



Pacific Northwest
NATIONAL LABORATORY

Environmental Molecular Sciences Laboratory
Deputy of Science

2019

Introduction

Environmental Molecular Sciences Laboratory (EMSL) seeks an accomplished and dynamic scientist to join EMSL as Deputy of Science. This person will join EMSL's senior leadership team and tackle some of the most important scientific challenges of today, helping to shape national strategies and priorities for new areas of science related to energy and the environment.

EMSL is a world-class user facility with an international reputation for ground-breaking fundamental science discoveries supported 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 Deputy of Science 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 Deputy of Science

The EMSL Deputy of Science will be a key member of EMSL's [leadership team](#) and will lead in shaping and implementing its scientific program. Additionally, the Deputy of Science will provide strategic scientific and managerial leadership to EMSL's user program and to the EMSL division, with primary responsibilities to include:

- Working with sponsors to bolster financial support for current research and new science areas within the division;
- Defining core science areas for the EMSL division;
- Aligning resources and capabilities with the scientific vision;
- Leading the annual science areas calls for user proposals;
- Communicating EMSL's core science areas and successes to the broader scientific community;
- Developing and supporting communications strategies to attract users and collaborators;
- Mentoring and developing teams within EMSL;
- Supporting career development for staff and scientists within EMSL;

- Establishing and building relationships with new research partners;
- Facilitating reorganization and managing change;
- Supporting budget planning and prioritization; and
- Interfacing with current and potential users.

Opportunities and Challenges for the Deputy of Science

In addition to these key roles and responsibilities, the incoming Deputy of Science will be in a unique position to strengthen and shape EMSL's contributions to scientific discovery, solidifying the lab's place among leading research institutions nationally and globally and further distinguishing EMSL as a world-class scientific hub working toward predictive understanding, analysis, and betterment of our environmental future. Working alongside the new Director and building upon 20 years of excellence, the next Deputy of Science will seize the opportunity to:

- **Develop a distinctive and forward-looking scientific vision for the EMSL division and user program** – The incoming Deputy of Science has the singular opportunity to assess and cultivate EMSL's core scientific strengths and leverage its unique capabilities and resources to address pressing areas of scientific concern. Illuminating core areas of excellence, the Deputy of Science will have the opportunity to champion exciting new cross-disciplinary initiatives that creatively engage the broader PNNL community, appeal to current and new sponsors, and help elevate EMSL as a model for other DOE user facilities and leading-edge research institutes. She/he/they will set a bold science vision and have the opportunity to take the needed risks and measured steps to push EMSL into new scientific territories.
- **Execute EMSL's science mission and roadmap** – Upon further defining EMSL's core scientific strengths and direction, the Deputy of Science will assist the Director in determining EMSL's needs in science, technology and computing, as well as other key integrative areas that will ensure EMSL's efficiency and excellence in future scientific endeavors. She/he/they will lead the implementation of science and technology road maps meant to chart the steady growth, utilization, and management of resources and plan for future investments in science and technology.
- **Provide the scientific focus to guide internal reorganization, team integration, and personnel development** – The Deputy of Science will support the internal change and reorganization efforts, supporting the retention and development of staff and scientists, developing and empowering group leads, and facilitating team collaboration and cooperation.
- **Build visibility for the EMSL user facility internally and externally** – In concert with efforts to strengthen and define EMSL's core areas of research and scientific contribution, the Deputy of Science will take the lead on communicating EMSL's goals and successes as a top-tier research and user facility. Working with the Director to improve communications and marketing strategy, the Deputy of Science will have the opportunity to shape messaging within PNNL to build awareness of the division's critical contributions while simultaneously demonstrating and promoting EMSL's invaluable position in the field. The Deputy of Science will expand EMSL's networks and sphere of influence to encompass a broad range of new partners, supporters, and collaborators.

Qualifications and Personal Characteristics

The next Deputy of Science will be a highly regarded senior researcher in the molecular sciences with deep knowledge of BER's scientific mission and an extensive professional network of collaborators and colleagues. She/he/they will be eager to develop a broad-scale scientific vision for EMSL and lead and support the work of a large group of talented scientists and researchers. A Ph.D. in a relevant field is required. Additionally, the successful candidate will have many of the following qualities:

