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NESACS

THE NUCLEUS

February 2008 Vol. LXXXVI, No. 6

Monthly Meeting

Jointly with NOBCChE; Dr. Joyce P. Foster and Dr. Valerie P. Wilson speak at Simmons College

Book Review

What Einstein Told His Cook 2. A review by Dennis Sardella

2008 Richards Award

To Robert G. Bergman, U. California at Berkeley

Summer Scholar Report

By Margaret Thompson and David R. Haines

Connections to Chemistry

October 17, 2007

The 2007 Connections to Chemistry program was held at Burlington High School on Wednesday, October 17th. There were 112 High School Chemistry teachers from 72 schools from Massachusetts, Maine, New Hampshire and Connecticut. Each received a bag with the ACS logo. Among several items in each bag were a copy of the October issue of the Journal of Chemical Education with a username and password for temporary full access to *JCE Online (October 17 – November 17, 2007)*, a copy of the October issue of ChemMatters, and a copy of a recent issue of C&EN that was provided by the ACS. In addition, each participant received a year's subscription to ChemMatters, and a certificate for three hours of Professional Development.

- The participants were welcomed by Mukund Chorghade, the NESACS chair, and by Terri Taylor from the Office of High School Chemistry, ACS Education Division, Washington, DC.
- Five workshops were offered in the late afternoon. Each teacher participated in two of them.
- Terri Taylor presented a workshop at the program on the high school chemistry initiative by the ACS.
- After dinner, the keynote address was given by Dr. Lori Krim Gavrin in Chemical and Screening Sciences from Wyeth Research. The program is posted in detail on the NESACS website.

Following the keynote speaker, a raffle was held that included three one-year subscriptions to the Journal of Chemical Education, three one-year memberships in the Division of Chemical Education's/ CTC (Chemistry Teacher Connection), /and various items with the ACS logo.

Five high school chemistry clubs are being connected to college student affiliate chapters.

Ruth Tanner ◇

2008 Richards Medal Awarded to Robert G. Bergman

Professor Robert G. Bergman of the Department of Chemistry of the University of California, Berkeley, has been selected by the Richards Award Committee as the recipient of the 2008 Theodore William Richards Medal. The Richards Medal Award dinner and presentation has been scheduled for Thursday, March 13, 2008 at the Harvard Faculty Club, followed by the Award Lecture in the Pfizer Lecture Hall in the Mallinckrodt Laboratory on Oxford Street.

G.R. Weisman ◇

Contents

Cover: *(l-r) Adelaide Cromwell (widow of Henry Hill), Anthony Cromwell Hill (son of Henry Hill), Dr. Ruth Tanner (2007 Henry A. Hill Award Recipient) and Martin Isaks (University of Massachusetts Lowell). Taken at the October NESACS Monthly Meeting. Photo by Morton Z. Hoffman.*

Deadlines: *April 2008 Issue: February 11, 2008*
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THE NUCLEUS

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Book Review

What Einstein Told His Cook 2. The Sequel, by Robert L. Wolke, with recipes by Marlene Parrish (W.W. Norton & Co., 2005) 444 pp., ISBN 0-393-05869-7; $25.95 hard cover)

Reviewed by Dennis J. Sardella
Department of Chemistry, Merkert Chemistry Center,
Boston College, Chestnut Hill, MA 02467

Take equal parts of recipe and science, leaven with a dash of terrible puns, and stir them smoothly into a base of questions and answers about the mysteries of the kitchen and what do you get? The recipe for Robert Wolke's thoroughly enjoyable (if rather bland-looking) book, *What Einstein Told His Cook 2. The Sequel*. Like its predecessor, *What Einstein Told His Cook: Kitchen Science Explained*, "Einstein 2" is based on material taken from Wolke's seven-year tenure writing the *Washington Post's* "Food 101" column and is presented in a question-and-answer format, in ten chapters devoted, respectively, to drinks (both alcoholic and non-), dairy products, vegetables, fruits, grains, sea foods, meats, spices, "galley gear", and (mostly) sweets.

Wolke, an emeritus professor of chemistry at University of Pittsburgh, debunks a range of dubious claims and foodie folklore, for instance, the idea that adding salt or vinegar before boiling eggs will prevent them from cracking, that "light" olive oil contains fewer calories than "regular" olive oil, and in the process, introduces a number of chemical principles. In addition, for those who want to go a bit more deeply into the scientific background, the book is peppered (no pun intended) with what Wolke calls "Sidebar Science", boxed discussions in the margins, covering such topics as the compressibility of cork (p. 55), enzymes (p. 13), "electron kidnappers" (p. 49), micronutrients (p. 125), fatty acid sidechains (p. 181), osmosis (p. 188), nitrites (p. 285), solvation (p. 316), capsaicin (p. 338), redox reactions (p. 378), and the difference between conduction, convection, and radiation (p. 403).

