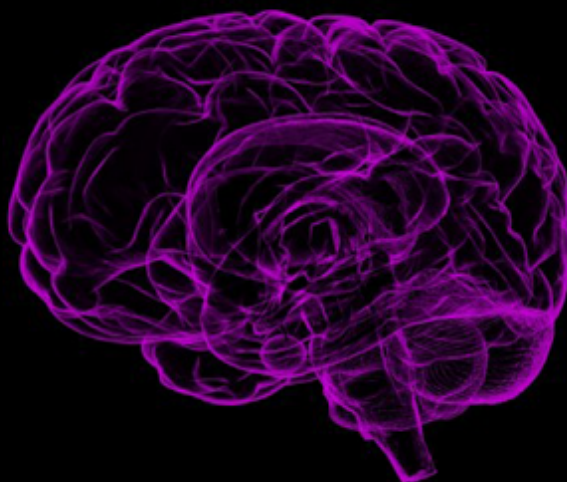




INSTITUTE NEWS



New blood test can detect 'toxic' protein years before Alzheimer's symptoms emerge

Research has shown that the seeds of Alzheimer's disease are planted years, even decades, before the cognitive impairments surface that make a diagnosis possible. Those seeds are amyloid beta proteins that misfold and clump together, forming small aggregates called oligomers. Over time, through a process scientists are still trying to understand, those "toxic" oligomers of amyloid beta are thought to develop into Alzheimer's.

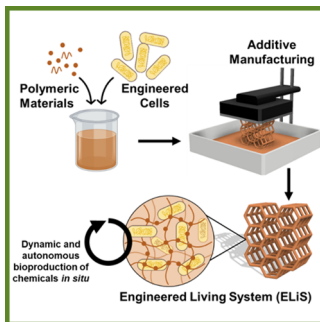
A team led by MoIES faculty member [Valerie Daggett](#) has developed a laboratory test that can measure levels of amyloid beta oligomers in blood samples. As they report in a [paper published in the *Proceedings of the National Academy of Sciences*](#), their test could detect oligomers in the blood of patients with Alzheimer's disease.

RESEARCH HIGHLIGHTS



[Retooling microbes to upcycle CO2](#)

An interdisciplinary team of synthetic biologists will embark on a 5-year, \$15 million project to engineer microbial genomes that transform CO₂ into high-value chemicals. MoES faculty members [James Carothers](#), [Georg Seelig](#), and [Anna Kuchina](#) will lead the project that brings together their expertise in CRISPR gene-expression programs, single-cell RNA sequencing, data-driven design, and carbon-conserving pathway engineering to advance fundamental research into greener, large-scale, bio-based chemical production.



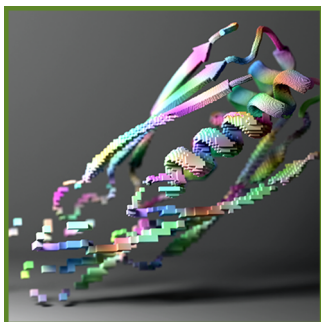
[Engineering living systems for 3D printed sustainable construction materials](#)

An interdisciplinary research team led by UW Chemistry professor and MoES director of education [Alshakim Nelson](#) received \$2 million in funding from the NSF to combine engineered microorganisms with 3D printing to create materials for sustainable built environments. MoES faculty member [Ayokunle Olanrewaju](#) also joins Nelson on the upcoming project.



[Q&A: UW researchers develop a reactor that can destroy 'forever chemicals'](#)

UW researchers, including MoES faculty member [Igor Novosselov](#), have created a reactor (pictured) that can completely break down hard-to-destroy chemicals. You can also listen to the story on [Oregon Public Radio](#).



[AI excels at creating new proteins](#)

Researchers at the [Institute for Protein Design](#) show how machine learning can accelerate solutions for protein design challenges in publications in the journal *Science*. Powerful machine learning algorithms including [AlphaFold](#) and [RoseTTAFold](#) have been trained to predict the detailed shapes of natural proteins based solely on their amino acid sequences.

