

HABIBA E. VAGHOO

Colorado College ♦ Department of Chemistry and Biochemistry ♦ 14 East Cache La Poudre St.
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EDUCATION

Ph.D in Organic Chemistry **December 2008**

University of Southern California, Los Angeles, CA

Dissertation: “*Synthesis of Organofluorine Compounds via Lewis/Brønsted Acid and Base Catalyzed Reactions and Related Chemistry*”

Advisor: Dr. G. K. Surya Prakash

BA, ACS Chemistry (Magna cum laude) **December 2003**

Concordia College, Moorhead, MN

TEACHING EXPERIENCE

Assistant Professor of Chemistry **August 2011-Present**

Colorado College, Colorado Springs, CO

Courses: Organic Chemistry I & II & III Lecture and Laboratory (CH 250, CH 251 & CH 351)

General Chemistry I Lecture and Laboratory (CH 107)

First Year Experience (CH 100-Food Chemistry)

Mentored Research Blocks CH 201, 301, 401

Bridge Course “The Culture and Scientific Construction of Identity: Food, Chemistry, Culture”
with Professor Mario Montano (Anthropology) Summer 2013 and 2014

Visiting Assistant Professor of Chemistry **August 2010-July 2011**

The College of Wooster, Wooster, OH

Courses: Organic Chemistry I & II (Lecture and Laboratory)

Introductory Chemistry (Lecture and Laboratory)

Junior independent study; Co-taught with Professors Judy Ambergey-Peters and Sibrina Collin

Visiting Assistant Professor **August 2009-July 2010**

Concordia College, Moorhead, MN

Courses: Organic Chemistry I & II (Lecture and Laboratory); General Chemistry II Lecture

PROFESSIONAL EXPERIENCE

Visiting Research Scientist **April 2015- June 2015**

University of Southern California, Los Angeles, CA

PI: Prof. G. K. Surya Prakash

Developed a variety of synthetic methodologies such as:

- Synthesis of 3-Methyl and 3-Trifluoromethyl-thiochroman-4-ones
- Friedel-Crafts Reactions of trifluoroacetaldimines and arenes

Postdoctoral Research Associate**January 2009-July 2009**

University of Southern California, Los Angeles, CA

Advisor: Prof. G. K. Surya Prakash

Superacid catalyzed synthesis of 3-Methylthiochroman-4-one and Trifluoromethyl-2-(phenylthiomethyl) propanoic acid derivatives via microwave irradiation.

Graduate Research Assistant**January 2004 – December 2008**

University of Southern California, Los Angeles, CA

Advisor: Prof. G. K. Surya Prakash

Developed a variety of synthetic methodologies such as:

- Stereoselective Synthesis of Vinyl Fluorides using α -substituted Fluoro(phenylsulfonyl)methane derivatives.
- 1,4-addition of Fluorobis(phenylsulfonyl)methane to alpha, beta unsaturated compounds.
- Gallium (III) triflate catalyzed synthesis of heterocycles (fluorinated benzimidazolines, 1,5 benzodiazepines and quinoxaline derivatives)
- Solid Acid Catalysis- Nafion[®]-H catalyzed synthesis of fluorinated heterocycles.
- Syntheses of α -aminonitriles and their fluorinated analogs via the multicomponent Strecker reaction using gallium (III) triflate.
- Trifluoromethylation and Cyanosilylation of carbonyl compounds using TMSCF₃ and TMSCN respectively, catalyzed by nucleophilic catalysts such as amine oxides, carbonates and phosphates.

Summer Research Assistant**2002, 2003**

Concordia College, Moorhead, MN

Research Advisor: Prof. Drew Rutherford

Designed and conducted multi-step synthesis of “tethered” Nitrofurazone and Polybrominated diphenyl ether (PBDE) for Immunochemical studies for USDA, Bioscience Research Lab, Fargo, ND

PROFESSIONAL AFFILIATIONS

American Chemical Society (ACS), and Sigma Xi, The Scientific Research Society (an honor society; election to membership is based on proven research ability)

AWARDS AND SCHOLARSHIPS

- Stauffer Post-Doctoral Fellowship 2009
- Harold and Lillian Moulton Graduate Fellowship Summer 2005/2008 for excellence in research, from Loker Hydrocarbon Research Institute, USC
- University Fellowship at USC, 2003-2008
- National Dean’s List, Concordia College Dean’s List, Concordia College Alpha Society, Ostercamp Scholarship, Ough Family Scholarship, Ella Olson Memorial Scholarship (Concordia College), Concordia College Merit based scholarship.

