

## **Catherine Michele Davis McGibony**

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### **Education:**

- 1997                    **Doctor of Philosophy in Chemistry**  
University of Alabama, Tuscaloosa, AL
- 1993                    **Bachelor of Science in Chemistry**  
Georgia Southern University, Statesboro, GA

### **Employment:**

- 2000-present        **Assistant Professor of Biochemistry**  
Georgia Southern University, Statesboro, GA
- 1999-2000          **Instructor of Organic Chemistry**  
University of Georgia, Athens, GA
- 1997-1999          **Instructor of Chemistry**  
Washington and Lee University, Lexington, VA
- 1993-1997          **Research Assistant**  
University of Alabama, Tuscaloosa, AL  
Thesis Advisor: Associate Professor John B. Vincent  
Thesis Title: Low-Molecular-Weight Chromium-Binding Substance: The Link  
Between Chromium and Diabetes
- 1993-1994          **Teaching Assistant**  
University of Alabama, Tuscaloosa, AL  
General Chemistry and General Organic and Biochemistry Laboratory.
- 1991-1993          **Teaching Assistant**  
Georgia Southern University, Statesboro, GA  
Instrumental Analysis Laboratory.
- 1990-1993          **Research Assistant**  
Georgia Southern University, Statesboro, GA  
Advisor: Associate Professor Norman Schmidt

### **Academic Honors:**

- 1998                Outstanding Dissertation Award
- 1998                Outstanding Graduate Student Award
- 1997                Award for Excellence in Research by a Doctoral Student
- 1996                Alan Hisey Memorial Endowed Biochemistry Scholarship
- 1993                American Institute of Chemistry Foundation Award for Outstanding Chemistry Senior

### **Professional Organizations:**

1997- present	Sigma Xi Scientific Honor Society
2003 – present	Vice-President
2004-present	President
1993-present	American Chemical Society
2002-present	Co-Chair of the Women’s Chemists Committee Coastal Georgia Section
1994-1993	American Institute of Chemists
1997-1993	Chemistry Graduate Student Organization
1997-1996	President
1993-1990	Student Affiliates of the American Chemical Society
1993-1992	President
1992-1991	Vice-President

### Patents:

1. U.S. Patent No. 6881752, John B. Vincent and C. Michele Davis. Awarded **April 2005**.  
"Use of triaqua-mu<sub>3</sub>-oxohexakis-mu-propionatotrichromium(1+), [Cr<sub>3</sub>O(O<sub>2</sub>CCH<sub>2</sub>CH<sub>3</sub>)<sub>6</sub>(H<sub>2</sub>O)<sub>3</sub>]<sup>+</sup>, as a nutritional supplement or in treatment of medical conditions." *Split Claims*.
1. U.S. Patent No. 6444231, John B. Vincent and C. Michele Davis. Awarded **September 2002**.  
"Use of triaqua-mu<sub>3</sub>-oxohexakis-mu-propionatotrichromium(1+), [Cr<sub>3</sub>O(O<sub>2</sub>CCH<sub>2</sub>CH<sub>3</sub>)<sub>6</sub>(H<sub>2</sub>O)<sub>3</sub>]<sup>+</sup>, as a nutritional supplement or in treatment of medical conditions." *Split Claims*.
2. U.S. Patent No. 6197816, John B. Vincent and C. Michele Davis. Awarded **March 2001**.  
"Use of triaqua-mu<sub>3</sub>-oxohexakis-mu-propionatotrichromium(1+), [Cr<sub>3</sub>O(O<sub>2</sub>CCH<sub>2</sub>CH<sub>3</sub>)<sub>6</sub>(H<sub>2</sub>O)<sub>3</sub>]<sup>+</sup>, as a nutritional supplement or in treatment of medical conditions."
3. U.S. Patent No. 5872102, John B. Vincent and C. Michele Davis. Awarded **February 1999**.  
"Method for Isolation of Bovine Low-Molecular-Weight Cr-Binding Substance and Method of Use of the Same".

