SYMPOSIUM
Undergraduate Research
2014

Every horizon, upon being reached, reveals another beckoning in the distance. Always I am on the threshold. - W. Eugene Smith

Monday
April 14
9:00-10:30am
1:00-2:30pm
La Maison Salon & Hall

For more information
Please visit the Assumption Portal

Tuesday
April 15
9:00-10:30am
1:00-2:30pm
La Maison Salon & Hall
2:30-4:00pm
Testa Fuller Aud
2:00-4:00pm
Testa Atrium
Welcome to the 20th Annual Undergraduate Symposium, highlighting the research and scholarly achievements of Assumption students working in collaboration with dedicated faculty mentors. These collaborations represent a model for integrating teaching, original research, and the beneficial effects of peer review in promoting intellectual development and professional growth. The Symposium provides the campus community the opportunity to gain a greater appreciation of the individual and collective accomplishments of our faculty and students, as well as to applaud those achievements.

I hope that you enjoy and profit from viewing the posters, hearing the papers, and speaking with the authors of this impressive work.

Sincerely,

Francis M. Lazarus
Provost and Academic Vice President
# Undergraduate Symposium

## Program Schedule
**Monday, April 14, 2014**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-10:30 a.m.</td>
<td>Presentation Session 1A</td>
<td>La Maison Salon</td>
</tr>
<tr>
<td></td>
<td>Presentation Session 1B</td>
<td>La Maison Hall</td>
</tr>
<tr>
<td>1-2:30 p.m.</td>
<td>Presentation Session 2A</td>
<td>La Maison Salon</td>
</tr>
<tr>
<td></td>
<td>Presentation Session 2B</td>
<td>La Maison Hall</td>
</tr>
</tbody>
</table>

**Tuesday, April 15, 2014**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-10:30 a.m.</td>
<td>Presentation Session 3A</td>
<td>La Maison Salon</td>
</tr>
<tr>
<td></td>
<td>Presentation Session 3B</td>
<td>La Maison Hall</td>
</tr>
<tr>
<td>1-2:30 p.m.</td>
<td>Presentation Session 4A</td>
<td>La Maison Salon</td>
</tr>
<tr>
<td></td>
<td>Presentation Session 4B</td>
<td>La Maison Hall</td>
</tr>
<tr>
<td>2:30-4 p.m.</td>
<td>Presentation Session 5</td>
<td>Testa Fuller Auditorium</td>
</tr>
<tr>
<td>2-4 p.m.</td>
<td>Poster Session</td>
<td>Testa Atrium</td>
</tr>
</tbody>
</table>
### Presentation Session 1A

**Monday, April 14**  
**9:00-10:30 a.m. La Maison Salon**

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Cathryn Andrews ’14</td>
<td>Typography and the Human Mind in the Age of Digital Technology</td>
</tr>
<tr>
<td>9:15</td>
<td>Lauren E. Brown ’14</td>
<td>Myth and Modern Day Media</td>
</tr>
<tr>
<td>9:30</td>
<td>Courtney Woods ’15, Abigail Heroth ’15, Barry Nicholson ’15 &amp; Nicole Stantial ’15</td>
<td>Utilizing YouTube as a Tool for Tutorials</td>
</tr>
<tr>
<td>9:45</td>
<td>Julia Jacques ’14</td>
<td>Re-Shoeing Cinderella: A Review and Recasting of Perrault's Cinderella for Today's Audience</td>
</tr>
<tr>
<td>10:00</td>
<td>Ashley DeLeon ’15</td>
<td>Para Ti Mujer: An Original Poem Inspired by the Women Writer's Movement in Contemporary Spain</td>
</tr>
<tr>
<td>10:15</td>
<td>Marie Theroux ’14</td>
<td>Poetry in the Style of the Women of Spain in Opposing Eras: Dictatorship and Democracy</td>
</tr>
</tbody>
</table>

### Presentation Session 1B

**Monday, April 14**  
**9:00-10:30 a.m. La Maison Hall**

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Kaitlin Genever Henry ’15</td>
<td>Van Gogh’s Missing Sunset; Rediscovering a Lost Masterpiece</td>
</tr>
<tr>
<td>9:15</td>
<td>Madeline Harley ’14</td>
<td>Chattel, Not Children: The Effects of American Slavery on Slave Childhoods</td>
</tr>
<tr>
<td>9:30</td>
<td>Jason Duke ’15</td>
<td>The Railroad: Its Technology, Economics, and Regulation</td>
</tr>
<tr>
<td>9:45</td>
<td>Maura Corbett ’14</td>
<td>Noah Webster and the Standardization of American English Orthography</td>
</tr>
<tr>
<td>10:00</td>
<td>Jennifer Gargan ’14</td>
<td>Spreading Political Ideologies Through Children's Literature: 1790-1860</td>
</tr>
<tr>
<td>10:15</td>
<td>Meghan Hall ’14</td>
<td>The Rise of Nazism: The History and the Psychology Behind the Rise of the Nazi Party</td>
</tr>
</tbody>
</table>
## Presentation Session 2A
### Monday, April 14
### 1:00-2:30 p.m. La Maison Salon

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00</td>
<td>Nicholas Silva ’14</td>
<td><em>Coping with the Stress of Police Work</em></td>
</tr>
<tr>
<td>1:15</td>
<td>Jacquilyn Zaremba ’14</td>
<td><em>Examining the Ways in Which Court-Appointed Advocates Represent the Developmental Needs of Children in Court Cases</em></td>
</tr>
<tr>
<td>1:30</td>
<td>Stephanie O'Brien ’15</td>
<td><em>Female Attorneys-Work &amp; Home Life Balance</em></td>
</tr>
<tr>
<td>1:45</td>
<td>Joshua McDuffie ’14</td>
<td><em>Masculinity in Police Departments</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Joelle DiDomenico ’14</td>
<td><em>Gender and Disclosures in Child Abuse Cases</em></td>
</tr>
<tr>
<td>2:15</td>
<td>Casey Vallas ’15</td>
<td><em>Police Cultural Immersion</em></td>
</tr>
</tbody>
</table>

## Presentation Session 2B
### Monday, April 14
### 1:00-2:30 p.m. La Maison Hall

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00</td>
<td>Anna Szemiot ’14</td>
<td><em>Perfection in Beauty</em></td>
</tr>
<tr>
<td>1:15</td>
<td>Brianna Carey ’14</td>
<td><em>Mary Cassatt's &quot;Modern Woman&quot; Mural at the 1893 World's Columbian Exposition</em></td>
</tr>
<tr>
<td>1:30</td>
<td>Alexandra Furtado ’14</td>
<td><em>The Nature and Character of Genius</em></td>
</tr>
<tr>
<td>1:45</td>
<td>Zebb Duffany ’15 &amp; Ted McCarty ’15</td>
<td><em>Something of Nothing</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Andrew Harmon ’14</td>
<td><em>Forgiveness and Atonement in Tales of Symphonia</em></td>
</tr>
<tr>
<td>2:15</td>
<td>OPEN</td>
<td></td>
</tr>
</tbody>
</table>
### Presentation Session 3A
**Tuesday, April 15**
**9:00-10:30 p.m. La Maison Salon**

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Maureen Quirk ‘14</td>
<td><em>Confessions of a Shopaholic: The Link Between Social Class Aspirations &amp; Marketing in the Retail Apparel Industry</em></td>
</tr>
<tr>
<td>9:15</td>
<td>Kathryn Cullerot ‘15</td>
<td><em>The Lunchbox: A Taste of Business Planning</em></td>
</tr>
<tr>
<td>9:30</td>
<td>Taylor Dimmick ‘14</td>
<td><em>Minding the GAAP: A Comparison Between US and International Accounting Standards</em></td>
</tr>
<tr>
<td>9:45</td>
<td>Jordan Sweigart ‘14</td>
<td><em>HWAR, What is it Good For?: An Evaluation of NHL Players</em></td>
</tr>
<tr>
<td>10:00</td>
<td>Samantha Minieri ‘14</td>
<td><em>NREGA's Impact on Women's Labor Force Participation in Rural India</em></td>
</tr>
<tr>
<td>10:15</td>
<td>Labeeby Servatius ‘17</td>
<td><em>Parallel Parking with Ruler and Compass</em></td>
</tr>
</tbody>
</table>

### Presentation Session 3B
**Tuesday, April 15**
**9:00-10:30 p.m. La Maison Hall**

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Mae L’Heureux ‘14</td>
<td><em>Suicide Prevention in Higher Education</em></td>
</tr>
<tr>
<td>9:15</td>
<td>Cassie Lincoln ‘15</td>
<td><em>Decoding Facial Expression Across the Menstrual Cycle</em></td>
</tr>
<tr>
<td>9:30</td>
<td>Peter Bui ‘14</td>
<td><em>Tool-Use Development in Children</em></td>
</tr>
<tr>
<td>9:45</td>
<td>Melissa McLain ‘14</td>
<td><em>A Review of Healthcare for Adolescent Females in the United States</em></td>
</tr>
<tr>
<td>10:00</td>
<td>Ashley Pereira ‘17</td>
<td><em>The Cupid to her Psyche</em></td>
</tr>
<tr>
<td>10:15</td>
<td>Alexandra Caulway ‘14</td>
<td><em>Realities of a Family Shelter: Trapped in a Cycle</em></td>
</tr>
</tbody>
</table>
### Presentation Session 4A
**Tuesday, April 15**  
**1:00-2:30 p.m. La Maison Salon**

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00</td>
<td>OPEN</td>
<td></td>
</tr>
<tr>
<td>1:15</td>
<td>Jennifer Gargan ’14</td>
<td><em>The Evolution and Efficacy of Deaf Education</em></td>
</tr>
<tr>
<td>1:30</td>
<td>Nabil Tueme ’14</td>
<td><em>The Credit Consciousness: A Historical-Comparative Understanding of Social Movement Responses in Periods of Income Inequality</em></td>
</tr>
<tr>
<td>1:45</td>
<td>Gabriella Mancini ’14</td>
<td><em>#It's 7.25$ in Texas That's Bullshit</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Megan Kasala-Hallinan ’14</td>
<td><em>Perceptions of Intercollegiate Athletes</em></td>
</tr>
<tr>
<td>2:15</td>
<td>Nabil Tueme ’14</td>
<td><em>Drawing the Islamic Curtain: The Racialization of Arabs in the Western World</em></td>
</tr>
</tbody>
</table>

