Molecular & Cellular Biology & Pathobiology Program
Donald R. Menick, Ph.D., Director
Annual Report 2014-2015
Division Directors

Dennis K. Watson, Ph.D.                              Donald R. Menick, Ph.D.
Cancer Biology                                      Cardiovascular Biology

Steven A. Rosenzweig, Ph.D.                         Andy Wessels, Ph.D.
Cell Regulation                                     Genetics and Development

Keith L. Kirkwood, DDS, Ph.D.                       Louis Guillette, Jr., Ph.D.
Caroline Westwater, Ph.D.                           Marine Biomedicine and
Oral Health Sciences                                Environmental Science

Progress Committee

Dr. Craig Beeson
Dr. Edward L. Krug
Dr. Steven W. Kubalak
Dr. Donald R. Menick

Twelve (12) students graduated: May 15, 2015

<table>
<thead>
<tr>
<th>Student’s Name</th>
<th>Matriculation Date</th>
<th>Mentor</th>
<th>Degree Sought</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akter, Tanjina</td>
<td>2013</td>
<td>Dr. Galina Bogatkevich</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Akerman, Adam</td>
<td>2012</td>
<td>Dr. Jeffrey Jones</td>
<td>Ph.D.</td>
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<tr>
<td>Al Sarraf, Oday*</td>
<td>2010</td>
<td>Dr. Craig Crosson</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Alge, Joseph*</td>
<td>2010</td>
<td>Dr. John Arthur</td>
<td>M.D./Ph.D. Defended PhD12/2013</td>
</tr>
<tr>
<td>Aseem, Obaidullah*</td>
<td>2006</td>
<td>Dr. Scott Argraves</td>
<td>M.D./Ph.D.</td>
</tr>
<tr>
<td>Bangma, Jacqueline</td>
<td>2013</td>
<td>Dr. Louis Guillette, Jr.</td>
<td>Ph.D.</td>
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<tr>
<td>Briggs, Laura</td>
<td>2008</td>
<td>Dr. Andy Wessels</td>
<td>M.D./Ph.D. Defended PhD 2/2014</td>
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<tr>
<td>Cantu, Theresa</td>
<td>2011</td>
<td>Dr. Louis Guillette, Jr.</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Corum, Daniel *</td>
<td>2009</td>
<td>Dr. Robin Muise-Helmericks</td>
<td>Ph.D. Defended 6/2014</td>
</tr>
<tr>
<td>Dahrouj, Mohammad III*</td>
<td>2010</td>
<td>Dr. Craig Crosson</td>
<td>M.D./Ph.D. Defended PhD12/2013</td>
</tr>
<tr>
<td>Mohammed Dany</td>
<td>2013</td>
<td>Dr. Besim Ogretmen</td>
<td>M.D., Ph.D.</td>
</tr>
<tr>
<td>Name</td>
<td>Year</td>
<td>Advisors</td>
<td>Degree(s)</td>
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<tr>
<td>Desjardins, Danielle</td>
<td>2011</td>
<td>Dr. Craig Crosson Dr. Zsolt Ablonczy</td>
<td>M.D./Ph.D.</td>
</tr>
<tr>
<td>Doheny, Brenna</td>
<td>2010</td>
<td>Dr. Louis Guillette, Jr.</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Durham, Emily</td>
<td>2014</td>
<td>Dr. James</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>e Silva (Trombetta), Jessica</td>
<td>2008</td>
<td>Dr. Amy Bradshaw</td>
<td>D.M.D./Ph.D.</td>
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<td>Flanary, Jocelyn</td>
<td>2004</td>
<td>Dr. Paul Becker</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Galligan, Thomas</td>
<td>2013</td>
<td>Dr. Louis Guillette, Jr.</td>
<td>Ph.D.</td>
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<tr>
<td>Grayson, Robyn*</td>
<td>2010</td>
<td>Dr. John Baatz</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Hale, Matthew</td>
<td>2013</td>
<td>Dr. Louis Guillette, Jr.</td>
<td>Ph.D.</td>
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<tr>
<td>Herbert, Bethany</td>
<td>2010</td>
<td>Dr. Keith Kirkwood</td>
<td>D.M.D./Ph.D.</td>
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<td>Herr, Daniel</td>
