

Academically Anchored. Industrially Connected.



More than 150 forward-thinking organizations have sought biofilm solutions as CBE Industrial Associates.

These relationships ensure our scientists seek solutions to real-world biofilm problems.

Aug 2026

Key Benefits for CBE Industrial Associates

- ❖ Reduced-cost testing projects with priority scheduling
- ❖ Personalized consultation with biofilm experts
- ❖ Free attendance to annual methods workshop
- ❖ Access to vetted state-of-the-art tools for biofilm analysis
- ❖ Objective research opportunities targeting specific interests
- ❖ Recruitment of highly-trained students in biofilm science

Advancing Science While Serving Industry



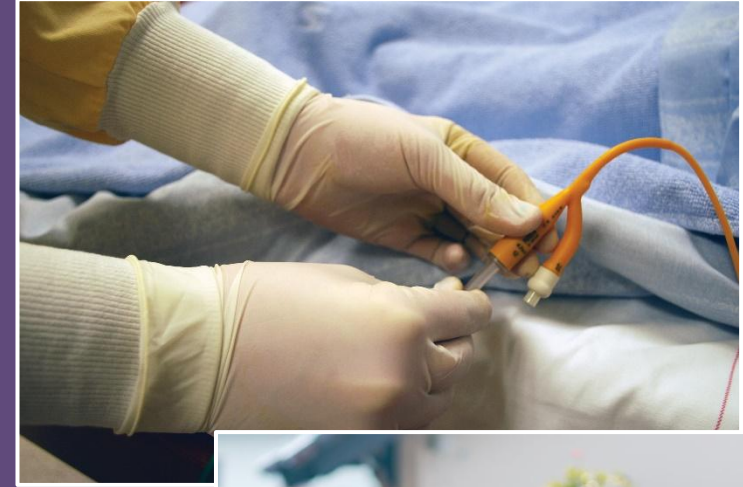
Research Emphasis

- Biofilm Control Strategies
- Energy & Environment
- Health & Medical
- Industrial Processes/Systems
- Standardized Methods
- Water Systems

Why Our Urgency? HEALTH & MEDICINE

Urinary-Catheter Infections ...

- lead to 13,000 U.S. deaths annually
- cause 30 percent of all hospital infections
- add ~\$1 million in treatment costs per day



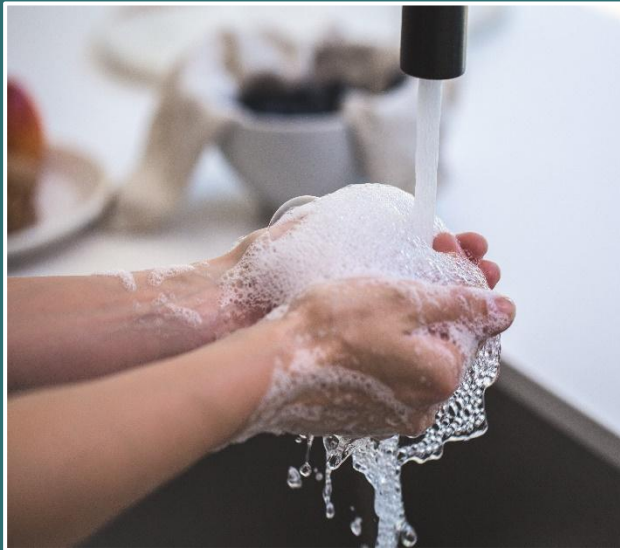
BIOFILM IS THE CULPRIT

There are 296 diabetes-related amputations each day in the U.S.



Why Our Urgency? BIOFILM CONTROL

Biofilms can wreak havoc, especially in home, hospital, food service, and industrial settings, as well as the human body.



Physically removing biofilms can be extremely difficult.

Antibiotics and topical agents are largely ineffective at controlling biofilms.

