

UNIVERSITÀ DEGLI STUDI DI MILANO

Procedura di selezione per la chiamata a professore di II fascia da ricoprire ai sensi dell'art. 18, commi 1 e 4, della Legge n. 240/2010 per il settore concorsuale 05/E2 Biologia Molecolare ,  
(settore scientifico-disciplinare BIO/11 - Biologia Molecolare)

presso il Dipartimento di Bioscienze,

(avviso bando pubblicato sulla G.U. n. \_\_\_\_\_ del \_\_\_\_\_) - Codice concorso 4384

## Marcello Forconi

### CURRICULUM VITAE

**INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)**

COGNOME	FORCONI
NOME	MARCELLO
DATA DI NASCITA	27/10/1972

Associate Professor of Chemical Biology  
Associate Chair of the Department  
Department of Chemistry and Biochemistry  
College of Charleston

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**I. Education**

**University of Sheffield** 1999-2003  
Sheffield, UK  
Ph.D., Chemistry. Thesis title: "Models of metallophosphatases"

**Università di Bologna** 1991-1997  
Bologna, Italy.  
M.S. & B.S., Industrial Chemistry. Thesis title: "Nucleophilic aromatic substitution between 2,4,6-trinitrofluorobenzene and neutral nucleophiles"

**II. Research Experience**

**College of Charleston,** 2016-present  
**Department of Chemistry & Biochemistry**  
Charleston, SC  
*Associate Professor*

<b>College of Charleston,</b> <b>Department of Chemistry &amp; Biochemistry</b> Charleston, SC <i>Assistant Professor</i>	2010-2016
<b>Stanford University, Biochemistry Department</b> Stanford, CA <i>Research Scientist</i>	2009-2010
<b>Stanford University, Biochemistry Department</b> Stanford, CA <i>Postdoctoral Researcher</i> Advisor: Dr. Daniel Herschlag	2003-2009
<b>University of Sheffield, Chemistry Department</b> Sheffield, United Kingdom <i>Ph.D. Student</i> Advisor: Dr. Nicholas H. Williams	1999-2003
<b>Università di Bologna, Industrial Chemistry Department</b> Bologna, Italy <i>Post-Master Researcher</i> Advisor: Dr. Luciano Forlani	1997-1998
<b>Università di Bologna, Industrial Chemistry Department</b> Bologna, Italy <i>Undergraduate Researcher</i> Advisor: Dr. Luciano Forlani	1996-1997

### III. Teaching Experience

#### College of Charleston

- Biochemistry, Part I (CHEM 351)
- Biochemistry, Part II (CHEM 352)
- Biochemistry Laboratory (CHEM 354L)
- Chemical Biology (CHEM 583/CHEM 353)
- Principles of Chemistry, part I (CHEM 111)
- Principles of Chemistry, part II (CHEM 112)
- Principles of Chemistry Lab, part I (CHEM 111L)
- Principles of Chemistry Lab, part II (CHEM 112L)
- Chemistry and Biochemistry Seminars (CHEM 490)
- Research Experience (CHEM 193, 2 days lab)
- Research at the College of Charleston (CHEM 397/481/482) and Bachelor's Essay (CHEM 490)

## University of Sheffield

- Teaching Assistant, Organic Chemistry Lab

### IV. Research

#### Current Research Projects:

1. *In-vitro* and *in-silico* studies of SDS-degrading enzymes and related metallo- $\beta$ -lactamases (with Jenn Fox, College of Charleston)
2. Kemp eliminase activity of ketosteroid isomerase (with Dan Herschlag, Stanford University) and other proteins
3. Kemp eliminase activity of heme proteins (with Alex Korendovych, Syracuse University )
4. Synthesis of deuterated benzisoxazoles (with Carla Boga, Università di Bologna, and Rich Heldrich, College of Charleston)
5. Cysteine modification via aromatic nucleophilic substitution as a facile way to introduce NMR and IR probes in proteins (with Mike Giuliano, College of Charleston)

#### Research Students.

§ denotes students co-mentored with Dr. Jenn Fox, CofC. ¶ denotes students co-mentored with Dr. Mike Giuliano, CofC.

- a. **Current Students:** Elizabeth Smolenski (2019-present); James Linzel¶ (2019-present); Kimberly Sok (2020-present); Griffin Bast (2020-present); Emma Van Horne (2020-present); Dana Mae Salvador§ (2020-present).
- b. **Past Students:** Avery Zierk (2010-2012); Thomas Struble (2010-2012); Matthew Knowe (2010-2012); James Holt (2011); Calynn Johnson (2011); Nathan Adamson (2012); Michael Epperson (2012; from BYU Idaho); Brooklyn Fillinger (2012); William Zierenberg (2012); Hayden Barrett (2012); Keith Morgenstern (2013); Corinne Shea (2013); Chloe Teichman (2013; Academic Magnet High School); Joshua Schmidt (2011-2014); Clayton Ehasz (2013-2014); Vince Giannandrea (2014); Jasmin Graham (2014); Blaike Marshall (2014); Kate Diederich (2013-2014); Steven Lu (2014; Academic Magnet High School); Ember Martin (2014); Carson Reed (2014); Jessica Kapp (2013-2014); Brenna Norton-Baker (2014-2015); John Mansure (2015); Catherine Smith (2014-2015); Kate Howe (2015; home-schooled high school student); Noah Denman (2014-2015); Taylor Devaney (2015-2016); Maria Alejandra Alvarez Gonzalez (2016, R.B. Stall High School); Enis Sanchez (2014-2016); Dario Linklore (2016); Lauren Fanning (2015-2017); Grace Waddell§ (2014-2017); Courtney Gensemer (West Chester University intern, summer of 2017); Jonathan Derryberry¶ (2015-2018); Caroline Gilmer§ (2016-2018); John Randolph Reveral§ (2016-2018); Rifah Tasnia (Summer 2018; Academic Magnet High School); Avery Callaway (2019); Briana Taormina (2017-2020); Jaclyn Dunne¶ (2018-2020); Abigail Reeves§ (2018-2020)

