

MINUTES OF THE MEETING  
OF THE  
MICHIGAN STATE UNIVERSITY  
BOARD OF TRUSTEES

August 29, 2014

President Simon called the meeting of the Board of Trustees to order at 9:30 a.m. in the Board Room.

Trustees present: Brian Breslin, Dianne Byrum, Joel Ferguson, Mitch Lyons, Brian Mosallam, and George Perles (via telephone).

Trustees absent: Faylene Owen and Diann Woodard.

University officers present: President Simon, Provost and Executive Vice President Youatt, Executive Vice President Udpa, Vice President and Secretary Beekman, Vice President and General Counsel Noto, Vice Presidents Burnham, Dawkins, Gore, Groves, Haas, Hsu, Maybank, and Swain, and Senior Advisor and Director Granberry Russell. Faculty liaisons present: Martin Crimp, William Davidson II, William Donohue, Deborah Moriarty, and Mary Noel. Student liaisons present: Emily Bank, James Conwell, Dontae Freeman, and Alex Grajewski.

All actions taken were by unanimous vote of the Trustees present, unless otherwise noted.

1. On a motion by Trustee Ferguson, supported by Trustee Breslin, the **BOARD VOTED to approve** the agenda.
2. On a motion by Trustee Breslin, supported by Trustee Lyons, the **BOARD VOTED to approve** the minutes of the June 20, 2014 Board of Trustees meeting.
3. President's Report

President Simon provided the following report to the Board.

A. Beginning of the Academic Year

President Simon recognized Provost Youatt and asked that she and her leadership team provide a report on the start of the academic year as part of the Policy Committee's report.

B. MSU 29<sup>th</sup> in National Ranking

MSU is one of the top 30 universities in the nation according to an annual ranking that measures what colleges and universities “are doing for the country.” In Washington Monthly’s 2014 National University Rankings, MSU ranked 29<sup>th</sup>, falling in the top 11 percent of the 277 higher education institutions analyzed by the publication. Washington Monthly rates schools based on whether they are improving social mobility, producing research, and promoting public service.

C. Ag Research Foundation

The United States Department of Agriculture announced the selection of board members for the new Ag Research Foundation created in the farm bill. MSU Director of AgBioResearch Dr. Douglas Buhler has been appointed to the board. Dr. Buhler brings vast knowledge and experience to this appointment and will be a great asset for the Foundation.

D. Transatlantic Leadership Award

The European Association of International Educators will award Dr. John Hudzik its Transatlantic Leadership Award. The European institute regularly confers the Award to a leader in the transatlantic community who has made a significant contribution to European-American relations.

E. UPPA Award

Jim Peck, MSU Director of University Photography and Videography, has been given the Board Appreciation Award from the University Photographers Association of America in honor of his significant impact on the profession of photography in service of higher education. Jim was recognized for his exceptional support in advancing professional development and the occupation of university photographer.

F. Honors College Welcomes Largest Class

The Honors College will welcome about 600 freshmen, the largest class in its 58-year history. Enrollment in MSU’s Honors College has been growing over the last five years. While the average ACT score in Michigan is 20.1, according to ACT Inc., the average ACT score for this year’s incoming class of Honors College students is 31.7. The average SAT score for the 2014 cohort is 1,390, and the

average high school GPA is 4.13. In addition, 64 of the incoming Honors College students were high school valedictorians.

G. MSU Students Receive National Next Generation Award

Three MSU graduate neuroscience students in the College of Natural Science have been awarded the Society of Neuroscience's 2014 Next Generation Award. Eileen Rodriguez-Tapia, Alexandra Colon-Rodriguez, and Chelsea Tiernan have developed a "Bridge to Neuroscience Workshop" in Puerto Rico for high school students that is designed to increase awareness of the field as a discipline and career option.

H. MSU Alumna Named Michigan's Top Teacher

MSU alumna Melody Arabo, who teaches third grade in the Walled Lake Consolidated School District, has been named the 2014-15 Michigan Teacher of the Year. The recognition is accompanied by a seat on the State Board of Education.

I. One Book, One Community Program

MSU and the City of East Lansing will host three influential voices on the continuing struggle for racial equality during the annual One Book, One Community program, which kicked off August 25. The three program selections this year are graphic novel "March Book One" by U.S. Congressman John Lewis, Andrew Aydin, and Nate Powell; the film, "Fruitvale Station," directed by Ryan Coogler; and the memoir "The Grace of Silence" by award-winning journalist and National Public Radio contributor Michele Norris. This is the first time in its 13-year history that the program features multiple selections as well as the first time that a non-written work has been chosen.

This year's program takes place in conjunction with MSU's yearlong Project 60/50, which commemorates the 60<sup>th</sup> anniversary of the Brown v. Board of Education decision by the U.S. Supreme Court and the 50<sup>th</sup> anniversary of the 1964 Civil Rights Act.

J. Fundraising

Vice President Groves said that, for the second straight year, MSU has had a record-setting year in fundraising. He acknowledged the hard work of the faculty, deans, and other University leaders who

are aggressively reaching out to connect with those who are willing to support MSU's outstanding students and programs.

