Minot State
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2017 Faculty and Students Research Poster Session

April 27, 2017

Book of Abstracts

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The Annual Research Poster Session and Book of Abstracts is sponsored by the MSU Faculty Research Committee.

Edited by Mikhail M. Bobylev
Professor of Chemistry
Faculty Research Committee

2017 MSU Research Poster Session – Book of Abstracts

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Parental Satisfaction with Information Provided by Health Care Professionals on Feeding Methods for Infants with Cleft Lip/Palate

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Consuming sufficient nutrition is vital for all infants' growth, and infants with a cleft lip or palate are especially vulnerable to improper nutrition because these infants cannot use typical feeding methods. Thus, it is important for the health of infants with cleft lip or palate to study whether their caregivers receive appropriate and timely information about feeding methods from health professionals so their nutritional needs can be met. The aim of this study was to explore how parents/caregivers of infants with CLP receive appropriate and timely information about feeding methods from health professionals so their nutritional needs can be met. This study was carried out using survey research during May 1 to August 31, 2016. This study sought to answer four research questions. The method employed used Google Forms. The survey design included twenty-three multiple-choice questions and two optional short answer questions. The results of this study determined that parents are not completely satisfied with information about feeding provided by health professionals. The study illustrated that the transmission of knowledge from health professionals to parents is a complex process. It concluded that the combination of timeliness of information provided to parents, sufficient resources, a variety of options available for feeding, and referrals to additional resources can positively contribute to the successful feeding of infants with CLP, which will ultimately impact their overall health.

Codex

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At the start, Codex was simply a creative response to the 2011 flood, but, over time, grew into a multivalent artwork, bringing attention to the challenges of the region and broader contemporary culture. Not only does Codex address human loss resulting from a disaster but, concurrently, comments on digital migration and decline of the printed book. Codex incorporates film, photography, and sculpture and engages students in a dynamic learning experience, involving them as active participants and artistic collaborators.

In 2015, Codex was exhibited at the North Dakota Museum of Art, and William Caraher visited the exhibition in Grand Forks, ND. Stirred by the depth and relevance of the project, he expressed interest to publish the work under the auspices of The Digital Press — a humanities inspired press out of the University of North Dakota. In hope of collaborating with other North Dakota University System scholars, as well as others from around the U.S., Caraher put out a call for critical essays on the project. The collection now includes various facets of the humanities: art history, language arts, philosophy, ND history, print history, studio art, etc. and will be compiled in both a traditional printed volume as well as an ebook.

The Digital Press is convinced that this work has significant cultural import, and part of its mission is to disseminate work to relevant, cultural repositories. Physical copies of Codex (with the accompanying digital format and film) will be destined to library and archive collections around the country.

Rapid synthesis of N-vanillylbutyramide

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Background: Recently, we investigated acetamide as an alternative solvent for the Leuckart reaction. In the reaction conducted on vanillin, N-vanillylacetamide was isolated as the main product of the reaction with the yield of 35.8%. The reaction comprised the first one-step synthesis of any capsaicinoid directly from vanillin.

Hypothesis: The reaction may lead to a new general method for the synthesis of capsacinoides. In this work, this hypothesis was tested by conducting the reaction between vanillin and butyramide.

Methods: The reaction was conducted on 10 mmol scale at 195°C. Column chromatography was used for the isolation of the products. NMR-spectroscopy and elemental analysis were used to determine the structure of the products.

Results: The reaction was completed in 6 minutes. N-vanillylbutyramide was produced with an isolated yield of 33.3%.

Conclusions: The first one-step synthesis of N-vanillylbutyramide directly from vanillin was conducted. The reaction will help in the development of the new general method for the synthesis of capsaicin and capsacinoides.

Support: The project was supported by NIH grant 8 P20 GM103442-12 from the National Institute of General Medical Sciences.

Choosing a Regularization Parameter for Tikhonov Regularization Method

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Ill-posed problems arise in many branches of science and engineering including statistics, geophysics, remote sensing, astronomy, physics, weather predictions, and many other fields.

An equation Ax = b in which the matrix A is generally very ill-conditioned and the data b is noisy represents an ill-posed problem. The solution to the perturbed problem is usually dominated by errors. In such a case, it is essential to use a special method to compute a solution that is less sensitive to the noise in the data. To ease this difficulty, we intend to use techniques to approximate solutions that are less sensitive to the noise in the data.

