

BIOL

Division of Biological Chemistry

J. T. Stivers and S. Walker,
Program Chairs

BUSINESS MEETING:
BIOL Business Meeting, 12-2 pm: Tue

SUNDAY MORNING

Section A

Salt Palace Convention Center
355 F

Frontiers in Imaging Biological Nanostructures Cosponsored by ANYL, COLL, PHYS, POLY, and NANO[‡]

D. Weibel and D. V. Vezenov, *Organizers*

- 8:20 Introductory Remarks.
- 8:30 **1.** Intracellular nanoscale imaging of molecular positions and anisotropies. **S. T. Hess**, T. J. Gould, M. S. Gunewardene, M. V. Gudheti, J. A. Gosse
- 9:10 **2.** Imaging, sensing, and cancer treatment with bioconjugates of nanowires and nanorods. **N. A. Kotov**
- 9:50 **3.** Intracellular, nonendocytic, delivery of quantum dots for live cell imaging. **C. K. Payne**, A. E. Jablonski
- 10:10 **4.** Luminescent nanostructures for intracellular imaging. **J. Zheng**, Y. Qin
- 10:30 Intermission.
- 10:40 **5.** Toward subdiffraction transmission microscopy of diffuse materials using nanoplasmonic hot spot beacons. **D. Chaudhuri**, J. W. Galusha, M. J. Walter, N. J. Borys, M. H. Bartl, J. M. Lupton
- 11:00 **6.** Large structural change in isolated synaptic vesicles upon glutamate loading. **K. L. Budzinski**, R. Allen, B. S. Fujimoto, D. Belnap, S. M. Bajjalieh, D. T. Chiu
- 11:20 **7.** Manipulation and detection of biopolymers using magnetic-luminescent microspheres. **P. Oliver**, J. S. Park, D. V. Vezenov
- 11:40 **8.** 2-D Supramolecular nanopatterns formed by DNA/RNA nucleobase molecules at the liquid-solid interface. **W. Mamdough**, M. Dong, R. E. A. Kelly, L. Kantarovich, F. Besenbacher

Functional Motions in Enzyme Catalysis
Sponsored by PHYS, Cosponsored by BIOL

Nano Meets Neuro: Novel Challenges for Nanoscience in Probing Brain Chemistry
Sponsored by MEDI, Cosponsored by ANYL, BIOL, COLL, and NANO[‡]

SUNDAY AFTERNOON

Section A

Salt Palace Convention Center
355 F

Frontiers in Imaging Biological Nanostructures Cosponsored by ANYL, COLL, PHYS, POLY, and NANO[‡]

D. Weibel and D. V. Vezenov, *Organizers*

- 1:15 **9.** Imaging beyond the diffraction limit in cells using single-molecule active control. **W. E. Moerner**, J. Biteen, N. R. Conley, H.-L. Lee, S. J. Lord, M. A. Thompson, L. Shapiro, N. Liu, R. Samuel, R. J. Twieg
- 1:55 **10.** Nanoscopic imaging of biomolecules, cells and tissues with STORM. **X. Zhuang**
- 2:35 **11.** Optofluidic microscopy: An on-chip, lensless and high resolution imaging approach. **C. Yang**
- 3:15 Intermission.
- 3:25 **12.** Angstrom-resolution imaging of biological materials and their aqueous environments. **S. Jarvis**

- 4:05 **13.** Probing the architecture and structure-function relationships of microbial and cellular systems by high-resolution in vitro atomic force microscopy. **A. J. Malkin**

Functional Motions in Enzyme Catalysis
Sponsored by PHYS, Cosponsored by BIOL

Genetically Designed Molecular Materials Peptide Binding, Kinetics and Assembly
Sponsored by NANO, Cosponsored by BIOL and MEDI

Nano Meets Neuro: Novel Challenges for Nanoscience in Probing Brain Chemistry
Sponsored by MEDI, Cosponsored by ANYL, BIOL, COLL, and NANO[‡]

MONDAY MORNING

Section A

Salt Palace Convention Center
355 A

Young Academic Investigators

J. T. Stivers and S. Walker, *Organizers*

- 8:30 **14.** Photocrosslinking sugars capture glycoconjugate interactions. **J. Kohler**
- 8:50 **15.** Pathway-specific small molecule probes of cell division. **A. Castoreno**, **U. S. Eggert**
- 9:10 **16.** Structural insights into the DNA alkylation damage response. **T. Bowles**, **A. H. Metz**, **J. O'Quin**, **Z. Wawrzak**, **B. F. Eichman**
- 9:30 **17.** Painting the cysteine chapel: New tools to probe oxidation biology. **K. S. Carroll**
- 9:50 **18.** Phase transitions and ternary diffusion in protein aqueous multicomponent solutions. **O. Annunziata**
- 10:10 **19.** Rationally designed peptide antagonists that disrupt the TLR4/MD-2 interactions in vivo. **H. Yin**
- 10:30 **20.** Interrelationships between local RNA structure and transfer factor binding: Implications for control of mRNA stability through AU-rich mRNA-destabilizing sequences. **G. M. Wilson**
- 10:50 **21.** Chemically ubiquitinated PCNA as a probe for eukaryotic translesion DNA synthesis. **Z. Zhuang**
- 11:10 **22.** Toward understanding the molecular determinants of PRMT1 substrate selection and processing. **W. Woolderchak**, **D. Chen**, **J. M. Hevel**
- 11:30 **23.** Antitumor effects of nitrosylcobalamin (a vitamin B12-based nitric oxide adduct) against spontaneous cancer in dogs. **J. A. Bauer**, **G. Frye**, **A. Bahr**, **J. Gieg**, **D. J. Lindner**
- 11:50 **24. Award Address** (Nobel Laureate Signature Award for Graduate Education in Chemistry, sponsored by Mallinckrodt Baker, Inc). A general method to rapidly and reversibly regulate protein function using synthetic small molecules. **L. A. Banaszynski**, T. J. Wandless