K. MSU Community Charitable Campaign

For many years MSU has been fortunate to have Craig Gunn and Jeff Brodie lead the MSU Community Charitable Campaign. They have given countless hours to this cause and have agreed to do so again this year. President Simon thanked them for their work.

Mr. Brodie thanked the Board of Trustees, President Simon, MSU faculty and staff, retirees, organized labor, and the MSU Federal Credit Union for their help in making the Campaign a success.

Mr. Gunn said that the campaign has raised approximately \$6,000,000 over the past 12 years. He said that there are approximately 300 campaign volunteers across campus and that approximately 120,000 people in the tri-county area benefit from the work that is done by United Way. Between 10 and 20 percent of the money raised for the Greater Lansing United Way comes from MSU.

4. There was no Public Participation on Issues Germane to the Agenda.
5. Personnel Actions

Provost Youatt presented the following personnel actions:

Wittenborn, Andrea, AY—Associate Professor, Department of Human Development and Family Studies, \$95,000, with Tenure, effective August 16, 2014.

Kim, Kyooil, AY—Associate Professor, Department of Economics, \$140,000, with Tenure, effective August 16, 2014.

Chen, Jiquan, AY—Professor, Department of Geography; Center for Global Change and Earth Observation, \$157,000, with Tenure, effective August 16, 2014.

Moran, Emilio F., AY—Hannah Distinguished Professor, Department of Geography; Center for Global Change and Earth Observation, \$223,300, with Tenure, effective August 16, 2014.

Hankenson, Kurt D., AN—Associate Professor, Departments of Small Animal Clinical Sciences; Physiology, \$140,000, with Tenure, effective August 16, 2014.

Young, Joanna C., AN—Vice President and Chief Information Officer, Office of CIO and Director of IT Services Technology, \$300,000, Executive Management, effective August 26, 2014.

David, Prabu, AN—Dean, College of Communication Arts and Sciences; Professor, Department of Media and Information Studies; Department of Communication, \$230,000, with Tenure, effective January 1, 2015.

Kempel, Leo C., AN—Acting Dean, College of Engineering; Professor, Department of Electrical and Computer Engineering, for a change in title from Acting Dean to Dean, College of Engineering, and for a change in salary to \$310,000, effective July 1, 2014.

Simmons, Elizabeth H., AN—Dean, Lyman Briggs College, University Distinguished Professor, Lyman Briggs College; Department of Physics and Astronomy, adding title of Acting Dean, College of Arts and Letters, for a change in salary to \$250,000, effective August 1, 2014.

Powell, John W., AY—Associate Professor, Departments of Kinesiology; Physical Medicine and Rehabilitation; Intercollegiate Athletics, to add title of Interim Secretary for Academic Governance, Office of the Secretary for Academic Governance, and for a change in salary to \$81,515, effective August 16, 2014.

Donohue, William, AY—Professor, Department of Communication, to add title of Interim Faculty Grievance Official, Office of the Faculty Grievance Official, and for a change in salary to \$113,177, effective August 16, 2014.

The following action includes a tenure recommendation which was delayed last Spring, recommended by the Department/Chairperson/School Director, the Deans, and the Provost in accordance with the tenure rules, to be effective July 1, 2014.

Lee, Eunsil, promotion to Associate Professor, School of Planning, Design and Construction

Trustee Ferguson **moved to approve** the recommendations, with support from Trustee Lyons.

**THE BOARD VOTED to approve** the recommendations.

6. Gifts, Grants, and Contracts

Vice President Hsu presented the Gifts, Grants, and Contracts Report for the period of May 22, 2014 through July 29, 2014. The report is a compilation of 613 Gifts, Grants and Contracts plus 58 Consignment/Non-Cash Gifts, with a total value of \$117,107,675.

Trustee Ferguson **moved to approve** the recommendation, with support from Trustee Breslin.

**THE BOARD VOTED to approve** the recommendation.

Vice President Hsu introduced James Stapleton, fixed-term Research Associate in the Department of Chemical Engineering and Materials Science. Dr. Stapleton made a presentation to the Board on identifying rare combinations of mutations in HIV patients to predict drug resistance. (Appendix A)

7. Finance Committee

Trustee Breslin presented the Trustee Finance Committee Report and the following recommendations and resolutions.

A. Fund Functioning as an Endowment

It was recommended that the Board of Trustees establish a fund functioning as an endowment to provide scholarships to undergraduate students who are at least sophomores and who are studying wildlife management, ecology, or natural resource management or who are conducting Arctic and Antarctic research, with an emphasis on the protection and preservation of wildlife in those regions.

Be it resolved, that the Board of Trustees of Michigan State University hereby establishes a fund functioning as an endowment entitled the "Vera M. Wallach Honors College Scholarship Fund."

It was recommended that the Board of Trustees establish a fund functioning as an endowment to provide fellowships to graduate students who are studying wildlife management, ecology, or natural resource management or who are conducting Arctic and Antarctic research, with an emphasis on the protection and preservation of wildlife in those regions.

Be it resolved, that the Board of Trustees of Michigan State University hereby establishes a fund functioning as an endowment entitled the “Vera M. Wallach Fellowship Fund for Graduate Students.”

Trustee Breslin **moved to approve** the resolutions, with support from Trustee Ferguson.

