

Ryan R. Julian

Department of Chemistry
University of California, Riverside
Riverside, CA 92521-0403

Phone: (951) 827-3958
Fax: (951) 827-4713
ryan.julian@ucr.edu

Education

- California Institute of Technology, Pasadena, CA
Ph.D. in Chemistry, April 2003
Thesis: Molecular Recognition of Biomolecules in the Gas Phase
Thesis Advisor: J. L. Beauchamp
- University of Utah, Salt Lake City, UT
B.S. in Chemistry, June 1999
Advisor: W.H. Breckenridge

Research Experience and Employment

- **University of California, Riverside, CA; 2005-present**
Principal Investigator: Areas of investigation include the development of new techniques utilizing mass spectrometry and spectroscopy to study biological systems including protein folding and assembly, molecular recognition, radical directed protein sequencing, and cluster chemistry.
- **Indiana University, Bloomington, IN; 2003-2005**
Postdoctoral Research: Studies in the areas of protein structure, chirality, small molecular clusters, viruses, proteomics, ion trajectory simulations, programming (.NET), and utilizing ion mobility for various applications in combination with mass spectrometry.
Advisors: Martin F. Jarrold and David E. Clemmer
- **Caltech, Pasadena, CA; 1999-2003**
Graduate Research: Studies of gas phase chemical reactions and supramolecular interactions utilizing ion trap, MALDI, and FT-ICR mass spectrometry coupled with extensive computational analysis. Synthesis, separation, and characterization of novel molecules designed to interact with biological species.
Graduate Teaching: Teaching assistant for Chem 120c, Computational Chemistry; Chem 21a, Physical Chemistry; Chem 1, Freshman Chemistry. Lab Assistant for Chem 3, Freshman Lab.

- **University of Utah**, Salt Lake City, UT; 1994, 1996-1999
Undergraduate Research: Conducted high resolution R2PI spectroscopy experiments and development of computational modeling for metal-rare gas complexes.
Undergraduate Teaching: Teaching assistant for Chem 1230, Honors Freshman Chemistry; Chem 1210, Freshman Chemistry; Chem 1010, Chemistry for Non-scientists; Chem 3000 Advanced Analytical Chemistry Lab. In addition, developed new experiments for and wrote the lab manual for Chem 1230.

Awards and Recognition

- NSF CAREER Award, 2008
- UC Regents Faculty Fellowship, 2006
- ASMS Research Award, 2006
- NIH Postdoctoral Fellowship, 2004-2005
- Herbert Newby McCoy Award in Chemistry, 2003
- Best Student Paper Award in Fundamental Chemistry for the Year 2001, awarded for publication of: (6) Julian R.R.; Beauchamp J.L. "Site specific sequestering and stabilization of charge in peptides by supramolecular adduct formation with 18-crown-6 ether by way of electrospray ionization" *Int. J. Mass Spectrom.* **2001**, *210*, 613-623
- Undergraduate Research Opportunity Fellowship, 1999
- Hyperchem Scholar Award, 1999
- Undergraduate Research Opportunity Fellowship, 1998

Memberships

American Chemical Society
American Society for Mass Spectrometry
American Association for the Advancement of Science
Golden Key National Honor Society

Publications (*featured on cover)

33. Ly, T; Pujanauski, B. G.; Sarpong, R.; Julian, R. R. "Surveying Ubiquitin Structure with ESI-MS: Determining Inter-residue Distance Constraints Using Site-Selective Noncovalent Attachment of Bis(crown) Ethers" *accepted for publication in Anal. Chem.* 04/08.
32. Liu, Z.; Cheng, S.; Gallie, D. R.; Julian, R. R. "Exploring the Mechanism of SNAPP Mass Spectrometry Utilizing Site Directed Mutagenesis to Examine Ubiquitin" *accepted for publication in Anal. Chem.* 03/08.
31. Spencer, E. A. C.; Ly, T; Julian, R. R. "Formation of the Serine Octamer: Ion Evaporation or Charge Residue?" *Int. J. Mass Spectrom.* **2008**, *270*, 166-172.
30. Ly, T.; Julian, R. R. "Residue Specific Radical Directed Dissociation of Whole Proteins in the Gas Phase" *J. Am. Chem. Soc.* **2008**, *130*, 351-358.

