



Pacific Northwest
NATIONAL LABORATORY

Environmental Molecular Sciences Laboratory
Director

2018

Introduction

Environmental Molecular Sciences Laboratory (EMSL) is a world-class user facility sponsored by the [U.S. Department of Energy \(DOE\)](#) and its [Office of Biological and Environmental Research \(BER\)](#). Housed on the campus of the Pacific Northwest National Laboratory (PNNL) in Richland, WA, EMSL currently seeks a new Director to lead a dynamic community of researchers and staff in furthering its mission to promote discoveries and accelerated solutions for national energy and environmental challenges.

The Next Director

Reporting to the [Earth and Biological Sciences Directorate \(EBSD\)](#) Associate Laboratory Director (ALD), the EMSL Director will be a key member of PNNL's and EBSD's [scientific leadership](#). Working collaboratively with the EMSL [leadership team](#), the Director will provide strategic scientific and managerial leadership to EMSL's user program.

The EMSL Director is responsible for developing and implementing a vision and strategy that pioneers molecular science discoveries and effectively mobilizes the scientific community to provide the foundations for BER research priorities and our nation's critical biological, environmental, and energy challenges. Essential to this role is the close collaboration and coordination with the leadership of EBSD's other research divisions, other PNNL organizations, and with the broader scientific user community. The EMSL Director acts as a spokesperson for the User Program in interactions with BER and other government agencies. The EMSL Director has accountability for User Program budgets, funding, workforce planning, human resource management, environmental health and safety, and property and facilities management.

This position is responsible for managing the Environmental Molecular Sciences Division within EBSD with the objective of achieving the highest scientific and engineering quality and impact through productivity of our programs, hiring and developing staff, and safe and effective operations, within established budgets and operating metrics. Additionally, the EMSL Director promotes and ensures the quality of research in the Division, enhances existing research programs, and guides the development of new programs. The EMSL Director oversees and provides strategic

direction to the research groups within EMSL and functions as supervisor to members of the EMSL leadership team. While the EMSL Director has primary line authority over the EMSL organization, daily line management activities are primarily the responsibility of the Chief Operations Officer.

Opportunities and Challenges for the next Director

In addition to these key roles and responsibilities in the day-to-day operation of EMSL, the next Director will have the singular opportunity, building upon over 20 years of excellence, to shape and lead EMSL in contributing nationally and globally toward the predictive understanding, analysis, and betterment of our environmental future. Among the many opportunities for the next EMSL Director are:

- Setting a vision for EMSL that simultaneously aligns with the priorities and directives of BER and allows the lab to remain at the forefront of research, discovery, and analysis so as to not only support its sponsor but also inform its direction and perspective;
- Uniting the EMSL community, including staff, users, and the broader scientific community, around a shared direction for the lab's future that reflects the unique capabilities and talent present at EMSL;
- Building and championing systems that foster collaboration between the computational and experimental sides of EMSL, enabling it to strengthen data analysis and use to inform research productivity and prediction;
- Serving as a responsible steward of EMSL's resources, aligning capabilities with stated research and computational goals, allocating resources to recapitalization accordingly, and working to secure additional funding where needed;
- Effectively promoting EMSL's unparalleled capabilities and groundbreaking science to a wide external audience, including lawmakers, educators, sponsors, users, and other scientists, to garner sponsorship and raise awareness;
- Ensuring a safe, productive, and collaborative environment for staff and users that enables a high standard of science and professional accomplishment and encourages continued contribution to the most pressing environmental priorities both nationally and globally; and
- Building and retaining a world-class staff through hiring and fostering a culture of inclusion, support, mentorship, and professional development.

Qualifications and Personal Characteristics

Strong candidates for this position will be proven leaders in biological or environmental-molecular research and discovery and will demonstrate the ability to drive forward a scientific program in a manner that is collegial, inclusive, and forward-thinking. Preferably, candidates should possess a Ph.D. in biology, chemistry, or relevant field and more than 10 years of experience. Additionally, candidates should ideally bring many of the following qualities and experiences:

- Demonstrated capability in line management and program management functions;

- Recognized national and international reputation and record of accomplishment in a relevant scientific and/or engineering field;
- Demonstrated technical knowledge and research experience with environmental and biological sciences;
- Leadership skills to create and articulate a strategic vision within a diverse scientific community;
- The ability to build capability by creating and communicating a clear vision and purpose;
- The ability to develop, motivate, and empower staff and engender a positive learning environment in which all staff can excel;
- Excellent communication and listening skills and the ability to foster the flow of information in all directions in the organization;
- Demonstrated experience developing and executing plans, with the ability to modify plans to respond to changing conditions;
- The ability to interact at the highest level of management, both internally and externally, in a constructive and collaborative manner and in way that appropriately represents the Laboratory;
- The ability to interact effectively with funding agencies, such as the Department of Energy, and secure research funding;
- The ability to manage large research budgets;
- Expertise in developing research projects and completing projects on time; and
- Knowledge of the relevant research sponsors.