I cannot guarantee that everyone will like this book. Other than its cover, it is rather bland in its appearance, lacking visual impact with diagrams drawn in grayscale. It features none of the luscious color photos of beautifully plated meals and fertile countryside that are the stock-in-trade of contemporary cookbooks, and is certainly not likely to leap off the shelf at the prospective buyer. Indeed, its principal attractive point to the person who happens across it while prowling through the local Barnes & Noble or Borders is probably its provocative title (which of course, has absolutely nothing to do with the contents).

A small, but probably vocal, minority of serious (or perhaps better, "solemn", in the sense of Russell Baker's distinction) foodies will not find the intense and detailed discussion

continued on page 12

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Monthly Meeting

The 885th Meeting of the Northeastern Section of the American Chemical Society

Jointly with NOBCChE (National Organization for the Professional Advancement of Black Chemists and Chemical Engineers)

Thursday, February 14, 2008

In honor of the day, you are invited to bring your special Valentine to the dinner as guest of the Section.

Simmons College

Main College Building, 300 The Fenway

4:30 pm Board Meeting

5:30 pm Social Hour

6:15 pm Dinner (Sheppard Room)

7:30 pm Evening Meeting (Sheppard Room)

Dr. Marietta Schwartz, NESACS Chair, presiding

Dr. Joyce.P. Foster, Director of Academic Resources, Williams College,

Dr. Valerie P. Wilson, Associate Dean of the Graduate School, Brown University, *Mentoring Matters across the Diverse Populations in the Academy*

Dinner reservations should be made no later than noon, Thursday, February 7, 2008. Please call or fax Marilou Cashman at 800-872-2054 or e-mail at Mcash0953(at)aol.com. Please specify vegetarian. Reservations not cancelled at least 24 hours in advance must be paid. Members,$28; Non-members, $30; Retirees, $15; Students, $10.

THE PUBLIC IS INVITED

Directions

By Public Transportation: Take the MBTA Green Line E train (Heath Street) to Museum stop. From Huntington Avenue, walk north on Louis Prang Street (MFA on your right) to the Fenway. Simmons College will be on your left, just past the Isabella Stewart Gardner Museum. Total walking distance five blocks (0.16 mile).

By Car (but see parking advisory below):

From Mass Turnpike Exit 22: Stay left and follow signs marked "Prudential Center/West 9." Stay on Huntington Ave West approximately 1 mile. Pass Museum of Fine Arts on right, then turn right at next light on Louis Prang St. Continue through two lights. The main building of Simmons will be on left. Turn left on Avenue Louis Pasteur. Simmons's library is on left. Drop passengers off here. See parking information that follows.

From I-93 North or I-93 South: Take exit 26. Keep left on exit and follow signs for Storrow Drive West. Look for sign "Kenmore Square, Fenway, Route1 South" and exit left, following sign for "Fenway 1 South." Do not take Kenmore Square exit. Stay right at light, following sign for "Boylston St Outbound, Riverway 1." Get in left lane and proceed to first light. Turn left onto Park Drive. Follow Park Drive to lights (gas station on right corner) and cross Boylston Street and Brook-line Avenue. Stay left. At next set of lights, bear left fol-

Continued on page 12

Biographies

JOYCE P. FOSTER , PH. D.

Director of Academic Resources at Williams College, B.A. Psychology, M.Ed. Rehabilitation Administration, Northeastern University, A.M. & Ph.D. Social/Cultural Anthropology, Brown University

A Washington, D.C. native who attended public schools, Joyce Foster was the first in her family to pursue a college education. She describes herself as an educator with a demonstrated commitment to diversity, access, inclusive academic excellence and intercultural understanding. After years of varied full-time professional employment both in and outside of the academy, in 1997 she earned the doctorate in social/cultural anthropology from Brown University. She returned to Brown in 2000 as Associate (Academic) Dean of the College and Coordinator of the Mellon Mays Undergraduate Fellowship Program. Joyce assumed her current position as Director of Academic Resources at Williams College in 2005. Her responsibilities include coordination of several academic supports including the Math and Science Resource Center, the Peer Tutor and Peer Mentor Programs, Writing Workshop, Disability Support Services, and in collaboration with faculty co-coordinator of curricular resources including academic advising. Dr. Foster has over 20 years of experience as an administrator, grant writer, program developer/manager, assessment specialist, academic advisor, and undergraduate and graduate teacher in several liberal arts colleges/universities. She says, "My interest in higher education stems from my desire to be a part of the "transforming experience that makes a difference both on the level of the individual and of society."

Dr. Foster is convinced that innovation, experience, teacher expectation,

continued on page 6

Biographies

Continued from page 5

mentoring and role modeling affect student performance. She has collaboratively developed innovative educational programs for students and colleagues. She has secured and administered private foundation, federal and state grants to prepare students for undergraduate and graduate school success (i.e. Upward Bound, McNair Post-Baccalaureate Achievement, Student Support Services, Mellon Mays Undergraduate Fellowship Program, etc.).

Valerie Petit Wilson, Ph.D.