**THE BOARD VOTED to approve** the resolutions.

B. Fund Functioning as an Endowment—Connected Mathematics Project 3 (CMP-3)

It was recommended that the Board of Trustees establish a fund functioning as an endowment for receipt and administration of royalties form the third version of Connected Mathematics.

Be it resolved, that the Board of Trustees of Michigan State University hereby establishes a fund functioning as an endowment entitled “Connected Mathematics Project Fund 3.”

Trustee Breslin **moved to approve** the resolution, with support from Trustee Ferguson.

**THE BOARD VOTED to approve** the resolution.

C. Lease Amendment—College of Osteopathic Medicine at the Detroit Medical Center

It was recommended that the Board of Trustees authorize the Administration to negotiate and execute an amendment to its existing lease with the Detroit Medical Center (DMC) for an addition of approximately 8,700 square feet of learning and office space at DMC; an extension of the original lease term through March 31, 2029; and the build-out of the new space and modification of existing space.

Be it resolved, the Board of Trustees of Michigan State University hereby affirms the existing lease for the College of Osteopathic Medicine at the Detroit Medical Center and authorizes the Administration to amend and extend it upon such terms and conditions as may be acceptable to the President and the Vice President for Strategic Infrastructure Planning and Facilities, including the build-out of additional space and renovations to existing space.

Trustee Breslin **moved to approve** the resolution, with support from Trustee Ferguson.

**THE BOARD VOTED to approve** the resolution.

D. Authorization to Plan

It was recommended that the Board of Trustees authorize the Administration to plan for the construction of a new facility for the men's and women's intercollegiate golf teams.

Be it resolved, that the Board of Trustees of Michigan State University hereby authorizes the Administration to plan for the project entitled "New Intercollegiate Golf Building."

Trustee Breslin **moved to approve** the resolution, with support from Trustee Ferguson.

**THE BOARD VOTED to approve** the resolution.

E. Eli Broad College of Business Addition No. 2—Graduate Pavilion

It was recommended that the Board of Trustees authorize the Administration to plan for the demolition of the west wing of the Eppley Building and its replacement with a new Graduate Pavilion.

Be it resolved, that the Board of Trustees of Michigan State University hereby authorizes the Administration to plan for the project entitled "Eli Broad College of Business Addition No. 2—Graduate Pavilion."

Trustee Breslin **moved to approve** the resolution, with support from Trustee Ferguson.

**THE BOARD VOTED to approve** the resolution.

F. Authorization to Plan—MSU Community Music School—Reconstruct Parking Lot

It was recommended that the Board of Trustees authorize the Administration to plan for demolition of a house and parking lot reconstruction at the MSU Community School property located at 4930 Hagadorn Road.



Be it resolved, that the Board of Trustees of Michigan State University hereby authorizes the Administration to plan for the project entitled "MSU Community Music School—Reconstruct Parking Lot."

Trustee Breslin **moved to approve** the resolution, with support from Trustee Byrum.

**THE BOARD VOTED to approve** the resolution.

G. Authorization to Plan—Data Center

It was recommended that the Board of Trustees authorize the Administration to plan for the relocation and upgrade of the University's main administrative computing data center and its high performance computing center.

Be it resolved, that the Board of Trustees of Michigan State University hereby authorizes the Administration to plan for the project entitled "Data Center."

Trustee Breslin **moved to approve** the resolution, with support from Trustee Byrum.

**THE BOARD VOTED to approve** the resolution.

8. Policy Committee

Trustee Byrum presented the Trustee Policy Committee Report and the following recommendations and resolutions.

A. Approval of Contract Terms

It was recommended that the Board of Trustees approve an amendment to a contract between Michigan State University and *Biophotonic Solutions, Inc.*, a company in which faculty member Marcos Dantus holds a financial interest.

Be it resolved that the Board of Trustees approves an amendment to a license with *Biophotonic Solutions, Inc.*, consistent with earlier public notice given at a Board meeting and with the "License Amendment Term Sheet" presented to the Board. (Appendix B)

It was recommended that the Board of Trustees approve a contract between Michigan State University and *Liuman Technologies, LLC*,

a company in which faculty member Dahsin Liu holds a financial interest.

Be it resolved that the Board of Trustees approves a testing agreement with *Liuman Technologies, LLC*, consistent with earlier public notice given at a Board meeting and with the "Testing Agreement Term Sheet" presented to the Board. (Appendix C)

It was recommended that the Board of Trustees approve contract between Michigan State University and *Piezonix, LLC*, a company in which faculty member Shantanu Chakrabarty holds a financial interest.

Be it resolved that the Trustee Policy Committee recommends to the Board of Trustees that it approve a research subcontract with *Piezonix, LLC*, consistent with earlier public notice given at a Board meeting and with the "Research Subcontract Term Sheet" presented to the Board. (Appendix D)

The Trustee Policy Committee recommends that the Board of Trustees approve a contract between Michigan State University and *Bioplastic Polymers & Composites, LLC*, a company in which faculty member Ramani Narayan holds a financial interest.

