opnMe by Boehringer Ingelheim

opn2EXPERTS – Reduce water and energy consumption in downstream bioprocesses

Leveraging novel technological approaches in downstream processing of biologicals, how would you propose to reduce water and/or energy consumption in future bioprocesses?

Answers to this question including a proposal for collaboration can only be considered if they arrive no later than February 15, 2023, 11:59 pm PST.

Have a chance to win up to USD 80,000 when your submission has been selected.

Boehringer Ingelheim

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What is the context of the problem that we would like to solve?

The manufacturing of the drug substance of biologics such as monoclonal antibodies is usually divided in an upstream section containing in most part the cell culture and the protein synthesis, and a downstream part for the purification and polishing to remove any impurities and obtaining the antibody in a very high purity. The main method of purification and polishing is chromatography which often requires large quantities of aqueous buffer solutions to equilibrate the resins, elute the product, and wash the columns. By regulatory requirements, for the safety of patients, only water of the highest quality must be used in the production of biologics. This water grade is called “water for injection” (WFI) and requires a highly energy intensive process including distillation, reverse osmosis and ultrafiltration.

Thus, the production of tens of thousands of liters of buffer solution for a large 12,000 L scale consumes not only large amounts of WFI, but also large amounts of energy, which may come from fossil fuels such as natural gas, significantly increasing the CO_2 footprint of the product. Reducing these consumptions would therefore reduce the environmental footprint of the process.

The challenge has been released as part of the Boehringer Ingelheim’s Innovation Unit (IU) More Green Grants program, whose intent is to minimize the environmental footprint of future medicines through sustainable science, technology, and innovation. Founded in 1885 and family-owned ever since, Boehringer Ingelheim takes a long-term perspective. Its commitment to contribute towards a healthier and more sustainable future is firmly anchored in our corporate philosophy since its founding.

Hence our question: How would you propose to reduce water and/or energy consumption in future downstream bioprocesses?

What potential solutions could be in scope?

The main goal is to develop approaches that are implementable in large scale downstream manufacturing that reduce water and/or energy consumption. Possible approaches for smart manufacturing may utilize advanced process modeling or apply digital twins to minimize buffer volumes, as well as new technologies to maximize process throughput and decrease buffer consumption, e.g., by increasing chromatography column and/or filtration membrane loadings. Furthermore, the project should deliver tangible results within 12 months.

What potential solutions would be out of scope?

Technologies that are not feasible and/or implementable for large scale manufacturing.

What benefits do we offer to you in exchange for having submitted a solution?

If your project is selected, you will have the opportunity to directly collaborate with the IU Sustainability team of Boehringer Ingelheim, and you gain exclusive access to company expertise and know-how.

You can expect appropriate funding for the intended 12-month collaboration period. Your exact funding request should be outlined in your proposal. As a framework, we suggest that your initial funding request is structured by milestones and does not exceed USD 80,000.

To maintain the highest degree of an open innovation environment, we plan to announce the winner(s) publicly and feature them on opnMe.com and our social media channels.

What are the key success criteria on which we base our selection for the best answer?

We are seeking research collaboration proposals that contain:

- A well-structured proposal outlining a **new and compelling sustainable scientific approach**.
- Outlining of the technical feasibility, and potentially existing data or previous publications that support feasibility / experience with outlined technology, based on existing techniques and established assays.
- Your exact funding request should be outlined in your proposal based on a well-thought-through project. The project should be structured in milestones and planned with key decision points (clear Go/No-Go criteria). The funding request should not exceed USD 80,000.
- We will only consider project proposals which can be completed within 12 months or less. Within this period, you should be able to generate confirmation about your hypothesis based on predefined experimental milestones, as well as publishable results.
- Proven track record in the required field of expertise.
- Ability to implement the outlined solution as part of a scientific collaboration project with Boehringer Ingelheim including access to a laboratory.

What information should be included in your answer submission?

Please use our answer submission template to provide a 2–3 page non-confidential proposal (available for download on the following site).

If confidential data exists that would strengthen the proposal, please indicate that information is available to share under a Confidential Disclosure Agreement (CDA). If we find the non-confidential concept proposal sufficiently interesting, we will execute a CDA for confidential discussions.

Anticipated Project Phases or Project Plan

Phase 1	Please complete your submission by **February 15, 2023, 11:59 pm PST at** the very latest
Phase 2	Our review of all proposals will be completed by end of March 2023 and scientists will be informed after that.
Phase 3	Potential collaboration starting date in Q2-3/2023.

Submitting a collaboration proposal

- Check the outline of the opn2EXPERTS "Reduce water and energy consumption in downstream bioprocesses" on opnMe.
- Alternatively, you may click the "Get Submission Template" banner to access the material transfer template.
- Follow the instructions to upload your submission document (requires login or registration).
- The upload allows you to attach additional application files if desired.
- You will be able to access your final submitted collaboration proposal in your personal dashboard and follow its review status.
- Please also visit the FAQ section on opnMe.com to learn more about our opn2EXPERTS program.