# Kevin Michael Ulmer, Ph.D.

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## SUMMARY OF EXPERIENCE & ACCOMPLISHMENTS

- Serial biotech entrepreneur and inventor
- Seasoned biotechnology executive with over 30 years of experience, especially with start-ups
- Extensive knowledge and expertise in all 'omics technologies
- Highly creative and inventive with broad multidisciplinary scientific background
- Proven track record of anticipating major technology trends and innovations
- Internationally recognized for ability to simply explain complex technology to lay audiences

## PROFESSIONAL ACTIVITIES

**Seaquester.org**
Woods Hole, Massachusetts
Founder, Chairman and Executive Director: November 2012 to present.
- Carbon sequestration in the ocean
- ATOEM – Autonomous Transient Ocean Event Monitoring submersible platform

**SomaLogic, Inc.**
Boulder, Colorado
Senior Consulting Advisor: August 2011 to August 2013. (full-time)
- µSOMA™ microfluidic assay development

**Marine Biological Laboratory**
**The Josephine Bay Paul Center for Comparative Molecular Biology & Evolution**
Woods Hole, Massachusetts
Visiting Investigator: November 2010 to June 2011.

**Woods Hole Oceanographic Institution**
**Marine Chemistry & Geochemistry** (**Christopher M. Reddy** – sponsor)
Woods Hole, Massachusetts
Guest Investigator: July 2010 to present.
- Technology commercialization – Office of Applied Oceanography
- Biofuels from marine microalgae
- Marine "omics"
- *In situ* "omics" instrumentation
- Global Biogeochemical Flux Observatory (**GBF-O**)

**Genome Corp**
East Sandwich, Massachusetts
Chief Executive Officer: December 2009 to present.

**Complete Genomics, Inc.**
Mountain View, California
Consulting Scientist: December 2008 to March 2009 (full-time)
- Genome Sequencing Center design & operations planning

**GenEncap, Inc.** (formerly **Genome Corporation**)
Providence, Rhode Island
Founder, Director, President & Chief Science Officer: July 2007 to present
- Massively Parallel Sanger DNA Sequencing
- Microencapsulation
- Flow Focusing
- $750K in seed funding from the **Slater Technology Fund**

**Really Tiny Stuff, Inc.**
Cohasset, Massachusetts
Founder, Chairman & CEO: February 2002 to December 2009
- Massively Parallel DNA Sequencing
- Single DNA molecule amplification
- Disease allele discovery
- Nanotechnology pioneer
- IP generation and tool building - contributed to formation of **GenEncap**

**Helicos Biosciences Corporation**
Cambridge, Massachusetts
Consulting Scientist: January 2004 to December 2005 (full time)
- Direct single-molecule DNA sequencing by synthesis
- Single molecule imaging instrumentation development
- Robotic sequencing reagent formulation & dispensing
- Microfluidics for single-molecule imaging flow cell
- Single-molecule sequencing experiments

**Exact Sciences Corporation**
Maynard, Massachusetts and Salem, New Hampshire
Consultant: October 1995 to February 1996.
- Assisted founder **Stanley Lapidus** with formation of company focused on early stage colon cancer detection from DNA in stool
- Co-inventor on first two key patents

Member - Scientific Advisory Board: February 1996 to March 1999.
- Emeritus member – March 1999

Consultant: February 2001 to February 2002.
- Assisted with development of novel digital PCR technology platform

- Primary responsibility for key patent in-licensing
- Inventor of novel microdroplet format for "digPCR"

**Center for Student Coastal Research** (fka - **Cohasset Lobster Lab, Inc**.)
Cohasset, Massachusetts
Founder & President: January 1998 to June 2002.

- Founder of unique extracurricular research and education facility for student-initiated and student-conducted original research with focus on lobster genome project
- Established 501(c)(3) tax-exempt non-profit organization
- Obtained 10-year lease for $1 per year from **Town of Cohasset** for building on Cohasset harbor
- Designed laboratory renovations for facility
- Obtained >$200K in private funding and commitments

**BeautyMedicines, Inc.** (fka **Pavonis, Inc.**)
Cohasset, Massachusetts
Founder, Chairman and CEO: August 1994 to February 2001.

- Founded world's first genomics company focused on cosmetic traits rather than disease
- >$7M in venture funding from **Atlas Venture** and **Apple Tree Partners**
- $4M in lease financing from **Comdisco Ventures**, **GE Capital** and **Silicon Valley Bank**
- Designed and equipped 7,000 square foot, state-of-the-art genomics research facility
- Pioneered application of Laser Capture Microdissection **(LCM)** to skin and hair follicles
- Lead discovery of >10,000 novel genes from human scalp
- Invented novel method and formulation for permanent hair removal

**Boston University**
**Department of Biomedical Engineering**
**Center for Molecular Engineering, Design & Analysis**
Boston, Massachusetts
Adjunct Professor: April 1991 - May 1992.

- Assisted in creation of the **Center for Advanced Biotechnology**

**Praelux, Inc.** (fka **SEQ, LTD.**)
Cohasset, Massachusetts & Lawrenceville, New Jersey
Founder, Chairman and President: September 1987 - January 1992.