The L-curve is one of the most popular methods for selecting the regularization parameter. In this work, we present a new parameter choice method and compare it with the L-curve method. We go over the science and the theory behind these methods and then we compare their performances by running numerical experiments on twelve different test problems for various noise levels.

Support: The project was supported by the Minot State University Small Grant for Faculty Research.

Rapid Synthesis of N-methyl-N-(3-trifluoromethylbenzyl)formamide

Tiffany Dostert-Azzarello, Lioudmila I. Bobyleva, MS, and Mikhail M. Bobylev, PhD
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Background: Recently, we developed a rapid procedure for the Leuckart reaction and successfully applied it for the synthesis of substituted N-benzyl-N-methylformamides. Interestingly, in the reaction conducted on 4-chlorobenzaldehyde, a large amount of a by-product, N,N-di-(4-chlorobenzyl)-N-methylamine was produced with an isolated yield of 31.3%. N-(4-chlorobenzyl)-N-methylformamide was produced as the main product with an isolated yield of 52.0%.

Hypothesis: The reactions conducted on benzaldehydes with strong electron-withdrawing substituents may produce larger yields of the respective N-benzyl-N-methylformamides. In this work the hypothesis was tested on 3-(trifluoromethyl)benzaldehyde.

Methods: The reaction was conducted on 10 mmol scale at 190°C. Column chromatography was used for the isolation of the products. NMR-spectroscopy and elemental analysis were used to determine the structures of the products.

Result: The reaction was completed in 5 minutes. The isolated yields of N-methyl-N,N-di-(3-trifluoromethylbenzyl)amine (33.1%) appeared to be close to the yield of N,N-di-(4-chlorobenzyl)-N-methylamine in the previous reaction. The isolated yield of N-methyl-N-(3-trifluoromethylbenzyl) formamide (47.6%) also appeared to be close to the yield of the respective product [N-(4-chlorobenzyl)-N-methylformamide] in the previous reaction.

Conclusion: A new method for the synthesis of N-methyl-N-(3-trifluoromethylbenzyl)-formamide and N-methyl-N,N-di-(3-trifluoromethylbenzyl)amine was developed.

Support: The project was supported by NIH grant 8 P20 GM103442-12 from the National Institute of General Medical Sciences.

Introducing a New Parameter Selection Strategy for Improving the Performance of Tikhonov Regularization

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Inverse problems have extensive use in many branches of science and engineering including statistics, geophysics, remote sensing, image de-blurring and de-noising, weather predictions, and many other fields.

An equation Ax = b in which the matrix A is generally very ill-conditioned and the data b is not exact, represents an ill-posed problem. This kind of problems are essentially underdetermined due to the cluster of small singular values. The computed solution is potentially very sensitive to perturbations of the data. In such a case, it is essential to use numerical regularization theory to provide efficient and numerically stable methods that lead to useful stabilized solutions.

Tikhonov regularization is one of the most popular regularization method for estimating the solutions of ill-posed problems and a significant drawback for this method is the need to choose the regularization parameter.

In this work, we summarize a known parameter choice technique; the multiplicative regularization method, and also introduce a new parameter choice strategy. We go over the science and the theory behind these methods, compare their performances on fourteen different test problems for various noise levels, and discuss some of the applications.

Support: The project was supported by the Minot State University Small Grant for Faculty Research

Leading University Students Together in a First-Year Learning Community

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First-year experience (FYE) learning communities have gained popularity in many university settings over the last decade to engage first-year students and increase retention and graduation rates. This session will describe the development and implementation of "Speak Up and Branch Out," an FYE designed for Communication Disorders majors.

Course content in CD 150 focused on learning about the various areas within the fields of communication disorders and the skills needed to become a speech-language pathologist, speech and hearing scientist, or audiologist. Course content in UNIV 110 focused on various topics relevant to general success as a university student and on developing empathy and awareness of disability-related issues. Through the FYE capstone project, "A Birthday Party for Everyone," students planned all aspects of an event for children with and without disabilities and their family members. Students raised funds, promoted the event, designed activities and decorations and conducted the event.