Functional Motions in Enzyme Catalysis
Sponsored by PHYS, Cosponsored by BIOL

Genetically Designed Molecular Materials Peptide-Based Molecular Erectors for Functional Systems Sponsored by NANO, Cosponsored by BIOL and MEDI

MONDAY AFTERNOON

Section A

Salt Palace Convention Center
355 A

Frontiers in Protein Science and Enzymology

J. T. Stivers, *Organizer*

- 1:30 **25.** Probing enzymatic phosphorylation using H-P-P correlation spectroscopy. **C. F. Meyers**, **A. Majumdar**, **M. H. Shah**

‡ Cooperative Cosponsorship

- 1:50 **26.** Molecular events of a slow substrate-product transition in orotidine 5'-monophosphate decarboxylase. **M. Fujihashi**, **A. M. Bello**, **L. P. Kotra**, **E. F. Pai**
- 2:10 **27.** Determining the molecular basis of nitric oxide signaling in bacterial biofilms. **E. M. Boon**
- 2:30 **28.** Ligand recognition by a multidrug-binding sensor. **H. Wade**, **R. Morissette**
- 2:50 **29.** Mechanistic enzymology of SgTAM, a tyrosine aminomutase. **H. A. Cooke**, **S. D. Bruner**
- 3:10 **30.** Mechanistic studies of benzylsuccinate synthase, a novel toluene degradation enzyme. **L. Li**, **E. N. G. Marsh**
- 3:30 **31.** 1.2 Å Crystal structure of a Ca²⁺ dependent PI-PLC from *Streptomyces antibioticus*. **M. R. Jackson**, **T. L. Selby**
- 3:50 **32.** Allosteric regulation of the substrate specificity for the human 15-lipoxygenase isozymes. **A. T. Wecksler**, **T. R. Holman**
- 4:10 **33.** Mechanistic studies of DpgC, a metal and cofactor free dioxygenase in the vancomycin biosynthetic pathway. **E. N. Fielding**, **S. D. Bruner**
- 4:30 **34.** Structural studies of Mtr4. **S. J. Johnson**

Section B

Salt Palace Convention Center
355 F

Frontiers in Imaging Biological Nanostructures Cosponsored by ANYL, COLL, PHYS, POLY, and NANO[‡]

D. Weibel and D. V. Vezenov, *Organizers*

- 12:00 **35.** Molecular resolution stiffness map of native membrane obtained by microsecond force spectroscopy. **M. Dong**, **O. Sahin**
- 12:20 **36.** Toward nanoscale chemical imaging of biomolecular networks using tip-enhanced fluorescence microscopy. **J. M. Gerton**, **B. D. Mangum**, **C. Mu**
- 12:40 **37.** Research on supramolecular structures formed by hydrogen-bonded amino acid and nucleic acid bases. **X. Ma**, **E. Zhang**, **R. Subramani**, **W. Mamdough**, **F. Besenbacher**
- 1:00 **38.** Dynamic imaging of vault nanoparticles. **J. Yang**, **L. Bentolila**, **V. A. Kickhoefer**, **L. H. Rome**
- 1:20 **39.** Multicolor superresolution microscopy with photoswitchable fluorescent probes. **M. Bates**, **M. Lakadamyali**, **G. Dempsey**, **B. Huang**, **X. Zhuang**
- 1:40 Intermission.
- 1:50 **40.** Electron cryotomography. **G. J. Jensen**
- 2:30 **41.** 3-D Optical superresolution: 4Pi Microscopy and photoactivation localization microscopy. **J. Bewersdorff**, **M. D. Lessard**, **M. J. Mlodzianowski**, **S. E. Kirschbaum**, **T. Hartwich**, **M. F. Juette**
- 3:10 **42.** Nanoscale structural, chemical and functional analysis of pathogens using AFM. **Y. F. Dufrene**
- 3:50 Concluding Remarks.

Functional Motions in Enzyme Catalysis
Sponsored by PHYS, Cosponsored by BIOL

Undergraduate Research Poster Session: Biochemistry Sponsored by CHED, Cosponsored by BIOL, BIOT, and SOCED

MONDAY EVENING

Section A

Salt Palace Convention Center
Hall 5

Sci-Mix

J. T. Stivers, *Organizer*

- 8:00-10:00
56, 109, 119-120, 133, 138, 183, 187, 207, 210. See subsequent listings.