- Founded world's first dedicated genomics company four years prior to official launch of Human Genome Project
- Conceived of novel, single-molecule DNA sequencing technology
- Recruited Scientific Advisory Board
- First demonstration of single fluorescent molecule detection in solution by Advisor **Rudolf Rigler**, **Karolinska Institute**, Stockholm, Sweden
- Obtained venture funding from **Johnston Associates**, Princeton, New Jersey

Executive Vice-President, Chief Scientific Officer & Director: January 1992 - March 1997.

- Recruited premier single-molecule detection team from AT&T **Bell Laboratories**
- Obtained corporate funding from **Bristol-Myers Squibb**

- Major grant support from National Human Genome Research Institute (**NHGRI**)
- Acquired by Amersham Biosciences (now **GE Healthcare**) – February 2000

**RIKEN - The Institute for Physical and Chemical Research**
**Frontier Research Programs**
Wako, Saitama, Japan

Head - Laboratory for Bioelectronic Materials: October 1986 - September 1991.

- Founding Director of initial phase of international research program
- "Sister" labs for Organic Electronic Materials and Nano Electronic Materials
- Focus on modeling, engineering and analysis of 2D crystals of cytochrome $b_{562}$
- Directed international research effort of 10 person research team + 15 academic collaborators
- Beta test site for **Stardent** graphics supercomputer

**Center for Advanced Research in Biotechnology** (CARB)
Rockville, Maryland

Director: April 1985 - June 1987.

- Founding Director of academic centerpiece of **Shady Grove Life Sciences Center,** now home to **Celera, Human Genome Sciences,**The Institute for Genomic Research **(TIGR**) and the **J. Craig Venter Institute.**
- Responsible for selecting focus on macromolecular structure determination and prediction, protein engineering and structure-based drug design
- Jointly funded by the **University of Maryland** (as the first Center of the **Maryland Biotechnology Institute)** and the National Institute of Standards and Technology **(NIST**)
- Designed and initiated construction of $10M, 40,000 square foot research facility
- Developed initial master plan for 50 acre CARB site
- Recruited initial senior scientific staff
- Directed beta test site for **NCUBE parallel supercomputer**
- Initiated structure determination program for IL-4 with **Otsuka Pharmaceuticals**

**University of Maryland Baltimore County**
**Department of Biological Sciences**
Catonsville, Maryland

Adjunct Associate Professor: April 1981 - June 1985.
Adjunct Professor: July 1985 - June 1987.

- Assisted in creation of first **biotechnology technician degree program**

**Genex Corporation**
Gaithersburg, Maryland

Research Scientist: September 1979 - December 1979.

- 6th employee of the 3rd genetic engineering company in the world
- Recombinant engineering of aromatic amino acid pathway in *E. coli* to produce L-tryptophan

Senior Research Scientist: January 1980 - February 1981.

- Initiated research on hollow fiber immobilized enzyme production of L-aspartate

Special Projects Manager: March 1981 - December 1981.

- Established pre-**GenBank** in-house DNA sequence data base and sequence analysis software
- DNA sequence analysis support of interferon and other gene cloning programs

Director of Exploratory Research: January 1982 - November 1983.

- Early proponent of "molecular electronics" and nanotechnology
- Provided technical support for international corporate development activities
- Conceived of field of protein engineering (1983 *Science* **219**:666)
- Negotiated $16.5M joint venture with Bendix Corporation to fund protein engineering and solid-state, antibody-based biosensor development

Research Director for Protein Engineering: December 1982 - November 1984.

- Recruited and directed world's largest commercial protein crystallography team
- Established facility for 2D protein crystallization & monolayer formation

Vice President - Advanced Technology: December 1983 - March 1985.

- Conceived of and directed effort to develop first **single-chain antibodies**
- Serine protease engineering for enhanced stability and nerve agent detoxification

**Massachusetts Institute of Technology**
**Department of Nutrition & Food Science**
Cambridge, Massachusetts

Chaim Weizmann Postdoctoral Fellow: September 1978 - August 1979.

- Established first recombinant DNA laboratory in Department
- Pioneered work on site-directed mutagenesis
- Initiated development of automated fluorescence DNA sequencer

## EDUCATION

Ph.D. Biological Oceanography - June 1978
**Joint Program** in **Biological Oceanography**
**Massachusetts Institute of Technology**
Cambridge, Massachusetts
**Woods Hole Oceanographic Institution**
Woods Hole, Massachusetts

Thesis title: **"Rate Zonal Density Gradient Ultracentrifugation Analysis of Repair of Radiation Damage to the Folded Chromosome of Escherichia coli."**

B.A. Biology & Physics - June 1972
**Williams College**
Williamstown, Massachusetts

Undergraduate Thesis Title: "**A Tunable Organic Dye Laser Microbeam**"

Degree completed in three years.

