2020 Innovation Awards

Recognizing University of New Mexico Faculty, Staff, and Students Who Have Received Issued U.S. Patents, Trademarks, and Registered Copyrights from March 1, 2019 - February 29, 2020

Honoring the 2020 STC.UNM Innovation Fellow

Honoring National Academy of Inventors (NAI) Fellows from UNM

Celebrating 25 years of Building a Rainforest in the Desert

celebration of imagination

STC.UNM

2020 Innovation Awards

Introduction

Elizabeth J. Kuuttila

CEO & Chief Economic Development Officer
STC.UNM

The 2020 STC.UNM Innovation Awards recognizes the accomplishments of UNM inventors who have received issued U.S. patents, trademarks, and registered copyrights within the past year. Between March 1, 2019 and February 29, 2020, 57 UNM inventors received issued U.S. patents for 54 technologies. Thirty-three patents were for technologies developed on main campus; 20 patents were for technologies developed on the health sciences campus; and one patent was developed collaboratively between the campuses.

2020 STC.UNM Innovation Fellow

David G. Whitten, Ph.D.

Distinguished Professor, Department of Chemical & Biological Engineering
Associate Director, Center for Biomedical Engineering

Dr. David G. Whitten is being honored this year as the recipient of the 2020 STC.UNM Innovation Fellow Award. The STC.UNM Board of Directors established the Innovation Fellow Award in 2010 to honor outstanding UNM inventors. Dr. Whitten is receiving this award for his body of technologies that have made a significant social and economic impact on society and the marketplace. He is a Distinguished Professor in the Department of Chemical & Biological Engineering and the Associate Director for the Center for Biomedical Engineering. Dr. Whitten joins 12 previous faculty Innovation Fellows.

Keynote Speaker

Douglas M. Brown

President, UNM Board of Regents
Dean Emeritus, Anderson School of Management
Former STC.UNM Board Member

Douglas M. Brown is a recognized financial leader with many years of banking and finance experience, currently as the head of Brown and Brown Ventures. Mr. Brown was previously appointed to the UNM Board of Regents in 2003 and served on the board until he was appointed State Treasurer of New Mexico in 2005, where he achieved the state's first AAA rating from Standard & Poor's. He served as the Dean of the UNM Anderson School of Management from 2009 to 2014 and was awarded the title of Dean Emeritus upon retirement. Other previous positions include Trustee of Stanford University, CEO of Tuition Plan Consortium, CEO of Talbot Financial, CEO of ABQ Bank, and EVP of Wells Fargo Bank. In 2013, Mr. Brown was named Top CEO of the Year by Albuquerque Business First, and in 2015 was awarded the Distinguished Leadership Award by Leadership NM.

Award Recipients

2020 STC.UNM Innovation Fellow

David G. Whitten, Ph.D.

2019 Fellows of the National Academy of Inventors

Bryce C. Chackerian, Ph.D.
David S. Peabody, Ph.D.

UNM Faculty

University of New Mexico faculty, staff and students who have received issued U.S. patents, trademarks, or registered copyrights from March 1, 2019 - February 29, 2020.

James C. Aarestad, Ph.D.
Ladan Arissian, Ph.D.
Dorian C. Arnold, Ph.D.
Plamen B. Atanassov, Ph.D.
Ganesh Balakrishnan, Ph.D.
Kiran Bhaskar, Ph.D.
Edgar C. Boedeker, M.D.
Virginie Bondu
Steven R.J. Brueck, Ph.D.
Tione Buranda, Ph.D.
Thomas P. Caudell, Ph.D.
Bryce C. Chackerian, Ph.D.
Eva Chi, Ph.D.
Christos Christodoulou, Ph.D.
Joseph Costantine, Ph.D.
Jean-Claude Diels, Ph.D.
Jeremy S. Edwards, Ph.D.
Fernando Garzon, Ph.D.
Steven W. Graves, Ph.D.
Frédéric Grillot, Ph.D.
Pamela Hall, Ph.D.
Sang Eon Han, Ph.D.
Sang M. Han, Ph.D.
Seok Jun Han, Ph.D.
Helen Hathaway, Ph.D.
Adam Hecht, Ph.D.
Ivy Hurwitz, Ph.D.
Matthew Lakin, Ph.D.
Seung-Chang Lee, Ph.D.
Ke Jian (Jim) Liu, Ph.D.
Gabriel P. López, Ph.D.
Shuang (Sean) Luang, Ph.D.
Andrea A. Mammoli, Ph.D.
Anthony R. Menicucci
Erin Milligan, Ph.D.
Abdullah Mueen, Ph.D.
Alexander Neumann, Ph.D.
Jeffrey P. Norenberg, Pharm.D., Ph.D.
Marek A. Osiński, Ph.D.
Rong Pan, Ph.D.
Surojit Paul, Ph.D.
John B. Plumley, Ph.D.
James Plusquellic, Ph.D.
Eric R. Prossnitz, Ph.D.
Geetanjali Sharma, Ph.D.
Daisuke (Dice) Shibata, Ph.D., L.A.T., A.T.C.
Laurel O. Sillerud, Ph.D.
Peter Simons, Ph.D.
Darko Stefanovic, Ph.D.
John Stormont, Ph.D.
Mahmoud Taha, Ph.D.
Youssef A. Tawk, Ph.D.
Graham Timmins, Ph.D.
Angela Wandinger-Ness, Ph.D.
David G. Whitten, Ph.D.
Yin Yang, Ph.D.
Payman Zarkesh-Ha, Ph.D.

celebration of imagination

Sponsors

STC would like to thank our Innovation Awards sponsors. These sponsorships make it possible for STC to award financial stipends to the inventors and creators being honored this year.

Gold

Shore Chan DePumpo LLP (Dallas, Texas)
The professionals of Shore Chan DePumpo LLP are a veteran team of trial lawyers and intellectual property attorneys. The firm focuses its expertise in matters involving complex commercial litigation and intellectual property licensing and enforcement.

Susman Godfrey (Houston, Texas)
For more than forty years, Susman Godfrey has focused its nationally recognized practice on just one thing: high-stakes commercial litigation. We are one of the nation's leading litigation boutique law firms with offices in Houston, Seattle, Los Angeles and New York.

Valauskas Corder LLC (Chicago, Illinois)
The law firm of Valauskas Corder protects clients' intellectual property in the United States and abroad. The firm's practice includes all aspects of patent, trademark, copyright, trade secret, and right of publicity law and litigation.

VOGT IP (Oakbrook, Illinois)
Our philosophy is simple—you're in control. From contingency, flat, or hourly fees to a hybrid-fee arrangement, there are no surprises. VOGT IP has a focus in handling intellectual property litigation, including patent, trademark, copyright, and trade secret and other commercial litigation matters throughout the United States.

Silver

CoSud Intellectual Property Solutions, PC (Bridgeport, Connecticut)
CoSud provides innovators, businesses and universities with insight into the creation, protection and valuation of intellectual property assets: patents, trademarks, copyrights, domain names and trade secrets.

Mueting, Raasch & Gebhardt, PA (Minneapolis, Minnesota)
At Mueting & Raasch, our clients value and benefit from our diverse and extensive legal, technical, scientific and business experience. We have the experience and knowledge to guide you through the ever-changing maze of international intellectual property issues.

Nusenda Credit Union (Albuquerque, New Mexico)
Nusenda Credit Union isn't your typical banking experience; we look for ways to go above and beyond to serve you. We're proud to offer you all the high quality banking tools and solutions that you'd receive from a big bank.

Schwegman, Lundberg & Woessner, PA (Minneapolis, Minnesota)
Schwegman Lundberg & Woessner, P.A. believes that all new ideas and innovation deserve the best protection and assistance. We are in the business of protecting your ideas. Schwegman focuses on providing clients with strong patents while exceeding client goals.

Bronze

MH² Technology Law Group (Tysons Corner, Virginia)
MH² Technology Law Group LLP is a client-centric IP firm, focused on the development, growth, and protection of our clients' patent portfolios.

Celebrating 25 Years of Building a Rainforest in the Desert

This year marks the 25th anniversary of STC.UNM. Created as a nonprofit in 1995 by the University of New Mexico Board of Regents to commercialize university inventions with just a staff of two, the organization has matured into a university technology-transfer and economic-development program with national and international stature. With a staff of business, science and legal professionals, STC has become an innovative leader in best practices for commercializing university technology, creating an entrepreneurial ecosystem, and protecting the intellectual property rights of university inventors.

Over the years, the organization has cultivated connection with its community and today its branches are blooming with a variety of programs and resources for budding inventors and entrepreneurs. New programs and services have also diversified STC's sources of income. This growth has been especially evident since 2012 when UNM tasked STC with implementing its economic-development initiatives and STC adopted the Rainforest model to develop an innovation ecosystem in New Mexico. This concept for developing sustainable, complex innovation economies to generate greater creative and economic output was the guiding framework that led to the creation of the research and innovation district initiative, Innovate ABQ, in downtown Albuquerque and the building in 2017 of its core site, the Lobo Rainforest Building.

Look at what we have accomplished - highlighted below!

Rankings
- Top 100 Universities Worldwide with largest number of issued U.S. patents for six years in a row
- Peer Institution Comparison (AUTM FY2017 data)
  - 1st in number of option and license agreements signed
  - 2nd in number of startups
- 28th Best University for Technology Transfer by Milken Institute

Awards
- APLU 2018 Innovation & Economic Prosperity University Award for Lobo Rainforest Building
- 2014 Global Innovation Summit Innovation Ecosystem Award
- 2014 MRCOG Public Partnership Award for Innovate ABQ

Inventor Honors
- 13 STC Innovation Fellows
- 7 National Academy of Inventors (NAI) Fellows

Economic Impact
- $3.1 billion economic output statewide

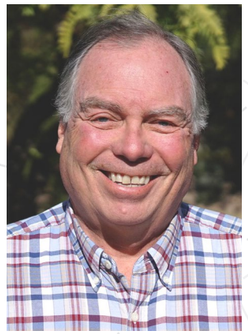
Grants
- University of New Mexico Rainforest I-Corps Site (NSF)
- New Mexico Rainforest University Center: Building a Distributed Entrepreneurial Ecosystem (EDA)

Programs
- **Technology Portfolio**
  https://stc.unm.edu/technologies/technology-portfolio/
- **Events & Seminars**
  https://stc.unm.edu/events/
- **Internship Academy**
  https://stc.unm.edu/econdev/stc-unm-internship-academy/
- **Joseph L. Cecchi VentureLab**
  https://stc.unm.edu/cvl/
- **Innovate New Mexico**
  https://innovatenewmexico.com
- **Lobo Rainforest**
  https://loborainforest.com
- **I-Corps**
  https://loborainforest.com/icorps/
- **Rainforest EDA University Center**
  https://nmrainforest.com

2019 Fellows of the National Academy of Inventors

UNM Inventors Elected 2019 Fellows of the National Academy of Inventors

Bryce C. Chackerian, Ph.D.