TUESDAY MORNING

Section A

Salt Palace Convention Center
355 A

New Drug Targets Cosponsored by MEDI

J. T. Stivers and J. Zablocki, *Organizers*

- 8:30 **43.** Exploring the regulation of O-GlcNAc. **L. K. Mahal**
- 8:50 **44.** Isolation of a suite of cell binding peptides: Novel ligands for diagnosis and targeted therapy for nonsmall cell lung cancer. **K. Brown**
- 9:10 **45.** Functionally selective opioids: A novel target for analgesics. **T. E. Prisinzano**
- 9:30 **46.** Acyclovir, the anti-herpes drug, has direct anti-HIV activity and selects for HIV reverse transcriptase mutants. **M. A. McMahon**, **J. T. Stivers**, **R. F. Siliciano**, **R. M. Kohli**
- 9:50 **47.** Inhibition of HIV budding by a genetically selected cyclic peptide targeting the TSG101-Gag interaction. **A. Tavassoli**
- 10:10 **48.** Chemical approaches to studying PAD4 function. **P. R. Thompson**
- 10:30 **49.** Chimeric protein-small molecule conjugates as selective inhibitors of protein kinases. **D. J. Maly**

Genetically Designed Molecular Materials Peptide-Based Molecular Scaffolds
Sponsored by NANO, Cosponsored by BIOL and MEDI

TUESDAY AFTERNOON

Section A

Salt Palace Convention Center
355 A

Nucleic Acids

J. T. Stivers, *Organizer*

- 1:30 **50.** AP endonuclease 1 actively stimulates thymine DNA glycosylase by disrupting its product complex. **A. C. Drohat**, **M. E. Fitzgerald**
- 1:50 **51.** Structural analysis of PARP-1: A regulator of DNA repair, transcription, and cell death signaling. **J. Pascal**
- 2:10 **52.** Herpes simplex virus-1 DNA primase: A remarkably inaccurate yet selective polymerase. **M. Urban**, **M. Hocke**, **N. Joubert**, **R. D. Kuchta**
- 2:30 **53.** Identifying and studying RNA loop-ligand interactions. **M. D. Disney**
- 2:50 **54.** Improved model to predict the thermodynamics of RNA tandem mismatches. **B. M. Znosko**
- 3:10 **55.** Junction probes – sequence specific detection of nucleic acids via template enhanced hybridization processes. **S. Nakayama**, **L. Yan**, **H. O. Sintim**
- 3:30 **56.** Phosphine-triggered α -azidoether probes to detect single nucleotide polymorphisms. **R. M. Franzini**, **E. T. Kool**
- 3:50 **57.** Repair of OG:A mismatches by the DNA adenine glycosylase MutYH and variants associated with colorectal cancer. **S. Kundu**, **M. Brinkmeyer**, **A. L. Livingston**, **S. S. David**
- 4:10 **58.** Ru(II) complexes as DNA probes in cell imaging applications. **M. Gill**, **G. Battaglia**, **J. A. Thomas**
- 4:30 **59.** Targeting HIV-1 TAR with branched peptides. **W. Santos**, **D. I. Bryson**, **A. Pagano**