### Presentation Session 4B
**Tuesday, April 15**  
**1:00-2:30 p.m. La Maison Hall**

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00</td>
<td>Maggie Bara ’14</td>
<td><em>Macrophage Response to BK polyomavirus infection</em></td>
</tr>
<tr>
<td>1:15</td>
<td>Madelaine Duarte ’16</td>
<td><em>UV mutagenesis in Haloferax volcanii</em></td>
</tr>
<tr>
<td>1:30</td>
<td>Felicia Baltazar ’14</td>
<td><em>Transcription-Coupled Repair in Archaea</em></td>
</tr>
<tr>
<td>1:45</td>
<td>Ashley Corridori ’15</td>
<td><em>Acetaminophen Toxicity: A Review of Evidence and Probe of Causation</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Megan Chan ’14</td>
<td><em>Epigenetic Regulation of crapb1</em></td>
</tr>
<tr>
<td>2:15</td>
<td>Lucas Cantwell ’15</td>
<td><em>Embryonic Development of Cardiac Parasympathetic Ganglia in Transgenic Neurturin Knock Out Mice and Wild Type Mice</em></td>
</tr>
</tbody>
</table>
### Presentation Session 5
**Tuesday, April 15**
2:30-4:00 p.m. Testa Fuller Auditorium

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:30</td>
<td>Kerriann Lusk ’14</td>
<td><em>Lack of Gender Bias in the Chesapeake Region: An Examination of the Treatment of Male and Female Slaves in the Nineteenth Century Through Slave Narratives</em></td>
</tr>
<tr>
<td>2:45</td>
<td>Erich Grosse ‘15</td>
<td><em>Modern Weaponry And its Effects on 19th century Society</em></td>
</tr>
<tr>
<td>3:00</td>
<td>Jesse Hunt ’14</td>
<td><em>The Cost of Freedom - An Evaluation of Self-Purchase and Escape in 19th Century Slave Narratives</em></td>
</tr>
<tr>
<td>3:30</td>
<td>Giuliana Franchetti ’14</td>
<td><em>Coping and Christianity</em></td>
</tr>
<tr>
<td>3:45</td>
<td>OPEN</td>
<td></td>
</tr>
</tbody>
</table>

### Poster Session
**Tuesday, April 15**
2:00-4:00 p.m. Testa Atrium

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00</td>
<td>Kyle MacGovern ’14</td>
<td><em>Inspirations</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Jennifer Gargan ’14</td>
<td><em>The Impact of Class-Wide Peer Tutoring: Perceptions of Tutors, Tutees, and Teachers</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Marie Theroux ’14</td>
<td><em>The Untold Stories of Unaccompanied Refugee Minor Immigrants: Seeking Home Through Service</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Lauren S. Brown ’15 &amp; Jane Dreske ’15</td>
<td><em>Classification and Characteristics of an Unknown Bacterium</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Meaghan Ekstrom ’15 &amp; Nicole Stantial ’15</td>
<td><em>Determining the Identity of an Unknown Bacterium: Sphingomonas</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Kelly Black ’15</td>
<td><em>Discovering an Unknown Bacterium</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Maggie Bara ’14, Amanda O’Malley ’14, Rebecca Rood ’14, Samantha Williams ’14 &amp; Sarah Williams ’14</td>
<td><em>Identification and Characterization of the Morphological, Metabolic, and Mammalian Immune Response to an Unknown Bacterium</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Kinga Piskorz ’15 &amp; Tamara Salman ’15</td>
<td><em>Identifying an Unknown Bacterium</em></td>
</tr>
<tr>
<td>Time</td>
<td>Presenter(s)</td>
<td>Title</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Paul Kehoe ‘14 &amp; Jack Mourad ‘14</td>
<td>Isolation and Analysis of Unknown Bacterium from the Lab Bench</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Julianna Elhoussan ‘14</td>
<td>Psoriasis and The Target On Gender, Race and Age</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Maggie Bara ‘14 &amp; Hieu Nguyen ‘15</td>
<td>RAW264.7 Cellular Response to Dermacoccal and Staphylococcal Infection</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Melanie Freitas ‘14</td>
<td>Synthesis of Montamine Analog 2</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Zacharia El-Samin ‘14</td>
<td>Optimization of DNA Sonication</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Katie Huling ‘14</td>
<td>Regulation of crabp1 Gene Expression in Mouse Mammary Adipose Stromal Cells</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Devyn Oliver ‘14</td>
<td>Genetic Analysis of Integrin Signaling in C. elegans axon Guidance</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Lauren Berntsen ‘14, Melanie McCauley ‘15, &amp; Bianca Monaco ‘16</td>
<td>Moisture Retention in Various Moss Species</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Maggie Bara ‘14, Ashley Impagliazzo ‘15, Sean Toomey ‘15 &amp; Delesha Woodley ‘14</td>
<td>Rhytisma Acerinum: Infection Patterns, Tree Characteristics and Microbial Diversity</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Lauren S. Brown ‘15, Megan McCann ‘15, Lauren Pepi ‘15 &amp; Mary Schneider ‘15</td>
<td>Vegetative Growth Along a Moisture Gradient in a Detention Pond</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Marinieves Del Valle ’14</td>
<td>Associative Learning Pathway in daf-7 Mutants</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Melanie McCauley ‘15</td>
<td>Room Temperature Storage Effects on Acidity of Northeastern Soils</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Andrea Clapp ‘14</td>
<td>The Ethical Implications of Physician-Assisted Suicide on Pharmacists</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Katelyn Colburn ’14 &amp; Kelsie Phillips ’14</td>
<td>Disability and Addiction: Explicit and Implicit Perceptions</td>
</tr>
<tr>
<td>2:00-4:00</td>
<td>Peter Bui ’14</td>
<td>The Effects of Empathy on Disparaging Humor</td>
</tr>
</tbody>
</table>
ABSTRACTS

Presentation Session 1A
Monday, April 14
9:00-10:30 a.m. La Maison Salon

Typography and the Human Mind in the Age of Digital Technology
Cathryn Andrews ’14
Art

In this visual and textual interpretation of the role that typographic composition has played in the evolution of human communication, this presentation culminates in an examination of contemporary digital technology and its impact on attention span and interpersonal relationships. This includes a look at the high modernist design focus on minimalism and its legacy in contemporary web design, as well as the difference between typography as an art form versus a mechanism of efficient information transmission.

Faculty Mentor: Prof. Lynn Simmons

Myth and Modern Day Media
Lauren E. Brown ’14
Art

While our scientific advancements have improved our understanding of the world around us such that we no longer depend upon myths to provide us with explanations, we have at the same time forgotten the ability to determine moral truths and to value ideas of spiritual transcendence without the presence of our modern myths to guide us. We instead allow the media to dictate to us what our values will be and how we are to pursue them. Man is no longer a spiritual being nor a political animal, but rather a mere consumer, a follower within a herd.

The main source of inspiration for my video project came from the works of Plato; specifically The Allegory of The Cave and more generally, his use of images and myths throughout the dialogues. The images that Socrates employs are not only meant to instruct, but also to challenge and edify the audience, provoking us to think for ourselves. Drawing from the imagery given in The Cave, I have chosen shadow puppetry as my media to communicate the main idea behind the cave: that we do not ourselves know truth but rather allow others to determine truth for us. Most have yet to transcend beyond the shadows on the wall. By use of symbolic imagery in my video, my goal is to represent our chasing after truth and as well as our perpetual failure to obtain it as long as we remain dependent on an external source.

Prof. Thomas Grady

Utilizing YouTube as a Tool for Tutorials
Courtney Woods ’15, Abigail Heroth ’15, Barry Nicholson ’15, Nicole Stantial ’15
Academic Support Center

Students have different learning styles, and tutors have different tutoring styles. This interactive presentation will explore the use of science, math, and accounting videos to enhance the learning experience of our tutees as a supplement to the tutoring session. We will use a learning style inventory to determine the learning styles of the audience and present strategies to target these different styles through the use of videos. We will then ask for audience input for ideas of videos they have used and then create a master list of videos. We believe that this additional resource would facilitate and promote independent learning, helping to ultimately create life long-learners.

Faculty Mentor: Dr. Allen Bruehl
Re-Shoeing Cinderella: A Review and Recasting of Perrault's Cinderella for Today's Audience
Julia Jacques '14
Education

This two-part project, Re-Shoeing Cinderella: A Review and Recasting of Perrault's Cinderella for Today's Audience, consists of a study of the perpetuation of gender stereotypes in the Cinderella fairy tale across time periods. First, the investigator undertook a historical study of several variants of the Cinderella fairy tale, beginning with Charles Perrault's 1697 short story Cendrillon. Subsequently, the investigator specifically examined the Disney film, Cinderella (1950), the Rodgers and Hammerstein musical, Cinderella (1965), and Robert D. San Souci's picture book, Cendrillon (1998), each of which is based upon the Perrault retelling. As a result of this study, the investigator concluded that despite little change in the Perrault tale across these variants, there is a strong potential for a revitalized Cinderella character in future rescriptings of Perrault's classic fairy tale. Additional investigation of the varying perspectives of male and female authors, as well as differences between variants by the same author may establish a clearer understanding of the development of the Cinderella character across space and time. Second, the investigator authored and illustrated an original picture book, entitled Cinderella, to “re-shoe” Perrault's heroine for a contemporary audience.

Faculty Mentor: Dr. Mary Kielbasa

Para Ti Mujer: An Original Poem Inspired by the Women Writer's Movement in Contemporary Spain
Ashley DeLeon '15
Modern and Classical Languages and Cultures

After the dictatorship of Spain with Francisco Franco (1939-1975), women began to take advantage of their new found freedom. Many women started to write poems and stories about their struggles during the dictatorship period and about their liberation post-dictatorship. The women writers of contemporary Spain wrote about social issues and about the social changes that occurred after Francisco Franco's death in 1975. There is a correlation between the dictator's death and the themes about which the women writers wrote. A few of the themes include self discovery, sexual freedoms, and liberation from oppression. This poem is an ode to the women writers of contemporary Spain who spoke up and paved the way for future women.

Faculty Mentor: Dr. Maryanne Leone

Poetry in the Style of the Women of Spain in Opposing Eras: Dictatorship and Democracy
Marie Theroux '14
Modern and Classical Languages and Cultures

This presentation will showcase two original poems inspired by Spanish women writers in two influential periods in Spain. The era of the dictatorship of Francisco Franco (1945-1975) is expressed through the first poem and explores the social and political expectations placed on women during that time because of strict censorship. During this time, women were idealized for their appearance, expected to work only within their homes, and were not considered equal to men. Because of the censorship, it is likely that a poem written by a woman such as this one would not have been published for a public audience. After Franco's death in 1975, the democracy (beginning in 1978) is exemplified in the second poem, illuminating the new opportunities that women began to enjoy. Women were less likely to carry on the traditional role of “the angel of the house” and more likely to feed their individual interests and passions. This second poem is modeled after the famous Spanish women writer Gloria Fuertes. In each work, familiar techniques are used by various writers at the time, such as free verse, no rhyme scheme, and references to everyday life that an audience reading each poem in its respective time period would easily understand.