Associate Dean of the Graduate School at Brown University
B.S. Xavier University Ph.D. Biology, Johns Hopkins

Valerie Petit Wilson, Ph.D., is Associate Dean of the Graduate School at Brown University and the Executive Director of the Leadership Alliance. As Associate Dean, she is involved with a variety of efforts related to diversity, recruiting and professional development, and serves as liaison for ethics initiatives and the development of studies related to graduate training and completion. As Executive Director of the Leadership Alliance, she oversees a consortium of 33 leading research and teaching universities, historically black colleges and universities, and several institutions that primarily serve Hispanic and Native American students. The goal of the Leadership Alliance is to address primarily the relatively low participation of underrepresented racial and ethnic minorities in the academic areas as educators, leaders and decision makers (www.theleadershipalliance.org). Dr. Wilson was instrumental in the historic meeting of the university presidents of theLeadership Alliance schools held at the National Academy of Sciences on April 19, 2005. The purpose of the Leadership Alliance Presidential Forum was to examine trends and challenges to academic diversity at all levels. Presenters at this event included presidents of Brown, University of Maryland, Baltimore County, Tougaloo College, Princeton University, and the University of Pennsylvania. Wilson is also a Clinical Professor of Community Health in the Program of Public Health and Public Policy, where she teaches Environmental Ethics.

From 1998 to mid- 2003, Dr Wilson was Deputy Director of the Center for Bioenvironmental Research (CBR) at Tulane and Xavier Universities and Clinical Professor of Environmental Health Sciences, Tulane School of Public Health and Tropical Medicine. Prior to this, Dr. Wilson served as Director of the Division of Health Sciences Policy, Institute of Medicine, National Academy of Sciences, in Washington D.C. from 1993-1997 after a distinguished research and administrative career in the Federal government in numerous research and policy positions. She is the recipient of awards from the Department of Health and Human Services, the National Academy of Sciences, and has been elected the Delta Omega Public Health honor society and is listed in American Men and Women of Science and Who's Who Among African Americans.

Dr. Wilson received her BS in Chemistry from Xavier University of Louisiana and her Ph.D. in Molecular Biology from Johns Hopkins University, where she was the first African-American woman to earn a PhD from this department.

Drs. Foster and Wilson's talk at the Northeastern Section of the American Chemical Society in conjunction with NOBCChe in honor of Black History Month is entitled: "Mentoring Matters Across the Diverse Populations in the Academy: or How to Be an Active and Effective Student-Focused Agent in the Transformation of the American Academy". ◇

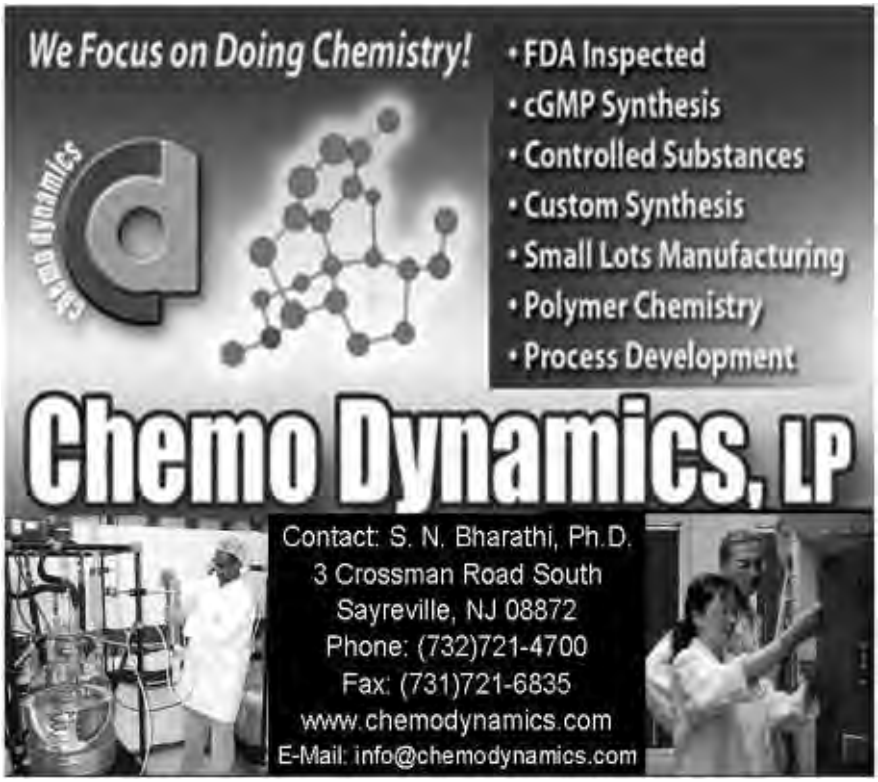
Abstract

"Mentoring Matters across the Diverse Populations in the Academy: or How to Be an Active and Effective Student-Focused Agent in the Transformation of the American Academy".