Why Our Urgency? **WATER SYSTEMS**

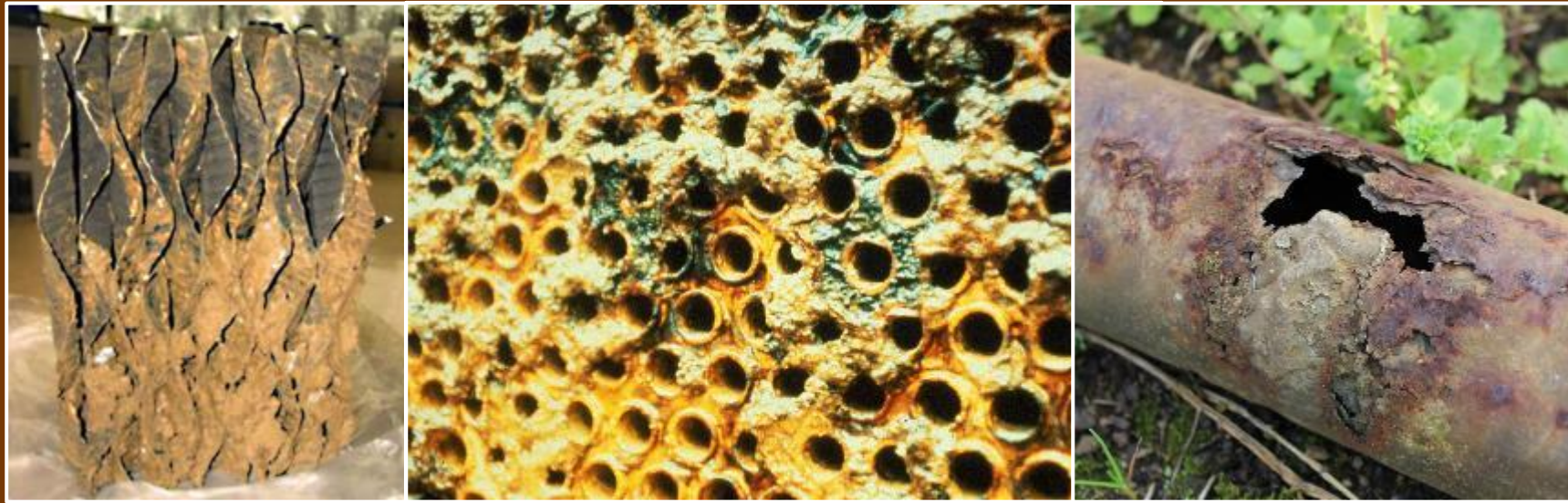


There are 265,000 coliform-based infections each year in the U.S., leading to 3,600 hospitalizations and 30 deaths.

City, state, and federal governments are on pace to spend more than *\$1 trillion* on water and wastewater utilities over the next decade.

Why Our Urgency? **INDUSTRIAL SYSTEMS**

In 2013, the U.S. government and industries spent \$500 billion fighting biofilm-related corrosion.



Product contamination can be deadly for consumers and bring significant financial burden to industry.

