

## Camille Dreyfus Teacher-Scholar Awards Program

<u>Institution</u>	<u>Awardee</u>	<u>Project</u>
<b>2017</b>		
Massachusetts Institute of Technology	William A. Tisdale	Energy Transport in Semiconductor Nanomaterials
Yale University	Jason M. Crawford	Decoding Specialized Bacterial Metabolic Pathways in the Human Microbiome
Princeton University	Robert R. Knowles	Proton-Coupled Electron Transfer in Organic Synthesis and Asymmetric Catalysis
North Carolina State University	Chase L. Beisel	Understanding and Exploiting the Biochemical Properties of CRISPR-Cas Immune Systems
University of Wisconsin–Madison	Randall H. Goldsmith	New Technologies for Single-Molecule Spectroscopy: Optical Microresonators, Fluorescent Catalysts, High Concentrations, and Cancelling Brownian Motion
Northwestern University	Julius B. Lucks	A Synthetic Approach to Uncovering how RNA Molecules Coordinate the Biochemical Processes of Life
University of Illinois at Urbana-Champaign	Alison R. Fout	Ligand Influences on Base Metals for Multi-Electron Reactions
The University of Texas at Austin	Guihua Yu	Building Artificial Layered Solids from the Bottom-Up to Enable New Energy Technologies
University of California, San Diego	Christian M. Metallo	Metabolic Regulation of Lipid Diversity
University of California, Irvine	Aaron P. Esser-Kahn	Chemical Methods to Understand and Improve Vaccines
University of California, Santa Barbara	Michelle A. O'Malley	Deconstructing Microbial Consortia for Sustainable Chemistry
Stanford University	Thomas E. Markland	Theory and Simulation of Quantum Processes at Interfaces and in Confinement
University of Washington	Brandi M. Cossairt	The Synthetic Inorganic Chemistry of Sustainable Technologies
<b>2016</b>		
Massachusetts Institute of Technology	Mircea Dincă	Teaching Sponges New Tricks: Charge Transport and Heterogeneous Catalysis in Microporous Metal Organic Frameworks
Columbia University	Luis M. Campos	Development of Materials for Next Generation Solar Cells
Carnegie Mellon University	Aditya S. Khair	Physico-chemical Transport Processes in Soft Materials and Complex Fluids
Virginia Polytechnic Institute and State University	Amanda J. Morris	Metal Organic Framework Artificial Photosynthetic Arrays
Duke University	Qiu Wang	Developing New Strategies and Chemical Probes for Molecular Imaging
University of Michigan	Nathaniel K. Szymczak	New Approaches to Develop Catalysts for Energy Relevant Chemical Conversions
Wayne State University	Eranda Nikolla	Oxidative Coupling of Methane using Layered, Nickelate Oxide Catalysts
The University of Chicago	Jared C. Lewis	Engineering Proteins for Selective Catalysis
University of California, San Diego	Neal K. Devaraj	Site-Specific Covalent Tagging of RNA for Live Cell Imaging and Affinity Purification
Stanford University	William C. Chueh	Ion Insertion Electrochemistry at the Molecular & Nano Scale
University of California, Berkeley	Naomi S. Ginsberg	Elucidating Dynamic Processes in Heterogeneous Condensed Phases at the Nanoscale

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University of Oregon	Michael D. Pluth	New Tools for Biological Hydrogen Sulfide Research and Applications to Enhanced Chemical Education
University of Washington	Andrew J. Boydston	Functional Materials across Multiple Length Scales

### 2015

Harvard University	Emily P. Balskus	Discovering and Manipulating the Chemistry of Human Gut Microbes
Massachusetts Institute of Technology	Bradley D. Olsen	New Materials from Bioinspired and Biofunctional Polymers
Columbia University	Wei Min	Seeing the Invisible: Discovering New Spectroscopic Contrasts for Bio-imaging
University of Pennsylvania	Joseph E. Subotnik	New and Intuitive Approaches for Modeling Electronic Relaxation After Photo-Excitation
The University of North Carolina at Chapel Hill	David A. Nicewicz	New Transformations in Chemical Synthesis via Organic Photoredox Catalysis
The Ohio State University	Joshua E. Goldberger	Solid-State Materials at the Atomic Scale
Northwestern University	Michael C. Jewett	Biocatalysis Beyond the Cell: Molecular Engineering Catalytic Ensembles for Cell-free Synthetic Biology
University of Illinois at Urbana-Champaign	Douglas A. Mitchell	Harnessing the Power of Genome-Mining and Biosynthesis to Combat Antibiotic Resistance
Washington University in St. Louis	Gary J. Patti	Mapping Cellular Interactions through Cell-Specific Isotopic Labeling and Metabolomics
California Institute of Technology	André Hoelz	Atomic Structure of the Nuclear Pore Complex
University of California, Irvine	Jennifer A. Prescher	Expanding the Imaging Toolbox
Stanford University	Jennifer A. Dionne	New Optical Materials to Visualize and Control Nanoscale Phenomena
University of Oregon	Shannon W. Boettcher	Semiconductors, Electrocatalysts, and Interfaces in Energy Conversion and Storage

### 2014

University of Massachusetts Amherst	Paul Dauenhauer	Production of Renewable Chemicals and Fuels by High Temperature Pyrolysis Chemistry of Cellulose
Massachusetts Institute of Technology	Elizabeth Nolan	Understanding the Physiological Role of Peptides / Proteins that Bind Metals and their Function as Antibacterial Agents
Boston University	Ramesh Jasti	The Bottom-Up Organic Synthesis of Graphitic Nanomaterials with Well-Defined Structures and Properties
Yale University	Nilay Hazari	Transition Metal Catalyzed Conversion of Carbon Dioxide and Mechanistic Studies of the Reactions
Princeton University	Rodney Priestley	Understanding the Combined Roles of Size, Interfaces, and Processing on the Properties of Amorphous Polymers
University of Rochester	Daniel Weix	New Methods and Mechanisms for Cross Couplings in C-C Bond Formation and Organic Synthesis
Temple University	Michael Zdilla	Synthesis and Reactivity of Multimetal Systems Inspired by Biology
Emory University	Khalid Salaita	Cellular Mechanochemistry at Interfaces: Sensing and Manipulating Forces in Living Systems
Indiana University Bloomington	Sara Skrabalak	Shaping the Synthesis of Nanoscale Solids
Purdue University	Adam Wasserman	Extending the Limits of Applicability of Density Functional Theory towards Larger Systems and Longer Times