A two-tailed t-test was conducted to compare students' ratings of perceived confidence at the beginning and end of the semester in 26 skills covered in the FYE using a five-point Likert scale on a retrospective pre- and post-experience survey. Students reported increased confidence of at least 1 point on 14 of the 26 FYE skills measured. Results were significant at $p<0.05$; $t = 13.725951$, $p = <0.00001$.

A Win-Win Experience for Graduate and Undergraduate Students

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Graduate student clinicians conducted vocabulary evaluations of undergraduate students under the supervision of a faculty member. In year one of the project, clinicians administered two standardized tests to each undergraduate. In year two, graduate students administered two standardized tests and conducted a brief interview to gather background information. Students documented results via formal written report and a SOAP note summary. Additionally, graduate students rated the undergraduates' effort and cooperation.

Undergraduate students wrote a reflection paper on the experience from which comments were analyzed and coded into four broad categories: emotions, increased knowledge, overall experience, and clinician-related. Undergraduate students' grades on the assignment were based on their written reflections and scores in effort and cooperation.

Graduate students' administration and written reports were evaluated based on ASHA Knowledge and Skill Standards. Graduate clinicians also anonymously answered three reflection questions for the purposes of this project and comments were coded as positive, negative and suggestions for improvement to the project.

Results indicated this experience was valuable to both graduate and undergraduate students. Graduate clinicians benefitted from additional assessment experiences. The researcher noted improvement in students' professionalism, test administration, and written documentation skills over the course of the project. Undergraduate students reported a high level of negative emotions while participating in the client role such as anxiety, nervousness, frustration, and confusion. Nearly half (42%) projected they would be more empathetic to future clients. One student wrote, "This should be done by any undergraduate student who wants to pursue this field of study."

Rapid Synthesis of N-methyl-N-(2-naphthylmethyl)formamide

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Background: Recently, we developed a rapid procedure for the Leuckart reaction and successfully applied it for the synthesis of substituted N-benzyl-N-methylformamides. Interestingly, in the reaction conducted on 4-chlorobenzaldehyde, a large amount of a by-product, N,N-di-(4-chlorobenzyl)-N-methylamine was produced with an isolated yield of 31.3%. N-(4-chlorobenzyl)-N-methylformamide was produced with an isolated yield of 52.0%.

Hypothesis: The reaction conducted on electron-rich aromatic aldehydes may produce higher yields of N,N-diaryl-N-methylamines and lower yields of N-aryl-N-methylformamides. In this work the hypothesis was tested by conducting the reaction on 2-naphthaldehyde.

Methods: The reaction was conducted on 10 mmol scale at 189-190°C. Column chromatography was used for the isolation of the products of the reaction. NMR-spectroscopy and elemental analysis were used to determine the structures of the products.

Results: The reaction was fully completed in 10 minutes. As expected, the isolated yield of N-methyl-N,N-di-(2-naphthylmethyl)amine (52.9%) appeared to be substantially higher than the yield of the respective product in the reaction with 4-chlorobenzaldehyde. Respectively, N-methyl-N-(2-naphthylmethyl)formamide was produced with a lower isolated yield of 45.0%.

Conclusions: A new rapid method for the synthesis of N-methyl-N-(2-naphthylmethyl)- formamide and N-methyl-N,N-di-(2-naphthylmethyl)amine was developed.

Support: The project was supported by NIH grant 8 P20 GM103442-12 from the National Institute of General Medical Sciences.

Rapid Synthesis of N-(4-bromobenzyl)-N-methylformamide

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Background: Recently, we developed a rapid procedure for the Leuckart reaction and successfully applied it for the synthesis of substituted N-benzyl-N-methylformamides. Interestingly, in the reaction conducted on 4-chlorobenzaldehyde, a large amount of a by-product, N,N-di-(4-chlorobenzyl)-N-methylamine was produced with an isolated yield of 31.3%. N-(4-chlorobenzyl)-N-methylformamide was produced with an isolated yield of 52.0%. It was interesting to determine what results the reaction will produce with 4-bromobenzaldehyde.

Hypothesis: Based on lower electronegativity of bromine, the reaction may produce a higher yield of the respective dibenzyl product and a lower yield of the respective monobenzyl product.