## V. Service Activities

- Associate Chair of the Chemistry and Biochemistry Department, College of Charleston (2018-present)
- Grant Reviewer, INBRE (2019)
- Ad-hoc reviewer for ACS Chemical Biology, PLoS One, ACS Catalysis, Molecular Informatics
- Thesis ("Laurea Magistrale"), Dario Telese, Università di Bologna, Bologna, Italy, 2017-2018; co-mentor with Dr. Carla Boga.
- Faculty Presenter, Arts Matter Symposium, College of Charleston, 02/26/2016
- Faculty Participant, Lady Cougars STEM Education Day, College of Charleston, 02/19/2016
- Session Chair, Sixth Southeast Enzyme Conference, Atlanta, GA 4/11/2015
- Mentor, Bachelor's Thesis, Joshua Schmidt (College of Charleston, 2014), Brenna Norton-Baker (College of Charleston, 2015), and Lauren Fanning (College of Charleston, 2017).
- Grant reviewer, Cottrell College Science Award, Research Corporation, August 2014.
- Mentor, Honor's Thesis, Chloe Teichman (High School student at Academic Magnet, 2013) and Steven Lu (Academic Magnet, 2014).
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- Research and Development Committee, Member, College of Charleston 2019-present
- Library Committee, Member, College of Charleston, 2016-2018
- Faculty Advisor to the President Committee, Member, College of Charleston, August 2011-April 2014
- Candidate for At-Large Senator, February 2014.
- Ph.D. Advisory Committee, Member, Fabio Casu, Medical University of South Carolina, May 2011-February 2013.
- Departmental Space Committee, Department of Chemistry and Biochemistry, College of Charleston, 2015-2016.
- Departmental Adjuncts Committee, Department of Chemistry and Biochemistry, College of Charleston, 2014-2015.
- Departmental Safety Committee, Member, Department of Chemistry and Biochemistry, College of Charleston, September 2010-2014.
- Departmental Instrument Committee, Member, Department of Chemistry and Biochemistry, College of Charleston, September 2010-August 2012; May 2016-2018
- Departmental T&P Committee for Jennifer Fox, Chair, Department of Chemistry and Biochemistry, College of Charleston, May 2016- 2018.
- Departmental T&P Committee for Michael Giuliano, Member, Department of Chemistry and Biochemistry, College of Charleston, May 2016- present.
- Lowcountry Regional Science and Engineering Fair, Juror, 03/12, 03/14, 03/15
- CofC Campus Bamboozle, Participant, February 29, 2012
- Conversation with Faculty on Convocation Day (one-day), panel member, 2011-present.
- Honors FYE seminar (one-day), panel member, 2011-2014.
- Biochemistry textbook committee, Chair, September 2012-present.
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## VI. Publications (\* denotes undergraduate students; # denotes high school students)

### As Associate Professor

1. Caselle, E.A.; Yoon, J.H.; Bhattacharya, S.; Rempillo, J.J.L.; Lengyel, Z.; D'Souza, A.; Moroz, Y.S.; Tolbert, P.L.; Volkov, A.N.; Forconi, M.; Castaneda, C.A.; Makhlynets, O.V.; Korendovych, I.V. "Kemp Eliminases of the AlleyCat Family Possess High Substrate Promiscuity" *ChemCatChem* (2019) 11 1425.
2. Waddell, G.;\* Gilmer, C.;\* Taylor, N.;\* Reveral, J.;\* **Forconi, M.**; Fox, J. "The Eukaryotic Enzyme Bds1 Is an Alkyl but Not an Aryl Sulfohydrolase" *Biophys. Biochem. Res. Comm.*, (2017) 491, 382-387.
3. Lamba, V.; Sanchez, E.;\* Fanning, L.;\* Howe, K.;# Gonzalez, M. A.;# Herschlag, D.; **Forconi, M.** "Kemp Eliminate Activity of Ketosteroid Isomerase" *Biochemistry* (2017), 56, 582-591.

### As Assistant Professor

4. Sanchez, E.;\* Lu, S.;# Reed, C.;\* Schmidt, J.;\* **Forconi, M.** "Kemp Elimination in Cationic Micelles: Designed Enzyme-Like Rates Achieved through the Addition of Long-Chain Bases" *J. Phys. Org. Chem.* (2016), 29, 185-189.
5. **Forconi, M.** "Medium effects in biologically related catalysis" *Adv. Phys. Org. Chem.* (2015) 49, 57-101.
6. Schmidt, J.\*; Ehasz, C.\*; Epperson, M.\*; Klas, K.\*; Wyatt, J.; Hennig, M.; **Forconi, M.** "The effect of the hydrophobic environment on the retro-aldol reaction: comparison to a computationally-designed enzyme" *Org. Biomol. Chem.* (2013) 11, 8419-8425. PMID: 24189834.
7. **Forconi, M.**; Benz-Moy, T.L.; Rule-Gleitsman, K.; Ruben, E.A.; Metz, C.; Herschlag, D. "Exploring Purine N7 Interactions via Atomic Mutagenesis: The Group I Ribozyme as a Case Study" *RNA* (2012) 18, 1222-1229. PMID: 22543863.
8. **Forconi, M.**; Schwans, J.P.; Sengupta, R.N.; Piccirilli, J.A.; Herschlag, D. "2'-Fluoro substituents can mimic native 2'-hydroxyls within structured RNA" *Chem. Biol.* (2011) 18, 949-954. PMID: 21867910.