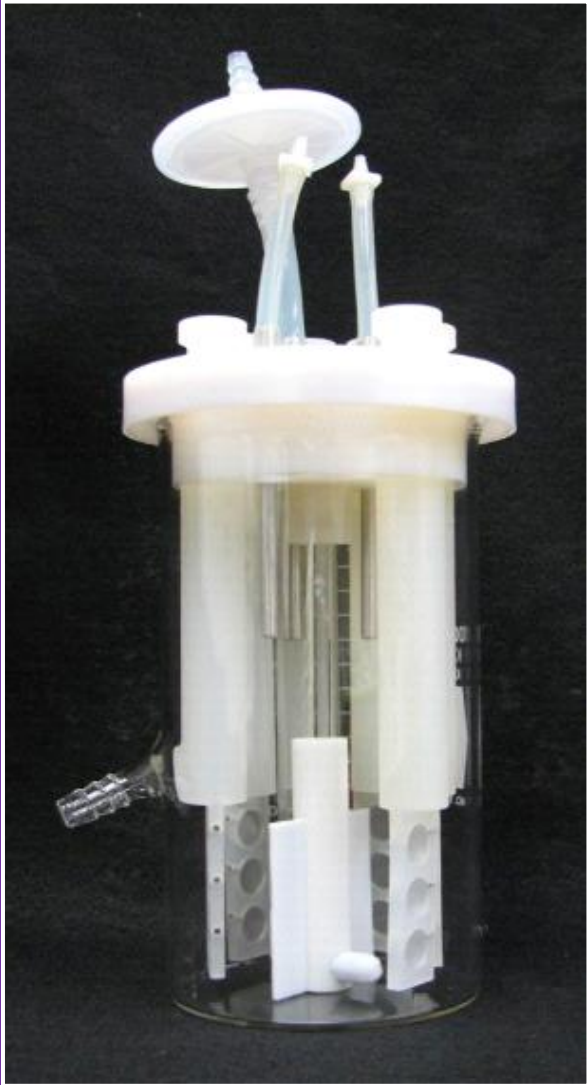
Why Our Urgency? ENERGY & ENVIRONMENT

The CBE engineered a biofilm to seal leaking gas and oil wells, creating efficiencies while limiting environmental damage.

Other promising areas of biofilm research include algal fuels, bio-remediation, and energy-extraction efficiency.