<td>2011</td>
<td>Dr. Donald Menick</td>
<td>M.D./Ph.D.</td>
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<tr>
<td>Holmes, Casey*</td>
<td>2010</td>
<td>Dr. Steve Rosensweig</td>
<td>M.D./Ph.D. Defended PhD 7/2014</td>
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<tr>
<td>Kemper, Jenny</td>
<td>2012</td>
<td>Dr. Gavin Naylor</td>
<td>Ph.D.</td>
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<tr>
<td>Kimbrough, Denise*</td>
<td>2009</td>
<td>Dr. Donald R. Menick</td>
<td>Ph.D. Defended 6/2014</td>
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<tr>
<td>Knackstedt, Rebecca*</td>
<td>2008</td>
<td>Dr. Michael Wargovich</td>
<td>M.D./Ph.D. Defended PhD 5/2013</td>
</tr>
<tr>
<td>Lindner, Amanda*</td>
<td>2007</td>
<td>Dr. Muise-Helmericks</td>
<td>D.M.D./Ph.D.</td>
</tr>
<tr>
<td>Lockhart, Marie*</td>
<td>2007</td>
<td>Dr. Arno Wessels</td>
<td>Ph.D. Defended 6/2014</td>
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<tr>
<td>McCoy, Jessica</td>
<td>2010</td>
<td>Dr. Louis Guillette</td>
<td>Ph.D.</td>
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<tr>
<td>Nilsen, Frances</td>
<td>2013</td>
<td>Dr. Stephen Long</td>
<td>Ph.D.</td>
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<tr>
<td>Pleasant, Dorea</td>
<td>2010</td>
<td>Dr. Dhan Kuppuswamy</td>
<td>Ph.D.</td>
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<tr>
<td>Reese, Charles</td>
<td>2014</td>
<td>Dr. Stanley Hoffman Dr. Elena Tourkina</td>
<td>Ph.D.</td>
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<td>Renaud, Ludivine</td>
<td>2010</td>
<td>Dr. Donald Menick</td>
<td>Ph.D.</td>
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<tr>
<td>Robichaux, Jacquelyne*</td>
<td>2010</td>
<td>Dr. Ann Ramsdell</td>
<td>Ph.D.</td>
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<td>Rosset, Emilie</td>
<td>2012</td>
<td>Dr. Amy Bradshaw</td>
<td>D.M.D./Ph.D.</td>
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<td>Sauls, Kimberly</td>
<td>2011</td>
<td>Dr. Chip Norris Dr. Roger Markwald</td>
<td>Ph.D.</td>
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<tr>
<td>Smith, Joshua</td>
<td>2008</td>
<td>Dr. Rick Schnellmann</td>
<td>M.D., Ph.D. Defended PhD 6/2015</td>
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<tr>
<td>Melissa Sokolosky</td>
<td>2011</td>
<td>Dr. Louis Guillette, Jr.</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Strungs, Erik</td>
<td>2009</td>
<td>Dr. Robert Gourdie</td>
<td>M.D./Ph.D.</td>
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<tr>
<td>Name</td>
<td>Year</td>
<td>Advisor</td>
<td>Degree</td>
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<td>Temkin, Alexis</td>
<td>2012</td>
<td>Dr. Demetri Spyropoulos</td>
<td>Ph.D.</td>
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<td>Toomer, Katelynn</td>
<td>2013</td>
<td>Dr. Roger Markwald</td>
<td>Ph.D.</td>
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<td></td>
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<td>Dr. Chip Norris</td>
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<td>Wenzel(Goodson), Abby</td>
<td>2011</td>
<td>Dr. Louis Guillette, Jr.</td>
<td>Ph.D.</td>
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<tr>
<td></td>
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<td>Wheeler, Jason</td>
<td>2009</td>
<td>Dr. Jeffrey Jones</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Zhang, Xiaoyi</td>
<td>2008</td>
<td>Dr. Keith Kirkwood</td>
<td>M.D./Ph.D. Defended PhD 12/2014</td>
</tr>
</tbody>
</table>