David S. Peabody, Ph.D.

Dr. Bryce Chackerian, professor and vice chair of the Department of Molecular Genetics & Microbiology, and Dr. David S. Peabody, professor in the Department of Molecular Genetics & Microbiology, at the University of New Mexico were recently named 2019 Fellows of the National Academy of Inventors (NAI).

Election to NAI Fellow status is a high professional distinction accorded to academic inventors who have demonstrated a prolific spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on quality of life, economic development, and the welfare of society.

With the election of the 2019 class, there are now 1,228 NAI Fellows, representing over 250 prestigious universities and governmental and non-profit research institutes. Collectively, the Fellows hold more than 38,000 issued U.S. patents, which have generated over 13,000 licensed technologies, 2,300 companies and created more than 19.5 million jobs. In addition, over $2.2 trillion in revenue has been generated based on NAI Fellow discoveries.

Included among all NAI Fellows are over 137 presidents and senior leaders of research universities, governmental and non-profit research institutes; 556 members of the National Academies of Science, Engineering and Medicine; 42 inductees of the National Inventors Hall of Fame; 63 recipients of the U.S. National Medal of Technology and Innovation and U.S. National Medal of Science; and 38 Nobel Laureates, among other awards and distinctions.

Both inventors have been chosen as 2019 National Academy of Inventor Fellow based on their work in vaccine development. Since 2006, Dr. Peabody and Dr. Bryce Chackerian have worked together to construct VLPs from RNA bacteriophages and develop an innovative VLP technology platform that allows for rapid vaccine discovery.

The bacteriophages (viruses that infect bacteria) can be produced at high yields, are very adaptable to protein engineering and are non-infectious. The technology platform integrates epitope (the part of the antigen molecule where antibodies attach) identification (antigen/antibody binding) with the VLP structures highly immunogenic display. The immune system responds to vaccination with VLP-based vaccines by producing high antibody levels that last longer than what is elicited by other vaccine technologies.

Recognized Patents

Treatment and Prevention of Stroke and Other Neurological Disorders
U.S. Patent No. 10,220,008 issued March 5, 2019

Signal Propagation Biomolecules, Devices and Methods
U.S. Patent No. 10,221,446 issued March 5, 2019

Systems and Methods for Leveraging Path Delay Variations in a Circuit and Generating Error-Tolerant Bitstrings
U.S. Patent No. 10,230,369 issued March 12, 2019

Compositions, Systems and Methods for the Encapsulation and Delivery of a Substance
U.S. Patent No. 10,238,586 issued March 26, 2019

Radiolabeled Alpha-Melanocyte Stimulating Hormone Hybrid Peptide for Melanoma Targeting
U.S. Patent No. 10,238,758 issued March 26, 2019

System and Methods for Performing Medical Physics Calculations
U.S. Patent No. 10,248,764 issued April 2, 2019

High Quality AlSb for Radiation Detection
U.S. Patent No. 10,249,780 issued April 2, 2019

Method for Treating Obesity, Diabetes, Cardiovascular and Kidney Diseases by Regulating GPR30/GPER Activity
U.S. Patent No. 10,251,870 issued April 9, 2019

Blood Biomarker for Early Blood Brain Barrier Disruption in Ischemic Stroke
U.S. Patent No. 10,254,295 issued April 9, 2019

Dual-Matrix Composite Embedded Conductors and Deployable Structures
U.S. Patent No. 10,256,546 issued April 9, 2019

Activated GTPase-Based Assays and Kits for the Diagnosis of Sepsis and Other Infections
U.S. Patent No. 10,261,084 issued April 16, 2019

Compounds for Use in Diagnosing and Treating Melanoma, including Metastatic Melanoma and Methods Related to Same
U.S. Patent No. 10,265,425 issued April 23, 2019

Synthetic Long Read DNA Sequencing
U.S. Patent No. 10,266,904 issued April 23, 2019

Methods and Systems for Detecting Cancer
U.S. Patent No. 10,278,649 issued May 7, 2019

PCSK9 Peptide Vaccine Conjugated to a Qbeta Carrier and Methods of Using the Same
U.S. Patent No. 10,279,019 issued May 7, 2019

Surface Plasma Wave Coupled Detectors
U.S. Patent No. 10,283,667 issued May 7, 2019

Attenuated EHEC and Clostridial Toxins TcdA- and TcdB-Based Vaccine for Clostridium Difficil-Associated Disease (CDAD)
U.S. Patent No. 10,286,054 issued May 14, 2019

Compact Biosensor of Matrix Metalloproteinase with Cadmium-Free Quantum Dots
U.S. Patent No. 10,299,707 issued May 28, 2019

Enhancement of the Phase Response of Intracavity Phase Interferometers
U.S. Patent No. 10,317,212 issued June 11, 2019

Light-Emitting Device Having III-V Semiconductor Gain Section Coupled to Whistle-Geometry Tunable Filter
U.S. Patent No. 10,320,149 issued June 11, 2019

DNA Sequencing and Epigenome Analysis
U.S. Patent No. 10,329,614 issued June 25, 2019

Ductile Fiber Reinforced Polymer Plates and Bars Using Mono-Type Fibers
U.S. Patent No. 10,337,186 issued July 2, 2019

Apparatus and Method for Solar Energy Micro-Forecasts for Solar Generation Sources and Utilities
U.S. Patent No. 10,345,486 issued July 9, 2019

Systems and Methods for Detecting Ribosome Inhibition
U.S. Patent No. 10,365,269 issued July 30, 2019

Reliability Enhancement Methods for Physically Unclonable Function Bitstring Generation
U.S. Patent No. 10,366,253 issued July 30, 2019

Encapsulated Polymer Nanocomposite for Efficient Crack Repair and Monitoring of Cement, Rock, and Other Brittle Materials
U.S. Patent No. 10,370,305 issued August 6, 2019

Recognized Patents

3D Printed Miniaturized Quadrifilar Helix Antenna
U.S. Patent No. 10,381,737 issued August 13, 2019

System and Methods for Detecting Bots Real-Time
U.S. Patent No. 10,389,745 issued August 20, 2019

Integrated Bound-Mode Spectral/Angular Sensors
U.S. Patent No. 10,408,673 issued September 10, 2019

Robust, Compact, Fieldable Tunable Integrated Photonic Device
U.S. Patent No. 10,411,436 issued September 10, 2019

High Speed Michelson Interferometer Microscope
U.S. Patent No. 10,436,570 issued October 8, 2019

Methods of Using N-Containing Compounds with Carbon Black to Replace Pan and Form Carbon Fibers
U.S. Patent No. 10,442,934 issued October 15, 2019

Growth of Cubic Crystalline Phase Structure on Silicon Substrates and Devices Comprising the Cubic Crystalline Phase Structure
U.S. Patent No. 10,453,996 issued October 22, 2019

Compounds with Reduced Ring Size for Use in Diagnosing and Treating Melanoma, Including Metastatic Melanoma and Methods Related to Same
U.S. Patent No. 10,464,985 issued November 5, 2019

Quantitative [Fe]-MRI (femri) of Anti-PSMA-Conjugated SPIONs Based on PSMA Expression Levels
U.S. Patent No. 10,466,326 issued November 5, 2019

Method for Treating Obesity, Diabetes, Cardiovascular and Kidney Diseases by Regulating GPR30/GPER Activity
U.S. Patent No. 10,471,047 issued November 12, 2019

Accelerated Precomputation of Reduced Deformable Models
U.S. Patent No. 10,474,927 issued November 12, 2019

Nanowire Bending for Planar Device Process on (001) Si Substrates
U.S. Patent No. 10,483,105 issued November 19, 2019

Methods to Introduce Sub-Micrometer, Symmetry-Breaking Surface Corrugation to Silicon Substrates to Increase Light Trapping
U.S. Patent No. 10,483,415 issued November 19, 2019

Electrically and Thermally Conductive Polymer Concrete
U.S. Patent No. 10,494,299 issued December 3, 2019

Systems and Methods for Integrating Distributed Energy Resources
U.S. Patent No. 10,511,172 issued December 17, 2019

Inhibition of MK2 in the Treatment of Cancer
U.S. Patent No. 10,512,651 issued December 24, 2019

Microsphere-Based Coatings for Radioactive Cooling Under Direct Sunlight
U.S. Patent No. 10,514,215 issued December 24, 2019

Tattletale Ion-Implanted Nanoparticles
U.S. Patent No. 10,514,361 issued December 24, 2019

Supported Ni-M Materials for Electrooxidation of Hydrazine
U.S. Patent No. 10,522,843 issued December 31, 2019

Light Trapping in Hot-Electron-Based Infrared Photodetectors
U.S. Patent No. 10,529,870 issued January 7, 2020

P-Phenylene Ethynylene Compounds as Bioactive and Detection Agents
U.S. Patent No. 10,533,991 issued January 14, 2020

CXCR Antagonistic Peptides and Uses Thereof
U.S. Patent No. 10,548,942 issued February 4, 2020

Irisin-Related Cancer Treatments
U.S. Patent No. 10,548,950 issued February 4, 2020

Control of Chronic Neuropathic Pain and Allodynia
U.S. Patent No. 10,548,994 issued February 4, 2020

Non-Toxic Larvicide
U.S. Patent No. 10,555,519 issued February 11, 2020

Device for Providing Cutaneous Sensations to a Fingertip
U.S. Patent No. 10,558,269 issued February 11, 2020

Inhibition and Treatment of Bacterial Infections by Sex-Specific GPER Targeting
U.S. Patent No. 10,561,648 issued February 18, 2020

STEP-Derived Peptide for Brain Injury Treatment
U.S. Patent No. 10,570,381 issued February 25, 2020

Inventor Honorees

James C. Aarestad, Ph.D.

Research Professor, School of Engineering
Chief Scientist, COSMIAC Research Center
Startup: Enthentica, Inc.

Recognized Patent

System and Methods for Leveraging Path Delay Variations in a Circuit and Generating Error-Tolerant Bitstrings
U.S. Patent No. 10,230,369, issued March 12, 2019. Inventors: James C. Aarestad, James Plusquellic

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Ladan Arissian, Ph.D.