### From post-doctoral, graduate, and undergraduate experiences.

9. **Forconi, M.**; Porecha, R.H.; Piccirilli, J.A.; Herschlag, D. " Tightening of active site interactions en route to the transition state revealed by single-atom substitution in the guanosine-binding site of the *Tetrahymena* group I ribozyme" *J. Am. Chem. Soc.* (2011) 133, 7791.
10. **Forconi, M.**; Sengupta, R.N.; Piccirilli, J.A.; Herschlag, D. "A rearrangement of the guanosine-binding site establishes an extended network of interactions in the *Tetrahymena* group I active site" *Biochemistry* (2010) 49, 2753.

11. **Forconi, M.**; Sengupta, R.N.; Liu, M.-C.; Sartorelli, A.C.; Piccirilli, J.A.; Herschlag, D. "Structure and function converge to identify a hydrogen bond in the group I ribozyme active site" *Angew. Chem. Intl. Ed.* (2009) 48, 7171.  
 ❖ This paper was selected as 'Hot Paper' by the Editors for "its importance in an evolving field of high current interest", and was highlighted in *Nat. Chem. Biol.* (2009) 5, 712.
12. **Forconi, M.**; Herschlag, D. "Metal ion-based RNA cleavage as a structural probe" *Method Enzymol.* (2009) 268, 91.
13. **Forconi, M.**; Herschlag, D. "Use of phosphorothioates to identify sites of metal ion binding in RNA" *Method Enzymol.* (2009) 268, 311.
14. **Forconi, M.**; Hougland, J.L.; Lee, J.; Piccirilli, J.A.; Herschlag, D. "Functional identification of ligands for a catalytic metal ion in group I introns" *Biochemistry* (2008) 47, 6883.
15. **Forconi, M.**; Piccirilli, J.A.; Herschlag, D. "Modulation of group I intron catalysis by a peripheral metal ion", *RNA* (2007) 13, 1656.
16. Hougland, J.L.; Piccirilli, J.A.; **Forconi, M.**; Lee, J.; Herschlag, D. "How the group I intron works: a case study of RNA structure and function" in *The RNA World*, 3<sup>rd</sup> edition, Gestland, R.F., Cech, T.R., Atkins, J.F. editors (2006) Cold Spring Harbor Laboratory Press, New York.
17. **Forconi, M.**; Herschlag, D. "Promiscuous catalysis by the *Tetrahymena* group I ribozyme" *J. Am. Chem. Soc.* (2005) 127, 6160.  
 ❖ This communication was classified as "of special interest" by Khersonsky, Roodveldt, and Tawfik [*Curr. Opin. Chem. Biol.* (2006) 498], and was highlighted by Faculty of 1000 Biology (<http://f1000biology.com/article/id/1025636>).
18. Humphry, T.; **Forconi, M.**; Williams, N.H.; Hengge, A.C. "Altered mechanism of reaction of phosphate esters bridging a dinuclear metal center" *J. Am. Chem. Soc.* (2004) 126, 11864.
19. Humphry, T.; **Forconi, M.**; Hengge, A.C.; Williams, N.H. "An altered mechanism of hydrolysis for a metal-complexed phosphate diester" *J. Am. Chem. Soc.* (2002) 124, 14860.
20. **Forconi, M.**; Williams, N.H. "Mimicking metallophosphatases: revealing a role for an OH group with no libido" *Angew. Chem. Intl. Ed.* (2002) 41, 849.
21. Forlani, L.; Boga, C.; Mezzina, B.; **Forconi, M.\*** "Tautomerism and dimerization of acetamidothiazole derivatives - UV/Vis and NMR spectroscopic investigation" *Eur. J. Org. Chem.* (2001) 2779.
22. Forlani, L.; Boga, C.; **Forconi, M.\*** "Kinetics and mechanism of reactions between 2,4,6-trinitrofluorobenzene and alcohols" *J. Chem. Soc., Perkin Trans. 2* (1999) 1455.

#### Manuscripts in preparation

1. Dunne, J.\*; Linzel, J.\*; Norton-Baker, B.\*; Reed, C.\*; Derryberry, J.\*; Mansure, J.\*; Giuliano, M.; **Forconi, M.** "Facile Introduction of FT-IR and <sup>19</sup>F NMR Probes into Peptides and Proteins via S<sub>N</sub>Ar"

2. Taormina, B.; Smolenski, E.; Gensemer, C.;\* Telese, D.; Boga, C.; Forconi M. "Kemp elimination by heme-containing systems: An Unusual Large Inverse Isotope Effect"