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Section B

Salt Palace Convention Center
Hall 5

Protein and Nucleic Acid Chemical Biology

J. T. Stivers, *Organizer*

5:00-7:00

60. Oligo(ethylene oxide)-based compounds for the control of protein adsorption. **M. L. Walker**, D. J. Vanderah
61. Cellular cholesterol in membrane raft domains is required for ultraviolet light (UV)-induced apoptosis in HaCaT keratinocytes. **K. S. George**, S. Wu
62. Development of a live cell-based immunofluorescent assay for the detection of pharmacologically-relevant secondary metabolites in plant cells. **V. Gaurav**, S. C. Roberts
63. Investigation of trimeric α -gp140DV2 TV1 immobilized on engineered surfaces. **Y. H. Tan**, L. Shi, E. Kan, I. Srivastava, G.-Y. Liu
64. Use of layer-by-layer assembly to pre-select cellular riboswitch function. **S. V. Harbaugh**, C. D. East, M. E. Davidson, J. L. Chávez, L. Narayanan, N. Kelley-Loughnane, M. O. Stone
65. A label-free binding assay for the thermodynamic analysis of protein-ligand interactions by dynamic ligand exchange-capillary electrophoresis. **J. M. A. Gavina**, M. T. Mazhab-Jafari, P. Britz-McKibbin
66. An approach to siRNA off-target effects using 8-oxo-2'-deoxyguanosine. **A. Kannan**, C. J. Burrows
67. Application of phosphopantetheinyl transferase catalyzed site-selective covalent protein immobilization on to nanofabricated surfaces. **L. S. Wong**, G. J. Leggett, J. Micklefield
68. Aptamer-based label-free direct detection of thrombin using SERS. **C. V. Pagba**, H. Cho, S. Lane, S. Wachsmann-Hogiu
69. Are density functional theory predictions of the Raman spectra accurate enough to distinguish conformational transitions during amyloid formation? **W. Berhanu**, I. A. Mikhailov, A. Schulte, A. E. Masunov
70. Base pairing effects on the oxidation of 8-oxoG within a DNA duplex. **A. M. Fleming**, A. C. Dlouhy, J. G. Muller, C. J. Burrows
71. Beta2-microglobulin removal at neutral pH using seed conjugated polymer bead. **M. Kim**, S. Kang, S. R. Paik, Y. S. Lee
72. Binding specificity of PI3 kinase C-SH2 domain as revealed by a combinatorial library approach. **W. Abugosh**, D. Pei
73. Biomimetic substrates for the detection of furin activity. **A. Dragulescu-Andrasi**, J. Rao
74. Withdrawn.
75. Characterization of the catalytic Mg of the hepatitis delta virus ribozyme by Raman spectroscopy. **B. Gong**, J.-H. Chen, B. L. Golden, P. C. Bevilacqua, **P. Carey**
76. Chemical probes of protein tyrosine phosphatase activity: Profiling PTP substrate selectivity and imaging intracellular PTP activity. **S. Mitra**, T. Kaltcheva, M. R. Karver, R. A. Kulkarni, S. Stanford, D. Krishnamurthy, N. Bottini, **A. M. Barrios**
77. Comparison of free-solution DNA hybridization using isothermal titration calorimetry and backscattering interferometry. **D. J. Bornhop**, **E. Pesciotta**, R. A. Flowers II
78. Comparison of oxidation products of guanosine in nucleoside and single-stranded oligodeoxynucleotide contexts. **P. Ghude**, M. Schallenberg, A. M. Fleming, J. G. Muller, C. J. Burrows
79. Cyclin-dependent kinase 2 negatively regulates human pregnane X receptor-mediated CYP3A4 gene expression in HepG2 liver carcinoma cells. **W. Lin**, J. Wu, H. Dong, D. Bouck, F.-Y. Zeng, T. Chen
80. Design, synthesis, and characterization of light-activatable fluorescent sensors of the proteasome. **A. Wakata**, M. Schmidt, A. Touthkine, D. S. Lawrence
81. Detection of broad spectrum aminoglycoside antibiotics through fluorescence-labeling aminoglycoside resistance enzymes. **D. Li**
82. Development of specific ligands and inhibitors of phosphoproteins. **D. Cai**, A.-Y. Lee, C.-M. Chiang, T. J. Kodadek
83. Engineering of endogenous protein by ligand-directed tosyl chemistry: Construction of a 19F NMR biosensor in live cells. **Y. Takaoka**, S. Tsukiji, I. Hamachi
84. Expression, purification, and characterization of hcentrin 1 variants. **J. E. Diaz-Arana**
85. Full-length HIV-1 gp120 glycosylation redistribution upon ligation with T-cell receptor CD4. **C. D. Boone**, F. Ashish, J. Krueger
86. Functional and structural comparisons of MscS and bCNG ion channels. **R. C. Guayasamin**, H. R. Malcolm, J. F. Hawkins, J. A. Maurer, D. E. Elmore
87. Functional enhancement of antimicrobials. **L. Smith**, N. Chaney, D. Ellis, S. Wilson-Stanford
88. Withdrawn.
