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NESACS

THE NUCLEUS

January 2013 *Vol. XCI, No. 5*

Monthly Meeting

At Boston University School of Medicine Allen Steere M.D., Harvard Medical School and Massachusetts General Hospital to speak

2013 Chair's Statement

By Liming Shao

A Simple Guide to Vendor Shows

By Kenneth Drew, Flamma USA

Connections to Chemistry 2012

By Marietta Schwartz with photos by Morton Z. Hoffman

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Cover: *The cover photo was taken at the Connections to Chemistry 2012 Meeting held at Burlington High School. Pictured are Keynote Speaker Robert Langer of the Massachusetts Institute of Technology and NESACS Education Chair, Marietta Schwartz of UMass Boston. (Photo by Morton Z. Hoffman)*

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THE NUCLEUS

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Informex? CPhI? ChemOutsourcing? DCAT? A Simple Guide to Vendor Shows

By Kenneth Drew, Ph.D., Flamma USA

A meeting like Informex or CPhI does not bring significant academic value to the scientific world, but they are not designed to do so. These meetings are specifically addressed to the industrial world of pharmaceutical and biotech companies. They allow a variety of people to interact and find the appropriate services and/or equipment to make their drug development proceed smoothly.

Whether you work for a small virtual company, a mid-sized biotech, or Big Pharma, you will find significance in these meetings. These shows have considerable importance for those who suddenly find themselves in charge of outsourcing either medicinal chemistry projects, small-scale kilo work, early-stage cGMP materials, or later-stage compounds that require commercial manufacturing. This includes the potential need to have secondary suppliers.

At these meetings, you will be able to meet with numerous vendors who are looking to introduce their company to your company and help provide you with the information that you require to make an informed decision. Best of all, you can do this at one location and provide important time and financial savings for you and your company. If properly planned in advance, you will have two to three full and productive days. Bear in mind, locally scheduled meetings offer more flexibility for scheduling informational meetings that, if desired, can be stretched into more detailed discussions of a vendor's services and offerings. With that said, quick 15-25 minute meetings at these shows can be very beneficial.

Informex

Informex was originally the idea of SOCMA (Society of Chemical Manufacturers and Affiliates). It began in 1985 in Atlanta as a way to allow vendors to interact with those needing pharmaceutical services. From its humble beginnings, Informex has grown into an event that brings over 500 vendors to one location to peddle their materials and services to the pharma world *(Editor's note: and the custom chemical manufacturing world in general)* with an attendance that tops 4,000. Companies from Asia, North America and Europe are well-represented at Informex.

Typically held in early February, the event moves around the USA. Its

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Monthly Meeting

The 929th Meeting of the Northeastern Section of the American Chemical Society

Thursday, January 10, 2013

Boston University School of Medicine
Hiebert Lounge,14th Floor, 72 East Concord Street, Boston, MA 02115

4:00 pm Annual Meeting

5:30 pm Social Hour

6:30 pm Dinner

7:45pm Meeting:
Dr. Liming Shao, NESACS Chair, Presiding
Speaker: Allen C. Steere, MD
Professor of Medicine, Harvard Medical School
Director of Translational Research in Rheumatology, Massachusetts General Hospital
Title: The Elucidation of Lyme Disease

Dinner Reservations should be made no later than 12:00 noon, Thursday, January 3rd. Reservations are to be made using PayPal services. Use the following link to log on to PayPal. http://acssymposium.com/paypal.html . Select pay with credit or debit card option and follow the additional instructions on the page. Members, $30; Non-members, $35; Retirees, $18; Students, $10. Reservations not canceled at least 24 hours in advance must be paid. For questions concerning reservations, please contact Anna Singer between 9am and 9 pm at phone/fax (781 272-1966) or email at secretary@nesacs.org .

Directions to Boston University School of Medicine:
http://www.bumc.bu.edu/about/map-directions/

By public transportation: Detailed directions are available at the link above.
From the West: Take the Massachusetts Turnpike (Route 90) East to the end. Take Expressway South (Route 93). Take Exit 18 (Mass Ave).
From the North or South: Take Route 93 to Exit 18 (Mass Ave).

Parking: Paid parking is available at the Albany Street Parking Garage, located at 710 Albany St. Free on street parking is available after 6 pm. ◇

Abstract

Lyme disease is a growing problem, particularly in the northeastern United States. The strains of *Borrelia burgdorferi* that cause the infection there are particularly arthritogenic. In genetically susceptible individuals, arthritis may persist after spirochetal killing with antibiotics. This is termed antibiotic-refractory Lyme arthritis. Infection-induced autoimmunity is thought to play a role in this outcome. However, identification of pathogenic autoantigens has been a great challenge. In collaboration with Dr. Catherine Costello, HLA-DR-presented peptides from patients' synovia were identified using tandem mass spectrometry, synthesized, and reacted with the matching patient's peripheral blood mononuclear cells. In this way, endothelial cell growth factor (ECGF) was recently identified as the first known autoantigen to induce T and B cell responses in a subset of patients with Lyme disease, particularly those with antibiotic-refractory arthritis. ◇

ACS Election

Congratulations to Thomas Gilbert

Thomas R. Gilbert, an Associate Professor of Chemistry and Chemical Biology at Northeastern University and a member of the Northeastern Section, has been elected to the ACS Board of Directors. The ACS Board of Directors administers all the affairs of the Society, including its funds and property. The Board is composed of the President, the President-Elect, the most recent Past President (all *ex officio*), six Directors-at-Large, and six District Directors, one elected from each of six geographical Districts. Dr. Gilbert won election to the Board as the Director for District I, which includes the Northeastern Section plus 20 other local Sections in New England, New York and Pennsylvania.