## VII. Presentations (\* denotes undergraduate students; # denotes high school students)

### As Associate Professor

1. Linzel, J.;\* Dunne, J.;\* Giuliano, M.W.; **Forconi, M.** "Introduction of fluoroaromatic probes into peptides and proteins via nucleophilic aromatic substitution" SERMACS 2019, Savannah, GA 10/21/2019 (poster presentation)
2. Reeves, A.E.;\* Fox, J.L.; **Forconi, M.** "Predicting reactivity of homologous sulfohydrolases via bioinformatics" SERMACS 2019, Savannah, GA 10/21/2019 (poster presentation)
3. Taormina, B.;\* Smolenski, E.;\* Callaway, A.;\* **Forconi, M.** "Kinetic isotope effect in the Kemp elimination catalyzed by heme systems" SERMACS 2019, Savannah, GA 10/20/2019 (oral presentation)
4. Dunne, J.;\* Giuliano, M.W.; **Forconi, M.** "Modification of thiols via nucleophilic aromatic substitution" SERMACS 2019, Savannah, GA 10/20/2019 (oral presentation)
5. Dunne, J.; **Forconi, M.** "Modification of thiols via nucleophilic aromatic substitution" SERMACS 2018, Augusta, GA 11/02/2018 (poster presentation)
6. Taormina, B.;\* **Forconi, M.** "Kemp eliminase activity of heme systems" SERMACS 2018, Augusta, GA 11/01/2018 (poster presentation)
7. Reeves, A.;\* Waddell, G.;\* Gilmer, C.;\* Reveral, J.R.;\* **Forconi, M.**; Fox, J.L. "Reactivity of homologous sulfohydrolases" SERMACS 2018, Augusta, GA 11/01/2018 (poster presentation)
8. **Forconi, M.** "Redox pathway for the Kemp elimination" SERMACS 2018, Augusta, GA 10/31/2018 (oral presentation)
9. **Forconi, M.** "New Catalysts for an Old Reaction: Adding Flavor to the Kemp Elimination", Syracuse University, Syracuse, NY, Department of Chemistry, 4/3/2018 (invited talk).
10. **Forconi, M.** "New Catalysts for an Old Reaction: Adding Flavor to the Kemp Elimination", Gainesville, FL, Department of Chemistry, 12/1/2017 (invited talk).
11. **Forconi, M.** "Computational design of enzymes –Are we there yet?" Dipartimento di Scienze Chimiche della Vita e della Sostenibilità Ambientale, Università di

Parma, Parma, Italy, 05/29/2017 (oral presentation)

12. **Forconi, M.** "Computational design of enzymes –Are we there yet?" Facoltà di Chimica Industriale, Università di Bologna, Bologna, Italy, 04/07/2017 (oral presentation)
13. Gensemer, C.\* **Forconi, M.** "Kemp eliminase activity of heme-containing systems" SERMACS 2017, Charlotte, NC, 11/10/2017 (poster presentation).
14. Derryberry, J.\* **Forconi, M.** "Introduction of fluoroaromatics in proteins vis  $S_NAr$ " Charlotte, NC, 11/10/2017 (poster presentation).
15. Gilmer, C.\*; Reveral, J.\*; Waddell, G.\*; Taylor, N.\*; Fox, J.; **Forconi, M.** "Eukaryotic enzyme Bds1 is an alkyl but not an aryl sulfohydrolase" SERMACS 2017, Charlotte, NC, 11/10/2017 (poster presentation)
16. Gilmer, C.\*; Waddell, G.\*; Taylor, N.\*; Reveral, J.\*; **Forconi, M.**; Fox, J. "Substrate specificity and reaction kinetics of two homologous enzymes with sulfohydrolase activity" SERMACS 2017, Charlotte, NC, 11/10/2017 (oral presentation)
17. **Forconi, M.** "New catalysts for an old reaction: Adding flavor to the Kemp elimination" SERMACS 2017, Charlotte, NC, 11/08/2017 (oral presentation)

As Assistant Professor

18. Derryberry, J.\* Linklore, D.\*; **Forconi, M.** "Introduction of fluoroaromatics in proteins via  $S_NAr$ " SERMACS 2016, Columbia, SC, 10/24/2016 (poster presentation).
19. Waddel, G.\*; Gilmer, C.\*; Reveral, J.\*; **Forconi, M.**; Fox, J." Analysis of SdsA1 and Bds1 sulfohydrolase activity by liquid chromatography-mass spectrometry" SERMACS 2016, Columbia, SC, 10/24/2016 (poster presentation).
20. Gilmer, C.\*; Reveral, J.\*; Waddel, G.\*; Fox, J.; **Forconi, M.** "Analysis of SdsA1 and Bds1 sulfohydrolase activity by NMR and GC-MS" SERMACS 2016, Columbia, SC, 10/24/2016 (poster presentation).
21. Fanning, L.\*; Sanchez, E.\*; **Forconi, M.** "Chance or design: What makes a good kemp eliminase?" SERMACS 2016, Columbia, SC, 10/25/2016 (oral presentation).
22. Sanchez, E.\*; Fanning, L.\*; Howe, K.\*; **Forconi, M.** "Ketosteroid isomerase-catalyzed Kemp elimination" SERMACS-SWRM 2015, Memphis, TN, 11/04/2015-11/07/2015 (oral presentation)
23. Waddell, G.\*; Denman, N.\*; Smith, C.\*; Forconi, M.; Fox, J. "SdsA1 sulfohydrolase and homologous proteins" SERMACS-SWRM 2015, Memphis, TN, 11/04/2015-11/07/2015 (poster presentation)
24. Denman, N.\*; Smith, C.\*; Waddell, G.\*; Fox, J.; **Forconi, M.** "SdsA1: A bioinformatics and kinetic study" SERMACS-SWRM 2015, Memphis, TN,



11/04/2015-11/07/2015 (poster presentation)