Faculty Mentor: Dr. Maryanne Leone
Van Gogh’s Missing Sunset; Rediscovering a Lost Masterpiece
Kaitlin Genever Henry ’15
History

On July 4th, 1888, Vincent Van Gogh sat on a rocky ledge in Arles, France and watched the sunset. While enjoying the scene, he began work on a painting he would later name Sunset at Montmajour. Now, if one were to go to the library and look up Van Gogh’s works, they would find that there is no historical account of this painting. After two years of work, the Van Gogh Museum in Amsterdam officially revealed Sunset at Montmajour as an authentic Van Gogh.

This paper strives to examine Van Gogh’s previously unknown masterpiece from an art-historical perspective, and looks to ask some of the bigger questions about the implications of such a discovery. Mapping the provenance of this work reveals a fascinating story of intrigue and deception. Seeing Sunset at Montmajour in person at the Van Gogh museum made all the difference in being able understand the true meaning of this work. Exploring this painting offers the observer a chance to understand art in its historical context, in its present context, and how making these connections between the two can have implications for the future.

Faculty Mentor: Dr. Barry Knowlton

Chattel, Not Children: The Effects of American Slavery on Slave Childhoods
Madeline Harley ’14
History

This research paper argues that slavery effectively robbed African American slave children of any semblance of a “normal” childhood. While previous attempts have been made to catalog the experiences of slave children, this paper draws on both slave narratives and secondary sources to explain how and why slave children were prevented from having the safe and loving childhood that many of their masters’ white children experienced. This paper attempts to provide evidence suggesting that the various experiences of African American slave children, prior to the Civil War, caused them to live in a “constant state of warfare,” in which their worlds could be turned upside down without a minute’s notice. These experiences included inadequate prenatal and infant care, lack of adequate food and clothing, unstable family structures, and abuse. In addition to arguing that these experiences robbed slave children of a true childhood, this paper also argues that both positive and negative interactions between slave children and their masters’ white children served to further widen the gap between “normal childhood,” experienced by the white children, and the harsh reality of life for slave children.

Faculty Mentor: Dr. Carl Keyes

The Railroad: Its Technology, Economics, and Regulation
Jason Duke ’15
History

The Railroad: Its Technology, Economics, and Regulation looks at the early history of the railroad, starting with the development of the technology needed for its implementation, continuing into the debate in society between utilizing the railroads and utilizing the canals (another form of mass transportation being utilized at the time), and concluding with a view into the economics of this mode of transportation. Each of these topics will be illuminated and interpreted through the analysis of primary sources found in the American Antiquarian Society. My research has led to a discovery that the technology for the railroad came about rather quickly, that there was surprisingly a large debate when deciding whether to implement it or not. Additionally, the project uncovered the existence of various economic issues such as the possibility of monopolies and subsidies, which resulted in government regulation.

Faculty Mentor: Dr. Carl Keyes
After its victory in the Revolutionary War, the United States focused on strengthening and sharpening its own uniquely-American identity. Because other nations had national characteristics, Americans believed they, too, should develop such qualities in order to assert their power as a nation. American independence made the country fundamentally different from Britain. As a result, America required its own version of English to further separate itself from Britain. By creating a particularly American orthography, Americans would both perfect the English language and unite behind a truly American quality. In particular, Noah Webster attempted and eventually succeeded in creating this specifically American orthography. Though originally a supporter of the phonetic alphabet, Webster is truly the father of American orthography. His numerous spelling changes created the American English we still use today.

Faculty Mentor: Dr. Carl Keyes

Spreading Political Ideologies Through Children’s Literature: 1790-1860
Jennifer Gargan ’14
History

Children's literature developed in America during the period of 1790-1860 due to advances in the printing press leading authors and publishers to create books with embedded political messages. Materials written for consumption by children provide insight into how society sought to educate and, in many ways, indoctrinate the next generation with certain values and beliefs. In early America, this meant training the next generation to inherit the country. This education included strict teaching of republican values and ideals because these would ensure a functioning nation. New systems were needed to distribute these published materials to the public. Thus, library systems, large publishing companies, and juvenile bookstores were created. The public slowly adapted to the use of this new technology and found ways to integrate it with American life. As time progressed though, new debates would sweep through the nation surrounding topics like industrialization and slavery. Publishers and authors, having been experienced with creating materials for consumption by the youth, could now experiment with incorporating new politically charged topics into their works. Thus, children’s literature served as another vehicle for political debates in early America. The primary research for this project was conducted at the American Antiquarian Society.

Faculty Mentor: Dr. Carl Keyes

The Rise of Nazism: The History and the Psychology Behind the Rise of the Nazi Party
Meghan Hall ’14
History

One of the greatest atrocities of all time, especially in the twentieth century, was the Holocaust that took place under the hands of the Nazi party during World War II. The question that is being addressed here regards the ability of Adolf Hitler to obtain and to develop such a strong party following. Hitler and the Nazi party arose out of obscurity, as a fringe movement during the dark days following the First World War, but the party very quickly emerged as a dominant force on the national scene. In order to understand the complexity of the Nazi party, the history of Germany in the wake of World War I and the life of Adolf Hitler are elements essential to understanding Nazism’s surprising emergence from the shadows into its eventual popularity during the early 1930s. Additionally, the psychological aspects that were employed in the development of the Nazi party are key to understanding the rise of the party. It is important to note that historians have drawn upon psychology as a method for explaining the rise of Nazism. However, psychology, like many sciences has grown and evolved, thus the newer concepts within psychology are more important than ever in explaining the phenomenon of the Nazi party’s rise to national prominence. The purpose of this thesis is to examine and to explore the origins of the Nazi party through a close examination of historical documents and interpreting them in light of more recent psychological concepts, in order to better understand the development of such a powerful dictator and the compliance of the Nazi party members.

Faculty Mentor: Dr. Thomas Wheatland
Presentation Session 2A  
Monday, April 14  
1:00-2:30 p.m. La Maison Salon

Coping with the Stress of Police Work  
Nicholas Silva ’14  
Sociology

Police work has always been stigmatized as stressful. In the past, there has been a great deal of research done to outline the different aspects of police work. Other studies in the past have focused on the effects of police officers’ personality and coping strategies on their well-being. Studies have asked three questions: (1) How does the level of psychological well-being reported by police officers compare to the levels reported by other occupations? (2) What are the positive and negative experiences of police work that may affect well-being? (3) How do police officer personality characteristics and coping strategies affect well-being? (Hart & Wearing, 1995) This study analyzed the stress of police work, as well working to identify the major coping skills that police officers share in common. Personality characteristics, family relationships, and the ability to learn and adapt quickly have been common occurrences that directly relate to police stress management abilities. These characteristics and factors also play a role in how well police officers do their job.

Faculty Mentor: Dr. Alison Cares

Examining the Ways in Which Court-Appointed Advocates Represent the Developmental Needs of Children in Court Cases  
Jacquilyn Zaremba ’14  
Sociology

This research investigates how court-appointed advocates, specifically Court Appointed Special Advocates (CASAs), represent the developmental needs of children in family court cases. CASAs are volunteers appointed by judges to advocate for children who have been abused and/or neglected; to act as their voice in the proceedings so that their needs are taken into account instead of considering the needs of the adults (i.e. parents and guardians). The goal of CASAs is to find permanent placement for the child, whether it be returning the child to his or her home or adoption. I conducted multiple interviews with CASAs and other professionals who have experience working with family and/or children services. While looking at how the developmental needs of children are represented, my research also focused on how this coincides with the “best interests of the child” standard. This standard refers to the deliberation that courts undertake when determining what types of services and actions will best serve a child as well as who is best suited to take care of that child. CASAs play an important role in making sure that these children are taken care of and advocated for.

Faculty Mentor: Dr. Alison Cares

Female Attorneys-Work & Home Life Balance  
Stephanie O'Brien ’15  
Sociology

Women are becoming much more prominent in the work force and are entering into professional careers. However, this does not mean there is a shift in home life responsibilities. Many women are faced with the burden of domestic responsibility on top of their professional career. More women find themselves more responsible for home life tasks than their male counterparts. My research will investigate how female attorneys balance their professional career with their home responsibilities and the impact it has on their life. I will draw my conclusion from a small sample of female attorneys that I have been working with at the Worcester County District Attorney's Office.

Faculty Mentor: Dr. Alison Cares
**Masculinity in Police Departments**  
Joshua McDuffie ’14  
Sociology

This study will examine the stereotypes and viewpoints of police officers. The intent of this study is to gain an understanding of the view of masculinity held by police officers within a department. The study will examine the viewpoint but also understand how the view of masculinity on the job is transferred into home life and on the job.

*Faculty Mentor: Dr. Alison Cares*

**Gender and Disclosures in Child Abuse Cases**  
Joelle DiDomenico ’14  
Sociology

Gender differences occur daily in our lives such as gender differences in the work place, at home, and how boys and girls socialize. Gender could possibly act as a barrier to disclosing abuse to forensic interviewers in child abuse cases. Forensic interviewers are the most important people in the cases because they are the ones that physically sit down with the child in SAIN (Sexual Abuse Intervention Network) interviews to hopefully get the child to disclose experiences of abuse, which prosecutors can use to bring charges against offenders, which will be helpful in any subsequent court case. Boys and girls may disclose experiences with physical and sexual abuse differently. This project used 20 SAIN interviews to compare aspects of disclosure of physical and sexual abuse between boys and girls. The findings may be used to help forensic interviewers tailor their approaches to the gender of the child.

*Faculty Mentor: Dr. Alison Cares*

**Police Cultural Immersion**  
Casey Vallas ’15  
Sociology

Police cultural immersion is the gradual acceptance into the camaraderie of law enforcement that develops through shared, unique, and sometimes dangerous experiences. This study seeks to differentiate between the influence of personal characteristics that contribute to a predisposition to work in law enforcement and the police cultural immersion that potentially cultivates a similar attitude on policing. In other words, police spend a lot of time bonding because they have a lot of downtime and the nature of their work requires trust and teamwork. As a result, police officers often look similar, act similar, and share similar beliefs with one another. This raises concern about the homogeneity of those who show an interest in working for law enforcement because it could create biases about how police should function in society. Interviews with police officers from a large metropolitan police department consistently point towards conformity through the development of camaraderie, although there is no evidence that suggests a negative impact on the functioning of the department.

*Faculty Mentor: Dr. Alison Cares*
Perfection in Beauty
Anna Szemiot ’14
Art

In highlighting a common perception of beauty through allusions to Vogue editorials, I argue that art can turn the different into beautiful. The pieces as well as sculptures will question the commonly accepted standards in beauty. Beauty comes in many shapes and forms, and should not be overlooked because of socially constructed attributes. The art will focus on the beautiful in its most fundamental form, avoiding particularly the physical side of hot, which simplifies the idea of brilliance to an almost vulgar form. Seeing beauty as a variance of perfection may bring more positivism to the world and a more accepting optimism to society.