Tom has been a member of the ACS and the Northeastern Section since 1968. He has served in various capacities in the NESACS. Among these have been the Chair of the Nominations Committee, Chair of the Analytical Group, and member of the Long Range Planning Committee. In 1988, he served as Chair of the Section. He has represented the Section on the ACS Council since 1989.

He has engaged in extensive ACS activities, serving as Vice Chair of the Council Policy Committee and Chair of its Long Range Planning Subcommittee. He was Vice Chair of the Committee on Nominations and Elections, Chair of the Committee on Meetings and Expositions, Chair of the Task Force on Election Procedures, and a member of the Board of Directors International Strategy Implementation Task Force, the ACS Fellows Presidential Task Force, and the ACS Awards Review Committee. He was General Chair of the 23rd Northeast Regional ACS Meeting.

Tom has published 45 journal articles, is senior author of a general chemistry textbook now in its 3rd edition, and holds three patents.

Congratulations to Dr. Thomas

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2013 Chair's Statement

by Liming Shao, Liming Shao@comcast.net

Happy New Year! Greetings to NESACS's 7,500 members.

It is my great honor to have the opportunity to serve you this year as Chair of the Northeastern Section of the ACS (NESACS). NESACS has a long and rich history and is one of the largest and most influential sections of American Chemical Society. The Section's base covers many academic institutions and a broad range of chemical, pharmaceutical and biotech companies. The diversity of the people and the organization make this chemistry community dynamic and vibrant.

I would like to take this opportunity to thank the outgoing Chair of the section, Prof. Ruth Tanner, for her dedication, leadership and excellent service to the Section.

In 2013 as Chair, I will concentrate on four priorities:

1. ***Expanding Cross-functional Collaborations***. My goal for NESACS is to expand the amount of cross-functional activity in NESACS between different NESACS groups [Medicinal Chemistry Group, YCC(Younger Chemists Committee), Continuing Education, Government Relations and Chemical Education] For example, local medicinal chemists of the MCG could be encouraged to support the Chemical Education group by making trips to local high schools for outreach; YCC could take more responsibility for organizing the annual celebration of the 50- and 60- year members.

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Applications Open for ACS Scholars

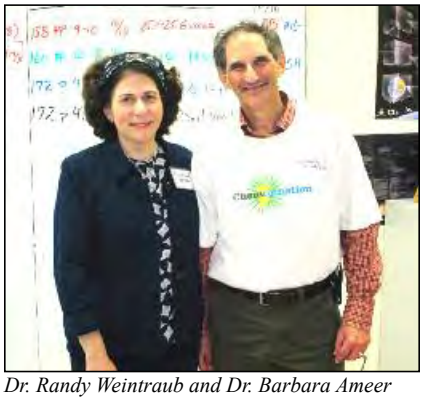
The ACS Scholars Program is now accepting online applications for awards beginning with the 2013-2014 academic year. The program is targeted at minority groups considered by NSF to be underrepresented in the sciences. It is open to graduating high school seniors, college freshmen, sophomores, and juniors majoring in a chemical science. Go to <www.acs.org/scholars> for complete information and the link to the application. Potential applicants can also call 202-872-6250 or send an email to <scholars@acs.org>. The application deadline is **March 1, 2013**. ◇

Apply Now to Participate in 2013 Project SEED

Applications are now being accepted to participate in the 2013 ACS Project SEED Program, which places economically disadvantaged high school students in academic, industrial, and governmental research laboratories during the summer. Under the supervision of volunteer scientists, students work on projects that expose them to the chemistry research environment. For additional information, visit the Project SEED website at <www.acs.org/projectseed>. If you have any questions, please e-mail <projectseed@acs.org> or call 800-227-5558, ext. 4380 (toll-free), or 202-872-4380. The application deadline is **January 31, 2013**. ◇

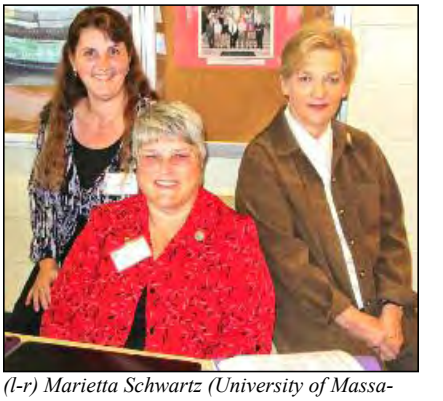
Connections to Chemistry 2012

By Marietta Schwartz, UMass-Boston (Photos by Morton Z. Hoffman)