PUBLICATIONS

1. Wilt, I.¹; Roos, J.¹; Keegan, C.¹; Vaghoo, H. “Direct Conversion of Nitrotoluenes to Aminobenzaldehydes by Microwave Assisted Oxidation-Reduction Protocol” *Manuscript in preparation*.
2. Prakash, G. K.; Narayanan, A.; Nirmalchandar, A.; Vaghoo, H.; Paknia, F.; Mathew, T.; Olah, G. A. Direct synthesis of 2-/3-(trifluoromethyl)thiochroman-4-ones: Superacid-induced tandem alkylation-cyclic acylation of benzenethiols using 2-/3-(trifluoromethyl)acrylic acid *Journal of Fluorine Chemistry*. **2016**, Article in Press.
3. Vaghoo, H.; Prakash, G. K.; Narayanan, A.; Choudhary, R.; Paknia, F.; Mathew, T.; Olah, G. A. Superelectrophilic Activation of Crotonic/Methacrylic Acids: Direct Access to Thiochroman-4-ones from Benzenethiols by Microwave-Assisted One-Pot Alkylation/Cyclic Acylation *Org. Lett.* **2015**, 17, 6170.
4. Prakash, G. K.; Paknia, F.; Vaghoo, H.; Rasul, G.; Mathew, T.; Olah, G. A. Preparation of Trifluoromethylated Dihydrocoumarins, Indanones, and Arylpropanoic Acids by Tandem Superacidic Activation of 2-(Trifluoromethyl)acrylic Acid with Arenes. *J. Org. Chem.* **2010**, 75(7), 2219.
5. Prakash, G. K., Vaghoo, H., Venkat, A., Panja, C., Chacko, S., Mathew, T., Olah, G. A. Gallium (III) triflate –catalyzed synthesis of heterocycles: quinoxalines, 1,5-benzodiazepines and their fluorinated derivatives. *Future Medicinal Chemistry*, **2009**, 1 (5), 909.
6. Prakash, G. K.; Chacko, S.; Vaghoo, H.; Shao, N.; Gurung, L.; Mathew, T.; Olah, G. A. Efficient Nucleophilic Fluoromethylation and Subsequent Transformation of Alkyl and Benzyl Halides Using Fluorobis(phenylsulfonyl)methane. *Org. Lett.* **2009**, 11(5), 1127.
7. Prakash, G. K. S.; Panja, C.; Do, Cl.; Bychinskaya, I.; Vaghoo, H.; Mathew, T.; Olah, G. A. Efficient one-pot synthesis of novel fluorinated heterocycles using trimethylsilyl trifluoromethanesulfonate as a metal-free homogeneous Lewis acid catalyst. *ACS Symposium Series* (**2009**), 1003 (Fluorinated Heterocycles), 59.
8. Prakash, G. K. Surya; Thomas, Tisa Elizabeth; Bychinskaya, Inessa; Prakash, Arjun G.; Panja, Chiradeep; Vaghoo, Habiba; Olah, George A. Efficient green synthesis of α -aminonitriles, precursors of α -amino acids. *Green Chemistry*, **2008**, 10, 1105.
9. Prakash, G. K. S.; Zhao, X.; Chacko, S.; Wang, F.; Vaghoo, H.; Olah, G. A. Efficient 1,4-addition of α -substituted fluoro(phenylsulfonyl)methane derivatives to α,β -unsaturated compounds. *Beilstein J. Org. Chem.* **2008**, 4, 17.
10. Prakash, G. K. S.; Vaghoo, H.; Panja, C.; Molnár, Á.; Mathew, T.; Olah, G. A. Nafion-H catalyzed synthesis of fluorinated benzimidazolines, benzothiazolines, benzoxazolines and dihydrobenzoxazinones. *Synthesis*, **2008**, 6, 897.