Faculty Mentor: Prof. Thomas Grady

Mary Cassatt’s “Modern Woman” Mural at the 1893 World’s Columbian Exposition
Brianna Carey ’14
Art History

Mary Cassatt was a well-known painter within the Impressionist movement. In the late 19th century she was commissioned to paint one of two murals for an exposition. Her mural, Modern Woman, was not well received. It was previously unclear as to whether this reception was due to her artistic execution, or due to the political climate towards women at the time. It was determined that it was a mixture of both execution and attitudes, but it was clear that Cassatt ultimately failed at her first (and only) venture into mural art.

Faculty Mentor: Dr. Toby Norris

The Nature and Character of Genius
Alexandra Furtado ’14
Philosophy

This paper is an ontological analysis of Arthur Schopenhauer’s understanding of the world as both will and representation. Beginning with a description of the world we inhabit as mere representation, Schopenhauer argues that the true essence of reality, as well as ourselves, is a manifestation of the one will--striving and fighting against itself as especially depicted within the wild and violent animal kingdom. Schopenhauer further asserts that the true genius, as understood in Schopenhauer’s terms, is one who has ascertained the truth of the one will as the driving metaphysical essence or force in all reality. Furthermore, Schopenhauer states that it is because of this insight that the genius’ character is one of anxiety, irrationality, imagination, melancholy, and even madness. It is this definition of genius which drastically contradicts modern-day conceptions, and, as such, shows the wide gap between traditional ideas of genius and those asserted by Arthur Schopenhauer. Such a wide variance prompts intellectuals to reconsider the true meaning of genius, and the most accurate, tell-tale characteristics of his or her nature.

Faculty Mentor: Dr. Anthony Traylor

Something of Nothing
Zebb Duffany ’15 & Ted McCarty ’15
Philosophy

This paper is a philosophical exploration into the relationship between Nothing and Something. Nothing, with a capital “N”, refers to a complete lack of existence, and Something, with a capital “S”, refers to anything which exists, including existence itself.

The main topic of exploration in this paper is whether the relationship between Something and Nothing is one that is mutually exclusive, or if there is somehow a connection between the two, and if there is a connection,
what the relationship between Something and Nothing would look like. In its attempt to address this question, this paper will include discussion on the Platonic conception of forms and scientific reductionism, and in the examination of these two extreme positions will also suggest the existence of a middle possibility of the nature of the existence of things; that a thing must be anchored to exist, and that because of this non-physical things must be known in order to exist.

**Forgiveness and Atonement in Tales of Symphonia**
Andrew Harmon ’14
Philosophy

The 2003 video game *Tales of Symphonia* raises numerous ethical dilemmas that are interesting sources for philosophical discussion. One such topic is the issue and nature of forgiving crimes, administering punishment, and seeking atonement. These themes are covered in the character arcs of Regal Bryant and Presea Combatir. Regal's fiancee Alicia (who is Presea's sister) is sold into human trafficking, and returned as a disfigured monster. Regal mercy kills Alicia and spends many years living with endless guilt. When he meets Presea and she learns what happened, Regal begs for her forgiveness. Presea was also sold into trafficking, but did not suffer the same fate; she lost her consciousness for 16 years, awakening to find her family dead, her village destroyed, and her sister killed by a complete stranger. Is Presea able to forgive Regal? Can Regal atone for this crime?

In this essay and discussion, the nature of forgiveness is discussed and contrasted against this scenario. The presentation will ask whether or not what Regal seeks is called forgiveness, or is something else entirely. Other options and opinions from scholarly philosophical sources will be introduced to help reach a better understanding of the scenario at hand as a living example of how these concepts can be applied and verified. The presentation will end with the presenter giving his own conclusion about the nature of forgiveness and whether the provided scenario can be called forgiveness, or if a different understanding must be reached.

**Confessions of a Shopaholic: The Link Between Social Class Aspirations & Marketing in the Retail Apparel Industry**
Maureen Quirk ’14
Business Studies

Today, many high-end, luxury designers, such as Vera Wang and Alexander McQueen, are creating an additional, cheaper brand for more mainstream department stores, including Target or Macy's. Research regarding the positive and negative effects of this strategy is lacking. By increasing accessibility through the creation of these less expensive lines with designer names attached to them are brands—and more specifically, their marketers—blurring the lines and making it difficult to differentiate between varying social classes? Foremost, what would spark those individuals in the lower class to strive for success and betterment when they are now able to attain the perceived benefits of the upper class so easily? The purpose of this paper is to examine the correlation between social class and marketing, and ultimately weigh how large of an effect one has on the other. It will conclude with an argument as to whether this designer-for-department-store strategy is advantageous or disadvantageous to the retail apparel industry as a whole.
The Lunchbox: A Taste of Business Planning
Kathryn Cullerot ’15
Business Studies

Through my research I plan to answer the question of what it takes for a small business owner to make a successful startup company. The purpose of my project is to show the importance of a business plan through the development of my own. I will be describing the process from idea development through market research and business management, and finally creating the financial statements necessary to know the cost of the business. The struggle with not just small businesses, but all businesses, is that one day they can be at the peak of their industry and the next day they are at the bottom. That being said, the biggest problem, and greatest reason associated with small business failure, is that an entrepreneur is so in love with their product that they are unwilling to make necessary changes to make it successful. There are plenty of guides that show entrepreneurs how to start a business, but there are few that discuss the process through a women’s perspective. By creating a business plan for a café it will put in perspective the struggles and successes that women face when starting a new business.

Faculty Mentor: Prof. Frances Skypeck

Minding the GAAP: A Comparison Between US and International Accounting Standards
Taylor Dimmick ’14
Business Studies

Since the beginning of the millennium, many significant changes have occurred in the accounting world. The most important changes, however, have yet to be completed. The US is trying to converge their Generally Accepted Accounting Principles (GAAP) with the International Financial Reporting Standards (IFRS) that other industrialized countries like Great Britain have already accepted. Although the two standards have made significant progress in the merging process, there are still many differences that need to be reconciled. When these changes occur, the two most important financial statements from US companies, the balance sheet and income statement, will be affected. These changes in the statements will also affect many of the financial ratios investors use to evaluate a company’s value. This presentation is the result of a semester-long research on some of the major differences between the two standards. In the presentation, I will present some of my findings on those differences and how they will affect financial statements, financial ratios, and the investor’s decision on a company’s value.

Faculty Mentor: Prof. Joseph Foley

HWAR, What is it Good For?: An Evaluation of NHL Players
Jordan Sweigart ’14
Economics

This analysis develops a new statistic, Hockey Wins Above Replacement (HWAR), in order to evaluate ice hockey players in the NHL. The statistic is loosely based on the baseball statistic, Wins Above Replacement (WAR). Furthermore, a linear regression is run to analyze and calculate the monetary value of a NHL win. Then HWAR and the value of a win are combined in order to determine the expected salary for an NHL player. Therefore, comparisons can be made to players’ actual NHL salaries, and HWAR’s effectiveness is measured accordingly. The results show that this analysis contributes a plausible and new approach that NHL managers can use to evaluate professional hockey players.

Faculty Mentor: Dr. Brian Volz

NREGA’s Impact on Women’s Labor Force Participation in Rural India
Samantha Minieri ’14
Economics

This presentation will illuminate the factors which lead to female participation in the National Rural Employment Guarantee Act and ask if this program is increasing overall female labor force participation. NREGA is an employment guarantee program that acts as a social safety net for the rural poor in India. My study uses
logistic regression to determine the primary socio-economic correlates of a woman’s participation in NREGA. Results from the regression show there are multiple factors that increase the likelihood of female participation, including whether they are illiterate, a member of the Scheduled Tribes, have other members in their household participating in the program, have children under the age of five, and have previously been employed in wage work. Women who were previously employed for wages are more likely to participate in the program, meaning it may not be increasing female labor force participation. While NREGA may not have a major impact on the number of female labor force participants, this program is helping to close the wage gap between men and women and increase women’s bargaining power in rural labor markets.

Faculty Mentor: Dr. Smriti Rao

Parallel Parking with Ruler and Compass
Labeeby Servatius ’17
Mathematics

In this talk I will explain how Euclidean geometry can be used to answer some questions about how to drive a car. Questions such as the following:
- Which parts of the car are in danger of collision when turning?
- At what point should one reverse the steering when parallel parking?
- What kind of car is best for parallel parking?
- How accurate are parallel parking simulators?
- Why is it better to parallel park backing up, rather than driving forwards?

Faculty Mentor: Dr. Joseph Alfano

Presentation Session 3B
Tuesday, April 15
9:00-10:30 p.m. La Maison Hall

Suicide Prevention in Higher Education
Mae L’Heureux ’14
Psychology

Mental health is becoming an increasing concern for college-aged students and unfortunately, there is a lack of resources available to help those who are struggling. This project looks at how higher education as a whole responds to the mental health needs of students and specifically, how Assumption College reacts and accommodates its students who are suffering psychologically. The major barriers to appropriate and effective mental health treatment for college students was examined and ways to combat them were addressed. Additionally, members from various departments on campus including Residential Life, Academics, Student Affairs, and the Student Development and Counseling Center were interviewed to see what their specific role is regarding this issue and to see how the College as a whole can do a better job assisting those who need it.

Faculty Mentor: Dr. Amy Lyubchik

Decoding Facial Expression Across the Menstrual Cycle
Cassie Lincoln ’15
Psychology

Recent studies along with proposed evolutionary perspectives suggest that recognition of emotional facial expressions fluctuates across the menstrual cycle. In the follicular phase when women are most fertile, they report greater attraction to men who possess masculine traits. In contrast, when women are in their luteal phase they prefer more feminine-looking men because feminine characteristics may imply care and nurturance. In the current study, 47 college females were monitored and participated in two lab sessions, one during their luteal phase (non-fertile), and one during their follicular phase (fertile). During the two lab sessions, each participant viewed male and female targets expressing neutral, angry, sad, and fearful facial expressions of varying
intensities. Participants were asked to label the emotion they saw in these facial expressions. Consistent with the hypothesis, participants were more accurate in identifying expressions during the luteal (non-fertile) phase than during the follicular (fertile phase), particularly at mid-intensity levels. More specifically women in the luteal phase were more sensitive to angry and sad expressions at mid-intensity levels. These current findings are in line with past research suggesting greater affiliative motivation during the luteal phase.

Faculty Mentor: Dr. Maria Parmley

Tool-Use Development in Children
Peter Bui ’14
Psychology

The ability to use a tool requires not only the motor skill to be able to manipulate the object but also the perceptual ability to perceive the relevant characteristics of an object for determining what an object can be used for. The current study examined the development of these abilities in preschool children and a comparison group of adults. Participants used a hammer to drive pegs into a peg-board and time series records of their movements were recorded. Participants also made perceptual judgments about which hammers were most effective. Results showed improvements in perceptual and motor abilities developmentally. Older children and adults were able to choose more effective hammers, hammer more pegs, and had less variability in movements than younger children. Inertial properties of the tool were shown to influence perceptual judgments and hammer effectiveness as hammers with the smaller inertial volume were chosen more often and were more efficient hammers. Our findings suggest that developmentally children become more attuned at adjusting hammering performance based on hammer properties.