Dr. Randy Weintraub and Dr. Barbara Ameer

David Sittenfeld and Karine Thate of the Museum of Science



(l-r) Marietta Schwartz (University of Massachusetts Boston), NESACS Education Committee Chair; Anna Singer, NESACS Administrative Secretary; Ruth Tanner (University of Massachusetts Lowell), NESACS Chair

The Thirteenth Annual Connections to Chemistry program took place at Burlington High School (Burlington, MA) on Thursday, October 18th, 2012. The program is aimed at connecting high school chemistry teachers with the educational resources of the American Chemical Society. Each registrant participated in two of four different workshops, which included presentations on "Using a Smartpen in Your Classroom: Inexpensive Technology with Positive Impact on Student Learning" (given by Mr. Alan Crosby, Newton South High School), a National Chemistry Week themed workshop on "Nano in the Museum: Opportunities and Resources for Chemistry Educators" (presented by David Sittenfeld and Karine Thate of the Boston Museum of Science), another National Chemistry Week themed workshop on "There's Plenty of Room at the Bottom: Nanotechnology" (offered by Dr. Frank Tsung and students, Boston College) and a workshop on "Chemagination!" (given by Dr. Randy Weintraub and Dr. Barbara Ameer). Over 50 registrants attended.

The participants were welcomed by Marietta Schwartz, Connections Program Chair and Chair of the NESACS Education Committee, and by Peter Nassiff, Head of the Science Department at Burlington High School.

Following the workshops and dinner (highlighted by the traditional baked apples with caramel sauce), the keynote address was given by Dr. Langer. His talk, entitled "*Biomaterials and biotechnology: From the discovery of the first angiogenesis inhibitors to the development of controlled drug delivery systems and the foundation of tissue engineering,*" gave an overview of his work in chemical engineering as applied to medical problems, including biodegradable polymers and tissue engineering. His address was followed by the traditional raffle of American Chemical Society items.

All of the participants received a one year's subscription to ChemMatters, an award–winning magazine for high school chemistry, published by the ACS. Participants also received copies of the *Journal of Chemical Education*, *Chemical & Engineering News*, and *The Nucleus*. ◇

Dr. Frank Tsung during his workshop

Alan Crosby of Newton South High School

THE COMMITTEE ON CHEMICAL ABSTRACTS (CCAS) WANTS YOUR FEEDBACK

Visit our page on ACS Network:
https://communities.acs.org/groups/chemical-abstracts-service-committee
or contact Michael Filosa with any suggestions at filosam@verizon.net

What exactly goes on at NESACS' monthly Board meetings?
www.nesacs.org/reports

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Summer Scholar Report

Ruthenium-Catalyzed Brook Rearrangements for the Rapid Synthesis of Complex Small Molecules

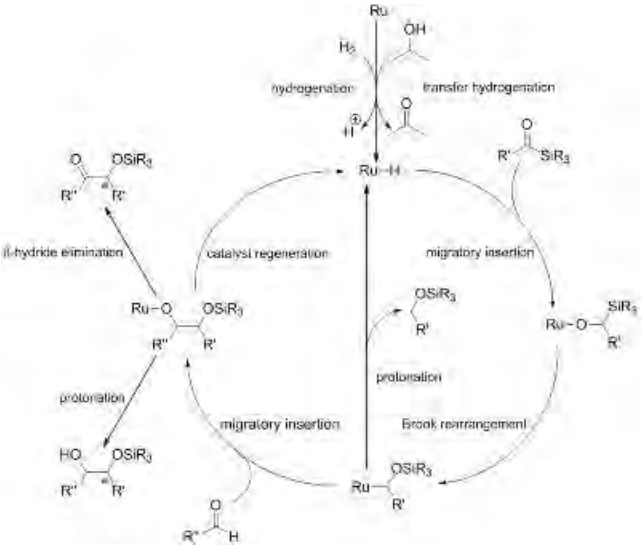
Benjamin R. Reiner, Michael K. Wojnar, Carolyn A. Heusser, and Dr. Jeffery A. Byers
Department of Chemistry, Boston College, Chestnut Hill, MA

Introduction

"Green" chemistry and atom efficient transformations have garnered increased attention with the reemergence of global climate concerns. Efficient access to and facile derivatization of small complex molecules continues to be an important facet of synthetic organic chemistry. The Brook rearrangement, discovered and studied by Adrian Brook in the 1960's and 70's, provides an unconventional mode for coupling chemistry. Generally initiated by the addition of a nucleophile to a carbonyl, a Brook rearrangement is a silyl group migration from carbon to oxygen. The nucleophile is usually a Grignard or organolithium reagent. The rearrangement is thermodynamically driven and proceeds with high stereochemical fidelity[1]. Anion relay chemistry (ARC) developed by Amos Smith III capitalizes on the mechanism of the Brook rearrangement, employing aldehydes and epoxides to trap the carbanion generated by the Brook rearrangement[2]. The concurrent formation of a C-C bond and a protected alcohol make this a compelling strategy for the rapid assembly of small complex molecules.

