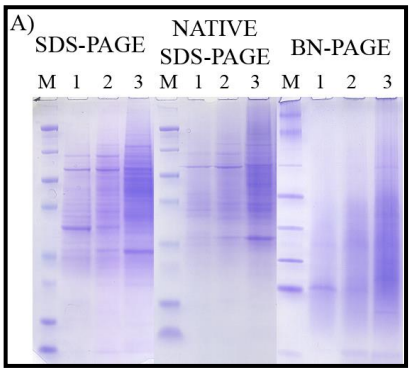
UWM RESEARCH FOUNDATION **Technology Overview**

Native SDS PAGE

OTT ID #1313

TECHNOLOGY



There is a great need for a robust method that combines the electrophoretic resolution of proteins with retention of their functional behavior. The laboratory of Dr. David Petering has devised a new method of sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) in which proteins can be well separated during electrophoresis as well as maintain their native 3-dimensional conformations and functional activity. This native SDS-PAGE method will allow for important new experiments to be conducted in the proteomic field and a better understanding of proteins such as isolation from the gel of native proteins for further analysis, direct in-gel assay of enzymatic activity, direct in-gel survey of binding activity of proteins with small molecules (e.g. drugs, toxic agents) and macromolecules (e.g. protein binding partners including antibodies, cognate DNA binding sites), and isolation of protein for subsequent mass spectral identification.

In traditional SDS-PAGE the proteins are well separated but are denatured such that the structure and function are no longer adequately maintained for carrying out further functional assays. The current commercial alternative, known as native PAGE, enables researchers to maintain protein function and structure, but the technique leads to poor separation and smearing of protein during electrophoresis. Our easy to implement Native SDS-PAGE method has retained the enzymatic activity of a number of enzymes tested, and has also maintained protein complexes in a bound state. This new technology will allow for multiple new applications in drug discovery, proteomics, protein therapeutics, and toxicology.

FEATURES/BENEFITS

Better Resolution	Activity Maintained	Quick to Market	Inexpensive Development	Numerous Applications
• Electrophoretic resolution is superior to Native PAGE methods	• Researchers can conduct further experiments with the electrophoresis products unlike with standard SDS-PAGE	• Only small adjustments to sample buffer and run buffers and SDS-PAGE kits currently in production will be required for the new product	• Minimal costs would be necessary to develop the "kit" for distribution	• Useful for proteomics work, drug discovery, diagnostics, personalized medicine, protein-based therapeutics, and toxicology

INTELLECTUAL PROPERTY

U.S. Patent 9,709,526

This technology is part of an active and ongoing research program and is seeking partners for development of the final product. It is available for developmental research support/licensing under either exclusive or non-exclusive terms.

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MARKETS

Electrophoresis is cited as one of the most frequently used separation and analysis techniques in life science laboratories. BCC Research reports that the life science tools and reagents market reached $48.2 billion in 2015 and is projected to reach $58 billion by 2020.

Proteomics research is utilized by research laboratories in the field of pharmaceutical, life sciences, and biotechnology. The global proteomics market is predicted to reach $21.87 billion by 2021 according to MarketsandMarkets Research. The global proteomics market exhibits potential for significant growth and is propelled by the increasing need for personalized medicine, R&D expenditure, technological advancements, and increased funding for proteomics projects. Protein-based therapeutics have been shown to be highly successful in the clinic and is one of the fast-growing markets globally. Better techniques in the life sciences such as native SDS-PAGE will enable these markets to continue to advance and grow.

INVENTORS

David Petering, William Wobig, Andrew Nowakowski

Dr. David Petering Is a University Distinguished Professor at the University of Wisconsin-Milwaukee in the Department of Chemistry and Biochemistry. He is internationally recognized as an expert on metals in biological systems. His laboratory investigates the metabolism of nutritionally essential metals, focusing on zinc trafficking, including the role of a major zinc protein, metallothionein, and the chemical biology of fluorescent zinc sensors. He studies the mechanisms of toxicity of toxic metals, particularly how cadmium causes kidney toxicity. Lastly, Dr. Petering is a major figure in research into the modes of action of metallodrugs. All three areas benefit from the discovery of native SDS-PAGE. Dr. Petering is a director of the National Institute of Environmental Health Sciences Children's Environmental Health Sciences Core Center that is joint between UWM and the Children's Research Institute of Children's Hospital and Health System and the Medical College of Wisconsin.

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