Be it resolved that the Board of Trustees approves the execution of an agreement with *Bioplastic Polymers & Composites, LLC*, consistent with earlier public notice given at a Board meeting and with the "Agreement Term Sheet" presented to the Board. (Appendix E)

The Trustee Policy Committee recommends that the Board of Trustees approve a license amendment and settlement agreement with *Natural Therapeutics, LLC*, a company in which faculty member Muraleedharan Nair holds a financial interest.

Be it resolved that the Board of Trustees approves the execution of a license amendment and settlement agreement with *Natural Therapeutics, LLC*, consistent with earlier public notice given at a Board meeting and with the "License Termination and Settlement Agreement Term Sheet" presented to the Board. (Appendix F)

The Trustee Policy Committee recommends that the Board of Trustees approve a contract between Michigan State University and *Ubiquitous Energy, Inc.*, a company in which faculty member Richard Lunt holds a financial interest.

Be it resolved that the Board of Trustees approves the execution of a sponsored research contract with *Ubiquitous Energy, Inc.*, consistent with earlier public notice and with the "Sponsored Research Contract Term Sheet" presented to the Board. (Appendix G)

Trustee Byrum **moved to approve** the resolutions, with support from Trustee Ferguson.

**THE BOARD VOTED to approve** the resolutions.

**B. Notice of Intent to Negotiate Contracts**

Pursuant to State law, Trustee Byrum gave public notice of the University's intent to negotiate contracts with *Black Pine Engineering, LLC*, a limited liability company based in Midland, Michigan.

Dr. Norbert H. Mueller, an Associate Professor in the Department of Mechanical Engineering, and his family own or have options to buy an ownership interest of more than one percent of the company. Dr. Mueller is also an officer of *Black Pine Engineering, LLC*.

Pursuant to State law, Trustee Byrum gave public notice of the University's intent to negotiate contracts with *Dr. Ryan O'Connor*, an Assistant Professor in the College of Osteopathic Medicine.

Pursuant to State law, Trustee Byrum gave public notice of the University's intent to negotiate contracts with *siRNAx, Inc.*, a company based in Ann Arbor, Michigan.

Dr. R. Michael Garavito, a Professor in the Department of Biochemistry and Molecular Biology, and his family own or have options to buy an ownership interest of more than one percent of the company. Dr. Garavito is also an officer of *siRNAx, Inc.*

**C. Launch of the Academic Year**

Provost Youatt said that she and her colleagues would provide a preliminary report on the opening of the academic year. MSU has welcomed 49,700 students to campus this fall including approximately 7,890 freshmen. Provost Youatt noted that approximately 77 percent of the undergraduate students are from the State of Michigan. Provost Youatt thanked the faculty for welcoming new and returning students this year.

Dr. Karen Klomparens, Associate Provost and Dean of the Graduate School, said 2,000 graduate students, representing all 50 states and more than 130 countries, were welcomed to campus. Dean Klomparens thanked the Board and President Simon for their support of Chittenden Hall and noted its official opening in September.

Dr. Doug Estry, Associate Provost and Dean of Undergraduate Education, said that MSU is focused on helping first-year students think about their purpose and goals as students, understand diversity, and connect with the values and traditions of MSU. Dean Estry stated that the Welcome Convocation was a success and that he looks forward to the upcoming academic year.

Vice President Maybank commented that the student move-in went very smoothly this year. She said that the Welcome Convocation was attended by approximately 9,000 students and was a huge success. Vice President Maybank noted that Spartan Spectacular was postponed due to inclement weather and would be held on September 14, 2014.

Vice President Gore said that 15,000 students moved into the residence halls. He reminded the Board that Landon and Butterfield Halls have reopened after significant renovations.

## 9. Audit Committee

Trustee Breslin presented the Trustee Audit Committee Report and recommendations.

The Trustee Audit Committee had no action items. It did, however, receive an overview of Internal Audit Office functions and a review of that Office's audit plan for the coming year. The Committee originally received the report in June of this year. Internal Audit Director Tom Luccock reviewed the areas of risk for the University and audit priorities for this year.

Board members also received information about compliance with NCAA rules in the Department of Intercollegiate Athletics. The athletics compliance unit is led by Associate Athletic Director Jennifer Smith. Her position reports not only to the Athletics Director, but to the General Counsel. The athletics compliance unit leads with a strong, proactive, and educational approach.

10. Trustee Comments

Trustee Ferguson thanked Dr. Stapleton for sharing his research with the group.

Trustee Lyons said that he enjoys seeing the students return to campus and is looking forward to the academic year.

Trustee Byrum said that she is looking forward to a great academic year.

Trustee Mosallam thanked Jim Cotter, Director of Admissions, and his team for all of their hard work.

Trustee Breslin thanked the faculty and administration for the attention and guidance that they provide to first-time students.

Trustee Perles wished the football team good luck with the season opening game.

11. Public Participation on Issues Not Germane to the Agenda

A. GEU Healthcare Changes

Ms. Erin Beard, MSU graduate student, said that small changes to medical coverage can have a big impact on the budget of graduate students. Ms. Beard stated that under the new medical plan the cap on out-of-pocket costs has doubled. Ms. Beard said the typical graduate employee stipend covers the essentials with very little for any extra expenses.