Mentoring is a core component of successful post-secondary achievement for all students, but perhaps moreso for those from underrepresented groups in the academy. This session highlights programmatic and academic leadership innovations that combine curriculum accessibility, civic engagement, and comprehensive mentoring to enhance student success. The mentoring experience incorporates a wide range of activities and is a very complex relationship. Mentors assume many roles. They are advisors, and people with career experience willing to share their knowledge. They are tutors, people who give special feedback on one's academic performance. They are supporters, people who give emotional and moral encouragement. They are sponsors, sources of information about and aid in obtaining opportunity. They are models of identity representing the kind of person one should be to be an academic. Because Mentoring Matters across the diverse populations in the academy, Dr. Joyce P. Foster and Dr. Valerie Petit Wilson's talk is organized in three parts: 1. Organizational structure/context; 2. Philosophy of mentoring and support; and 3. Challenges and Opportunities. They will share several mentoring practices that have been successfully integrated into the institutional culture of rewards and recognitions on selected campuses. ◇

Looking for seminars in the Boston area?

Check out the
NESACS Calendar
www.nesacs.org/seminars



February Historical Events In Chemistry

by Leopold May
The Catholic University of America, Washington, DC

February 2, 1566
Michał Sędziwój (Michael Sendivogius), an alchemist, was born on this date. He discovered that air is not a single substance and contains a life-giving substance. He identified this 'food of life' with the gas given off by heating nitre (saltpetre) and developed methods for isolating and purifying various acids, metals and other chemical compounds.

February 5, 1872
Lafayette Benedict Mendel, who made discoveries concerning the value of vitamins and proteins, was born on this date. Thomas Osborne and he established the modern concepts of nutrition. He discovered vitamins A (co-discoverer, Elmer McCollum) and B complex.

February 7, 1864
John A. R. Newlands published his first paper on this date on his law of octaves showing that in order of increasing atomic weights of the element, the properties repeated with every 8th element.

February 10, 1846
Ira Remsen, who was a founder of *American Chemical Journal*, was born on this date. He was a researcher in organic chemistry and co-synthesizer of saccharin.

February 12, 1785
Pierre L. DuLong, who was born on this date, discovered the law of constancy of atomic heat (DuLong & Petit) in 1819, and nitrogen trichloride in 1813. He did research on refractive indices and specific heats of gases and suggested that acids were compounds of hydrogen in 1815. He also devised a formula for heat value of fuels (DuLong Formula) that is still used today.

February 16, 1886
Robert R. Williams, Jr., a member of the Hall of Fame of Inventors for the "Process for Obtaining Vitamins", was born on this date. He was a telephone company researcher who in his spare time developed ways to synthesize vitamins, isolated thiamine in crystalline form in 1933, and synthesized vitamin B1.

February 18, 1799
Ferdinand Reich, who co-discovered indium with Hieronymus T. Richter in 1863, was born on this date.

February 19, 1859
Svante A. Arrhenius, who was born on this date, devised a theory of electrolytic dissociation and did research in viscosity and reaction rates. He received the Nobel Prize in 1903 in recognition of the extraordinary services he had rendered to the advancement of chemistry by his electrolytic theory of dissociation.

February 22, 1828
Frederich Wöhler in a letter to Jöns J. Berzelius, announced the synthesis of urea from ammonium cyanate, asking whether this is a true synthesis of organic from inorganic material.

February 24, 1783
Two hundred and twenty years ago, John Gorham was born. He was the author of an early American text, *Elements of Chemical Science*.

February 27, 1869
Alice Hamilton, who was the first woman professor at Harvard Medical School, was born on this day. She researched toxic substances in the workplace. ◇

The October NESACS Monthly Meeting

Hill Award Presentation and Recognition of 50-year Members

Photos by Morton Z. Hoffman

Tony Hill, son of Henry Hill

The October meeting is the Professional Relations Meeting and, traditionally honors the Henry A. Hill awardee and recognizes 50-year members of the American Chemical Society who reside in the Northeastern Section. This year's meeting was held on October 18, 2007 at UMass Boston and was attended by approximately 40 members. Ruth Tanner received the Henry Hill Award for Outstanding Service to the Northeastern Section for 2007. The award was then presented by NESACS Chair, Mukund Chorghade. Ruth has served the section with great distinction for many years as Chair of the Education Committee and she is a major driving force behind a number of the most significant NESACS initiatives involving students from high school through graduate school.

The featured event of the evening was an entertaining talk by Mukund, President of Chorghade Enterprises/THINQ Pharma entitled, "Progression of a drug from test tube to clinic: A personal adventure."

