

## John Cavanagh

### **Education:**

University of Surrey, UK	Chemistry	B.Sc., 1985 (1st Class Hons.)
University of Cambridge, UK	Chemistry	Ph.D., 1988 (under Dr. James Keeler)

### **Appointments:**

2023 –	Associate Dean for Research and Chair of Foundational Sciences Brody School of Medicine, ECU	
2022 – 2023	Interim Associate Dean for Research Brody School of Medicine, ECU	
2019 -	Professor and Chair Department of Biochemistry & Molecular Biology, Brody School of Medicine, ECU	
2016 – 2018	Senior Vice President Discovery Sciences, RTI International	
2014 - 2017	President David H. Murdock Research Institute, North Carolina Research Campus	
2013 - 2016	Assistant Vice Chancellor for Research NC State University	
2008 - 2016	William Neal Reynolds Distinguished Professor Department of Molecular & Structural Biochemistry, NC State University	
2008 - 2021	Co-Founder & Chief Scientific Officer Agile Sciences Inc.	
2004 - 2007	Director of Research Development Office of the Vice Chancellor, NC State University	
2000 - 2016	Professor Department of Molecular & Structural Biochemistry, NC State University	
1999 –2000	Professor Department of Chemistry, Purdue University	
1994-1999	Director Structural Biology Facility Wadsworth Center, New York State DOH	Associate Professor Dept. of Biomedical Sciences School of Public Health, SUNY Albany
1991-1994	Senior Research Associate Department of Molecular Biology, The Scripps Research Institute	
1990-1991	Foulerton Gift and Binmore Kenner Research Fellow, Royal Society Department of Chemistry, University of Cambridge, UK.	
1990-1991	Fellow of Physical Chemistry Churchill College, University of Cambridge, UK.	
1988-1990	Post-doctoral Fellowship Department of Molecular Biology, The Scripps Research Institute	

### **Other:**

2009 - 2016	Director, Jimmy V-NCSU Cancer Therapeutic Training Program
2008 – 2016	Director, NCSU BioNMR Facility, NCSU
2002 - 2016	Director, Advanced Biomolecular Interaction Resource, NCSU

### **Awards:**

2017	Highly Cited Author Award, RTI International
2017	Career Author Award, RTI International
2012	Entrepreneur of the Year, North Carolina State University
2008	William Neal Reynolds Distinguished Professor
2005	NC State Alumni Association Outstanding Research Award
1991	British Council/Swedish Academy of Sciences Award
1990	Foulerton Gift and Binmore Kenner Fellowship - Royal Society
1990	Research Fellowship, Churchill College, University of Cambridge.
1989	Fulbright award
1987	Jr. Research Fellow, Selwyn College, University of Cambridge.
1985	Senior Research Scholarship, Selwyn College, University of Cambridge.

### **Synergistic Activities:**

2024 – present	Board of Directors, North Carolina Association for Biomedical Research
2023 – present	Board of Directors, North Carolina Agromedicine Institute
2015 – 2019	Board of Directors, North Carolina Association for Biomedical Research

### ***Federal Study Sections:***

2021	ZAT1 PS(05) study section, NIH
2013-2019	MSFB, NIH Study Section
2013	DTRA, DoD study Section
2011	MSFB, NIH Study Section
2011	DTRA, DoD reviewer
2010	MSFB, NIH Study Section
2009	MRI, NIH Study Section
2008	MSFB, NIH Study Section
2006	MSFB, NIH Study Section
2005	MSFC, NIH Study Section
2002	BBCA, NIH Study Section
2000	NSF Chemical Instrumentation Study Section

### ***At NCSU – Served on the following:***

Chancellor's Strategic Planning Committee, University Science and Technology Advisory Group, Centennial Campus Planning Committee, University Nanotechnology Steering Committee, Office of Technology Transfer Advisory Group, Executive Board – Genome Research Laboratory.

### ***At ECU – Serving on the following:***

ECU Patent Committee (holder of 6 patents), Research/Creative Activities Committee (Chancellor's representative).

### **Funding Overview:**

NIH, NSF, NCBC, DoD, V Foundation for Cancer Research, Kenan Foundation for Engineering, Technology and Science, Swim Across America Cancer Foundation, UNC-General Administration, Army Research Office, North Carolina Biotechnology Center, Brody Brothers Foundation, Wooten Brain Health Institute.

**Total >\$18,000,000**

### **PhD Students**

Jude Kinkade, Alex Hondros, Felicia Jaimes, Jacob Hyatt, Samantha Palethorpe (Pesci/Cavanagh) PhD 2021, Logan Draughn PhD 2016, Ashley Tucker PhD 2013, Sean Stowe PhD 2013, Carey Hobbs PhD, 2009, Dan Sullivan PhD 2008, Dave Kordys PhD, 2007, Pat McLaughlin PhD, 2006, Douglas Kojetin PhD, 2005, Ben Bobay PhD, 2004.

### **MS Students**

Jude Kinkade MS 2023, Kathryn Earley MS 2010, Nicole Perry MS 2009, Constance Rogers MS 2004, Erin Regel MS, 2006, James Ruby MS 2004.

