

Daniel T. de Lill, PhD

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Education

The George Washington University (GWU), Washington, DC

Ph.D. – Inorganic Chemistry, May 2008

M.Phil. – Chemistry, 2006

Research Advisor: Dr. Christopher L. Cahill

Lock Haven University of Pennsylvania (LHU), Lock Haven, PA

B.A. – Natural Sciences: Chemistry, 2000, cum laude

B.A. – French, 1999, cum laude, minor: International Studies

Professional Experience

Assistant Professor, Florida Atlantic University (FAU),

Department of Chemistry and Biochemistry, Boca Raton, FL, 2010-current

Faculty Member, FAU Center for Molecular Biology & Biotechnology, 2015-current.

Courses Taught:

Materials Chemistry (developed course; UG and G)

Advanced Inorganic Chemistry (developed course; G)

Quantitative Analysis (UG; lecture and lab sections)

Inorganic Chemistry (UG; lecture and lab sections; author of lab manual)

Instrumentation (G, co-instructor)

Topics in Physical Chemistry (G; developed course)

Directed Independent Study (UG)

(National Science Foundation) Postdoctoral Fellow, University of Nevada, Reno (UNR),

Department of Chemistry, Reno, NV, 2008-2010

▪ Research laboratory of Dr. Ana de Bettencourt-Dias

▪ 3 publications; 4 presentations (2 oral; 2 poster); NSF Fellow 2009-2010

Publications

FAU (undergraduate researchers at time of research are underlined)

23. A. Santana, L. Navrazhnykh, M. Ruiz, X. Mei, A.S. Gonzalez, N.E. Greig, J. Brennar, and **D.T. de Lill**, "Lanthanide induced aggregation of mercaptobenzoic acid-functionalized gold nanoparticles." **In preparation**. (targeted submission 4/2016).

22. J.D. Einkauf, J.M. Clark, A. Paulive, G.P. Tanner, and D.T. de Lill, "A general model of sensitized luminescence in lanthanide-based coordination polymers and metal-organic framework materials." **In preparation**. (targeted submission 3/2016)

21. J.W. Dixon, B.C. Chan, and D.T. de Lill, "Size-induced structural evolution in a series of lanthanide-organic frameworks constructed from 1,2,4,5-benzenetetracarboxylate." **In preparation**. (targeted submission 3/2016).

20. J.D. Einkauf, L. Mathivathanan, D. O’Nolan, J.M. Clark, and D.T. de Lill, "Synthesis, structure, and spectroscopic properties of the $[\text{Ln}_2(\text{L})_3(\text{H}_2\text{O})_6]$ (Ln = Sm – Yb, L = 2,2'-bithiophene-5,5'-dicarboxylate) coordination polymer system." **In submission**. *Dalton Transactions*.