Methods: The reaction was conducted on 10 mmol scale at 186°C. Column chromatography was used for the isolation of the products of the reaction. NMR-spectroscopy and elemental analysis were used to determine the structures of the products.

Results: The reaction was completed in 5 minutes. The isolated yields of N,N-di-(4-bromobenzyl)-N-methylamine (36.3%) and N-(4-bromobenzyl)-N-methylformamide (47.6%) appeared to be approximately 5% higher and 5% lower, respectively, than the yields of the respective products in the previous reaction.

Conclusions: A new method for the synthesis of N-(4-bromobenzyl)-N-methylformamide and N,N-di-(4-bromobenzyl)-N-methylamine was developed.

Support: The project was supported by NIH grant 8 P20 GM103442-12 from the National Institute of General Medical Sciences.

Enhancing Relationships: An Investigation of Foster Parent-Child Characteristics

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The purpose of this study was to identify whether parenting characteristics that make up the overall parent-child relationship differ between foster parents and traditional parents in relation to their care for their children. In sum, 127 foster and traditional parents participated in this study. Each participant completed the Behavior Assessment System for Children-Third Edition Parenting Relationship Questionnaire, which measured seven parenting characteristics deemed critical to the overall parent-child relationship. A MANOVA was conducted showing that foster parents rated their relationship with their foster child significantly lower than traditional parents rated their relationship with their biological child. Specifically, foster parents rated themselves significantly lower in relation to Attachment, Communication, Discipline Practices, Parenting Confidence, and Satisfaction with School. The results of the study add to the dearth of literature regarding parent-child relationships for foster children and also provide an opportunity for foster care agencies and community resources to develop collaborative relationships in an effort to support foster parents and enhance outcomes for foster children.

Rapid Synthesis of N-(2-chlorobenzyl)-N-methylformamide

Erika Y. Mojica, Lioudmila I. Bobyleva, MS, and Mikhail Bobylev, PhD
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Background: Recently, we developed a rapid procedure for the Leuckart reaction and successfully applied it for the synthesis of substituted N-benzyl-N-methylformamides. Interestingly, in the reaction conducted on 4-chlorobenzaldehyde, a large amount of a by-product, N,N-di-(4-chlorobenzyl)-N-methylamine was produced with an isolated yield of 31.3%. N-(4-chlorobenzyl)-N-methylformamide was produced with an isolated yield of 52.0%. It was interesting to determine what results the reaction will produce with 2-chlorobenzaldehyde.

Hypothesis: The yields of both of the 2-chlorobenzyl products will be similar to the yields of the respective 4-chlorobenzyl products.

Methods: The reaction was conducted on 10 mmol scale at 187°C. Column chromatography was used for the isolation of the products of the reaction. NMR-spectroscopy and elemental analysis were used to determine the structures of the products.

Results: The reaction was completed in 10 minutes. The isolated yields of N,N-di-(2-chlorobenzyl)-N-methylamine (42.5%) and N-(2-chlorobenzyl)-N-methylformamide (37.3%) were approximately 11% higher and 15% lower than the yields of the respective products in the previous reaction. N,N-di-(2-chlorobenzyl)-N-methylamine appeared to be the main product of the reaction.

Conclusions: A new method for the synthesis of N-(2-chlorobenzyl)-N-methylformamide and N,N-di-(2-chlorobenzyl)-N-methylamine was developed.

Support: The project was supported by NIH grant 8 P20 GM103442-12 from the National Institute of General Medical Sciences.

Acceptance and Use of Internet Banking among Small and Medium Enterprises in Kenya

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In order to examine the determinants of internet banking among small and medium sized enterprises, a stratified random survey of 300 businesses was conducted in the city of Nakuru, Kenya. Based on the literature a (Unified Theory of Acceptance and Use of Technology in the context of consumers, UTAUT2) model with eight constructs was proposed. The constructs included facilitating conditions, social influence, price value, anxiety, performance expectancy, effort expectancy, behavioral intention, and voluntariness. Regression Analysis and Correlation testing were used to test the relationship between various variables in the proposed model. The results indicate that performance expectancy, social influence, price value, anxiety and behavioral intention are important determinants of internet banking. Demographics factors including age, and gender were also found to be significant. The results are comparable to a similar study in North Dakota (Sawe, 2016) where all factors (except voluntariness which had been omitted), as well as the demographic factors, were found to be significant determinants. These findings should help the banking community creates strategies to better meet their customers' needs and increase shareholder profits.

