The Life Science and Technology Institute in 2015

This report covers the period between July 1, 2014 and June 30, 2015. On April 22, 2015 the Biotechnology Research Center (BRC) was transformed into the Life Science and Technology Institute (LSTI). The change was necessary because of the increased size and diversity of the membership and the need of organization by scientific field within the institute. The name of the institute also better reflects the scientific areas represented among the membership.

The overarching mission of the institute is to promote excellence in research and education in the areas of molecular biology, biochemistry, genetics, genomics, bioinformatics, kinesiology, physiology, biomedical engineering and biotechnology for the benefit of society and the environment. This is accomplished through fostering interdisciplinary collaborative research, helping to provide state-of-the-art research facilities, and facilitating graduate and undergraduate education in the above-mentioned areas.

LSTI continues the BRC tradition in research excellence. 2015 was a productive year with more than 54 active research grants totaling more than $12.9 million, $2.2 million in new research funding, and more than 100 peer-reviewed publications. LSTI continued to strongly support various research activities including helping in purchasing new scientific instrumentation totaling more than $877,000.

Continuing BRC’s commitment to education, LSTI members supported over the past year 58 Ph.D., 30 M.S. and 86 undergraduate students. LSTI provided financial support to allow 21 students to travel to scientific through more than $5,000 of travel awards. LSTI for the first time held its own research forum. Twenty seven graduate students participated through oral and poster presentations. LSTI also helped supporting graduate students in their last semesters before graduation through $10,000 of finishing fellowships.

LSTI membership is strong and diverse, including 47 faculty members from three different colleges and schools, representing a variety of research fields and in different levels of their careers. We have lost and gained members in the past year. For the ones that left MTU, we wish them success in their new endeavors and warmly welcome the ones that just joined and looking forward to their participation and contribution to LSTI.

LSTI 2015 at a Glance

- 47 Faculty members
- 58 Ph.D. students
- 86 Undergraduate students
- 34 SURF and Other Awards
- 51 Active research projects
- $12,930,431 Total Research Funding
- 18 Research scientists/associates
- 30 M.S. students
- 9 Summer Internships
- 102 Peer-reviewed publications
- $2,215,670 in new research awards
- $2,539,661 Research Expenditures
Current LSTI Support Team

**Director**
Víctor Busov

**Staff Assistant**
Laura Mattila

**Travel Grant Committee**
Lanrong Bi, Chair (CSA)
Yinan Yuan (SFRES)

**Executive Committee**
Oliver Gailing (SFRES*)
Guiliang Tang (CSA)
Jeremy Goldman (COE)

* COE: College of Engineering; CSA: College of Science and Arts; SFRES: School of Forest Resources and Environmental Science

LSTI Membership

The LSTI currently has 47 faculty members including two department chairs and two associate deans. MTU departments represented include Biological Sciences, Biomedical Engineering, Physics, Mechanical Engineering–Engineering Mechanics, School of Forest Resources and Environmental Sciences, Mathematics, Chemistry, Chemical Engineering, Kinesiology & Integrative Physiology, and Material Sciences and Engineering. Two new members joined the Life Science and Technology Institute (formerly BRC) in 2015 - Ye Sun (Assistant Professor, ME-EM) and Ebenezer Tumban (Assistant Professor, Biological Sciences). LSTI members Aparna Deshpande, Reza Shahbazian-Yassar, Toulou Shokuhfar, Ramakrishna Wusirika and Yordan Yordanov left the university in academic year 2015.

Current LSTI Faculty Members

1. Susan Bagley  Professor Emeritus, Biological Sciences
2. Lanrong Bi  Associate Professor, Chemistry
3. Victor Busov  Professor, SFRES
4. Jason Carter  Department Chair, Associate Dean, Associate Professor, KIP
5. Qing-Hui Chen  Assistant Professor, KIP
6. Tarun Dam  Assistant Professor, Chemistry
7. Rupali Datta  Associate Professor, Biological Sciences
8. John Durocher  Assistant Professor Biological Sciences
9. Steven Elmer  Interim Department Chair, Assistant Professor, KIP
10. Shiyue Fang  Associate Professor, Chemistry
11. Megan Frost  Associate Professor, Biomedical Engineering
12. Oliver Gailing  Associate Professor, SFRES
13. Jeremy Goldman  Associate Professor, Biomedical Engineering
14. Michael Gretz  Professor, Biological Sciences
15. Patricia Heiden  Professor, Chemistry
16. Caryn Heldt  Assistant Professor, Chemical Engineering
17. Erika Hersch-Green  Assistant Professor Biological Sciences
18. Jingfeng Jiang  Assistant Professor, Biomedical Engineering
19. Chandrashekhar Joshi
Department Chair, Biological Sciences; Professor, SFRES