19. J.D. Einkauf, T.T. Kelley, B.C. Chan, and **D.T. de Lill**, "Unexpected luminescent behavior of $[\text{Ln}(\text{C}_{15}\text{H}_9\text{O}_5)_3(\text{H}_2\text{O})_3]_n$ (Ln = Eu, Tb): Rethinking sensitized luminescence in lanthanide coordination polymers." **In submission**. *Inorganic Chemistry*.
18. J.D. Einkauf, J.P. Karram, N.E. Greig, B.C. Chan, and **D.T. de Lill**, "Hole-size relationships in the assembly of a furandicarboxylate-based metallolinker in praseodymium coordination polymers synthesized under basic conditions." **Accepted**. *European Journal of Inorganic Chemistry*, **2016**. (DOI: 10.1002/ejic.201501350)
17. J.D. Einkauf, L. Mathivathanan, and **D.T. de Lill**, "Structural, spectroscopic, and computational studies of [2,2'-bithiophene]-5-carboxylic acid." *Journal of Molecular Structure*, **1104**, 33-39, **2016**.
16. N.E. Greig, J.D. Einkauf, J.M. Clark, E.J. Corcoran, J.P. Karram, C.A. Kent, V.E. Eugene, B.C. Chan, and **D.T. de Lill**, "Luminescent lanthanide containing coordination polymers synthesized via *in-situ* hydrolysis of dimethyl-3,4-furandicarboxylate." *Journal of Solid State Chemistry*, **225**, 402-409, **2015**.
15. **D.T. de Lill** and B.C. Chan, "Structure and luminescence of a one-dimensional uranium coordination polymer assembled through benzophenone-4,4'-dicarboxylate." *Inorganica Chimica Acta*, **404**, 215-218, **2013**.
14. A.L. Ramirez, K.E. Knope, T.T. Kelley, N.E. Greig, J.D. Einkauf, and **D.T. de Lill**, "Structure and luminescence of a 2-dimensional 2,3-pyridinedicarboxylate coordination polymer constructed from lanthanide(III) dimers." *Inorganica Chimica Acta*, **392**, 46-51, **2012**.
13. A.L. Ramirez, B.C. Chan, and **D.T. de Lill**, "Benzothiophene-4,8-dione." *Acta Crystallographica*, **E68**, o1428, **2012**.

Graduate/Postdoctoral

12. K.E. Knope, **D.T. de Lill**, C.E. Rowland, P.M. Cantos, A. de Bettencourt-Dias, and C.L. Cahill, "Uranyl sensitization of samarium(III) luminescence in a two-dimensional coordination polymer." *Inorganic Chemistry*, **51(1)**, 201-206, **2012**. **(Cover Article)**
11. A. de Bettencourt-Dias, P.S. Barber, S. Viswanathan, **D. T. de Lill**, Rollett, A., G. Ling, M. S. Altun, "Para-derivatized pybox and its highly luminescent Eu(III) and Tb(III) complexes." *Inorganic Chemistry*, **49 (19)**, 8848-8861, **2010**.
10. **D.T. de Lill** and A. de Bettencourt-Dias, "4-Bromo- $\text{N}^2, \text{N}^2, \text{N}^6, \text{N}^6$ -tetraethylpyridine-2,6-dicarboxamide." *Acta Crystallographica Section E*, **E66**, o2124-m1345, **2010**.
9. **D.T. de Lill**, A.M. Tareila, and C.L. Cahill, "Synthesis, structure, and luminescence of a two-dimensional lanthanide(III)-suberate coordination polymer resulting from dimeric secondary building units." *Inorganic Chemistry Communications*, **12**, 191-194, **2009**.
8. **D.T. de Lill** and C.L. Cahill, "The Synthesis and Characterization of a Praseodymium-Adipate Framework Templated with 1,2-Bis(4-pyridyl)ethane : Host-Guest Interactions and Structural Survey." *Crystal Growth & Design*, **7(12)**, 2390-2393, **2007**.
7. **D.T. de Lill** and C.L. Cahill, "Coordination Polymers of the Lanthanide Elements : A Structural Survey." *Progress in Inorganic Chemistry*, **55**, 143-203, **2007**.
(reviewed: *J. Am. Chem. Soc.*, **130**, 2878-2882, **2008**.)
6. **D.T. de Lill**, A. de Bettencourt-Dias, and C.L. Cahill, "Exploring Lanthanide Luminescence in Metal-Organic Frameworks: Synthesis, Structure, and Guest-Sensitized Luminescence of a Mixed Europium/Terbium-Adipate Framework and a Terbium-Adipate Framework." *Inorganic Chemistry*, **46(10)**, 3960-3965, **2007**.
5. C.L. Cahill, **D.T. de Lill**, and M. Frisch, "Homo- and Heterometallic Coordination Polymers from the f-Elements." *CrystEngComm*, **9**, 15-26, **2007**. **(Highlight Article; Cover Article)**