## AWARDS & HONORS

**Sigma Xi** Centennial **Lecturer** – 1986
*The Biologist as Engineer*
Indianapolis, Indiana - March
Lincoln, Nebraska - April
Milwaukee, Wisconsin - September
Ottawa, Canada - October
Davis, California - November
Boston, Massachusetts - November

Chaim Weizmann Postdoctoral Fellow: September 1978 - August 1979.
Department of Nutrition & Food Science
**Massachuestts Institute of Technology**
Cambridge, Massachusetts

Travel Award - May 1979
"6th International Congress of Radiation Research"
Tokyo, Japan
**Radiation Research Society** - USA

Research Fellow - June 1972 to June 1978.
**Joint Program** in **Biological Oceanography**
**Massachusetts Institute of Technology**
Cambridge, Massachusetts
**Woods Hole Oceanographic Institution**
Woods Hole, Massachusetts

**Phi Beta Kappa**
*Magna cum laude*
Highest honors - Biology
Highest honors - Physics
**Sigma Xi** Recognition for Undergraduate Research
**Williams College** - June 1972
Williamstown, Massachusetts

## PROFESSIONAL SOCIETY MEMBERSHIPS

**American Association for the Advancement of Science (AAAS)**
**American Crystallographic Association**
**Sigma Xi**
**Society of Photo-Optical Instrumentation Engineers (SPIE)**
**American Geophysical Union (AGU)**
**IEEE – Oceanic Engineering Society**

## ADVISORY & REVIEW BOARDS

"Environmental Sample Processor (**ESP**) Development: Targeting Cost Reductions, Robustness and Improved User Interface" – NOAA Grant
PCB-HAB Technical Advisory Committee
**McLane Research Laboratories, Inc.**
East Falmouth, Massachusetts – September 2010 to present.

**Global Biogeochemical Flux Observatory (GBF-O)** – Co-convener & Scientific Steering Committee
**Woods Hole Oceanographic Institution**
Woods Hole, Massachusetts – September 2010 – ongoing

Human Genome Data Base (GDB)
DOE site visit & review
Johns Hopkins University - June 1997.

Executive Mini-Course on Genetics/Genomics - Planning Committee
**The Jackson Laboratory** - July 1995.

"Biology in the First Decade of the Twenty-First Century"
8th Science and Technology Forum
Japan Science Foundation
Oiso, Japan - January 1989.

"Prospects and Problems of Biomolecular Devices" - Report
Research & Development Association for Future Electron Devices
Tokyo, Japan - June 1988.

"Collaborative Research Arrangements in Biotechnology" - Panel Member
Congress of the United States - Office of Technology Assessment (OTA)
Washington, D.C. - April 1987.

The National Project for Molecular Parameter Development (Co-Founder)
Center for Advanced Research in Biotechnology
Rockville, Maryland - September 1986.

Member - NASA/USRA (Universities Space Research Association)
Biotechnology Discipline Working Group - September 1986 to October 1987.

Technical Consultant Review Panel
"Jobs, Science and Technology Bond Act Proposals:
Senior Public Sector Panel"
New Jersey Department of Higher Education
Bordentown, New Jersey - May 1986.

Ohio Eminent Scholars Program
Expert Consultant - Site Visit Team
Ohio State University Proposal in "Protein Engineering"
Ohio State University - April 1986.

Industrial Research Chair - Protein X-Ray Crystallography (site visit)
Natural Sciences and Engineering Research Council of Canada
University of Toronto - February 1986.

American Society for Testing and Materials (ASTM)
Founding Chairman - Committee E48 on Biotechnology - October 1985 thru June 1987.

Science Task Force
Montgomery County Public Schools
Montgomery County, Maryland - September 1985 to August 1986.

Search Committee for Director of COMB
Center of Marine Biotechnology (COMB)
University of Maryland - July 1985 to December 1985.

Task Force on Agricultural Biotechnology
University of Maryland - April 1985 to February 1986.

Center for Advanced Research in Biotechnology (CARB)
Advisory & Planning Committees - January 1984 thru March 1985.

Research Briefing on Chemical and Process Engineering for Biotechnology
Chairman: Arthur Humphrey (Prepared for George Keyworth, OSTP)
National Research Council
Washington, D.C. - July - September 1984.

Cold Neutron Source Review Committee
Center for Cold Neutron Research
National Bureau of Standards
Gaithersburg, Maryland -February 1984

Patent Committee
Genex Corporation
Rockville, Maryland - 1979-1985

## INVITED SEMINARS, LECTURES & PAPERS PRESENTED

*Autonomous Transient Ocean Event Monitoring (ATOEM)*
**18th International Symposium on Unmanned Untethered Submersible Technology**
Portsmouth, NH – August 2013

*The Oceans and Global Warming – Victim or Savior?* – Keynote Speaker
"Interdisciplinary Perspectives on Water and Marine Environments from the Giants' Shoulders: Increasing Global Awareness for the Young Generation"
**Toyo University** – 125th Anniversary Symposium
Tokyo and Itakura, Japan – March 2013

**Global Biogeochemical Fluxes Program for the Ocean Observatories Initiative: A Proposal**
**American Geophysical Union**, Special Session GC33, Fall-Meeting
San Francisco, CA - December 2010

**Human Genome Sequencing: What's in it for me?**
**Brown Alumni Club**
Brown University
Providence, RI – December 2009

*Sequencing is Dead. Long Live Sequencing!* – Keynote Address
**Exploring Next-Generation Sequencing**
**Cambridge Healthtech Institute**
Providence, Rhode Island – October 2007

*Really Tiny Stuff, Inc.: Massively Parallel Sanger DNA Sequencing*
**Crossroads** 10th Annual Venture Fair
New Haven, Connecticut – April 2003
"Best Ignite Company" – runner up

*Pharmacogenomics & Perspectives on Select Tools of the Genomics Trade*
Leerink Swann & Company/MEDACorp Physician Conference
Boston, Massachusetts & New York, New York – March 2000