Another highlight of the October meeting is the recognition of the 50-year members. This year thirty-two members were honored as 50-year members. Of particular note was the beautiful roses presented to Mary Burgess for reaching her 60th anniversary as an ACS member. The following 50-year members were honored:

Ruth Tanner (University of Massachusetts Lowell), receiving the Henry Hill Award for Outstanding Service to the Northeastern Section from Michael Dube (Chair, Hill Award Committee), at right, and Mukund Chorghade, NESACS Chair

Robert J. Allen	Edward W. Merrill
Joseph A. Baglio	Richard A. Meyer
Frank D. Brako	G. J. O'Neil
Sam S. Brody	Joseph S. Panto
Ralph D. Cole	Alfred S. Panto
L. W. Duncan	Alfred Prock
Jerzy Engel	Charles P. Riley, Jr.
Louis L. Gershman	James F. Riordan
William B. Glen	John L. Roebber
Leon E. Granahan	Ronald H. Rogstad
William J. Holloway	Alexander D. Shaw
Albert W. Horlbeck	Louis Shuster
James F. Hornig	Augustine Silveira
George L. Innes	Per Sten Stensby
Martin Isaks	Donald L. Towns
Lee A. Johnson	David L. Williams
Ihor Kocur	Mary Burgess - 60-years

60-Year Member and long-time NESACS Board Member and Chair of the Hospitality committee, Mary Burgess, with NESACS Chair Elect (L), Marietta Schwartz, and NESACS Chair Mukund Chorghade (R)

Henry Hill's wife, Adelaide Cromwell was in attendance along with her son, Anthony Cromwell Hill. Tony spoke in remembrance of his father and about the Henry Hill Award. The award then presented by Mukund Chorghade and Michael Dube, Chair of the Hill Award Committee.

-MPF ◇

Summer Scholar Report

Preparation of photo-reactive analogs of an inverse agonist of the glucagon-like peptide-1 receptor

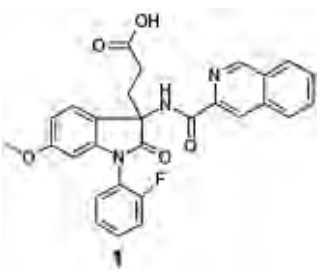
Margaret W. Thompson and David R. Haines
Department of Chemistry, Wellesley College, Wellesley, MA 02481

Introduction

With the current rise in obesity, type 2 (adult-onset) diabetes is plaguing Americans in record numbers.[1] The glucagon-like peptide 1 (GLP-1) and its membrane-bound receptor, GLP-1R, play an important role in the insulin induction pathway and have been considered as potential therapeutic targets for the treatment of diabetes. When food is ingested, the L cells of the intestine release and activate GLP-1. This thirty amino acid peptide hormone travels through the bloodstream to the β cells of the pancreas where it binds to GLP-1R.[2] This binding event signals the cell to release stored insulin and to begin producing more insulin.[3] Some patients with type 2 diabetes mellitus have a failure in this pathway, so that they produce insufficient functional insulin to mediate the uptake of glucose into their cells. By understanding the relationship between the structure and function of GLP-1R, drugs can be designed that exploit the specific chemical interactions in order to optimize insulin production.

A small, non-peptidic drug that was initially developed as a treatment for pancreatitis, T-0632 (**1**), has been shown to bind well to GLP-1R in a site in the receptor proximal to, but distinct from the binding site of GLP-1.[4]

compound 1



Because of its strong receptor binding near the active site, characteristic of an inverse agonist, T-0632 is being considered as a potential delivery system for drugs that can stimulate the body to produce more insulin. To exploit T-0632's binding to GLP-1R to create the most effective therapeutics, it is important to understand how T-0632 is oriented within the receptor. A series of aryl azide analogs of T-0632 has been designed that will help define which regions of T-0632 interact with which regions of GLP-1R (Figure 1).

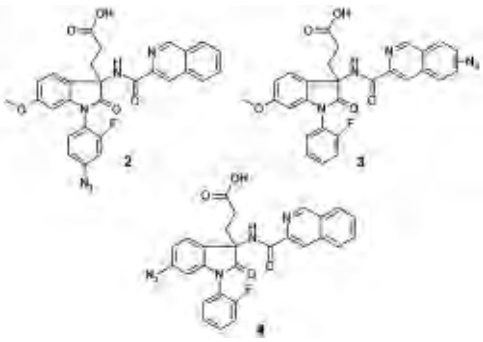


Figure 1. *Aryl azide analogs of T-0632*

These analogs can be incubated with the receptor and allowed to bind to it. Upon flash photolysis, the azide group is converted to a reactive nitrene species that will insert-into nearby bonds.[5] The modified GLP-1R, covalently bonded to the T-0632 analog can be purified, digested with a restriction enzyme, and the fragments analyzed by MALDI-TOF MS. Based on the known activity of the protease, the masses of the fragments of GLP-1R can be predicted, and the observed fragments identified. Comparison of the MALDI-TOF data for the digestion of GLP-1R with that of the modified receptor will indicate with which residues T-0632 interacts.

The standard synthesis of T-0632 has been modified to include mild methods of incorporating an additional primary amine that can later be converted into the azide using the methods described by Carroll and co-workers.[6] The primary amine was selectively protected throughout the synthesis to prevent cross reactivity. The work focused on the synthesis of N-(3-methoxyphenyl)-2-fluoro-4-nitroaniline (**5**), the first step in creating each of the analogs.