4. **D.T. de Lill** and C.L. Cahill, "An Unusually High Thermal Stability within a Novel Lanthanide-Organic Framework: Synthesis, Structure, and Thermal Properties." *Chemical Communications*, **47**, 4946-4948, **2006**.
3. **D.T. de Lill**, W.W. Brennessel, L.A. Borkowski, N.S. Gunning, and C.L. Cahill, "Poly(n-hexane-1,6-dicarboxylato)dysprosium(III)" *Acta Crystallographica Section E*, **E61**, m1343-m1345, **2005**.
2. **D.T. de Lill**, D.J. Bozzuto, and C.L. Cahill, "Templated Metal-Organic Frameworks: Synthesis, Structures, Thermal Properties, and Solid-State Transformation of Two Novel Calcium-Adipate Frameworks." *Dalton Transactions*, **12**, 2111-2115, **2005**.
1. **D.T. de Lill**, N.S. Gunning, and C.L. Cahill, "Toward Templated Metal-Organic Frameworks: Synthesis, Structures, Thermal Properties, and Luminescence of Three Novel Lanthanide-Adipate Frameworks." *Inorganic Chemistry*, **44(2)**, 258-266, **2005**.

Publications - other

1. E.M. Rezler, **D.T. de Lill**, J.E. Haky, "Experiments in Inorganic Chemistry." Third Edition. Wiley & Sons. **2015**. ISBN: 9781119195061.

Conference Proceedings (as presenter)

FAU Proceedings

- "Lanthanide-based nano-MOFs as multimodal bioimaging agents", **Oral** presentation at ACS Boston, 8/2015.
- "Incorporation of polymer chemistry topics in inorganic and materials chemistry courses at Florida Atlantic University", **Oral** presentation at ACS Boston, 8/2015.
- "Spectator ion-directed synthesis of lanthanide-organic frameworks", **Oral** presentation at ACS Boston, 8/2015.
- "Investigating sensitized luminescence in lanthanide coordination polymers", **Oral** presentation at ACS, Denver, CO, USA. 3/2015.
- "Lanthanide-organic frameworks as asymmetric heterogeneous catalysts", **Poster** and **Sci-Mix** presentation at ACS, Denver, CO, USA. 3/2015
- "Examining the antenna effect within lanthanide coordination polymers", **Oral** presentation at the Southeastern Regional Meeting of the American Chemical Society (SERMACS), Atlanta, GA, 11/2013. **Invited contribution**.
- "Photophysical studies of lanthanide-organic hybrid materials", **Oral** presentation at the Florida Annual Meeting and Exposition of the American Chemical Society (FAME), Palm Harbor, FL, 5/2013. **Invited contribution**.
- "Lanthanide doped III-V semiconducting nanoparticles via hydrothermal methods" **Oral** presentation at NanoFlorida, Miami, FL, USA. 10/2011. **Invited contribution**.
- "New linkers for use in lanthanide-based MOFs" **Poster** presentation at the 2011 Rare Earth's Research Conference (RERC), Santa Fe, NM, USA. 6/2011.

Graduate/Postdoctoral Proceedings

- "Chemistry as a PR client: A national campaign aimed at promoting careers in chemistry" **Oral** presentation and **Sci-Mix Poster** at ACS, San Francisco, CA, USA. 3/2010.
- "Visible and near-infrared emissive lanthanide complexes: Pyridine-bis(thiazoline) and related derivatives as sensitizers" **Oral** presentation at ACS, San Francisco, CA, USA. 3/2010.
- "Luminescent lanthanide complexes of pybox and its derivatives" **Oral** presentation at ACS, Salt Lake City, UT, USA. 3/2009.