Support: The project was supported by the Minot State University Small Grant for Faculty Research

Rapid Synthesis of N-methyl-N-(4-trifluoromethylbenzyl)formamide

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Background: Recently, we developed a rapid procedure for the Leuckart reaction and successfully applied it for the synthesis of substituted N-benzyl-N-methylformamides. Interestingly, in the reaction conducted on 4-chlorobenzaldehyde, a large amount of a by-product, N,N-di-(4-chlorobenzyl)-N-methylamine was produced with an isolated yield of 31.3%. N-(4-chlorobenzyl)-N-methylformamide was produced as the main product with an isolated yield of 52.0%.

Hypothesis: The reactions conducted on benzaldehydes with strong electron-withdrawing substituents may produce larger yields of the respective N-benzyl-N-methylformamides. In this work the hypothesis was tested on 4-(trifluoromethyl)benzaldehyde.

Methods: The reaction was conducted on 10 mmol scale at 190°C. Column chromatography was used for the isolation of the products. NMR-spectroscopy and elemental analysis were used to determine the structures of the products.

Result: The reaction was completed in 5 minutes. The isolated yield of N-methyl-N,N-di-(4-trifluoromethylbenzyl)amine (31.8%) appeared to be identical to the yield of N,N-di-(4-chlorobenzyl)-N-methylamine in the previous reaction. The isolated yield of N-methyl-N-(4-trifluoromethylbenzyl) formamide (25.0%) appeared to be unexpectedly low and resulted from the compound's unusually fast evaporation during the drying process.

Conclusion: A new method for the synthesis of N-methyl-N-(4-trifluoromethylbenzyl)-formamide and N-methyl-N,N-di-(4-trifluoromethylbenzyl)amine was developed.

Support: The project was supported by NIH grant 8 P20 GM103442-12 from the National Institute of General Medical Sciences.

"I love tater tot casserole, I just make it vegan": Examining the identity management techniques vegans employ to communicate normalcy

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Approximately 7.5 million people in the U.S. subscribe to a vegan diet and thus don't consume any animal products such as meat, fish, dairy, or eggs. Despite the considerable growth of veganism in the last decade, little is known about how people communicate about such a seemingly restrictive diet and what implications this might have for communication theory and the field of food studies. Therefore, the purpose of this study was to explore how vegans communicatively negotiate their identity through the lens of Hecht's (1993) communication theory of identity (CTI).

I conducted phone interviews with forty vegans residing across the U.S. and completed thematic analysis to qualitatively analyze interviews. Four themes emerged to describe the ways vegans manage their identity (Facilitating Smooth Interactions, Wearing Symbols of Veganism, Vegan Food Preparation and Consumption, Education and Community Engagement). Participants explained that they are purposeful, cognizant, and sometimes cautious in discussing their identity, and they overwhelmingly emphasized the importance of doing so in a positive manner. One way that vegans reported managing their identity is by engaging in "cupcake activism" and cooking and baking for others. Participants explained that they like to let the food do the talking, so to speak, because it is an unobtrusive way to manage their identity and potentially counter negative perceptions of vegans and vegan food. Taken together, the results of this study indicate that vegans engage in a variety of identity management techniques that not only help them demonstrate normalcy but also cultivate positive relationships with others.

Investigating "Deaf" Minors in Higher Education

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As the number of programs for personnel preparation programs in deaf education continues to dwindle, questions arise about just what type of programs are offered relative to deafness in higher education. Coursework in American Sign Language is often popular in higher education as it is increasingly recognized and accepted as equivalent foreign language credit. Many post-secondary institutions are packaging ASL and other coursework into transcripted minors. This practice gives cause to wonder about the various content of such minors, for whom are they designed, and what might students who complete them be equipped to do (or perceive they are equipped to do)? The current study investigated a large sample of "deaf" related minor in higher education in an attempt to gain an understanding of what these programs are made of. Research was conducted online using the Google search engine and the descriptors DEAF and MINOR and DEAF MINOR. All hits that involved an institution of higher education were recorded. Secondly, each of these hits were investigated to determine if the program was a minor, major, both, or other. Classes that made up the minor, number of credits and other relative information was recorded in a spreadsheet. The results of this investigation are represented through descriptive statistics that depict the number and nature of "deaf" related minor programs in higher education.