Ms. Sara Johnson, MSU graduate student, said increased healthcare costs place a burden on already cash-strapped students. Ms. Johnson asked the Board to support graduate student employees.

Mr. Daniel Ritter, MSU graduate student, said that the unilateral change in the collective bargaining agreement constitutes an unfair

labor practice. Mr. Ritter said that there has been no intent to bargain. Mr. Ritter said that the GEU would like to discuss solutions and work with MSU going forward.

Mr. David Hecker, President of the American Federation of Teachers Michigan, said that he hopes that the MSU Administration and the GEU can work together to resolve this healthcare issue.

12. Request to Adjourn

On a motion by Trustee Breslin, supported by Trustee Lyons, **THE BOARD VOTED to adjourn** at 10:50 a.m.

Respectfully submitted,



William R. Beekman  
Vice President and  
Secretary of the Board of Trustees

**RESEARCH  
PRESENTATION  
TO THE MSU BOARD OF TRUSTEES**

**AUGUST 29, 2014**

**JAMES STAPLETON  
TIMOTHY WHITEHEAD**

**COLLEGE OF ENGINEERING**

Facilitated by the Office of the Vice President for  
Research and Graduate Studies

## James Stapleton Introduction

Jim holds a BS in Bioengineering from UC Berkeley and a MS and PhD in Chemical Engineering from Stanford University. He did postdoctoral research at Kyoto University and Rutgers University before joining Tim Whitehead's lab at MSU. He also served for two years as a Peace Corps Volunteer in West Africa.



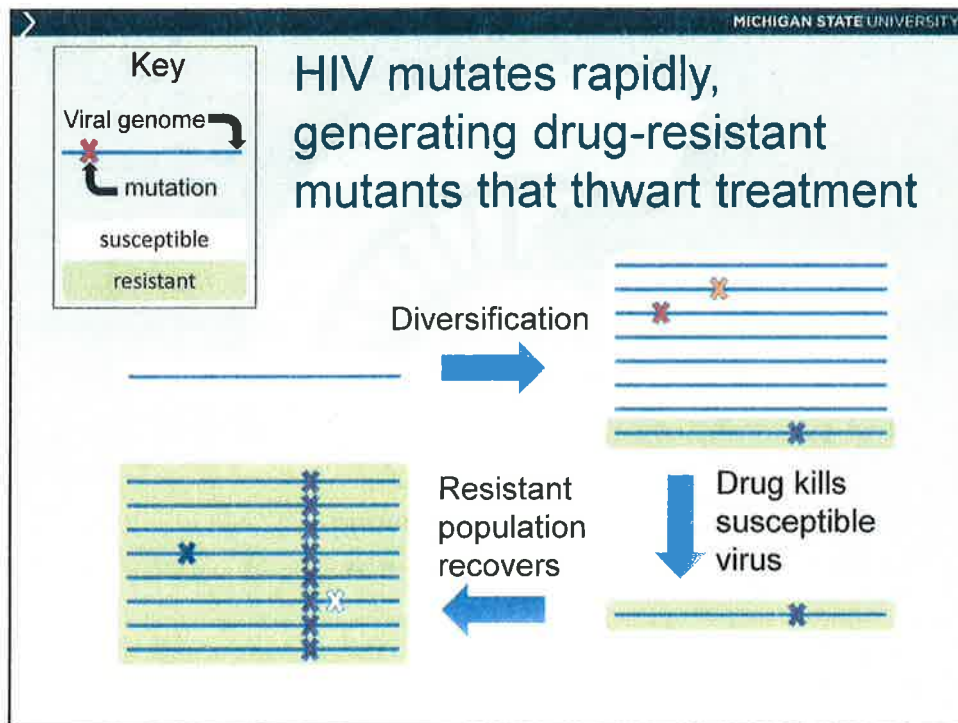
## Identifying rare combinations of mutations in HIV patients to predict drug resistance

James Stapleton  
Timothy Whitehead

Department of  
Chemical Engineering  
& Materials Science

## Organisms store genetic information in nucleic acid molecules (DNA & RNA)

- Long chains of four bases  
...ACTGTATGAGGATCCCATGAGAGTATAC...
- DNA sequencing allows us to read the order of the bases
  - The rise of next-generation DNA sequencing technologies in the past decade has drastically lowered the cost of DNA sequencing