- “Examples of lanthanide-organic hybrid materials with interesting physical properties” **Oral** Presentation at SERMACS 2007, Greenville, SC, USA. 10/2007.
- “Tuning solid-state luminescence in lanthanide-containing metal-organic framework materials” **Oral** presentation at the 59th Southeastern Regional Meeting of the American Chemical Society (SERMACS 2007), Greenville, SC, USA. 10/2007.
- “Novel strategies in the crystal engineering of lanthanide coordination polymers: Harnessing structure-directing agents and monodentate linkages” **Oral** Presentation at ACS, Chicago, IL, USA. 3/2007.
- “Introduction of structure-directing agents in the synthesis of lanthanide-organic frameworks and subsequent luminescent properties” **Oral** Presentation at Mid-Atlantic Seaboard Inorganic Symposium, Washington, DC, USA. 8/2006.
- “Lanthanide co-luminescence studies in metal-organic frameworks” **Oral** Presentation at the 38th Middle Atlantic Regional Meeting of the American Chemical Society (MARM 2006), Hershey, PA, USA. 6/2006.
- “Manipulating lanthanide luminescence in metal-organic frameworks” **Poster** Presentation at NECZA, Philadelphia, PA, USA. 12/2005.
- “Host-guest interactions within metal-organic frameworks” **Oral** Presentation at ACS, Washington, DC, USA. 8/2005.
- “Towards templated metal-organic frameworks” **Poster** Presentation at the 228th National Meeting and Exposition of the American Chemical Society (ACS, Fall 2004), Philadelphia, PA, USA. 8/2004.

Departmental Seminars

- University of Florida, Gainesville, FL, TBP 3/7/2016
 Angelo State University, San Angelo, TX, 11/2015
 Florida Atlantic University, Boca Raton, FL, 10/2015
 University of Nevada, Reno, Reno, NV, 4/2015
 Florida Institute of Technology, Melbourne, FL, 3/2015
 Georgetown University, Washington, DC, 2/2015
 Broward College North Campus, Coconut Creek, FL, 10/2014
 Florida International University, Department of Chemistry, Miami, FL, 12/2011
 Barry University, Miami, FL, 4/2011
 Florida International University, CeSMEC, Miami, FL, 3/2011

Current and Pending Research and Teaching Grants

1. FAU OURI SURF, “Synthesis of lanthanide coordination polymers for use in environmental sensing”, \$4,000, Student: Raul Ortega, Summer 2016.
2. NSF, “Evaluating sensitized emission in luminescent lanthanide coordination polymers”, \$329,532, 7/2016-6/2019, pending.
3. ACS PRF, “Combining gas sorption capacity and heterogeneous catalysis in metal-organic frameworks”, \$110,000, 9/2016-8/2018, pending.
4. Janke Research Fund, “New catalysts for more widespread and economical production of biodiesel fuel from broader feedstock sources”, \$50,000, 6/2016-12/2017, pending.

Previous Research and Teaching Grants

NSF American Competitiveness in Chemistry Postdoctoral Fellowship, \$200,000, 2009-2010

FAU Faculty Mentoring Award, \$2000, 2012

FAU Faculty Research SEED Grant, \$5,000, 2013

FAU Quality Enhancement Plan Curriculum Enhancement Grant, \$3,500, 2013

Graduate Students (FAU, current/alumni)

Ryan Crichton, PhD Student, Fall 2015-current

Jeffrey Einkauf, PhD Candidate, Spring 2013-current

Jessica Clark, MS 2013

Joseph Dixon, MS 2015

Natalie Grieg, MS 2012

Amanda Ramirez, MS 2013

Undergraduate Students (FAU; * = racial minority (38%); 42% women)