Faculty Mentor: Dr. Paula Fitzpatrick

A Review of Healthcare for Adolescent Females in the United States
Melissa McLain ’14
English

A review of the current health care that is provided to all adolescent females in the United States was conducted in consideration of the recent changes to the health care system in the US and the evolving challenges that face adolescent females. Adolescent medicine is not a designated subunit of medicine. Female adolescents are among a complex population of individuals that continue to face physical/emotional/mental health issues. The central question raised is: In what ways can the health care of adolescent females improve? Through reviewing the healthcare provided to adolescent females in the US, it was determined that if changes were made in individual parts of medicine, such as adjusting the medical school curriculum or making patient-doctor evaluation conversations more of a priority, the healthcare provided to adolescent females in the United States might prove to be more beneficial to adolescent females.

Faculty Mentor: Dr. Ann Murphy

The Cupid to her Psyche
Ashley Pereira ’17
English

In this adaptation of the Greek myth of Psyche and Cupid, the two lovers are turned into twenty-first century Bostonians. In the original myth, Psyche is an unusually beautiful young girl whose parents give her hand to Cupid. He is a beautiful god but he does not allow Psyche to see him in the light. Psyche's jealous sisters convince her that he is a beast, so Psyche sneaks into Cupid's lair at night to find out the truth. Psyche sees his beautiful form; however, Cupid feels betrayed by his wife. In the end, Cupid finds out the truth and forgives her. Psyche is made a goddess and the two live happily every after together. In this short story, modern-day artist Alma replaces Psyche, and an aspiring baker named David, resembles Cupid.

Faculty Mentor: Prof. Brett Murphy
Realities of a Family Shelter: Trapped in a Cycle
Alexandra Caulway ’14
English; Sociology

This thesis focuses on issues young mothers experience while they are in shelter. It studies the individual and the greater picture in terms of government assistance and systematic flaws, pointing out areas for improvement using personal experience as evidence.

Faculty Mentors: Dr. Michael Land and Dr. Robert Biggert

Presentation Session 4A
Tuesday, April 15
1:00-2:30 p.m. La Maison Salon

The Evolution and Efficacy of Deaf Education
Jennifer Gargan ’14
HSRS

The practice of educating students who are deaf has changed dramatically throughout history. Deaf education began as a segregated practice of isolating children who are deaf from the general population of students. In the 1970’s, practices moved toward mainstreaming and inclusion environments. Today, the advancements with cochlear implants have impacted deaf education as well. Further, the perspectives of the Deaf community, who are a distinct culture with strong views on deaf education, have not typically been considered when educational initiatives were developed and implemented. In an effort to collect the voices of the deaf community, a survey was administered to a small sample of deaf adults. The majority of these participants were completing their K-12 education while major changes were occurring in the field. Participants’ views and perspectives confirm the many challenges faced by students who are deaf in a variety of classroom settings. While looking to the future, participants desired more qualified teachers, the continuation of deaf schools, and improved access to communication. The participants’ voices and perspectives complimented the historical narrative and provided a more descriptive and personal response to the many changes in the field of deaf education.

Faculty Mentor: Dr. Susan Scully-Hill

The Credit Consciousness: A Historical-Comparative Understanding of Social Movement Responses in Periods of Income Inequality
Nabil Tueme ’14
Sociology

The state of income and wealth inequality has been steadily worsening for the past three decades and is today—for the first time in United States history—comparable to the state of inequality preceding the Great Depression. The top 1 percent of American households in both 1929 and 2007 resembled each other nearly identically in terms of relative income and wealth. Significant structural changes, whether prosperous or devastating, have long been posited as causes for personal and civic unrest. Thus, the presence of nationwide strikes, demonstrations, and protests in both periods is unsurprising. What is surprising is that the most successful movements of each period differed greatly from one another in their class-oriented grievances and propositions for reform. With such egregious similarities, why were there different social movement responses? This paper examines the key structural differences in each period of income inequality that created the necessary material climates for each movement—Labor and the Tea Party—to both triumph over others and alter the existing order of their times.

Faculty Mentor: Dr. Steven Farough
#It's 7.25$ in Texas That's Bullshit

Gabriella Mancini ’14
Sociology

Social media has hugely impacted the lives of people in first world countries and has created a new discursive medium. Social networking sites give users the ability to instantly communicate with those around the world and communication via social networking sites has the ability to spread instantaneously. Social scientists have shown that Twitter opinions accurately reflected public opinion. Research into social media has been fruitful in terms of relating online opinions to public polls. However, research hasn't contributed much about minimum wage discourse nor has research been done been the upcoming social networking site Tumblr which has 270 million monthly visitors. This research explores the types of people on Tumblr who discuss minimum wage, what their beliefs are, and how it could represents the American public’s view. Understanding these concepts can help us in our understanding of where the US general public stands in terms of minimum wage policy.

Faculty Mentor: Dr. Steven Farough

Perceptions of Intercollegiate Athletes

Megan Kasala-Hallinan ’14
Sociology

This project enhances the understanding of the perceptions of intercollegiate athlete’s social and academic life, while taking into account the gender of the perceiver and whether or not the perceiver is an athlete. A survey, The Perceptions of Intercollegiate Athletes, consisting of 17 questions, was taken by 172 undergraduate students at Assumption College to measure their perceptions of athletes’ social and academic lives. Overall, respondents felt that admission standards were lowered for athletes, and that non-athletes were more likely to attend parties where there is alcohol. In addition, athletes felt that non-athletes drank more than them.

Faculty Mentor: Dr. Alison Cares

Drawing the Islamic Curtain: The Racialization of Arabs in the Western World

Nabil Tueme ’14
Sociology

Both the history and contemporary experiences of Arab-Americans and Muslims pose a challenge to Post-Civil Rights era theories on the social construction of race. Such theories propose that while the US has experienced significant changes in the state of racial relations, a new framework and discourse permit covert transgressions of racial equality on a structural level. This new framework operates on rhetoric that emphasizes the attitudes and behaviors of groups as the primary determiner of socioeconomic status and mobility as opposed to the overt racism characteristic of Jim Crow segregation. However, this seemingly colorblind racial tolerance is not applied similarly to Arab-Americans and Muslims in the US. In fact, Arab and Muslim Americans have experienced a widening social gap that is characterized by not only overt hateful rhetoric, but also physical assault and murder. This paper examines the conditions of the unique racial formation process of Arab and Muslim Americans from their early immigration to the United States until present day.

Faculty Mentor: Dr. Steven Farough

Presentation Session 4B

Tuesday, April 15
1:00-2:30 p.m. La Maison Hall

Macrophage Response to BK polyomavirus infection

Maggie Bara ’14
Natural Sciences

A cell line of macrophages, a type of immune cell, was challenged with BK polyomavirus which is known
to cause kidney destruction in 5-10% of renal transplant patients. The immune response was analyzed in terms of the production of reactive oxygen and nitrogen species, the production of a TNF-alpha, and chemotaxis towards supernatant collected from infected cells.

Faculty Mentor:  Dr. Aisling Dugan

UV mutagenesis in Haloferax volcanii

Madelaine Duarte ’16
Natural Sciences

Haloferax volcanii is a type of halophilic archaea, an organism in a separate evolutionary domain from eukaryotes and bacteria. Haloferax grows in high salt environments that are being exposed to high levels of sunlight. The ultraviolet light (UV) from the sun induces DNA damage, and we are interested in how it responds to this. DNA damage can cause mutation, cancer, and cell death. In its response to DNA damage, Haloferax may employ protective mechanisms, DNA repair, and/or DNA damage tolerance mechanisms. To investigate this, we use survival assays in order to design new ways to screen for UV resistant and UV sensitive mutants. This data is significant when trying to determine how Haloferax survives under high amounts of UV.

Faculty Mentor:  Dr. David Crowley

Transcription-Coupled Repair in Archaea

Felicia Baltazar ’14
Natural Sciences

All living cells undergo damage to their DNA. The ultraviolet (UV) light produced by the sun is one of the most common environmental causes of DNA damage in cells. A DNA repair mechanism known as nucleotide excision repair (NER) repairs damage from UV light. NER can further be divided into two main subgroups: transcription-coupled NER and global genomic NER. Transcription-coupled NER is transcription dependent, meaning that the repair only occurs on transcribed strands of DNA. If not functioning properly, it can lead to many diseases. Organisms can be classified into three main domains: Archaea, Bacteria, and Eukaryotes. Archaea have similarities with these two other domains, however, Archaea are evolutionarily distinct and are therefore categorized into its own domain. It is not known whether transcription-coupled repair exists in Archaea. The chosen model organism used to study transcription-coupled repair is the halophile, Haloferax volcanii. There is a fructose operon that has been found in Haloferax volcanii that is transcribed in the presence of fructose in the environment. Therefore, if the Archaea are grown in the presence of fructose, the gene will be transcribed and experiments can be performed to try and determine whether transcription-coupled NER occurs after exposure to UV light.

Faculty Mentor:  Dr. David Crowley

Acetaminophen Toxicity: A Review of Evidence and Probe of Causation

Ashley Corridori ’15
Natural Sciences

Acetaminophen is a common analgesic and antipyretic found in over 300 over-the-counter and prescription medications. Although acetaminophen is a safe and effective drug when taken properly, it can have significant negative effects on the body when taken in excess. In fact, the most common cause of acute liver failure in the United States is due to acetaminophen overdoses. Researchers of many types have been studying the effects of acetaminophen toxicity over the last few years, and the popular press has reported some of the conflicts that have recently arisen. Acetaminophen toxicity results from the saturation of conjugative metabolism resulting in an increase of oxidative metabolism to make the toxic metabolite NAPQI through the enzyme CYP2E1. While acetaminophen overdoses can be dangerous, there is still hope for treatment as NAC therapy has been proven as an effective antidote to acetaminophen toxicity. The literature on this subject has been reviewed and compiled to present an understanding of the relationships between the metabolism and toxicity of acetaminophen, as well as the treatment of overdoses.

Faculty Mentor:  Dr. Ed Dix
**Epigenetic Regulation of crabp1**  
Megan Chan ’14  
Natural Sciences

Pregnancy Associated Breast Cancers (PABCs) are breast cancers diagnosed during pregnancy, lactation, or within the first postpartum year. These cancers are harder to detect, diagnose, and treat. Cancer growth is increased when tumor cells are in the presence of lactating mammary tissue. The gene cellular retinoic acid binding protein-1 (crabp1) is expressed in both mouse and human stromal cells that promote tumor growth. It is regulated by thyroid hormone, in one non-cancerous cell line, but the mechanism behind this regulation is unknown. Alterations to gene expression that occur outside of the genomic DNA are known as epigenetic modifications. Histone acetylation is one form of epigenetic regulation wherein an acetyl group attaches to and loosens histone interaction with DNA. The epigenetic regulation of crabp1 is investigated using NIH3T3 and primary adipose stromal cells treated with drugs that manipulate histone acetylation. Samples were analyzed using western analysis. We show that crabp1 protein expression increases with thyroid hormone. We also show that crabp1 protein expression is independent of histone acetylation when treated with thyroid hormone. Identifying the mechanism behind the regulation of crabp1 by thyroid hormone can lead to the tailoring of prevention and treatment of PABC.

