



Joseph Provost , Ph.D.
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Joseph Provost is currently a Professor of Biochemistry and Molecular Biology at the Department of Chemistry, Minnesota State University Moorhead. He received his Bachelor's degree in Chemistry from Bemidji State University and his doctorate in Biochemistry and Molecular Biology from the University of North Dakota School of Medicine. Dr. Provost did his post-doctoral work as a Howard Hughes Medical Institute Research Associate in the laboratory of Dr. John Exton at Harvard University in the department of Molecular Physiology and Biophysics.

While teaching 12 contact hours (four classes) each semester, advising students and being involved throughout campus and the community on many committees, Dr. Provost has maintained a successful research program where he has been funded with nearly \$1,200,000 in awards from the Autism Foundation, the National Science Foundation, the National Institutes of Health, the State of Minnesota and private foundations.

For the past ten years Provost focused on how G protein coupled signaling pathways cross-talk to signal to growth factor cascades. These signaling pathways in turn regulate the activity of the Sodium Hydrogen Exchanger (NHE). While NHE regulation is important for intracellular pH homeostasis, a second role for the transporter has also recently gained prominence. The dynamic restructuring of the cytoskeleton, and the migration and invasion of cancer cells is in part impacted by a second biochemical function of NHE. Furthermore, the Dr Provost has initial evidence that NHE may also be involved in the regulation of several proteases including urokinase type plasminogen activator and one or more matrix metalloproteinases. Both are proteins that are key functions of how an aggressive tumor moves. A new direction in the Provost laboratory is on understanding the biochemistry that may cause Autism. In 40-60% of diagnoses, Autism patients are deficient in Tuberous Sclerosis Complex. This is a newly discovered protein that can activate two pathways that both lead to NHE regulation. In all of these efforts undergraduates are fully involved in all phases of the experimentation.

Dr. Provost is an active member of Project Kaleidoscope Faculty for the 21st Century. In the past few years he helped facilitated many workshops throughout the country on teaching investigative laboratories and incorporating research into the undergraduate curriculum as well as give workshops on how to conduct undergraduate research. Dr Provost is on the board of directors for the Minnesota Academy of Science and is a regular organizer for the Academies Annual Meeting. Dr. Provost also serves as the Northwest Regional Co-Directors for the American Society of Biochemistry and Molecular Biology (ASBMB) Undergraduate Biochemistry and Molecular Biology project and is a member of the ASMBB Education and Professional Development Committee. In these positions Provost is responsible for the coordination of resources for biochemistry and molecular biology courses in the nation. For the past six years, Provost is one of the organizers for the undergraduate poster session and runs one of the sessions at the national meeting. Dr Provost is on the editorial board for several journals including Chemical Biology & Drug Design, Biochemistry and Molecular Biology Education and is a regular Panel member reviewing research and teaching grants at the National Science Foundation and the National Institutes of Health.

The primary purpose for faculty members at MSUM having ongoing research projects is to provide undergraduates a meaningful research experience. In the past ten years Dr. Provost has had 69 different students participate in research for a total of 94.5 years of research experience. Of the students who have graduated from Dr. Provost's laboratory, over 39 have continued on to graduate or professional school. Collectively, these students have been co-authors on several refereed publications, 36 nationally presented abstracts and well over 65 abstracts at the Minnesota Academy of Sciences or Tri Beta Meetings.

Dr. Provost is also the CEO of DragonTech. DragonTech is biotechnology company who provides R&D, federal policy consulting, purification of biological materials and validation services for at Universities and Pharmaceutical / Biotechnology companies. DragonTech provides outsourcing resources for its clients. DragonTech Clients have included the USDA, Aldevron, Clinical Supplies Management, Ependorf 5', Prometic, Qiagen, The Mayo Clinic and many other colleges and universities. DragonTech can supply purified protein, DNA, cell based assays and many other needs.



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