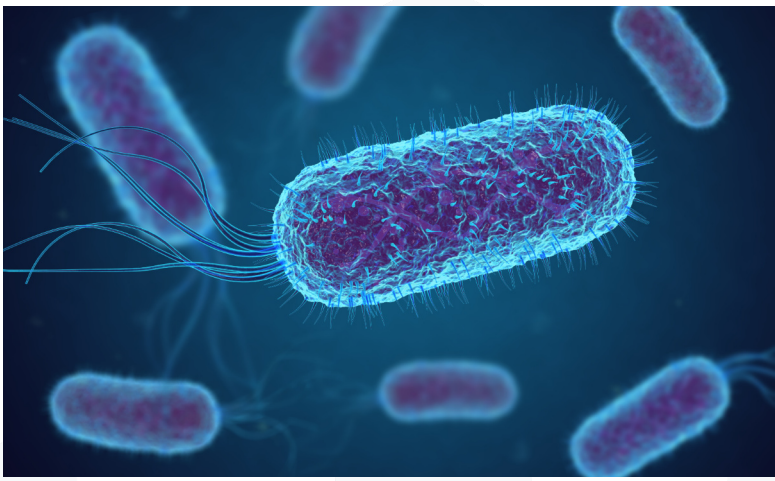
STUDY HIGHLIGHTS

VMF of *E. coli* Cultures & Lysates

SANI Membranes

E. coli Harvest & Wash and Lysate Protein Clarification & Recovery using Vibro® Membrane Filtration (VMF)

VMF performs better than conventional TFF for the processing of high-density *E. coli* cultures and lysates. VMF demonstrated high protein recovery and solids handling at low TMP for three different expressed proteins, making it a robust, high-performance solution for demanding midstream applications.



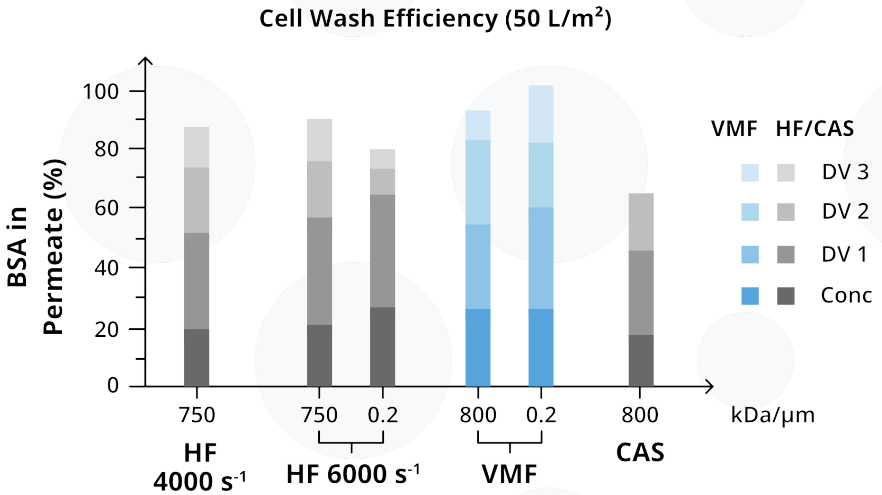
A "Near-Universal Clarification Platform"

To identify a "near-universal clarification platform" capable of handling diverse bioprocessing needs, this study compared the performance of Vibro® Membrane Filtration (VMF), Hollow Fiber (HF) and Cassettes (CAS) in:

- Cell harvest and wash of *E. coli* cells
- Lysate clarification and recovery of three different recombinant proteins

VMF outperformed the other modalities in both process steps, **operating reliably at low TMP** and achieving **superior cell wash and target protein recovery** compared to conventional TFF technologies like HF and CAS.

100% Cell Wash Efficiency With VMF



VMF was the most effective modality for cell wash, demonstrated by a measured **100% BSA clearance** after three diafiltration volumes (DV). In contrast, HF only achieved ~90% clearance, while CAS was unable to complete three DV in the first place.

***Figure 1:** Vibro® Membrane Filtration (VMF) achieved 100% BSA clearance after three diafiltration volumes (DV), outperforming TFF.*

Read the Article

J. Reid, J. Ni, A. Chen, P. Gomes, A. Szto, A. Yu, A. Luo, B. Kong, C. Adams, N. Jeyachandran, A. Amir, X. Teixeira, T. Yuan, C. Charretier: *Exploration of alternative microfiltration modalities for the harvest and clarificationof diverse recombinant proteins from high-density E. coli culture and lysate using hollow fibre, flat sheet cassette, and vibro membrane filtration technologies.* Journal of Industrial Microbiology and Biotechnology, 2025, 52, kuaf008

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VMF of *E. coli* Cultures & Lysates

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Robust Operation at Extremely Low and Uniform TMP

During both cell harvest and lysate clarification, VMF:

- Demonstrated **solids handling capabilities** on par with HF, whereas CAS loads consistently had to be reduced to allow operation
- Met the overall process targets
- Operated at a much **lower and more uniform TMP** compared to HF and CAS

Additionally, the **VMF flux could be doubled** during the diafiltration, resulting in a higher but stable TMP for the remainder of the diafiltration, indicating a potenital for further process optimization.