April Ballard*	Zachary Harrison	Zachary Seay
Spencer Brown	Tim Hulse	Rafal Walisiewicz
Jayson Burkhardt*	Piengkamol Intarasuwan*	Kevin Cunningham
Daniel Castrillo	Joseph Karram	Allison Garnsey
Eric Corcoran	Tanya Kelley	James Peters
Ryan Crichton*	Charles Kent	Sandra Plata
Mykela Deluca	Melyse Laud*	C. Preston Powell
Kara DeNew	Tucker Lewis	Charles Read*
Jeffrey Einkauf	Maria Martinez*	Benjamin Roberts
Vadine Eugene*	Xiu Mei*	William Rubin
Arianna Gagnon*	Eka Melani*	Alexander Santana*
Cory Gondre*	Luizetta Navrazhnykh	Kenneth Shelley
Aida Gonzalez*	Kassandra Pedron*	Gary Smith
Michael Hall	Kathryn Pitton	Melissa Torres*
Jonathan Hardie*	Gabriel Quinones-Medina*	Ryoko Vomsaal
Christine Harpster	Mark Reed	Dan Zribi

FAU Undergraduate Student Publications (representing 25% of DIS students)

1. A. Santana, L. Navrazhnykh, M. Ruiz, X. Mei, A.S. Gonzalez, N.E. Greig, J. Brennar, and **D.T. de Lill**, "Lanthanide induced aggregation of mercaptobenzoic acid-functionalized gold nanoparticles." **In preparation**. (targeted submission 3/2016).
2. J.D. Einkauf, T.T. Kelley, B.C. Chan, and **D.T. de Lill**, "Unexpected luminescent behavior of $[\text{Ln}(\text{C}_{15}\text{H}_9\text{O}_5)_3(\text{H}_2\text{O})_3]_n$ (Ln = Eu, Tb): Rethinking sensitized luminescence in lanthanide coordination polymers." **In submission**. *Inorganic Chemistry*.
3. J.D. Einkauf, J.P. Karram, N.E. Greig, B.C. Chan, and **D.T. de Lill**, "Hole-size relationships in the assembly of a furandicarboxylate-based metallolinker in praseodymium coordination polymers synthesized under basic conditions." **Accepted**. *European Journal of Inorganic Chemistry*, **2016**. (DOI: 10.1002/ejic.201501350)

4. N.E. Greig, J.D. Einkauf, J.M. Clark, E.J. Corcoran, J.P. Karram, C.A. Kent, V.E. Eugene, B.C. Chan, and **D.T. de Lill**, "Luminescent lanthanide containing coordination polymers synthesized via *in-situ* hydrolysis of dimethyl-3,4-furandicarboxylate." *Journal of Solid State Chemistry*, **225**, 402-409, **2015**.
5. A.L. Ramirez, K.E. Knope, T.T. Kelley, N.E. Greig, J.D. Einkauf, and **D.T. de Lill**, "Structure and luminescence of a 2-dimensional 2,3-pyridinedicarboxylate coordination polymer constructed from lanthanide(III) dimers." *Inorganica Chimica Acta*, **392**, 46-51, **2012**.

FAU Undergraduate Student Presentations and Awards (excluding FAU presentations)

1. Xiu Mei, "Developing nMOFs for use as multi-modal imaging agents." **Poster** presentation at Florida Inorganic and Materials Symposium (FIMS), Gainesville, FL, USA. 10/2015. **Nominated** for OURI Undergraduate Researcher of the Year Award, 2015.
2. Alexander Santana, "Gold nanoparticles in the use of aqueous trivalent lanthanide ions." **Poster** presentation at FIMS, Gainesville, FL, USA. 10/2015. **Nominated** for OURI Undergraduate Researcher of the Year Award, 2015.
3. Arianna Gagnon and Kenneth Shelley, "Metal cation detection using a novel small molecule chemosensor." **Joint Oral** presentation at the American Chemical Society (ACS) National Meeting, Denver, CO, USA. 3/2015. Arianna won an ACS Division of Inorganic Chemistry **Student Travel Award** to attend this conference and give this presentation.
4. Ryan Crichton, "Secondary building unit formation in the hydrothermal synthesis of lanthanide coordination polymers." **Poster** presentation at the Florida Undergraduate Research Conference (FURC), Gainesville, FL, USA. 2/2015.
5. Ryan Crichton, "Secondary building unit formation in the hydrothermal synthesis of lanthanide coordination polymers." **Poster** presentation at FIMS, Gainesville, FL, USA. 10/2014.
6. Arianna Gagnon, "Spectroscopic detection of metal cations with a novel small molecule sensor." **Oral** presentation at the Southeastern Regional Meeting of the American Chemical Society, Nashville, TN, USA. 10/2014. Arianna was awarded the **first-prize winner** for this presentation by the ACS Division of Analytical Chemistry.