25. Fanning, L.\*; Sanchez, E.\*; Howe, K.\*; **Forconi, M.** "Kemp eliminase activity of ketosteroid isomerase: Kinetic behavior of active site mutants" SERMACS-SWRM 2015, Memphis, TN, 11/04/2015-11/07/2015 (poster presentation)
26. Derryberry, J.\*; Mansure, J.\*; Norton-Baker, B.\*; **Forconi, M.** "Introduction of fluoroaromatics in proteins via  $S_NAr$ " SERMACS-SWRM 2015, Memphis, TN, 11/04/2015-11/07/2015 (poster presentation)
27. **Forconi, M.** "Kemp eliminase activity of ketosteroid isomerase" Gordon Research Conference on Enzymes, Coenzymes, and Metabolic Pathways, Waterville Valley, NH, 07/17/2015-07/21/2015 (oral presentation)
28. Denman, N.\*; Smith, C.\*; Waddell, G.\*; Fox, J.; **Forconi, M.** "Why would the Tibetan antelope eat detergents? A story of an enzyme and its (probably unknown) function" Gordon Research Conference on Enzymes, Coenzymes, and Metabolic Pathways, Waterville Valley, NH, 07/17/2015-07/21/2015 (poster presentation)
29. Sanchez, E.\* **Forconi, M.** "Solvent, micelles, and random proteins: Are they different from computationally-designed enzymes?" Sixth Southeast Enzyme Conference, Atlanta, GA 4/11/2015 (poster presentation)
30. Denman, N.\*; Smith, C.\*; Waddell, G.\*; Fox, J.; **Forconi, M.** "Why would the Tibetan antelope eat detergents? A story of an enzyme and its (probably unknown) function" Sixth Southeast Enzyme Conference, Atlanta, GA 4/11/2015 (poster presentation)
31. Sanchez, E.\* **Forconi, M.** "Kemp elimination in micelles, proteins, and non-polar solvents: Comparison to a computationally-designed enzyme" SC-INBRE Meeting, Columbia, SC, 02/29/2015 (poster presentation)
32. Denman, N.\*; Smith, C.\*; Waddell, G.\*; Fox, J.; **Forconi, M.** "Why would the Tibetan antelope eat detergents? A story of an enzyme and its probably unknown function" SC-INBRE Meeting, Columbia, SC, 02/29/2015 (poster presentation).
33. Norton-Baker, B.\*; Reed, C.\*; Kapp, J.\*; **Forconi, M.** "Introduction of FT-IR and  $^{19}F$  NMR probes in proteins via  $S_NAr$ " SERMACS 2014, Nashville, TN, October 2014 (oral presentation)
34. Sanchez, E.\*; Lu, S.\*; Reed, C.\*; **Forconi, M.** "Kemp elimination in cationic micelles" SERMACS 2014, Nashville, TN, October 2014 (poster presentation)
35. Waddell, G.\*; Martin, E.\*; **Forconi, M.**; Fox, J. "Proteins Homologous to the Bacterial Sulfatase SdsA1" SERMACS 2014, Nashville, TN, October 2014 (poster presentation)

36. Schmidt, J.\*; **Forconi, M.** "Evaluation of computationally-designed enzymes by comparison with model systems" SEC V, Atlanta, GA, April 5, 2014 (oral presentation)
37. **Forconi, M.** "Evaluation of computationally-designed enzymes by comparison with model systems" USCB, Beaufort, SC, March 21, 2014 (oral presentation)
38. **Forconi, M.** "Micellar catalysis as a benchmark for de novo enzymes" Florida State University, Tallahassee, FL, December 3, 2013 (oral presentation)
39. Diederich, K.\*; Teichman, C.\*; Schmidt, J.\*; **Forconi, M.** "Chemical modification of a computationally-designed enzyme" SERMACS 2013, Atlanta, GA, November 2013 (poster presentation)
40. Morgenstern, K.\*; Shea, C.\*; Adamson, N.\*; Zierk, A.\*; Holt, J.\*; **Forconi, M.** "SdsA1: A true alkylsulfatase?" SERMACS 2013, Atlanta, GA, November 2013 (poster presentation)
41. Schmidt, J.\*; Ehasz, C.\*; Epperson, M.\*; **Forconi, M.** "Effect of the hydrophobic environment on the retro-aldol reaction: Comparison to a computationally-designed enzyme" SERMACS 2013, Atlanta, GA, November 2013 (oral presentation)
42. Kapp, J.\*; **Forconi, M.\*** "Cysteine modification via nucleophilic aromatic substitution" SERMACS 2013, Atlanta, GA, November 2013 (poster presentation)
43. Schmidt, J.\*; Epperson, M.\*; Forconi, M." The retroaldol reaction in micelles: magnitude of hydrophobic interactions and comparison to a computationally-designed enzyme" Bioorganic Chemistry Gordon Research Conference, Andover, NH, June 2013 (poster presentation)
44. Forconi, M. "Computationally Designed Enzymes: Are We There Yet?" SC INBRE Spring Symposium 2013, Columbia, SC, April 20, 2013 (oral presentation).
45. Schmidt, J.\*; Forconi, M. "Testing Strengths and Limitations of Computationally-Designed Enzymes: What is the Origin of Catalysis?" SC INBRE Spring Symposium 2013, Columbia, SC, April 20, 2013 (poster presentation).
46. Forconi, M.; Adamson, N.\* "Functional Characterization of SdsA1, an Alkylsulfatase Secreted by *Pseudomonas aeruginosa*" SC INBRE Spring Symposium 2013, Columbia, SC, April 20, 2013 (poster presentation).
47. Forconi, M.; Struble, T.J.\* "Testing Structural and Computational Models of Enzymes Active Sites through Chemical Modifications: Metal Ion Interactions in the Hammerhead Ribozyme" Nucleic Acid Enzymes FASEB Meeting, Snowmass Village, CO, June 2012 (poster presentation).
48. Struble, T.J.\*; Forconi, M. "Testing Structural and Computational Models of Enzymes Active Sites through Chemical Modifications: Metal Ion Interactions in the

Hammerhead Ribozyme" Third Southeast Enzyme Conference, Atlanta, GA, April 2012 (poster presentation).