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University of Wisconsin–Madison	Jordan Schmidt	Computational Modeling for the Properties of Complex Materials, with Applications to Energy and Catalysis
Northwestern University	Emily Weiss	Controlling the Electronic Structure and Dynamics at Nanoscale Interfaces between Inorganic and Organic Materials
University of Texas at Austin	Hal Alper	Utilizing Cells as Biocatalysts for Producing Commodity and Specialty Chemicals
California Institute of Technology	Theodor Agapie	Multimetallic and Metal-ligand Cooperativity for Catalysis
Stanford University	Matthew Kanan	Catalyzing CO <sub>2</sub> Recycling and Controlling Reactions at Interfaces

### 2013

Harvard University	Theodore A. Betley	Correlation of Electronic Structure to Reactivity in Organometallic Catalysis and Small Molecule Activation
Boston University	Corey R. J. Stephenson	Sustainable Catalysis Mediated by Visible Light Photosensitization
Princeton University	Abigail G. Doyle	Transition Metal Catalysis for the Discovery and Development of Valuable Synthetic Methods
Hunter College of the City University of New York	Mandë Holford	Lessons From Nature: Discovery, Characterization and Delivery of Novel Peptide Therapeutics from Venomous Marine Snails
Cornell University	William R. Dichtel	Bottom-up Synthesis of Structurally Precise Organic Materials and Interfaces
University of Michigan	Stephen Maldonado	New Frontiers in Semiconductor Electrochemistry
Michigan State University	Thomas W. Hamann	Molecular and Material Approaches to Advance Solar Energy Conversion
University of Illinois at Urbana-Champaign	Charles M. Schroeder	Molecular Engineering of New Materials for Biological Imaging & Polymeric Assembly
University of California, Los Angeles	Neil K. Garg	Catalytic Formation of Amide Bonds
California Institute of Technology	Thomas F. Miller	Quantum Dynamics from Classical Trajectories: New Approaches to Simulating Biological and Molecular Catalysts
University of California, Santa Barbara	Baron Peters	Additives for Control over Polymorph Selection during Nucleation: Computational Approaches
University of California, Berkeley	Michelle C. Chang	System Level Studies for Cellular Synthetic Biology
University of Washington	Munira Khalil	Measuring Complex Molecular Dynamics in Solution with High Spatial and Temporal Resolution

### 2012

Harvard University	Adam Cohen	New Tools to Study Molecules and Cells
Massachusetts Institute of Technology	Christopher Love	Application of interfacial chemistry, microfabrication, and process design to engineer integrated approaches to single-cell analysis
Yale University	Seth Herzon	Synthesis and Study of Complex Antiproliferative Natural Products
Princeton University	Celeste Nelson	The Chemistry of Morphogenesis: Quantitative Analysis of Transcription Factor Kinetics During Tissue Development
University of Pittsburgh	Steven Little	Mimicking Biological Structure and Behavior Using Polymeric Release Systems and Carbon Nanotubes
The Pennsylvania State University	William Noid	Theory and method development for improved multiscale models
The Ohio State University	Christopher Jaroniec	Atomic Resolution Studies of Biomacromolecular Assemblies by Solid-State Nuclear Magnetic Resonance Spectroscopy

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University of Michigan	Anne McNeil	Towards the Next Generation of Tunable Organic Materials
The University of Chicago	Greg Engel	Exploiting coherent response to electronic excitation to control excited state reactivity
The University of Utah	Valeria Molinero	Microscopic Mechanisms Of Phase Transitions And Molecular Organization
California Institute of Technology	Sarah Reisman	Target-Directed Synthesis: A Platform for the Discovery and Development of New Synthetic Methods and Strategies
University of California, San Diego	Joshua Figueroa	Isolable Monoalkyne Intermediates in the Alkyne Cyclotrimerization Catalytic Cycle
University of Oregon	Shih-Yuan Liu	Developing the basic science and applications of boron nitrogen heterocycles
University of Washington	Dustin Maly	Chemical Tools for Studying Signal Transduction

### 2011

University of Massachusetts Amherst	George Huber	The development of catalytic chemical processes for producing hydrocarbon fuels and chemicals from renewable biomass sources.
Harvard University	Tobias Ritter	Redox Chemistry for Positron Emission Tomography Imaging
Tufts University	Charles H. Sykes	Turning Molecules into Motors and Mechanical Devices
Columbia University	Ruben L. Gonzalez, Jr.	Single-molecule mechanistic studies of protein synthesis by the ribosome
Carnegie Mellon University	Rongchao Jin	Quantum-Sized Metal Nanoclusters
University of Pennsylvania	So-Jung Park	Controlling Materials Properties through the Self-Assembly of Nanoparticles and Polymer Amphiphiles
University of Maryland, College Park	Herman Sintim	Small Molecule Modulators of Bacterial Virulence and Biofilm Formation
The University of North Carolina at Chapel Hill	Wei You	Organic/Molecular Materials Science: Integration of Synthesis with Devices
The Ohio State University	John Herbert	Quantum Chemistry in the Condensed Phase
University of Michigan	Kevin Kubarych	Ultrafast Vibrational Snapshots of Photocatalysis and Protein Dynamics
University of Illinois at Urbana-Champaign	Nathan Price	Integrative implementation of complex biochemical reaction networks for systems biology and medicine
Kansas State University	Christine Aikens	Unraveling the Role of Electronic Structure in Nanoparticle Physical and Chemical Properties
University of California, Berkeley	Ting Xu	Directed Hierarchical Assemblies Toward Functional Soft Materials

### 2010

Queens College, City University of New York	Seogjoo Jang	Theory development and computational modeling of exciton and electron/hole migration in soft disordered environments
University at Buffalo	Matthew Disney	Progress Towards the Rational and Modular Design of Small Molecules Targeting RNA
University of Virginia	B. Jill Venton	Tiny sensors for tiny organisms: measuring neurotransmitter dynamics in the fruit fly brain.
Virginia Polytechnic Institute and State University	Edward Valeev	Predictive computation of molecular properties with explicitly correlated wave function methods: energetics, spectra, transport.