89. Identifying the type I collagen binding site on osteocalcin. **A. Janiga**, R. V. Prigodich
90. Improved carcinostatic activity of novel lipophilic silicon-containing *n*-acetyl l-cysteine antioxidants. **U. I. Zakai**, G. A. Bikhanova, S. Gately, R. West
91. In silico selection of RNA aptamers. **Y. Chushak**, M. O. Stone
92. In situ spectrophotometric analysis in gel electrophoresis. **A. F. Charlebois**, A. Brandolini, P. Patel, R. Rene
93. Incorporation of modified nucleosides into DNA: Tricking enzymes into revealing themselves. **S. Cao**, S. S. David
94. Increasing alpha-chymotrypsin thermodynamic stability upon PEGylation correlates with reduced structural dynamics. **J. A. Rodriguez-Martinez**, R. J. Sola, B. Castillo, I. Rivera-Rivera, H. R. Cintron-Colon, G. Barletta, K. Griebenow
95. Inhibition of colon cancer cell proliferation is greater with quercetin 3-beta-D-glucoside than with quercetin or its rutinoside. **M. A. Lea**, C. Ibeh, C. desBordes
96. Interaction of peptide dimers with X-linked inhibitor of apoptosis protein. **K. E. Splan**, C. L. Cosimini, G. L. McLendon
97. Investigating the bactericidal mechanism of three novel histone-derived antimicrobial peptides. **H. S. Tsao**, A. T. Lee, N. P. Maharaj, D. E. Elmore
98. Investigating the chemical interactions at the DCoH(α) dimer-dimer interface. **C. M. Hansen**, J. M. Hevel
99. Investigating the role of proline in the function of the antimicrobial peptide buforin II. **Y. Xie**, N. P. Maharaj, E. Fleming, D. E. Elmore
100. Investigation of amyloid aggregation on the controlled self-assembled monolayers. **Q. Wang**, J.-C. Yang, X. Yu, S. Z. D. Cheng, **J. Zheng**
101. Investigation of length requirements of Hoogsteen bound third strand in intramolecular RNA triple helices. **D. J. Holland**
102. JS-K: Pathways of anticancer action. **D. Basudhar**, L. A. Ridnour, K. M. Miranda, D. A. Wink
103. Lysophosphatidic acid (LPA) antagonists treat breast and lung cancer in engineered tumor models. **X. Xu**, H. Zhang, A. Parrill, G. Tigy, G. D. Prestwich
104. MALDI TOF mass spectrometry: A new methodology for footprinting protein/SSDNA complexes. **M. Light**, R. V. Prigodich
105. Mapping the structure of the "ON" and "OFF" states of the ykkCD riboswitch. **K. Roark**, T. Gerczei
106. Mechanism of interaction of Alzheimer's disease drugs with aggregates of β -amyloid peptide (A β 1-42). **L. Ramakrishnan**, N. Bhattarai, P. P. Henning, L. Rajbhandari, R. B. Thapa
107. Modulation of the selectivity of nucleoside functionalized congeners as A1 and A3 adenosine receptor agonists by attachment to poly(amidoamine) (PAMAM) dendrimer carriers. **A. M. Klutz**, Z.-G. Gao, J. Lloyd, A. Shainberg, K. Jacobson
108. New reductive ligation of S-nitrosothiols. **M. Xian**
109. Noncovalent functionalization of bacteriophage Qbeta: Addressing encapsidated RNA aptamers. **J. L. Lau**, P. Ordoukhanian, M. M. Bakshi, M. G. Finn
110. Novel use of quaternions in the analysis of protein and nucleic acid secondary structure. **R. M. Hanson**, **D. Kohler**, A. J. Hanson
111. Oral delivery of insulin through the vitamin B12 uptake pathway. **A. K. Petrus**
112. Oral delivery of RNA aptamer as reversible antagonist of coagulation factor IXa. **R. T. S. Lam**, S. Oney, B. A. Sullenger, K. W. Leong
113. PEI-SWNTs: Small molecule capture and release. **E. Dillon**, C. A. Crouse, C. Craven, A. R. Barron
114. Peptide nanocapsules and their conjugation with inorganic nanoparticles. **Y. Yang**, P. Burkhard
115. Peptide nanoparticles as novel immunogens: Design and biophysical analysis of a prototype SARS vaccine. **T. Pimentel**, Z. Yan, S. A. Jeffers, K. V. Holmes, R. S. Hodges, P. Burkhard
116. Potential inhibitory fullerene-peptides for neuroblastoma cells. **N. Doostdar**, J. Yang, A. R. Barron
117. Potential roles of lipids and nucleic acids in prion disease: Characterizing the interactions of lipids and nucleic acids with PrP. **J. G. Cannon**, W. K. Surewicz
118. Probing adenine rings and backbone linkages using isotope edited Raman difference spectroscopy: Applications to group II intron ribozyme domain 5. **Y. Chen**, K. T. Dayie, P. Carey
119. Probing bacterial isoprenoid biosynthesis: 1-deoxy-D-xylulose 5-phosphate synthase (Dxs). **L. A. Brammer**, C. F. Meyers