*Pavonis, Inc.*
Atlas Venture Life Sciences Meeting
Cambridge, Massachusetts – October 1997

*Proteome Chips and Single-Molecule DNA Sequencing: Potential Genomics Applications for Aptamers and Ribozymes?*
Department of Molecular, Cellular & Developmental Biology
University of Colorado at Boulder - September 1997

*Application of Single-Molecule Manipulation & Spectroscopy to Genomics, Diagnostics & High-Throughput Screening*
NeXstar Pharmaceuticals, Inc.
Boulder, Colorado - March 1997

*Further Progress on the Detection of Native Nucleotides*
Single Molecule Spectroscopy: New Systems and Methods
Monte Veritá, Ascona, Switzerland - March 1996

*Single-Molecule DNA Sequencing with Native Nucleotides*
International Workshop on "Single Molecule Detection: Basics and Applications in Life Sciences"
BiosQuant GmbH
Berlin, Germany - October 1995

*A Fab Facility for DNA Sequencing*
Boston Area MEMS Seminar (BAMS)
Massachusetts Institute of Technology - September 1995

*Direct Sequencing of Single Native DNA Molecules: A Progress Report*
**Seventh International Genome Sequencing and Analysis Conference**
Hilton Head, South Carolina - September 1995

*Sequencing of Single, Native DNA Molecules by Fluorescence*
The Human Genome Project: Commercial Implications
San Francisco, California - March 1995

*SEQ, LTD.*
B.I.O. Asian Partnering Mission
Tokyo, Japan - November 1994

*SEQ, LTD.*
Innovative Drug Development '93
New York, New York - March 1993

*Research on Bioelectronic Materials*
Symposium on the 1st Phase Achievements of the Frontier Research Program
Tokyo, Japan - November 1991

*Stepping Stones to Bioelectronic Materials*
Laboratory for Bioelectronic Materials Forum
Frontier Research Program
RIKEN, Japan - June 1991

*Prospects and Problems of Bioelectronic Materials*
Symposium on Molecular Electronics
Babson College - November 1990

*Engineering Protein Crystallization & Self-Assembly*
The Structure and Engineering of Proteins
Boston Research Community Minisymposium
Boston University - June 1990

*Mosaic Tiling of the Plane With Proteins*
Nanotechnology: Molecular Engineering and its Implications
The Fifth NSG Nanotechnology Symposium
Massachusetts Institute of Technology - January 1990

*Problems and Prospects for Bioelectronics*
*Interdisciplinary Research Opportunities in Molecular Electronics*
Arizona State University - November 1989

*Prospects and Problems of Biomolecular Electronics*
Digital Equipment Corporation
Hudson, Massachusetts - November 1989

*Crystallization and Self-Assembly in Two-Dimensional Protein Crystals*
Organic Ultrathin Films
Max Planck Institut - RIKEN Joint Symposium
RIKEN, Japan - March 1989

*Problems and Prospects for Bioelectronics*
Future Prospects for Molecular Electronics
Ciba Foundation/Royal Society Discussion Meeting
London, England - March 1989

*Problems and Prospects for Bioelectronics*
L'Electronique Moleculaire - d'ARAGO 7
L'Observatoire Français des Techniques Avancées (l'OFTA)
Paris, France - December 1988

*Cellular Automata From Engineered Proteins*
9th Course: Towards the Biochip
International School of Pure & Applied Biostructure
Ettore Majorana Centre for Scientific CultureErice, Sicily - November 1988

*Protein Engineering for Bioelectronics*
Materials Research Forum - Bioelectronics Section & Bioelectronic Materials Laboratory

RIKEN, Japan - October 1988
*Bioelectronic Materials*
Department of Chemistry
University of Lowell
Lowell, Massachusetts - September 1988

*Bioelectronic Materials and Protein Engineering*
MACRO ’88
Kyoto, Japan - August 1988

*Protein Engineering*
Electronics Design Center
Case Western Reserve University - October 1987

*Rational Improvement of Enzymes*
Biotechnology in Chemistry - The Challenge for Biocatalysis
EUCHEM Conference
Schloß Elmau
Mittenwald, West Germany - October 1987

*Current Achievements in Protein Engineering and the Future Prospects*
At the Front of Protein Engineering
Association for the Progress of New Chemistry
Fujinomiya & Tokyo, Japan - August 1987

*Protein Engineering for the Development of Novel Affinity Separations*
Frontiers in Bioprocessing
University of Colorado at Boulder - June 1987

*Engineering Proteins for Biosensor Applications*
International Workshop on Biosensors
Gesellschaft für Biotechnologische Forschung mbH (GBF)
Braunschweig-Stöckheim, West Germany - June 1987

*The Center for Advanced Research in Biotechnology*
National Library of Medicine - Director & staff
Bethesda, Maryland - April 1987

*Strategies for Bioelectronic Materials Development*
Foundations for Bioelectronic Materials Development (Chairman)
International Frontier Research Forum
RIKEN, Japan - March 1987

*Molecular Properties of Proteins as Phototransducers*
Photocontrol of Gene Expression
International Frontier Research Forum
RIKEN, Japan - March 1987

*Bioelectronic Materials*
Inauguration Lecture Meeting of Frontier Research Programs
RIKEN, Japan - March 1987