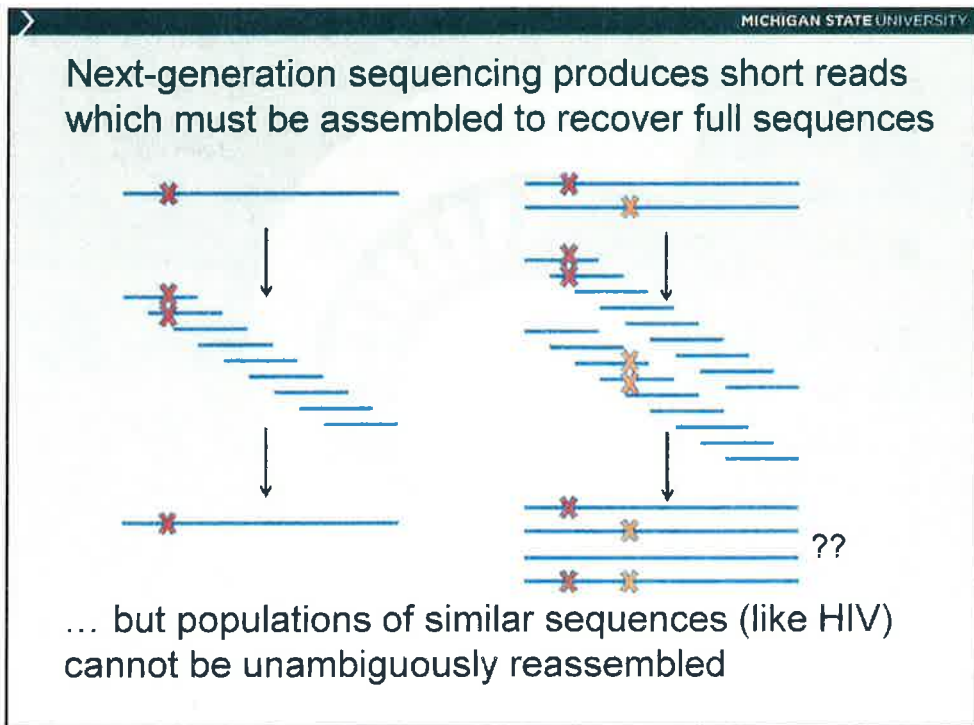
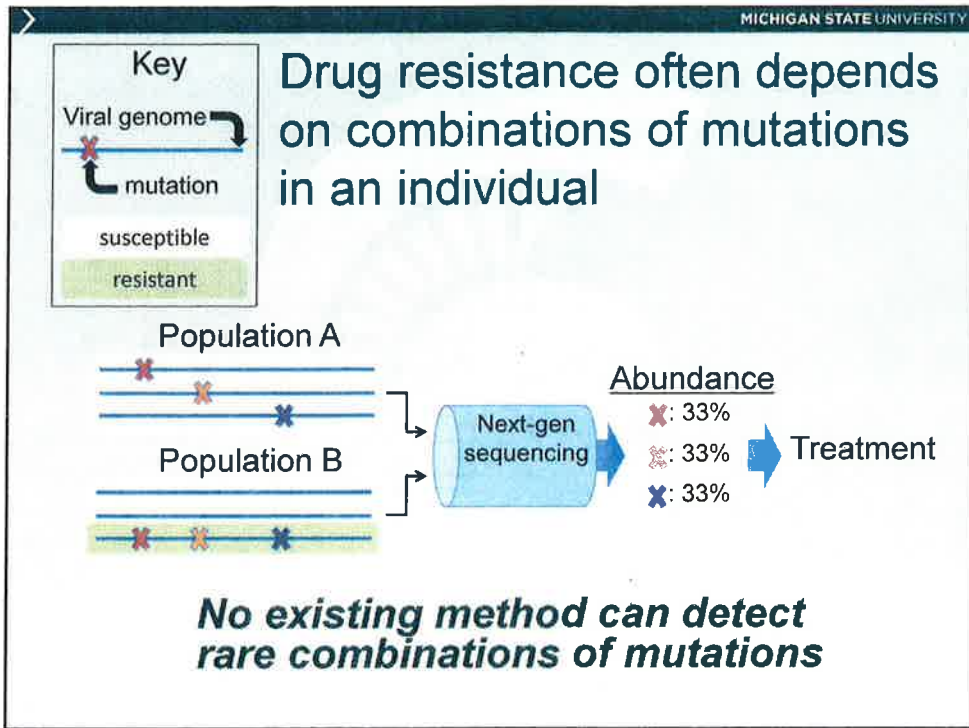