49. Knowe, M.\*; Forconi, M. "Analysis of a Discontinuous RNA Enzyme" Third Southeast Enzyme Conference, Atlanta, GA, April 2012 (poster presentation).
50. Zierk, A.\*; Holt, J.\*; Forconi, M. "Functional Characterization of SdsA1, an Alkylsulfatase from *Pseudomonas aeruginosa*" Third Southeast Enzyme Conference, Atlanta, GA, April 2012 (poster presentation).
51. Struble, T.J.\*; Forconi, M. "Testing Structural and Computational Models of Enzymes Active Sites through Chemical Modifications: Metal Ion Interactions in the Hammerhead Ribozyme" SC-INBRE Research Symposium 2012, Columbia, SC, February 2012 (poster presentation).
52. Knowe, M.\*; Forconi, M. "Analysis of a Discontinuous RNA Enzyme" SC-INBRE Research Symposium 2012, Columbia, SC, February 2012 (poster presentation).
53. Zierk, A.\*; Holt, J.\*; Forconi, M. "Functional Characterization of SdsA1, an Alkylsulfatase from *Pseudomonas aeruginosa*" SC-INBRE Research Symposium 2012, Columbia, SC, February 2012 (poster presentation).

*Presentations from post-doctoral, graduate, and undergraduate experiences.*

54. **Forconi, M.** "Unraveling Single Interactions and Complex Networks in the Group I Ribozyme by Atomic Mutagenesis" Invited presentation at the RNA Club, Department of Biochemistry and Molecular Biology, MUSC, Charleston, SC, November 2010 (oral presentation).
55. **Forconi, M.**; Sengupta, R.N.; Piccirilli, J.A.; Herschlag, D. "Structure and function converge to identify a hydrogen bond in the group I ribozyme active site" Nucleic Acid Gordon Conference, Biddeford, ME, June 2009 (poster presentation).
56. **Forconi, M.** "Metal ions in RNA catalysis: Active site and beyond" Università di Padova, Italy, January 2008 (oral presentation).
57. **Forconi, M.**; Lee, J.; Hougland, J.L.; Lee, J.K.; Kravchuk, A.V.; Piccirilli, J.A.; Herschlag, D. "Perturbation of metal ions binding sites reveal a high degree of communication in a catalytic RNA" RNA Society Annual Meeting, Madison, WI, May 2007 (oral presentation) .  
❖ *This contribution was selected for the Organizer's Highlight Section of the meeting.*
58. **Forconi, M.**; Lee, J.; Hougland, J.L.; Piccirilli, J.A.; Herschlag, D. "Functional identification of ligands for 'catalytic' metal ions in group I introns" RNA Society Annual Meeting, Seattle, WA, June 2006 (poster presentation).
59. **Forconi, M.** "Functional identification of ligands for 'catalytic' metal ions in group I introns" RNA Club, San Francisco, CA, March 2006 (oral presentation).

60. **Forconi, M.** "RNA catalysis: towards a detailed snapshot of the transition state" Department of Biology, University of Bologna, Italy, October 2005 (oral presentation).
61. **Forconi, M.;** Herschlag, D. "Exploring the promiscuous potential of the *Tetrahymena* ribozyme: reactivity of a methylphosphonate diester" 8<sup>th</sup> Enzyme Mechanism Conference, Pacific Grove, CA, USA, January 2005 (poster presentation).
62. **Forconi, M.;** Hengge, A.C.; Humphry, T.; Williams, N.H. "The mechanism of phosphate ester hydrolysis in a model of metallophosphatases as revealed by kinetic isotope effects", ISBOC VI, Toronto, ON, Canada, August 2002 (poster presentation).
63. **Forconi, M.;** Williams, N.H. "Effective cooperative interactions in mimicking metallophosphatases", ICPOC XVI, San Diego, CA, USA, August 2002 (poster presentation).
64. **Forconi, M.;** "Models for metallophosphatases", Department of Biochemistry, Cambridge University, UK, May 2002 (oral presentation).
65. **Forconi, M.;** Williams, N.H. "Mimicking metallophosphatases through efficient multiple interactions", WISOR XI, Bressanone, Italy, January 2002 (poster presentation).
66. Hengge, A.C.; Humphry, T.; **Forconi, M.;** Williams, N.H. "Mechanism of reaction of phosphate esters coordinated to a model of dinuclear metallophosphatases", 22<sup>nd</sup> ACS meeting, Chicago, IL, USA, August 2001 (poster presentation).
67. **Forconi, M.;** Williams, N.H. "Efficient phosphate ester hydrolysis using multiple metal ions", NACON V, Sheffield, UK, June 2001 (poster presentation).

## IX. Funding

### • External Grant Proposals, funded

1. April 2014 NSF-MRI CHE-1429308 (as Co-PI) "MRI: Acquisition of a 400 MHz Nuclear Magnetic Resonance Spectrometer with a Multinuclear Probe and a Sample Changer". Collaborative grant with Justin Wyatt (PI), Tim Barker (Co-PI), Brooke Van Horn (Co-PI), and Wendy Cory (Co-PI), \$ 328,900.
2. July 2014-June 2016 "Nucleophilic aromatic substitution: An old reaction for new functionalization strategies" Single Investigator Cottrell College Science Award, Research Corporation, \$ 45,000 (which includes \$ 10,000 matching funds from the College of Charleston).
3. August 2012 (as a co-PI) NSF-MRI CHE -1229559 "MRI: Acquisition of an Ultra High Pressure Liquid Chromatograph - Mass Spectrometer for Interdisciplinary Undergraduate Research and Teaching in Chemistry and Related Fields"

Collaborative Grant, NSF, with Wendy Cory (main PI), Jenn Fox (co-PI), Brooke Van Horn (Co-PI), and Vijay Vulava (Co-PI), \$ 277,191.