Using Family as Faculty in Deaf Education Personnel Preparation

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There are many things that cannot be adequately learned from a text book. The unique perspectives brought by families of children who are deaf and hard of hearing can be invaluable. The concept of "families as faculty" appears in the medical field literature as far back as the mid-90's (Heller & McKlindon, 1996). Due to the legal mandates for family-centered and collaborative service provision in Special Education, our field is also adding to the research base supporting the use of families to teach key concepts in preservice coursework. According to Prosser (2009), the benefits of having parents as presenters in university classes include modeling family/professional partnerships, getting students to connect theory to practice, and keeping a family perspective in course content. The current study used a qualitative approach to determine the benefits of using families as faculty in deaf education personnel preparation programs. Analysis of extant data in the form of student reflection papers was conducted to determine students' perceived benefits of interacting with families of students who are d/hh. The results of this investigation indicate that the use of families of children who are deaf and hard of hearing in the education of pre-service professionals in deaf education has important benefits. These benefits are discussed in a framework of family-centered services and student engagement.

The Impact of Disability Awareness Training on the Knowledge and Self-Efficacy of Church Ministry Personnel

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In 2010, the American Association on Intellectual and Developmental Disabilities (AAIDD) and the Arc adopted the following joint statement related to faith and people with disabilities. "People with intellectual and/or developmental disabilities have the right to choose their own expressions of spirituality, to practice those beliefs and expressions and to participate in the faith community of their choice or other spiritual activities." Despite this compelling statement, research indicates that individuals with disabilities are not included in faith communities and families with children who have disabilities report many barriers to active participation in their churches (Briggs, 2014; Griffin, Kane, Taylor, Francis, and Hodapp, 2012). The purpose of this study is to measure the impact of a disability training curriculum on the knowledge and self-efficacy of church ministry staff. To date, steps one and two have been completed: 1) an original survey tool has been developed and received external review, and 2) the disability training curriculum has been written. Step three, implementation of the curriculum and pre-post data collection will take place this month. A mixed-method approach to data-collection will be used. A pre- and post-training quantitative survey designed to measure disability inclusion knowledge and self-efficacy of the participants will be administered. A group exit interview will also be conducted to gather qualitative data on participant perceptions of the training. This poster will present the study's rationale, significance, methodology, and work done to date.

Implementation of Self-Healing Techniques Using 97% Carbon Content Graphene-Based Conductors (GBC) on Flat and Conformal Antennas

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In the modern age, the usage of the conformal antenna application is gaining popularity. Bending the surface of the antenna is very common in most of the conformal antenna applications. To immune the conformal antennas to the events of cracking or breaking is one of the challenging tasks. In this work, we demonstrated a self-healing technique on the antenna components for the very first time, where 97% carbon content graphene based antennas were used as self-healed on the event of cracking or breaking transmission line and/or antenna radiators. Due to cracking, a sensitive parameter in antenna design is affected when the effective length is changed due to cracking or breaking of conductive materials. Here, cracking or breaking was imitated on the antenna to investigate the advantages of using 97% carbon content graphene-based conductors on both flat and conformal surface.

Four flat antenna samples and two conformal antenna samples with different scenarios were used to prove the self-healing techniques. Overall, the graphene-based conductive material performed very well to mitigate the antennas (both flat and conformal) on the events of cracking or breakage. It acted as a self-healing technique in the antenna applications where cracking or breaking events are important factors to be considered. Finally, the results proved that the graphene-based conductors (GBC) made the antenna immune to cracking or breaking, and the antenna acted as a self-healed antenna.