Selected Former DIS Student Highlights

1. Luizetta Navrazhnykh – FAU HS graduate, obtained BS – Chemistry from University of Chicago, PhD student at Carnegie Mellon University.
2. Joey Karram – Currently an MS student at FAU, Biomedical Sciences program
3. Tanya Kelley – Currently a PhD student at the University of Miami
4. Jeff Einkauf – Currently a PhD candidate in my lab at FAU
5. Alex Santana – Applying to the FAU PhD – Chemistry program to work in my lab
6. Melyse Laud – Applying to the FAU PhD – Chemistry program to work in my lab
7. Ryan Crichton – Currently a PhD student in my lab at FAU
8. Eric Corcoran – Currently a PhD student at my alma mater, GWU
9. Mykela DeLuca – Currently an MS Student at University of Florida
10. Kevin Cunningham – Obtained an MA – Chemistry from University of Chicago
11. Allison Garnsey – Obtained an MS – Chemistry from University of Florida

Current DIS Students and Projects

1. **Xiu Mei** and **Aida Gonzalez**, Synthesis of nanoMOFs for use as multimodal contrast agents; graduate mentor: Ryan Crichton as of 1/2016 (before this date, they had no graduate mentor and was supervised directly by me.)
2. **Spencer Brown** and **Melyse Laud**, Detection of Cu and Hg ions using the “dione” chemosensor; no graduate mentor; Jeff Einkauf assists with lab supervision of their work.
3. **Alex Santana**, Developing MOFs as heterogeneous catalysts; no graduate mentor; Jeff Einkauf assists with lab supervision of his work.
4. **Pedro Flores**, Synthesis and characterization of graphene based superconductors; no graduate mentor; directly supervised by myself.
5. Several students applied for DIS positions this semester, but I was unable to accommodate them. However, I wanted to expand the Inorganic Chemistry lab curriculum. These students have been tasked with developing a new lab experiment based on the current research literature, under my direct supervision: **Alex Santana** (Au nanoparticles for the detection of lanthanide ions) – Alex developed this lab in summer 2015, and it was used in the Inorganic lab last semester, and is being used this semester; he is currently finishing a manuscript about the research on which this experiment was based. New this semester: **Kassandra Pedron** (ferrofluids and magnetics); **Jonathan Hardie** (Co complexes and ligand field theory); **Gary Smith** (MOF-5 for sensing); **Kathryn Pitton** (Ca-MOF for catalysis); **Michael Hall** (high temperature superconductors); **Tucker Lewis** (spectroscopy of various Au nanoparticles).

University Service (FAU)

Graduate Admissions and Programs, Department of Chemistry & Biochemistry, member, Fall 2011-current
MCAT Course Instructor, Organic Chemistry, Spring 2014-Summer 2014
MCAT Course Instructor, General Chemistry, Summer 2013-Summer 2014
Science Olympiad, Materials Science Coordinator, Spring 2014
Faculty Learning Community, proposal awarded, Facilitator, 2012-2013 academic year
FAU Marketing, organized and modeled in stock “science” video footage, per request

Refereed Journals

Acta Crystallographica Section C: Crystal Structure Communications
Chemical Physics
Comments on Inorganic Chemistry
Crystal Growth & Design
Dalton Transactions
European Journal of Inorganic Chemistry
Inorganic Chemistry Communications
Inorganica Chimica Acta
Journal of Chemical Crystallography
Journal of Physical Chemistry
Journal of Solid State Chemistry
Physical Chemistry Chemical Physics
Polyhedron