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Case Western Reserve University	R. Mohan Sankaran	A new paradigm for plasma processing: Microplasma synthesis of nanomaterials for catalytic, electronic, and photovoltaic applications
Indiana University	Amar Flood	Strong CH---Anion Hydrogen Bonds from Triazoles and in Triazolophanes
University of Michigan	Kate Carroll	Painting the Cysteine Chapel: New Tools to Probe Oxidation Biology
University of Wisconsin--Madison	Tehshik Yoon	Novel Strategies for Catalytic Redox Reactions
University of Minnesota	Kevin Dorfman	Simulating DNA Electrophoresis in Complex Geometries
The University of Chicago	Dmitri Talapin	III-V semiconductors through solution-phase synthesis and self-assembly
University of Illinois at Urbana-Champaign	Benjamin McCall	Astrochemistry: combining high resolution spectroscopy and measurements of reaction kinetics/dynamics with astronomical observations and modeling
Louisiana State University	Jayne Garno	Combining Magnetic Sample Modulation (MSM) with Contact&#8208;Mode Atomic Force Microscopy for Measurement of Magnetic Properties at the Nanoscale
University of California, Santa Barbara	Song-i Han	Unraveling the role of hydration water in protein dynamics and function
University of California, Berkeley	Rachel Segalman	Functional Nanoscale Polymers for Energy Applications: Molecular Design, Self-Assembly and Structure-Device Property Relationships

### 2009

Harvard University	Alán Aspuru-Guzik	Quantum Computation and Quantum Information for Chemistry
Columbia University	Laura J. Kaufman	The Effects of Crowding on Dynamics Across Length Scales and Across Disciplines
Cornell University	Abraham Stroock	Science and engineering of metastable liquid water in synthetic trees.
Duke University	Katherine J. Franz	Chemical Tools to Manipulate Metal-Catalyzed Oxidative Stress
University of South Carolina	Paul Ryan Thompson	Chemical Biology of Eukaryotic Gene Regulation
University of Florida	So Hirata	The developments and applications of predictive electronic and vibrational many-body methods for molecules and macromolecules.
University of Michigan	Suljo Linic	Heterogeneous catalysis in 21st Century: well defined, high uniform, targeted nano-structures as highly selective heterogeneous catalysts, photo-catalysts, and characterization tools
University of Minnesota	Christy L. Haynes	Electroanalytical Eavesdropping on Cellular Communications
New Mexico State University	Jeremy M. Smith	Research on "nitrogen atom transfer" by three-fold symmetric iron nitrido complexes and description of the electronic structures of thermally stable iron(IV) complexes.
California Institute of Technology	Shu-ou Shan	Towards a new paradigm for GTPase regulation of intracellular protein targeting.
University of California, Irvine	Alan F. Heyduk	Redox-Active Ligands as a New Paradigm for Multi-Electron Small-Molecule Reactions Relevant to Energy Efficiency
University of California, Santa Barbara	Todd M. Squires	Dynamic effects at physico-chemical interfaces
University of California, Berkeley	Richmond Sarpong	New strategies and methods for the total synthesis of natural and unnatural compounds using metal-catalyzed reactions.
University of California, Davis	Xi Chen	Chemoenzymatic Approaches for Chemical Glycobiology

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<b>2008</b>		
Cornell University	Garnet K. Chan	Building New Paradigms in Quantum Chemistry: from Quantum Renormalisation Groups to Quantum Tensor Networks
The Johns Hopkins University	Justine P. Roth	Fundamental Principles of Oxidation Chemistry Relevant to Biology and Medicine
Massachusetts Institute of Technology	Mohammad Movassaghi	Syntheses of Biologically Interesting Alkaloids and the Development of New and General Routes to Nitrogen-containing Heterocycles
Northwestern University	Lincoln J. Lauhon	Development of Quantitative Synthesis-Structure-Property Relationships for Nanostructured Materials
Texas A&M University	Victor M. Ugaz	Directed Assembly of Ultra-concentrated Mesophases: a New Way to Detect and Characterize Biomolecules
The Ohio State University	Dongping Zhong	Ultrafast Functional Dynamics of Biomolecules
The University of North Carolina at Chapel Hill	Garegin Papoian	Multi-Scale Modeling of Biophysical Processes in the Cell
University of California, Berkeley	Haw Yang	Single-Molecule Approaches Towards Understanding Chemical Reactivity in Complex Systems
University of California, Los Angeles	Yi Tang	Natural Product Biosynthetic Pathways for Novel Enzymes and Useful Biocatalysts
University of California, Santa Barbara	Thuc-Quyen T. Nguyen	Understanding Charge Transport and Electronic Properties of Small Conjugated Molecules and Conjugated Polyelectrolytes for Applications in Optoelectronic Devices
Virginia Polytechnic Institute and State University	Theresa M. Reineke	Carbohydrate-Based Polymers for Cardiovascular Nucleic Acid Delivery and MRI
University of Houston	Olafs Daugulis	New Synthetic Organic Chemistry Reactions Involving Transition-Metal Mediated Electrophilic C-H Bond-Activation
University of Illinois at Urbana-Champaign	M. Christina White	Aliphatic and Allylic C-H Oxidations Methods for Streamlining Complex Molecule Synthesis
University of South Carolina	Qian Wang	Hierarchical Micro-Nano Assemblies for Probing Cell-Matrix Interactions
University of Texas at Austin	Christopher W. Bielawski	Reversible Polymers Based on Biscarbenes: Creating New Opportunities in Self-Healing Electronics, Catalysis, and Emissive Materials
<b>2007</b>		
The University of Chicago	David A. Mazziotti	Blueprints of Atoms and Molecules: Two-particle Density-Matrix Representations of Electronic and Nuclear Motion
University of Wisconsin-Madison	Helen E. Blackwell	Expanding the Language of Bacterial Communication Using Synthetic Ligands
University of California, Santa Barbara	Frank L. H. Brown	Theoretical studies of biomembrane dynamics and structure, single molecule spectroscopy, and stochastic processes in chemistry and biophysics
Brandeis University	Oleg V. Ozerov	Recyclable catalysts and structural discovery through ligand design
University of Pennsylvania	Ivan J. Dmochowski	Chemical tools for elucidating complex biological processes such as brain development, limb regeneration, and tumorigenesis
University of Washington	David S. Ginger	Probing Optoelectronic Processes in Nanostructured Organic Solar Cells
Harvard University	Gavin MacBeath	Receptor Tyrosine Kinase Promiscuity and Cancer
University of Minnesota	Efrosini Kokkoli	Biomimetic approaches for the design of materials and therapeutics