*Guidelines and Test Methods for Biotechnology*
Symposium: rDNA-Derived Proteins: Toxicological Considerations
Society of Toxicology - 26th Annual Meeting
Washington, D.C. - February 1987

*Protein Engineering and Rational Drug Design*
Biological Applications Program
Office of Technology Assessment (OTA)
Washington, D.C. - February 1987

*Considerations for the Analysis of Nanostructures*
"In Search of Philosophy for Developing New Materials"
Sixth Science and Technology Forum
Japan Science Foundation
Hakone, Japan - January 1987

*Materials Science and Protein Engineering*
Exploring Nanotechnology - MIT Nanotechnology Study Group
Massachusetts Institute of Technology - January 1987

*The Center for Advanced Research in Biotechnology and Biosensors*
Naval Surface Weapons Center
Silver Spring, Maryland - November 1986

*The Center for Advanced Research in Biotechnology*
American Society for Microbiology
Washington Area Chapter
Biotechnology Mini-Symposium
Walter Reed Army Medical Center - October 1986

*Biotech's Future*
Symposium on Recombinant DNA
20th Middle Atlantic Regional Meeting
American Chemical Society
Baltimore, Maryland - September 1986

*Protein Engineering: Optimizing the Protein for the Process*
Fifth International Conference on Biochemical Engineering (co-chairman: "Basic Advances in Biological Sciences")
Henniker, New Hampshire - July 1986

*Protein Engineering*
Advanced Molecular Cloning Course
Cold Spring Harbor Laboratory - July 1986.

*Seat-of-the-Pants Protein Engineering*
Molecular Graphics Symposium: New Drug Design and Protein Engineering
University of California at Irvine - June 1986

*Technology Transfer and University Industrial Relationships*
Molecular Graphics Symposium: New Drug Design and Protein Engineering
University of California at Irvine &
California College of Medicine Symposium - June 1986

*Biology in Transition*
Science Futures Symposium
University of Texas at Austin - April 1986

*Forecasting the Commercial Impact of Protein Engineering*
Symposium on Computer Aided Protein Engineering (session Chairman)
American Chemical Society Annual Meeting
New York, New York - April 1986

*Protein Engineering*
Georgetown University
Department of Chemistry - April 1986

*Current State of the Art in Protein Engineering*
Center for Strategic Technology
Texas Engineering Experiment Station
Texas A & M University - February 1986

*Computer Applications at CARB (Center for Advanced Research in Biotechnology)*
"International Congress on Computers in Biotechnology"
Baltimore, Maryland - January 1986

*The New Biology: Engineering DNA, Proteins and Living Cells*
"Biotechnology - Risks and Rewards"
The Smithsonian Institution
Washington, D.C. - January 1986

*Protein Engineering at the Center for Advanced Research in Biotechnology*
Eastman Kodak Company
Biochemistry Laboratory
Biosciences Division
Rochester, New York - December 1985

*Protein Engineering*
Fisher Scientific/Mediatech Joint Seminar
Washington, D.C. - December 1985

*Engineering Protein Monolayers*
Department of Macromolecular Science
Case Western Reserve University - December 1985

*Biomolecular Assembly for Bioelectronic Devices*
"Bioelectronic and Molecular Electronic Devices"
International Symposium on Future Electron Devices
Tokyo, Japan - November 1985

*Henry Ford and Protein Engineering*
"BIO 85 JAPAN"
Osaka, Japan - November 1985

*Structure Analysis in Protein Engineering*
"BIOTEC 85"
Düsseldorf, West Germany - October 1985

*Protein Engineering: A New World of Polymer Chemistry?*
Chemical Society of Washington (Washington Section of the American Chemical Society)
Georgetown University - October 1985

*Bioseparations*
Inter-Organizational Committee on Separations
National Research Council
Washington, D.C. - September 1985

*Implementing Emerging Technologies: Problems and Progress*
"The Global Economy: Today, Tomorrow, and the Transition"
World Futures Society
Washington, D.C. - August 1985

*Protein Modeling*
"Protein Engineering Workshop"
National Research Council of Canada

Ottawa, Canada - May 1985

*Protein Modeling*
"Protein Engineering: Applications in Basic Science, Industry & Medicine"
Fourth Stony Brook Symposium on Molecular Biology
SUNY Stony Brook - May 1985

*Engineered Enzymes: Status and Prospects*
"Seventh Symposium on Fuels & Chemicals from Biomass"
Gatlinburg, Tennessee - May 1985

*Protein Engineering: The Second Decade in Biotechnology*
Council of Scientific Society Presidents
Washington, D.C. - May 1985

*Protein Engineering*
Eastern North Carolina Section of the American Chemical Society
University of North Carolina at Wilmington - April 1985

*Designing New Enzymes* - Workshop Chairman
"Protein Structure, Folding & Design"
Genex/UCLA Symposium
Keystone, Colorado - March 1985

*State of the Art of Protein Engineering*
"Protein Alterations: Genetics, Biophysics & Engineering"
University of Rochester Medical Center - March 1985

*Protein Engineering*
"Mini Workshop on Biotechnology"
Materials Research Council
Defense Advanced Research Projects Agency (DARPA)
Arlington, Virginia - February 1985

*Protein Engineering*
Biomedical Engineering and Instrumentation Branch
National Institutes of Health - December 1984