Supplementary Education and Short Courses

Université de Haute-Alsace, Mulhouse, France, 1998

American Crystallographic Association, Summer course in Small Molecule Crystallography, 2004

Awards and Grants (Graduate School)

Graduate Student Prize in Chemistry

American Institute of Chemists, 2008

Dimitris N. Chorafas Foundation Prize

International award recognizing exceptional achievements in research, 2007

Cosmos Club Foundation Grants-in-Aid of Young Scholars

\$1000 grant in support of research proposal, 2007

Sigma Xi Grants-in-Aid of Research (national competition)

\$400 grant to conduct research with collaborator, 2006

Achievement Reward for College Scientists (ARCS) Scholar

\$15,000 award, 2005-2006

\$15,000 award, 2006-2007

Graduate Student Travel Award

Division of Inorganic Chemistry, August 2004

Daniel T. de Lill
Philosophy on Undergraduate Research

*Tell me and I forget.
Teach me and I remember.
Involve me and I learn.*

I first heard these words from my Organic Chemistry II professor, Dr. Roberta Kleinman. She believed in this philosophy, and when I reflected upon my own personal philosophy regarding teaching and research, this phrase instantly came to mind. I have had many teachers/professors tell me a lot of things, and most of them I have forgotten. Those who took the time to teach, I remembered many facts, but rarely saw how all the pieces fit together in the end. Student involvement is where actual learning truly takes place. In chemistry curricula, this ideally happens in accompanying laboratory courses. In reality, students often see these labs as monotonous and pointless, when in fact this is where they learn how to measure, record, and observe. Still, there is little active involvement of many students in lab courses, for they often find ways to circumvent the system. When reflecting back on my own education, it was through active interactions with my professors and classmates that allowed me to really learn. Therefore, I have based my teaching philosophy on actively involving students, whether it be in lecture or my research lab. Lecture courses include several in-class workshops that allow students to actively learn the material in a friendly setting that encourages inquiry and learning from mistakes. I also often show how course topics relate directly back to my research, which the students find interesting. All of this coupled with my passion for the subject material has encouraged many undergraduate students to approach me about conducting research in my lab.

While “involve me and I learn” may be somewhat obvious when it involves an undergraduate student doing original research in a lab setting, I regard the technical aspect of research as only the beginning. The students surely augment their rudimentary laboratory skills and begin to develop a sense of curiosity and inquiry, but I involve my undergraduate research students in many other ways as well. Over the years, I have slowly evolved from largely accepting DIS students to assist graduate students on their projects to having DIS students work mostly on independent projects that they take leadership in and responsibility for. Most work in groups of two in order to have someone to work with and discuss the results, but extremely talented and motivated students may work independently. The graduate students supervise the laboratory work of the DIS students, and answer any technical questions they may have. But, each week, the students and I sit down to discuss their projects and the potential directions to take. Throughout the week, we also informally discuss results and possible actions to take. When a problem arises, I encourage them to think of a solution on their own first. We then discuss the problem and various ways to approach it. Sometimes their potential solution is a possible approach, and that is recognized. Other times, the potential solution will not address the problem, and we discuss why. This usually occurs without the student even recognizing that their research skills are carefully being cultivated through these discussions.

Each week, we have a group meeting in which all group members participate. Everyone is tasked with presenting a brief PowerPoint presentation on research updates. They inform the group on recent developments, and the group probes them with questions and suggestions for future studies. Every group member also presents at least one “topic and question”, “recent literature”, and a formal end-of-semester 20-minute presentation modeled after those given at meetings of the American Chemical Society. The topic and question involves introducing a concept related to inorganic or materials chemistry, and then ask a question to the group about the concept. They then explain the correct answer in detail. The literature is an informal discussion of a recent research article about a study relevant to their respective research projects. We analyze the paper as a group - not just the science, but also the actual composition of the article. Aspects that are liked and disliked are both shared, and the science is critiqued for quality. The ultimate goal is to encourage the students to analyze and question the literature, not just to accept it at face value. The final presentation is required for students to receive DIS credits for their research each semester. These two hours reinvigorate us for another week of research, and we always leave the meeting having learned something new and/or with new questions to explore.