20. Sean Kirkpatrick
Chair and Professor, Biomedical Engineering

21. Bruce Lee
Assistant Professor, Biomedical Engineering

22. Haiying Liu
Professor, Chemistry

23. Lynn Mazzoleni
Assistant Professor, Chemistry

24. Adrienne Minerick
Associate Professor, Chemical Engineering

25. Pushpalatha Murthy
Professor, Chemistry

26. Keat Ghee Ong
BRC Director, Associate Professor, Biomedical Eng.

27. Rupak Rajachar
Senior Lecturer, Biomedical Engineering

28. Paul Sanders
Assistant Professor, Materials Science & Engineering

29. Qiuying Sha
Associate Professor, Mathematical Sciences

30. Zhiying Shan
Assistant Professor, KIT

31. David Shonnard
Robbins Professor, Chemical Engineering

32. Ye Sun
Assistant Professor, ME-EM

33. Marina Tanasova
Assistant Professor, Chemistry

34. Guiliang Tang
Associate Professor, Biological Sciences

35. Xiaoping Tang
Assistant Professor, Biological Sciences

36. Stephen Techtmann
Assistant Professor Biological Sciences

37. Martin Thompson
Associate Professor, Chemistry

38. Ashutosh Tiwari
Assistant Professor, Chemistry

39. Ebenezer Tumban
Assistant Professor, Biological Science

40. Leah Vucetich
Research Assistant Professor, SFRES

41. Hairong Wei
Assistant Professor, SFRES

42. Thomas Werner
Assistant Professor, Biological Sciences

43. Yinan Yuan
Research Assistant Professor, SFRES

44. Kui Zhang
Professor, Mathematical Sciences

45. Shuanglin Zhang
Professor, Mathematical Sciences

46. Feng Zhao
Assistant Professor, Biomedical Engineering

47. Wen Zhou
Assistant Professor, Chemical Engineering

Research Scientists/Associates

1. Dr. Jinsen Chen, Postdoctoral Researcher (Fang)
2. Dr. Madumita Dash, Postdoctoral Researcher (Busov)
3. Dr. Katja Dzepina, Postdoctoral Research Associate (Massoleni)
4. Dr. Marius Ekue, Visiting Scientist, September, 2015 (Gailing)
5. Dr. Tatyana Georgieva, Postdoctoral Researcher (Busov)
6. Mingjun Gu, Research Associate (Chen)
7. Dr. Shuvashish Kundu, Postdoctoral Fellow (Massoleni)
8. Hwi Yong Lee, Postdoctoral Researcher (Minerick)
9. Tao Liu, Research Associate (Chen)
10. Hector Moncada, Postdoctoral Researcher (Minerick)
11. Bo Peng, Postdoctoral Scientist (Jiang)
12. Dr. Swati Puranik, Postdoctoral Research Scientist (Gailing/Joshi)
13. Dr. Thiers Uehara, Postdoctoral Research Scientist (Zhao)
14. Dr. Qi Xing, Postdoctoral Researcher (Zhao)
15. Dr. Elena Yordanova Postdoctoral Researcher (Busov)
16. Dr. Yordan Yordanov, Research Assistant Professor (Busov)
17. Dr. Shuwei Zhang, Postdoctoral Associate (Liu)
18. Yu Zhao, Research Associate (Zhao)
Graduate Students

Biological Sciences

1. Yogesh Ahlawat (Ph.D., Joshi)
2. Tahiya Alothaim (M.S., X Tang)
3. Faten Dhawi (Ph.D., Datta/Wusirika)
4. Abishai Dominic (Ph.D., X Tang)
5. Kyle Driscoll (M.S., Deshpande/Wusirika)
6. Kavitha Kumar (Ph.D., Joshi)
7. Wixiang Liu (M.S., X Tang)
8. Yiping Mao (Ph.D., X Tang)
9. Chelsea Mitchell (M.S., Werner)
10. Ramkumar Mohan (Ph.D., X Tang)
11. Shashank Pandey [Korea] (Ph.D., Joshi)
12. Nafeesa Rahman (M.S., Deshpande/Wusirika)
13. Komal Kumar Bollepogu Raja (Ph.D., Werner)
14. Pedro Rodriguez (M.S., X Tang)
15. Nikko Sirdenis (M.S., Durocher)
16. Travis Wakeham (M.S., Durocher)

Biomedical Engineering

17. Shruti Moham Amre (M.S., Jiang)
18. Andrew DeRouin (Ph.D., Ong)
19. Avik Ghosh (M.S., Zhao)
20. Weiue He (Ph.D., Frost)
21. Sean Hopkins (Ph.D., Frost)
22. Baratwaaj Kannan (M.S., Zhao)
23. Sushant Kolipaka (M.S., Frost)
24. Elizabeth Kruppe (M.S., Frost)
25. Sayali Vinaya Kulkami (M.S., Jiang)
26. Wenkai Jia (Ph.D., Zhao)
27. Yuting Li (M.S., Lee)
28. Connor McCarthy (Ph.D., Frost/Goldman)
29. Nik Mittal (M.S., Frost)
30. Heo Meng (Ph.D., Lee)
31. Ameya Narkar (M.S., Lee)
32. Julie Osborne (M.S., Frost)
33. Rattapol Pinnaratip (Ph.D., Lee)
34. Sterling Prince (Ph.D., Ong)
35. Zichen Qian (Ph.D., Zhao)
36. David Rosen (M.S., Jiang)
37. Emily Shearier (Ph.D., Zhao)
38. Kevin Sunderland (Ph.D., Jiang)
39. Govindan Suresh (M.S., Ong)
40. Yu Wang (Ph.D., Jiang)
41. Fan Zhang (M.S., Jiang)
Chemical Engineering

42. Zainab Alshoug (Ph.D., Minerick)
43. Jeana Dillon (Ph.D., Minerick)
44. Maria (Tafur) Gencoglu (Ph.D., Heldt)
45. Sanaz Habibi (Ph.D., Minerick)
46. Maryam Khaksari (Ph.D., Minerick)
47. Elizabeth Kruppe (Ph.D., Heldt)
48. Ashish Saksule (Ph.D., Heldt)
49. Soontorn Thuntithavornwat (Ph.D., Heldt)