*Graduated in May 2015

**STUDENTS’ PUBLICATIONS**

**Journals**


**Bowden JA**, **Cantu TM**, Sommerville S, Guillette M, Botha H, Guillette L. Plasma-based biomarkers for pansteatitis in Mozambique Tilapia from Loskop dam, South Africa. (In review at PLoS ONE). *Co-First Author*


Doheny, B.M., S. Kohno, L.J. Guillette, Jr. Activation of Estrogen Receptor 1 (ESR1; ERalpha), induces hypertrophy and precocious development in the embryonic American alligator female reproductive tract. In press.


Herr DJ, Aune SE, Menick DR. Induction and Assessment of Ischemia-Reperfusion Injury in Langendorff-Perfused Rat Hearts. The Journal of Visualized Experiments. 2015 [In Press]
Aune SE, Herr DJ, Kutz CJ, Menick DR. Histone deacetylases exert class specific roles in conditioning the brain and heart against acute ischemic injury. Frontiers in Neurology. 2015. doi: 10.3389/fneur.2015.00145 [In Press]


Smith JA, Stallons LJ, Collier JB, Chavin KD, Schnellmann RG. Suppression of mitochondrial biogenesis through toll-like receptor 4-dependent mitogen-activated protein kinase kinase/extracellular signal-regulated kinase signaling in endotoxin-


Temkin AM¹, Bowers R¹, Magaletta M, Holshouser S, Maggi A, Ciana P, Guillette L, Bowden J, Kucklick J, Baatz J, Spyropoulos D. Dioctyl Sodium Sulfo succinate (DOSS; CAS #577-11-7) a Major Dispersant Component is a Putative Obesogen. Environmental Health Perspectives. 2015. In Press. ¹The first two authors made equal contributions to this work.


Abstracts


Cantu T, John Bowden, Jacob Scott, Louis Guillette, Jr. Eicosanoid measurement in extraembryonic membranes through Liquid Chromatography/Tandem Mass
**Spectrometry. Poster presentation. MUSC Marine Biomedicine and Environmental Health Open House. Hollings Marine lab, July 18th, 2014.**

**Dany M, Ogretmen B.** Inhibition of FLT3 in Acute Myeloid Leukemia induces lethal autophagy after activating Ceramide Synthase 1 expression. Southeastern Medical Scientist Symposium. Poster presentation. Emory School of Medicine, Atlanta, GA, August 23, 2014.

**Dany M, Ogretmen B.** Inhibition of FLT3 in Acute Myeloid Leukemia reactivates Ceramide Synthase 1 expression resulting in C_{18}-ceramide mediated mitophagy. Poster presentation. Hollings Cancer Center Research Symposium, Charleston, SC, November 7, 2014.

**Dany M, Ogretmen B.** Inhibition of FLT3 in Acute Myeloid Leukemia reactivates Ceramide Synthase 1 expression resulting in C_{18}-ceramide mediated mitophagy. Poster presentation. Research Symposium-MUSC College of Medicine, Charleston, SC, February 20, 2015.

**Dany M, Ogretmen B.** Ceramide mediated lethal mitophagy: a novel cell death mechanism in FLT3 targeted therapy for Acute Myeloid Leukemia. Poster presentation. CSCTR Annual Meeting, Chicago, IL, April 22, 2015.

**Dany M, Ogretmen B.** Ceramide mediated lethal mitophagy: a novel cell death mechanism in FLT3 targeted therapy for Acute Myeloid Leukemia. Poster presentation. ASCI/AAP/APSA Annual Meeting, Chicago, IL, April 24, 2015.