### Professional Development:

May 2003      Biotechnology and Bioinformatics for the Undergraduate Classroom, A Chautauqua National Science Foundation (NSF) Short Course, Georgetown University, Washington, DC

July 1995      Bioinorganic Chemistry, NSF Workshop, University of Georgia, Athens, GA

### Grants Awarded:

1. "A DNA Sequencer in the Undergraduate Laboratory". LI-COR Biosciences Genomics Educations Matching Fund Award, \$34,449.50, 2005.
2. "The Development of an Upper Level Project-Based Biochemistry Laboratory: Recombinant DNA Technology and Cloning", Georgia Southern University Faculty Development and Welfare Committee, \$3,000, 2005.

3. "229<sup>th</sup> National ACS Meeting a Professional Travel Grant", Georgia Southern University Faculty Development and Welfare Committee, \$580, 2005.
4. "Introducing the World of Genomics and Proteomics into the Undergraduate Curriculum at Georgia Southern University", Georgia Southern University Faculty Development and Welfare Committee, \$3,000, 2003.
5. "Investigations of Novel Iron Chelation Therapy Drugs: Natural vs. Synthetic", Georgia Southern University Faculty Research Stipend, \$3,000, 2003.
6. "The 225<sup>th</sup> National American Chemical Society Meeting: Research Presentation and Service Participations" Academic Excellence Committee, \$100, 2003.
7. "The Beauty of Chemistry: A Chemistry Day Camp for Middle School Girls", Georgia Southern University Faculty Service Committee, \$260, 2003.
8. "Spectroscopic Investigations of Adenochrome", Georgia Southern University Faculty Research Stipend, \$2,500, 2002.
9. 2002 ASBMB Conference a Professional Travel Grant, Georgia Southern University Faculty Development and Welfare Committee, \$689, 2002.
10. "Isolation of the Marine Metabolite Adenochrome", Georgia Southern University Faculty Research Stipend, \$1,000, 2001.
11. "Sequestration of an Iron (III)-Binding Peptide from Octopus", Georgia Southern University Faculty Research Grant, \$1,750, 2001.
12. "Development of an Upper Level Interdisciplinary Biochemistry Laboratory: Exploring the Symptoms and Treatment of Gout", Georgia Southern University Faculty Development and Welfare Committee, \$1,500, 2001.
13. "Chromium and Diabetes", Travel Grant Award from the Keystone Symposia on Molecular and Cellular Biology: Insulin Action and Secretion in NIDDM, \$350, 1997.

### **Publications:**

1. Davis-McGibony, C. M., Hand, J. K., Sears, R. B. Phosphonylation of an Alkyl Bromide. *Synthetic Pages*, **2005**, 226.
2. Davis-McGibony, C.M., Sears, R.B., Hill, A. Location and Distribution of Adenochrome in the Common Brown Octopus. *Journal of Undergraduate Chemistry Research*, **2005**, 4, 2, 63-66.
3. Davis-McGibony, C. M.; Whitlock, C. R. Encouraging Diversity among Undergraduate Science Majors: The Effect of the Georgia HOPE Scholarship on the Chemistry Department at Georgia Southern University. *New England Association of Chemistry Teachers Journal*, **2004**, 23, 22-26.
4. Davis, C.M. The Successful Use of Case Studies in Nutritional Biochemistry. *Georgia Journal of Science*, **2004**, 62, 2, 79-86.
5. Davis, C. M., Stewart, A.L.; Askea M.E.; Hill, A.J. Isolation of Adenochrome from the Branchial Hearts of the Common Brown Octopus. *Journal of Undergraduate Chemistry Research*, **2004**, 3, 1, 1-5.