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University of California, Irvine	Sergey Nizkorodov	Laboratory studies of chemical processes taking place in atmospheric aerosol particles
Emory University	Justin P. Gallivan	Reprogramming Bacteria with Small Molecules and RNA
The Pennsylvania State University	Raymond E. Schaak	Chemical Strategies for the Synthesis of Multi-Metal Nanomaterials: Exploring Uncharted Territory in the Synthesis of Metallurgical Solids
Massachusetts Institute of Technology	Michael S. Strano	Conduction channel spectroscopy: a new tool to study the chemistry of 1-D systems
Rice University	Jeffrey D. Hartgerink	Self-assembly of nanostructured organic materials for biomedical applications and multi-disciplinary education
Northwestern University	Bartosz A. Grzybowski	Electrostatic Self-assembly of Static and Dynamic Nanostructures and Nanostructured Materials.
University of Massachusetts Amherst	Jeffrey M. Davis	Understanding the Dynamics of Microscale Flows Over Heterogeneous Surfaces

### 2006

Massachusetts Institute of Technology	Alice Y. Ting	New chemical methodologies for cellular imaging
Cornell University	Paul J. Chirik	New Transition Metal Reagents for Energy-Efficient, Environmentally Benign Chemical Synthesis
The Pennsylvania State University	Carsten Krebs	Mechanisms of Iron-containing Enzymes: Characterization of reaction intermediates by a combination of rapid kinetic and spectroscopic methods
University of Pennsylvania	Eric Meggers	Chemical Biology with Organo-Metallic Compounds
The Johns Hopkins University	David H. Gracias	A Research and Education Program in Nano and Microscale Self Assembly: Integrated circuits, chemical sensors and remote controlled chemistry
The University of North Carolina at Chapel Hill	Jeffrey S. Johnson	The Application of Polarity Reversal Concepts in the Discovery of New Catalysts and Chemical Reactivity
North Carolina State University	Orlin D. Velev	Colloidal and Biocolloidal Engineering on Electrically Controlled Microchips: New Principles for Making Bionanomaterials, Microbioassays and Microrobots
Emory University	James T. Kindt	Simulation and statistical theory of self-assembled systems: Molecular and mesoscale modeling of mixed membranes and more
The Ohio State University	Heather C. Allen	Atmospheric Aerosol Chemistry: Understanding How Liquid and Solid Surfaces Mediate Aerosol Chemistry
University of Michigan	John P. Wolfe	New Reactions for the Construction of Biologically Active Molecules and Intermediates of Synthetic Importance
University of Illinois at Chicago	Yoshitaka Ishii	Expanding Boundaries of Structural Analysis by Solid-State NMR: From Paramagnetic Complexes to Misfolding of Amyloid Proteins
The University of Chicago	Chuan He	Developing Chemical Probes to Study DNA Repair and DNA Methylation/Demethylation
University of Illinois at Urbana-Champaign	Paul J. Hergenrother	Targeting mRNA for the Treatment of Neurodegenerative Disorders
Arizona State University	Dong-Kyun Seo	Theoretical and Experimental Studies on Itinerant Electron Magnetism in Intermetallics
University of California, Santa Barbara	Patrick S. Daugherty	Molecular Specificity Evolution: Enabling Technology for Therapeutic Engineering and Diagnostic Proteome Fingerprinting

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<b>2005</b>		
Boston College	Shana O. Kelley	Cellular and Molecular Probes of Oxidative Biomolecular Damage
California Institute of Technology	Brian M. Stoltz	Complex Natural Products as a Driving Force for Discovery in Organic Chemistry
Columbia University	Brian R. Gibney	Design of Synthetic Metalloproteins Using Nonnatural Amino Acid Ligands
Georgia Institute of Technology	Marcus Weck	Densely Multifunctional Copolymers: Nature-Inspired Use of Multi-Recognition Site Self-Assembly Onto Polymer Backbones for Materials Applications
Harvard University	Xiaowei Zhuang	Exploring RNA-protein interactions and virus infections by ultra-sensitive fluorescence imaging and single-molecule spectroscopy
Indiana University	Daniel J. Mindiola	New Paradigms in Early Transition Metal Complexes Containing Reactive Metal-Ligand Multiple Bonds
North Carolina State University	Jason M. Haugh	Seminal and integrative advances in cell signaling from molecular structure and function to pathways, cell function, and tissue response
The Pennsylvania State University	Christine D. Keating	Chemical approaches to the materials/biology interface: nanobiosensors and synthetic cells
The University of Chicago	Rustem F. Ismagilov	Supporting Undergraduate Research to Understand Complex Chemical and Biochemical Reaction Networks Top-Down and Bottom-Up Using Microfluids
University of California, Berkeley	Kristie A. Boering	Atmospheric Chemistry and Climate on Earth and Other Exotic Planets: From the Molecular to the Global Scale
University of California, Irvine	Zhibin Guan	Programing Non-Covalent Interactions into Polymers for High-Order Structures and Advanced Properties.
University of California, Los Angeles	Yung-Ya Lin	Seeing the Seeds of Cancer: Contrast and Sensitivity Enhancement for Early MRI Tumor Detection by the Butterfly Effect and Chaos Control
University of Rochester	Todd D. Krauss	Investigations of fundamental properties of nanometer scale materials, and the development of nanomaterials for novel applications in photonics and biology.
The University of Utah	Janis Louie	The Development of Transition Metal Catalysts for New Cycloaddition Reactions.
University of Washington	Daniel Gamelin	High-Tc Ferromagnetic Semiconductors for Spintronics Applications: Development, Physical Characterization, and Chemical Manipulation
Yale University	Victor Batista	Development of Semiclassical and Quantum Dynamical Methods for Quantum Reaction Dynamics Simulations