The Aquatic Vascular Flora of the Richland County, North Dakota

Ryan Perry and Alexey Shipunov, PhD
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North Dakota is among a few North American regions which have not been researched in full for plant diversity. Before 2011, only 55% of state territory was researched botanically. From 2011, we are surveying "botanical white spots" using 30×30 miles virtual grid. However, in North Dakota we have also the different type of locations, under-researched "hot spots" where plant diversity is dramatically higher than in the surrounding areas. Richland county is one of the examples, it is likely most rich with plant species among all counties of the state of North Dakota (Seiler & Barker, 1985). However, most of the botanical research there was restricted to 1970s and to the Sheyenne National Grassland sites. This might be one of explanations to the phenomenon observed in the the distribution of white waterlily, Nymphaea odorata Ait. which presents on (almost) all territory of continental U.S. but absent in North Dakota.

In 2016 summer, we planned and performed multiple trips around Wahpeton, ND, concentrating on lakes, oxbows and still rivers. We were able to recover the more than 100 year old location of Nymphaea in western Minnesota and found many interesting and unusual aquatic and semi-aquatic species in North Dakota. We did not recover Nymphaea in North Dakotan part of Red River valley, this is probably due to the outstandingly high levels of pH in lakes there. Data collected was used to update the North Dakota plant checklist, plant samples were dried, pressed, mounted, databased and finally deposited in the herbarium of Minot State University (international herbarium code "MISU").

Rapid Synthesis of N-(3-chlorobenzyl)-N-methylformamide

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Division of Science – Chemistry, Minot State University, Minot, ND 58707

Background: Recently, we developed a rapid procedure for the Leuckart reaction and successfully applied it for the synthesis of substituted N-benzyl-N-methylformamides. Interestingly, in the reaction conducted on 4-chlorobenzaldehyde, a large amount of a by-product, N,N-di-(4-chlorobenzyl)-N-methylamine was produced with an isolated yield of 31.3%. N-(4-chlorobenzyl)-N-methylformamide was produced with an isolated yield of 52.0%. It was interesting to determine what results the reaction will produce with 3-chlorobenzaldehyde.

Hypothesis: The yields of both of the 3-chlorobenzyl products will be similar to the yields of the respective 4-chlorobenzyl products.

Methods: The reaction was conducted on 10 mmol scale at 187°C. Column chromatography was used for the isolation of the products of the reaction. NMR-spectroscopy and elemental analysis were used to determine the structures of the products.

Results: The reaction was completed in 15 minutes. The isolated yield of N,N-di-(3-chlorobenzyl)-N-methylamine (32.6%) appeared to be very close to the yield of N,N-di-(4-chlorobenzyl)-N-methylamine in the previous reaction. However, the isolated yield of N-(3-chlorobenzyl)-N-methylformamide (41.8%) was approximately 10% lower than the yield of N-(4-chlorobenzyl)-N-methylformamide.

Conclusions: A new method for the synthesis of N-(3-chlorobenzyl)-N-methylformamide and N,N-di-(3-chlorobenzyl)-N-methylamine was developed.

Support: The project was supported by NIH grant 8 P20 GM103442-12 from the National Institute of General Medical Sciences.

A Lasting Influence: The David Driesbach & John Kaericher Exhibits

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Purpose: A Lasting Influence considered the power of teaching and mentoring in the arts by following the legacy of Mauricio Lasansky in two of his students: David Driesbach and John Kaericher. Both featured artists, Driesbach and Kaericher, were graduate students of Argentinian born artist Mauricio Lasansky at the University of Iowa—Driesbach in the 1950s and Kaericher in the 1960s. Kaericher also studied under Driesbach while earning his bachelor's degree at Millikin University in Decatur, Ill.

A Lasting Influence was a shared project between the Northwest Art Center (NAC) and Flat Tail Press (FTP), and was comprised of 3 simultaneous exhibits spanning all three of MSU's galleries and an interpretive lecture on the exhibits, the artists, and their work. The lectured highlighted their educational philosophies, the interconnections among their work in both process and style, as well as outside stylistic influences from Picasso, Giacometti, Chagall, among others.

David Driesbach's work was curated from MSU's recent acquisition of nearly 70 etchings and lithographs from Driesbach himself, while Kaericher's work was curated from his personal collection. In addition, FTP has worked to print, 3 previously un-editioned prints with John Kaericher. These prints will be split between MSU and the Artist, with one from each edition entered into the MSU art collection.