Research Assistant Professor
Department of Electrical & Computer Engineering
Member, Center for High Technology Materials

Recognized Patent

Enhancement of the Phase Response of Intracavity Phase Interferometers
U.S. Patent No. 10,317,212, issued June 11, 2019. Inventors: Ladan Arissian, Jean-Claude Diels, Matthias Lenzner, James Hendrie

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Dorian C. Arnold, Ph.D.

Associate Professor
Department of Computer Science

Recognized Patent

System and Methods for Performing Medical Physics Calculations
U.S. Patent No. 10,248,764 issued April 2, 2019. Inventors: Dorian C. Arnold, Shuang (Sean) Luan, Roy William Keyes, Christian Romano

Plamen B. Atanassov, Ph.D.

Chancellor's Professor
Department of Chemical & Biomolecular Engineering
University of California, Irvine
Research Professor
Department of Chemical & Biological Engineering
The University of New Mexico
2014 STC.UNM Innovation Fellow
2017 NAI Fellow
Startup: Pajarito Powder, LLC

Recognized Patent

Supported NI-M Materials for Electrooxidation Of Hydrazine
U.S. Patent No. 10,522,843 issued December 31, 2019. Inventors: Plamen B. Atanassov, Alexey Serov, Hirohisa Tanaka, Koichiro Asazawa, Tomokazu Sakamoto

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Ganesh Balakrishnan, Ph.D.

Professor
Department of Electrical & Computer Engineering
Associate Director, Center for High Technology Materials

Recognized Patent

High Quality AlSb for Radiation Detection
U.S. Patent No. 10,249,780 issued April 2, 2019. Inventors: Ganesh Balakrishnan, Adam Hecht, Erin Ivey Vaughan

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Kiran Bhaskar, Ph.D.

Associate Professor
Department of Molecular Genetics & Microbiology
Co-Director, Brain and Behavioral Health Institute
Startup: Biosafe Defenses, LLC

Recognized Patent

P-Phenylene Ethynylene Compounds as Bioactive and Detection Agents
U.S. Patent No. 10,533,991 issued January 14, 2020. Inventors: Kiran Bhaskar, Eva Chi, David G. Whitten, Harry Pappas, Eric H. Hill, Yue Zhang, Arjun Thapa, Patrick L. Donabedian, Ying Wang

Inventor Honorees

Edgar C. Boedeker, M.D.

Professor
Department of Internal Medicine
Division of Gastroenterology

Recognized Patent

An Attenuated EHEC and Clostridial Toxins TcdA- and TcdB-Based Vaccine for Clostridium Difficil-Associated Disease (CDAD)
U.S. Patent No. 10,286,054 issued May 14, 2019. Inventors: Edgar C. Boedeker, Sudeep Kumar

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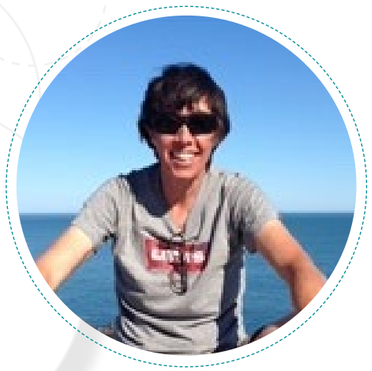

Virginie Bondu

Associate Scientist
Department of Molecular Genetics & Microbiology

Recognized Patent

Activated GTPase-Based Assays and Kits for the Diagnosis of Sepsis and Other Infections
U.S. Patent No. 10,261,084 issued April 16, 2019. Inventors: Virginie Bondu, Tione Buranda, Angela Wandinger-Ness, Peter Simons, Jacob Ongudi Agola, Soumik BasuRay, Scarlett Swanson

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Steven R. J. Brueck, Ph.D.

Distinguished Professor Emeritus
Department of Electrical & Computer Engineering
Director Emeritus, Center for High Technology Materials
2010 STC.UNM Innovation Fellow
2015 NAI Fellow
Startups: Armonica Technologies, Inc., GPB Scientific, Inc.

Recognized Patents

Surface Plasma Wave Coupled Detectors
U.S. Patent No. 10,283,667 issued May 7, 2019. Inventors: Steven R.J. Brueck, Seung-Chang Lee, Sanjay Krishna

Dr. Brueck's recognized patents continued:

Integrated Bound-Mode Spectral/Angular Sensors
U.S. Patent No. 10,408,673 issued September 10, 2019. Inventors: Steven R.J. Brueck, Payman Zarkesh-Ha, Alexander Neumann

Robust, Compact, Fieldable Tunable Integrated Photonic Device
U.S. Patent No. 10,411,436 issued September 10, 2019. Inventors: Steven R.J. Brueck, Sanjay Krishna, Daniel P. Dapkus

Growth of Cubic Crystalline Phase Structure on Silicon Substrates and Devices Comprising the Cubic Crystalline Phase Structure
U.S. Patent No. 10,453,996 issued October 22, 2019. Inventors: Steven R.J. Brueck, Seung-Chang Lee, Christian Wetzel, Mark Durniak

Nanowire Bending for Planar Device Process on (001) Si Substrates
U.S. Patent No. 10,483,105 issued November 19, 2019. Inventors: Steven R.J. Brueck, Seung-Chang Lee

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Tione Buranda, Ph.D.

Associate Professor
Department of Pathology

Recognized Patent

Activated GTPase-Based Assays and Kits for the Diagnosis of Sepsis and Other Infections
U.S. Patent No. 10,261,084 issued April 16, 2019. Inventors: Virginie Bondu, Tione Buranda, Angela Wandinger-Ness, Peter Simons, Jacob Ongudi Agola, Soumik BasuRay, Scarlett Swanson

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Thomas P. Caudell, Ph.D.

Professor Emeritus
Department of Electrical & Computer Engineering

Recognized Patent

Apparatus and Method for Solar Energy Micro-Forecasts for Solar Generation Sources and Utilities
U.S. Patent No. 10,345,486 issued July 9, 2019. Inventors: Thomas P. Caudell, Andrea Mammoli, Anthony Menicucci

Inventor Honorees

Bryce C. Chackerian, Ph.D.

Professor and Vice Chair
Department of Molecular Genetics & Microbiology
2017 STC.UNM Innovation Fellow
2019 NAI Fellow

Recognized Patent

PCSK9 Peptide Vaccine Conjugated to a Qbeta Carrier and Methods of Using the Same
U.S. Patent No. 10,279,019 issued May 7, 2019. Inventors: Bryce C. Chackerian, Alan Remaley, John T. Schiller, Marcelo Amar

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Eva Chi, Ph.D.

Professor and Regents' Lecturer
Department of Chemical & Biological Engineering
Member, Center for Biomedical Engineering
Startup: Biosafe Defenses, LLC

Recognized Patent

P-Phenylene Ethynylene Compounds as Bioactive and Detection Agents
U.S. Patent No. 10,533,991, issued January 14, 2020. Inventors: Kiran Bhaskar, Eva Chi, David G. Whitten, Harry Pappas, Eric H. Hill, Yue Zhang, Arjun Thapa, Patrick L. Donabedian, Ying Wang

Christos Christodoulou, Ph.D.

Jim and Ellen King Dean of Engineering and Computing, School of Engineering
Distinguished Professor, Department of Electrical & Computer Engineering

Recognized Patents

Dual-Matrix Composite Embedded Conductors and Deployable Structures
U.S. Patent No. 10,256,546 issued April 9, 2019. Inventors: Christos Christodoulou, Joseph Constantine, Youssef Tawk, Christoph Benedikt Lukas Karl, Nicolas Nik Lee, Ignacio Maqueda Jimenez, Sergio Pellegrino, Maria Sakovsky

3D Printed Miniaturized Quadrifilar Helix Antenna
U.S. Patent No. 10,381,737 issued August 13, 2019. Inventors: Christos Christodoulou, Joseph Constantine, Youssef Tawk, Michel Chahoud, Marwan Fadous

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Joseph Costantine, Ph.D.

Research Associate Professor
Department of Electrical & Computer Engineering

Recognized Patents

Dual-Matrix Composite Embedded Conductors and Deployable Structures
U.S. Patent No. 10,256,546 issued April 9, 2019. Inventors: Christos Christodoulou, Joseph Constantine, Youssef Tawk, Christoph Benedikt Lukas Karl, Nicolas Nik Lee, Ignacio Maqueda Jimenez, Sergio Pellegrino, Maria Sakovsky

3D Printed Miniaturized Quadrifilar Helix Antenna
U.S. Patent No. 10,381,737 issued August 13, 2019. Inventors: Christos Christodoulou, Joseph Constantine, Youssef Tawk, Michel Chahoud, Marwan Fadous

Inventor Honorees

Jean-Claude Diels, Ph.D.

Professor
Department of Physics & Astronomy
Member, Center for High Technology Materials

Recognized Patent

Enhancement of the Phase Response of Intracavity Phase Interferometers
U.S. Patent No. 10,317,212 issued June 11, 2019. Inventors: Ladan Arissian, Jean-Claude Diels, Matthias Lenzner, James Hendrie

Jeremy S. Edwards, Ph.D.

Professor and Department Chairman
Department of Chemistry & Chemical Biology
Startups: EquiSeq, Inc., Armonica Technologies, Inc.

Recognized Patents

Synthetic Long Read DNA Sequencing
U.S. Patent No. 10,266,904 issued April 23, 2019. Inventor: Jeremy S. Edwards

DNA Sequencing and Epigenome Analysis
U.S. Patent No. 10,329,614 issued June 25, 2019. Inventor: Jeremy S. Edwards

Fernando Garzon, Ph.D.

Professor
Department of Chemical & Biological Engineering
Director, Center for Mico-Engineered Materials

Recognized Patent

Tattletale Ion-Implanted Nanoparticles
U.S. Patent No. 10,514,361 issued December 24, 2019. Inventors: Fernando Garzon, Timothy J. Boyle, Stephen J. Bauer, Khalid Mikhiel Hattar

Steven W. Graves, Ph.D.

Professor
Department of Chemical & Biological Engineering
Member, Center for Biomedical Engineering
Startup: BennuBio, Inc.

Recognized Patent

Signal Propagation Biomolecules, Devices and Methods
U.S. Patent No. 10,221,446 issued March 5, 2019. Inventors: Steven W. Graves, Matthew Lakin, Darko Stefanovic, Carl Brown III

Frédéric Grillot, Ph.D.