4. August 2011 (as a collaborator) "MRI: Acquisition of a Quadruple Resonance (QCI)-Cryoprobe for NMR Research and Training at MUSC", NSF, PI: Mirko Hennig (MUSC).

- **Internal Grant Proposals, funded**

1. Summer 2018. "Isotope effects in the Kemp elimination", SURF Grant, URCA, College of Charleston, with Briana Taormina (student), \$ 7000.
2. Summer 2018. "Reactivity of homologous sulfohydrolases" SURF Grant, URCA, College of Charleston, with Abigail Reeves (student) and Jenn Fox (co-PI), \$ 7500.
3. Summer 2018. "Modification of thiols via nucleophilic aromatic substitution", Research Grant, Dean's Fund, School and Sciences and Mathematics, College of Charleston, with Jaclyn Dunne (student) \$ 2,500.
4. Summer 2017. "Comparison of Bds1 and SdsA1 reactivities", Research Grant, HHMI/INBRE, College of Charleston, with Caroline Gilmer and John Reveral (students), \$ 5,000.
5. Summer 2017 "Synthesis and modification of short peptides" SURF grant, URCA, College of Charleston, with Jonathan Derryberry (student), \$ 5,000.
6. February 2017. "Synthesis of deuterated benzisoxazoles to determine the rate-limiting step in enzyme-catalyzed Kemp elimination" Research and Development Grant, College of Charleston, \$ 1,450.
7. Summer 2016 "Investigation of Bds1 reactivity" SURF grant, URCA, College of Charleston, with Caroline Gilmer (student), \$ 6,500.
8. Summer 2016. "Kemp eliminase activity of ketosteroid isomerase" Research Grant, HHMI, College of Charleston, with Enis Sanchez and Lauren Fanning (students), \$ 10,000.
9. Summer 2015 "Kemp eliminase activity of ketosteroid isomerase" Research Grant, HHMI, College of Charleston, with Maria Alejandra Alvarez Gonzalez (high school student), \$ 1,500
10. September 2015, RPG Travel Grant to SERMACS-SWRM (Memphis, TN Nov 4-7, 2015) as co-PI with Jennifer Fox (PI) and Grace Waddell (student), URCA, College of Charleston, \$ 500
11. September 2015, RPG Travel Grant to SERMACS-SWRM (Memphis, TN Nov 4-7, 2015) with Noah Denman (student), URCA, College of Charleston, \$ 500
12. September 2015, RPG Travel Grant to SERMACS-SWRM (Memphis, TN Nov 4-7, 2015) with Lauren Fanning (student), URCA, College of Charleston, \$ 250

13. September 2015, RPG Travel Grant to SERMACS-SWRM (Memphis, TN Nov 4-7, 2015) with Enis Sanchez (student), URCA, College of Charleston, \$ 250
14. September 2015, RPG Travel Grant to SERMACS-SWRM (Memphis, TN Nov 4-7, 2015) with Jonathan Derryberry (student), URCA, College of Charleston, \$ 100
15. Summer 2015 "Kemp eliminase activity of ketosteroid isomerase" Research Grant, HHMI, College of Charleston, with Enis Sanchez (student), \$ 4,000
16. Summer 2015 "Kemp eliminase activity of ketosteroid isomerase" Research Grant, HHMI, College of Charleston, with Kate Howe (high school student), \$ 1,500
17. Summer 2015 "Sulfatase activity of SdsA1" SURF Grant, URCA, College of Charleston, with Noah Denman (student), \$ 6,500.
18. October 2014 RPG Travel Grant with Enis Sanchez (student) to SERMACS 2014 (Nashville, TN, Oct 16-19, 2014), URCA, College of Charleston, \$ 250.
19. October 2014 RPG Grant to SERMACS 2014 (Nashville, TN, Oct 16-19, 2014), with Brenna Norton-Baker (student), URCA, College of Charleston, \$ 250.
20. October 2014 RPG Grant to SERMACS 2014 (Nashville, TN, Oct 16-19, 2014), as co-PI with Jenn Fox (PI) and Grace Waddell (student), URCA, College of Charleston, \$ 250.
21. Summer 2014 "Chemical modification of a computationally-designed enzyme ", Research Grant, HHMI, College of Charleston, with Kate Diederich (student), \$ 4,000
22. Summer 2014 "Effects of hydrophobic interactions with the substrate in Kemp Elimination promoted by micelles", Research Grant, HHMI, College of Charleston, with Steven Lu (high school student), \$ 1,500.
23. September 2013, RPG travel grant to SERMACS 2013 (Atlanta, GA, Nov 12-17 2013), with Keith Morgenstern (student), URCA, College of Charleston, \$200.
24. September 2013, RPG travel grant to SERMACS 2013 (Atlanta, GA, Nov 12-17 2013), with Kate Diederich (student), URCA, College of Charleston, \$200.
25. September 2013, RPG travel grant to SERMACS 2013 (Atlanta, GA, Nov 12-17 2013), with Jessica Kapp (student), URCA, College of Charleston, \$200.
26. September 2013, RPG travel grant to SERMACS 2013 (Atlanta, GA, Nov 12-17 2013), with Joshua Schmidt (student), URCA, College of Charleston, \$200.
27. Fall 2013 "Expression, purification, and functional characterization of Melf" MAYS Grant, URCA, College of Charleston, with Clayton Ehasz (student), \$ 4,000.
28. Summer 2013 "Chemical rescue of a mutant version of a computationally-designed enzyme" SURF Grant, URCA, College of Charleston, with Joshua Schmidt (student), \$ 6,500.