Forest Resources and Environmental Sciences

50. Mehmet Acet (M.S., Gailing)
51. Roba Bdeir (Ph.D., Gailing)
52. Wenping Deng (Ph.D., Wei)
53. Chathura Gunasekara (Ph.D., Wei)
54. Monica Harmon (M.S., Gailing)
55. Priyanka Kadav (M.S., Gailing)
56. Sirkorn Khumwan (Ph.D., Gailing)
57. Sudhir Khodwekar (Ph.D., Gailing)
58. Justin Segula (Ph.D., Busov)
59. Avinash Subramanian (M.S., Wei)
60. K. Saagar Vijayaragavan (Ph.D., Heldt)

Kinesiology & Integrative Physiology

61. Andrew Chapp (Ph.D., Chen)
62. Ida Fonkoue (Ph.D., Carter)
63. Michael Huber (M.S., Chen)
64. Robert Larson (Ph.D., Chen)

Mathematical Sciences

65. Xueling Li (M.S., Sha)
66. Xiaoyu Liang (Ph.D., Zhang)
67. Zhenchuan Wang (Ph.D., Zhang)
68. Xinlan Yang (Ph.D., Sha)
69. Huanhuan Zhu (Ph.D., Sha)
## Undergraduate Students

1. Alexandri Armentrout, Biological Sciences (Werner)
2. Evan Bachman, Biological Sciences (Werner)
3. Korrina Baird, Chemical Engineering (Minerick)
4. Brandon Barkle, Chemistry (Yuan)
5. Stephanie Bean, Biological Sciences (Heldt)
6. Ryan Bensen, Biological Sciences (Werner)
7. Stephen Berridge, Biomedical Engineering (Shan)
8. Grace Carey, Biomedical Engineering (Jiang)
9. Nicholas Carlson, Chemistry (Fang)
10. Sean Casey, Biomedical Engineering & ECE (Jiang)
11. Cassandra Cecchettoni, Biological Sciences (Shan)
12. Rianne Chittenden, Biological Sciences (Tumban)
13. Joy Collard, Biomedical Engineering (Jiang)
14. Danielle Dawson, Biological Sciences (Tumban)
15. Madison Diehl, Chemical Engineering (Minerick)
16. Derrick Diver, Biomedical Engineering (Jiang)
17. Luke Doskey, Chemistry (Dam)
18. Shannon Doufek, Biological Sciences (Werner)
19. Holly Eyrich, Biomedical Engineering (Ong)
20. Corey Fase, Biomedical Engineering (Zhao)
21. Madeline Faust, Biomedical Engineering (Lee)
22. Kemin Fena, Biomedical Engineering (Zhao)
23. Evan Fernandez, Biological Sciences (Wusirika)
24. Christopher Fisher, Biomedical Engineering (Lee)
25. Alexander Gauronskas, Chemistry (Fang)
26. Brett Gervais, KIP (Carter)
27. Amani Gillette, Biomedical Engineering (Goldman)
28. Ian Greenlund, Biological Sciences (Werner)
29. Michael Grillo, Chemical Engineering (Heldt)
30. Benjamin Gresko, Chemical Engineering (Heldt)
31. Roger Guillory, Biomedical Engineering (Goldman)
32. Christopher Haferman, Biomed & ME (Jiang)
33. Rebecca Hobmeyer, Biological Sciences (Werner)
34. Olivia Ingram, Biological Sciences (Werner)
35. Tyler Jensen, Chemical Engineering (Heldt)
36. Ami Klings, Biomedical Engineering (Jiang)
37. Wade Korf, Chemistry (Heldt)
38. Katrina Latuszek, Biological Sciences (Werner)
39. Max Lee, Biomedical Engineering (Zhao)
40. Parrisha Louis, Biological Sciences (Tumban)
41. Laura Lynch, Biomedical Engineering (Goldman)
42. Hannah Marti, Biomedical Engineering (Durocher)
43. Katherine Massa, Chemical Engineering (Minerick)
44. Cameron McKenzie, Biological Sciences (Frost)
45. Logan McMillan, Chemical Engineering (Minerick)
46. Alexander McQueeney (Biological Sciences (Werner)
47. Abigail Meisel, Biological Sciences (Werner)
48. Ross Micheals, Biomedical Engineering (Jiang)
49. Audri Mills, Biological Sciences (Werner)
50. Elizabeth Mundell, Biological Sciences (Werner)
51. Meredith Murley, Biomedical Engineering (Lee)
52. Eliot Nagler, Chemical Engineering (Minerick)
53. Anna Nelson, Chemical Engineering (Minerick)
54. Peter Nouhan, Biological Sciences (Werner)
55. Zachary Otis, Chemical Engineering (Heldt)
56. Nina Pacella, Biomedical Engineering (Ong)
57. Amber Peabody, Biological Sciences (Werner)
58. Jared Pecore, Biological Sciences (Chen/Werner)
59. Ana-Lisa Powdhar, Biomedical Engineering (Shan)
60. Bridgett Rebbeck, Biological Sciences (Werner)
61. Travis Redman, Biomedical Engineering (Zhao)
62. Ramandeep Rekhi, Chemistry (Dam)
63. Mikayla Revoyr, Biological Sciences (Durocher)
64. Cal Rittua, Biomedical Engineering (Jiang)
65. Pedro Rodriguez, Biological Sciences (Tumban)
66. Jessika Rogers, Chemical Engineering (Minerick)
67. Tyler Sawall, Chemistry (Massoleni)
68. Brandon Schmidt, Chemical Engineering (Heldt)
69. David Schriefels, Cognitive & Learning Sciences (Chen)
70. Ashley Schuman, Chemistry (Fang)
71. Trevor Simmons, Biomedical Engineering (Zhao)
72. Damon Stafford, Biological Sciences (Tumban)
73. Mary Stangis, Biological Sciences (Werner)
74. Hugh Stanton, Biomedical Engineering (Zhao)
75. Rachel Stites, Biomedical Engineering (Zhao)
76. Mitchell Tahtinen, Biomedical Engineering (Zhao)
77. Alexander Viurraga, Chemistry (Dam)
78. Caleb Vogt, Biomedical Engineering (Zhao)
79. Anna Waller, Biomedical Engineering (Goldman)
80. Elizabeth Waters, Chemical Engineering (Heldt)
81. Marie Wendling, Biomedical Engineering (Zhao)
82. Travis Wigstrom, Chemistry (Fang)
83. Randall Wilharm, Chemistry (Lee)
84. Pennie Winters, Chemical Engineering (Heldt, Minerick)
85. Casey Wood, Biomedical Engineering (Zhao)
86. Tim Wuepper, SFRES (Gailing)
LSTI Faculty Members Special Honors