Involvement also extends outside of the lab and group meetings as well. I encourage my students to present their research whenever possible at research symposia at FAU and elsewhere. Several of my DIS students have presented at statewide, regional, and national conferences over the years (see CV for details). I find that when students present their findings in a formal setting, they realize they need to know their projects intimately. It is often during the preparation of their talks and posters that they fully grasp the broader nuances of their research. I also include undergraduate students as authors on publications in which they participated in the progression of the project.

Utilizing this combination of involvement-oriented activities, students leave my lab with the ability and confidence to take the next step in their scientific endeavors. Students can easily remember countless amounts of information to pass an examination, but knowing facts is much different than learning. Through active involvement, I believe students finally begin to truly comprehend and learn.

Involve me and I learn.

I do not believe a teaching philosophy could be more simple or succinct than that.

Alexander Santana
alexandersan2014@fau.edu
March 1, 2016

Dear Sir or Madam,

I am overjoyed at the opportunity to give a letter of support for Dr. Daniel de Lill in consideration of this year's Distinguished Undergraduate Research Mentor of the Year at Florida Atlantic University. As an undergraduate member of his research group, I have benefited from his mentorship for two years here at FAU. I base my recommendation on both the excellent quality of guidance that Dr. de Lill has provided me personally and my observations of mentorships with many other undergraduate students.

Dr. de Lill stands heads and tails above his peers when it comes to mentoring undergraduate students about academic research. In the last two years, he has taken on more students into his laboratory than any other professor I've seen at FAU. However, it is not the sheer number of students that is indicative of Dr. de Lill's excellence, but his retention of students long after they have completed curriculum requirements. After my first semester with Dr. de Lill, I was inspired and excited to continue my independent research because of his helpful expertise and encouragement. Together we were able to shape my work into a professional format to be presented at conferences and to be submitted for publication. The fact that his undergraduate students have the opportunity to publish their work in real scientific journals is a testament to Dr. de Lill's ability to cultivate the very best out of students.

To be specific, it is his patient attitude and teaching style that differentiates him from other professors. Mentoring undergraduates can require extensive amounts of time and patience. Even though he is constantly busy, he always finds the time for undergraduate students. This one-on-one mentorship combined with his very sensitive disposition and technical mastery of the field erases anxieties that undergraduates commonly have in this very intimidating endeavor.

I have had the opportunity to conduct undergraduate research under other professors in the same field at the University of Florida, which has given me some perspective about Dr. de Lill. Whereas other professors can be aloof, apathetic or unapproachable, Dr. de Lill is the exact opposite. Students can and do benefit from direct access to his knowledge and encouragement on a daily basis. I feel extremely lucky to have an energetic and inspirational professor who is willing to put on a lab coat and work side-by-side with me in the lab.

To conclude, Dr. de Lill embodies the ideal candidate for this award. His lab is a diverse safe space for all cultures, ethnicities, and sexual orientations. I laud his ability to attract minority women, in particular African-American and Hispanic women, to the field of chemistry, something that is sorely lacking in today's scientific environment. Undergraduates here at FAU recognize that both his cutting edge research and inclusive worldview represent the future of our field. It is no wonder why his research group is the most popular with Chemistry undergraduate students. He is the example that FAU should seek to achieve in mentoring undergraduate research in all fields, and therefore is the clear choice for this year's Distinguished Undergraduate Research Mentor of the Year. I would be delighted to further discuss Dr. de Lill's brilliant qualities and accomplishments if required. Feel free to contact me at your leisure.

Sincerely,

Alexander Santana