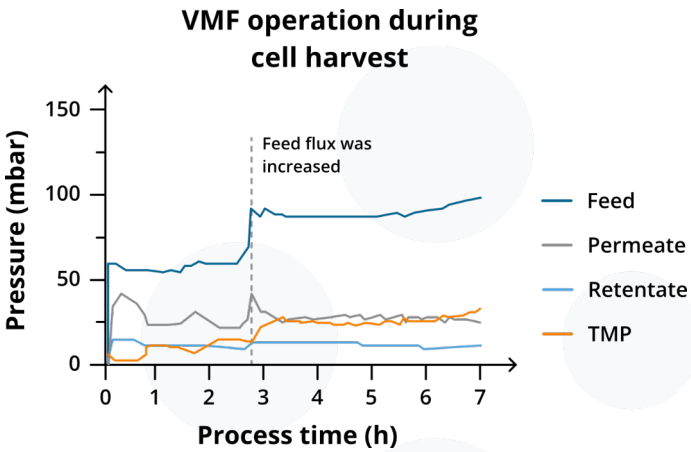
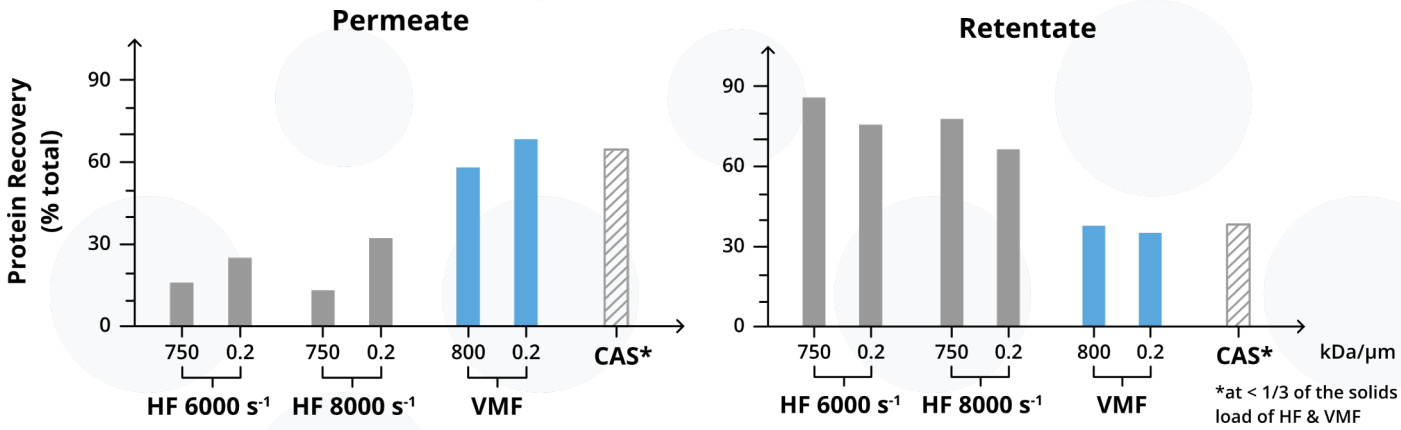


Figure 2: *During cell harvest, VMF maintained low and stable TMP even after a flux increase.*

Superior Target Protein Recovery

Lysate protein recovery was tested across three recombinant proteins of varying size and pI-value. VMF achieved the best product recovery for all three proteins. In particular, VMF **more than doubled the product recovery (68%)** for the largest protein (90-120 kDa) compared to the next-best modality, HF (32%).



Figures 3 and 4: *After three diafiltration volumes, VMF achieved more than twice the protein recovery for the largest protein (90-120 kDa) compared to HF. Conversely, the lowest percentage of protein remained in the retentate. The mass balance between the two measurements verifies the results. Cassettes were unable to operate at the same solids load as VMF and HF, so the shown CAS results are using less than 30% of the load for HF and VMF.*

Read the Article

J. Reid, J. Ni, A. Chen, P. Gomes, A. Szto, A. Yu, A. Luo, B. Kong, C. Adams, N. Jeyachandran, A. Amir, X. Teixeira, T. Yuan, C. Charretier: *Exploration of alternative microfiltration modalities for the harvest and clarificationof diverse recombinant proteins from high-density E. coli culture and lysate using hollow fibre, flat sheet cassette, and vibro membrane filtration technologies.* Journal of Industrial Microbiology and Biotechnology, 2025, 52, kuaf008

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