Additionally, familiarity with ES&H safety criteria for safe operation of laboratories, in compliance with lab, state, and federal regulations, is required. Field deployments are also an activity in this division, and the successful candidate will be expected to have or gain experience in overseeing such activities, as they hold accountability for safe operations.

About EMSL

History

In the mid-1980s, Dr. William R. Wiley, then director of Pacific Northwest National Laboratory, and his senior leaders proposed a center for molecular science that would bring together theoreticians with experience in computational modeling of molecular processes with researchers from the physical and life sciences. They understood the scientific advances that were happening and would continue to occur in conjunction with the ability to characterize, manipulate, and create molecules. The facility was dedicated in Wiley's honor in October 1996 and EMSL opened on Oct, 1, 1997 as DOE's newest national scientific user facility.

EMSL's design and approach to science was built on two founding concepts: that addressing complex environmental and energy challenges requires a multi-disciplinary interplay among the physical, mathematical, and life sciences; and a user facility created to address a specific problem – molecular aspects of environmental challenges – can develop and provide users a new generation of tools and related expertise needed to advance the fundamental science required to address existing and emerging environmental challenges.

Science Areas

In January 2018, EMSL reorganized its science programs for closer alignment with BER's mission areas increased scientific synergies with BER research programs. This reorganization and realignment led to two new sciences areas:

[Biological Sciences Area](#): The Biological Sciences Area focuses on molecular “machines,” processes, and interactions to improve strategies for designing plants, fungi, and microbes for biofuels and bio-based products and that underpin complex plant and microbial metabolism impacting carbon, nutrient, and elemental cycles.

[Environmental Sciences Area](#): The Environmental Sciences Area focuses on fundamental biogeochemical, plant, microbial, hydrologic, and atmospheric processes to provide mechanistic understanding of these processes, their interdependencies across scales, and their representation in predictive models.

EMSL is focusing its science toward developing predictive understandings that ultimately enable design and control of complex biological and environmental systems of importance to the Department of Energy and its Office of Biological and Environmental Research.

Capabilities

EMSL solves problems by providing an unparalleled integration of expert staff, facilities, and over 150 specialized, state-of-the-art [instruments](#). EMSL's integrated capabilities provide the framework to execute the experimental, analytic, and modeling approaches needed to address and solve key research questions that advance BER science. EMSL's integrated capabilities include: 1) Theory and Simulation, Data Analytics, and Visualization, 2) Proteomics, Metabolomics, and Transcriptomics, 3) Bioimaging and Structural Analysis, 4) Cell Spatial and Temporal Dynamics, 5) Isotope and Chemical Analysis, and 6) Plant, Aerosol, and Soil Systems.

Some of the premier instruments can be remotely accessed by EMSL users from outside institutions or remote locations (e.g., the high-performance computing system and some NMRs) and run 24/7, but most of the instruments require the support of expert staff, and users are actively encouraged to bring their experiments onsite to work side-by-side with the EMSL staff. EMSL is also developing instrumentation that can be deployed outside the building in “field campaigns.”

EMSL opened their Quiet Wing in 2011; this unique research environment houses an integrated suite of ultrasensitive microscopy instruments. The Quiet Wing protects against acoustic noise, floor vibrations, air flow, temperature fluctuation and electromagnetic interference, and enables users to apply these instruments for studying fundamental, atomic-level reactions relevant to catalysis, energy storage, subsurface science, and microbial and plant biology.

Mission and Achievements

EMSL is strategically aligned with the overall mission of the U.S. Department of Energy to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions. Within DOE, EMSL also addresses the missions and strategic directions of the DOE Office of the Undersecretary for Science and Energy, the [DOE Office of Science \(SC\)](#), and BER.

For BER, EMSL seeks to enable users to obtain a systems-level understanding of how genomic information is translated into functional capabilities of living systems to enable prediction or redesign of metabolic processes for sustainable bioenergy and environmental purposes and to understand fundamental molecular-scale properties of natural and anthropogenic inputs to improve predictions of key environmental and atmospheric processes.

EMSL has seen [over 20 years of scientific advancement and achievement](#) in support of its various directives. Among these include: the discovery of stable gold atom clusters (the first known hollow metallic equivalent of the famous “buckyball”); the first whole-organism computer model of cyanobacteria that predicts the genes central to capturing energy from sunlight; and the development of a new paradigm for organic aerosol particle formation, volatility, and microphysics using EMSL’s unique SPLAT (single particle laser ablation time-of-flight) mass spectrometer. EMSL developments have also led to the advanced omics-based analytics now incorporated into laboratories around the world; these protocols and methods have been used in EMSL to gain insight into over 150 different species spanning viruses and very small bacteria to complex plants and microbial communities.

In addition, EMSL is advancing technology with 136 patents, 16 software copyrights, 17 active technology licenses, nine R&D 100 Awards, and eight Federal Laboratory Consortium Technology Transfer Awards. It has supported small businesses on more than 50 DOE Technical Assistance Program projects. Engaged scientists at EMSL provide scientific leadership worldwide with service and awards at the laboratory, national, and international levels, and through professional society fellowships and leadership positions. Staff scientists and 700 annual visiting “users” have produced more than 6,000 scientific publications. Their work has been cited more than 200,000 times by scientists building on the work done at least in part at EMSL. More information about EMSL’s scientific impact can be found [here](#).