Jason Carter, President, Michigan Physiological Society, Board of Directors, American Kinesiology Association, Executive Committee, American Kinesiology Association

Tarun Dam, Exceptional Graduate Student Mentor Award (2016), Distinguished Teaching Award (2016), Nominated for Exceptional Graduate Student Mentor Award (2015, Distinguished Teaching Award Finalist (2015)

Megan Frost, Three Ph.D. students successfully defended in December, 2015.

Caryn Heldt, Research Mentor of the Year Award from AIChE Student Chapter, Dean’s Teaching Showcase given by the Dean of Engineering at MTU, NSF CAREER Award

Feng Zhao, Received the BMES-CMBE Rising Star Award, Dr. QiXing (Zhao Post-doc) won 2nd place in Young Investigator Section-America (SYIS-AM) Poster Competition at TERMIS-AM annual Conference

Outreach/ Summer Internships

Harsh Gandhi, India Institute of Technology, Wharangal (Minerick)

Phoebe Hu, Houghton High School (Frost)

Sahil Jaiswal, India Institute of Technology, Wharangal (Minerick)

Emma Johnson, MiCUP, Grand Rapids Community College (Minerick)

Crystal Juarez, MiCUP, Grand Valley State University (Jiang)

Emily Nelson, Delta College (Durocher)

Dustin Rens, MiCUP, Grand Rapids Community College (Lee)

Facundo Santome, Grand Rapids Community College (Zhao)

Ai Hui Yap, Houghton High School (Zhao)
SURF Awards

Stephanie Bean (Chemical Engineering), Advisor: Caryn Heldt

Mark Keranen (Biological Sciences), Advisor: Thomas Werner

Ross Michaels (Biomedical Engineering), Advisor: Jingfeng Jiang

Peter Nouhan (Biological Sciences), Advisor: Thomas Werner

Mitchell Tahtinen (Biomedical Engineering), Advisor: F Zhao

Randall Wilharm (Biomedical Engineering), Advisor: Bruce Lee

Student Honors Received

Andrew Chapp (KIP, Chen): Outstanding Oral Presentation Awards at the 1st and 2nd Annual Meetings of Michigan Physiology Society; Predoctoral Fellowship, Midwest Affiliate, AHA

Ni Fan (Chemistry, Dam): Ray & Eleanor Cross Endowed Graduate Fellowship in Chemistry. Merit Award LSTI poster presentation.

Suntara Fueangfung (Chemistry, Fang): Won the Chemistry Division Superior Presenter Medal for his poster presentation at the Sigma Xi Annual Meeting & International Research Conference

Maria Gencoglu (Chem. Engg, Heldt): Awarded the Janice Lumpkin Travel Award to AIChE Awarded Outstanding Scholarship Award from MTU Graduate School

Ben Gresko (Chemical Engineering, Heldt): MSGC Fellowship

Chris Haferman (Biomedical Engineering, Jiang): Awarded academic internship, Honors College, MTU

Michael Huber (KIP, Shan): Received 2016 APS Caroline tum Suden/ Frances Hellebrandt Professional Opportunity Award

Maryam Khaksari (Chemical Engineering, Minerick): Portage Health Foundation Fellowship; oral and poster presentation at Annual Keweenaw Medical Conference

Robert Larson (KIP, Chen): Outstanding Research Recognition Van Harreveld Award for outstanding research presented at the Experimental Biology annual meeting.

Hannah Marti (Biological Sciences, Durocher): Second place poster presentation at the Michigan Tech Undergraduate Research Expo.
Ross Michaels (Biomedical Engineering, Jiang): Awarded academic internship, Honors College, MTU

Ramkumar Mohan (Biological Sciences, X Tang): Finishing Fellowship from Graduate School; Outstanding Scholarship Award from Graduate School (2015)

Ameya Narkar (Biomed, Lee): Honor Mention; U. P. American Chemical Soc. Student Research Symposium

Cal Riutta: (Biomedical Engineering, Jiang): Awarded academic internship, Honors College, MTU

Hugh Stanton (Biomed, Zhao): Received fellowship from the Pavlis Honor Undergraduate Research Internship Program

Mitchell Tahtinen (Biomed, Zhao): Received fellowship from the Pavlis Honor Undergraduate Research Internship Program

Melanie Talaga (Chemistry, Dam): MTU Graduate School Doctoral Finishing Fellowship; First Place for poster presentation ACS Student Research Symposium – UP Section; Third Place and most attended for oral presentations at MTU Graduate Research Conference

K. Saagar Vijayaragavan (Chemical Engineering, Heldt): Graduate School Finishing Fellowship

Travis Wakeham (Biological Sciences, Durocher): David S. Bruce Excellence in Undergraduate Research

LSTI Student Support/ Sponsored Activities

The LSTI continued to offer research opportunities and financial support to our graduate and undergraduate students through its various initiatives. In 2015, LSTI faculty members advised 88 graduate and mentored 86 undergraduate students and continue to volunteer for outreach activities like the Summer Youth Programs and the Summer Undergraduate Research.