While the use of the traditional Brook rearrangement provides a powerful method for small molecule synthesis, it has several important drawbacks. The stoichiometric use of strong bases such as Grignards and alkyl lithiums can racemize chiral centers α to the carbonyl of an acyl silane substrate. HMPA, a harsh and carcinogenic solvent, is often used to further promote the rearrangement by forming a more reactive alkoxide through the ligation of lithium counterions. Furthermore, the reactivity of a lithiated carbanion is limited to electrophiles such as aldehydes and epoxides. It is also notoriously difficult to control the stereochemistry of the subsequent reaction without the use of a chiral auxiliary. A significant improvement to this method could be the use of a transition metal instead of an organolithium reagent. The absence of strong Lewis bases and harsh solvents presents a more tolerant reaction. Ruthenium-alkyl bonds exhibit unique reactivity and widen the scope of coupling partners to potentially include non-traditional electrophiles, such as olefins. Finally, the stereochemistry of the transformation can be controlled by chirality around the metal center. We envision a catalytic cycle as the one shown in Scheme 1, which illustrates a possible synthesis of benzoin and pinacol condensation type products. Such structural motifs are synthetically valuable building blocks, in addition to being common to natural products. Enantio-enriched variants of these molecules are difficult to access via traditional methods, such as enolate oxidation or benzoin condensation without the use of either chiral auxiliaries or a stereoelectronic bias inherent in the electrophilic coupling partners[3,4].

Before our foray into synthetic endeavors could begin,



Scheme 1

proof of the existence of a metal-catalyzed Brook rearrangement was necessary. There are only a handful of examples of metal-catalyzed rearrangements in the literature[5]. We chose ruthenium as the first transition metal to research, considering the literature precedence of highly stereoselective ketone hydrogenation developed by Noyori and others[6]. The first step of the catalytic cycle is analogous to a hydrogenation. Considering the stereochemical fidelity of the Brook rearrangement, asymmetric ruthenium-catalysts could introduce chirality during this hydrogenation step. Herein we report the results of our efforts, which include the first example of a ruthenium catalyzed Brook rearrangement.

Experimental

General considerations: Unless otherwise stated all manipulations were carried out under an atmosphere of nitrogen, using standard Shlenk techniques. All solvents were passed through a column of alumina and degassed before use. Reagents were purchased from Sigma Aldrich, VWR, or Fischer Scientific and were used without further purification. Nuclear Magnetic Resonance (NMR) spectra for characterization of compounds were recorded on a Varian VNMRS 500 MHz (broadband probe). Gas chromatograph (GC) spectra were recorded on a Shimadzu GC- 2014 - FID (Shimadzu SHRXI-5MS column, 15m X 0.25mm X 0.25μm). Acyl silanes[8] and $RuH_2(PPh_3)_4$[(9)] were prepared by literature procedures.

Transfer hydrogenation reactions general procedure: A 10 ml round bottom flask was charged with acyl silane (0.227 mmol) and ruthenium catalyst (2.4 μmol). The flask

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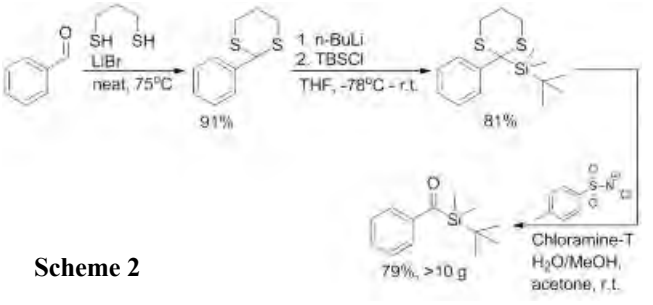
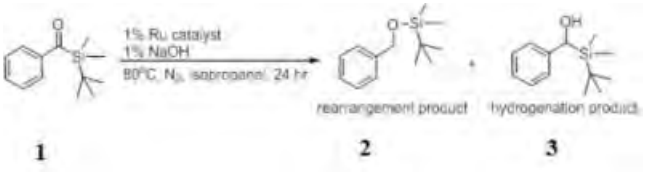
was evacuated and placed under an inert atmosphere. The mixture was diluted with 2 ml of a solution of degassed isopropanol and NaOH (2.4 μmol). The reaction was stirred at 82°C for 24 hours under an inert atmosphere. The reaction was monitored by GC. Products were identified by comparing reaction spectra to the spectra of independently synthesized compounds. Digylme was used as an internal standard.