6. Uffelman, E.S., Cox, E.H.; Goehring, J.B.; Loring, T.S.; Davis, C. M. An NMR-Smell Module for the First Semester General Chemistry Laboratory. *Journal of Chemical Education*, **2003**, *80*, 1368-1372.
7. Davis, C. M. An Analogy for Electrophiles and Nucleophiles. *New England Association of Chemistry Teachers Journal*, **2003**, *22*, 8-9.
8. Davis, C. M.; Stewart, A. L. Pursuit of Excellence: Rebuilding the Georgia Southern University SAACS Chapter. *In Chemistry*, **2003**, Nov/Dec, 6-7.
9. Davis, C. M.; Vincent, J.B. The Role of Chromium in Glucose Metabolism. *Journal of Biological Inorganic Chemistry*, **1998**, *2*, 675-679.
10. Davis, C. M.; Royer, A.C, Vincent, J.B. Synthetic Multinuclear Chromium Assembly Activates Insulin Receptor Kinase Activity: Functional Model for Low-Molecular Weight Chromium-Binding Substance. *Inorganic Chemistry*, **1997**, *36*, 5316-5320.
11. Davis, C. M.; Vincent, J.B. Low-Molecular Weight Chromium-Binding Substance Activates Insulin Receptor Kinase Activity in Response to Insulin and May Represent the Association between Chromium and Diabetes. *Biochemistry*, **1997**, *36*, 4382-4385.
12. Davis, C. M.; Vincent, J.B. The Biologically Active Form of Chromium Contains a Multinuclear Chromium(III) Assembly. *Archives of Biochemistry and Biophysics*, **1997**, *339*, 335-343.
13. Davis, C. M.; Sumrall, K.H., Vincent, J.B. The Biologically Active Form of Chromium May Activate a Membrane Phosphotyrosine Phosphatase (PTP) in Response to Insulin. *Biochemistry*, **1996**, *35*, 12963-12969.

### **Manuscripts Submitted or in Preparation:**

1. Davis-McGibony, C.M., Bennett, R.R., Bossart, A., Deal, S.T. Carbohydrate Analysis of Bananas: A Procedure Modification Utilizing Commercial Test Strips. *Journal of Chemical Education*, **2005**, (submitted 2-21-05, resubmitted with requested revisions 7-10-05).
2. Davis-McGibony, C. M., Stewart, A.L. *p*-Nitrobenzylphosphonic Acid Inhibits the Action of Alkaline Phosphatase. *Bioorganic and Medicinal Chemistry*, **2005** (in preparation).

### **Invited Presentations:**

1. Invited Seminar on "The Investigations of Adenochrome: A Potential Iron Chelation Therapy Drug" University of Montevallo, Montevallo AL on 9-12-03.
2. Invited Oral Presentation on "The Investigations of Adenochrome: A Potential Iron Chelation Therapy Drug" SECURE [Southeastern Conference of Undergraduate Research] at Emory University, Atlanta, GA on 11-15-03 by *Research Student Bryan Sears*.
3. Invited Panel Speaker on "Women in the Chemical Workforce", C. Michele Davis, 221<sup>st</sup> American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001.