*Faculty Mentor: Dr. Jessica McCready*

**Embryonic Development of Cardiac Parasympathetic Ganglia in Transgenic Neurturin Knock Out Mice and Wild Type Mice**  
Lucas Cantwell ’15  
Natural Sciences

The aim of our study was to determine at what point during development was the deficiency of neurturin, a glial cell line-derived neurotrophic factor family ligand, affecting the development of cardiac parasympathetic ganglia. Also the aim was to determine the role of neurturin during development. Neuron and glial cell development and morphology, from precursor neural crest cells were closely observed.

*Faculty Mentor: Dr. Kim Schandel for Dr. Donald Hoover*

**Presentation Session 5**  
**Tuesday, April 15**  
**2:30-4:00 p.m. Testa Fuller Auditorium**

**Lack of Gender Bias in the Chesapeake Region: An Examination of the Treatment of Male and Female Slaves in the Nineteenth Century Through Slave Narratives**  
Kerriann Lusk ’14  
History

This presentation examines if there is a differentiation in treatment between male and female slaves. It is split into different sections: physical abuse, mental abuse, sexual abuse, poor living conditions and no abuse. The results challenge what would commonly be expected – most would assume men and woman got different treatment based on their gender. In reality, there was not a huge difference. This presentation examines different narratives that justify the claim that there was no difference in punishment based on gender.

*Faculty Mentor: Dr. Carl Keyes*

**Modern Weaponry And its Effects on 19th century Society**  
Erich Grosse ’15  
History

The American identity in the 19th century greatly revolved around Samuel Colt’s guns. Colt’s bold republicanism, evident through his factories, not only provided jobs for the community, but also made his guns
globally popular. The weapons he made and sold were famous because of his republicanism, but the biggest reason they sold so well was because they were much more powerful, much more accurate, and surprisingly easy to use, giving Americans a false sense of power and confidence. Westerners were most often the ones caught up in this gun-owning hysteria, or gun culture, because the new and technologically allowed his guns to travel into the dangerous frontier and help their owners face threatening factors such as the Native Americans, or “Indians”. Americans already marginalized and disrespected the “Indians,” and the new guns that they owned made them believe they were even more superior. The “Indians” actually had many of Colt’s and other inventor's guns, allowing them to have some victories. The use of these guns to fight on the frontier shaped the America we see today.

Faculty Mentor: Dr. Carl Keyes

The Cost of Freedom - An Evaluation of Self-Purchase and Escape in 19th Century Slave Narratives
Jesse Hunt ’14
History
Throughout the history of slavery in America, slaves always sought to gain their freedom. They attempted various methods of obtaining liberty. Some managed to make enough of their own money so that they could purchase manumission. Others took the risk of going on the run, and became fugitives. Whichever way the slaves gained their freedom, there was a cost. This cost could come in many ways; it could be financial or even emotional, as well as psychological. Many Slave narratives included accounts of both self-purchase and escape. By observing these first-hand accounts, the costs become much more tangible. Through the varied experiences expressed in the narratives, it will be shown that the cost of freedom was high no matter which route a slave took and that nobody, self-purchased or fugitive, paid the same price.

Faculty Mentor: Dr. Carl Keyes

The Power of Mastery: Slaves, Slaveholders and Family Dynamics in Nineteenth-Century Slave Narratives
John McGinty ’14
History
Historians have frequently investigated master-slave relationships during the era of slavery in America from the period of the founding of the United States to the implementation of the Thirteenth amendment. In a provocative essay, Nell Irvin Painter suggests that the development of feminist scholarship, such as analyzing women’s writing and the importance of gender, has led to other intellectuals and activists focusing their attention on a “protected, potent social institution: the family.” Family is important in shaping identity and values, which in turn promote society with regards to shaping the political atmosphere and public policy. Both politics and public policy influence a family, thus more consideration is needed to demonstrate how family dynamics are important for understanding slavery and society as a whole. Slave narratives reveal that slavery played an influential role in shaping American families and, more broadly, American society in the nineteenth century. This element of culture cannot be separated from traditional explorations of the labor and economics of slavery. Slave narratives demonstrate that the institution of slavery was detrimental to the family structures and dynamics of both slave families and white slave-holding families.

Faculty Mentor: Dr. Carl Keyes

Coping and Christianity
Giulianna Franchetti ’14
History
Slave narratives tell the stories of both fugitive slaves and those who found freedom by legal means; narratives reveal the terror, oppression, and hardship slaves faced; the intelligence level of slaves as well as their ability to understand, despite their repression, the hypocrisy of the entire institution. Incredibly common among slave narratives is the presence of religion- more specifically Christianity. Their experiences with Christianity and the results of their exposure to this religion are illustrated mostly through those narratives that appeared in the 19th century. Through careful examination and unpacking, slave narratives portray slaves use of Christianity as a coping mechanism. Additionally, what some historians call “spiritual narratives” can show that Christianity
allowed for a certain freedom of the mind - of not only coming to terms with their life as a slave but providing them the knowledge and ability to mentally break free from their masters (which then led to an actualization of their freedom). Using Christianity as a coping mechanism however would not have been possible without a transformation of the religion that was actually provided and exposed to slaves from white slaveholders or preachers.

Faculty mentor: Dr. Carl Keyes

Poster Session
Tuesday, April 15
2:00-4:00 p.m. Testa Atrium
(in order of discipline)

Inspirations
Kyle MacGovern ’14
Art

There are a number of people, places, and things that inspire us. For my art pieces I decided to create illustrations of people. The people I chose are inspirational to me, and I wanted to recognize them for influencing me, and my art. When constructing my pieces I focused on the pop art era, and also looked at cartoon illustrations. I worked mostly with Abode Illustrator to make the series. With these styles in mind I created a series of artwork that displays the people whom I find most inspiring.

Faculty Mentors: Prof. Lynn Simmons and Prof. Tom Grady

The Impact of Class-Wide Peer Tutoring: Perceptions of Tutors, Tutees, and Teachers
Jennifer Gargan ’14
Education

Teachers across the United States are consistently looking for new ways to improve their classrooms and promote student learning. One effective way of promoting academic achievement and fostering positive attitudes toward learning is through the use of peer tutoring. Class-wide peer tutoring (CWPT) is a subset of this approach. This strategy has been successfully implemented in a local high school in central Massachusetts. This program places classroom assistants or peer tutors in classes containing 9th and 10th grade students. At the end of each semester, tutors, tutees, and teachers were asked to evaluate this program. After two years of the study, the highest ratings come from teachers. The results were overwhelmingly positive from all participants. However, some challenges persisted including scheduling difficulties, resistant tutees, and shy tutors. Suggestions for improvement included more training for tutors, more explicit instructions for teachers about the role of the tutor, and extra sessions outside class for tutees. Overall, the data collected in the second year of this study continues to show tutees, tutors, and teachers are responding positively toward CWPT and the majority of participants stated it is resulting in academic and social benefits.

Faculty Mentor: Dr. Nanho Vander Hart

The Untold Stories of Unaccompanied Refugee Minor Immigrants: Seeking Home Through Service
Marie Theroux ’14
Modern and Classical Languages and Cultures

This project aims to discuss and shine a light on the rising issue and prevalence of Latin American immigration to the United States, specifically focusing on its effects on children under the age of 18 who immigrate without a parent or guardian. Various perspectives on immigration are explored including historical, legal, psychological, humanitarian, and social justice. Furthermore, by working closely with and volunteering for Lutheran Social Services, a humanitarian non-profit organization in Worcester that sponsors the Unaccompanied Refugee Minor Program, I have a unique firsthand perspective. Because of this, I can say that these experiences
have allowed me to come into full contact with real people who have shared their stories of immigration and new life in the United States. It is my goal that many more people would be able to experience a similar empathizing realization that would break any preconceived notions and stereotypes they may have on immigration.

Faculty Mentor: Dr. Esteban Loustaunau

**Classification and Characteristics of an Unknown Bacterium**
Lauren S. Brown ’15 & Jane Dreske ’15

Natural Sciences

Microorganisms are the most abundant form of life and make up the majority of the earth’s biomass. The bacterial domain of life consists of millions of different bacterial species. Shape, cell wall composition, cell features, nutrition, pathogenicity, and DNA sequence are all characteristics that aid in the classification of these microbes. The purpose of our study was to identify and determine the growth characteristics of the unknown bacterium through structural, environment preference, and metabolic assays. The bacterium appeared pale yellow, circular, raised, and entire when grown on nutrient agar plates. The bacterium was gram positive, staphylococcal in shape, non-motile and a facultative anaerobe. The bacterium was able to catabolize glucose into a highly acidic byproduct, catabolize the amino acid tryptophan, ferment glucose, sucrose, and mannitol and was able to survive in high concentrations of salt. By isolating the DNA from the bacterium, conducting PCR of the 16s rRNA gene and sequencing the product, BLAST databases indicated that the closest relative to the unknown bacterium was Staphylococcus pasteuri, a bacterium found in humans, processed meat, vegetables, and milk as well as sometimes associated with wounds, prosthetics, and device implants.

Faculty Mentor: Dr. Aisling Dugan

**Determining the Identity of an Unknown Bacterium: Sphingomonas**
Meaghan Ekstrom ’15 & Nicole Stantial ’15

Natural Sciences

Bacteria are found in nearly all environments on planet Earth from the harsh conditions of a geyser to all over the human body. An unknown bacterium that was isolated from the bottom of a shoe was analyzed to determine its identity. Its physical, genetic, and metabolic characteristics were analyzed using a number of assays. It was determined that the unknown bacterium was gram-negative small and bacilli shaped. The unknown bacterium survived best in an aerobic environment, neutral pH level, and at 20°C. It cannot ferment sugars or starch, nor could it catabolize most proteins that were tested. However, it did hydrolyze gelatin and partially catabolize ornithine. A disc diffusion assay showed that the bacterium is sensitive to Lysol, Betadine, and Touch Spot cleaning reagents as well as the antibiotics chloramphenicol and vancomycin. Genetic analysis was used to determine that the unknown bacterium’s genome had a 95% similarity to the bacteria Sphingomonas, making this the closest relative to the unknown bacterium. Sphingomonas is a bacterium that has a yellow-orange pigment and is typically found in soil. This bacterium has been found to cause brown spots on squash. Investigating the identity of the bacterium will help to understand its function in the environment.

