WASTEWATER TECHNOLOGY FACT SHEET

Lab-scale Membrane Bioreactors (MBRs)

School of Life Sciences (FHNW) technology
developed under the EU-funded NYMPHE project

PROBLEM

INEFFICIENT WASTEWATER TREATMENT FOR MULTI-COMPOUND POLLUTION.

Target pollutants:

Municipal wastewater pharmaceutical pollutants: ibuprofen, diclofenac, enalapril, caffeine, atenolol, paracetamol.

TECHNOLOGY

System setup:

1 L MBRs operated with modified OECD medium (400 mL), continuous aeration and stirring.

Operation:

Hydraulic Retention Time (HRT) = 38 h, infinite Sludge Retention Time (SRT) → prolonged microbial adaptation and evolutionary processes.

Function:

Stable conditions allow microbial communities to adapt to stress from pharmaceutical pollutants and enhance degradation efficiency over time.

NYMPHE

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TAILORED MICROBIAL CONSORTIA = ADVANCED WASTEWATER TREATMENT & ENHANCED ECOLOGICAL SAFETY.

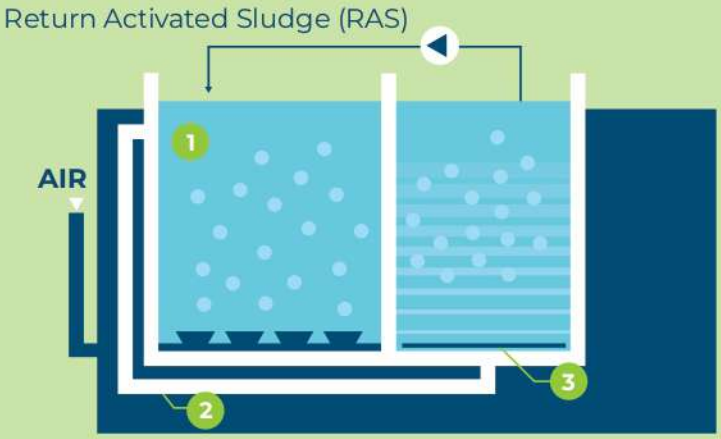
INNOVATION

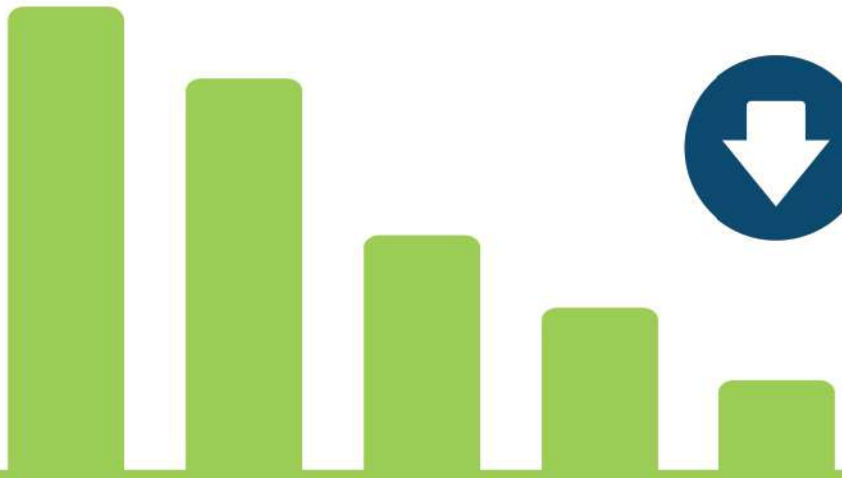
The technology goes beyond conventional systems that target single pollutants at low concentrations.

Simultaneous biodegradation of multiple pharmaceuticals at both low and high concentrations (1–100 mg/l).

Application of infinite SRT enables microbial evolution within the system, enhancing degradation functions.

1. **Bioreactor**
2. **Aeration**
3. **Membrane filtration tank**





RESULTS

REMOVAL EFFICIENCY:

30–100%

UNDER FLUCTUATING LOADS

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