### **Presentations with Published Abstracts:**

1. Chelation Studies of the Marine Metabolite Adenochrome R. Bryan Sears, J. Kevin Hand, and C. Michele Davis-McGibony, 229<sup>th</sup> ACS National Meeting, San Diego, CA, March 14, 2005, Abstract #CHED772.
2. SAACS Chapter at Georgia Southern University: A mixture of the right ingredients gives a great product. R. Bryan Sears, Ceba L. Humphrey, J. Kevin Hand, Emily T. Edenfield, and C. Michele Davis-McGibony, 229<sup>th</sup> ACS National Meeting, San Diego, CA, March 14, 2005, Abstract #CHEM1275.
3. Nucleophilic Addition Synthesis of 1,4-Nitrobenzylphosphonic Acid as a Competitive Inhibitor for Alkaline Phosphatase. J. Kevin Hand and C. Michele Davis, 36<sup>th</sup> Annual Southeast Undergraduate Research Conference, Statesboro, GA, April 2, 2004, Abstract #24.
4. Investigations of Adenochrome: A Potential Iron Chelation Therapy Drug: R. Bryan Sears and C. Michele Davis, 36<sup>th</sup> Annual Southeast Undergraduate Research Conference, Statesboro, GA, April 2, 2004, Abstract #18.
5. Chelation Studies of Adenochrome, a Novel Iron Binding Protein Amanda L. Stewart, R. Bryan Sears, and C. Michele Davis, 227<sup>th</sup> ACS National Meeting, Anaheim, CA, March 27-30, 2004, Abstract #150.
6. SAACS Chapter at Georgia Southern University: A Pursuit of Excellence Amanda L. Stewart, R. Bryan Sears, and C. Michele Davis, 227<sup>th</sup> ACS National Meeting, Anaheim, CA, March 27-30, 2004, Abstract #1032.
7. The Successful Use of Case Studies in Nutritional Biochemistry C. Michele Davis, Experimental Biology 2003, San Diego, CA April 11-15, 2003, Abstract #278.16.
8. Adenochrome: A Novel Iron-Binding Motif from the Heart of an Octopus. Amanda L. Stewart and C. Michele Davis, Experimental Biology 2003, San Diego, CA April 11-15, 2003, Abstract #364.23.
9. The Biochemical Basis of Gout. Amber Everette, L. Nikki Fox, and C. Michele Davis, Abstracts of Papers, 35<sup>th</sup> A.C.S. Southeast Regional Undergraduate Research Conference, Keenesaw State University, Kennesaw, GA, April 3-5, 2003, Abstract #14.
10. Georgia HOPE Scholarship Program: Impact on Educational Opportunities for African-American Chemistry Majors at Georgia Southern University. C. Michele Davis and Christine R. Whitlock, 225<sup>th</sup> ACS National Meeting, New Orleans, LA, March 23-27, 2003 Abstract # 78.
11. Bradford Assay Under Fire: A Study of Common Protein Assays for the Undergraduate Biochemistry Laboratory. Laura D. Frost, C. Michele Davis, Amanda L Stewart, Sharfi Peart, and Zandis N. Spencer, 225<sup>th</sup> ACS National Meeting, New Orleans, LA, March 23-27, 2003, Abstract # 273.
12. Adenochrome: A Novel Iron-Binding Motif from the Heart of an Octopus. Amanda L. Stewart and C. Michele Davis, 225<sup>th</sup> ACS National Meeting, New Orleans, LA, March 23-27, 2003, Abstract # 833.
13. Adenochrome: Location and Distribution in an Octopus. R. Bryan Sears and C. Michele Davis, 225<sup>th</sup> ACS National Meeting, New Orleans, LA, March 23-27, 2003, Abstract # 834.
14. Iron Chelation Therapy Drugs: Natural vs. Synthetic. Arthur D. Bosshart III and C. Michele Davis, 225<sup>th</sup> ACS National Meeting, New Orleans, LA, March 23-27, 2003, Abstract # 910.
15. SAACS at Georgia Southern University: A Chapter Rebuilt. Amanda L. Stewart and C. Michele Davis, 225<sup>th</sup> ACS National Meeting, New Orleans, LA, March 23-27, 2003, Abstract # 1129.