*Protein Engineering*
"Biotechnology Symposium '84"
Japan Management Association
Tokyo, Japan - November 1984

*Biomaterials in Electronics*
North Carolina State University - September 1984

"New Horizons" - Session Chairman
BIOTECH '84
Washington, D.C. - September 1984

*Biotechnology: State of the Art*
"Synthetic Membranes"
Gordon Research Conference - June 1984

*Education and Training: Employers' Best Choices*
"The Challenge of Changing Technology"
Metropolitan Washington Council of Governments
National Academy of Sciences
Washington, D.C. - April 1984

*Rational Modification of Proteins*
American Society of Microbiology
North Central Branch Annual Meeting
Milwaukee, Wisconsin - April 1984

*Potential Electronic Applications of Biological Materials*
"COMPCON 84"
IEEE Computer Society
San Francisco, California - February 1984

*Biotechnology and Microsensors*
"Biotechnology and Microsensor Information Acquisition"
University of Pennsylvania - November 1983

*Engineering Novel Enzymes*
"Seventh Engineering Foundation Conference on Enzyme Engineering"
White Haven, Pennsylvania - September 1983

*Potential Electronic Applications of Engineered Proteins*
"Organic Electronic Materials"
Department Of Energy Workshop
Snowmass, Colorado - June 1983

*Self-Organizing Protein Monolayers as Substrates for Molecular Device Fabrication*
"Workshop on Molecular Electronic Devices II" (member - Organizing Committee)
Naval Research Laboratory
Washington, D.C. - April 1983

*The Future of Biotechnology*
Nature Biotechnology - executive and editorial staff at journal launch
New York, New York - March 1983

*Biotechnology and Innovation*
"Creativity: Concepts and Applications"
National Defense University - Industrial College of the Armed Forces
Washington, D.C. - November 1982

*Genetic Engineering*
"Education and Technology Conference"
New Jersey Department of Education
East Brunswick, New Jersey - October 1982

*Genetically Engineered Proteins and Molecular Device Fabrication*
IBM Research Laboratory
Yorktown Heights, New York - April 1982

*Biotechnology: Applications to Personal Care and OTC Drug Products*
New England Chapter of the Society of Cosmetic Chemists
Boston, Massachusetts - March 1982

"Biotechnology Update: An Overview for the Top Executive"
Robert S. First, Inc.
New York, New York - February 1982

*The Future of Enzymes*
Institute of Food Technologists
Clifton, New Jersey - January 1982

*Protein, Polymer, and Molecular Alternatives to Transistor Switching*
Bell Telephone Laboratories
Holmdel, New Jersey - December 1981

*Feedstock Options: Biomass*
"Second Annual Chemical Feedstocks Conference"
Houston, Texas - November 1981

*Applicability of Genetic Engineering to the Chemical Industry in the 1980's and 1990's*
"Biotechnology: Present Status and Future Prospects"
Robert S. First, Inc.
Tokyo, Japan - May 1981
White Plains, New York - June 1981

*Genetic Engineering: Hype or Hope?*
1981 Melvin Oliven Memorial Lecture
Kirkwood Community College
Cedar Rapids, Iowa - April 1981

"Genetic Engineering Forum"
Phi Beta Kappa Association
Chicago, Illinois - April 1981

*Strategies for Efficient Expression in Genetically Engineered Bacteria*
Howard University
Washington, D.C. - March 1981

*Biological Assembly of Molecular Ultracircuits*
"Workshop on Molecular Electronic Devices" (member - Organizing Committee)
Naval Research Laboratory
Washington, D.C. - March 1981

*Recombination-Dependent Repair of DNA Double-Strand Breaks in Gamma-Irradiated Folded Chromosomes of Escherichia coli.*
"Sixth International Congress of Radiation Research"
International Radiation Research Society
Tokyo, Japan - May 1979

## OTHER MAJOR CONFERENCES, WORKSHOPS & COURSES ATTENDED

**"µTAS 2011"**
Seattle, Washington – September 2011

**"Microfluidics 2.0"**
University of Washington
Seattle, Washington – September 2011

**"Next-Generation Sequencing"** - Co-Chair with Prof. Annelise Barron – Stanford
**MSB 2009: 23rd International Symposium on MicroScale Bioseparations**
Boston, Massachusetts - February 2009

**"Exploring Next Generation Sequencing"**
**Cambridge Healthtech Institute**
Providence, Rhode Island - September 2008

"2002 Engineering/Manufacturing Conference: MEMS"
Massachusetts Institute of Technology
Cambridge, Massachusetts – March 2002

"MEMS Technology Workshop"
IntelliSense Corporation
Wilmington, Massachusetts – October 2001

"BioMEMS 2001"
Sunnyvale, California – May 2001

"SNPs and Pharmacogenomics"
Philadelphia, Pennsylvania – March 2001

"11th International Genome Sequencing and Analysis Conference"
Miami, Florida - September 1999

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - May 1999

"Tenth International Genome Sequencing and Analysis Conference"
Miami, Florida - September 1998

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - May 1998

"Genetics of Aging"
Cold Spring Harbor Laboratory - April 1998

"Ninth International Genome Sequencing and Analysis Conference"
Hilton Head, South Carolina - October 1997

"Conference on Breast Development, Physiology & Cancer"
National Institutes of Health
Bethesda, Maryland - June 1997