Herr DJ, Aune SE, Menick DR. Inhibition of class I histone deacetylases at reperfusion attenuates ischemia-reperfusion injury and modifies mitochondrial acetylation. Poster Presentation at the 11th Annual American Physician Scientists Association Meeting, Chicago IL, April 25th, 2015.

Herr DJ, Aune SE, Menick DR. Inhibition of class I histone deacetylases at reperfusion attenuates ischemia-reperfusion injury and modifies mitochondrial acetylation. Poster Presentation at the MUSC Department of Medicine Research Symposium, Charleston SC, February 18th 2015.

Herr DJ, Aune SE, Menick DR. Inhibition of class I histone deacetylases at reperfusion attenuates cardiac ischemia-reperfusion injury. Poster presentation at the MUSC Perry V. Halushka Student Research Day, Charleston SC, November 14th, 2014.

Herr DJ, Aune SE, Menick DR. Inhibition of class I histone deacetylases at reperfusion attenuates ischemia-reperfusion injury. Poster presentation at the National M.D./Ph.D. Student Conference, Keystone, CO, July 18th, 2014.


Pleasant D, Sundararaj K, Kasiganesan H, Panneerselvem K, Balasubramanian S, Jones J, & Kuppuswamy D. Fibrosis is promoted by Beta3 Integrin in the pressure
overloaded Heart. Poster presentation. Medical University of South Carolina, Perry V. Halushka Student Research Day, November 2014.

Pleasant D, Sundararaj K, Kasiganesan H, Panneerselvem K, Balasubramanian S, Jones J, & Kuppuswamy D. Fibrosis is promoted by Beta3 Integrin in the pressure overloaded Heart. Poster presentation. Medical University of South Carolina, Department of Medicine Research Symposium, February 20, 2015.

Renaud, L. Acetylation and methylation regulates miRNAs expression during hypertrophic cardiac remodeling. Poster Presentation. MUSC Department of Medicine Research Day, January 2015.


Collier JB, Smith JA, Whitaker RM, Schnellmann RG. ERK1/2 Suppresses PGC-1α and Mitochondrial Biogenesis in Endotoxin and I/R-Induced AKI. Society of Toxicology Annual Meeting, San Diego, CA, March 2015.


Temkin A et al. Predicting long term impacts of oil/dispersant exposures on human health and other higher trophic organisms: obesogenicity. Poster Presentation. Oil Spill and Ecosystem Science Conference. Houston, TX. February 2015


**Presentations**


Theresa Cantu, John Bowden, Jacob Scott, Louis Guillette, Jr. The development of a method to measure pro and anti-inflammatory eicosanoids in both clinical and environmental samples. NIST interlab meeting, Hollings Marine Lab, Charleston, SC February 6, 2014. Oral Presentation, contributed.


Jessica McCoy. MUSC Summer Undergraduate Program (guest lecture), MUSC, Neuroendocrine Targets of EDCs. July 2014.
Jessica McCoy. Bench to Bedside Program (guest lecture), Winthrop University, Endocrine Disruption and the developing ovarian follicle. November 2014.

Dorea Pleasant. To Connect or Not Connect: Understanding the Multifaceted Role of Beta3 Integrin in the Heart. Ernest E. Just Symposium, Charleston, SC February 2015.


Kimberly Sauls, Katelynn Toomer, Johnson A, Williams K, Norris RA. Hematopoietic Derived Cells Contribute to Disease in the Filamin-A Model of Myxomatous Valvular Dystrophy. Presented at Weinstein Cardiovascular Conference, Boston, MA.


Jason Wheeler MD; Rupak Mukherjee, PhD; Robert E. Stroud, MS; Jeffrey A. Jones, PhD; and John S. Ikonomidis, MD/PhD. Age-related Changes in the Structure and Composition of the Thoracic Aorta. MUSC Department of Surgery Smithy Lecture, 2014.

