



Curriculum Vitae Prof. Dr. Carolyn Bertozzi

Name: Carolyn Bertozzi

Major Scientific Interests: Bioorthogonal chemistry, chemical glycobiology, protein engineering, bionanotechnology, tuberculosis

Carolyn Bertozzi made her name as a pioneer of chemical glycobiology, an area of science dealing with the function of glycans on the surface of cells.

Academic and Professional Career

- since 2015 Professor of Chemistry at Stanford University and Stanford Chemistry, Engineering & Medicine for Human Health Institute (ChEM-H Institute), USA
- since 2006 Director, The Molecular Foundry, Lawrence Berkeley National Laboratory, USA
- since 2002 Professor of Chemistry and Molecular and Cell Biology, University of California, Berkeley, USA
- since 2000 Scientist at Howard Hughes Medical Institute, USA
- ince 2000 Professor at the Chemistry Department, University of California San Francisco, USA
- 1999 - 2002 Associate Professor at the Chemistry Department, University of California, Berkeley, USA
- 1996 - 1999 Assistant Professor of Chemistry, University of California, Berkeley, USA
- 1993 - 1995 Postdoc, American Cancer Society, University of California, San Francisco, USA
- 1993 Ph.D. in Chemistry, University of California, Berkeley, USA
- 1988 B.A. in Chemistry at Harvard University, USA

Honours and Awarded Memberships

since 2018	Foreign Member of the Royal Society
2015	150th Anniversary Alumni Excellence Award, University of California, San Francisco
2013	Hans Bloemendal Award, Radboud University Nijmegen
since 2013	Member of the National Academy of Inventors
2012	Heinrich Wieland Prize
2011	Tetrahedron Young Investigator Award for Bioorganic and Medicinal Chemistry
2010	Lemelson-MIT Prize
2009	Albert Hofmann Medal, University of Zurich
since 2008	Member of the German National Academy of Sciences Leopoldina
2008	Roy L. Whistler International Award in Carbohydrate Chemistry
2008	Li Ka Shing Women in Science Award
2007	Ernst Schering Prize
since 2005	Member of the US-National Academy of Sciences
since 2003	Member of the American Academy of Arts and Sciences
since 2002	Fellow of the American Association for the Advancement of Science (AAAS)
2002	Irving Sigal Young Investigator Award of the Protein Society
2001	Donald Sterling Noyce Prize for Excellence in Undergraduate Teaching
2001	Berkeley Distinguished Teaching Award
1999	MacArthur Foundation (Genius) Award
1998	Beckman Young Investigator Award
1996	Exxon Education Fund Young Investigator Award
1988	Thomas T. Hoopes Undergraduate Thesis Prize
1988	New England American Institute of Chemists Award

Honorary Doctorates: Freie Universität Berlin, Duke University and Brown University

Major Scientific Interests

Carolyn Bertozzi made her name as a pioneer of chemical glycobiology, an area of science dealing with the function of glycans on the surface of cells. These sugar residues play an important role in the communication and the metabolism of cells and undergo changes during illnesses. She established an entirely new avenue of research in order to be able to observe the glycans in living cells: the field of bioorthogonal chemistry.

Carolyn Bertozzi researches at the interfacing boundaries of chemistry, biology and medicine. By concentrating on glycans, she entered into an area of science that had till then hardly been investigated at all. It is probable that a large part of all proteins is glycosylated. Bertozzi seeks to understand what role these sugars have in our biological processes and in what specific ways the patterns of glycosylation change in the course of human aging or during illnesses. Methods for early recognition and possibly even therapies for maladies like cancer, infectious diseases or autoimmune diseases could be developed based on this investigation. The fact that there was no procedure with which these molecules could be specifically observed represented one of the biggest challenges. The conventional methods of fluorescence microscopy were not suited to the task. This has now, however, become possible due to the so-called bioorthogonal chemistry developed by Bertozzi. This enables molecules in living cells to be chemically modified in such a way that they become observable. For this, small “reporter molecules” are infused into cells that are themselves integrated into the sugars through the metabolism of the cell. In this way the glycans carry a kind of label by which they then – through the docking of other chemical substances – can be recognized and observed; it also opens up the possibility that they can be specifically addressed for therapeutic purposes. In order for this to function, the reporter molecule must be bioorthogonal, which means that it will not react with the complex and multifaceted biological environment and also be non-toxic.

In addition, Bertozzi developed further chemically based methods for modifying biological systems. These include a process for protein engineering that enables synthetic proteins to be built, which has led to new ways for developing protein-based materials. Her agenda also includes nano tools like nano needles or particles that can be used to examine cells in a non-destructive way. And not least, she has dedicated herself to researching tubercular pathogens, an area of concern with global dimensions.

She founded the company Redwood Bioscience in order to make her discoveries available to medical practitioners.