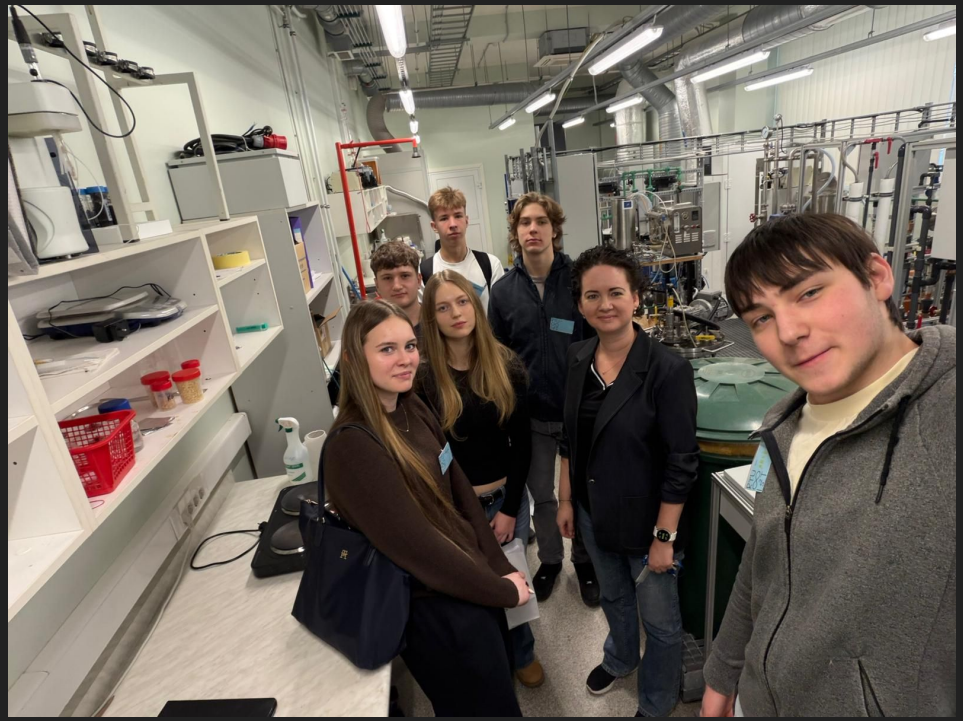

The Institute of Water Systems and Biotechnology (USBI)

History of the Faculty

- Founded in 2005 by Tālis Juhna
- Research Center for Civil Engineering
- The Institute of Water Systems and Biotechnology was established in June, 2020


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Fun facts

- Teamwork → Experiments
- 40-45 people in faculty of USBI
- You can apply for IPQ and ZPD
- Visited 3 labs

Collaboration

- Work with universities from, Norway, Sweden and the Netherlands
- Cat litter pellets
- Work together with “Rīgas Ūdens”

Experiments

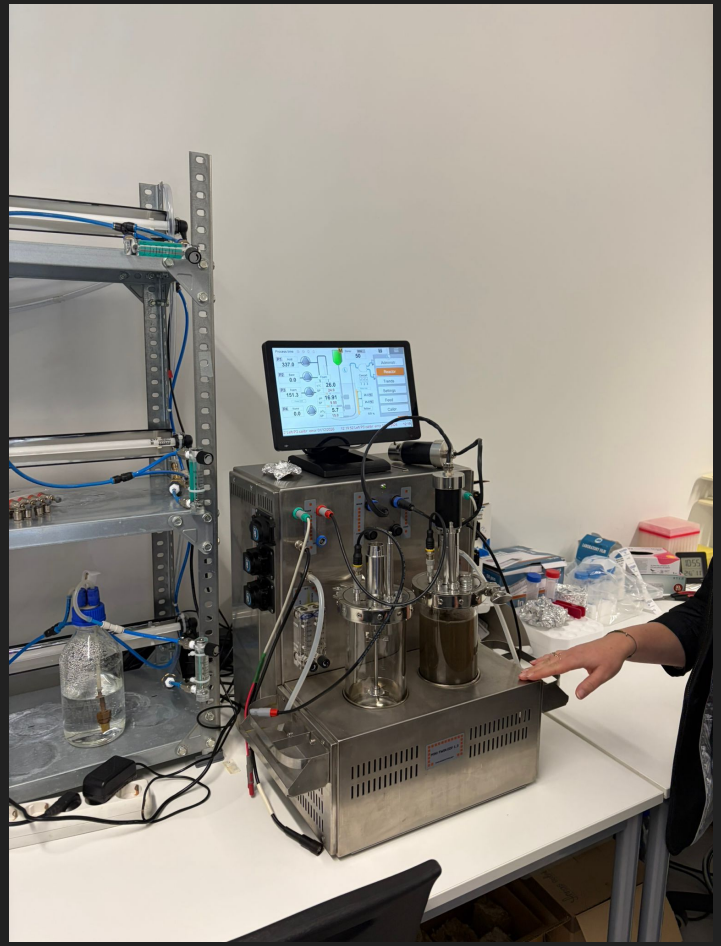
Water Filtration

Mycofiltration Technology: A biological filtration system using **Fungal Mycelium** (Fungi).

The "Double-Capsule" Process: * Inlet Capsule: Receives "Greywater" or contaminated water.

Outlet Capsule: Collects purified water after it has passed through the biological membrane.

Nature’s "Scissors": The fungi secrete powerful enzymes that chemically "cut" toxic molecules into harmless fragments.



Algae research

Purpose:

- For biotechnology
- Sustainability
- Relevant for biomaterials, environmental research, and circular bioeconomy
- This experiment helps optimize growth conditions for further research

DNA Testing

Identifies Microorganisms

Monitors Health: It is used to track diseases (like Covid-19)

Environmental DNA (eDNA): It can tell what fish or animals live in a river just by analyzing DNA fragments floating in the water.

Verifies Cleaning: Used to prove that the **fungal filter** actually removed the "bad" bacteria from the dirty water.

JARGON

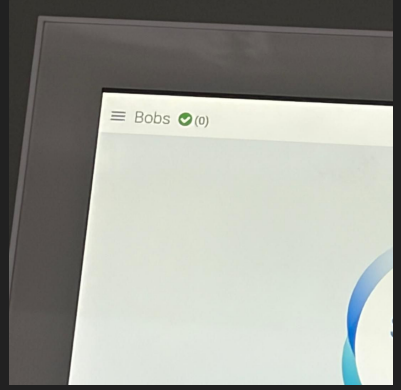
Incubation: Controlled conditions for growth or reactions.

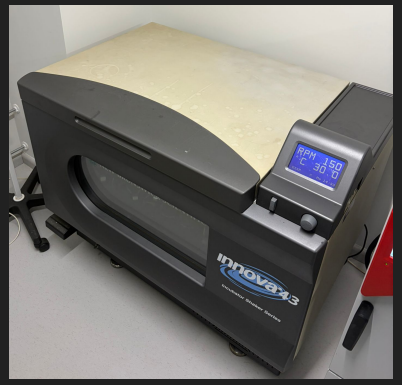
Enzymatic catalysis: Enzyme-driven speed-up of a reaction.

Sequencing cartridge: Disposable unit used to sequence DNA.

Sporulation: Formation of fungal spores.

Inoculum: Starter culture used to begin growth.





Thank you for your attention!