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - May 1997

"Eighth International Genome Sequencing and Analysis Conference"
Hilton Head, South Carolina - October 1996

"Quantitative Genetics & Biotechnology"
Gordon Research Conference
Ventura, California - February 1997

"Molecular Genetic Profiling"
Cambridge Healthtech Institute
McLean, Virginia - June 1996

“Bioinformatics and Genome Research”
Cambridge Healthtech Institute
Baltimore, Maryland - June 1996

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - May 1996

“Organic Thin Films”
Gordon Research Conferences
Ventura, California - January 1996

“Symposium on Genomic Medicine”
The Institute for Genomic Research - TIGR
Gaithersburg, Maryland - December 1995

“Emerging Roles of High-Performance Computing in Biotechnology”
Johns Hopkins University - November 1995

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - May 1995

“Scanning Probe Microscopies III”
“Advanced Optical Methods for Ultrasensitive Detection”
“Advances in DNA Sequencing Technology II”
“Advances in Fluorescence Sensing Technology II”
*Photonics West ‘95*
San Jose, California - February 1995

“Speeding Discovery in Biomedical Research”
Alex, Brown & Sons / The Genome Data Base at Johns Hopkins University
Baltimore, Maryland - October 1994

"Genome Sequencing and Analysis Conference VI"
Hilton Head, South Carolina - September 1994

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - May 1994

"The Human Genome Project: Commercial Implications"
San Francisco, California - February 1994

"Genome Sequencing and Analysis Conference V"
Hilton Head, South Carolina - October 1993

"Genome Mapping and Sequencing"
Cold Spring Harbor Laboratory - May 1993

"Human Genetics: Mapping the Future"
Nature *Genetics*
Washington, D.C. - April 1993

"Optical Tweezers and Optical Material: Radiation Pressure Through the Microscope"
Opticon '92
Boston, Massachusetts - November 1992

"Genome Sequencing IV"
Hilton Head, South Carolina - September 1992

"Transcription & Drug Discovery"
Oncogene Science Conference
Cold Spring Harbor Laboratory - October 1992

"Gene Therapy"
Cold Spring Harbor Laboratory - September 1992

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - May 1992

"Diagnostic & Therapeutic Aspects of Human Genome Research"
Public Health Service Technology Transfer Forum
National Institutes of Health - November 1991

"Human Genome III"
San Diego, California - October 1991

"Genome Sequencing III"
Hilton Head, South Carolina - September 1991

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - May 1991

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - May 1990

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - April 1989

"Genome Mapping & Sequencing"
Cold Spring Harbor Laboratory - April 1988

"Organic Thin Films”
Gordon Research Conference
Oxnard, California - February 1988

"Cost of Human Genome Projects”
Mapping the Human Genome
United States Congress - Office of Technology Assessment (OTA)
Washington, D.C. - August 1987

"Committee E48 on Biotechnology" - Chairman
American Society for Testing & Materials (ASTM)
Cincinnati, Ohio - May 1987

"First CODATA Workshop on Nucleic Acid and Protein Sequencing Data”
Committee on Data for Science and Technology (CODATA)
Center for Advanced Research in Biotechnology (CARB)
National Bureau of Standards
Gaithersburg, Maryland - May 1987

"Mapping the Human Genome”
United States Congress - Office of Technology Assessment (OTA)
Washington, D.C. - April 1987

"The Second Symposium on U.S.-Japan Science & Technology Exchange: Patterns of Interdependence" (moderator for "Biotechnology" session)
McLean, Virginia - November 1986

"Committee E48 on Biotechnology" - Chairman
American Society for Testing & Materials (ASTM)
San Jose, California - November 1986

"3rd International Symposium on Molecular Electronic Devices"
(Organizing Committee and Chairman of Biological Theme Session)
Arlington, Virginia - October 1986

"Informational Forum on the Human Genome"
Howard Hughes Medical Institute
National Institutes of Health
Bethesda, Maryland - July 1986

"Mid-Atlantic Protein Crystallography Workshop"
National Bureau of Standards
Gaithersburg, Maryland - May 1986

"Committee E48 on Biotechnology" - Chairman
American Society for Testing and Materials (ASTM)
New Orleans, Louisiana - May 1986

"Organic Thin Films"
Gordon Research Conference
Santa Barbara, California - February 1986

"New Alliances and Partnerships in American Science & Engineering"
Government-University-Industry Research Roundtable
National Academy of Sciences
Washington, D.C. - December 1985

"The University and Applied Research"
National Research Council
Washington, D.C. - October 1985

"Eighth International Conference on Enzyme Engineering"
Helsingor, Denmark - September 1985

"First International Conference on Protein Crystal Growth"
Stanford University - August 1985

"Academic Research Facilities: Financing Strategies & Evaluation Procedures"
National Academy of Sciences
Washington, D.C. - July 1985

"Current Trends in the Production and Use of Microbial Enzymes"
First NOVO Biotechnology Symposium
Copenhagen, Denmark - May 1984

"Protein Folding and Design"
University of Michigan - March 1984

"Conference on Macromolecular Structure & Specificity:
Computer Assisted Modeling & Applications"
New York Academy of Sciences
New York, New York - October 1983

"Organic Thin Films & Solid Surfaces"
Gordon Research Conference - January 1983

"Langmuir-Blodgett Films"
Durham University, U.K. - September 1982

American Crystallographic Association - Summer Meeting
La Jolla, California - August 1982

"Diffraction Methods in Molecular Biology"
Gordon Research Conference - July 1982

"*In Vitro* Mutagenesis"
Cold Spring Harbor Laboratory - May 1982

"Pattern Analysis in Nucleic Acid and Protein Sequences"
EMBO Workshop
Saint-Agnan, France - October 1981

"Genetic Engineering: The 1981 International Conference"
Battelle Memorial Institute - April 1981.