Results and Discussion

In the nucleophilic aromatic substitution method, the nucleophilic amino group of m-anisidine attacks 1,2-difluoro-4-nitrobenzene to produce **5** in one step after purification by flash chromatography and recrystallization (Figure 2).

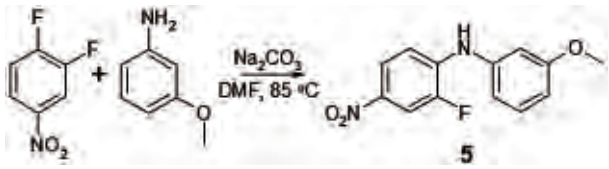


Figure 2. *Nucleophilic aromatic substitution by m-anisidine onto 1,2-difluoro-4-nitrobenzene.*

Although 1,2-difluoro-4-nitrobenzene has two potential leaving groups, the attack is directed, with great selectivity, to the carbon para to the nitro group.

Compound **5** is a precursor for T-0632 and all of the desired aryl azide analogs of interest because the nitro group can be reduced to a primary amine and then removed or protected. The nitro group of compound **5** was reduced with palladium on carbon in ethanol under hydrogen gas as described by Davey and co-workers (Figure 3).[7]

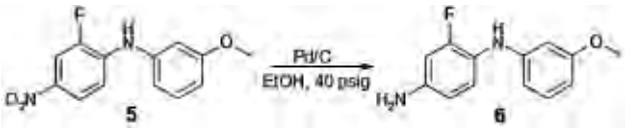


Figure 3. *Reduction of the nitro group of the substituted diphenyl amine.*

Unmodified T-0632 and two of the desired analogs do not have an azide group on the aromatic ring with the fluoride group. For these compounds, isoamyl nitrite in DMF was used to diazotize and reduce the primary amine of compound **7** in one step in a modification the work of Doyle and colleagues (Figure 4).[8]

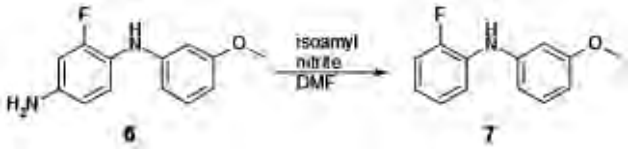


Figure 4. *Removal of the primary amine.*

To prepare T-0632 analog **2** with the azide group on the same ring as the fluoride, the primary amine must be protected until it is converted into an azide in the final step of the synthesis. Choosing the proper protecting group is difficult because the standard procedure for making T-0632 involves acidic solutions, basic solutions, and reduction by catalytic hydrogenation.[9, 10] A benzyl carbamate group was chosen as a transient protecting group because it is stable to both acids and bases, both of which are used to form the isatin intermediate in the next steps, and other protecting groups will be added as needed in subsequent steps of the synthesis. The combined reduction and protection procedure was adapted from Renslo and co-workers.[11] Compound **5** was reduced with iron in an ethanol-water mixture with ammonium chloride, and without purification the product was stirred with benzyl chloroformate and pyridine to yield the desired benzyl carbamate-protected diphenyl amine **8** (Figure 5).

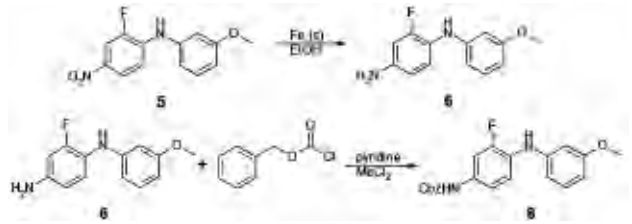


Figure 5. *Reduction to and benzyl carbamate protection of the primary amine.*

Future Directions

The synthesis of T-0632 analog **2** will be completed following the procedure developed by Yamada and co-workers and modified by Kim and Haines.[9,10] The aryl azide precursor will be converted into the azide, and the analog will be cross-linked to GLP-1R. After receptor purification and enzymatic digestion, fragment masses will be used to orient T-0632, and its fluoride-containing ring in particular, within the receptor.

Experimental

Synthesis of N-(3-methoxyphenyl)-2-fluoro-4-nitroaniline (5)

1,2-Difluoro-4-nitrobenzene (6.59 mL, 60 mmol), m-anisidine (10.06 mL, 90 mmol), and sodium carbonate (6.36 g, 60 mmol) were dissolved in DMF (10 mL) and stirred at 85 °C for 50 h. The dark yellow-green liquid was washed with aqueous hydrochloric acid (5 %, 45 mL). The aqueous layer was extracted with dichloromethane (3 x 60 mL). The organic layers were combined and dried with sodium sulfate. After separation by gravity column chromatography (70-100 % dichloromethane in hexanes, 0-20 % methanol in dichloromethane) and recrystallization from ethanol-water, 8.22 g (37.9 mmol, 63 % yield) of orange, needle-shaped crystals of 2-[amino-(3-methoxyphenyl)]-1-fluoro-3-nitrobenzene were produced. Mp: 110-112 °C. GC-MS: M+ 217. ^{1}H NMR ($CDCl_3$): δ 8.0 (m, 1 or 2 H), 7.26 (m, 3 H), 6.78 (m, 2 H), 6.35 (s, 1 H), 3.85 (s, 3 H).