Research Professor
Member, Center for High Technology Materials

Recognized Patent

Light-Emitting Device Having III-V Semiconductor Gain Section Coupled to Whistle-Geometry Tunable Filter
U.S. Patent No. 10,320,149 issued June 11, 2019. Inventors: Frédéric Grillot, Marek Osiński

Pamela Hall, Ph.D.

Associate Professor
Department of Pharmaceutical Sciences
Starup: Sensor-Kinesis Corp.

Recognized Patent

Inhibition and Treatment of Bacterial Infections by Sex-Specific GPER Targeting
U.S. Patent No. 10,561,648 issued February 18, 2020. Inventors: Pamela Hall, Helen Hathaway, Eric R. Prossnitz

Sang Eon Han, Ph.D.

Associate Professor
Department of Chemical & Biological Engineering
Member, Center for High Technology Materials
Startup: Osazda Energy, LLC

Recognized Patents

Methods to Introduce Sub-Micrometer, Symmetry-Breaking Surface Corrugation to Silicon Substrates to Increase Light Trapping
U.S. Patent No. 10,483,415 issued November 19, 2019. Inventors: Sang M. Han, Sang Eon Han, Swapnadip Ghosh, Brittany R. Hoard

Microsphere-Based Coatings for Radioactive Cooling Under Direct Sunlight
U.S. Patent No. 10,514,215 issued December 24, 2019. Inventors: Sang M. Han, Sang Eon Han

Light Trapping in Hot-Electron-Based Infrared Photodetectors
U.S. Patent No. 10,529,870 issued January 7, 2020. Inventors: Sang Eon Han, Seok Jun Han

Sang M. Han, Ph.D.

Regents' Professor
Associate Chair, Department of Chemical & Biological Engineering
Director, Nanoscience & Microsystems Engineering
Member, Center for High Technology Materials
2018 STC.UNM Innovation Fellow
Startup: Osazda Energy, LLC

Recognized Patents

Methods to Introduce Sub-Micrometer, Symmetry-Breaking Surface Corrugation to Silicon Substrates to Increase Light Trapping
U.S. Patent No. 10,483,415 issued November 19, 2019. Inventors: Sang M. Han, Sang Eon Han, Swapnadip Ghosh, Brittany R. Hoard

Microsphere-Based Coatings for Radioactive Cooling Under Direct Sunlight
U.S. Patent No. 10,514,215 issued December 24, 2019. Inventors: Sang M. Han, Sang Eon Han

Seok Jun Han, Ph.D.

Research Assistant
Center for High Technology Materials

Recognized Patent

Light Trapping in Hot-Electron-Based Infrared Photodetectors
U.S. Patent No. 10,529,870 issued January 7, 2020. Inventors: Sang Eon Han, Seok Jun Han

Helen Hathaway, Ph.D.

Professor
Department of Cell Biology & Physiology
Member, Comprehensive Cancer Center

Recognized Patent

Inhibition and Treatment of Bacterial Infections by Sex-Specific GPER Targeting
U.S. Patent No. 10,561,648 issued February 18, 2020. Inventors: Pamela Hall, Helen Hathaway, Eric R. Prossnitz

Adam Hecht, Ph.D.

Associate Professor
Department of Nuclear Engineering

Recognized Patent

High Quality AlSb for Radiation Detection
U.S. Patent No. 10,249,780 issued April 2, 2019. Inventors: Ganesh Balakrishnan, Adam Hecht, Erin Ivey Vaughan

Inventor Honorees

Ivy Hurwitz, Ph.D.

Research Associate Professor
Department of Internal Medicine
Member, Center for Global Health

Recognized Patent

Non-Toxic Larvicide
U.S. Patent No. 10,555,519 issued February 11, 2020. Inventors: Ivy Hurwitz, Ravi Durvasula, Scott Matthews

Matthew Lakin, Ph.D.

Assistant Professor
Department of Computer Science
Member, Center for Biomedical Engineering

Recognized Patent

Signal Propagation Biomolecules, Devices and Methods
U.S. Patent No. 10,221,446 issued March 5, 2019. Inventors: Steven W. Graves, Matthew Lakin, Darko Stefanovic, Carl Brown III

Seung-Chang Lee, Ph.D.

Research Associate Professor
Member, Center for High Technology Materials

Recognized Patents

Surface Plasma Wave Coupled Detectors
U.S. Patent No. 10,283,667 issued May 7, 2019. Inventors: Steven R.J. Brueck, Seung-Chang Lee, Sanjay Krishna

Growth of Cubic Crystalline Phase Structure on Silicon Substrates and Devices Comprising the Cubic Crystalline Phase Structure
U.S. Patent No. 10,453,996 issued October 22, 2019. Inventors: Steven R.J. Brueck, Seung-Chang Lee, Christian Wetzel, Mark Durniak

Nanowire Bending for Planar Device Process on (001) Si Substrates
U.S. Patent No. 10,483,105 issued November 19, 2019. Inventors: Steven R.J. Brueck, Seung-Chang Lee

Ke Jian (Jim) Liu, Ph.D.

Distinguished Professor and Associate Dean for Research
Department of Pharmaceutical Sciences
Department of Neurology

Recognized Patent

Blood Biomarker for Early Blood Brain Barrier Disruption in Ischemic Stroke
U.S. Patent No. 10,254,295 issued April 9, 2019. Inventors: Ke Jian (Jim) Liu, Graham Timmins, Rong Pan, Wenlan Liu

Gabriel P. López, Ph.D.

Vice President for Research
Professor, Department of Chemical & Biological Engineering
Founding Director and Member, Center for Biomedical Engineering
2016 STC.UNM Innovation Fellow
2016 NAI Fellow
Startups: BennuBio, Inc., Biosafe Defenses, LLC, GPB Scientific, Inc.

Recognized Patent

Compositions, Systems and Methods for the Encapsulation and Delivery of a Substance
U.S. Patent No. 10,238,586 issued March 26, 2019. Inventors: Gabriel P. López, Charles W. Shields IV, Nick Kirby

Shuang (Sean) Luan, Ph.D.

Professor
Department of Computer Science
Department of Radiology

Recognized Patent

System and Methods for Performing Medical Physics Calculations
U.S. Patent No. 10,248,764 issued April 2, 2019. Inventors: Dorian C. Arnold, Shuang (Sean) Luan, Roy William Keyes, Christian Romano

Inventor Honorees

Andrea A. Mammoli, Ph.D.

Professor
Department of Mechanical Engineering
Director, Center for Emerging Energy Technologies

Recognized Patents

Apparatus and Method for Solar Energy Micro-Forecasts for Solar Generation Sources and Utilities
U.S. Patent No. 10,345,486 issued July 9, 2019. Inventors: Thomas P. Caudell, Andrea Mammoli, Anthony Menicucci

Systems and Methods for Integrating Distributed Energy Resources
U.S. Patent No. 10,511,172 issued December 17, 2019. Inventors: Andrea Mammoli, Yasser Yasaei

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Anthony R. Menicucci

Research Assistant & Doctoral Student
Department of Mechanical Engineering
Member, Center for Emerging Energy Technologies

Recognized Patent

Apparatus and Method for Solar Energy Micro-Forecasts for Solar Generation Sources and Utilities
U.S. Patent No. 10,345,486 issued July 9, 2019. Inventors: Thomas P. Caudell, Andrea Mammoli, Anthony Menicucci

Erin Milligan, Ph.D.

Associate Professor
Department of Neurosciences

Recognized Patents

Compact Biosensor of Matrix Metalloproteinase with Cadmium-Free Quantum Dots
U.S. Patent No. 10,299,707 issued May 28, 2019. Inventors: Erin Milligan, Marek Osiński, John B. Plumley

Control of Chronic Neuropathic Pain and Allodynia
U.S. Patent No. 10,548,994 issued February 4, 2020. Inventors: Erin Milligan, Jeffrey P. Norenberg

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Abdullah Mueen, Ph.D.

Associate Professor
Department of Computer Science

Recognized Patent

System and Methods for Detecting Bots Real-Time
U.S. Patent No. 10,389,745 issued August 20, 2019. Inventors: Abdullah Mueen, Nikan Chavoshi

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Alexander Neumann, Ph.D.

Research Assistant Professor
Member, Center for High Technology Materials
Startup: Armonica Technologies, Inc.

Recognized Patent

Integrated Bound-Mode Spectral/Angular Sensors
U.S. Patent No. 10,408,673 issued September 10, 2019. Inventors: Steven R.J. Brueck, Payman Zarkesh-Ha, Alexander Neumann

Inventor Honorees

Jeffrey P. Norenberg, Pharm.D., Ph.D.

Professor and Director Emeritus
Department of Anesthesiology & Critical Care Medicine
Startup: Concardia BV

Recognized Patent

Control of Chronic Neuropathic Pain and Allodynia
U.S. Patent No. 10,548,994 issued February 4, 2020. Inventors: Erin Milligan, Jeffrey P. Norenberg

Marek A. Osiński, Ph.D.

Distinguished Professor
Department of Electrical & Computer Engineering
Member, Center for High Technology Materials

Recognized Patents

Compact Biosensor of Matrix Metalloproteinase with Cadmium-Free Quantum Dots
U.S. Patent No. 10,299,707 issued May 28, 2019. Inventors: Erin Milligan, Marek Osiński, John B. Plumley

Light-Emitting Device Having III-V Semiconductor Gain Section Coupled to Whistle-Geometry Tunable Filter
U.S. Patent No. 10,320,149 issued June 11, 2019. Inventors: Frédéric Grillot, Marek Osiński

Rong Pan, Ph.D.

Research Assistant Professor
Department of Pharmaceutical Science

Recognized Patent

Blood Biomarker for Early Blood Brain Barrier Disruption in Ischemic Stroke
U.S. Patent No. 10,254,295 issued April 9, 2019
Inventors: Ke Jian (Jim) Liu, Graham Timmins, Rong Pan, Wenlan Liu

Surojit Paul, Ph.D.

Professor
Department of Neurology
Startup: Zocere, Inc.

Recognized Patent

STEP-Derived Peptide for Brain Injury Treatment
U.S. Patent No. 10,570,381 issued February 25, 2020. Inventor: Surojit Paul

John B. Plumley, Ph.D.

Postdoctoral Appointee
Center for Micro-Engineered Materials

Recognized Patent

Compact Biosensor of Matrix Metalloproteinase with Cadmium-Free Quantum Dots
U.S. Patent No. 10,299,707 issued May 28, 2019. Inventors: Erin Milligan, Marek Osiński, John B. Plumley

James Plusquellic, Ph.D.

Professor
Department of Electrical & Computer Engineering
Startups: IC-Safety, LLC, Enthentica, Inc.