Why Our Urgency? **STANDARDIZED METHODS**



Standardized testing methods ensure results are repeatable and trustworthy.

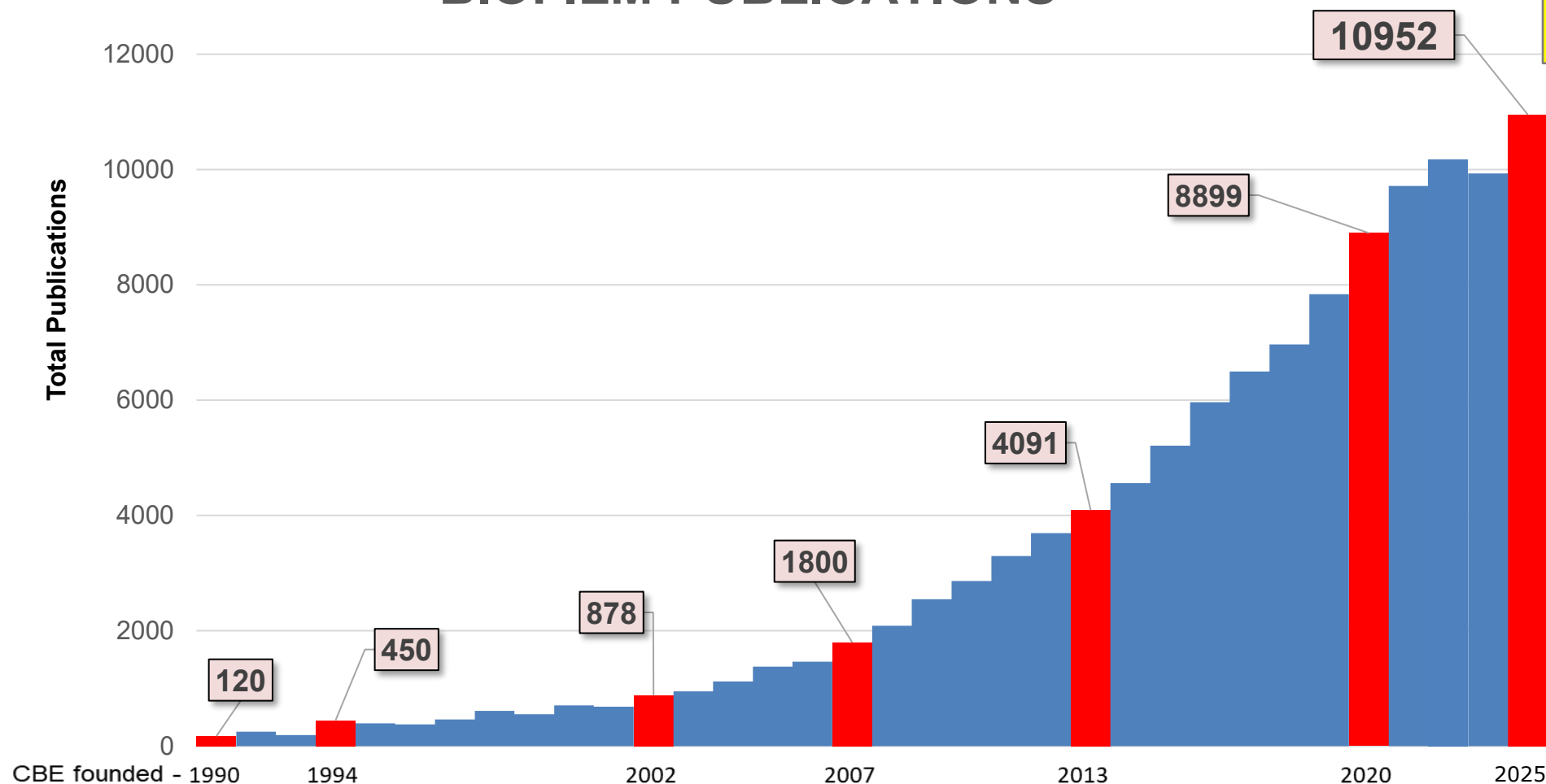
EPA relies exclusively on a testing method developed at the CBE to evaluate anti-biofilm product claims made by manufacturers.