29. Julian, R. R.; Ly, T.; Finaldi, A. M.; Morton, T. H. "Decomposition of a protonated secondary amine in the gas phase via an ion-neutral complex" *Int. J. Mass Spectrom.* **2007**, *265*, 302-307.
28. Ly, T.; Krout, M.; Pham, D. K.; Tani, K.; Stoltz, B. M.; Julian, R. R. "Synthesis of 2-Quinuclidonium by Eliminating Water: Experimental Quantification of the High Basicity of Extremely Twisted Amides" *J. Am. Chem. Soc.* **2007**, *129*, 1864-1865.
27. Myung, S.; Lorton, K. P.; Merenbloom, S. I.; Fioroni, M.; Koeniger, S. L.; Julian, R. R.; Baik, M.-H.; Clemmer, D. E. "Evidence for Spontaneous Resolution of Icosahedral Proline" *J. Am. Chem. Soc.* **2006**, *128*, 15988-15989.
26. Myung, S.; Fioroni, M.; Julian, R. R.; Koeniger, S. L.; Baik, M. H.; Clemmer, D. E. "Chirally Directed Formation of Nanometer Scale Proline Clusters." *J. Am. Chem. Soc.* **2006**, *128*, 10833-10839.
- 25.* Ly, T.; Julian, R. R. "Using ESI-MS to probe protein structure by site-specific noncovalent attachment of 18-crown-6" *J. Am. Soc. Mass Spectrom.* **2006**, *17*, 1209-1215.
24. Julian, R. R.; Mabbett, S. R.; Jarrold, M. F. "Ion Funnels for the Masses: Experiments and Simulations with a Simplified Ion Funnel." *J. Am. Soc. Mass Spectrom.* **2005**, *16*, 1708-1712.
23. Suzumura, A.; Paul, D.; Sugimoto, H.; Shinoda, S.; Julian, R. R.; Beauchamp, J. L.; Teraoka, J.; Tsukube, H. "Cytochrome c - Crown Ether Complexes as Supramolecular Catalysts: Cold-Active Synzymes for Asymmetric Sulfoxide Oxidation in Methanol" *Inorg. Chem.* **2005**, *44*, 904-910.
22. Julian, R. R.; Myung, S.; Clemmer, D. E. "Do Homochiral Aggregates Have an Entropic Advantage?" *J. Phys. Chem. B.* **2005**, *109*, 440-444.
21. Julian, R. R.; Jarrold, M. F. "Gas Phase Zwitterions in the Absence of a Net Charge" *J. Phys. Chem. A.* **2004**, *108*, 10861-10864.
20. Cox, H. A.; Julian R. R.; Lee, S.-W.; Beauchamp, J. L. "Gas Phase H/D Exchange of Sodiated Glycine Oligomers with ND₃: Exchange Kinetics Do Not Reflect Parent Ion Structures." *J. Am. Chem. Soc.* **2004**, *126*, 6485-6490.
19. Julian R. R.; Myung, S.; Clemmer, D. E. "Spontaneous Anti-Resolution in Heterochiral Clusters of Serine" *J. Am. Chem. Soc.* **2004**, *126*, 4110-4111.
18. Myung, S.; Julian, R. R.; Nanita, S. C.; Cooks, R. G.; Clemmer, D. E. "Formation of Nanometer Scale Serine Clusters by Sonic Spray" *J. Phys. Chem. B.* **2004**, *108*(19), 6105-6111.
17. Julian R.R.; Beauchamp, J. L. "Selective Molecular Recognition of Arginine by Anionic Salt Bridge Formation with Bis-Phosphate Crown Ethers: Implications for Gas Phase Peptide Acidity from Adduct Dissociation" *J. Am. Soc. Mass Spectrom.* **2004**, *15*, 616-624.
16. Julian, R. R.; May, J. A.; Stoltz, B. M.; Beauchamp, J. L. "Biomimetic Approaches to Gas Phase Peptide Chemistry: Combining Selective Binding Motifs with Reactive Carbene Precursors to Form Molecular Mousetraps" *Int. J. Mass Spectrom.* **2003**, *228*(2-3), 851-864.
15. Washenfelder, R. A.; Roehl, C. M.; McKinney, K. A.; Julian, R. R.; Wennberg, P.O. "A Compact, Lightweight Gas Standards Generator for Permeation Tubes" *Rev. Sci. Instr.* **2003**, *74*(6), 3151-3154.