### 2004

Harvard University	David R. Liu	Organic Synthesis Programmed by DNA Templates
Princeton University	Stanislav Shvartsman	Quantitative Analysis of Receptor-mediated Gene Expression
Columbia University	Colin P. Nuckolls	Nanoscale electronic materials from self-assembled organic building blocks
The Pennsylvania State University	Blake R. Peterson	Synthetic receptor targeting as a novel tool for drug delivery
Georgetown University	Jennifer A. Swift	Surface Chemistry Approaches to Understanding & Directing Molecular Crystal Growth Processes
University of Michigan	Nils G. Walter	Structural dynamics and function of RNA enzymes highlighted by fluorescence spectroscopy at the single-molecule and ensemble levels
The University of Chicago	Sergey A. Kozmin	Chemical Synthesis: from Molecular Complexity and Skeletal Diversity to Cell-Regulatory Function



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University of Illinois at Urbana-Champaign	Neil L. Kelleher	The evolution of large molecule Mass Spectrometry
The University of Utah	Matthew S. Sigman	Physical Organic Chemistry as a Tool for Catalyst Design and Development
University of Arizona	Andrei Sanov	Photoelectron imaging of the electronic structure and time-resolved dynamics of molecular cluster anions: Unraveling the driving force of chemistry
Stanford University	Justin Du Bois	Reaction design for the synthesis of neuroactive agents
University of California, Berkeley	Peidong Yang	Chemistry and physics of semiconductor nanowires.
University of California, Riverside	Pingyun Feng	Development of Novel Porous Materials as Fast Ion Conductors and Photocatalysts

### 2003

Harvard University	Hongkun Park	Transport and scanned probe investigation of chemical nanostructures
Massachusetts Institute of Technology	Jianshu Cao	Statistical analysis of single molecule measurements and theoretical description of non-exponential and non-Gaussian single-particle slow dynamics
Princeton University	Suzanne Walker	Understanding post-translational modifications: chemical approaches to identifying the O-GlcNAcylated proteome
Cornell University	Kelvin H. Lee	New microfabricated technologies for proteome analysis
Carnegie Mellon University	Catalina Achim	Design and synthesis of biology-inspired metal-containing nanostructures with potential applications in molecular electronics
Georgia Institute of Technology	Louis A. Lyon	Design, synthesis, and self-assembly of stimuli-sensitive core/shell hydrogel nanoparticles
University of Wisconsin–Madison	Shannon S. Stahl	Catalytic methods for selective chemical oxidation with molecular oxygen
Texas A&M University	Paul S. Cremer	Investigations of the lower critical solution temperature of polymers and proteins with a linear temperature array
University of Texas at Austin	Michael J. Krische	Catalytic reductive C-C bond formation: elemental hydrogen as terminal reductant
University of California, Los Angeles	Christopher J. Lee	Deciphering alternative splicing in the human genome: the new frontier in genomic complexity and proteome functional regulation
California Institute of Technology	David W. C. MacMillan	Enantioselective organocatalysis: Design of new catalysis concepts of broad utility to asymmetric chemical synthesis
The Scripps Research Institute	Floyd E. Romesberg	New approaches to combating antibiotic resistance
Stanford University	Vijay S. Pande	New methods for the simulation of the kinetics and thermodynamics of biological molecules

### 2002

Harvard University	David R. Reichman	Dynamics and spectroscopy of molecules in superfluid helium clusters
Princeton University	Jeffrey D. Carbeck	Measurements and modeling of electrostatic interactions in folded and denatured proteins
New York University	Mark E. Tuckerman	Theoretical studies and new-methods development for proton-transfer processes in biologically and technologically important systems
Columbia University	Dalibor Sames	C-H bond activation in complex chemical assembly

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Carnegie Mellon University	David S. Sholl	Development and applications of intrinsically chiral solid surfaces based on metals, semiconductors, and natural minerals
Georgia Institute of Technology	Robert M. Dickson	Single-molecule electroluminescence in nanotechnology - from fundamental understanding to device development
Purdue University	Jillian M. Buriak	Nanoscale semiconductor surface chemistry
Wayne State University	Theodore G. Goodson	Ultra-fast optical investigations of novel dendrimer macromolecules and dendrimer metal nanocomposites for applications in photonics
Northwestern University	Annelise E. Barron	N-substituted glycine oligomers (peptoids) with helical, amphipathic structure as biostable mimics of antimicrobial peptides
University of Illinois at Urbana-Champaign	Wilfred van der Donk	Exercises in understanding enzyme catalysis
The University of Utah	Peter A. Beal	In vitro evolution of RNA for selective binding to acridine-peptide conjugates
University of California, Los Angeles	Michael W. Deem	Statistical mechanical studies of zeolite nucleation
California Institute of Technology	Jonas C. Peters	New strategies in catalysis with novel coordination complexes
Stanford University	Hongjie Dai	Carbon nanotubes as a model system for nanoscale chemistry and physics
University of Washington	Younan Xia	Chemistry and the physics of one-dimensional nanostructures