Recognized Patents

Systems and Methods for Leveraging Path Delay Variations in a Circuit and Generating Error-Tolerant Bitstrings
U.S. Patent No. 10,230,369 issued March 12, 2019. Inventors: James C. Aarestad, James Plusquellic

Reliability Enhancement Methods for Physically Unclonable Function Bitstring Generation
U.S. Patent No. 10,366,253 issued July 30, 2019. Inventor: James Plusquellic

Inventor Honorees

Eric R. Prossnitz, Ph.D.

Distinguished Professor
Department of Internal Medicine
Chief, Division of Molecular Medicine
Maralyn S. Budke Endowed Chair in Cancer Chemical Biology and Therapeutics
Co-Leader, Cancer Therapeutics Program, UNM Comprehensive Cancer Center
Associate Director, Autophagy, Inflammation and Metabolism Center of Biomedical Research Excellence
Leader, Team Science and Commercialization, Clinical and Translational Science Center
UNM PI, ASCEND: Accelerating Solutions for Commercialization and Entrepreneurial Development
Startups: GPER G-1 Development Group, LLC, Linnaeus Therapeutics, Inc., Sandia Biotech, Inc.

Recognized Patents

Method for Treating Obesity, Diabetes, Cardiovascular and Kidney Diseases by Regulating GPR30/GPER Activity
U.S. Patent No. 10,251,870 issued April 9, 2019. Inventors: Eric R. Prossnitz, Matthias Barton, Matthias R. Meyer

Method for Treating Obesity, Diabetes, Cardiovascular and Kidney Diseases by Regulating GPR30/GPER Activity
U.S. Patent No. 10,471,047 issued November 12, 2019. Inventors: Eric R. Prossnitz, Sharma Geetanjali

Inhibition and Treatment of Bacterial Infections by Sex-Specific GPER Targeting
U.S. Patent No. 10,561,648 issued February 18, 2020. Inventors: Pamela Hall, Helen Hathaway, Eric R. Prossnitz

Geetanjali Sharma, Ph.D.

Research Assistant Professor
Department of Internal Medicine, Division of Molecular Medicine
Startup: GPER G-1 Development Group, LLC

Recognized Patent

Method for Treating Obesity, Diabetes, Cardiovascular and Kidney Diseases by Regulating GPR30/GPER Activity
U.S. Patent No. 10,471,047 issued November 12, 2019. Inventors: Eric R. Prossnitz, Geetanjali Sharma

Daisuke (Dice) Shibata, Ph.D., L.A.T., A.T.C.

Assistant Professor
Department of Health, Exercise and Sports Science

Recognized Patent

Device for Providing Cutaneous Sensations to a Fingertip
U.S. Patent No. 10,558,269 issued February 11, 2020. Inventors: Daisuke Shibata, Francesco Chinello, Domenico Prattichizzo, Marco Santello

Laurel O. Sillerud, Ph.D.

Research Professor
Department of Neurology

Recognized Patent

Quantitative [Fe]-MRI (femri) of Anti-PSMA-Conjugated SPIONs Based on PSMA Expression Levels
U.S. Patent No. 10,466,326 issued November 5, 2019. Inventors: Laurel O. Sillerud

Peter Simons, Ph.D.

Associate Scientist
Department of Pathology

Recognized Patent

Activated GTPase-Based Assays and Kits for the Diagnosis of Sepsis and Other Infections
U.S. Patent No. 10,261,084 issued April 16, 2019. Inventors: Virginie Bondu, Tione Buranda, Angela Wandinger-Ness, Peter Simons, Jacob Ongudi Agola, Soumik BasuRay, Scarlett Swanson

Inventor Honorees

Darko Stefanovic, Ph.D.

Professor
Department of Computer Science
Member, Center for Biomedical Engineering

Recognized Patent

Signal Propagation Biomolecules, Devices and Methods
U.S. Patent No. 10,221,446 issued March 5, 2019. Inventors: Steven W. Graves, Matthew Lakin, Darko Stefanovic, Carl Brown III

John Stormont, Ph.D.

Professor
Department of Civil, Construction & Environmental Engineering

Recognized Patent

Encapsulated Polymer Nanocomposite for Efficient Crack Repair and Monitoring of Cement, Rock, and Other Brittle Materials
U.S. Patent No. 10,370,305 issued August 6, 2019. Inventors: Mahmoud Taha, John Stormont, Edward N. Mateo

Mahmoud Taha, Ph.D.

Distinguished Professor, Regents' Lecturer & Chair
Department of Civil, Construction & Environmental Engineering

Recognized Patents

Ductile Fiber Reinforced Polymer Plates and Bars Using Mono-Type Fibers
U.S. Patent No. 10,337,186 issued July 2, 2019. Inventors: Mahmoud Taha, Eslam M. Soliman

Encapsulated Polymer Nanocomposite for Efficient Crack Repair and Monitoring of Cement, Rock, and Other Brittle Materials
U.S. Patent No. 10,370,305 issued August 6, 2019. Inventors: Mahmoud Taha, John Stormont, Edward N. Mateo

Methods of Using N-Containing Compounds with Carbon Black to Replace Pan and Form Carbon Fibers
U.S. Patent No. 10,442,934 issued October 15, 2019. Inventors: Mahmoud Taha, Richard Kemp

Electrically and Thermally Conductive Polymer Concrete
U.S. Patent No. 10,494,299 issued December 3, 2019. Inventors: Mahmoud Taha, Usama Farid Kandil, Ala Eddin Douba, Mehmet Emiroglu

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Youssef A. Tawk, Ph.D.

Research Associate Professor
Department of Electrical & Computer Engineering

Recognized Patents

Dual-Matrix Composite Embedded Conductors and Deployable Structures
U.S. Patent No. 10,256,546 issued April 9, 2019. Inventors: Christos Christodoulou, Joseph Constantine, Youssef Tawk, Christoph Benedikt Lukas Karl, Nicolas Nik Lee, Ignacio Maqueda Jimenez, Sergio Pellegrino, Maria Sakovsky

3D Printed Miniaturized Quadrifilar Helix Antenna
U.S. Patent No. 10,381,737 issued August 13, 2019. Inventors: Christos Christodoulou, Joseph Constantine, Youssef Tawk, Michel Chahoud, Marwan Fadous

Inventor Honorees

Graham Timmins, Ph.D.

Associate Professor
Department of Pharmaceutical Sciences
2013 STC.UNM Innovation Fellow
Startups: Avisa Pharma, Inc., SpinCeutica, Inc.

Recognized Patent

Blood Biomarker for Early Blood Brain Barrier Disruption in Ischemic Stroke
U.S. Patent No. 10,254,295 issued April 9, 2019. Inventors: Ke Jian (Jim) Liu, Graham Timmins, Rong Pan, Wenlan Liu

Angela Wandinger-Ness, Ph.D.

Professor
Department of Pathology
Victor and Ruby Hansen Surface Endowed Professor in Cancer Cell Biology & Clinical Translation
Associate Director for Education, Training & Mentoring, UNM Comprehensive Cancer Center
2019 STC.UNM Innovation Fellow
Startup: Revere Pharmaceuticals, Inc.

Recognized Patent

Activated GTPase-Based Assays and Kits for the Diagnosis of Sepsis and Other Infections
U.S. Patent No. 10,261,084 issued April 16, 2019. Inventors: Virginie Bondu, Tione Buranda, Angela Wandinger-Ness, Peter Simons, Jacob Ongudi Agola, Soumik BasuRay, Scarlett Swanson

David G. Whitten, Ph.D.

Distinguished Professor
Department of Chemical & Biological Engineering
Associate Director, Center for Biomedical Engineering
2020 STC.UNM Innovation Fellow
Startup: Biosafe Defenses, LLC

Recognized Patent

P-Phenylene Ethynylene Compounds as Bioactive and Detection Agents
U.S. Patent No. 10,533,991 issued January 14, 2020. Inventors: Kiran Bhaskar, Eva Chi, David G. Whitten, Harry Pappas, Eric H. Hill, Yue Zhang, Arjun Thapa, Patrick L. Donabedian, Ying Wang

Yin Yang, Ph.D.

Research Associate Professor
Department of Electrical & Computer Engineering

Recognized Patent

Accelerated Precomputation of Reduced Deformable Models
U.S. Patent No. 10,474,927 issued November 12, 2019. Inventor: Yin Yang

Payman Zarkesh-Ha, Ph.D.

Associate Professor
Department of Electrical & Computer Engineering
Startup: Dynamic Photonics, Inc.

Recognized Patent

Integrated Bound-Mode Spectral/Angular Sensors
U.S. Patent No. 10,408,673 issued September 10, 2019. Inventors: Steven R.J. Brueck, Payman Zarkesh-Ha, Alexander Neumann

"Dave has been an incredible mentor and collaborator, and an inspiration to me as a scientist. He is humble, open, and always ready to listen and discuss, whether it's science or life. He is also always brimming with ideas. Science to him is not just an abstract pursuit of knowledge, but how the knowledge can impact the world and real lives. In this regard, the Innovation Fellow is a fitting, and well-deserved honor for Dave as it recognizes the significant social and economic impact his work has had on society and the marketplace."

Eva Chi, Ph.D.
Professor and Regents' Lecturer
Dept. of Chemical & Biological Engineering
Member, Center for Biomedical Engineering

2020 STC.UNM
Innovation Fellow

David G. Whitten, Ph.D.

About the STC.UNM Innovation Fellow Award

The STC.UNM Board of Directors created this award in 2010 to honor annually a University of New Mexico inventor whose body of technologies has generated significant commercialization activities. Based on achievements in new technologies disclosed, patents received, license and option agreements entered into, new companies started and income generated from these technologies, the STC.UNM Innovation Fellow Selection Board Committee evaluates and selects an Innovation Fellow.

The social and economic impact of the awardee's technologies in the marketplace is important. New technologies resulting in substantial benefit to the public may have the most valuable impact on society. The STC.UNM Innovation Fellow Award is recognition of that impact.

The award includes an honorarium, recognition of the impact of the awardee's technologies at the annual Innovation Awards event, and a commemorative gift.

The STC.UNM Innovation Fellows raise the visibility of inventors both inside and outside the UNM community and act as a network of mentors and collaborators who will drive future inventive endeavors for UNM and STC.

