Introducing our AUTHORS

Steven W. Millward

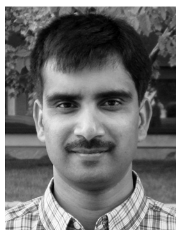
Current position: California Institute of Technology, NanoSystems Biology Cancer Center, Postdoctoral Scholar with Prof. James R. Heath
Education: Johns Hopkins University, B.A. in biology, 2000; California Institute of Technology, Ph.D. in biochemistry and molecular biophysics with Prof. Richard W. Roberts, 2007
Nonscientific interests: Music, history

I am interested in molecular recognition and the use of peptides and small molecules as tools for the study of protein–protein interactions. My article describes the selection of a high-affinity ligand for Giα1 by using cyclic messenger RNA (mRNA) display. This technique blends conventional mRNA display with unnatural amino acid incorporation and post-translational cyclization to generate a library biased toward the selection of drug-like cyclic peptides. One of the selected sequences was demonstrated to have antibody-like affinity for Giα1 and increased resistance to proteolytic degradation. This technique represents a general method for the discovery of high-affinity lead compounds for use in diagnostic assays, chemical genetics, and drug development. (Read Millward's article on p 625.)

Tek N. Lamichhane

Current position: Wayne State University, Department of Chemistry, Ph.D. candidate with Profs. Christine S. Chow and Philip R. Cunningham
Education: Tribhuvan University, Kathmandu, Nepal, B.S. in biology, 1997; Tribhuvan University, M.S. in organic chemistry, 2000
Nonscientific interests: Traveling, gardening, watching movies

Ribosomal RNA (rRNA) is the catalytic portion of the ribosome, and its function is tuned by different modified nucleotides. Although they are randomly distributed within different helices of rRNA, 3D structures show that they are clustered together and located at functional centers of the ribosome. My research is focused on helix 31 of *Escherichia coli* 16S rRNA of the 30S subunit, which harbors two modified nucleotides, m^2G966 and m^5C967. I am studying the role of these modified nucleotides on ribosome function such as translational fidelity and initiation of protein synthesis by using genetic and biochemical approaches. One of my research interests is to discover potential lead compounds that can selectively bind to the bacterial rRNA helix, but not to human analogues. (Read Lamichhane's article on p 610.)



Santosh K. Mahto

Current position: Wayne State University, Department of Chemistry, Ph.D. candidate with Prof. Christine S. Chow
Education: Tribhuvan University, Kathmandu, Nepal, B.Sc. in chemistry, 1993; M.Sc. with Prof. C. L. Gajurel, 1995
Nonscientific interests: Traveling, photography

Various modified nucleosides are found in ribosomal RNAs (rRNAs) at or near the functional sites of the ribosome. My research project is to determine the importance of modifications in the decoding region (helix 44), a primary functional region of 16S rRNA. The site is involved in translational accuracy and binding to messenger RNA, transfer RNAs, the large subunit rRNA, and several known antibiotics. To carry out detailed studies on the roles of modified nucleosides, I have synthesized methylated cytidines, incorporated them into model systems, and performed biophysical studies such as UV melting, NMR, and CD spectroscopy. In the future, I hope to employ biological assays to determine the importance of these modified nucleosides, which may eventually lead to the development of novel anti-infectives. (Read Mahto's article on p 610.)

Ish Kumar

Current position: Fairleigh Dickinson University, School of Natural Sciences, Assistant Professor
Education: Panjab University, India, B.S. and M.S. in chemistry, 1994, Institute of Microbial Technology, Council for Scientific and Industrial Research laboratory, Ph.D. in biotechnology with Dr. R. S. Jolly, 2001
Postdoctoral work: State University of New York, Upstate Medical University, Department of Biochemistry and Molecular Biology, with Dr. B. N. Singh, 2001–2002; Wesleyan University, Department of Chemistry, with Prof. Rex Pratt, 2002–2007
Nonscientific interests: Spending time with my family, cooking

The focus of my graduate work was on application of biocatalysis in the preparation of enantiomerically pure pharmaceuticals, their intermediates, and fine chemicals by following approaches such as microbial screening, enzyme screening, and substrate-structure screening. I also undertook a study of the effect of substrate structure on chemo- and enantioselectivity of enzymes. My work at Wesleyan involved the specificity of penicillin-binding proteins (PBPs) with the ultimate goal to develop better antibiotics to overcome the problem of antibiotic resistance by bacteria. We studied natural peptidomimetic side chain specificity on the inhibition of PBPs by β-lactams. We found no evidence of specificity toward these side chains. Substrate recognition by these important enzymes is not yet understood. (Read Kumar's article on p 620 and Point of View on p 603.)

Helen R. Josephine

Current position: Brandeis University, Postdoctoral Fellow with Prof. Lizbeth Hedstrom
Education: Indian Institute of Technology, Madras, India, M.Sc. in chemistry, 2000; Wesleyan University, Ph.D. in bioorganic chemistry with Prof. Dr. Rex F. Pratt, 2006
Nonscientific interests: Dancing with my 15-month-old son to Indian music

For many decades, penicillins and cephalosporins have been the first line of defense against bacterial infections. These β-lactams inhibit bacterial cell wall synthesizing enzymes called penicillin-binding proteins (PBPs). Extensive use of penicillins and cephalosporins led to the evolution of β-lactamases, the enzymes responsible for bacterial resistance to β-lactam antibiotics. During my graduate work in Dr. Pratt's laboratory, I synthesized penicillins and cephalosporins with side chains that are bacterial-species-specific by mimicking cell wall components. We hoped that they would be good inhibitors of bacterial cell wall synthesizing enzymes (PBPs) yet poor substrates of β-lactamases, which have also evolved to not hydrolyze cell wall components. (Read Josephine's article on p 620 and Point of View on p 603.)

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