### 2001

Brandeis University	Wenbin Lin	Crystal engineering of polar and chiral solids for applications in nonlinear optics and enantioselective separations and catalysis
Duke University	Ross Widenhoefer	Palladium-catalyzed carbocyclization of functionalized dienes
Harvard University	Matthew Shair	Target-oriented and diversity-oriented synthesis of complex molecules applied to chemical biology
North Carolina State University	Jan Genzer	Self- and directed assembly of polymers in thin films and at interfaces
Northwestern University	Amy Rosenzweig	Metal trafficking by copper ATPases
Rice University	Vicki Colvin	Protein crystals as scaffolds for materials design
The Pennsylvania State University	Philip Bevilacqua	Mechanistic studies of general acid-base catalysis and folding complexity in the HDV ribozyme
The Scripps Research Institute	Erik Sorensen	Profiling the chemical reactivity of complex proteomes
University of California, Los Angeles	Benjamin Schwartz	Experimental and theoretical studies of ultrafast processes in condensed phases: charge transfer, conjugate polymer/metal interfaces, and multiphoton lithography
University of Illinois at Urbana-Champaign	David Gin	Development and application of novel and practical methods for the efficient synthesis of complex carbohydrates
University of Minnesota	Richard Hsung	Development of novel methodologies for synthesis of natural products with biological and medicinal relevance
University of Notre Dame	Olaf G. Wiest	Electron-transfer-induced reactions in organic and bio-organic chemistry
University of Oregon	Mark Lonergan	Engineering depletion regions and controlling interfacial reactivity at conjugated polymer interfaces through internal compensation
University of Rochester	Benjamin Miller	Understanding carbohydrate recognition through the design, synthesis, and analysis of synthetic receptors

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University of Wisconsin–Madison	Paul Nealey	Hybrid nanofabrication techniques combining advanced lithography and self-assembling systems for applications in molecular electronics and cell culture
Utah State University	John Peters	Investigating the biochemical mechanism of reactions catalyzed by enzymes that contain transition metals using structure determination by X-ray diffraction methods

### 2000

University of Massachusetts Amherst	James J. Watkins	Novel deposition methods for the preparation of nanostructured devices
Boston College	Scott J. Miller	Discovery of new catalysts for the asymmetric synthesis of compounds of pharmaceutical interest
Columbia University	James L. Leighton	New methods and strategies for the synthesis of antibiotic medicinal agents
Cornell University	Geoffrey W. Coates	New catalysts for the synthesis of biodegradable polycarbonates from CO <sub>2</sub>
University of Pennsylvania	Patrick J. Walsh	Chiral environment amplification: use of achiral ligands in asymmetric catalysis
The Johns Hopkins University	John P. Toscano	Rational design of novel photochemical precursors to nitric oxide
The University of North Carolina at Chapel Hill	Michel R. Gagné	An outer-sphere approach to controlling catalytic reaction selectivities
Duke University	Mark W. Grinstaff	Mechanistic studies of charge transfer in DNA
University of South Carolina	Uwe H. F. Bunz	Synthesis and property evaluation of novel organic semiconductors based on poly(paraphenyleneethynylene)s
University of Minnesota	Marc A. Hillmyer	Design, synthesis, and application of new functional block copolymers
Northwestern University	Hilary A. Godwin	Elucidation of the molecular mechanism of lead poisoning: biochemistry and aqueous coordination chemistry of Pb(II)
The University of Chicago	Milan Mrksich	Tailored substrates for mechanistic studies of cell adhesion
University of Illinois at Urbana-Champaign	Todd J. Martinez	First-principles modeling of reaction dynamics including quantum effects
University of Colorado Boulder	Kristi S. Anseth	Novel photocrosslinkable materials and photopolymerization methods
University of New Mexico	Deborah G. Evans	Development of computational techniques and methods to simulate electron transfer in molecular arrays
University of California, Santa Barbara	Timothy Deming	Transition-metal complexes for peptides and polypeptide synthesis
Stanford University	Thomas J. Wandless	New strategies to improve protein-ligand binding interactions
University of California, Berkeley	Jeffrey R. Long	Manipulating inorganic structures: general strategies for the synthesis of multimetal clusters and extended solid materials

## Camille Dreyfus Teacher-Scholar Awards Program

<u>Institution</u>	<u>Awardee</u>	<u>Project</u>
<b>1999</b>		
University of California, Santa Barbara	Dimitrios Maroudas	Multiscale computational study of semiconductor thin-film deposition and heteroepitaxial growth of strained semiconductor films and confined quantum structures
Texas A&M University	Daniel Romo	Synthesis and biological studies of natural products displaying potent physiological effects
Boston University	Amy S. Mullin	Putting out molecular fires: energy flow pathways and chemical reactions of highly excited molecules
University of Arizona	Dominic V. McGrath	Photoresponsive dendritic macromolecules for information storage, organic synthesis, and chemical agent delivery
University of Pennsylvania	Andrew M. Rappe	Tailoring molecule-surface properties via substrate modification
University of Colorado Boulder	Randall L. Halcomb	New directions in organic synthesis: targets, strategies, methods, and biochemical applications
The Johns Hopkins University	Thomas Lectka	Catalytic, asymmetric alkylations of N, O- and N, N-acetals
University of Oregon	James E. Hutchison	Chemical approaches to nanoscale electronic materials and devices
University of Illinois at Urbana-Champaign	Yi Lu	Structural characterization and engineering of metalloproteins and metalloribozymes
Indiana University	David E. Clemmer	Development of gas-phase separations for the analysis of peptide libraries
University of Massachusetts Amherst	Scott M. Auerbach	Theory and simulation of molecules in nanopores
The Ohio State University	Anne B. McCoy	Theoretical investigations of the effects of weak intermolecular interactions on spectroscopy and reaction dynamics in van der Waals complexes
Tulane University	Daniel K. Schwartz	The structural and dynamic properties of ultra-thin organic films formed on liquid and solid surfaces
Boston College	John T. Fourkas	Probing single-molecule dynamics and structure using two-photon microscopy
University of Delaware	Raul Lobo	Molecular recognition phenomena in crystalline silica-water networks containing organic guests
Wayne State University	Peng George Wang	Chemical and enzymatic synthesis of glycoconjugates and their biomedical applications
Colorado State University	Yian Shi	Asymmetric synthesis with chiral dioxiranes
University of Notre Dame	Sharon Hammes-Schiffer	Theoretical and computational investigations of chemical reaction dynamics in complex systems
University of Minnesota	C. Daniel Frisbie	Nanoprobng electrical transport and luminescence in organic materials
University of California, Berkeley	Carolyn R. Bertozzi	Chemical approaches to understanding and modulating dynamic cell surface structures

