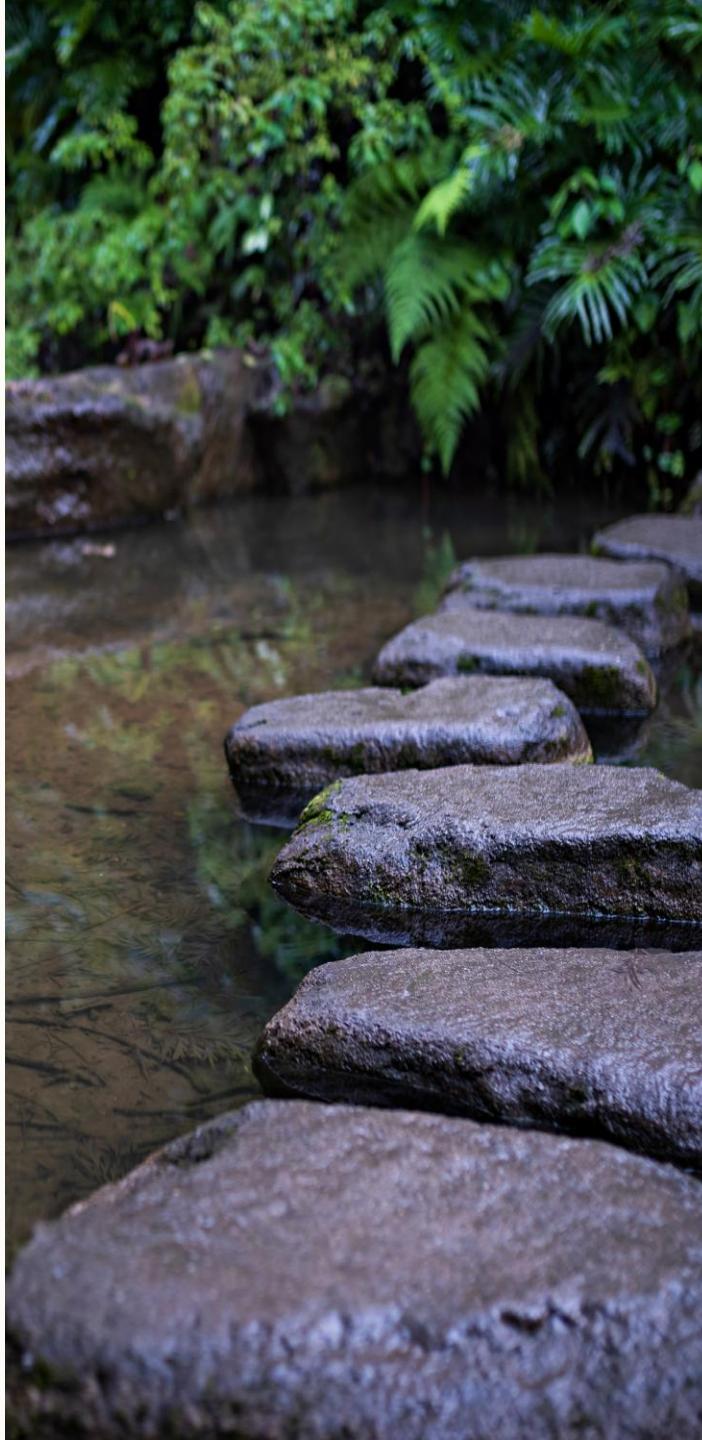
🌍 Moving across countries & institutions
🔄 Restarting networks, labs, and identity
⚖️ Balancing family decisions with career shifts
👩‍🔬 Navigating male-dominated spaces

Opportunities that emerged

🤝 Collaborations that only happened because I moved
🌱 Fresh starts for research ideas
💡 Skills from industry + academia + business
🌏 Broader global perspective & resilience

Leveraging flow – rather than resisting it

No two careers are alike – enjoy and appreciate diversity in paths
🌿 Consolidating life experiences to shape sustainable, interdisciplinary science
👥 Building inclusive teams where non-linear paths are seen as strengths



Growing with the flow: biofilms do it naturally, and so do many rewarding careers!