120. Rational structure-based redesign of beta-peptide helical bundles: Mimicking protein-like architectures. **C. J. Craig**, J. L. Goodman, A. Schepartz
121. Reactivity of DNA lesions in large DNAs. **E. J. Merino**, A. Luckenbill, Y. He
122. Real time monitoring of heat induced (35-120°C) denaturation and aggregation of beta-lactoglobulin in aqueous solutions in the presence of chaperones. **A. Ochendusko**, V. Buckin
123. Recognition of duplex RNA with novel helix-threading ligands. **N. Schirle**, M. Krishnamurthy, P. A. Beal
124. Regulation of pyrimidine biosynthesis in *Pseudomonas nitroreducens*. **T. P. West**
125. Restriction enzyme activity studies of the binding of cisplatin to different DNA structures and sequences. **J. E. Pulido**, J. Gattorno, V. Ng, T. Rao, R. L. D. L. Vega, S. A. Winkle
126. Role of the 2-amino group of purines during dNTP polymerization by human DNA polymerase α . **J. N. Patro**, M. Urban, R. D. Kuchta
127. Selective protein labeling using reactive-tag system. **H. Nonaka**, S. Uchinomiya, S. Fujishima, A. Ojida, I. Hamachi
128. SNARE proteins are highly mobile, yet cluster beneath secretory vesicles, on the plasma membrane of PC12 cells. **M. K. Knowles**, S. Barg, L. Wan, W. Almers
129. Spatially controlled dual surface modifications of a symmetrical multisubunit protein cage architecture and composition analysis using mass spectrometry. **S. Kang**, L. M. Oltrogge, P. A. Suci, C. C. Broomell, M. Young, T. Douglas
130. Stereospecific repair of the 5R spore photoproduct by spore photoproduct lyase. **S. C. Silver**, T. Chandra, E. Zilinskas, E. M. Shepard, W. E. Broderick, J. B. Broderick
131. Structural characterization of 2x3 internal loops. **N. Zulic**, B. M. Znosko
132. Structure constraints of gelsolin and actin complex in solution using small-angle scattering. **R. C. Oliver**, J. Krueger, F. Ashish
133. Structure elucidation and biosynthesis of the fuscahelins, nonribosomal peptide siderophores from the moderate thermophile *Thermobifida fusca*. **E. J. Dimise**, S. D. Bruner
134. Supramolecular nanopatterns of self-assembled peptide nucleic acids at the liquid/solid interface. **R. Subramani**
135. Synthesis and study of multifunctional enzyme inhibitors in mevalonate pathway. **J. Gao**, Y. Qiao, J. Wu, Y. Qiu, Z. Lun, D. Li
136. Synthesis of biological activity of 3- and 5-PP-IP5. **J. Zhang**, H. Zhang, Y.-S. Lee, E. O'Shea, G. D. Prestwich
137. Synthesis of fullerene amino acids and peptides. **A. Strom**, A. R. Barron
138. Synthesis of selenium modified thymidine phosphoramidites and their incorporation into oligonucleotides for structural and functional study of nucleic acids. **J. Sheng**, J. Salon, J. Jiang, Z. Huang
139. Synthesis of templates with guanine-N7 adducts of 2,7-diaminonitrosene to monitor translesion synthesis by different DNA polymerases. **C. C. Clement**, S. Ladwa
140. Targeted inactivation of proteins triggered by visible light. **J. Lee**, H.-S. Lim, D. G. Udugamasooriya, T. Kodadek
141. The alteration of microRNAs expression profile by RDX follows a tissue-specific pattern. **X. Pan**, **B. Zhang**
142. The mechanism of gene expression regulation by the ykkCD riboswitch. **W. Howe**, T. Gerczei
143. Toward an artificial metallo-ribozyme: Enantioselective allylic substitution by a DNA-diene-iridium hybrid catalyst. **P. Fournier**, R. Fiammengo, A. Jäschke
144. TPLH network: Maintaining the global structure of anykri repeat proteins. **Y. Guo**, C. Yuan, M.-D. Tsai, J. Li
145. Tuning the redox properties of ruthenium(II) polypyridyl-viologen complex by the linkage chain for effective DNA photocleavage. **Y. He**, S. Sun, Z. Yang, J. Fan, X. Peng
146. Unraveling the interaction between poly(CUG)RNA and the MBNL1 protein and inhibition of complex formation by small molecules. **S. R. Ramisetty**
147. Urea denaturation of various elastin-like polypeptides. **L. B. Sagle**, Y. Cho, J. Kherb, Y. Zhang, P. S. Cremer
148. Using NMR to determine the conformation of capsaicin in environments of varying polarity: Relevance to capsaicin binding to TRPV1 receptors. **B. Vallieres**, R. V. Prigodich
149. Using quaternions to analyze ligand-protein interactions in molecular dynamics calculations. **R. M. Hanson**, **S. Johnston**
150. Using transmission electron microscopy (TEM) to image the osteocalcin binding site on type I tropocollagen. **P. Klemm**, R. V. Prigodich

