Leopoldina
Nationale Akademie
der Wissenschaften

Curriculum Vitae Professor Dr Donna G. Blackmond

Image: Don Boomer

Name: **Donna G. Blackmond**
Born: **19 April 1958**

Research priorities: asymmetric catalysis, kinetics, organic chemistry, reaction mechanisms, homochirality

Donna G. Blackmond's research focuses on mechanistic studies of organic reactions, including asymmetric catalysis. She pioneered the methodology of "Reaction Progress Kinetic Analysis (RPKA)" for fundamental mechanistic studies of complex organic reactions. She studies prebiotic chemistry and the origin of biological homochirality.

Academic and Professional Career

since 2018	Department Chair, California Campus, Scripps Research, La Jolla, USA
since 2010	Professor of Chemistry, Scripps Research, La Jolla, USA
since 2010	Visiting Professor, Imperial College of Science, Technology, and Medicine, London, UK
2004 - 2010	Professor of Chemistry, Professor of Chemical Engineering and Chair in Catalysis, Imperial College of Science, Technology, and Medicine, London, UK
1999 - 2003	Professor and Chair in Physical Chemistry, University of Hull, Hull, UK
1996 - 1999	Group Leader, C3 Equivalent Professor, Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr, Germany
1995 - 1996	Professor of Technical Chemistry, University of Essen, Essen, Germany
1992 - 1995	Associate Director, Technical Operations, Merck & Company Inc., Rahway, USA
1984 - 1992	Professor of Chemical Engineering, University of Pittsburgh, Pittsburgh, USA
1984 - 1989	Assistant Professor, University of Pittsburgh, Pittsburgh, USA

1989 - 1992	Associate Professor (with tenure) and BP America Faculty Fellow, University of Pittsburgh, Pittsburgh, USA
1992 - 1999	Adjunct Professor, University of Pittsburgh, Pittsburgh, USA
1984	PhD, Chemical engineering, Carnegie Mellon University, Pittsburgh, USA
1981	Master of Science, Chemical Engineering, University of Pittsburgh, Pittsburgh, USA
1980	Bachelor of Science, Chemical Engineering, University of Pittsburgh, Pittsburgh, USA

Functions in Scientific Societies and Committees

since 2020	Member, External Advisory Board, Department of Chemistry, Imperial College London, UK
since 2020	Member, External Advisory Board, Department of Chemistry and Biochemistry, University of California (UC) Santa Barbara, Santa Barbara, USA
since 2019	Member, External Advisory Board, Faculty of Chemical Engineering, UC Santa Barbara, Santa Barbara, USA
since 2019	Member, Scientific Advisory Board, ChemRxiv, American Chemical Society (ACS), USA, German Chemical Society (GDCh), Royal Society of Chemistry, UK, Chinese Chemical Society (CCS), China and Chemical Society of Japan (CSJ), Japan
since 2019	Committee Chair, Section 3 “Search”, National Academy of Engineering, USA
since 2019	Member, Editorial Advisory Board, Chemical Science
since 2019	Member, External Advisory Board, UK Catalysis Hub, UK
since 2019	Member, External Advisory Board, ROAR, Imperial College London, London, UK
2011 - 2017	Member, Chemical Sciences Roundtable, National Academy of Sciences, USA
2014 - 2016	Member, Peer Committee, National Academy of Engineering, USA
since 2016	Associate Editor, Journal of Organic Chemistry
since 2015	Member, Editorial Board, ACS Central Science
since 2015	Member, Editorial Board, Reaction Chemistry & Engineering
since 2006	Member, Editorial Board, Organic Letters
2006 - 2013	Member, Editorial Board, OPRD
2004 - 2006	Member, Editorial Board, Organic and Biomolecular Chemistry
2002 - 2004	Member, Advisory Board, Chemical & Engineering News
2002 - 2016	Member, Editorial Advisory Board, Journal of Organic Chemistry

since 2000	Member, Editorial Advisory Board, Advanced Synthesis and Catalysis
1999 - 2004	Member, Editorial Board, Catalysis Letters
1997	Member, Board of Visitors, Engineering Directorate, National Science Foundation (NSF), USA
1994 - 2000	Member, Editorial Board, Journal of Catalysis
1994 - 1998	Director, Organic Reactions Catalysis Society (ORCS), USA