29. Summer 2013 "Role of the hydrophobic tail in SdsA1 catalysis ", Research Grant, HHMI, College of Charleston, with Keith Morgenstern (student), \$ 4,000.
30. Summer 2013 "Chemical modification of a computationally-designed enzyme", Research Grant, HHMI, College of Charleston, with Kate Diederich (student), \$ 4,000.
31. Summer 2013 "Chemical rescue of mutant version of a computationally-designed enzyme", Research Grant, HHMI, College of Charleston, with Chloe Teichman (high school student), \$ 1,500.
32. Summer 2012 "Micellar Catalysis in the Retroaldol Reaction: Implications for Computational Design of Enzymes" Research Grant, HHMI, College of Charleston, with Michael Epperson (student), \$ 4,000.
33. Summer 2012 "Reactivity of SdsA1, an Alkylsulfatase from *Pseudomonas aeruginosa* ", Research Grant, HHMI, College of Charleston, with William Zierenberg (student), \$ 4,000.
34. Summer 2012 "Structural analysis of a discontinuous group I intron" SURF Grant, URCA, College of Charleston, with Brooklyn Fillinger (student), \$ 6,500.
35. Spring 2012 "Analysis of a Discontinuous RNA Enzyme", MAYS grant, URCA, College of Charleston, with Matthew Knowe (student), \$ 2,500.
36. Fall 2011 "Functional Characterization of SdsA1, an Alkylsulfatase from *Pseudomonas aeruginosa*", Research and Development Grant, College of Charleston, \$ 4,000.
37. Summer 2011 "Expression and Purification of the Alkylsulfatase SdsA1" Research Grant, HHMI, College of Charleston, with James Holt (student), \$ 4,000.
38. Summer 2011 "Testing Enzymatic Reaction Mechanisms Derived from Computation with Chemical Tools: The Hammerhead Ribozyme Case" SURF grant, URCA, College of Charleston, with Thomas Struble (student), \$ 6,500.
39. Spring 2011 "Purification and preliminary kinetic characterization of SdsA1, an alkylsulfatase from *Pseudomonas aeruginosa*" MAYS grant, URCA, College of Charleston, with Avery Zierk (student), \$ 800.

- **Internal grant proposals, pending**

None

- **External Grant Proposals, not funded**

May 2013 "Micellar catalysis of retro-aldol reactions." ACS-PRF, \$ 50,000.

February 2013 NSF- MRI (as Co-PI) "Acquisition of a quadrupole resonance CryoProbe and an automatic sample changer to strengthen bio-NMR and metabolomics research at Claflin University," with Rajagopalan Bhaskaran (PI).  
 February 2013 NSF-MRI (as Co-PI) "Acquisition of a 400 MHz NMR at the College of Charleston", with Justin Wyatt (PI).

February 2013 "Mechanistic studies of SdsA1, an SDS-degrading enzyme from the metallo-beta lactamase superfamily." NIH-AREA, \$ 250,000. Impact score: 43.

January 2013 "Collaborative Research: Functional and Structural Analysis of a Discontinuous Intron ", National Science Foundation, Collaborative grant with Scott O. Rogers (Bowling Green State University), \$237,972.

September 2012, "Role of the La protein translational initiation and protein isoform expression", HHMI, with Tilman Heise (MUSC, Charleston), \$ 24,700.

"Collaborative Research: Functional and Structural Analysis of a Minimal Ribozyme" submitted on 1/18/2012 to the National Science Foundation, Collaborative grant with Scott O. Rogers (Bowling Green State University), \$ 221,984.

November 2011 "A Functional Approach to Validate and Refine Models Derived from Structural and Computational Work on the Hammerhead Ribozyme", Research Corporation, \$ 45,000.

"Collaborative Research: Functional and Structural Analysis of a Minimal Ribozyme" submitted on 5/31/2011 to the National Science Foundation, Collaborative grant with Scott O. Rogers (Bowling Green State University), \$ 220,567.

November 2010 "A Functional Approach to Validate and Refine Models Derived from Structural and Computational Work on the Hammerhead Ribozyme", Research Corporation, \$ 45,000.

- **Internal Grant Proposals, not funded**

February 2015 "Kemp Eliminase Activity of Ketosteroid Isomerase" SURF Grant, URCA, College of Charleston, with Enis Sanchez (student), \$ 6,500.

February 2014 "Comparative enzymology of three evolutionarily-related proteins", SURF Grant, URCA, College of Charleston, with Ember Martin (student), \$ 6,500.

October 2011 "Analysis of a Discontinuous RNA Enzyme", MAYS grant, URCA, College of Charleston, with Matthew Knowe (student), \$ 5,000.

April 2011 "Micellar Catalysis in Retro-Aldol Reactions", SURF Grant, URCA, College of Charleston, with Corey Ballenger (student), \$ 6,500.

February 2011 "Analysis of a Discontinuous RNA Enzyme", MAYS grant, URCA, College of Charleston, with Matthew Knowe (student), \$ 5,000.

- **Other Support**

August 2010- July 2015. SC-INBRE Research Grant to the College of Charleston. Supplies money: \$ 30,000. Funding for students' stipends: \$ 35,000.



**X. Professional Societies and Affiliations**

American                      Chemical                      Society                      (Division                      –                      BIOL)

Data	<div>14/07/2020</div>	Luogo	<div>Charleston, South Carolina</div>
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