Support: The project was supported by the Minot State University Small Grant for Faculty Research, by Northwest Art Center, by Flat Tail Press, and by Janet Wentz Foundation

Rapid Synthesis of N-(4-isopropylbenzyl)-N-methylformamide

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Background: Recently, we developed a rapid procedure for the Leuckart reaction and successfully applied it for the synthesis of substituted N-benzyl-N-methylformamides. Interestingly, in the reaction conducted on 4-chlorobenzaldehyde, a large amount of a by-product, N,N-di-(4-chlorobenzyl)-N-methylamine was produced with an isolated yield of 31.3%. N-(4-chlorobenzyl)-N-methylformamide was produced as the main product with an isolated yield of 52.0%.

Hypothesis: The reaction conducted on benzaldehydes with electron-donating substituents may produce higher yields of the respective N,N-dibenzyl-N-methylamines and lower yields of the respective N-benzyl-N-methylformamides. In this work the hypothesis was tested by conducting the reaction on 4-isopropylbenzaldehyde.

Methods: The reaction was conducted on 10 mmol scale at 189°C. Column chromatography was used for the isolation of the products of the reaction. NMR-spectroscopy and elemental analysis were used to determine the structures of the products.

Result: The reaction was completed in 10 minutes. The isolated yields of N,N-di-(4-isopropylbenzyl)-N-methylamine (44.0%) and N-(4-isopropylbenzyl)-N-methylformamide (42.0%) appeared to be approximately 13% higher and 12% lower than the yields of the respective products in the previous reaction.

Conclusion: A new rapid method for the synthesis of N-(4-isopropylbenzyl)-N-methyl-formamide and N,N-di-(4-isopropylbenzyl)-N-methylamine was developed.

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Rapid synthesis of N-(4-chlorobenzyl)morpholine

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Background: Benzylamines are important structural elements in many pharmaceutically active compounds. Recently, a novel method for the synthesis of N,N-dialkyl-N-benzylamines via a direct coupling of benzyl alcohols and secondary amines was published. The method showed lower reactivity with less electron rich substrates. For example, N-(4-chlorobenzyl)morpholine was obtained with the yield of only 40%. Recently, we developed a rapid procedure for the synthesis of N-benzylformamides via the Leuckart reaction. The procedure was equally successful with substrates containing either electron-donating or electron-withdrawing substituents. It was interesting if it can be used for the synthesis of N,N-dialkyl-N-benzylamines.

Hypothesis: Our rapid procedure is likely to produce high yields of N,N-dialkyl-N-benzylamines with electron withdrawing substituents. In this work the hypothesis was tested by conducting the reaction of 4-chlorobenzaldehyde and N-formylmorpholine.

Methods: The reaction was conducted on 10 mmol scale at 220°C. Column chromatography was used for the isolation of the reaction products. NMR-spectroscopy and elemental analysis were used to determine the structures of the products.

Results: The reaction was fully completed in 17 minutes and produced N-(4-chlorobenzyl) morpholine with the yield of 82%.

Conclusions: A new rapid method for the synthesis of N-(4-chlorobenzyl)morpholine was developed.

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An Assessment of the Functions and Needs of Child Advocacy Centers in North Dakota

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Purpose: The main objective of this study is to make an assessment on the functions and needs of the Child Advocacy Centers in North Dakota. These centers depict a rare example for multi-agency/disciplinary team work in the process of criminal investigation. Understanding the dynamics and/or obstacles of such a rare process, hence, is considered to be valuable to develop policy suggestions in order to increase the efficiency of the investigation process especially for the crimes against children.

Methods: A broad qualitative data collection strategy was pursued through in-depth interviews, focus group meetings and on-site observations for this research. The data collected though these strategies were, then, analyzed based on a grounded theory approach.

Summary Results: This study indicated that CACs in ND are providing victimized children and the criminal justice system, in general, with invaluable services by reducing the secondary trauma resulting from the investigative process and by increasing the quality of information gathered through forensic interviews conducted by specifically trained professionals. Dynamics of an effective team work in these centers include; having an effective leadership, consistent participation of active professionals, support from higher administrators and prosecutors, developing informal networks, and having a positive attitude regarding the impact of these centers' functions towards the best interest of children. The research indicated that the funding of these centers' activities should be well-established with further public resources and sustainable alternatives. In addition, their positions in the criminal investigation process should be promoted through active training programs, informative printed and digital materials as well as formal policy statements.