Project Coordination, Membership in Collaborative Projects

since 2020	Center for Synthetic Organic Electrochemistry, NSF, USA
since 2013	Simons Investigator, Simons Collaboration on the Origins of Life, Simons Foundation, New York City, USA
since 2012	Center for Selective C-H Functionalization, NSF, USA
2003 - 2005	Consortium “From Micrograms to Multikilos”, Engineering and Physical Sciences Research Council (EPSRC), Swindon, UK

Honours and Awarded Memberships

2023	James Flack Norris Award, American Chemical Society, USA
2022	Robert Robinson Award, Royal Society of Chemistry, UK
since 2022	Van’t Hoff Award, Royal Netherlands Academy of Arts and Sciences (KNAW), The Netherlands
since 2021	Fellow, Royal Society of Chemistry, UK
since 2021	Member, National Academy of Sciences, USA
since 2020	Member, German National Academy of Sciences Leopoldina, Germany
2019	Award for Distinguished Women in Chemistry or Chemical Engineering, International Union of Pure and Applied Chemistry (IUPAC)
2018	Irving Wender Award for Creative Research in Catalysis, Pittsburgh-Cleveland Catalysis Society (PCCS), Pittsburgh, USA
since 2016	Member, American Academy of Arts and Sciences, USA
2016	Chemical Pioneer Award, American Institute of Chemists, USA
since 2013	Member, National Academy of Engineering, USA
2009	Physical Organic Chemistry Award, Royal Society of Chemistry, UK

2007	Wolfson Research Merit Award, Royal Society, UK
2005	Arthur C. Cope Scholar Award, American Chemical Society, USA
2001	Paul H. Emmett Award in Fundamental Catalysis, North American Catalysis Society
1998	Max-Planck-Society Award for Outstanding Women Scientists, Max-Planck-Society, Munich, Germany
1985	Presidential Young Investigator Award, NSF, USA

Research Priorities

Donna G. Blackmond's research focuses on mechanistic studies of organic reactions, including asymmetric catalysis. She pioneered the methodology of "Reaction Progress Kinetic Analysis (RPKA)" for fundamental mechanistic studies of complex organic reactions. She studies prebiotic chemistry and the origin of biological homochirality.

Donna G. Blackmond's focuses on blending the quantitative aspects of her chemical engineering background together with the synthesis of complex organic molecules by catalytic routes, particularly asymmetric catalysis with application in pharmaceutical processes. This work led to development of Reaction Progress Kinetic Analysis (RPKA), a methodology combining highly accurate in-situ data collection with a rigorous mathematical and graphical approach that permits "kinetic-assisted mechanistic analysis" of complex reaction networks.

Her research efforts involve experimental, computational, and theoretical investigations of complex organic reactions and reaction networks including asymmetric organocatalytic reactions, Pd-catalyzed C-C and C-N bond forming reactions, asymmetric hydrogenation, competitive reactions including kinetic resolutions, and investigations of nonlinear effects in stoichiometric, catalytic, and autocatalytic reactions.

Donna G. Blackmond's theoretical work has derived relationships between catalyst enantiopurity and reaction rate that expand the power of this tool as a meaningful mechanistic probe. This work led into another area of fundamental research probing the origin of biological homochirality, a phenomenon that may itself be considered a remarkable nonlinear effect.

Her team has expanded the range of models from proposals based purely on chemical reactions, including symmetry breaking in asymmetric autocatalysis, to models based on physical phase behavior of chiral molecules as well as a combination of chemical and physical processes. They seek to rationalize the evolution of biological homochirality with experimental work and theoretical models.