Jason Wheeler, MD; Rupak Mukherjee, PhD; Robert E. Stroud, MS; Jeffrey A. Jones, PhD; and John S. Ikonomidis, MD/PhD. Age-related Changes in the Structure and

STUDENTS’ HONORS AND AWARDS

Jacqueline Bangma
Center for Global Health Trainee Travel Grant Award, MUSC Center for Global Health, 2015.

Theresa Cantu
SACNAS Travel Scholarship, 2014
Grant Submission: MUSC Center for Global Health, Faculty Pilot Project “Pansteatitis in Loskop Dam: Implications for human health”. PI: Dr. Louis Guillette, Jr. Co-PI: Dr. John Bowden and Theresa Cantu. 2015.

Mohammed Dany
Southeastern Medical Scientist Symposium SEMSS Best Poster Presentation Award, August 23, 2014
American Society for Investigative Pathology (ASIP) award for outstanding research in experimental pathology, Experimental Biology 2015 meeting-Boston, MA, March 28-31, 2015
Ray Greenberg Presidential Scholar Award, Medical University of South Carolina, April 14, 2015
Student Leadership Society Honor Award, Medical University of South Carolina, April 15, 2015
Central Society for Clinical and Translational Research Trainee Travel Award, CSCTR 2015 Annual Meeting- Chicago, IL, April 23, 2015
American Physician Scientist Association Trainee Travel Award, ASCI/AAP/APSA Annual meeting 2015- Chicago, IL, April 25, 2015
ASCI/APSA Best Presentation Award, ASCI/AAP/APSA Annual meeting 2015- Chicago, IL, April 26, 2015

Danielle Desjardins
MUSC Ray Greenberg Presidential Scholar
Ruth L. Kirschstein NRSA F30 Fellowship Awardee
**Brenna Doheny**  
National Science Foundation. East Asia and Pacific Summer Institutes. Brenna Doheny, P.I. Funded.  

**Emily Durham**  
2015 SMART Award eBioscience, Characterization of murine cranial suture cells.

**Thomas Galligan**  
NSF Graduate Research Fellowship Program 2015 Honorable Mention

**Bethany Herbert**  
Ruth L. Kirschstein NRSA F30 Fellowship Awardee, Sept., 2014  
1st place, poster presentation, Life Sciences Baltics MAP Kinases Conference, 2014  
1st place Kinard-Gadsden Award, PhD III poster presentation, Perry V. Halushka MUSC Student Research Day, 2014

**Daniel Herr**  
Ralph H. Johnson Student Research Honorable Mention Certificate-Perry V Halushka Student Research Day  
SCTR NIH/NCATS Pre-doctoral Fellowship Training Grant TL1 TR 000061 2014-2015  
T32 Cardiovascular Training Grant Pre-doctoral Fellowship, 8/1/2015-7/31/2016.

**Jessica McCoy**  
Eric R. Lacy Poster Presentation Award, July 2014  
Slocum Lunz Foundation Award, April 2015  
Sigma Xi Membership, April 2015  

**Dorea Pleasant**  
Medical University of South Carolina Student Leadership Society, 2014-2015.
Medical University of South Carolina Provost Scholarship, 2014-2015.

United Negro College Fund (UNCF)/Merck Graduate Dissertation Fellowship, 2015-2016.

**Ludivine Renaud**
2014 Ralph H. Johnson VAMC Student Research Award, 1st Place Winner, Oral Presentation.

**Emilie Rosset**
AADR Student Research Fellowship 2015 Recipient

Perry V. Halushka MUSC Student Research Day 2014, 1st Place Winner, PhD I Poster Presentation

Ralph H. Johnson VAMC Student Research Honorable Mention, PhD I Poster Presentation, 2014

**Alexis Temkin**
TA for Molecular Biology (BIO312) at College of Charleston Fall 2015

Grant Submission: EPA Science to Achieve Results (STAR) Fellowships for Graduate Environmental Study, Evaluating Dioctyl Sodium Sulfosuccinate (DOSS) as an Obesogen, 05/26/2015

