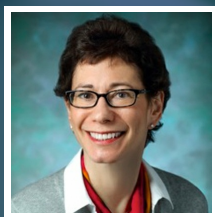


# Regulating Gene Expression: A Pathway to Novel Therapeutics



Cynthia Wolberger  
Professor, Biophysics and Biophysical Chemistry

## CURRENT RESEARCH

### Treating Untreatable Cancers

Our cells have a remarkable toolkit of macromolecules that harness the information encoded in our genes and defend our genomes from damage. Intricate patterns of chemical modifications decorate different regions of our chromosomes and dictate whether genes are turned on and off, or whether a break in the chromosome is repaired. Termed the "histone code," these modifications are attached to the histone proteins that package our chromosomes and range in size from small chemical groups to modifications as large as the protein, ubiquitin. The enzymes that deposit and remove histone modifications thus play a central role in regulating gene expression, as well in marshalling the cell's response to chromosome damage. Dr. Cynthia Wolberger, of the Johns Hopkins University School of Medicine, uses x-rays to determine the three-dimensional structure of macromolecular complexes that attach and remove histone modifications. By understanding the inner workings of specialized enzyme complexes that can select the right target and attach or remove the right modification from the right site, Dr. Wolberger is able to unravel the cascade of biochemical events that result in an increase or decrease in gene expression or repair of DNA damage. Dr. Wolberger and her team hope to use their molecular insights to establish new avenues to developing drugs that target specific biochemical pathways that are misregulated in cancer.

Dr. Wolberger's research lays the groundwork for discovering new drugs that can treat cancers that are resistant to currently available chemotherapeutic agents. In fact, her studies of enzyme complexes involved in attaching and removing modifications such as ubiquitin from chromosomes are providing new...

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## AFFILIATION



Johns Hopkins University

## EDUCATION

- Ph.D. in Biophysics 1987, Harvard University
- A.B. in Physics 1979, Cornell University

## AWARDS

- Damon Runyon - Walter Winchell Cancer Research Fund Fellow, 1987-1990
- March of Dimes - Basil O'Connor Starter Scholar Award, 1992-1994
- David and Lucile Packard Fellowship for Science and Engineering, 1992-1997
- American Cancer Society Junior Faculty Award, 1993-1994
- Howard Hughes Medical Institute Investigator, 1994-2014

## RESEARCH AREAS

Health & Wellness, Longevity, Immortality Research

## FUNDING REQUEST

Your contributions will support the continued research of Dr. Cynthia Wolberger, of the Johns Hopkins School of Medicine, as she studies the different protein complexes that attach and remove regulatory modifications. Donations will support the necessary \$750K required for personnel, equipment, and reagents each year. In choosing to donate, you will play a role in laying the groundwork for discovering new drugs that can treat cancers.