Synthesis of N-(3-methoxyphenyl)-4-amino-2-fluoroaniline (6)[7]

The 2-[amino-(3-methoxyphenyl)] -1-fluoro-3-nitrobenzene was dissolved in absolute ethanol (138 mL) with 5 % palladium on carbon (1.38 g) and shaken under 40 psig of hydrogen gas for 2 h. The solution was filtered through a glass frit, and the solvent was removed to yield a dark purple oil that was >95 % pure by GC-MS. The 4-[amino-(3-methoxyphenyl)]-3-fluoroaniline yielded 6.92 g (29.8 mmol, 78 % yield) GC-MS: M+ 232. ^{1}H NMR ($CDCl_3$): δ 7.1 (m, 2 H), 6.45 (m, 4 H), 5.4 (s, 1 H), 3.85 (s, 3 H), 3.6 (s, 1 H).

Synthesis of 2-[amino-(3-methoxyphenyl)]-1-fluorobenzene (7)[8]

Isoamyl nitrite (2.15 mL, 16 mmol) was dissolved in DMF (21 mL) and heated to 55 °C. The 4-[amino-(3-methoxyphenyl)]-3-fluoroaniline (2.26 g, 9.7 mmol) was dissolved in DMF (25 mL) and added slowly to the isoamyl nitrite solution. Bubbles evolved upon addition of the fluoroaniline, and the solution was stirred at 55 °C until the bubbles ceased. The solution was cooled to room temperature and washed with aqueous hydrochloric acid (7 %, 70 mL). The aqueous layer was extracted with diethyl ether (3 x 60 mL). The organic layers were combined, and the aqueous layer was neutralized with aqueous sodium hydroxide (5 %) and re-extracted with diethyl ether (3 x 40 mL). GC-MS: M+ 217. ^{1}H NMR ($CDCl_3$): δ 7.50 (dd, 1 H), 7.30 (m, 2 H), 7.15 (m, 2 H), 6.85 (m, 2 H), 6.65 (dd, 1 H), 5.80 (s, 1 H), 3.90 (s, 3 H).

Synthesis of N-(3-methoxyphenyl)-4-(benzyl carbamate)-amino-2-fluoroaniline (8) [11]

Compound **5** (1.70 g, 6.49 mmol) was dissolved in 68 mL of a 2:1 ethanol-water mixture with ammonium chloride (3.44 g, 64.2 mmol) and brought to reflux. Iron powder (1.08 g, 19.3 mmol) was added in 5 increments over one hour. The mixture heated at reflux for another 90 min, cooled to room temperature, and filtered to remove iron

Continued on page 12

Book Review

Continued from page 4

of obscure food items and recipe optimization ("the small nuances of how to improve a particular recipe or tweak an ingredient to bring out its fullest potential", to quote one of them) they long for, while some scientists will look down their noses dismissively at what one person derided as its third grade presentation of science (though personally, I would be thrilled to think that American third-graders – let alone members of the general public – are learning about osmotic pressure, how differing molecular structures determine the properties of different classes of carbohydrates, or the difference between hemoglobin and oxyhemoglobin, but that's just me!). So, it is true that *What Einstein Told His Cook* is neither high-end science nor *cordon bleu* cuisine, but I found it enjoyable – a kind of hors d'oeuvre selection that I could pick through at leisure, knowing that I would learn a thing of two while smiling at Wolke's wit. As G.K. Chesterton once said that, "If a thing is worth doing, it's worth doing badly," though in no way has Wolke done it badly.

I never did find out what Einstein told his cook, although, since he once did assert that "Nothing will benefit human health and increase the chances for survival of life on Earth as much as the evolution to a vegetarian diet", it may be that he might perhaps have advised her to skip chapter 7 ("A Carnival For Carnivores").

All in all, *What Einstein Told His Cook* made enjoyable light reading, and you might consider reading it yourself, and perhaps recommending it to a nonscientist friend who might otherwise be put off by the prospect of actually reading a book that deals with chemistry. ◇

Summer Scholar

Continued from page 11

oxide. The mixture was concentrated *in vacuo* to remove ethanol and extracted with ethyl acetate (3 x 40 mL). The combined organic layers were washed with brine (40 mL) and dried over magnesium sulfate. The crude amine was dissolved in dichloromethane (60 mL) with pyridine (1.48 mL, 18.3 mmol) and cooled to 0 °C. Benzyl chloroformate (1.45 mL, 10.3 mmol) was added and the mixture stirred for 30 min at 0 °C and 30 min at room temperature. The reaction mixture was washed with water (50 mL), dried over magnesium sulfate, and concentrated. The resulting oil was triturated with hexanes, and the product was purified with flash chromatography (100 % dichloromethane) to yield N-(3-methoxyphenyl)-4-(benzyl carbamate)-amino-2-fluoroaniline (2.36 g, 6.44 mmol, 99 % yield). GC-MS M+ 258. ^{1}H NMR ($CDCl_3$): δ 7.40 (m, 5 H), 7.15 (dd, 1 H), 6.92 (d, 2 H), 6.55 (m, 4 H), 5.60 (s, 1 H), 3.85 (s, 3 H).