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<u>Institution</u>	<u>Awardee</u>	<u>Project</u>
<b>1998</b>		
University of Oregon	Michael M. Haley	Synthesis and characterization of novel benzenoid and non-benzenoid aromatic systems
New York University	Stacey F. Bent	Studies of amorphous semiconductor alloys: growth and processing at a molecular level
University of South Carolina	Catherine J. Murphy	Biophysical applications of nanomaterials
University of Massachusetts Amherst	Michael Tsapatsis	Synthesis and assembly of hollow silicate nanospheres and incorporation of materials chemistry in the curriculum
North Carolina State University	David A. Shultz	Preparation and characterization of building blocks for molecule-blocks for molecule-based magnets
Wayne State University	John Montgomery	New cyclizations and multicomponent couplings
University of Illinois at Urbana-Champaign	Martin Gruebele	Coordination of secondary and tertiary structure during protein folding
University of Delaware	P. Andrew Evans	New transition-metal-catalyzed carbon-carbon bond forming reactions
Colorado State University	Ellen Fisher	Use of resonantly enhanced multiphoton ionization to probe radical-surface interactions
The Pennsylvania State University	Xumu Zhang	Development of asymmetric catalysts for the synthesis of chiral drugs and agrochemicals
Massachusetts Institute of Technology	Paul E. Laibinis	Development and application of solution-phase reactions at hydrogen-terminated silicon surfaces
University of Virginia	Brooks Hart Pate	New high-resolution infrared spectroscopy techniques for measuring the rate of conformational isomerization
Michigan State University	Marcos Dantus	Elucidating the dynamics of chemical reactions at high energies by femtosecond time-resolved techniques in the vacuum ultraviolet
Yale University	John L. Wood	Organic chemistry: synthetic methods and strategy development, natural product synthesis, and applications of synthesis at the organic chemistry/cellular biology interface
University of California, Davis	Nicholas L. Abbott	Spontaneous assembly on the meso-scale using surface forces mediated by liquid crystals
University of California, Irvine	Keith A. Woerpel	The development of stereoselective methods of organic synthesis using new reactions of organosilicon compounds
Stony Brook University	Clare P. Grey	Solid-state NMR studies of disordered materials: molecular sieves, fluorides and oxyfluorides
Polytechnic University	Nitash P. Balsara	Microstructured polymer materials under quiescent conditions and under the influence of external fields
Boston College	Marc L. Snapper	Development of new olefin metathesis-based methods for the construction of complex natural products
University of Maryland, College Park	Jeffery T. Davis	Bioorganic chemistry and molecular recognition

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<u>Institution</u>	<u>Awardee</u>	<u>Project</u>
<b>1997</b>		
Massachusetts Institute of Technology	Gregory C. Fu	Development of organometallic catalysts for stereoselective organic synthesis
Colorado State University	Peter K. Dorhout	Polychalcogenide and main-group metal-ion speciation in solvothermal synthesis
Clark University	Dale F. Mierke	Design, synthesis, and structural characterization of peptidomimetics for drug design
Rensselaer Polytechnic Institute	Todd M. Przybycien	Rational manipulation of protein aggregation behavior
Purdue University	Igal Szleifer	Theoretical studies of the structural and thermodynamic properties of chain molecules in confined environments
University of Massachusetts Amherst	Vincent M. Rotello	Model systems for flavoenzyme activity, recognition and catalysis in sol-gel matrices
University of Michigan	Richard A. Goldstein	Evolutionary perspectives on protein structure formation
University of Illinois at Urbana-Champaign	Nancy Makri	Path-integral methods for condensed-phase quantum dynamics
Northwestern University	Frank E. McDonald	New synthesis methods and strategies for oligosaccharides and polycyclic ethers
University of Wisconsin–Madison	Juan J. de Pablo	Fundamental molecular-level studies for the structure and phase behavior of linear, branched, and crosslinked polymeric systems for engineering applications
University of Pennsylvania	Michael J. Therien	The biomimetic chemistry of light harvesting, energy migration, and electron transfer: mechanism, theory, molecular design, and biomaterials
University of California, Santa Barbara	Eray S. Aydil	<i>In situ</i> surface and plasma diagnostics during plasma-assisted deposition and etching of electronic materials
The University of Tennessee	Ziling (Ben) Xue	Synthetic and mechanistic organometallic chemistry in molecular approaches to advanced materials
The Pennsylvania State University	Karl T. Mueller	Development of solid-state NMR methods with applications for polycrystalline, amorphous, and biomolecular solids
California Institute of Technology	Konstantinos P. Giapis	Scattering dynamics at complex surfaces with applications to semiconductor etching and deposition
Yale University	John F. Hartwig	Metal-mediated amine, ether, and borane production