14. Julian, R. R.; May, J. A.; Stoltz, B. M.; Beauchamp, J. L. "Gas Phase Synthesis of Charged Copper and Silver Fischer Carbenes from Diazomalonates: Mechanistic and Conformational Considerations in Metal Mediated Wolff Rearrangements" *J. Am. Chem. Soc.* **2003**, *125(15)*, 4478-4486.
13. Julian, R. R.; Beauchamp, J. L. "Abiotic Synthesis of ATP from AMP in the Gas Phase: Implications for the Origin of Biologically Important Molecules from Small Molecular Clusters." *Int. J. Mass Spectrom.* **2003**, *227*, 147-159.
- 12.* Julian, R. R.; May, J. A.; Stoltz, B. M.; Beauchamp, J. L. "Molecular Mousetraps: Gas Phase Studies of the Covalent Coupling of Non-Covalent Complexes Initiated by Reactive Carbenes Formed by Controlled Activation of Diazo Precursors" *Angew. Chem. Int. Ed.* **2003**, *42(9)*, 1012-1015.
11. Julian, R. R.; Akin, M.; May, J. A.; Stoltz, B. M.; Beauchamp, J. L. "Molecular Recognition of Arginine in Small Peptides by Supramolecular Complexation with Dibenzo-30-Crown-10 Ether" *Int. J. Mass Spectrom.* **2002**, *220*, 87-96.
10. Julian, R. R.; Beauchamp, J. L. "The unusually high proton affinity of aza-18-crown-6 ether: Implications for the molecular recognition of lysine in peptides by lariat crown ethers" *J. Am. Soc. Mass Spectrom.* **2002**, *13:5*, 493-498.
9. Julian R. R.; Hodyss R.; Kinnear B.; Jarrold M. F.; Beauchamp J. L. "Nanocrystalline aggregation of serine detected by electrospray ionization mass spectrometry: Origin of the stable homochiral gas-phase serine octamer" *J. Phys. Chem. B* **2002**, *106*, 1219-1228.
8. Julian R. R.; Beauchamp J. L.; Goddard W. A. "Cooperative salt bridge stabilization of gas-phase zwitterions in neutral arginine clusters" *J. Phys. Chem. A* **2002**, *106*, 32-34.
7. Hodyss R.; Julian R. R.; Beauchamp J. L. "Spontaneous chiral separation in noncovalent molecular clusters" *Chirality* **2001**, *13*, 703-706.
6. Julian R. R.; Beauchamp J. L. "Site specific sequestering and stabilization of charge in peptides by supramolecular adduct formation with 18-crown-6 ether by way of electrospray ionization" *Int. J. Mass Spectrom.* **2001**, *210*, 613-623.
5. Julian R. R.; Hodyss R.; Beauchamp J. L. "Salt bridge stabilization of charged zwitterionic arginine aggregates in the gas phase" *J. Am. Chem. Soc.* **2001**, *123*, 3577-3583.
4. Leung A. W. K.; Julian R. R.; Breckenridge W. H. "Potential curves for several electronic states of the MgHe, Mg⁺He, and Mg⁺²He van der Waals complexes" *J. Chem. Phys.* **1999**, *111*, 4999-5003.
3. Leung A. W. K.; Julian R. R.; Breckenridge W. H. "Potential curves for the ground states and some excited states of MgNe, Mg⁺Ne, and Mg⁺²Ne van der Waals complexes" *J. Chem. Phys.* **1999**, *110*, 8443-8447.
2. Leung A. W. K.; Bellert, D.; Julian R. R.; Breckenridge W. H. "Resonant two-color photoionization threshold measurements of the Zn+(4s)center dot Ar bond strength: Model-potential analysis of M+(ns)center dot Ar interactions" *J. Chem. Phys.* **1999**, *110*, 6298-6305.
1. Leung A. W. K.; Julian R. R.; Breckenridge W. H. "The lowest energy (II2,1,0+,0-)-I-3 and (3)Sigma(+)(1,0-) excited states of the MgNe van der Waals molecule" *Chem. Phys. Lett.* **1999**, *301*, 325-330.