"Introduction of Macromolecules into Eucaryotic Cells"
Gordon Research Conference - June 1980.

"Tumor Biology Course"
Harvard Medical School - November 1978

"Recombinant Molecules"
Tenth Miles International Symposium
Massachusetts Institute of Technology - June 1976

## INTERVIEWS, VIDEOS, QUOTES & IN THE NEWS

**The Oceans and Global Warming - Victim or Savior?** – Keynote Speaker
"Interdisciplinary Perspectives on Water and Marine Environments from the Giants' Shoulders: Increasing Global Awareness for the Young Generation"
**Toyo University** – 125th Anniversary Symposium
Tokyo and Itakura, Japan – March 2013.

**Why we need a Hubble for the seas** (2010) CNN Opinion piece

**The $1,000 Genome** (2010) Kevin Davies, Simon & Schuster

**Kevin Ulmer – The Sisyphus of Sequencing** (September-October 2010) Kevin Davies, Bio-IT World Magazine

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February 2009

**In the Face of Complete Genomics' Competition, Global Financial Crisis, Genome Corp Closes Doors**
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CHI's "Exploring Next-Generation Sequencing" Conference – October 17-18, 2007
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**Engines of Creation 2.0: The Coming Era of Nanotechnology** (2007) K. Eric Drexler, **WOWIO** Books.

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## PATENTS & PATENT APPLICATIONS

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Ulmer, K., "Apparatus and Methods for Analyzing Samples", U.S. Patent No. **7,593,109,** September 28, 2009. [single-molecule DNA sequencing - **Helicos**]

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Ulmer, K., "Apparatus and Methods for Analyzing Samples", U.S. Patent No. **7,276,720**, October 2, 2007. [single-molecule DNA sequencing - **Helicos**]

Kwagh, Jae-Gyu, Macklin, John J., Mitsis, Paul G. and Ulmer, Kevin M., "Method for Sequencing and Characterizing Biomolecules Using Aptamers and a Method for Producing Aptamers", U.S. Patent No. **6,515,120** issued February 4, 2003. [single-molecule DNA sequencing - SEQ, Ltd.]

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Lapidus, S.N., Shuber, A.P. and Ulmer, K.M., "Method for the detection of clonal populations of transformed cells in a genomically heterogeneous cellular sample". U.S. Patent No. **5,670,325** issued September 23, 1997. [**Exact Sciences Corporation**]

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## PATENT EXPERT WITNESS

**Kilpatrick Townsend & Stockton LLP**
Lead Attorney: Matius Ferrario
Winston-Salem, North Carolina

Expert Witness for Esoterix Genetic Laboratories, LLC: August 2013 to present.

- Patent Infringement Suit
- Inventor - U.S. Patent No. 5,670,325
- Esoterix Genetic Laboratories, LLC v. Life Technologies Corporation, et al.
- Case No. 12-cv-411
- United States District Court for the Middle District of North Carolina - Greensboro Division

**Goodwin Proctor LLP**
Lead Attorney: Daniel M. Forman
Boston, Massachusetts

Expert Witness for Helicos: March 2012 to September 2012.
Inventor and 30(b)(6) designee for Helicos: February 2011 to September 2012.

- Patent Infringement Suit
- Helicos Biosciences Corporation *v.* Pacific Biosciences of California, Inc., Life Technologies Corporation, and Illumina, Inc.
- C.A. No. 10-735-SLR
- U.S. District Court for the District of Delaware
- Deposed in Boston, MA – May 2012.
- Deposed in Boulder, CO – May 2012.
- Deposed in Boulder, CO – November 2011.

- Settled with Pacific Biosciences
- Settled with Life Technologies
- Partial settlement with Illumina
- Judge ruled in favor of Illumina for lack of written description in final patent at issue

**Troutman Sanders LLP**
Lead Attorney: Daniel A. Ladow
New York, New York

Expert Witness for Life Technologies: December 2011 to April 2012.

- Life Technologies Corporation *v.* Pacific Biosciences of California, Inc.
- Appeal of Board of Patent Appeals and Interferences (BPAI) decision on Patent Interference No. 105,677 – 31 January 2011
- Case settled

**Buchanan Ingersoll & Rooney PC**
Lead Attorney: Brian P. O'Shaughnessy
Alexandria, Virginia

Expert Witness – Single-Molecule Sequencing: July 2009 to September 2009

- Deposed in Alexandria, VA – August 2009.
- Representing Life Technologies Corporation
- Patent Interference No. 105,677 (SGL)
- Susan Hardin *et al.* - Junior Party (Patent 7,329,492)
- John G.K. Williams – Senior Party (Application No. 11/459,182)

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This is a complete and accurate description of my professional career.

Kevin M. Ulmer, Ph.D. Date: 2 August 2014