The CBE principal investigator who developed the testing method used by the EPA is also an officer of ASTM International.



Ignited the Field of Biofilm Research

BIOFILM PUBLICATIONS

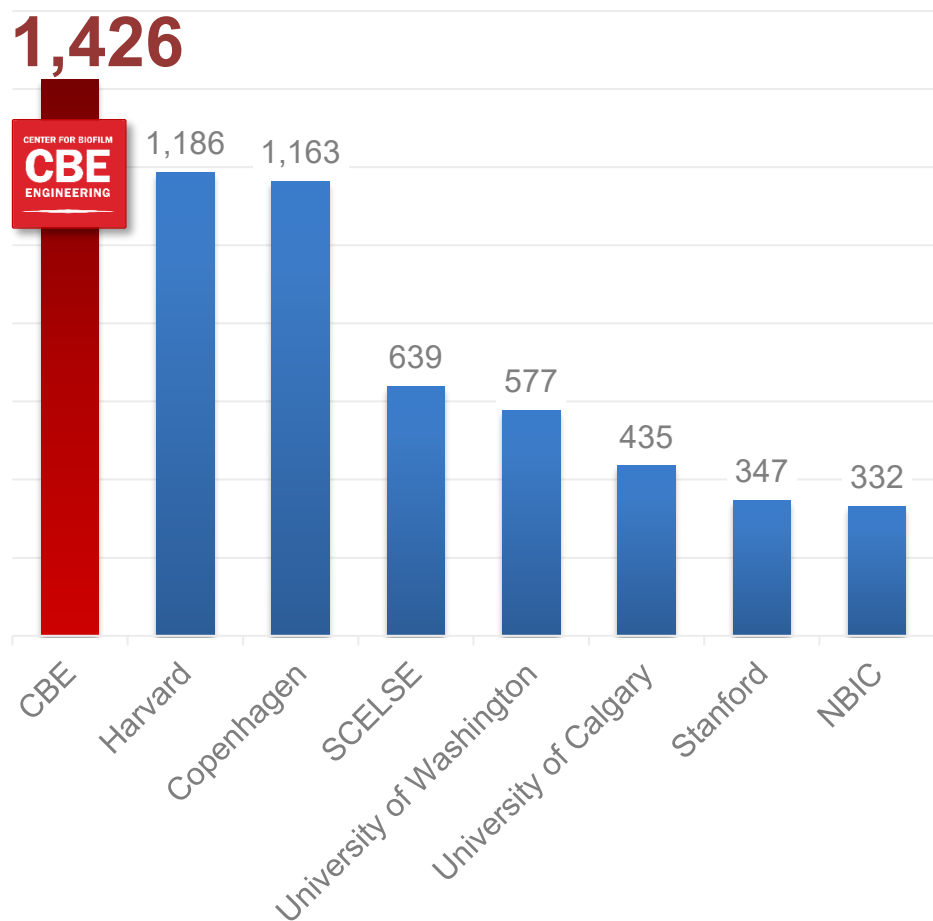


Pubs have doubled approx. every 6 years

'Biofilm' Search: CBE Leads in Publications and Citations

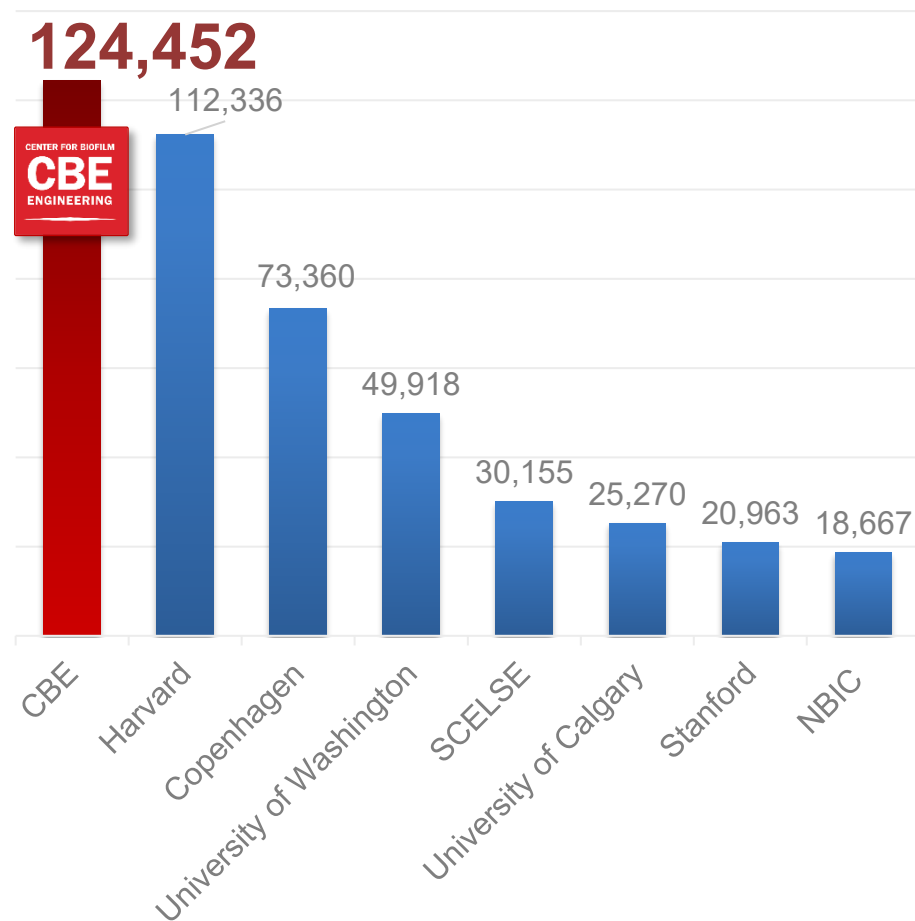
PUBLICATIONS

1990-2025



CITATIONS

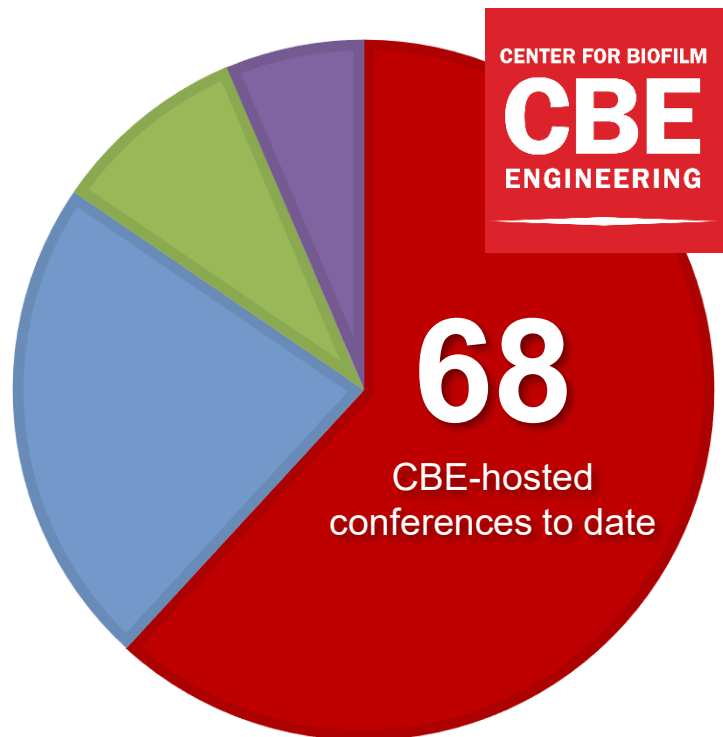
1990-2025



CBE Leads the World in Biofilm Conferences

BIOFILM CONFERENCES

- CBE
- International Water Association
- ASM Biofilms
- EuroBiofilms



The CBE hosts two annual conferences. Each convenes industry representatives and leading biofilm scientists from around the world.



Montana Biofilm Meeting Bozeman, MT

Explores leading-edge research and best practices.



Regulatory Meeting Washington, DC

Places scientists from regulatory agencies, including the U.S. EPA and FDA, in a featured role.

Framing the Future of Biofilm Research

The CBE has trained 1,832 students and visiting researchers between 1990 and 2026.

356

Graduate
Students
(Graduated)

1,076

Undergraduate
Students

400

Visiting
Researchers

Interdisciplinary Collaboration Expands Perspectives

Diversity of disciplines strengthens our understanding of broad, real-world biofilm impacts and opportunities