Results and Discussion

A mechanistic probe was required to probe the possibility of a Brook rearrangement occurring during the course of the reaction. As shown in Scheme 3, the acyl silane substrate we chose was benzoyl-*tert*-butyldimethylsilane[**1**]. An electron withdrawing group α to the carbonyl stabilizes the negative charge generated by the rearrangement and large silyl groups are less labile under reaction conditions. These acyl silanes are easy to access and are derived from cheap starting materials[8] (Scheme 2). Benzaldehyde can be treated with 1,3-propanedithiol to yield a 1,3-dithiane. This dithiane can be deprotonated, treated with an electrophilic silyl group, and deprotected to yield the final acyl silane. Brevity allows a fairly modular synthesis with derivatization available by changing either the starting aldehyde or electrophilic silyl group.



Scheme 2



Scheme 3

If the ruthenium catalyst only hydrogenated the acyl silane the α-hydroxysilane product **3** would be observed. However if a rearrangement occurred the silyl-ether product **2** would be observed. The catalyst we first explored, $RuCl_2(PPh_3)_3$, is air and moisture stable and has a proclivity for ketone hydrogenation. When **1** was treated with 1% $RuCl_2(PPh_3)_3$ and 1% NaOH under transfer hydrogenation conditions for 24 hours the silyl ether product **2** was isolated in 58% yield. The hydrogenation product **3**, tertbutyldimethylsilanol, and an unknown byproduct were observed in lower yields. Control reactions were then run to confirm that the rearrangement was metal catalyzed and not catalyzed by base, PPh_3, or solvent. The results are shown in Table 1.

Substrate	Reactant(s)	Result
1	isopropanol	No reaction
1	3 eq PPh_3	No reaction
3	1% NaOH	No reaction
2	1% $RuCl_2(PPh_3)_3$/NaOH	No reaction

All reactions were stirred under inert atmosphere at 82°C for 24 hours in degassed isopropanol. Digylme was used as an internal standard. Reactions were followed by GC.

Table 1

The first three entries show the reaction is not base, ligand, or solvent catalyzed. The last entry shows that the final silyl ether product does not react further under reaction conditions.

Due to the low solubility of NaOH (and most common activators) in isopropanol, it was proposed that treating **1** with a ruthenium hydride, which is presumably generated *in situ*, would be logistically and chemically more efficient. Two ruthenium hydride complexes were synthesized[9]. $RuHCl(PPh_3)_3$ was prepared by treating $RuCl_2(PPh_3)_3$ with a solution of methanol, excess PPh_3, and 1 equivalent of sodium borohydride yielding a red purple solid. $RuH_2(PPh_3)_3$ was synthesized analogously by treating $RuCl_2(PPh_3)_3$ with a solution of methanol, excess PPh_3, and an excess of sodium borohydride yielding a bright yellow solid. Both complexes are crystalline solids that are mildly sensitive to oxygen and moisture. The results of treating **1** with the ruthenium hydride complexes are summarized in Table 2.

Substrate	Catalyst	Yield 2
1	1% $RuHCl(PPh_3)_3$	0%
1	1% $RuH_2(PPh_3)_3$	24%

Yields were calculated based an internal standard of digylme All reactions were stirred under inert atmosphere at 82°C for 24 hours in degassed isopropanol. No base or activator was present in the reactions.

Table 2

The results in Table 2 show the first example of a ruthenium-catalyzed Brook rearrangement and indicates that a monohydride species is most likely not the active catalyst for the reaction. It is hard to ascertain the identity of the active catalyst for the rearrangement, but further investigation is underway. Treatment of the acyl silane with the dihydride species alone did not produce yields equivalent to

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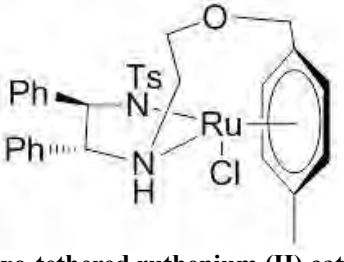
analogous reaction conditions with $RuCl_2(PPh_3)$/NaOH, which indicated that a more complex mechanism may be operating during the reaction.

Two more reactions were of note. When **1** was treated with 1% NaOH and 1% of catalyst **4** under transfer hydrogenation conditions, **2** was observed in 81% yield. When **1** was treated with $RuCl_2(PPh_3)_3$, the reaction required roughly 18 hours before **1** converted completely. However, when **1** was treated with catalyst **4**, the reaction only required roughly 5 hours before **1** converted completely. Furthermore, when **1** was treated with catalyst **4**, the rearrangement and hydrogenation product formed concurrently, though at drastically different rates. This suggests that the rearrangement product may be forming via two pathways. As shown in **Scheme 4**, the rearrangement product may be accessed directly from the acyl silane or through a α-hydroxyl silane intermediate. It was surprising that treatment of **1** with the DENEB catalyst **4** yielded rearrangement product **2,** considering the catalyst is known to operate via an outer-sphere mechanism[7]. Literature precedence would suggest that synchronous delivery of a hydride and proton would yield the hydrogenation product **3** exclusively, but formation of the rearrangement product implies that the [1,2] Brook rearrangement occurs faster than the asynchronous delivery of the final proton. This kinetic phenomenon is akin to a radical clock experiment and could allow study of the persistence of alkoxides by comparing the rate of Brook rearrangement to protonation.