RECENT PUBLICATIONS

[Are Three-Dimensional Batteries Beneficial? Analyzing Historical Data to Elucidate Performance Advantages](#)

ACS Energy Letters - Corie Cobb

[Novel Perfluorooctanesulfonate-Imprinted Polymer Immobilized on Spent Coffee Grounds Biochar for Selective Removal of Perfluoroalkyl Acids in Synthetic Wastewater](#)

ACS ES&T - Jessica Ray

[Additive Manufacturing of Engineered Living Materials with Bio-Augmented Mechanical Properties and Resistance to Degradation](#)

*Advanced Functional Materials - Alshakim Nelson, **Gokce Altin***

[User-controlled 4D Biomaterial Degradation with Substrate-selective Sortase Transpeptidases for Single-cell Biology](#)

Advanced Materials - Cole DeForest

[Marine Gels \(book\)](#)

Gels - Pedro Verdugo

[Organic Electro-Optics and Optical Rectification: From Mesoscale to Nanoscale Hybrid Devices and Chip-scale Integration of Electronics and Photonics](#)

Industrial Engineering and Chemistry Research - Larry Dalton

[Discovery of a transferrin receptor 1-binding aptamer and its application in cancer cell depletion for adoptive T-cell therapy manufacturing](#)

Journal of the American Chemical Society - Suzie Pun

[Optimization of a Mannosylated Polymer with Endosomal Release Properties for Peptide Antigen Delivery](#)

*J Controlled Release - Suzie Pun, **Dinh Chuong (Ben) Nguyen***

[Theory-Guided Design and Synthesis of Chromophores with Enhanced Electro-Optic Activities in Both Bulk and Plasmonic-Organic Hybrid Devices](#)

Materials Horizons - Larry Dalton

[Co-Assembly of Carbon Nanotube Porins into Biomimetic Peptoid Membranes](#)

Small - Shuai Zhang

[Sustainable valorization of asphaltenes via flash joule heating](#)

Science Advances - Aniruddh Vashisth

[Effects of mechanical cell disruption on the morphology and properties of spirulina-PLA biocomposites](#)

ScienceDirect - Eleftheria Roumeli

**MoIE student authors in bold*

CONGRATULATIONS



**David Baker awarded
Frontiers of
Knowledge from BBVA
Foundation**

UW Biochemistry professor [David Baker](#) received the award for leading efforts that are revolutionizing artificial intelligence for protein design.



**Kai-Mei Fu named
2023 Optica Fellow**

UW Physics and ECE Professor [Kai-Mei Fu](#) was recently named a 2023 Optica Fellow for outstanding contributions to optics and photonics — the study of the fundamental properties of light and harnessing this knowledge in practical application.



**Jim Pfaendtner
receives the 2022
CoMSEF Impact Award**

UW Chemical Engineering professor and chair [Jim Pfaendtner](#) was recognized for his contributions to methods and applications in the field of molecular simulation of interfacial phenomena of biomolecules.

SPRING SEMINAR SERIES

Tuesdays 1:00 - 2:00 PM in Nano Engineering and Sciences (NAN 181)

4/11 | Warren Chan, Professor, Canada Research Chair in Nanobioengineering & Director, University of Toronto

4/18 | Junsuk Rho, Mu-Eun-Jae Endowed Chair Professor, Mechanical & Chemical Engineering, POSTECH

5/2 | Tom Muir, Professor, Chemistry, Princeton University

5/9 | Neel Joshi, Associate Professor, Chemistry and Chemical Biology, Northeastern University

5/23 | Wilson Wong, Associate Professor, Biomedical Engineering, Boston University

5/30 | Antonia Statt, Assistant Professor, Materials Science & Engineering, University of Illinois Urbana-Champaign

6/6 | Andy Geall, Co-Founder and Chief Development Officer, Replicate Bioscience, Inc.



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