Genetically Designed Molecular Materials Nanostructured Biomolecules
Sponsored by NANO, Cosponsored by BIOL and MEDI

WEDNESDAY MORNING

Section A

Salt Palace Convention Center
355 F

Nakanishi Prize: Symposium in Honor of JoAnne Stubbe

J. Stubbe, *Organizer*9:00 151. Nanocarrier delivery of platinum anticancer drugs. **S. Lippard**9:40 152. Fluorescent and luminescent probes for biological chemistry. **B. Imperiali**10:20 153. ENDOR in metallobiochemistry. **B. M. Hoffman**11:00 154. Award Address (Nakanishi Prize, sponsored by Nakanishi Prize Endowment). Ribonucleotide reductases as a paradigm for control of radical mediated reactions in biology. **J. Stubbe**, E. B. Minnihan, K. Yokoyama, M. Seyedsayamdost

Functional Motions in Enzyme Catalysis
Sponsored by PHYS, Cosponsored by BIOL

The official technical program for the 237th National Meeting is available online at oasys2.confex.com/acs/237nm/techprogram/.

WEDNESDAY AFTERNOON

Section A

Salt Palace Convention Center
Hall 5

Enzyme Structure and Mechanism

J. T. Stivers, *Organizer*

5:00-7:00

155. Aggregation and stability characterization of abatacept (orencia), a therapeutic fusion protein. **J. L. Fast**, J. F. Carpenter, T. W. Randolph
156. Characterization of the calcium binding domain of NADPH oxidase 5 (NOX5). **C. L. Qi**, C.-C. Wei, K. A. Levek, N. A. Mott
157. 5-F Substituent effects on orotidine 5'-monophosphate decarboxylase-catalyzed decarboxylation of orotidine monophosphate and on exchange of the C-6 hydrogen of uridine 5'-monophosphate for deuterium. **S. A. Barnett**, W.-Y. Tsang, T. L. Amyes, B. M. Wood, J. A. Gerit, J. P. Richard
158. A new family of ATP-dependent oligomerization-macrocyclization biocatalysts. **N. Kadi**
159. Aerobic ethylbenzene metabolism via a CO₂-dependent pathway by *Rhodococcus ruber*. **A. Mashruwala**, S. A. Ensign
160. Application of nonhydrolyzable coenzyme A analogs in manipulation of nonribosomal peptide synthetases geometry. **Y. Liu**, S. D. Bruner
161. Applications of immobilized biomacromolecules and whole organelles at thiazine dye mediated carbon electrode surfaces. **M. J. Moehlenbrock**
162. Bacterial squalene synthase: Cloning, solubilization, characterization, and mutagenesis studies of *Thermosynechococcus elongatus* BP-1 squalene synthase. **S. Lee**, C. D. Poulter
163. Biochemical characterization of yeast vacuolar ATPase protein subunits E and G. **D. D. Ojennus**, B. Hams, J. Spaun
164. Biochemical investigation of stereochemical control in polyketides biosynthesis. **C. R. Valenzano**, D. E. Cane
165. Characterization of cellulases from *Penicillium funiculosum* and organic solvent effects on activity. **A. J. Kelkhoff**, S. N. Lone, **R. C. Steinmeier**
166. Characterization of H57R, a novel mutant of deacetoxycephalosporin-c synthase by molecular dynamics: Insight into substrate selection. **N. Balakrishnan**, T. J. Masilamani, C. M. Krishnan, P. Rajasekaran, V. Vinayagam, **M. Durairaj**
167. Consequences of extreme evolution on the tertiary structure of the RNAP alpha-subunit in *Pelargonium x hortorum*. **K. M. French**, G. S. Murphy, B. Kuhlman, P. Kuhlman
168. Correlation of human NQO1 activity with quinone substrate reduction potential. **M. F. Mendoza**, N. Hollabaugh, R. L. McCarley
169. Design and properties of mutant sulfo-transferases for heterodimerization. **K. L. Hughes**, J. A. Dopke, J. D. Beckmann
170. Determinants of PRMT1-catalyzed ADMA product formation. **S. Gui**, J. M. Hevel, W. Woodechak
171. Determining the role for methionine 234 in substrate recognition in human carbonyl reductase. **C. R. Young**, H. A. Charlier Jr.
172. Development of assays monitoring the inhibition of heat shock protein 70. **C. C. Clement**, R. D. Lang
173. Directed evolution of lactase: Controlling substrate specificity. **N. Gupta**, E. T. Farinas
174. Engineering synthetase promiscuity to incorporate a family of fluorinated amino acids. **S. J. Miyake-Stoner**, R. A. Mehl
175. Enzymatic pathways in the development of beetle elytral cuticle. **J. Lomakin**, C. Eichler, Y. Arakane, K. J. Kramer, R. W. Beeman, M. R. Kanost, **S. H. Gehrke**
176. Functional and structural characterization of the noncanonical nucleotide pyrophosphatase TM0159 from *Thermotoga maritima*. **K. A. Awwad**, **A. Desai**, M. Sommerhalter
177. How do monomethylated substrates bind PRMT1? **Y. Morales**, J. M. Hevel
178. Identification and characterization of AsbF: The missing link in petrobactin biosynthesis. **D. T. Fox**, K. Hotta, C.-Y. Kim, A. T. Koppisch
179. Identification of soluble proteins in bovine and porcine vitreous humor. **K. Sherman**, F. Y. Ohene
180. Impact of metal, Tyr-Cys crosslink and the outer-sphere residues on the geometric and electronic structures for the catalytic site in galactose oxidase.
181. In vitro characterization of enzymes from the phaseolotoxin biosynthetic pathway. **R. F. Roush**, I. Ntai, N. L. Kelleher, C. T. Walsh
182. Interactions between positively charged residues (Arg, Lys) and the sulfonate of coenzyme M responsible for stereoselectivity of R- and S-hydroxypropyl CoM dehydrogenases. **D. A. Sliwa**, A. M. Krishnakumar, J. W. Peters, S. A. Ensign
183. Investigating the catalytic mechanism of the yeast palmitoyltransferase Akr1. **X. Guan**, A. F. Roth, N. G. Davis, C. A. Fierke
184. Investigating the role of the N-terminal tail of the human protein arginine methyltransferase 1 on substrate recognition. **B. B. Suh**, **J. Delka**, J. Hevel
185. Leukocyte 12-lipoxygenase: ESI-MS and EPR investigations of the iron site. **S. Xu**, J. Rapp, W. P. Griffith, D. M. O. Funk Jr.
186. Withdrawn.
187. Mechanism of PDK1-catalyzed T229 phosphorylation of the S6K1 protein kinase. **M. M. Keshwani**, T. K. Harris
188. Mechanistic studies of MenD, 2-succinyl-5-enolpyruvyl-6-hydroxy-3-cyclohexene-1-carboxylic acid synthase from *Staphylococcus aureus*. **H. Xu**, M. Graham, J. Karelis, S. G. Walker, P. J. Tonge
189. Mechanistic studies of novel antibacterials. **S. K. Vooturi**, M. Rybak, S. M. Firestone
190. Mechanistic studies of reductive product release in NRPS and PKS/NRPS systems. **J. A. Read**, C. T. Walsh
191. Molecular dynamics simulation of chemical rescue experiments in mutants of human carbonic anhydrase II. **N. Castillo Rijo**, C. M. Maupin, G. A. Voth
192. Monitoring changes in human serum ganglioside profiles via HPLC/MS to aid in diagnosis and treatment of ganglioside synthase deficiencies. **A. L. Stokes**, J. Blevins, K. R. Hess, R. A. Mehl
193. Novel reactivity of the enzymatic non-heme Fe(II) centre of diketone dioxygenase Dke1. **C. M. L. Di Giuro**, G. D. Straganz
194. Oxidative inhibition of protein tyrosine phosphatases. **C. E. Hubbard**, A. M. Barrios
195. Parallel characterization of thermophilic isopentenyl phosphate kinases from *Archaea*. **M. Chen**, C. Poulter
196. Withdrawn.
197. Purification and characterization of lysyl oxidase from pig aorta. **J. Barnes**, **E. Camire**, H. Kagan, H. Lucero, F. Ryvkin
198. Pyrrolidinedione in andrimid biosynthesis. **X. Liu**, C. T. Walsh
199. Relationship of copper-binding activity of 8-hydroxyquinoline analogs and their inhibitory property to human cancer cell growth. **V. Milacic**, P. Jiao, **L. Yang**, Q. P. Dou, B. Yan

Please refrain from using cellular telephones and cameras during technical sessions.