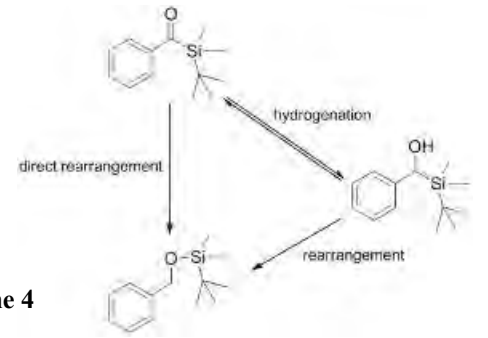
Finally, changing from aryl to alkyl acyl silane substrates leads to no observation of a Brook rearrangement with either $RuCl_2(PPh_3)_3$ or the DENEB catalyst. This emphasizes the importance of an electron withdrawing group alpha to the carbonyl and its role in stabilizing the carbanion in the transition state.



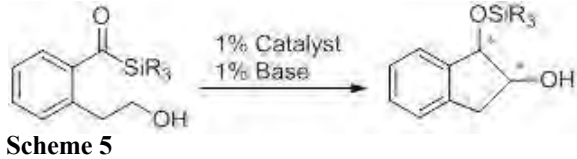
DENEB/Oxo-tethered ruthenium (II) catalyst 4

Conclusion and Future Directions

Treatment of aryl acyl silane **1** with $RuH_2(PPh_3)_3$ without base or activator under transfer hydrogenation conditions yielded rearrangement product **2**, which is the first example of a ruthenium-catalyzed Brook rearrangement. The active catalyst is most likely not a monohydride species, although the identity of the active species is difficult to ascertain at this time. Furthermore, mechanistic experiments indicate that a [1, 2] Brook rearrangement can occur with a catalyst that operates with either an inner-sphere or outer-sphere mechanism. We have also determined that an electron-withdrawing group alpha to the carbonyl is required for the transformation to occur. Evidence of a metal-catalyzed Brook rearrangement suggests that such rearrangements could be a viable architecture for asymmetric small molecule synthesis. Future work will focus on developing a coupling reaction between acyl silanes and aldehydes to yield silyl-benzoin condensation or silyl-pinacol type products. Condition optimization and catalyst screenings are already under way. Future work will also focus on intramolecular Brook rearrangements by synthesizing the substrate shown in Scheme 5 and subjecting it to the reaction conditions tested previously. [1, 2] – Dioxygenated bicyclic compounds are difficult to synthesize but are a common motif found in nature[10], making the facile synthesis of these complex small molecules very attractive in natural product total synthesis.



Scheme 4



Scheme 5

Acknowledgements

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CAREER DEVELOPMENT

Being an active participant in NESACS activities will enable you to network with major institutions and corporations in our area and can open up new career opportunities.

The NESACS Board of Publications, which is responsible for both the *Nucleus* newsletter and the NESACS website, is looking to increase its activities in this arena.

We would like to expand our capabilities for keeping our membership informed on what is happening in our field and how to adapt to changing times and new technologies.

You can help us do that. All we ask of you is a few hours a month and a smile.

Call or email to see what opportunities are available.

contact -- Vivian Walworth
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Email vwalworth@comcast.net

Chair's Statement

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2. ***Reaching out with Better Communications***. My goal is to proactively reach out to students and our local communities to increase the public appreciation of chemistry for meeting world needs. I also want to encourage interest in chemistry among young people and to increase membership and attendance at NESACS events and meetings.
3. ***Increasing Support for Career Development.*** Continue to sponsor workshops to help local scientists in their career development. Explore innovative ways to train members for today's competitive global work environment.
4. ***Enhancing Global Collaboration***. Enhance international cooperation by supporting an expansion in the number of "international" symposia and exchange programs that bring academic and industrial scientists based in Europe and Asia to NESACS events to share ideas and to network. Explore setting up an international exchange fund to support such activities.

Stay connected! You can keep track of our activities and upcoming events by visiting the section website at http//www.nesacs.org for breaking news as well as to read *The Nucleus* in PDF format. You can also read our outstanding blog at http://blog.nesacs.org/. In addition, you can join a NESACS discussion group and get updates on the Section's activities at the NESACS LinkedIn® network.

Get involved! I hope to see more and more of you participating in the events that NESACS offers. Our monthly meetings usually take place somewhere in the Boston area on the second Thursday of each month between September and May. Please tell us your thoughts and your suggestions to help make this section better.

This is your Section. Together, we can make a difference! Wish you all the best in 2013! ◇

The NESACS website
WWW.NESACS.org

Summer Scholar

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Vendor Shows Guide

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home for numerous years was New Orleans, but recent locations have included San Francisco, Las Vegas, Charlotte, and in 2013, it will be in Anaheim (Los Angeles) on February 19-22, 2013.