Faculty Mentor: Dr. Aisling Dugan

**Discovering an Unknown Bacterium**
Kelly Black ’15

Natural Sciences

Only 1% of over 1 billion bacterial species estimated to exist on planet Earth can be cultured in the laboratory leaving the majority of bacterial species unknown and waiting to be discovered. According to this, approximately 10 million species of bacteria can be isolated and cultivated in a lab. In this research study, an unknown bacterium was collected from the sidewalk outside of the Assumption College Testa Science Center and cultured on nutrient agar. To determine the identity of this unknown bacterium various cellular stains, environmental growth tests, and metabolic assays were performed. The bacterium was determined to be a facultative anaerobe that prefers 37 degree Celsius. The bacterium was a gram-positive bacillus that forms endospores. This unknown was not able to catabolize many proteins or carbohydrates except it did hydrolyze starch, reduce nitrate, and possessed hemolysin. Isolation of genomic DNA following by PCR amplification of 16s
rRNA gene and nucleic acid sequencing determined that the closest match, with 98% similarity, was Bacillus thuringiensis. It is thus concluded that the unknown bacterium is a strain of Bacillus thuringiensis. Bacillus thuringiensis is a natural soil dwelling bacterium that is best known for its insecticidal properties of creating proteins that act as toxins within the stomachs of insects.

Faculty Mentor: Dr. Aisling Dugan

**Identification and Characterization of the Morphological, Metabolic, and Mammalian Immune Response to an Unknown Bacterium**

Maggie Bara ’14, Amanda O’Malley ’14, Rebecca Rood ’14, Samantha Williams ’14 & Sarah Williams ’14
Natural Sciences

Bacteria are single celled organisms that are highly diverse. The purpose of this study was to characterize and determine the identity of an unknown bacterium isolated from a sink in Testa Science Center and then to characterize how innate immune cells respond to this microorganism. After initial isolation from the sink, we cultivated the unknown bacterium on a nutrient agar plate. Using staining techniques, the unknown bacterium was found to be a small, gram-negative, bacillus-shaped bacterium, and may have a capsule. A series of metabolic tests indicated that the bacterium has the ability to respire aerobically, could not ferment sugars, was resistant to high salt concentrations, and lysed hemoglobin. PCR analysis and bioinformatics revealed that the unknown 16S rRNA sequence was most closely related to Pseudomonas chlororaphis. Next, a cell line of murine macrophages, RAW 264.7, was challenged with the bacterium. Macrophage cell death was observed when the cells were challenged with the bacterium. The bacterium caused the macrophages to produce reactive oxygen, but not reactive nitrogen species. The cytokine, TNF alpha, was produced by the RAW cells at 18 and 24 hours after infection. This bacterium stimulates immune cell activity which is clinically relevant because its relative Pseudomonas aeruginosa is the causative agent of cystic fibrosis.

Faculty Mentor: Dr. Aisling Dugan

**Identifying an Unknown Bacterium**

Kinga Piskorz ’15 & Tamara Salman ’15
Natural Sciences

Microbiology is the study of microorganisms. One subdivision of microbiology is bacteriology, which is the study of bacteria. Scientists in this field are usually interested in determining the morphology, identification, and other characteristics of a bacterium because of its diversity. In doing so, a microbiologist would grow it on pure cultures in the laboratory. This study consisted of performing different types of traditional assays and a modern test to determine the identification of a bacterium that was isolated from the floor. The traditional assays determined the bacterium’s structure, growth characteristics, metabolism of proteins and carbohydrates, and respiration. Assays such as Gram stain, simple stain, and negative stain determined the cell’s morphology. Wet mounts, colony morphology, slant and deep tubes, and different pH, oxygen, and environment preference tests determined the growth characteristics. Metabolism was analyzed by starch hydrolysis, MRVP, hemolysin, EMB, mannitol salt, gelatin hydrolysis, urease, indole, phenylalanine deaminase, tests. The modern test gave a genetic analysis of the floor bacterium and its sequence was compared to other organisms. The isolated floor bacterium was a bacillus shaped and Gram positive. It had no preference for oxygen, pH, or temperature. It can break down some proteins and carbohydrates and has certain enzymes that can produce reactions in respiration and metabolism.

Faculty Mentor: Dr. Aisling Dugan

**Isolation and Analysis of Unknown Bacterium from the Lab Bench**

Paul Kehoe ’14 & Jack Mourad ’14
Natural Sciences

The field of microbiology studies the microscopic world, which has an important and direct impact on every day life. To better understand microscopic life, a bacterium was isolated from the lab bench and cultured on a nutrient agar plate. This bacterial species was studied throughout the semester. We found that the isolated
bacterium was a Gram-positive coccus and may have a capsule. The bacterium preferred a more basic, room-temperature environment, and was able to grow in both aerobic and anaerobic environments. Additionally, it lacked an ability to metabolize most carbohydrates and proteins with the exception of gelatin, which it was able to hydrolyze. The genomic DNA of this species was isolated, the 16s rRNA gene amplified using PCR, and the gene segment was sequenced. Using a BLAST search, the most closely related bacterial family member was the “Fleming strain” of Micrococcus luteus with a 94% query coverage. A literature search revealed that Micrococcus luteus exhibited very similar characteristics (immotility, colony morphology, and metabolic capabilities) to the unknown bacterium we cultured with the exception that it was strictly aerobic, and unable to metabolize gelatin. M. luteus has been linked to several cases of endocarditis, suggesting our isolate may cause disease if given the opportunity. The study and identification of this unknown bacterium highlights the variability and diversity of bacteria providing a greater appreciation of the vastness of the microbial world.

Psoriasis and The Target On Gender, Race and Age
Juliana Elhoussan ’14
Natural Sciences
Psoriasis is an autoimmune disease that affects approximately 2-3% of the world’s population and is characterized by immune complexes of the body attacks itself. The goal of this research study is two fold. First, psoriasis patient demographics was compared to the general Worcester population to determine if gender, age, and race increase one’s risk of developing Psoriasis. Analysis of 36 patients enrolled for treatment at Clinical Pharmaceutical Group revealed that the being Caucasian, a male, and between the ages of 25 to 54 were risk factors to the development of Psoriasis. The second part of this research project analyzed a double blind clinical study that consists of three test groups: the placebo group, the placebo and Enbrel group which is a drug that is already on the market, and the new drug group that is currently in phase III trials. My study analyzed the severity of psoriasis of 36 patients in these three groups over a twelve week period. There were 13 females and 23 males ranging from the ages of 18 to 75. The drug treatment results (both Enbrel and new drug) revealed that individuals who were on the drugs experienced decreased Psoriasis severity compared to placebo group and initial assessment before treatment. Together this work indicates risk factors that contribute to psoriasis and provide insight into new treatment options.

RAW264.7 Cellular Response to Dermacoccal and Staphylococcal Infection
Maggie Bara ’14 & Hieu Nguyen ’15
Natural Sciences
The mammalian immune system is comprised of physical, chemical, and cellular defenses. Here we investigate how a subset of immune cells known as macrophages respond to infection by two gram-positive cocci bacterial species that are part of the normal human flora. Two bacterial species were isolated from a science building at Assumption College in Worcester, MA and cultured on nutrient agar plates. 16srRNA sequencing revealed that these two species were members of the Staphylococcus and Dermacoccus genera. To investigate if these two members of the human microbiome stimulate the immune system, a mouse macrophage cell line, RAW264.7 cells, were challenged with each bacterial type and the response to infection was evaluated. Our results found that after exposing the bacteria to the macrophages for 45 min, RAW264.7 cells phagocytosed 54% and 14% of Staphylococcus and Dermacoccus, respectively. The Staphylococcus species, but not Dermacoccus, showed significant chemotaxis towards towards the bacteria after 6 h. Immunoblot analysis revealed that both microorganisms robustly activated the MAPK molecule, p38, at 15 and 30 minutes after infection, but only Staphylococcus infection induced RAW264.7 TNF-a production. Taken together, two common inhabitants of the human skin and mucosal human microbiome induce different macrophage responses.
**Synthesis of Montamine Analogs 2**  
Melanie Freitas ’14  
Natural Sciences

Montamine is a natural product found in the seeds of the Centaurea montana plant. In previous studies, montamine was isolated from these seeds and tested against colon cancer cells, showing anticancer activity. Because the plant produces only small quantities of the natural product, there is a need to synthesize montamine in a laboratory to generate significant quantities for further development as a therapy. In this work, a synthetic strategy was developed to access the general molecular structure of montamine, relying on alkylation and subsequent acylation of both nitrogen atoms of a hydrazine core. Proof-of-concept was achieved through the successful synthesis of several compounds structurally similar to montamine. These compounds could be tested in the future to determine their efficacy against colon cancer cells in comparison to montamine. Significantly, this strategy has enabled further research toward the synthesis of montamine.

*Faculty Mentor: Dr. Elizabeth Colby Davie*

---

**Optimization of DNA Sonication**  
Zacharia El-Samin ’14  
Natural Sciences

The developmental stage of breast tissue significantly influences the prognosis of breast cancer. Pregnancy-associated breast cancers (PABCs) are diagnosed during pregnancy, lactation, or within the first year postpartum. PABCs have a more aggressive development and a poorer prognosis. Adipose stromal tissue adjacent to mouse and human breast cancer samples expresses high levels of crabp1 (cellular retinoic acid-binding protein) however its regulation is unknown. DNA binding proteins known as transcription factors can regulate gene expression by influencing the rate of transcription. Chromatin Immunoprecipitation (ChIP) is a technique used to investigate the interaction and abundance of proteins bound to the regulatory regions of DNA. A critical component of ChIP is the sonication of the DNA sample that breaks open cells and shears DNA. This step must be optimized in order to know the ideal conditions to consistently obtain DNA of the same size. In this study, NIH3T3 mouse fibroblasts were sonicated under a variety of conditions including sonication time, frequency, and intensity. Further investigation is required to finalize the optimization so that we can begin to determine which proteins are bound to the crabp1 promoter region in adipose stromal cells.

*Faculty Mentor: Dr. Jessica McCready*

---

**Regulation of crabp1 Gene Expression in Mouse Mammary Adipose Stromal Cells**  
Katie Huling ’14  
Natural Sciences

Pregnancy-Associated Breast Cancer (PABC) is breast cancer that is diagnosed during pregnancy or in the first postpartum year. It is associated with a poorer prognosis and accounts for approximately 1-3% of all breast cancers. During development, the breast undergoes structural changes, with the most drastic changes occurring to the adipose stromal cells present during lactation (ASC-L). It has been shown that mouse ASC-L express high levels of cellular retinoic acid binding-protein 1 when compared to ASCs in mice who have never been pregnant. Additionally, it has been shown that thyroid hormone (T3) activates Crabp1 expression in a non-cancerous cell line, but the mechanism is unknown. Because T3 is required for lactation, we hypothesized that T3 activates Crabp1 gene expression in mouse ASC-Ls and contributes to PABC. T3’s affect on Crabp1 transcription can be measured using luciferase promoter assays. However, the plasmid containing both the luciferase gene and Crabp1 promoter first needs to be constructed. The Crabp1 promoter sequence was obtained and two thyroid response elements were found. The Crabp1 promoter product was obtained using PCR, however we are still working on generating the plasmid. Once generated, this plasmid will determine if T3 activates Crabp1 gene expression in ASCs.

