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Organic Synthesis Informs Epigenetics

Cynthia J. Burrows

Distinguished Professor
Thatcher Presidential Endowed Chair of Biological Chemistry
The University of Utah
Department of Chemistry
Salt Lake City, UT

4:00 p.m. Monday March 21st, 2016
Wolfe Hall 1205

Cynthia J. Burrows

Dr. Cynthia J. Burrows is a Distinguished Professor of Chemistry at the University of Utah and presently Chair of the Department of Chemistry. Her early training was in Phys. Org. Chem. with Prof. Stan Cristol at the University of Colorado (B. A. 1975) followed by Prof. Barry Carpenter at Cornell University (Ph.D., 1982). She then received a NSF-CNRS postdoctoral fellowship to work in the lab of Prof. Jean-Marie Lehn, Université Louis Pasteur, Strasbourg (1981-83). From 1983-1995, she held the positions of Assistant through Full Professor of Chemistry at the State University of New York at Stony Brook, before taking up a position at the University of Utah in 1995.

Prof. Burrows has been a member of numerous editorial boards and review panels; from 2001-2013, she served as Senior Editor of the *Journal of Organic Chemistry*, and in 2014, began as Editor-in-Chief of *Accounts of Chemical Research.* She is a past recipient of the Robert Parry Teaching Award and in 2011 received the University Distinguished Teaching Award. Her research accomplishments have been recognized by a number of awards including: the ACS Utah Award, ACS Cope Scholar Award, and the University of Utah's Distinguished Creative and Scholarly Research Award. In 2009, she was inducted into the American Academy of Arts and Sciences, and in 2013 she was appointed the inaugural

holder of the Thatcher Presidential Endowed Chair of Biological Chemistry. In 2014, she received the Linda K. Amos Award for Distinguished Service to Women at the University of Utah and was elected to the National Academy of Sciences.

Her research interests include: 1) elucidation of Guanosine Oxidation Products, 2) understanding Photoredox Chemistry of DNA/RNA bases as it pertains to the Origins of Life, 3) Nanopore Sequencing of DNA Damage, 4) Oxidative Damage in G Quadruplexes and 5) Base Switches for RNA Interference.

Selected Recent Scientific Contributions

1. J. Riedl, A. M. Fleming and C. J. Burrows, “Sequencing of DNA lesions facilitated by site-specific excision via base excision repair DNA glycosylases yielding ligatable gaps,” *J. Am. Chem. Soc.* **2016**, *138*, 491-494.
2. R. P. Johnson, A. M. Fleming, L. R. Beuth, C. J. Burrows and H. S. White, “Base Flipping within the α-Hemolysin Latch Allows Single-Molecule Identification of Mismatches in DNA,” *J. Am. Chem. Soc.* **2016**, *138*, 594-603.
3. J. Riedl, Y. Ding, A. M. Fleming, and C. J. Burrows, “Identification of DNA Lesions Using a Third Base Pair for Amplification and Nanopore Sequencing,” *Nature Comm.* **2015**, *6*, 8807.
4. Y. Ding, A. M. Fleming, L. He, and C. J. Burrows, “Unfolding kinetics of the human telomere i-motif under a 10 pN force imposed by the alpha-hemolysin nanopore identify transient folded-state lifetimes at physiological pH,” *J. Am. Chem. Soc.* **2015**, *137*, 9053-9060.
5. Y. Ding, A. M. Fleming, L. He, and C. J. Burrows, “Unfolding kinetics of the human telomere i-motif under a 10 pN force imposed by the alpha-hemolysin nanopore identify transient folded-state lifetimes at physiological pH,” *J. Am. Chem. Soc.* **2015**, *137*, 9053-9060.
6. A. M. Fleming, J. Zhou, S. S. Wallace, and C. J. Burrows, "A role for the fifth G-track in G-quadruplex forming oncogene promoter sequences during oxidative stress: Do these "spare tires" have an evolved function?" *ACS Central Science* **2015**, *1*, 226-233.
7. N. An, A. M. Fleming, E. G. Middleton, and C. J. Burrows, “Single-Molecule Investigation of G-Quadruplex Folds of the Human Telomere Sequence in a Protein Nanocavity,” *Proc. Natl. Acad. Sci.* **2014**, *111*, 14325–14331.
8. Y. Zhang, J. Dood, A. Beckstead, X.-B. Li, K. V. Nguyen, C. J. Burrows, R. Improta, and B. Kohler, “Efficient UV-induced charge separation and recombination in an 8-oxoguanine-containing dinucleotide,” *Proc. Natl. Acad. Sci.*, **2014**, *111*, 11612-11617.
9. Q. Jin, A. M. Fleming, R. P. Johnson, Y. Ding, C. J. Burrows, and H. S. White, "Base-Excision Repair Activity of Uracil-DNA Glycosylase Monitored Using the Latch Zone of α-Hemolysin," *J. Am. Chem. Soc.* **2013**, *135*, 19347-19353.
10. A. M. Fleming, A. M. Orendt, Y. He, J. Zhu, R. K. Dukkor, and C. J. Burrows, "Reconciliation of chemical, enzymatic, spectroscopic and computational data to assign the absolute configuration of the DNA base lesion spiroiminodihydantoin," *J. Am. Chem. Soc.* **2013**, *135*, 18191-18204.
11. P. L. McKibbin, A. M. Fleming, M. A. Towheed, B. V. Houten, C. J. Burrows, S. S. David, "Repair of Hydantoin Lesions and Their Amine Adducts in DNA by Base and Nucleotide Excision Repair," *J. Am. Chem. Soc.* **2013**, *135*, 13851-13861.

12. N. An, A. M. Fleming, and C. J. Burrows, "Interactions of the Human Telomere Sequence with the Nanocavity of the Hemolysin Ion Channel Reveal Structure-Dependent Electrical Signatures for Hybrid Folds," *J. Am. Chem. Soc.* **2013**, *135*, 8562-8570.

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