3D Printing

Fluid-Structure Interaction

Molecular Genetics

Biofuels

Geomicrobiology

Physiology & Ecology

Biostatistics

Industrial Systems

Standardized Methods

Bioremediation

Magnetic Resonance Phenomena

Subsurface Biotechnology

Control Strategies

Mathematical Biofilm Models

Water Systems

Electromagnetic Fields

Medical Biofilms

Web-Based Education

Extremophilic Bioprocessing

Microbe-Mineral Interactions

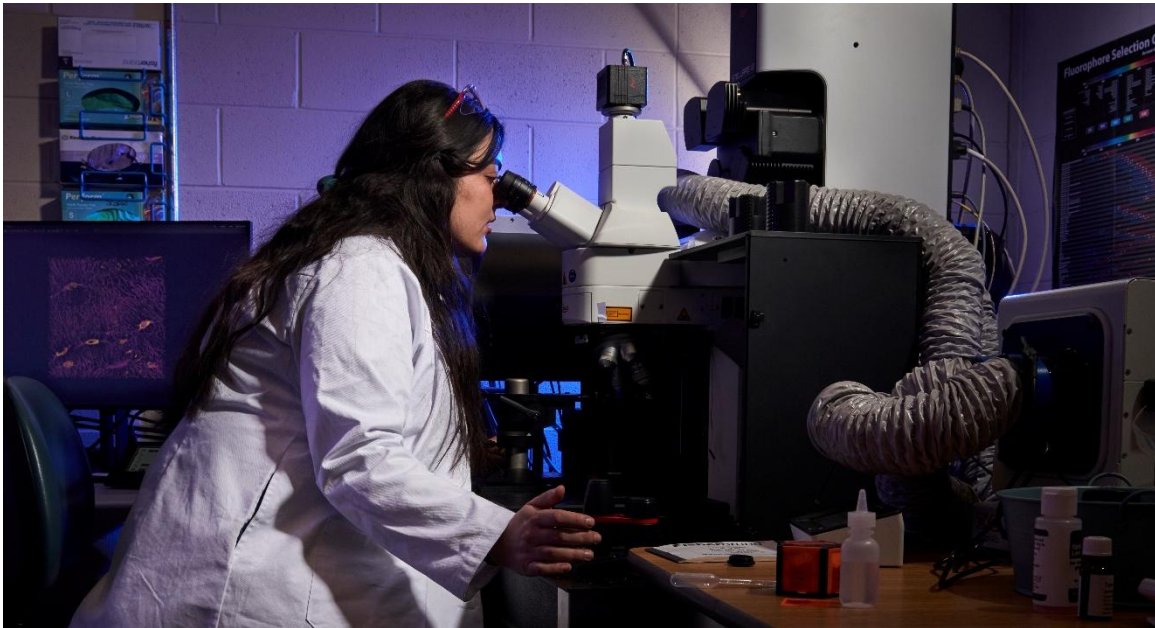
Wetland Treatments

Engineered Living Materials

Microbial Ecology in Cold Temps

Upgraded CBE Bioimaging Instrumentation

*Customized for imaging
diverse intact biofilms while
minimizing artifacts from sample
preparation or imaging*



CBE microscopy equipment includes ...

**Dedicated image analysis
computers and software (Imaris)**

**Leica LMD6 Laser
Microdissection microscope**

**Two Leica Stellaris 8 confocals
with incubation environmental
control**

Two new state-of-the-art confocals, Multiphoton
and with Stimulated Raman Spectroscopy

**Stereomicroscopes
(Leica M 205 FA
Stereomicroscope &
Nikon SMZ-1500 Barrel Zoom
Stereomicroscope w/Color
Camera)**

**Leica Live Cell Thunder widefield
microscope**

Generates confocal-like images via
deconvolution, optimally configured for allow
real-time, high-sensitivity, high-throughput
imaging

**Horiba LabRam Raman confocal
microscope**

**Epifluorescence microscopes
(Leica DM6 and Nikon Eclipse
E-800)**

**Thor Labs Optical Coherence
Tomography (OCT) system**

Fluid Imaging FlowCam

For more detailed information:
www.biofilm.montana.edu
heidi.smith@montana.edu

Scientifically Sound, Repeatable Results

Current industry testing projects

Antimicrobials

Industrial Process

Pharmaceutical Water

Cooling Water

Water

Well Biofouling

Drinking Water

Medical Devices

Wound Care

Dry biofilm

Methods Development

Food Safety

Oil and Gas

Groundwater Contamination

Oral Care

*members
receive
discount rates
on testing
projects

CBE solves your biofilm challenges



- ✓ **Reducing costs** through improved biofilm understanding in your system
- ✓ **Increasing revenue** by exploring biofilm markets
- ✓ **Product testing** using standard test methods developed & validated at the CBE
- ✓ **Protecting your brand** by controlling biofilm related issues



Looking for answers to a biofilm issue?

If your organization is facing biofilm challenges, we look forward to partnering with you as a member of the CBE's Industrial Associates Program.

It starts with a quick conversation to identify specific studies, statistics, or other collaborations.



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