*Faculty Mentor: Dr. Jessica McCready*
Genetic Analysis of Integrin Signaling in C. elegans axon Guidance
Devyn Oliver ’14
Natural Sciences

During development, millions of neurons extend axons to their appropriate targets. Growth cones at the tips of extending axons integrate extracellular cues and guide axons to their correct destinations. Although this navigational ability is essential for proper wiring of the nervous system, the molecular mechanisms of neurons’ GPS systems are not yet well understood. Here we show that a family of transmembrane receptors, known as integrins, regulate axon guidance in a cell type-specific manner in Caenorhabditis elegans. Using a genetic approach, we found that decreased integrin function produces: 1) striking defects in the patterning of commissural axons from GABAergic neurons, 2) strong, but less robust effects on commissural axons from cholinergic neurons, and 3) no obvious effects on longitudinal axons projecting from the tail to the head (e.g. from the interneuron DVA). Future studies will elucidate mechanisms by which integrin signaling effects axon guidance and synapse development in specific cell-types.

Faculty Mentor: Dr. Michele Lemons

Moisture Retention in Various Moss Species
Lauren Berntsen ’14, Melanie McCauley ’15, & Bianca Monaco ’16
Natural Sciences

Different moss species are widely distributed throughout the environment and regions around the streams and in forests of Assumption College. Moisture content plays an important role in abundance and location of moss species in the environment. In this study, seven different moss samples were examined for their percentage of moisture content, the substrate on which they grew (soil, bark or rock) and the total abundance of each type of moss in relation to their distance from the water source. Some of the species had high moisture content and some had much less moisture. There was an indirect relationship between abundance and distance; as the moss's distance from the edge of the stream increased, the abundance decreased. Moisture content, in contrast, was not affected by distance from the stream. Instead, the results show that the samples taken from similar substrates had similar moisture contents, but demonstrated no relationship between water retention and distance from the primary water source.

Faculty Mentor: Dr. Owen Sholes

Rhytisma Acerinum: Infection Patterns, Tree Characteristics and Microbial Diversity
Maggie Bara ’14, Ashley Impagliazzo ’15, Sean Toomey ’15 & Delesha Woodley ’14
Natural Sciences

Rhytisma acerinum is a fungus that infects the leaves of sycamore and maple trees, causing the formation of a dark patches known as tar spots or stromata. Infected Norway Maples, Acer platanoides, located on the Assumption College Campus in Worcester, MA were investigated in terms of the tree characteristics, location relative to other trees, and the culturable bacteria living on the leaves. There was a strong positive correlation between the percentage of leaves infected and the density of stomata per leaf. Proximity to infected trees was correlated with the percent of leaves infected. Tar spot infection was not related to tree height or girth, or the location of leaves on the tree (height where infection was concentrated) or the culturable bacteria isolated from infected versus non-infected leaves. Proximity to other areas infected with Rhytisma acerinum seems to facilitate its spread; this was observed both in terms of host density and the percentage of leaves infected and the density of stromata per leaf.

Faculty Mentor: Dr. Owen Sholes

Vegetative Growth Along a Moisture Gradient in a Detention Pond
Lauren S. Brown ’15, Megan McCann ’15, Lauren Pepi ’15 & Mary Schneider ’15
Natural Sciences

Environmental gradients are defined by gradual changes from one place to another due to moisture, temperature, disturbance, or other conditions and these gradients can occur on small or large scales. The
detention pond and the area that surrounded it located near Testa Science Center were studied in order to
examine the presence of an environmental gradient through soil moisture. Parallel transects were constructed
along the proposed gradient and soil samples were taken to observe the gradual change in soil moisture. The
species of plants were also identified on the parallel transects. The height of the cattails within the detention
pond was also studied to determine their preference for the water depth. It was confirmed that soil moisture
decreased with distance from the detention pond. Species such as Glechoma and plantain were prevalent in the
beginning of the transect, while switch grass and cattails were prevalent closer to the detention pond. The
maximum cattail height increased as the water depth increased, which suggested the cattails preferred to grow in
deep water. In conclusion, plant growth near the detention pond was directly related to the water content in the
soil of the proposed gradient.

Faculty Mentor: Dr. Owen Sholes

Associative Learning Pathway in daf-7 Mutants
Marinieves Del Valle ’14
Natural Sciences

The formation of memories can result in small changes at synapses (1). These changes are seen in the
number and localization of glutamate receptors (GluRs) at the synapse after learning (2). The glutamate
receptor GLR-1 is important for diacetyl (DA) associative learning, because glr-1 mutants show reduced learning in a DA
associative learning test (2). Unpublished results from the Juo lab suggest that the DAF-7 pathway is important in
controlling GLR-1 levels; more specifically, daf-7 mutants have increased GLR-1 levels. We wanted to know if DAF
-7 has an important impact on learning. We hypothesized that daf-7 mutants have a defect in learning, due to the
fact, that they do not control GLR-1 levels normally. We tested associative learning in daf-7 mutants by
performing a DA associative learning test and comparing the ability of wild type and daf-7 worms to learn. Wild
type worms, after the DA associative learning test, normally learn to associate the DA with starvation and no
longer move towards DA in the chemotaxis assay. We also tested glr-1 and casy-1 mutants, which have been
shown to have a defect in learning in this assay (3). By testing glr-1 and casy-1 as controls we could assess
whether the procedure followed for this experiment was the correct one. The results suggested that the DAF-7
pathway may be important for learning.

Faculty Mentor: Dr. Jessica McCready for Dr. Peter Juo

Room Temperature Storage Effects on Acidity of Northeastern Soils
Melanie McCauley ’15
Natural Sciences

Soil samples were collected throughout the Northeast in the summer of 2001 and tested for their acidity,
basicity, %C, %N, and pH levels. These soils were stored for 12 years and then the re-examined for any changes in
soil acidity. The top two layers of soil for each sample were examined to determine the effects of storage on the
soil. The research conducted was to determine whether changes were due to methodology or because of storage
effects. The same methods were used for this study as in the 2001 study. Cations in the soils were extracted with
a neutral salt solution of 1 M KCl and a mechanical vacuum extractor. The acid-base titration was conducted with
0.007 M NaOH and a phenolphthalein indicator with an end-point of pH 8.2. The soils were found to have acidified
significantly over the decade, particularly with the Oa soils. This could be due to microbial oxidation, especially
with finer soils that have more surface area as seen in the Oa soils.

Faculty Mentor: Dr. Richard Warby

The Ethical Implications of Physician-Assisted Suicide on Pharmacists
Andrea Clapp ’14
Philosophy

Recently, states in the U.S. have been interested in whether physician-assisted suicide should be legalized
and some states, such as Oregon and Washington, even practice it. Physician-assisted suicide, however, raises
moral questions for health professionals, such as pharmacists. It is the responsibility of a pharmacist to dispense
the drug to patients, and therefore the pharmacist is directly involved in assisting the patient’s suicide. However,
the pharmacist may believe it is immoral to dispense because it helps the patient's suicide and contradicts their purpose as a pharmacist. What are the ethical implications of pharmacists providing lethal medication to willing, terminally ill patients given their professional responsibilities, using ethical principles from Aristotle, Kant, Aquinas, and other modern bioethical thinkers? My analysis found that physician-assisted suicide is unjust because it allows for an inherently unjust practice, suicide. It is not illegal in certain states, however, so participation should not allow for legal consequences. For pharmacists who do not wish to participate, they may offer referrals, but along with this, the pharmacist should offer alternative options, such as hospice and palliative care.

**Faculty Mentor: Dr. Molly Flynn**

**Disability and Addiction: Explicit and Implicit Perceptions**
Katelyn Colburn ’14 & Kelsie Phillips ’14
Psychology

Although addictions can be considered disabilities under certain circumstances, previous research indicates that individuals with these conditions are perceived and treated differently by society. To examine public perceptions of individuals with these conditions, we used three measures: a self-report questionnaire to examine explicit perceptions, a facial recognition task, and an Implicit Association Test (IAT) to measure implicit perceptions. Responses to the self-report questionnaire showed that compared to people with addictions, participants perceived individuals with disabilities to be less different from themselves, to have less social distance from themselves, and to be less responsible for the onset of their condition. Emotional labeling in the facial recognition task showed that participants labeled more neutral faces in the control condition (those of “average” individuals) as happy than in the addiction condition, more neutral faces in the addiction condition as neutral than in the control condition, and more 30% angry faces in the addiction condition as angry than in the disability condition. Reaction times in the IAT showed that participants had a positive implicit bias toward individuals with disabilities compared to those with addictions overall.

**Faculty Mentor: Dr. Fang Zhang**

**The Effects of Empathy on Disparaging Humor**
Peter Bui ’14
Psychology

Explanations of why we find other people’s misfortune amusing range from unconscious urges to elevating self-esteem. This investigation is about the influence of induced empathy on reducing ratings of disparagement humor. Sixty-four undergraduate students participated in this experimental study. In the pre-test, they all watched video clips eliciting disparagement humor and rated them in terms of funniness and pleasure. The experimental group read an empathy-inducing story whereas the control group read a neutral story. Afterwards, both groups provided ratings of two different video clips. Participants also completed questionnaires for dispositional empathy and humor. Results show that experiencing empathy towards a stranger makes us less likely to laugh at this person's misfortune. Perceiving humor and experiencing empathy are both based on the ability to understand others’ mental states, intentions, and feelings. Future research could expand our understanding of disparagement humor by investigating the cognitive appraisal that takes place and the associated feelings created before the production of disparagement humor.

**Faculty Mentor: Dr. Maria Kalpidou**
Acknowledgements

Thank you to the Undergraduate Research Symposium committee members (Dr. David Crowley, Dr. Rachel Ramsey, Dr. Sarah Cavanaugh, Dr. Alison Meyer, Dr. Tom Wheatland, Dr. Aisling Dugan), the faculty mentors for the students, the faculty respondents for the individual sessions, and Dr. Landy Johnson for her helpful advice on organizing the Symposium.

Thank you to the President of the College, the Office of the Provost, Business Services, Sodexo, Curry Printing, and Silver Screen Design for their help in supporting the Symposium.

Thank you to Benjamin Gadwah, Assumption College graphic design major, for designing the Symposium t-shirts, posters and programs.

And our very special thanks to Michele Aubin, from the Office of the Provost, for her invaluable help in organizing the Symposium.
EVERY HORIZON, UPON BEING REACHED, REVEALS ANOTHER BECKONING IN THE DISTANCE. ALWAYS I AM ON THE THRESHOLD.

W. Eugene Smith