Held at a convention center, Informex stretches over 375,000 sq. ft. consisting of vendor booths as small as 100 sq. ft. and up to very fancy booths with meeting rooms and elaborate signage. Often you will find smaller companies who decide against the cost of a booth and attend the meeting in order to walk the floor to network and, perhaps, have an impromptu meeting.

A typical Informex schedule has a format where companies can purchase 30-minute blocks to present themselves in a meeting room to whoever shows up. These Monday events are called Exhibitor Showcases. There are also Technological Showcases where companies will present a basic technology they use or are looking to introduce to the pharma public.

Typically over 40 companies participate at the exhibitor Showcases. From my experience, the turnout tends to be limited when it comes to potential customers. Most attendees are other vendors trying to either sell something or find out what their competition is doing. As a person in charge of outsourcing, this is an excellent event to see many companies from afar and then decide if you want to schedule a formal meeting.

The Exhibition Hall opens Tuesday and Wednesday mornings at 9AM and closes at 5PM. The hours on Thursday are from 9AM to 12noon. Usually the best meetings are held on Tuesday and Wednesday, although I have found that meetings on Thursday can be surprisingly productive. While most people are planning their departures to the airport on Thursday, I once had a meeting at 11:30AM that led to a significant project, so never underestimate the potential of a positive meeting.

Several companies have meeting rooms that are off the show floor, while some actually have meeting rooms built into their booths. Most have open meetings at their booths for less formal introductions and discussions.

Literature abounds and can weigh you down when traveling home. Regardless, it is useful to be organized and collect literature from companies and file them back at work for future reference.

There are several events that allow for networking, and these can range from formal sponsored events with a cash bar and hors d'oeuvres to vendors who host informal get-togethers at their booths. These are excellent opportunities to speak to people in a less formal setting and get a feel for personalities, as well as the capabilities of companies.

As noted earlier, Informex 2013 will be in Anaheim, California so it is always preferable to book airfare and hotels early. While your boss may not think it is wise, Informex can be used as a great tool to have meetings with current vendors to discuss current and upcoming projects, as well as search for new vendors. Informex has a registration fee for individuals of about $450.
Website: http://www.informex.com

CPhI

CPhI is the European equivalent of Informex, yet much larger. The main difference between the two is that attendees do not have to pay to attend CPhI (if they register in advance). At CPhI, you will also find significantly more drug product packaging, as well as clinical vendors (typically found at AAPS).

CPhI started in 1990 and is now the largest of all meetings. With over 29,000 attendees from 140 countries, the event now covers more than 60,000 m^2 (over 11 football fields!) of exhibition space, hosting over 2,200 exhibitors, and is the market leader for the global pharmaceutical ingredients industry.

CPhI is held every October, and like Informex, changes locations. CPhI has been held in Paris, Milan, and Madrid. CPhI 2013 will be held once again in Frankfurt, Germany, from October 22-24, 2013. As expected, there tends to be a larger showing of European companies, yet it is a very international event with companies from all over the world exhibiting or attending.

A well-planned visit to CPhI can result in many useful meetings with companies that do not have a presence in the US marketplace, but which sell into the US. Thus, you can meet with owners and directors of companies face-to-face for a level of comfort that a website or phone call cannot bring.

CPhI has started a franchise in which it holds other CPhI events around the globe, such as CPhI China, CPhI Japan, CPhI India, and others, but CPhI Worldwide is the crown jewel of meetings. The exhibitor booths are far more elaborate than those seen at other meetings. Some booths will have full kitchens and meeting rooms, along with sofas and tables to sit and relax. It is quite an event.

I have found it beneficial to go over to Europe early and meet with customers at our plant in Italy before attending CPhI. Thus customers can get much more out of the trip by having actual on-site visits with suppliers coupled with meetings at CPhI.
Website: http://www.cphi.com/

ChemOutsourcing

ChemOutsourcing started as the brainchild of Mark Alexey in 2006. It is held in September in Long Branch, NJ and was designed to be a smaller Informex. While there are exhibitors, ChemOutsourcing offers the inexperienced outsourcing person a chance to learn from experts by attending numerous panel sessions held every day. Networking events help to create a casual atmosphere to allow for conversations between people. This event is undervalued by smaller companies that could benefit from the intimacy of the conference.

While there are many CMOs (Contract Manufacturing Organizations) at the event, those in the pharma industry can take advantage of this and meet many vendors. There is a small exposition hall with vendor booths and displays. Meetings tend to be arranged on site rather than ahead of time, since there is ample time to see the same people over the course of

Vendor Shows Guide

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the event, as meals and entertainment (such as the Beach Party or Casino night) are included in the cost of the registration.