LSTI Research Forum

Due to the growth in popularity and participation, the LSTI directors decided that it was time for each center/ institute to hold their own forums. LSTI chose to hold theirs in the Fall. The First Student Research Forum sponsored by the Life Science and Technology Institute was held on September 24-25, 2015. Twenty-seven students at both the graduate and undergraduate levels submitted abstracts and posters.
LSTI Research Forum 2015 Award

Recipients Graduate Student Awards

Grand Prizes
Sanaz Habibi (ChE, A. Minerick)

Merit Awards
Ramkumar Mohan (Biology, Zhang/Tang)
Ni Fan (Chemistry, Dam)
Robert Larson (Biomed, F Zhao)
Yu Yang (KIP, Chen)

Undergraduate Student Awards

Grand Prizes
Jared Pecore (Biology, Werner)

Merit Award:
Dakota Anderson (KIP)
LSTI Travel Grants

In the spring of 2005, the Biotechnology Research Center began offering travel grants to MTU graduate and undergraduate students and post-doctoral research scientists who present biotechnology related research at national or international conferences. Grants are awarded in the spring and fall each year. Twenty-two applications were submitted in 2015 with twenty-one grants awarded totaling $6,150. Students from Biological Sciences, Biomedical Engineering, Chemistry, Chemical Engineering, KIT, Math, Cognitive & Learning Sciences, Materials Science and Engineering and SFRES participated. Since 2005, $89,698 has been awarded as BRC/LSTI Travel Grants.

Spring 2015 Travel Award Recipients

- **Andrew Chapp** ($400), Experimental Biology Conference
- **Faten Dhawi Almuanna** ($400), Experimental Biology Conference
- **Ida T. Fonkoue** ($400), Experimental Biology Conference
- **Michael Huber** ($400), Experimental Biology Conference
- **Haiping Liu** ($300), 20th Annual Meeting of the RNA Society
- **Zichen Qian** ($400), Gordon Research Conference
- **Lina Shi** ($300), 20th Annual Meeting of the RNA Society
- **Travis Wakeham** ($300), Experimental Biology Conference
- **Qi Xing** ($300), 2014 TERMIS-AM Annual Conference

Fall 2015 Travel Award Recipients

- **Patrick Bowen** ($350) 7th International Symposium on Biodegradable Metals
- **Maryam Khaksari** ($350) 2015 AIChE Meeting
- **Ida Fonkoue** ($250) Hypertension Scientific 2015 Sessions
- **Robert Larson** ($250) Hypertension Scientific 2015 Sessions
- **Emily Shearier** ($250) 7th International Symposium on Biodegradable Metals
- **Xiaoyu Liang** ($250) 24th Annual Meeting of International Genetic Epidemiology Society
- **Zhichao Wang** ($250) AIChE Meeting
- **Xinlan Yang** ($250) 24th Annual Meeting of International Genetic Epidemiology Society
- **Huanhuan Zhu** ($250) 24th Annual Meeting of International Genetic Epidemiology Society
- **Ramkumar Mohan** ($200) 2015 Midwest Islet Club Meeting
- **Ashish Saksule** ($200) 2015 AIChE Meeting
- **Zhenchuang Wang** ($200) 24th Annual Meeting of International Genetic Epidemiology Society
PhD Finishing Fellowships

In 2008 the BRC/LSTI established a PHD finishing fellowship to provide partial financial support to PhD students in the final year of their program and who are no longer receiving other financial support. To qualify, applicants must have been supported by BRC/LSTI affiliated external research grants for at least three years, and they must be in the final year of their PhD program. Fellowships are awarded on an as-needed basis.

BRC Finishing Fellowships Awarded in 2014

- **Connor McCarthy** - $5,000; Summer, 2014 (Biomed, Goldman/Frost)
- **Venkataramana Pidatala** - $2,500; Summer 2014 (Biology, Datta)
- **María Tafur** - $2,500; Fall, 2014 (Chem Engg, Heldt)

LSTI Invited Speaker Seminars

The LSTI seminar series, begun in 2006, has helped support at least 35 speakers invited to the University. 2015 seminars include:

- **Dr. Kelly Dyer**; University of Georgia; September, 2014.
- **Dr. Wan-ju Li**; University of Wisconsin at Madison; October, 2014.
- **Dr. Kevin Hefferman**; Syracuse University; October, 2014.
- **Dr. Sara Zimmer**; University of Minnesota, School of Medicine; June, 2015.
- **Dr. Ming Gong**; University of Kentucky, September, 2015
FY15 Infrastructure Improvement Grants

Maintaining and upgrading the Life Science and Technology Institute’s research facilities is vital to the continued success of the BRC/LSTI and remains a priority of members of the Institute. The sharing of equipment and facilities by the Institute’s researchers is economically and strategically prudent. State-of-the-art equipment and facilities also help attract faculty, graduate students and research scientists to Michigan Tech.

The infrastructure improvement grants guidelines, established in FY06, require a 100% match from other funding sources. These grants are open to all departments represented by the members in the center, and have been primarily used by junior faculty as a supplement to start-up funding. Requests for awards are accepted throughout the two year cycle with the three groups receiving equal amounts each cycle.

The BRC members voted to continue this initiative resulting in the fifth round of funding (FY15 & FY16). These awards have supported research infrastructure improvements at MTU since 2006. In 2015, over $45,500 was awarded to support purchasing equipment valued at more than $877,000.