16. The Successful Use of Case Studies in Nutritional Biochemistry C. Michele Davis, 54th Southeastern Regional Meeting of the American Chemical Society, Charleston, SC, November 13-16, 2002, Abstract #541.
17. A Novel Synthesis of 1,4-Nitrobenzylphosphonic acid as a Potential Inhibitor of Alkaline Phosphatase Randall R. Bennett and C. Michele Davis, 54th Southeastern Regional Meeting of the American Chemical Society, Charleston, SC, November 13-16, 2002, Abstract #781 .
18. Revitalizing the SAACS at Georgia Southern University Amanda L. Stewart, J. David Jenkins, and C. Michele Davis, 54th Southeastern Regional Meeting of the American Chemical Society, Charleston, SC, November 13-16, 2002, Abstract #782.
19. Adenochrome: A Potential Iron Chelation Therapy Drug Meaghan E. Askea and C. Michele Davis, Experimental Biology **2002**, New Orleans, LA, April 20-24, Abstract # 682.25.
20. The Biochemical Basis of Gout: A Laboratory Experience Randall R. Bennett, Jessica E. Jones and C. Michele Davis, Abstracts of Papers, 222<sup>nd</sup> American Chemical Society National Meeting, Orlando, FL April 7-10, **2002**, Abstract #653.
21. Adenochrome: A Potential Iron Chelation Therapy Drug Meaghan E. Askea, Khrystel Kirschstein and C. Michele. Davis 222<sup>nd</sup> American Chemical Society National Meeting, Orlando, FL April 7-10, **2002**, Abstract #279.
22. Isolation and Characterization of a Novel Iron-Binding Peptide from Octopus. Meaghan E. Askea, Khrystel Kirschstein and C. Michele. Davis, 53<sup>rd</sup> Southeastern Regional Meeting of the American Chemical Society, Savannah, GA, September 23-26, **2001**, Abstract #161.
23. The Biochemical Basis of Gout: A Laboratory Experience. Jessica E. Jones and C. Michele Davis, Abstracts of Papers, 33<sup>th</sup> A.C.S. Southeast Regional Undergraduate Research Conference, Georgia Southern University, Statesboro, GA, April 5-6, **2001**, Abstract #28.
24. A Gift - Straight from the Octopus' Heart. Khrystel Kirschstein and C. Michele Davis, Abstracts of Papers, 33<sup>th</sup> A.C.S. Southeast Regional Undergraduate Research Conference, Georgia Southern University, Statesboro, GA, April 5-6, **2001**, Abstract #29.
25. Isolation and Characterization of a Novel Iron-Binding Peptide from Octopus. Khrystel Kirschstein and C. Michele Davis, The 2001 Georgia Academy of Science Meeting, Coastal Georgia Community College, Brunswick, GA, March 23-24, **2001**.
26. Low-Molecular-Weight Chromium-Binding Substance Activates Insulin Receptor Kinase Activity in Response to Insulin: A Solution to the Relationship Between Chromium, Glucose Tolerance, and Diabetes? J.B. Vincent and C.M. Davis, Abstracts of Papers, Keystone Symposia on Molecular and Cellular Biology: Insulin Action and Secretion in NIDDM, **1997**, 116.
27. The Biologically Active Form of Chromium Contains a Multinuclear Cr(III) Assembly. C. M. Davis and J.B. Vincent, Abstracts of Papers, Keystone Symposia on Molecular and Cellular Biology: Insulin Action and Secretion in NIDDM, **1997**, 104.
28. Low-Molecular-Weight Chromium-Binding Substance May Activate Insulin Receptor Kinase Activity in Response to Insulin: A Solution to the Relationship Between Chromium, Glucose Tolerance, and Diabetes? C.M. Davis and J.B. Vincent, Abstracts of Papers, 212<sup>th</sup> A.C.S. National Meeting, **1996**, INOR 207.

29. Low-Molecular-Weight Chromium Protein from Bovine Liver Activates Phosphotyrosine Phosphatase Activity in Adipocyte Membranes. K.H. Sumrall, C.M. Davis, and J.B. Vincent. Abstracts of Papers, 211<sup>th</sup> A.C.S. National Meeting, **1996**, INOR 494.
30. The Biologically Active Form of Chromium Contains a Multinuclear Cr(III) Assembly. C.M. Davis and J.B. Vincent. Abstracts of Papers, 211<sup>th</sup> A.C.S. National Meeting, **1996**, INOR 585.
31. Low-Molecular-Weight Chromium Protein from Bovine Liver Activates Phosphotyrosine Phosphatase Activity in Adipocyte Membranes. K.H. Sumrall, C.M. Davis, and J.B. Vincent. Abstracts of Papers, 47<sup>th</sup> A.C.S. Southeast / 51<sup>st</sup> Southwest Joint Regional Meeting, **1995**, Abstract #293.
32. Isolation and Characterization of Low-Molecular-Weight Chromium Proteins Which Contain Multinuclear Chromium(III) Assemblies. J.B. Vincent and C.M. Davis, Abstracts of Papers, 46<sup>th</sup> A.C.S. Southeast Regional Meeting, **1995**, Abstract #239.
33. Characterizations of Low-Molecular-Weight Chromium-Binding Proteins from Bovine Liver. C.M. Davis and J.B. Vincent. Abstracts of Papers, 209<sup>th</sup> A.C.S. National Meeting, **1994**, Abstract #406.

### **Other Presentations:**

1. Adenochrome: A Novel Iron-Binding Motif from the Heart of an Octopus Amanda L. Stewart, Arthur D. Bosshart III, and C. Michele Davis, 3rd Annual WildGame Supper, Atlanta, GA, February 8, **2003**.
2. Adenochrome: A Potential Iron Chelation Therapy Drug from the Sea? Meaghan E. Askea, Khrystel Kirschstein and C. Michele. Davis 2<sup>nd</sup> Annual Wild Game Supper, Atlanta, GA, January 27, **2002**.