There are significant discounts and opportunities for those who work for a biotech or pharma company, so take advantage of a meeting that you can drive to from the local Boston area. To inquire about discounts, contact ChemOutsourcing directly via their website. The next ChemOutsourcing will be held at the Ocean Place Resort in Long Branch, NJ, from September 16-18, 2013.
Website: http://chemoutsourcing.com

DCAT

DCAT is held every March at the Waldorf Astoria in NYC. Founded in 1890, the Drug, Chemical & Associated Technologies Association, Inc. (DCAT) is actually an association that many companies belong to. Although DCAT member companies represent the entire spectrum of the pharmaceutical industry, including pharmaceutical, API, and excipient manufacturers, it also includes companies that help with sales, manufacturing, and distribution, as well as support technologies and packaging products and services.

DCAT is the centerpiece meeting for those looking at generic pharmaceuticals. It is probably best known for its Gala Ball, a black tie event held in the world-famous Waldorf Astoria grand ballroom. This event has featured speakers ranging from George Bush, Sr. to Arnold Schwarzenegger. The evening is not complete without roaming around and visiting the various hospitality suites that numerous companies host throughout the Waldorf.

Most meetings are held in hotel suites or at any available space one can find near the lobby of the Waldorf. Networking takes place in and around the lobby of the Waldorf near the clock tower. While formal meetings are set in and around the numerous hotels in the area, many of them take place rather informally. This tends to be a meeting for companies involved with generics or established commercial products, rather than those with new chemical entities. DCAT 2013 is from March 11-14, 2013.
Website: http://www.dcat.org and http://www.dcat.org/Pages/week_DCATWeek.aspx

AAPS

The American Association of Pharmaceutical Scientists (AAPS) sponsors its annual meeting and exposition in the fall. In 2013, AAPS will be held in San Antonio from November 10–14, 2013. The meeting is typically referred to as AAPS and features a more clinical slant. For those looking to formulate their drug product or package it, AAPS is for you. AAPS seeks to foster the integration of those sciences related to discovery, design, analysis, development, production, quality control, safety, clinical evaluation, regulation, distribution, and utilization of drugs and drug delivery systems.

Started in 1986, AAPS has various programs that one can attend. Most visit the exposition hall to see vendor booths and collect information on a variety of scientific tools for drug development. Vendors often setup meetings around this meeting to catch up with customers. As with any other meeting, proper planning can lead to a more productive event allowing you to meet with numerous vendors in one place.

While AAPS provides a dynamic international forum for the exchange of knowledge, it is a meeting that can be beneficial to any pharma or biotech depending on the stage of itspipeline.
Website: http://www.aaps.org ◇

ACS Election

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Gilbert. It is an honor for the Northeastern Section to have one of its members elected to the ACS Board of Directors.

Ruth Tanner, 2012 Chair, NESACS ◇

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Calendar

Check the NESACS home page for late Calendar additions: http://www.NESACS.org

Note also the Chemistry Department web pages for travel directions and updates.
These include:
http://chemserv.bc.edu/seminar.html
http://www.bu.edu/chemistry/events/
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Jan 08
O'Malley Lecturer
Prof. Philip A. Cole, M.D., Ph.D. (Johns Hopkins University)
"Exploring the Language of Protein Post-translational Modifications"
Boston College, Merkert 130
4:00 pm

Jan 09
Prof. Yogesh Surendranath (UC Berkeley)
MIT, 6-120
4:15 pm

Jan 16
Prof. Jeffrey Rinehart (Univ. Washington)
"Employing Lanthanides and Actinides in the Construction of Single-Molecule Magnets"
MIT, 6-120
4:15 pm

Jan 17
R.B. Woodward Lectures in the Chemical Sciences
Prof. Xiaoyang Zhu (Univ. Texas)
"Exciton fission, quantum coherence, and solar energy conversion beyond the limit"
Harvard, Pfizer Lecture Hall 4:15 pm

Jan 22
Prof. Gregory Fu (MIT)
Boston College, Merkert 130 4:00 pm

Jan 23
Prof. Joshua Figueroa (UCSD)
MIT, 6-120
4:15 pm

Jan 28
Abbott Symposium
Prof. Kian Tan (Boston College)
Dr. Philip Hajduk, (Abbott Laboratories)
Harvard, Pfizer Lecture Hall 4:15pm

Jan 29
Prof. Rick Herrick (College of the Holy Cross)
"Organorhenium Chemistry and its Application to Biological Problems"
UNH, N104
11:10am

Jan 30
Prof. David Britt (UC Davis)
MIT, 6-120
4:15 pm

Jan 31
Prof. Hongjie Dai (Stanford)
Harvard, Pfizer Lecture Hall 4:15pm

Notices for The Nucleus Calendar of Seminars should be sent to:
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ACS-GREET Offers Funding for International Research Travel

The ACS Committee on International Activities and the Office of International Activities are pleased to announce a third call for proposals to the ACS Global Research Experiences, Exchanges, and Training (GREET) program. The program supports intensive, high impact international chemistry experience and collaboration opportunities to U.S. researchers by providing all-inclusive travel awards of up to $11,000 for at least five teams comprised of an early-to-mid career mentor and a mentee. Visit <www.acs.org/greet> or e-mail <greet@acs.org> to learn more about the program and obtain application materials before the **March 6, 2013**, deadline. ◇