<table>
<thead>
<tr>
<th>Grant</th>
<th>Total Value</th>
<th>LSTI Match</th>
<th>Department</th>
<th>Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomaterial Tester</td>
<td>$3,350</td>
<td>$1,700</td>
<td>COE</td>
<td>J. Jiang</td>
</tr>
<tr>
<td>Ultra High Resolution Mass Spectrometer</td>
<td>$771,588</td>
<td>$25,000</td>
<td>COE/CSA/SFRES</td>
<td>L. Mazzoleni/ E. Kane/ A. Minerick/ D. Minakata</td>
</tr>
<tr>
<td>HPLC Computer and Software upgrade</td>
<td>$6,802</td>
<td>$3,401</td>
<td>COE</td>
<td>M. Frost</td>
</tr>
<tr>
<td>Bioanalyzer</td>
<td>$20,000</td>
<td>$5,000</td>
<td>CSA</td>
<td>G. Tang</td>
</tr>
<tr>
<td>DNA Synthesizer</td>
<td>$25,000</td>
<td>$5,000</td>
<td>CSA</td>
<td>M. Tanasova/ S. Fang/ L. Bi/ X. Xia/ C. Chabalowski</td>
</tr>
</tbody>
</table>
Begun in 2011, the BRC Research Initiative provides PIs access to additional funding which helps to support various research projects and assistance with graduate education in biotechnology.

<table>
<thead>
<tr>
<th>BRC Member</th>
<th>Research Initiative Funds Used Toward:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jason Carter</strong></td>
<td>-Received a $9,000 cost-share for the purchase of a new finger plethysmography unit for our research studies. The old one was purchased from my start-up package in 2006, and was beyond its life expectancy for research. The new unit cost $44,000. In addition to the $9,000 from LSTI, I received $10,000 from Department of KIP, $10,000 from Department of Bio Sci, and $15,000 from College of Sci &amp; Arts.</td>
</tr>
<tr>
<td></td>
<td>It is important to note that over the past nine years as a BRC/LSTI member, the PI (Carter) has secured over $1.1 million from four NIH grants. <strong>These four NIH grants have generated $385,244 of Indirect Cost for the university, of which $77,048 has gone back to BRC/LSTI.</strong> When you account for the 10% PI return policy, the PI has generated $38,524 towards the BRC/LSTI general budget. <strong>Prior to this LSTI contribution, the PI has not made a single Infrastructure Program request in the past from BRC/LSTI.</strong></td>
</tr>
<tr>
<td><strong>Shiyue Fang</strong></td>
<td>-Purchase of chemicals and other lab supplies for research projects</td>
</tr>
<tr>
<td><strong>Megan Frost</strong></td>
<td>-Support of students to have the opportunity to participate in research</td>
</tr>
</tbody>
</table>
| **Oliver Gailing** | -Partial support of research for PhD students supported by a scholarship (Sudhir Khodwekar, Sirikorn Khumwan) (Khodwekar et al. 2015)  
-Generation of genetic data for Q. rubra that was used in a grant application to NSF and the Huron Mountain Wildlife Foundation (Zhang et al. 2015). The project was done by a visiting scientist who was supported by a scholarship.  
-Partial support of undergraduate research projects (Collins et al. 2015). |
| **Jeremy Goldman** | -Research  
-Publications |
| **Caryn Heldt** | -Repair of plate reader  
-Purchased new pipettes for the lab  
-Lab supplies for the start up of new projects |
| **Jingfeng Jiang** | -Cost-share for a C2E2 proposal toward an acoustic pulser/receiver (funded)  
-Cost-share for a REF/IE proposal toward purchasing a high-frequency small animal ultrasound scanner (pending) |
<table>
<thead>
<tr>
<th>Bruce Lee</th>
<th>Supplies and Facility Usage Fee for conducting animal studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrienne Minerick</td>
<td>Continued funding for Maryam Khaksara, Ph.D. student since the Gerger Foundation funding ended. Costs included stipend and user-costs on Dr. Lynn Mazzoleni’s LC-MS instrument.</td>
</tr>
<tr>
<td>Xiaqing Tang</td>
<td>Office supplies</td>
</tr>
<tr>
<td></td>
<td>Equipment maintenance (Beckman LS-6500 Mini Vial Service Agreement)</td>
</tr>
<tr>
<td></td>
<td>Airgas for tissue culture</td>
</tr>
<tr>
<td></td>
<td>Mailroom charges</td>
</tr>
<tr>
<td>Yinan Yuan</td>
<td>Purchased a thermos cycler for research</td>
</tr>
<tr>
<td>Hairong Wei</td>
<td>Student support, lab computer</td>
</tr>
<tr>
<td>Feng Zhao</td>
<td>Purchase of lab supplies</td>
</tr>
</tbody>
</table>

**Financial Report**

2015 was a successful year for LSTI. Although, compared to 2014, the total research funding decreased with $166,000, the research expenditures increased with $422,000.

**In FY2015:**

- Total research funding: $12,930,431
- Active Research Projects: 51
- New awards: 11 totaling $2,215,670
- Total Research Expenditures: $2,539,661
FY15 IRAD Report

In FY15, LSTI affiliated projects generated $639,753 in IRAD. This is approximately 20% higher than 2014. The IRAD received fund the various BRC initiatives, which were established to enhance research efforts of members, their students and research assistants. In special cases, an IRAD waiver may be provided to a BRC member to ease financial constraints of a proposal. The BRC continues to keep its operational budget to a minimum so that the majority of funds generated by the BRC members will help them reach their research goals.