Planning and Governance

EMSL’s strategic plan, refreshed in 2018, is a 10-year plan that presents science challenges EMSL will undertake with its users and looks ahead to specific goals and how to achieve them. Under the leadership of the new Director, EMSL will have the opportunity to refine this important document and develop a vision that builds on EMSL’s historic accomplishments and charts a path for the future. Copies of the strategic plan will be available in September 2018.

Working closely with EMSL’s leadership team, the User Executive Committee (UEC) is responsible for conducting the regular business of the EMSL User Organization (EMSLUO) and is charged with providing objective, timely advice and recommendations to the EMSL Director and [management team](#) related to matters affecting the EMSLUO. Additional details regarding the EMSLUO and UEC responsibilities are in the [charter](#).

Budget

The annual budget for EMSL Operations in FY 2018 was \$44.7M. From this budget \$6M was converted to Capital funding to start the recapitalization of EMSL and the purchase of new instrumentation. The recapitalization of EMSL is driven by EMSL’s Strategic Plan, which outlines the scientific and technological directions of EMSL and the user community for the next several years. The budget for EMSL is expected to be stable into FY 2019.

The scientific staff in EMSL are partially supported by EMSL Operations for approximately 50% of their time with the remainder of their support from their own externally funded research projects. EMSL staff can have up to 20% access of the instrumentation to conduct their own research. This allows staff to focus on collaboration with our user community and to develop their own scientific expertise.

About the Associate Laboratory Director

[Allison Campbell](#) is the Associate Laboratory Director for Earth and Biological Sciences at PNNL. In this role, she sets the vision and strategy for PNNL's research in support of BER and National Institutes of Health. Allison leads a research directorate of more than 530 staff members.

Prior to this role, she served for more than 10 years as Director of EMSL. She led significant scientific progress that was demonstrated through publications of users and EMSL's experts as evidenced by more than 3,555 peer-reviewed journals with an h-index of 41. Allison also managed the rapid deployment of more than 30 new instruments funded with \$60 million from the American Recovery and Reinvestment Act, and she oversaw construction of a Quiet Wing that houses a unique suite of high-resolution, advanced microscopes in EMSL. Under her leadership, innovative solutions and enhanced understanding of problems related to atmospheric aerosols, feedstocks, global carbon cycling, biogeochemistry, subsurface science, and energy materials emerged from EMSL.

In 2013, the American Association for the Advancement of Science elected Allison a Fellow for her work in the "synthesis of thin films for ceramics and biomaterial development." She also has testified before the House of Representatives Committee on Science and Technology regarding the value of research at DOE labs

In 2016, Allison was elected by the American Chemical Society's membership to serve as the president-elect. She served as president of the society in 2017 and is now serving as immediate past-president; she has also served on the board of directors during that time.

Allison earned her Ph.D. in physical chemistry from State University of New York at Buffalo and a B.A. in chemistry from Gettysburg College in Pennsylvania.

About the Pacific Northwest National Laboratory

For more than 50 years, PNNL has pushed the boundaries of science. Its discoveries and innovations have strengthened the nation's scientific foundations and have provided solutions to some of the nation's most complex problems in energy, the environment, and national security. PNNL researchers are recognized worldwide for making fundamental discoveries in the atmospheric, biological, chemical, computational, and materials sciences. They pioneered CD and DVD technology, which revolutionized data storage, and engineered the technology used in airport scanning systems that make air travel safer. Currently, PNNL scientists and engineers are helping create a more reliable electric grid, and advancements they've made in catalysts are enabling industry to create engines that run cleaner and more efficiently. Along with its partners in academia, industry, and government, PNNL will no doubt continue to enable the world to live prosperously, safely, and securely.

PNNL is comprised of 4,486 scientists, engineers, and professionals and did \$987 Million in R&D expenditures for FY 2017. Sponsors include the U.S. Department of Energy, U.S. Department of

Homeland Security, and other federal, state, and local agencies. Key partnerships include scientists, engineers, and other professionals within academia, other national laboratories, and industry.

Richland, WA

EMSL and PNNL are located in the City of Richland, which is found at the confluence of the Columbia and Yakima Rivers in southeastern Washington. Sitting on the "desert" side of Washington, Richland enjoys more than 300 days of sunshine a year. Together with the nearby cities of Pasco and Kennewick, it is often referred to as part of the "Tri-Cities," where the Columbia, Snake, and Yakima Rivers meet before heading to the Pacific Ocean. EMSL is located on the north Richland campus, most of which is just a short walk away from the Columbia River. Richland is roughly a 45-minute flight from Seattle or 4-hour drive from Seattle or Portland.

Inquiries, Nominations, and Applications

For best consideration, inquiries, nominations, and applications should be sent in confidence to:

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PNNL is an Equal Opportunity/Affirmative Action Employer that is committed to hiring a diverse, talented workforce. EOE Disability/Vet/M/F/Sexual Orientation/Gender Identity. Staff at PNNL must be able to demonstrate the legal right to work in the United States.