200. Role of coupled domain motions on the catalytic activity of Escherichia coli prolyl-tRNA synthetase. **K. Zimmermann**, B. Shane, M. Ignatov, K. Musier-Forsyth, S. Hati
201. Role of histidine residues in the catalytic mechanism of 2-ketopropyl CoM oxidoreductase/carboxylase from *Xanthobacter autotrophicus* Py2. **M. Kofoed**, S. A. Ensign
202. Structural and biochemical characterization of the RNA helicase, Mtr4. **R. Jackson**, B. Hintze, S. J. Johnson
203. Structural and functional studies of M2 proton channel from influenza A virus. **D. D. Busath**, M. Sharma, H. Qin, E. Peterson, C. Larson, W. Caywood, R. Rawlings, T. A. Cross
204. Structural insights into the mechanism of tartrate dehydrogenase: A versatile enzyme catalyzing multiple reactions. **R. Malik**, R. E. Viola
205. Structure of human ETHE1 protein. **N. E. Adams**, P. Limphong
206. Synthesis and evaluation of modified nucleotides for RNA editing enzymes. **P. Jayalath**, S. Pokharel, O. Maydanovich, P. A. Beal
207. Synthesis and kinetic evaluation of Acetylcholinesterase inhibitors. **K. R. Cavanaugh**, Y. Wang, D. Quinn
208. Synthesis and photophysical studies of photocaged N-protected glycines as substrates for peptidyl alpha-hydroxylating monooxygenase. **S. Handa**, A. Mokdad, R. Larsen, D. J. Merkler
209. Synthesis of naphthoyl amino-CoA inhibitor for cocrystallization with NcsB2. **E. L. Guenther**, H. A. Cooke, S. D. Bruner
210. The rescue of a K12G mutant of triose-phosphate isomerase by small alkylammonium cations. **M. K. Go**, J. P. Richard, T. L. Amyes
211. Theoretical study of the inhibitory reaction mechanisms between GAPDH and Nitroxy (HNO). **M. P. Sherman**, R. D. McCulla
212. Utilization of synthetase promiscuity to site-specifically incorporate new photocrosslinking unnatural amino acids. **J. C. Peeler**, R. A. Mehl
213. Purification and peptide mapping of the heme biosynthesis enzyme ferrochelatase. **A. P. Asuru**, L. S. Busenlehner

Section B

Salt Palace Convention Center
Salt 5 A

Frontiers in Chemical Biology

J. T. Stivers, *Organizer*

- 1:30 214. Quantitative phosphoproteomic dissection of signaling pathways applied to T cell and mast cell signaling. **A. Salomon**
- 1:50 215. Development and application of a set of chemical probes to investigate protein kinase function in lysates and living cells. **R. Krishnamurthy**, D. J. Maly
- 2:10 216. Differential innate immune detection of peptidoglycan by Toll-like receptor 2. **J. Asong**, M. Wolfert, K. Maiti, D. Miller, G.-J. Boons
- 2:30 217. Exosite II-mediated allosteric inhibition of selected coagulation enzymes by novel hydrophobic, yet water soluble, molecules. **U. R. Desai**, B. L. Henry, A. Liang
- 2:50 218. Expanding the fluorosensory arsenal, tetrafluorinated phenylalanines for protein design. **H. Zheng**, J. Gao
- 3:10 219. Forward chemical screen using zebrafish embryos with novel 2-substituted 2H-chromene derivatives. T. Evans, **B. C. Das**
- 3:30 220. Pc 4 induced photodamage of intact mitochondria. **J. Kim**, M. E. Rodriguez, N. L. Oleinick, V. E. Anderson
- 3:50 221. New class of detergents for membrane protein manipulation. **P. S. Chae**, P. D. Laible, S. H. Gellman

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- 4:10 222. Synthesis of hybrid fluorosurfactants and their application as additives for protein renaturation. **R. Singh**, R. A. Flowers II
- 4:30 223. Synthesis of novel water soluble linker for antibody/quantum dot assemblies targeting cancer biomarkers. **M. Kalita**, S. Cingarapu, R. Jankowiak, K. J. Klabunde, S. H. Bossmann

Functional Motions in Enzyme Catalysis
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THURSDAY MORNING

Functional Motions in Enzyme Catalysis
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THURSDAY AFTERNOON

Functional Motions in Enzyme Catalysis
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BMGT

Division of Business Development & Management

M. L. Hurrey, *Program Chair*

OTHER SYMPOSIA OF INTEREST:

Legal Perspectives on a Shrinking World: Intellectual Property, Business and Regulatory Issues in Nanotechnology (see CHAL, Tue)

SOCIAL EVENT:
Award Reception, 4:30 pm: Mon

BUSINESS MEETING:
Open Meeting, 12:00 pm: Mon

MONDAY AFTERNOON

Section A

Salt Palace Convention Center
Ballroom A

ACS Award in Industrial Chemistry:
Symposium in Honor of George G. I. Moore
Cosponsored by ORGNF and PROF,
Financially supported by 3M

M. E. Hoke, *Organizer*

- 1:25 Introductory Remarks.
- 1:30 1. Systematic design of chemistries and interlaces for the covalent attachment of low molecular weight and biogenic amines. **R. R. Shah**, G. G. I. Moore, C. M. Leir
- 1:55 2. Trifluoromethyl- and trifluorovinylcopper reagents: Elusive reagents. **D. J. Burton**
- 2:20 3. Novel heterocyclic TLR-7 and TLR-8 immune response modifiers. **D. S. Hays**, M. E. Danielson, S. Niwas, J. F. Gerster, C. A. Haraldson, J. D. Bonk, S. J. Mackey, K. J. Lindstrom, W. H. Moser, R. B. Prince, T. A. Kshirsagar, P. D. Heppner, G. D. Lundquist, M. A. Kavanagh, J. T. Moseman, S. Olson, M. J. Rice, J. R. Wurst, S. A. Strong, D. J. Willie, L. R. Wurst, S. J. Gibson
- 2:45 Intermission.
- 3:00 4. Hydrofluoroethers: Chemistry and applications. **R. M. Flynn**
- 3:25 5. Solvent tuning in fluorosurfactants: Increasing separation efficiency while lowering fluorine content. **M. S. Yu**, T. Nagashima, Q. Chu, D. Curran
- 3:50 6. Award Address (ACS Award in Industrial Chemistry, sponsored by ACS Division of Business Development and Management and the Synthetic Organic Chemical Manufacturers Association). Creativity, chemistry, utility: My career at 3M. **G. G. I. Moore**
- 4:30 Concluding Remarks.