¹ Denotes Colorado College undergraduate student

11. Prakash, G. K. S.; Mathew, T.; Panja, C.; Alconcel, S.; Vaghoo, H.; Do, C.; Olah, G. A. Gallium (III) triflate catalyzed efficient Strecker reaction of ketones and their fluorinated analogs. *Proc. Natl. Acad. Sci. USA*. **2007**, *104* (10), 3703.
12. Prakash, G. K. S.; Vaghoo, H.; Panja, C.; Surampudi, V.; Kultyshev, R.; Mathew, T.; Olah, G. A. Effect of carbonates/phosphates as nucleophilic catalysts in dimethylformamide for efficient cyanosilylation of aldehydes and ketones *Proc. Natl. Acad. Sci. USA*. **2007**, *104* (9), 3026.
13. Prakash, G. K. S.; Mathew, T.; Panja, C.; Vaghoo, H.; Venkataraman, K.; Olah, G. A. Efficient one-pot synthesis of fluorinated benzimidazolines, benzothiazolines, benzoxazolines, and dihydrobenzoxazinones using gallium(III)triflate as a catalyst. *Org. Lett.* **2007**, *9* (2), 179.
14. Prakash, G. K. S.; Panja, C.; Vaghoo, H.; Surampudi, V.; Kultyshev, R.; Mandal, M.; Rasul, G.; Mathew, T.; Olah, G. A. Facile Synthesis of TMS-Protected Trifluoromethylated Alcohols Using Trifluoromethyltrimethylsilane (TMSCF₃) and Various Nucleophilic Catalysts in DMF. *J. Org. Chem.* **2006**, *71*(18), 6806.

PRESENTATIONS

1. Vaghoo, Habiba. Faculty Lunch Talk at Colorado College, “Fluorine: A small atom with a big ego.” An overview of the history of fluorinated compounds and their application towards antimalarial drugs. April 26, **2016**.
2. Keegan, Casey '17, Wilt, Ingrid '17 and Vaghoo, Habiba. “Progress towards the synthesis of fluorinated antimalarial analogs” Midstates Consortium Undergraduate research Symposium in the Physical Sciences, Math and Computer Science. University of Chicago, November 13-14, **2015**.
3. Keegan, Casey '17, Wilt, Ingrid '17 and Vaghoo, Habiba. “Progress towards the synthesis of fluorinated antimalarial analogs” Colorado College SCoRe Symposium, September 29, **2015**.
4. Roos, Jackson'15.; Vaghoo, Habiba. “Progress towards the synthesis of fluorinated antimalarial analogs” Abstracts of Papers, 249th ACS National Meeting & Exposition, Denver, CO, United States, March 22-26, **2015** (2015), CHED-1216.
5. Vaghoo, Habiba. Invited Talk at University of Southern California Chemistry Departments Career Day “How to get a job at a small liberal arts college”, February 13, **2015**.
6. Roos, Jackson'15.; Vaghoo, Habiba. “Progress towards the synthesis of fluorinated antimalarial analogs” Colorado College Summer Collaborative Research Symposium, September 15, **2014**.
7. Vaghoo, Habiba and Daugherty, Margaret. Invited Sigma Xi Talk “An Introduction To The Chemistry Of Food Pairing”, Dec 9, **2013**.

8. Vaghoo, Habiba and Daugherty, Margaret. The Chemistry of Ice-Cream, Loomis Hall, Oct 15, **2013**.
9. Vaghoo, Habiba and Daugherty, Margaret. Fall Conference: The Chemistry of Ice-Cream, Aug 27, **2013**.
10. Prakash, G. K. Surya; Chacko, Sujith; Vaghoo, Habiba; Mathew, Thomas; Olah, George A. Stereoselective one-pot synthesis of vinyl fluorides using α -substituted fluoro(phenylsulfonyl)methane derivatives. Abstracts of Papers, 237th ACS National Meeting, Salt Lake City, UT, United States, March 22-26, **2009**.
11. Prakash, G. K. S.; Chacko, S.; Vaghoo, H.; Olah, G. A. Efficient 1, 4-addition of α -substituted fluoro-(phenylsulfonyl)methane derivatives to α, β -unsaturated compounds. 235th ACS National Meeting, New Orleans, LA, United States, April 6-10, **2008**.
12. Prakash, G. K. S.; Vaghoo, H.; Panja, C.; Molnár, Á.; Mathew, T.; Olah, G. A. "Nafion[®]-H Catalyzed Synthesis of Fluorinated Benzoimidazoles, Benzothiazolines, Benzoxazolines and Dihydrobenzoxazinones." 234th ACS National Meeting, Boston, MA, United States, August 19-23, **2007**.
13. Prakash, G. K. S.; Mathew, T.; Vaghoo, H.; Panja, C.; Venkat, A.; Chacko, S.; Olah, G. A. Gallium triflate catalyzed synthesis of quinoxalines. 234th ACS National Meeting, Boston, MA, United States, August 19-23, **2007**.
14. Prakash, G. K. S.; Panja, C.; Vaghoo, H.; Surampudi, V.; Kultyshev, R.; Mandal, M.; Golam, R.; Mathew, T.; Olah, G. A. "Facile Synthesis of TMS-Protected Trifluoromethylated Alcohols Using Trifluoromethyltrimethylsilane (TMSCF₃) and Various Nucleophilic Catalysts in DMF." 232nd ACS National Meeting, San Francisco, CA, Sept. 10-14, **2006**.
15. Prakash, G. K. S.; Mathew, T.; Vaghoo, H.; Panja, C.; Olah, G. A. "Use of Gallium (III) Triflate as an Efficient Lewis Acid Catalyst for Multicomponent and Cyclization Reactions." 232nd ACS National Meeting, San Francisco, CA, Sept. 10-14, **2006**.
16. Vaghoo, H.; Prakash, G. K. S.; Panja, C.; Surampudi, V.; Kultyshev, R. G.; Mathew, T.; Olah, G. A. An efficient addition of trimethylsilyl cyanide to aldehydes and ketones using nucleophilic catalysts in N,N-dimethylformamide. 230th ACS National Meeting, Washington, DC, United States, Aug. 28-Sept. 1, **2005**.
17. Rutherford, D.; Vaghoo, H.; Gilbertson, J. "Synthesis and Characterization of Polybrominated Diphenyl Ether Antigens (PBDE) for Immunochemical Quantitation Studies of Environmental Contamination" Iowa State University, Ames, Undergraduate Research Poster Presentation ChemCy, **2003**.