STC.UNM Innovation Fellows

2020 Innovation Fellow
David G. Whitten, Ph.D.

2019 Innovation Fellow
Angela Wandinger-Ness, Ph.D.

2018 Innovation Fellow
Sang M. Han, Ph.D.

2017 Innovation Fellow
Bryce C. Chackerian, Ph.D.

2017 Innovation Fellow
David S. Peabody, Ph.D.

2016 Innovation Fellow
Gabriel P. López, Ph.D.

2015 Innovation Fellow
C. Jeffrey Brinker, Ph.D.

2015 Innovation Fellow
Cheryl L. Willman, M.D.

2014 Innovation Fellow
Plaman B. Atanassov, Ph.D.

2013 Innovation Fellow
Graham S. Timmins, Ph.D.

2012 Innovation Fellow
Stephen D. Hersee, Ph.D.

2011 Innovation Fellow
Larry A. Sklar, Ph.D.

2010 Innovation Fellow
Steven R. J. Brueck, Ph.D.

2020 STC.UNM Innovation Fellow

David G. Whitten, Ph.D.

Introduction

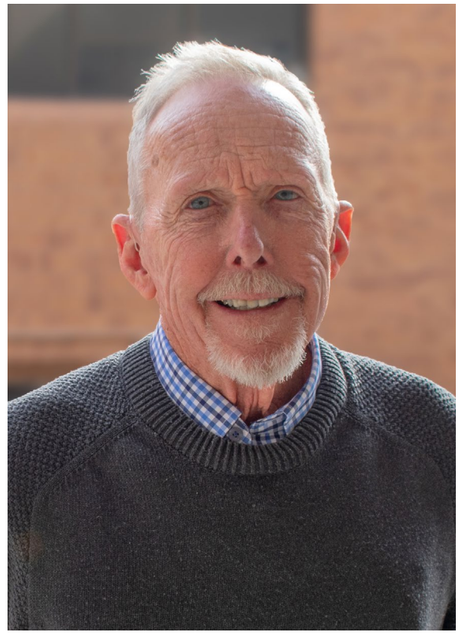
The 2020 STC.UNM Innovation Fellow being honored this year is an individual whose work is not only driven by the pursuit of innovation and knowledge, but also by the objective of positively impacting our society.

Dr. David Whitten has over 50 year of experience as a scientist and an academic. He joined the University of New Mexico in 2005 and has since excelled as an inventor, disclosing 33 technologies and has received 17 issued patents. He was selected as a Distinguished Professor in 2016 and is the Associate Director for the Center for Biomedical Engineering. He also serves as Associate Editor for *ACS Applied Materials and Interfaces.*

Dr. Whitten explores the mechanisms by which different compounds function and their potential application as antimicrobials.

When asked why Dr. Whitten pursues this type of research, he replied, "Too often I think scientists like to compartmentalize what they're doing as one sort of thing or another. Like pure research or fundamental research or curiosity driven research – those mean you're really just looking at for the fun of finding new knowledge. On the other hand, there are people who do this kind of work but are also working towards an application – and I find that more appealing. I really like the idea that something I've done can be useful."

Dr. Whitten's conjugated polyelectrolyte technology combats two of the largest threats to human health and wellbeing in the 21st century; antibiotic resistant bacteria and most recently the spread of infectious disease. The emergence of these significant problems has resulted in a considerable amount of clinical research on the study of different methods of infection control practices. One of the most significant interests has been on antimicrobial surfaces for medical facilities, medical devices, and personal



residences and household items. These antimicrobial surfaces would be used to reduce the transmission of disease and infection spread from one organism to another through eliminating microbes.

Most microbes can linger on surfaces for several hours and can infect numerous organisms within a short period of time. Scientific research has confirmed that microbes contribute to many infectious diseases, cancers, and infections. Although standard disinfection protocols work well for microbes in suspension, they aren't nearly as effective against microbes attached to surfaces, which account for the majority of bacteria in the world. This has led researchers to instead focus on a different method of disinfection using unique coatings which can trap, capture, and kill pathogens.

Dr. Whitten, Dr. Kirk Schanze of the University of Florida and their collaborators have created novel coatings using cationic conjugated polyelectrolytes (CPEs) to entrap bacteria in a dark process and subsequently kill the entrapped bacteria upon irradiation with visible light. This remarkable technology not only provides an effective method for killing microbes while displaying a low toxicity to organisms, but also represents a method that should not promote the formation of resistant strains of microbes. These innovative coatings will revolutionize how individuals disinfect medical areas, offices, homes, instruments, clothes, and material goods, which will significantly reduce the number of infections and diseases transmitted from microbes.

In partnership with his students and collaborators, Dr. Whitten's innovations and discoveries have the potential of impacting the health of our community and those all around the world. This extraordinary pursuit is just one of the many reasons Dr. Whitten has been chosen as an STC.UNM Innovation Fellow.

An Innovator's Journey

David Whitten was born on January 25, 1938 in Washington, D.C. When he was a year old, his family moved to Bethesda, Montgomery County, MD, where he attended school from K-9th grade in the Montgomery County public schools. His family moved to Baltimore County, MD in 1952 where he attended public high school in Towson, MD.

Dr. Whitten received his B.A., M.A. and Ph.D. in Chemistry from Johns Hopkins University. After completing his Ph.D. with Alsoph Corwin in 1963, he spent a tour of duty as a US Army officer assigned to NASA doing research at the Caltech Jet Propulsion Laboratory (1963-1965). Following a postdoctoral stay in the Chemistry Department at Caltech with George Hammond (1965-1966), he joined the chemistry faculty of the University of North Carolina at Chapel Hill (1966). He moved to the University of Rochester in 1983. While at Rochester, he was twice department chair and founding director of the NSF Center for Photoinduced Charge Transfer (1989), a pioneering multidisciplinary research center promoting university-industrial collaborative research.

In 1997, he became a technical staff member at Los Alamos National Laboratory and was co-founder and chief science officer of QTL Biosystems, a company developing biosensing and bioassay technology in Santa Fe, NM from 2000-2005. In 2005, Dr. Whitten joined the University of New Mexico as a professor in the Department of Chemical & Biological Engineering and is currently a distinguished professor in the department and associate director of the Center for Biomedical Engineering. In 2010, he was elected as a fellow of the American Chemical Society.

Dr. Whitten's professional activities have included serving as editor-in-chief of *Langmuir*, a peer-reviewed journal published by the American Chemical Society, from 1998-2014. In 2015, he joined the editorial board of *ACS Applied Materials and Interfaces* as an associate editor.

Dr. Whitten and his family have been fortunate to travel and live in various parts of the US, Europe, Asia and South America. He has been visiting professor with extended stays in Germany, Switzerland, Japan, Brazil and most recently, Austria. In recent years, he has participated in several worldwide outreach activities on behalf of the American Chemical Society in its ACS on Campus program.

His research areas of current interest are spectroscopy, molecular assemblies, diagnostics, interfaces, conjugated polymers and antimicrobials. Motivated by a desire to find a better method for disinfection, Whitten and his students and collaborators have developed novel antimicrobial polymers and oligomers (smaller and simpler versions of the polymers), conjugated polyelectrolytes (CPEs) that have unique properties as antimicrobials, killing bacteria, viruses, fungi and biofilms in dark- and light-activated processes. Dr. Whitten's research focuses on the mechanisms by which these compounds are active and on several potential applications based on their antimicrobial properties.

CPEs can be made into antimicrobial coatings that have the ability to destroy bacteria slowly in the dark or rapidly on exposure to light. Composite materials have been used to self-clean the accumulation of dead bacteria, which allows the coating to retain its biocidal effectiveness through multiple uses--with high toxicity to microbes, but not to mammalian cells. Thus far, CPEs have not been found to promote the formation of resistant strains of microbes and, in cases studied thus far, laboratory strains and antibiotic resistant strains have shown equivalent vulnerability to the CPEs. Perhaps the greatest commercial potential for the CPE technologies are as wipes, sprays and coatings for solids and plastics, such as surfaces in hospitals and public facilities. In December 2015, he joined with colleagues to start a new company, Biosafe Defenses, LLC, to commercialize these technologies.

Technologies

Pending U.S. & PCT Patent Applications

(as of February 29, 2020)

Structure, Synthesis, and Applications for Poly (Phenylene) Ethynylenes (PPEs)
Application No. 16/192,248 filed November 15, 2018

P-Phenylene Ethynylene Compounds as Bioactive and Detection Agents
Application No. 16/707,501 filed December 9, 2019

Conjugated Polyelectrolytes and Methods of Using the Same
Application No. 15/668,390 filed August 3, 2017

Treatment and Prevention of Fungal Infections
Application No. 15/886/469 filed February 1, 2018

Substituted Thiophene Oligomers and Polymers
Application No. PCT/US18/52014 filed September 20, 2018

Novel Theranostics for Protein Misfolding Diseases
Application No. 16/285,809 filed February 26, 2019

Issued U.S. Patents

(as of February 29, 2020)

Surface Grafted Conjugated Polymers
U.S. Patent No. 8,455,265 issued June 4, 2013

Structure, Synthesis, and Applications for Oligo Phenylene Ethynylenes
U.S. Patent No. 8,753,570 issued June 17, 2014

Conjugated Polyelectrolyte Capsules: Light-Activated Antimicrobials
U.S. Patent No. 8,618,009 issued December 31, 2013

Conjugated Polyelectrolyte Capsules: Light-Activated Antimicrobials
U.S. Patent No. 9,005,540 issued April 14, 2015

Materials Incorporating Antimicrobial Polymers
U.S. Patent No. 8,598,053 issued December 3, 2013

Structure, Synthesis, and Applications for Oligo Phenylene Ethynylenes (OPEs)
U.S. Patent No. 10,092,000 issued October 9, 2018

Structure, Synthesis, and Applications for Poly (Phenylene) Ethynylenes (PPEs)
U.S. Patent No. 9,527,806 issued December 27, 2016

Structure, Synthesis, and Applications for Poly (Phenylene) Ethynylenes (PPEs)
U.S. Patent No. 10,174,042 issued January 8, 2019

Thiophene-Based Oligomers As Light-Activiated Biocides
U.S. Patent No. 9,125,415 issued September 8, 2015

Antimicrobial Materials and Methods
U.S. Patent No. 9,549,549 issued January 24, 2017

Antimicrobial Materials and Methods
U.S. Patent No. 10,058,099 issued August 28, 2018

Charged Singlet-Oxygen Sensitizers and Oppositely-Charged Surfactants
U.S. Patent No. 9,968,698 issued May 15, 2018

P-Phenylene Ethynylene Compounds as Bioactive and Detection Agents
U.S. Patent No. 10,533,991 issued January 14, 2020

Conjugated Polyelectrolytes and Methods of Using the Same
U.S. Patent No. 9,750,250 issued September 5, 2017

The technologies highlighted below are a sample of Dr. Whitten's most important inventions that are optioned/licensed or are currently being marketed.