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Acknowledgments

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Monthly Meeting

Continued from page 5

lowing "Fenway" sign to reverse direction. At light, continue straight, crossing Brookline Avenue again. You will be on "The Fenway." Turn right onto Avenue Louis Pasteur after Emmanuel College. The Simmons library is on left. Passengers may be dropped off here. After the library, take the first driveway on the left into the parking area.

Parking: Due to construction, on-campus parking is extremely limited. Please use public transportation if possible. If you need to drive, please contact Marilou Cashman (800-872-2054) at least one day in advance of the meeting. She will forward a list of guests who require parking to the Simmons Chemistry Dept. ◇

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Nominations Wanted

The Middle Atlantic Regional Meeting (MARM) is requesting nominations for the 2008 E. Emmet Reid award for outstanding teaching at a small college. The awardee must teach chemistry or the chemical sciences at a non-Ph.D. granting institution located in the Middle Atlantic Region. Completed nomination packages are due by March 1, 2008 and should be sent to:

Dr. Mihaela D. Bojin
Department of Chemistry
Queensborough Community College
222-05 56th Avenue
Bayside, NY, 11364
Phone: 718-281-5615
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A more detailed description of the selection process and criteria is available from Dr. Bojin. ◇

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Feb 04
Merck Lecture
Paul Clemons (The Broad Institute of Harvard & MIT)
Harvard Univ., Pfizer Lecture Hall
3:30 pm

Mark Goulet (Merck)
Harvard Univ., Pfizer Lecture Hall
4:30 pm

Feb 05
Prof. Joel Schneider (Univ. Delaware)
"De Novo Design of Peptide Materials"
Boston College, Merkert 130
4:00 pm

Dr. Alan Packard (Children's Hospital/Harvard Med School)
TBA
University of New Hampshire, Iddles Room L103
11:10 am

Feb 06:
Dr. Richard Porter (Porter Thermometer Museum)
"Thermometers, a History"
UMass Dartmouth, Building Group II, Room 115
4:00 pm

Clifford Kubiak (Univ. California, San Diego)
TBA
MIT, Room 6-120
4:00 pm

Feb 07
Professor Jin Z. Zhang (Univ. California, Santa Cruz)
"Novel Optical and Dynamic Properties and Emerging Applications of Nanomaterials"
Boston College, Merkert 130
4:00 pm

George Schatz
TBA
Harvard Univ., Pfizer Lecture Hall
5:00 pm

Feb 11
Mohammad Movassaghi (MIT)
"Cascade Reactions in Complex Alkaloid Synthesis"
Boston University, Life Science and Engineering Building Auditorium (B01),
4:00 pm

Feb. 12
Roald Hoffmann (Cornell Univ.)
TBA
University of New Hampshire, Iddles Room L103
11:10 am

Feb. 13
Dr. Fred Wudl (UCSB)
Univ. New Hampshire, Iddles Lecture Series
1 pm MUB Theater 2
4 pm MUB Theater 1

Dr. Morris Robins (Brigham Young Univ.)
TBA
Northeastern Univ. 129 Hurtig Hall
12 noon

Dr. Yi Sun (BB Tech, Dartmouth, MA)
TBA
UMass Dartmouth, Building Group II, Room 115
4:00 pm

Feb 14
Darrell G. Schlom (Penn. State Univ.)
TBA
Harvard Univ., Pfizer Lecture Hall
4:00 pm

Feb. 19
Prof. Ray Fort, Jr. (Univ. of Maine Orono)
"Exploring the Chemistry of Hemicelluloses"
University of New Hampshire, Iddles Room L103
11:10 am

Feb 20
Dr. Rich Dluhy (Univ. Georgia)
TBA
Northeastern Univ., 129 Hurtig Hall
12 noon

Dr. Barry Snider (Brandeis)
TBA
UMass Dartmouth, Building Group II, Room 115
4:00 pm

Feb 21
Prof. J. Daniel Gezelter (Notre Dame)
"Rippled Membranes and Imaginary Ice: Surprise From Molecular Dynamics"
Boston College, Merkert 130
4:00 pm

Feb 26
Prof. Maureen A. Fagan (Smith College)
"Synthesis and Reactivity of Palladium Enolate Complexes"
University of New Hampshire, Iddles Room L103
11:10 am

Feb 27
Dr. Sunny Zhou (Northeastern Univ)
TBA
Northeastern Univ., 129 Hurtig Hall
12 noon

Dr. Richard W. Vachet (UMass Amherst)
"Cu(II)-induced Amyloid Formation of Beta-2-Microglobulin Studied by Mass Spectrometry".
UMass Dartmouth, Building Group II, Room 115
4:00 pm

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