COLLEGE SERVICE

- Admissions Office Open House participant at Colorado College (Spring 2011, 2016)
- Department sub-committees

- Volunteered with the Southern California American Chemical Society's team at the Annual Youth Expo Chemistry Merit Badge Day, Boy Scouts of America, Pasadena, California, May 30, 2015.
- Faculty Chaperone for off campus trips (Symposiums, Conferences and courses)- accompanied students to several off campus events both in and out of state.
- Invited Speaker for Carol Emmer's Summer Course for Incoming first year international students. "*The Chemistry of Chocolate*" July 22, 2014.
- Campus Activities Office Resource Fair Department Representative at Colorado College (Fall 2013)
- Fall conference co-presenter 'The Chemistry of Ice-Cream' , Fall 2013
Session chair-Midstates Consortium Undergraduate research Symposium in the Physical Sciences, Math and Computer Science. Washington University, November 2-3, 2012.
- Session chair- 9th Annual Colorado Springs Undergraduate Research Forum (CSURF), Colorado College, April 28, 2012.
- Bridge Program (2013 and 2014)
- First Gen, Muslim and International Students Support/Resource
- Colorado College Refugee Alliance member

Standing Committees

- 2016-2017 Elected Natural Science Pre-Tenure Representative on the Curriculum Executive Committee (1 year term)
- 2015-2016 Faculty representative on the Children's' Center Committee
- 2013-2016 Co-representative for CC at the Midstates Consortium for Math and Science
- 2013 Member of the Strategic Planning Action Team on "Building a Diverse and Inclusive Campus"
- 2012-2014 Member of Women's Concerns Committee

Search Committees

Fall 2011	Organic Chemistry (Department of Chemistry & Biochemistry)
Fall 2012	Inorganic Chemistry (Department of Chemistry and Biochemistry)
Fall 2013	Inorganic Chemistry (Department of Chemistry and Biochemistry) Bioorganic Chemistry (Department of Chemistry and Biochemistry) Internal Communications Director (Office of Communications)

Fall 2015 Bioorganic Chemistry (Department of Chemistry and Biochemistry)
Fall 2016 Organic Chemistry (Department of Chemistry and Biochemistry)
 Analytical Chemistry (Department of Chemistry and Biochemistry)

PROFESSIONAL DEVELOPMENT

- ACM-CIC Undergraduate and Faculty Fellows Program for a Diverse Professoriate, “Illinois Hiring and Diversity Workshop” Chicago, August 15-16, **2016**.
- Excel @ CC “Good to Great: The Journey to Inclusion at CC, Butler Center Sponsored program at Colorado College, August 11, **2015**.
- NSF Sponsored Chemistry Collaborations, Workshops and Communities of Scholars (cCWCS). *“Teaching Guided-Inquiry Organic Chemistry Laboratories”*, University of Minnesota, Minneapolis, June 8-13, **2014**.
- NSF Sponsored Chemistry Collaborations, Workshops and Communities of Scholars (cCWCS). *“Food Chemistry”*, Clarke University, Iowa, July 13-19, **2013**.
- Midstates Consortium for Math and Science “*2011 New Faculty Workshop*”, Hope College, Michigan, July 7-10, **2011**.
- Council on Undergraduate Research (CUR) “*Beginning a Research Program in the Natural Sciences at a Predominantly Undergraduate Institution*”, Calvin College, Michigan, Nov 20-22, **2009**.