"End-Only" Functionalized Oligo Phenylene Ethynylenes: Synthesis, Photophysical and Biocidal Activity

Background:
Bacteria contamination can cause a variety of superficial and life-threatening skin/wound/internal infections. Over time, bacteria have become increasingly resistant to existing antibiotics. In efforts to address this dual threat, antibacterial research has turned to photophysical processes that utilize the absorption of visible and ultraviolet light to induce phototoxic reactions leading to bacterial damage and death. There is a present market demand for the development of photosensitizers with high efficiency, broad-spectrum, and controllable release antimicrobials. "End-only" functionalized oligo phenylen ethynylenes (OPEs) have recently been found to be broad-spectrum and effective antibacterial agents because of their unique structure and optical properties. Synthesized oligomes show exceptional dark and UV-light activated biocidal activity against gram-negative and gram-positive bacteria and bacterial spores.

Technology:
Researchers at the University of New Mexico and University of Florida have developed a method for synthesizing end-only functionalized oligo phenylen ethynylenes (OPEs) that are characterized by exceptional dark and UV-light activated biocidal activity against gram negative and gram positive bacteria and bacterial spores.

Advantages/Applications:
- High efficiency at inhibiting growth and killing of Gram-positive spores and Gram-negative bacteria under 365 nm radiation
- Broad spectrum light-induced biocidal activity resulting in significant bacterial kills under low concentration of OPE
- Controllable release
- Straightforward synthesis requires five steps

Conjugated Polyelectrolytes with Variable Chain Lengths: Complexation with Oppositely Charged Compounds and Biocidal Activity

Background:
The physical and photophysical properties of conjugated polymers and conjugated polyelectrolytes have often been the subject of investigation. Oftentimes, these compounds are synthetically prepared without rigorous control of the polymer chain's length, and the macromolecules used in the synthesis may be from a mixture of molecules with a wide range of molecular weights. Such a synthesis technique can be problematic, as it is inaccurate and allows for a great degree of molecular variation. A synthesis technique that allows for precise control of the polymer chain's length and results in the generation of a pool of molecules having similar molecular weights is desirable, as well as beneficial for a wide range of applications.

Technology:
Researchers at the University of New Mexico have developed a method of synthesizing conjugated polyelectrolytes (CPEs) with six different chain lengths. These synthesized compounds were created from precursors with controlled and similar molecular weights. These polymers have also shown significant biocidal activity against both Gram-

positive and Gram-negative bacteria while under UV light. Given these traits, these compounds can be used in a wide variety of applications and may be effective in a variety of new antibacterial treatment methods.

Advantages/Applications:

- A method of synthesizing compounds with substantial biocidal activity
- May be used against Gram-positive or Gram-negative bacteria
- Biocidal activity can be controlled by the absence or presence of light
- Compounds can be synthesized with different polymer chain lengths
- The precursors of these compounds can be controlled, resulting in the selection of precursors with similar and identifiable molecular weights
- Applications in antibacterial treatment, sensing (e.g., DNA detection), and more

Thiophene-Based Oligomers as Light-Activated Biocide

Background:

Bacterial resistance to conventional antibiotics is a growing global concern. Photodynamic therapy is a promising alternative to conventional antibacterial regimens. Photodynamic therapies employ the absorption of visible and UV light to induce phototoxic bacterial reactions. Current research trends in photodynamic therapy are targeted toward the development of antibacterial agents possessing the capacity for optimal singlet oxygen yield. Increased singlet oxygen yield has been found to magnify biocidal activity against several pathogens including bacteria and viruses. Therefore, there exists a present market need for novel antibacterial agents that can produce increased levels of singlet oxygen. Recent developments revolving around the use of thiophene-based oligomers as light-activated bodies reagents have shown promising results in producing increases in singlet oxygen.

Technology:

University of New Mexico and University of Florida researchers have developed a method for synthesizing thiophene-based oligomers functionalized with cationic end groups exhibiting light-activated biocidal characteristics.

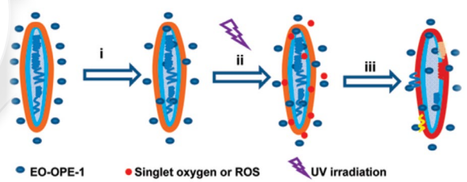
Advantages/Applications:

- Empirically shown to be very efficient at killing *Staphylococcus aureus* in the presence of light
- Potential application for antimicrobial materials, such as hospital garments, medical devices, filtration systems, surgical instruments
- Efficiently sensitizes the formation of singlet oxygen, enhancing biocidal activity

Efficacy of "End-Only" Functionalized Oligo (Phenylene Ethynylene)s in Killing Biofilm Bacteria

Background:

Bacterial biofilms are public health concerns due to their prevalence on all living and inanimate surfaces, and their relatively high resistance to antimicrobials. Biofilms are a basis for various infections in the body, such as middle-ear infections, formation of dental plaque, and infections related to indwelling medical devices. Although several techniques have been developed to prevent biofilm formation and to produce disinfection on surfaces, it is difficult to completely inhibit biofilm formation due to the physiological heterogeneity of bacteria in biofilms and their resistance to antibiotics. Two primary determinants of an antimicrobial agent's bacterial inhibition and killing efficiency are (1) its minimum inhibitory concentration (MIC), which is the concentration of antimicrobial required to inhibit growth of a planktonic bacterial population, and (2) its minimum biofilm eradication concentration (MBEC), which represents the concentration of an antimicrobial required to eradicate a bacterial biofilm. Furthermore, a high triplet yield is a leading determinant of an effective antimicrobial. There exists a pronounced market demand for new antimicrobials to prevent and eradicate biofilms. Ideally, these novel antimicrobials will possess a combination of effective MIC and MBEC, with a capacity for high triplet yield.



Potential Mechanism for EO-OPE Light-Activated Cytotoxicity

Technology:

Researchers at the University of New Mexico have developed methods and materials for decontamination of surfaces and fabrics, such as non-woven fabrics, that are contaminated with infestations of microorganisms such as bacteria. A composition of matter comprising a fibrous material having poly (phenylene ethynylene)-based cationic conjugated polyelectrolyes bonded thereto, the composition being prepared by contacting a fibrous material comprising a fiber-forming polymer having iodophenyl groups bonded thereto and a di-iodo reagent of formula.

Advantages/Applications:

- Higher triplet yield, resulting in enhanced light-induced biocidal activity
- Effective at killing biofilm in the dark at relatively low concentrations (MBEC)
- Applicable in health care settings, mainly for products to prevent hospital acquired infections

Enhanced Biocidal Activity of Negatively-Charged OPE's

Background:

The problem of antibiotic-resistant bacteria has become a substantial burden for healthcare providers in the last few decades. Hospitals in the United States have seen a drastic increase in cases of patients acquiring infections of antibiotic-resistant bacteria—both Gram-negative and Gram-positive bacteria—to the extent that 1.7 million hospital-acquired infections are documented annually. Several large-scale studies have shown that exposure to antibiotics can increase the chances of acquiring such an infection in a hospital environment since antibiotics kill most of the natural flora of the body while allowing the antibiotic-resistant bacteria to thrive. Thus, the development of novel antibiotics or bactericides that do not induce resistance in targeted pathogens is vital for effective treatment of many types of nosocomial infections.

Technology:

Researchers at the University of New Mexico have developed a surfactant complex that is able to withstand prolonged periods of irradiation, continuing to effectively kill both Gram-negative and Gram-positive bacteria, while the oligomer by itself loses its biocidal effectiveness quickly in the presence of light. This novel technology has demonstrated that complexation with surfactants is a viable method for long-term, light-activated biocidal applications.

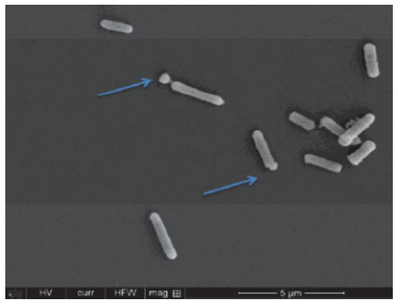
Advantages/Applications:

- Effective for both Gram-negative and Gram-positive bacteria
- Resistant for prolonged irradiation
- Effective treatment for nosocomial infections
- Enhanced lifetime of biocides
- Applications in long-term light-activated biocidal
- Possible application for lifetime enhancement of sensors, dyes, and organic LEDs

Cationic Conjugated Polyelectrolytes (CPEs) Induce Germination of Spore-Forming Bacillus Anthracis and *B. Atrophaeus*

Background:

Bacilli are an extremely diverse group of bacteria that include both the causative agent of anthrax (*Bacillus anthracis*) as well as several species that synthesize important antibiotics. The disease anthrax is a dangerous disease for livestock and humans. *B. anthracis* can be grown in an ordinary nutrient medium under aerobic or anaerobic conditions. *B. anthracis* spores are known to persist in contaminated soil for decades, making habitation of regions contaminated with spores of this potential biological warfare agent risky.



The image above llustrates the accomplishment of spore germination by the cationic OPEs by the presence of vegetative cells and spore-coat remains (indicated by the arrows)

Bacillus atrophaeus (also known as *Bacillus subtilis*) is a related bacterium that can be used as a sterilization control strain. It can cause disease in immunocompromised patients, and can cause food poisoning, although it is also commonly found in the human gut and has been used as a probiotic nutrient. *B. subtilis* can also form very persistent spores that can remain viable for many years, and is resistant to stressful environmental conditions such as drought, salinity, radiation, organic solvents, and pH extremes. Due to the durability of this bacterial strain, it has been approved under military specifications as a sterilization control strain. In other words, if sterilization conditions kill *B. atrophaeus*, they will likely kill most other bacteria. In today's market, more effective means of sterilization of materials contaminated with *B. anthracis* or *B. atrophaeus/subtilis* is needed so sites can be decontaminated and rendered suitable for keeping animals and for human populations.

Technology:

Researchers at the University of New Mexico have developed a novel use of cationic oligio (p-phenylene-ethynylene) (OPE) oligomers and polymers to induce germination of *B. atrophaeus* spores. Antibiotic compounds can kill mature bacteria, but certain species like *B. anthracis* and *B. atrophaeus* can lie dormant in the form of highly durable and antibiotic-resistant spores. Through the use of the cationic OPEs, spore germination is induced and the resulting mature bacteria are now susceptible to the antibiotic agents. Thus, contaminated materials, such as soil, can be effectively sterilized.