- Leading-edge vision and the desire to ask and answer emerging, large-scale scientific questions;
- The ability to translate strategic vision into actionable steps and outcomes;
- A record of managing through times of change;
- A team-oriented leadership approach and ability to be collaborative and collegial;
- Demonstrated experience building and leading research programs;
- Familiarity with DOE/BER and its science areas and directions;
- A talent for making strategic decisions, identifying key priorities, and setting aspirational and attainable goals;
- Credibility within the scientific community and the ability to build trust internally and externally;
- Superb organizational skills and ability to manage conflicting demands on time and resources;
- Experience communicating and marketing complex scientific concepts to a wide range of audiences;
- A record of motivating, mentoring, and empowering staff and team members;
- The ability to ask questions, be curious, challenge status quo, and lead innovation;
- Experience incorporating computational approaches and predictive analysis into a scientific program;
- A broad knowledge base within different areas of science and a record of staying engaged in new developments within the scientific community;
- The ability to anticipate changes in how science is being approached and conducted;
- An earnest passion for the work and mission of EMSL and the ability to be honest, open-minded, and reflective;
- Excellent communication and diplomacy skills and an engaging and dynamic presence;
- Ability to inspire sponsors and users to partner with EMSL and support its research and scientific directions;
- A diverse portfolio of successful scientific projects funded by different agencies;
- Record of leading multidisciplinary teams within a complex organization; and
- A willingness to travel on behalf of EMSL.

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 that 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 and increased scientific synergies with BER research programs. This reorganization and realignment led to two new sciences areas:

Biochemical Pathways: The **Biochemical Pathways Area** focuses on elucidating and harnessing the biochemical pathways that connect unknown gene functions to complex phenotypic responses through a deep understanding of interactions within cells, among cells in communities, and between cellular membrane surfaces and their environment for microbes (archaea, bacteria, algae), fungi, and plants. Research supported by this area focuses on improving mechanistic understanding of how molecular and genetic information is translated into phenotypic responses that cross spatial and organizational scales: biological machines, cellular components/compartments, whole cells/organisms, consortia, and multispecies communities. This understanding will encompass experimental observations, accurate metabolic reconstructions and predictive models, and thereby improve strategies for designing plants, fungi, and microbes for biofuels and bio-based products, as well as unravel the complexities of carbon, bio-nutrient, and elemental cycles within cells and their immediate environment.

Environmental Molecular Transformations: The **Environmental Molecular Transformations Area** focuses on the mechanistic and predictive understanding of molecular transformations effected by physiochemical, ecological, hydrological, biogeochemical, plant and microbial processes in above- and below-ground terrestrial and subsurface ecosystems, the atmosphere, and their interfaces. EMSL provides the experimental, computational, and simulation expertise to investigate cycling, transformation, and transport of critical bio-nutrients, elements, contaminants, and atmospheric aerosols. Coupled experiment and modeling approaches will accelerate mechanistic understanding of soil-microbe-plant-atmosphere molecular processes and their interdependencies, ultimately informing models of land-atmosphere interactions at larger scales.

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 more than 150 specialized, state-of-the-art [instruments](#). EMSL's integrated research platforms 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 research platforms include: 1) Omics, 2) Bioimaging, 3) Cellular Dynamics, 4) Biogeochemical Transformation; 5) Isotope and Chemical Analysis, and 6) Molecular Plant Phenotyping.

While some of EMSL's premier instruments can be remotely accessed by users from outside institutions or remote locations (e.g., the high-performance computing system and some NMRs) and run 24/7, the majority 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. 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

About the Director

[Dr. Douglas Mans](#) joined EMSL as Director in April 2019. He oversees the entire EMSL user program and is the primary interface with BER, PNNL, and the user community for science, management, and operations of EMSL. He establishes a scientific vision to attract outstanding staff scientists and users to EMSL facilities and programs, promotes innovative research, and fosters the creation of robust scientific teams and communities. He leads more than 160 staff members in growing EMSL’s reputation as a premier scientific user facility.

A biopharmaceutical strategic science and technology expert, Dr. Mans has more than 13 years of experience in the pharmaceutical industry. Before joining EMSL in 2019, he was Innovation Director at Janssen Pharmaceuticals managing a portfolio of global external innovation projects and collaborations starting in 2017. Dr. Mans spent most of his career at GlaxoSmithKline, a multinational pharmaceutical company. He started in 2006 as an Investigator/Principal Scientist. He held several management positions of increasing responsibility at GSK including Innovation Seeker, Global Director of Continuous Processing, Asset Management Lead, and Global Director for Chemical Catalysis and Novel Methods. In 2016, he was part of a team at ViiV Healthcare, a GSK subsidiary, developing innovative solutions to challenges associated with HIV treatments and patient support.

Executive Committee

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 2020.

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 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.