**Katelynn Toomer**
T32 Cardiovascular Training Grant Pre-doctoral Fellowship, 8/1/2015-7/31/2016.

**Abby Wenzel**


**Department/Program Accomplishments for 2014-2015**

This has been another exceptional year for the students in the MCBP Program. This year, our students published 34 manuscripts, many in high-impact journals, including *Nature, Journal of American Heart Association, Cancer Research, and The Journal of Biological Chemistry*. In addition to the manuscripts, our students presented 63 abstracts/presentations at local, national, and international meetings. Our students’ work has been honored with an impressive number of highly competitive local, national, and international local awards and fellowships. Both Bethany Herbert and Danielle Desjardins received Ruth L. Kirschstein NRSA F30 Fellowships. Dorea Pleasant received a UNCF/Merck Graduate Dissertation Fellowship. Emilie Rosset received a
AADR Student Research Fellowship. Jessica McCoy was awarded a Slocum Lunz Foundation Award. Daniel Herr received a SCTR NIH/NCATS Pre-doctoral Fellowship. Five of our students, Dylan Richards, Tucker Williamson, Abby Washispack, Daniel Herr, and Katelynn Toomer received NIH T-32 Training Fellowships, “NIH Training to Improve Cardiovascular Therapies”. Our students do very well each year at the MUSC Perry V. Halushka Student Research Day. Theresa Cantu received the Sigma Xi Best Oral Presentation, Bethany Herbert was awarded the 1st place Kinard Gadsden Award, Daniel Herr received Ralph H. Johnson Student Research Honorable Mention, Jessica McCoy received the Eric R. Lacy Poster Presentation Award, Ludivine Renaud was a Ralph H. Johnson VAMC Student Research 1st place winner for an oral presentation, Emilie Rosset was awarded 1st place in PhD I Poster Presentation and Ralph H. Johnson VAMC Student Research Honorable Mention, Abby Wenzel received the Sigma Xi Best Poster Presentation Award and Health Disparities 2nd place poster award. Our students receive recognition at national meetings as well, with Theresa Cantu receiving a SACNAS Travel scholarship, Mohammed Dany was awarded the Southeastern Medical Scientist Symposium Best Poster Presentation award, the ASIP award for outstanding research in experimental pathology 2015, and American Physician Scientist Association Trainee travel award, Bethany Herbert-1st place poster presentation at the Life Sciences Baltics MAP Kinases Conference, and Jacqueline Bangma-Center for Global Health Trainee Travel Grant award. Theresa Cantu, Jessica McCoy, Alexis Temkin have all submitted small grants for their work, and Emily Durham was awarded a 2015 SMART award eBioscience. Lastly, 12 of our students graduated from MUSC on May 15, 2015. Six received PhD degrees, 1 received a DMD/PhD dual degree, and 5 received a MD/PhD dual degree. These graduates are moving on to postdoctoral trainees positions and internships in some of the best laboratories and institutes in the country. One of our graduates, Jacqulyne Robichaux, was recognized as one of the 2015 Distinguished Graduates. All the students in the MCBP program have done well and we are very proud of their accomplishments.

Department/Program Goals for 2015-2016

The MCBP Graduate Program provides a rich and diverse training environment for students, allowing for multi-disciplinary projects that can easily span the traditional areas of molecular biology, cell biology, pharmacology, and physiology. One of the greatest challenges we continue to have in this time of increased difficulty in getting and maintaining extramural support for our research efforts is preventing the erosion of the quality of teaching and academic excellence. We are undergoing a concerted effort to maintain and even increase the number of advanced courses that are being offered to our students. Our commitment is to making the MCBP Program the best possible training environment for our students. To this end, our goals for the next year are to ensure that the many MCBP advanced graduate courses including new courses are offered on a regular basis. We will work to insure that the journal clubs, which have been established in many of the divisions, are continued and new journal clubs established in those that do not have them, be more informative to students inquiring about the program as well as our own students who are currently in the program, and to
re-double our efforts to giving our students the best training and preparation possible for a fulfilling career in biomedical research.