Advantages/Applications:

- Effective method for controlling a bacterial population
- Decontaminates materials
- Increases livable areas for animal or human populations. Biological warfare test sites can be suitable for habitation once again
- Applications include: clean-up of biological warfare test sites and sterilization of contaminated areas

Novel Theranostics for Protein Misfolding Diseases

Background:

Generation of reactive oxygen species as a product of photoexcited electronic states in organic molecules can be a useful tool in a variety of applications. The possibilities of spatially localized generation of reactive oxygen species (ROS) in response to irradiation are only just beginning to be explored, despite the long history of phototherapy in modern medicine, and are already in the clinic in the form of photodynamic therapy (PDT) for cancers of the skin, esophagus, and organ linings, actinic keratosis, and acne. Photodynamic destruction of pathogenic bacteria, viruses, and fungi is also under investigation for anti-biowarfare applications, passive sanitization of hospital surfaces under room light, and active sanitization of medical devices such as catheters. A major drawback of systemically dosed PDT photosensitizers, which

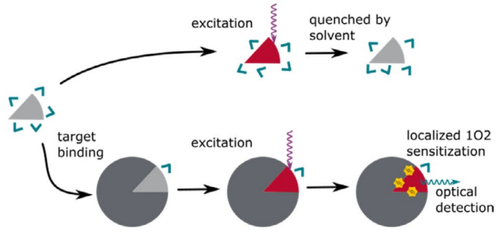
are primarily porphyrins or their prodrugs, is their accumulation in the skin and eyes leading to long-lasting (weeks to months) post therapeutic photosensitivity. Generation of ROS outside the target area can have multiple harmful effects by overwhelming endogenous, ROS-dependent signaling cascades. A solution to these issues would be a localized photosensitizer whose ROS-generating properties can be controllably activated, for example, in response to the binding to a target.

Technology:

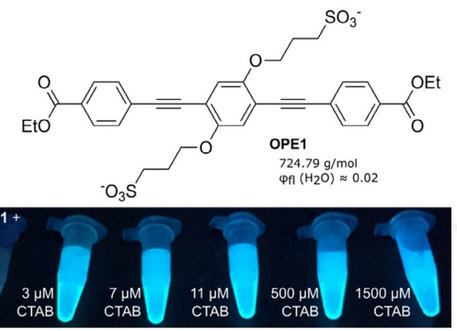
Researchers at the University of New Mexico have developed novel theranostics for neurodegenerative diseases such as Alzheimer's and Parkinson's diseases. More specifically, researchers have discovered that the photosensitization activity of certain oligo-phenynlene ethynylenes (OPEs) can be turned on when their fluorescence is turned on by binding to specific biological entities, such as amyloid protein aggregates. This can subsequently cause localized oxidation of the amyloid aggregates, and trigger their clearance in the brain. As the protein aggregates are recognized as toxic species implicated in the pathogenesis of these disorders, clearance of these aggregates could result in slowing down or reversing the progression of these diseases.

Advantages/Applications:

- Clears toxic protein aggregates in the brain
- Potential to slow down or reverse the progression of neurodegenerative diseases
- Able to turn on the OPEs photosensitization activity
- Possible applications as a theranostic agent for amyloid protein misfolding diseases such as Alzheimer's and Parkinson's diseases



Schematic of binding-induced self-assembly model of targeted singlet oxygen sensitization and optical detection



Structure of anionic OPE1 (top) and pictures of 2 mM OPE1 in water or water containing varying concentrations of cationic detergent cetyl trimethyl ammonium bromide (CTAB) under UVA illumination

Startup Activity

Biosafe Defenses, LLC

Founded in 2016, Biosafe Defenses is developing a new class of antimicrobial compounds for use in consumer products. Their extensive technology portfolio licensed from STC includes polymers and oligomers with antibacterial, antifungal, antiviral and antibiofilm characteristics. They are currently developing an industrial-grade disposal wipe that has been treated with the antimicrobials for a rapid and prolonged killing of bacteria, fungi, and viruses.

The new class of antimicrobial compounds offers great promise in the defense against pathogenic microbes and the spread of disease. These compounds, known as conjugated polyelectrolytes (CPEs), fundamentally differ from traditional antimicrobials in that they are "light-activated" and deal broad-spectrum damage in a detergent-like manner. They have been shown to kill antibiotic-resistant strains of bacteria, destroying both pathogenic proteins and DNA in the process. The potential applications for this technology are vast, including the coating of solids of surfaces for medical devices, implants, and hospitals; use in fabrics and fibers such as bandages, bedding/linens, and gloves/masks; and, as additives for existing products such as paints, plastics, and soaps.

To learn more, visit their website at biosafedefenses.com.

BIOSAFE
DEFENSES, LLC

"Dave Whitten has been a spectacular leader, innovator and mentor for his entire career which has spanned greater than 50 years. His work as a academic scientist is widely respected with >400 publications and tens of thousands of citations. He was the director of the first National Science Foundation Science and Technology Center, bringing together scientists from industry and academia to work on problems of mutual interest. He has founded several startup companies and each one has provided opportunities for young scientists to advance their careers in science and innovation. Overall, I cannot think of a person who is more deserving of the STC.UNM Innovation Award."

Kirk S. Schanze, Ph.D., Robert A. Welch Distinguished University Chair in Chemistry
University of Texas, San Antonio

"Dr. Whitten has spent the better part of his life researching how the world can perfect better antibacterials to combat the dangers of continuously evolving pathogens. He stands on the cusp of potentially saving hundreds of thousands of lives worldwide. His selfless dedication to his profession and to society sets the gold standard for all of us. What an honor to be associated with him!"

Andy Pham, Chairman, and the Biosafe Defenses Team

Curriculum Vitae

David G. Whitten, Ph.D.

Distinguished Professor
Department of Chemical & Biological Engineering
Associate Director, Center for Biomedical Engineering
The University of New Mexico

Education:
1959 B.A. The Johns Hopkins University (Chemistry)
1961 M.A. The Johns Hopkins University (Organic Chemistry)
1963 Ph.D. The Johns Hopkins University (Organic Chemistry)

Professional Experience:
1963-1965 Research Fellow, U.S. Army at California Institute of Technology Jet Propulsion Laboratory
1965-1966 Research Fellow, California Institute of Technology, Professor George S. Hammond, Advisor
1966-1970 Assistant Professor of Chemistry, University of North Carolina
1970-1973 Associate Professor of Chemistry, University of North Carolina
1973-1980 Professor of Chemistry, University of North Carolina
1975-1976 Vice Chairman, Department of Chemistry, University of North Carolina
1980 Invited Visiting Professor, Ecole Polytechnique Federale de Lausanne, Switzerland
1980-1983 M. A. Smith Professor, University of North Carolina
1983-1997 C. E. Kenneth Mees Professor, University of Rochester
1988-1991 Chair, Department of Chemistry, University of Rochester
1989-1995 Director, NSF Center for Photoinduced Charge Transfer, University of Rochester
1995-1997 Chair, Department of Chemistry, University of Rochester
1997-2001 Technical Staff Member, Los Alamos National Laboratory
1997-2015 Editor-in-Chief, *Langmuir*
2000-2005 Cofounder and Chief Science Officer, QTL Biosystems, LLC
2000-2004 Professor of Chemistry and Biochemistry, Arizona State University (Part-time 2000-2002, Adjunct 2002-2004)
2005-2016 Professor, Department of Chemical & Biological Engineering, University of New Mexico
2005-2009 Associate Director, Center for Biomedical Engineering, University of New Mexico
2009-2012 Interim Director, Center for Biomedical Engineering, University of New Mexico
2012-present Associate Director, Center for Biomedical Engineering, University of New Mexico
2015-present Associate Editor, *ACS Applied Materials and Interfaces*
2016-present University Distinguished Professor, University of New Mexico

Honors and Awards:
1970 Alfred P. Sloan Foundation Fellowship
1973 John van Geuns Fellowship, University of Amsterdam, The Netherlands
1975 Humboldt Award (Special U.S. Scientist Award), Alexander von Humboldt Foundation, Göttingen, Germany
1978 Distinguished Visiting Lecturer, University of Texas
1980 Invited Visiting Professor, Ecole Polytechnique Federale de Lausanne, Switzerland
1982 Japan Society for the Promotion of Science Fellowship
1982 National Science Foundation Research Award for Special Creativity

Honors and Awards (Continued):

1983 Distinguished Lecturer, Peter Leermakers Symposium, Wesleyan University
1983 Elected President, Inter-American Photochemical Society
1983 Chevron Lecturer, University of Nevada
1984 Humboldt Award, Alexander von Humboldt Foundation, Göttingen, Germany
1990 National Science Foundation Research Award for Special Creativity
1992 ACS Award in Colloid or Surface Chemistry
1993 Elected Chair, 1997 Gordon Research Conference on Organic Photochemistry
1994 University of North Carolina at Chapel Hill, Bicentennial Symposium Lecturer
1997 Editor-in-Chief, *Langmuir*
1998 Received 1998 Award of the Inter-American Photochemical Society Honors and Awards Continued
2001 National Science Foundation Science and Technology Pioneer Award
2003 Tarrant Distinguished Visiting Professor, University of Florida
2009 Witten Lecturer at University of North Carolina, Chapel Hill
2009 The Japanese Photochemistry Association Special Award for Distinguished Contributions to Basic and Applied Research in Photochemistry and Large Contribution to Photochemistry in Japan
2009 Invited Visiting Professor, Osaka University
2010 Selected as ACS Fellow
2012 Selected as Special Visiting Fellow, Ciencia sem Fronteras Brazil
2016 Nominated and Selected as University Distinguished Professor, UNM
2017 George S Hammond Award from the InterAmerican Photochemical Society for Lifetime Contributions to Photochemistry
2017-2019 Invited Visiting Professor at University of Health and Natural Sciences, Vienna, Austria

Research Interests:

Fundamental studies of photoinduced electron transfer reactions, chemical reactions at interfaces and in microheterogeneous media, molecular assembly and aggregation, photophysics and photochemistry of conjugated polymers, advanced materials based on self-assembly, biosensing and medical diagnostics based on fluorescence and related properties, light-activated antimicrobials based on conjugated polyelectrolytes and oligomers and their mechanisms of action. Theranostic materials for neurological diseases involved in protein misfolding.

Publications: 390 in refereed journals

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STC.UNM
Lobo Rainforest Building
101 Broadway Blvd. NE, Suite 1100
Albuquerque, NM 87102
(505) 272-7900
stc.unm.edu