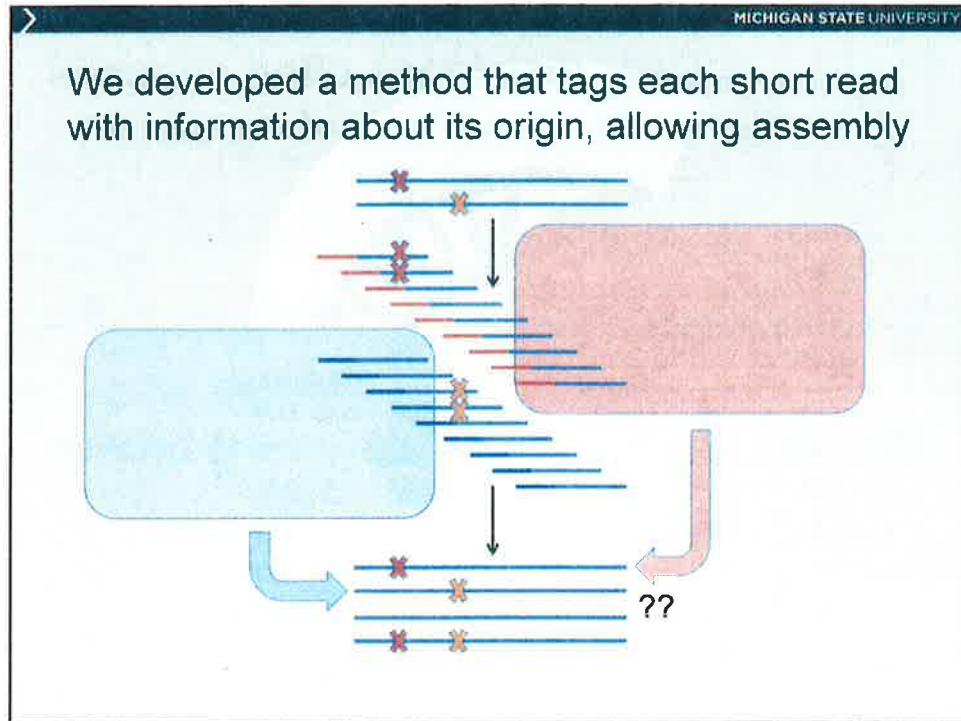
MICHIGAN STATE UNIVERSITY

### DNA sequencing guides drug selection

- Mutations causing drug resistance are known
  - If we know which mutations are present in a patient, we can choose an effective drug regimen
- Resistance mutations are routinely identified by DNA sequencing; robust market exists
- ... but existing methods have limitations

Key attributes	Ideal	Established	Next-gen
Identify rare mutations	1 in 100	1 in 5	1 in 100
Identify combinations	yes	yes	no





MICHIGAN STATE UNIVERSITY

**Conclusion:**  
We have invented a broadly useful method that extends the capability of next-generation sequencing platforms

The method is applicable to a wide variety of sequencing problems, including:

- Genome assembly and haplotyping
- mRNA splice variant analysis
- Metagenomics
- Protein engineering

**LICENSE AMENDMENT TERM SHEET**

**Party:** Biophotonic Solutions, Inc.

**License:** Third amendment to exclusive license agreement

**Term:** Extending to the expiration of the last to expire patent

**Technology:** Addition of MSU Invention Disclosure No. TEC2014-0096 "Laser Pulse Fidelity Measurement" to existing license agreement; U.S. Patent Application No. 62/008,568\*  
MSU invention disclosures and related patents currently under license:  
TEC2000-0086, Optimal Laser Desorption and Ionization Source for Mass Spectrometry  
TEC2004-0052, Binary Laser Pulse Shaping  
TEC2005-0056, Laser Selective Excitation  
TEC2005-0099, Femtosecond Laser Output Optimization  
TEC2006-0043, Laser-Based Identification of Stereoisomers  
TEC2006-0055, Laser Source for Material Processing  
TEC2006-0092, Control System and Apparatus for Use with Ultra-Fast Laser  
TEC2007-0029, Dispersion Compensation for Lasers  
TEC2009-0033, Autocorrelation Laser Pulse Measurement Using Phase Modulator  
TEC2009-0034, Autocorrelation Laser Pulse Measurement Using Phase Modulator with Novel Programming Function  
TEC2009-0045, Ultrafast Protein Activation  
TEC2009-0076, Pulse Compression Method  
TEC2011-0061, Adaptive Laser for Action in Variably Dispersive Substrates

The parties may add or remove technologies under the agreement, including improvements generated under a separate sponsored research agreement, provided that the change does not affect the financial consideration of the parties or the nature or extent of any pecuniary interest of MSU personnel.

**Technology's Potential Commercial Utilization:**

LASER fidelity measurement method

**Payment Terms:** Payment of a licensing fee of \$1,000 due within 30 days of invoice and running royalty of 4% on net sales

**Services Provided:** By MSU to Biophotonic Solutions: None under contemplated amendment  
By Biophotonic Solutions to MSU: None under contemplated amendment

**Use of University Facilities/Personnel:**

None

**Organization Type:** Michigan-based corporation

**Personnel Interest:** Dr. Marcos Dantus, a Professor in the Department of Chemistry, and his immediate family own or have options to buy an equity interest of more than 1% of the company. Dr. Dantus is also an officer of Biophotonic Solutions, Inc.

\*Please note that this is the only change to the existing license agreement.

**TESTING AGREEMENT TERM SHEET**

**Party:** Liuman Technologies, LLC

**Contract:** Testing agreement

**Term:** September 1, 2014 to November 28, 2014

**Payment Terms:** \$50,000

**Services Provided:** By MSU to Liuman Technologies: impact testing and fabrication

By Liuman Technologies to MSU: none

**Use of University Facilities/Personnel:**  
Use of MSU facilities/personnel by Liuman Technologies provided at relevant standard rates for industrial research

**Organization Type:** Limited liability company based in Okemos

**Personnel Interest:** Dr. Dahsin Liu, a Professor in the Department of Mechanical Engineering, and his family own or have options to buy an ownership interest of more than 1% of Liuman Technologies. Dr. Liu is also an officer of Liuman Technologies, LLC.