## **Selected Publications:**

The Biofilm Regulatory Network from *Bacillus subtilis*: A Structure-Function Analysis. Milton ME, **Cavanagh J**. *J Mol Biol*. 2023 Feb 1;435(3):167923.

2-Aminoimidazole Analogs Target PhoP Altering DNA Binding Activity and Affect Outer Membrane Stability in Gram-Negative Bacteria. Zeczycki TN, Milton ME, Jung D, Thompson RJ, Jaimes FE, Hondros AD, Palethorpe S, Melander C, **Cavanagh J**. *Biochemistry*. 2022 Dec 20;61(24):2948-2960.

*A. baumannii* Regulates Its Stress Responses via the BfmRS Two-Component Regulatory System. Palethorpe S, Farrow JM 3rd, Wells G, Milton ME, Actis LA, **Cavanagh J**, Pesci EC. *J Bacteriol*. 2022 Feb 15;204(2)

Structure of the *A. baumannii* PmrA receiver domain and insights into clinical mutants affecting DNA binding and promoting colistin resistance. Palethorpe S, Milton ME, Pesci EC, **Cavanagh J**. *J Biochem*. 2022 Jan 7;170(6):787-800. **(COVER ARTICLE)**

*Francisella novicida* Two-Component System Response Regulator BfpR Modulates igIC Gene Expression, Antimicrobial Peptide Resistance, and Biofilm Production. Dean SN, Milton ME, **Cavanagh J**, van Hoek ML. *Front Cell Infect Microbiol*. 2020 Mar 13;10:82.

The Solution Structures and Interaction of SinR and SinI: Elucidating the Mechanism of Action of the Master Regulator Switch for Biofilm Formation in *B. subtilis*. Milton ME, Draughn GL, Bobay BG, Stowe SD, Olson AL, Feldmann EA, Thompson RJ, Myers KH, Santoro MT, Kearns DB, **Cavanagh J**. *J Mol Biol*. 2020 Jan 17;432(2):343-357. **(COVER ARTICLE)**

The Structure of the Biofilm-controlling Response Regulator BfmR from *Acinetobacter baumannii* Reveals Details of Its DNA-binding Mechanism. Draughn GL, Milton ME, Feldmann EA, Bobay BG, Roth BM, Olson AL, Thompson RJ, Actis LA, Davies C, **Cavanagh J**. *J Mol Biol*. 2018 Mar 16;430(6):806-821.

Re-sensitizing Multidrug Resistant Bacteria to Antibiotics by Targeting Bacterial Response Regulators: Characterization and Comparison of Interactions between 2-Aminoimidazoles and the Response Regulators BfmR from *Acinetobacter baumannii* and QseB from *Francisella* spp. Milton ME, Minrovic BM, Harris DL, Kang B, Jung D, Lewis CP, Thompson RJ, Melander RJ, Zeng D, Melander C, **Cavanagh J**. *Front Mol Biosci*. 2018 Feb 13;5:15.

Structure of the *Francisella* response regulator QseB receiver domain, and characterization of QseB inhibition by antibiofilm 2-aminoimidazole-based compounds. Milton ME, Allen CL, Feldmann EA, Bobay BG, Jung DK, Stephens MD, Melander RJ, Theisen KE, Zeng D, Thompson RJ, Melander C, **Cavanagh J**. *Mol Microbiol*. 2017 Oct;106(2):223-235

Evaluation of a 2-aminoimidazole variant as adjuvant treatment for dermal bacterial infections Draughn GL, Allen CL, Routh PA, Stone MR, Kirker KR, Boegli L, Schuchman RM, Linder KE, Baynes RE, James G, Melander C, Pollard A, **Cavanagh J**. *Drug Des Devel Ther*. 2017 Jan 16;11:153-162.

Small-molecule suppression of  $\beta$ -lactam resistance in multidrug-resistant gram-negative pathogens Brackett CM, Melander RJ, An IH, Krishnamurthy A, Thompson RJ, **Cavanagh J**, Melander C. *J Med Chem*. 2014 Sep 11;57(17):7450-8.

Structure and DNA-Binding Traits of the Transition State Regulator AbrB. Olson AL, Tucker AT, Bobay BG, Soderblom EJ, Moseley MA, Thompson RJ, **Cavanagh J**. *Structure*. 2014 Nov 4;22(11):1650-6.

Membrane- Permeabilizing Activity of Reverse- Amide 2- Aminoimidazole Antibiofilm Agents Against *Acinetobacter Baumannii*. Stowe SD, Thompson RJ, Peng L, Su Z, Blackledge M, Draughn GL, Coe WH, Johannes E, Lapham VK, Mackenzie J, Melander C, **Cavanagh J**. *Curr Drug Deliv*. 2015;12(2):223-30.

A DNA Mimic: The Structure and Mechanism of Action for the Anti-Repressor Protein AbbA. Tucker AT, Bobay BG, Banse AV, Olson AL, Soderblom EJ, Moseley MA, Thompson RJ, Varney KM, Losick R, **Cavanagh J**. *J. Mol Biol*. 2014 May 1;426(9):1911-24. **(COVER ARTICLE)**