Table: Distribution of LSTI IRAD Returns by the Unit in FY15

<table>
<thead>
<tr>
<th>Unit</th>
<th>Total LSTI Generated IRAD</th>
<th>20% Returned to LSTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences</td>
<td>$127,503</td>
<td>$25,501</td>
</tr>
<tr>
<td>Biomedical Engineering</td>
<td>$213,318</td>
<td>$42,664</td>
</tr>
<tr>
<td>Chemistry</td>
<td>$29,523</td>
<td>$5,905</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>$56,804</td>
<td>$11,361</td>
</tr>
<tr>
<td>KIP</td>
<td>$54,696</td>
<td>$10,940</td>
</tr>
<tr>
<td>Mathematics</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>ME-EM</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>SFRES</td>
<td>$157,909</td>
<td>$31,582</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>$639,753</strong></td>
<td><strong>$127,953</strong></td>
</tr>
</tbody>
</table>

Table: Distribution of LSTI IRAD Returns by the Colleges and Schools in FY 15:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Total LSTI Generated IRAD</th>
<th>20% Returned to BRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Engineering</td>
<td>$271,275</td>
<td>$54,256</td>
</tr>
<tr>
<td>College of Sciences &amp; Arts</td>
<td>$210,569</td>
<td>$42,115</td>
</tr>
<tr>
<td>SFRES</td>
<td>$157,909</td>
<td>$31,582</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$639,753</strong></td>
<td><strong>$127,953</strong></td>
</tr>
</tbody>
</table>
LSTI Affiliated Active Grants

Fang
$260,000; 08/11 – 07/15
Purification Synthesis Peptides Using a Catching by Polymerization Approach

Fang, Shahbazian-Yassar, Yuan
$200,000; 05/12 – 04/15
IDBR (EAGER): An AFM-Based Instrument for Monitoring DNA Synthesis in Real-Time

Frost
$455,775; 07/14 – 06/17
Tunable Nitric Oxide Release Materials

Heldt
$174,175; 08/11 – 07/15
BRIGE: Chitosan Electrospun Membrane for Pathogen Removal

Heldt
$276,731; 06/12 – 09/15
Precipitation and Self-Interaction of Viruses by Preferential Hydration

Heldt
$525,684; 05/15 – 04/20
CAREER: Surface and Interparticle Forces to Improve Virus Removal

Heldt
$349,250; 05/15 – 04/18
GOALI: Graphene Paper Sensor for Disease Detection

Mazzoleni et al
$540,111; 10/15 - 09/17
Ultra High Resolution Mass Spectrometer

Minerick, Raber, Bergstrom
$200,000; 05/14 – 04/16
PFI:AIR – TT: Blood Typing Device without Reagents: Sensing Electrodes to Replace Optics

Minerick
$50,000; 08/15 - 07/16
EAGER: Therapeutic Protein Separations via Surface Isoelectric Focusing (sIEF)

Tang, G, Wei
$2,499,979; 06/14 – 05/17
Targeting MicroRNAs for Destruction in Crops by Short Tandem Target Mimic (STTM)

Tang, G
$251,592; 11/11 – 07/14
EAGER: RNAi Gene Discovery Tool to Randomly Generate Dominant Mutant Pools in Plants

Wei
$384,351; 07/15 – 06/18
Collaborative Research: ABI Innovation: Plant Genotype-Phenotype (G2P) Association Discovery via Integrative Genome-scale Biological Network & Genome-wide Association Analysis
Bi
$202,263; 08/09 – 07/14
Enhancing the “Barcode” Readability of Color-Labeled Molecular Tags by Linker Engineering to Facilitate Genetic Analysis

Carter
$465,000; 09/14 – 08/17
Sleep Deprivation and Neural Cardiovascular Control in Postmenopausal Women

Chen
$460,486; 11/14 – 10/17
ER Stress and Reduced SK Channel Function in PVN in Rats with High Salt Intake

Goldman, Frost
$459,600; 05/12 - 04/15
Therapeutic Lymphatic Collecting Vessel Regeneration by Directed Fluid Flow

Goldman
$42,684; 08/13 – 06/16
Small Diameter Blood Vessel

Fang
$333,631; 02/14 – 01/17
Oligodeoxynucleotide Synthesis Using Protecting Groups and a Linker Cleavable Under Neutral Oxidative Conditions

Frost
$86,212; 05/12 – 04/15
Lymphatic Regeneration

Jiang, Kirkpatrick, Rajachar
$450,000; 09/14 – 08/16
Virtual Breast Project: Improving Non-invasive Differentiation of Breast Tumors

Liu, Tiwari
$338,552; 05/15 – 04/17
Ratiometric Near-infrared Fluorescent Probes for Lysosomal pH in Living Cells

Lee
$344,459; 03/13 – 02/19
Biomimetic Tissue Adhesive with Mechanically Tough Hydrogel Support

Rajachar, Ong
$168,774; 08/12 – 07/14
Novel Nano-Mechanical Platform to Investigate Therapeutic Sub-Cellular Mechanical Stimulation

Rajachar, Lee, Frost
$326,346; 05/15 - 04/18
Adhesive PEG-fibrinogen Nitric Oxide Releasing Hydrogels for Use as a Wound Healing and Tissue Engineering Support

Tang X
$421,653; 05/15 - 04/18
Role of microRNA-483 in pancreatic alpha-and beta-cells

Werner
$436,031; 02/16 - 01/19
Role of Toolkit Genes in Generating Complex Color Patterns in Drosophila

Zhao
$450,502; 07/13 – 06/16
Development of Off-the-shelf Completely Biological Small-diameter Blood Vessel with Human Stem Cells
Busov
$7,000; 10/14 – 09/15
McIntire Stennis: Regulation of Biomass Growth in Trees