<b>1996</b>		
University of Rochester	Guillermo C. Bazan	Development of synthetic methodology based on transition-metal complexes for preparation of macromolecules with prespecified electronic properties or secondary structures
University of California, San Diego	Robert E. Continetti	Energetics and dissociation dynamics of transient species and dynamics of elementary termolecular reactions
University of Wyoming	D. Scott Bohle	Mechanistic chemistry of peroxyxynitrite
University of Colorado Boulder	Christopher N. Bowman	Photopolymerization of multifunctional monomers: characterization of reaction diffusion kinetics, materials structure and properties
Northwestern University	Chad A. Mirkin	Self-assembled surface structures and redox-switchable electrocatalytic materials
Stanford University	John H. Griffin	Molecular recognition and catalysis in naturally occurring and designed synthetic systems
University of Illinois at Urbana-Champaign	Jonathan V. Sweedler	Increased sensitivity of capillary zone electrophoresis by improving optical detection methods: fundamental studies of resolution and efficiency

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<u>Institution</u>	<u>Awardee</u>	<u>Project</u>
Indiana University	Andrew D. Ellington	Evolutionary engineering of metabolism: transfer of yeast lysine biosynthesis to bacteria and selective optimization of metabolic flux
Duke University	Mark J. Burk	Design, development, and application of asymmetric catalytic processes
University of California, Davis	Susan C. Tucker	Theoretical and computational studies of supercritical fluid solvent effects on chemical reaction rates
University of Wisconsin–Madison	Laura L. Kiessling	Chemical approaches to structure/ function relationships in protein-carbohydrate interactions
California Institute of Technology	Erick M. Carreira	Studies in asymmetric catalysis
University of Illinois at Chicago	Lucio Frydman	Development of new methods in NMR analysis and their application to chemical and biochemical studies
University of Pennsylvania	Norbert F. Scherer	Experimental chemical physics
University of Minnesota	Karin Musier-Forsyth	Biophysical approaches to study of RNA structure and function
University of California, Irvine	James S. Nowick	Protein structure, new catalyst creation, and drug delivery to intracellular targets
Massachusetts Institute of Technology	Jackie Y. Ying	Processing of mesoporous transition-metal oxide catalysis and permselective inorganic membranes
<b>1995</b>		
New York University	John Z. H. Zhang	Time-dependent quantum dynamics study for chemical reactions
University of Michigan	Gary D. Glick	New approaches to the study of structure-function relationships in biological macromolecules
Rutgers, The State University of New Jersey	Gaetano T. Montelione	Heteronuclear three-dimensional-NMR studies of protein-protein and protein-nucleic acid complexes
University of Maryland, College Park	Sarah A. Woodson	Folding of catalytic RNA from thermophiles
University of Pittsburgh	Peter Wipf	Total synthesis of natural products
University of Minnesota	William B. Tolman	Bioinorganic and organometallic chemistry
Massachusetts Institute of Technology	James R. Williamson	Structure and function of RNA and RNA-protein complexes
University of Texas at Austin	Brent L. Iverson	Manipulation of recognition and catalysis in biological macromolecules
Duke University	Eric J. Toone	Biocatalysis and protein-carbohydrate interactions
University of Pennsylvania	Timothy M. Swager	Development of novel conducting polymers and liquid crystals
The University of Chicago	Lawrence R. Sita	Synthesis, characterization, and investigation of new classes of organic and organometallic oligomers and polymers in solution and at interfaces
Yale University	Lynne Regan	Protein design as a tool to study structures and function
The University of North Carolina at Chapel Hill	H. Holden Thorp	Transition-metal redox reactions of biological significance
University of California, Irvine	Reginald M. Penner	Nanostructure-based investigations of metal surfaces by scanning tunneling microscopy
Wayne State University	Robert J. Levis	Chemistry in high coulombic fields: the nature of the surface chemical bond, and laser vaporization and femtosecond photoionization of DNA

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<u>Institution</u>	<u>Awardee</u>	<u>Project</u>
California Institute of Technology	Zhen-Gang Wang	Statistical mechanics of structures, phase transitions and dynamics of complex fluids
<b>1994</b>		
University of Southern California	Chi H. Mak	Theoretical understanding of quantum tunneling in condensed phase chemical and biological reactions
Stanford University	Eric S. G. Shaqfeh	Investigation of fluid mechanics, non-linear transport phenomena, viscoelastic fluid instabilities, and reactive ion etching
University of Illinois at Urbana-Champaign	Jeffrey S. Moore	Molecular synthesis of porous crystals, liquid crystals, organic monolayers, and structure-controlled macromolecules
Texas A&M University	Jeffery W. Kelly	Synthetic, physical organic, and spectroscopic approaches to evaluate the folding, structure, and function of $\beta$ -sheet peptides and proteins
Indiana University	Theodore S. Widlanski	Protein-DNA interactions: chemical methods for controlling and studying signal transduction
University of California, San Diego	Michael J. Sailor	Synthesis and study of materials with novel electrical and photochemical properties
University of Colorado Boulder	Margaret A. Tolbert	Atmospheric chemistry: heterogeneous reactions on polar stratospheric clouds and sulfuric acid aerosols
The University of Utah	Thomas P. Beebe, Jr.	Surface chemistry of DNA and other large molecules
University of Texas at Austin	Eric V. Anslyn	Development and use of combinatorial libraries for use in gene therapy
Yale University	Patrick H. Vaccaro	State-selective preparation and characterization of energetic molecular species and studies of reaction dynamics and relaxation
Boston College	Amir H. Hoveyda	Catalytic and asymmetric transformations and their application to synthesis of medicinally important agents
University of California, Berkeley	Arup K. Chakraborty	Quantum and statistical mechanical modeling of polymer-metal interfaces, zeolites, and complexation with macrocyclic ethers
University of Pennsylvania	Gregory A. Voth	Theoretical and computational studies of dynamical processes in condensed matter
California Institute of Technology	Pamela J. Bjorkman	Three-dimensional structural and functional studies of cell-surface proteins involved in the immune response
University of California, Los Angeles	Craig A. Merlic	Discovery, development and application of organometallic chemistry for bioactive natural products synthesis and materials research
The Ohio State University	James A. Cowan	Structural, mechanistic, and regulatory roles of metal cofactors in biological redox chemistry, nucleic acid biochemistry, and immunochemistry