Busov, Yordanov, Gailing
$499,916; 05/12 – 04/15
USDA NIFA: Plant Growth and Development Program: Role of Lateral Organ Boundary transcription factors in regulation of wood formation in poplar

Deshpande, Wusirika, Datta
$150,000; 02/14-01/16
Bioactive Components in Rice Callus Culture and Blueberry Extract as Anti-inflammatory Agents of the Gastrointestinal Tract

Gailing
$7,000; 10/15 – 09/16
McIntire Stennis: Identification of Genes Involved in the Maintenance of Species Identity in North American Red Oaks

Wei
$7,000; 10/15 – 09/16
McIntire Stennis: Regulation of Leaf Growth Shapes and Vein Patterns in Birch

Yuan, Wei
$149,888; 04/12 – 04/16
Systemic Identification and Characterization of Overlapping Sense/Antisense Gene Loci in Populus Genome

Busov, Yordanov, Tuskan, Wellington and Sykes
$1,100,000; 8/12 – 7/15
DOE Feedstock Genomics. Gene discovery. Functional discovery and characterization of genes and alleles affecting wood biomass yield and quality in poplar using activation tagging and association analysis

The American Blueberry Council

Tang X
$75,000; 06/15 – 05/16
Blueberry protects pancreatic beta cell

The Gerber Foundation

Minerick
$219,728; 06/12 – 01/16
Rapid Nutritional Analysis from Infant Tears

M-TRAC (MI Economic Development Corp.-MI Translational Research & Commercialization Prog)

Fang
$34,000; 07/14 – 09/17
Commercialize Technologies for Biopolymer Purification
Huron Mountain Foundation

Gailing
$3,000; 02/15 – 01/16
Patterns of Seed Dispersal in Red Oak Species Assessed at Maternally Inherited Chloroplast DNA Markers

Werner
$3,500; 05/14 – 04/17
The Lepidoptera and Drosophilidae of the Huron Mountains

Michigan Tech

Carter
$61,000; 07/14 – 08/15
Bio Imaging Core Facility

Durocher
$31,600; 07/13 – 08/15
REF seed grant: The Effect of Diet or Exercise on Visceral Obesity, Neural Cardiovascular Reactivity and Arterial Stiffness in Obese Humans

Jiang
$23,000; 07/15 – 08/16
REF: Mathematical Imaging: toward reduction in hemorrhagic stroke

Kirkpatrick et al
$30,000; 01/15 - 08/16
Microscope Repair

Tanasova
$61,000; 07/14 – 08/15
Cell Culture and Bioimaging Core Facility

Tang X
$30,000; 07/15 – 08/17
Role of microRNA in pancreatic beta-cells

Tiwari
$24,560; 07/14 – 08/15
Understanding the Role of Protein Aggregation in Cellular Toxicity

Werner
$20,000; 07/15 – 08/17
Color pattern evolution in an emerging fruit fly model organism

Yuan
$15,000; 07/14 – 08/15
Genome-wide Analysis of Regulatory RNAs Associated with Wood Formation in Populus
REF Mentor Grant: Evolutionary Ecology

Mayo Clinic

Ong
$50,758; 02/15 – 12/16
A Wireless Sensor System for Monitoring Load at External Bone Fixation Plate (Subcontract)

Morton Arboretum

Gailing
$4,500; 12/15 – 11/16
Characterization of EST SSRs in the Endangered Tree Quercus Georgiana

North Carolina State University

Wei
$50,758; 02/13 – 05/15
Construction of Gene Regulatory Networks of Wood Formation in Poplar
Portage Health Foundation (MTU & Superior Ideas)

Carter, Lehman, Minerick, Ong, Hembroff
$2,500,000; 09/15 – 08/20
A Partnership to Improve Health Education, Research, Infrastructure, and Local Economic Growth

Carter, Smoot
$25,000; 01/13 – 02/14
Sleep Apnea and Neurovascular Control in Humans

Penn State

Gailing
$215,077; 04/11 – 06/15
TRPGR: Comparative Genomics of Environmental Stress Responses in North American Hardwoods

Radiological Society of North America

Jiang
$8,427; 09/14 – 09/15
Development and Validation of Simulations and Phantoms Mimicking the Viscous Properties of Human Liver

Siemens Medical Solution (USA), Inc.

Jiang
$56,000; 06/13 – 07/16
CFD Simulations for Neurovascular Applications Using Siemens Prototype

Southern Illinois University - Carbondale

Datta
$95,094; 09/12 – 08/14
Low-Cost Green Technology to Improve Water Quality in Mining-Impacted Ecosystems

The University of Chicago (passthrough Merck)

Carter
$50,631; 04/14 – 12/15
Multi-Level Assessment of Physiologic Hyper-Arousal in Chronic Primary Insomnia: A Case Control Study

University of Michigan (MIIE)

Jiang, Wang, Bharti
$45,000; 07/14 – 06/15
Translation of Automated Flow Analysis into Clinical Worklow

University of Wisconsin Madison - NIH

Jiang
$75,000; 07/13 – 06/18
Real-Time Ultrasonic Monitoring of Tumor Ablation

Virginia Polytechnic Institute & State University

Murthy
$50,146; 04/11 – 03/15
Collaborative Research: Functional Characterization of Diphospho and Tripho-inositol Phosphates in Plants


DeRouin A, Ong KG (2016) Multi-parameter sensing with a single magnetoelastic sensor by applying loads on the null locations of multiple resonant mode, Smart Materials and Structures, in press.