## RESEARCH SUBCONTRACT TERM SHEET

**Party:** Piezonix, LLC

**Contract:** Research subcontract from Piezonix to MSU  
“Self-powered Health Monitoring of Orthopedic Implants and Data Retrieval Using Diagnostic Ultrasound”

**Term:** From the effective date of the agreement to June 30, 2015

**Payment Terms:** \$72,252

**Services Provided:** By MSU to Piezonix: research regarding self-powered monitoring of orthopedic implants and data retrieval using diagnostic ultrasound  
By Piezonix to MSU: none

**Use of University Facilities/Personnel:** Use of MSU facilities/personnel by Piezonix provided at relevant standard rates for sponsored research

**Organization Type:** Limited liability company based in East Lansing

**Personnel Interest:** Dr. Shantanu Chakrabarty, an Associate Professor in the Department of Electrical and Computer Engineering, and his family own or have options to buy an ownership interest of more than 1% of the company. Dr. Chakrabarty is also a partner in Piezonix, LLC.

## AGREEMENT TERM SHEET

- Party:** Bioplastic Polymers & Composites, LLC
- Project Description:** Use of pilot plant infrastructure and operational staff at the MSU facility in Holland, MI for production of chemical intermediates, process optimization and related research
- Term:** Two years, unless terminated at an earlier date at the discretion of either party
- Contractual Terms:** Bioplastic Polymers & Composites, LLC is responsible for providing all raw materials, for the shipping of all products, and for disposal of all wastes generated. The company is responsible for complying with all applicable laws and regulations, as well as all MSU policies, and for cooperating fully with MSU Environmental Health & Safety. The company assumes all risks of failed production runs not resulting from demonstrable MSU error or negligence. No intellectual property rights of either party are modified under this agreement.
- All payments are by Bioplastic Polymers & Composites, LLC to MSU. Charges will be governed by the attached rate sheet.
- Services Provided:** By MSU to Bioplastic Polymers & Composites, LLC: Pilot plant scale-up and lab optimization of chemical syntheses
- By Bioplastic Polymers & Composites, LLC to MSU: None under contemplated agreement
- Use of University Facilities/Personnel:** MSU personnel will execute the pilot plant synthesis runs in the MSU facility in Holland, MI.
- Organization Type:** Bioplastic Polymers & Composites, LLC is a Michigan limited liability company based in Okemos, MI.
- Personnel Interest:** Dr. Ramani Narayan, a Professor in the Department of Chemical Engineering, and his immediate family own or have options to buy an equity interest of more than 1% of the company. Dr. Narayan is also an officer of Bioplastic Polymers & Composites, LLC.



**SPONSORED RESEARCH CONTRACT TERM SHEET**

**Party:** Ubiquitous Energy, Inc.

**Contracts:** Sponsored research agreement  
“Transparent Molecular Photovoltaic Devices”

**Term:** From the effective date of the agreement to August 31, 2016

**Payment Terms:** \$92,455

**Services Provided:** By MSU to Ubiquitous: Research regarding power-producing window technology, including transparent molecular photovoltaic devices

By Ubiquitous to MSU: none

**Use of University Facilities/Personnel:**  
Use of MSU facilities/personnel by Ubiquitous Energy, Inc., provided at relevant standard rates for sponsored research

**Organization Type:** Delaware corporation based in Menlo Park, California

**Personnel Interest:** Dr. Richard Lunt, an Assistant Professor in the Department of Chemical Engineering and Materials Science, and his family own or have options to buy an ownership interest of more than 1% of the company.

## LICENSE AMENDMENT AND SETTLEMENT AGREEMENT TERM SHEET

<b>Party:</b>	Natural Therapeutics, LLC
<b>Contract:</b>	License amendment and settlement agreement
<b>Term:</b>	From the date of the agreement to the expiration of the last to expire of the Patents
<b>Technology:</b>	<p>MSU Invention Disclosure (ID) TEC2001-0023 “Phytoceuticals from Cornus Mas”; MSU ID TEC2004-0123 “Insulin Secretion by Anthocyanins and Anthocyanides”; MSU ID TEC2005-0061 “Antidiabetic and Antiobese Cornus Mas Fruits and its Components”; MSU ID TEC2003-0017 “Cyclooxygenase-2 Inhibitory Withanolides from Withania Somnifera Leaves”; MSU ID TEC2004-0005 “Potent Antioxidant Compounds from Withania Somnifera Seeds for Potential Treatment and Prevention of Alzheimer’s Disease, Depression, Obesity and Migraine Headaches”</p> <p>Any and all U.S. and foreign patent applications and registrations filed by or on behalf of MSU claiming the technology and/or any patents maturing from related patent applications, including U.S. Patents 7,737,121; 7,772,195; 8,198,249; 7,195,784; 7,141,253; 7,211,277; 7,208,182; 7,264,832; 7,264,831; 7,264,833; 7,270,836 and U.S. Patent Application 13/460,781(Patents)</p>
<b>Technologies’ Potential Commercial Utilization:</b>	Natural and/or homeopathic therapeutic products
<b>Payment Terms:</b>	<p>From Natural Therapeutics to MSU: \$200,000 on the effective date of the agreement, plus reimbursement of all patent-related expenses after the effective date of the agreement; under license agreement AGR2004-0020 a running royalty of 1% of gross sales plus 33% of all sublicensing revenues including minimum annual royalty payments of \$5000; and under license agreement AGR2004-0021 a running royalty of 3% of gross sales plus 33% of all sublicensing revenues including minimum annual royalty payments of \$10,000. MSU to waive all remaining outstanding royalties and expenses due under the licenses (\$124,593.37 as of 6/30/2014).</p>

**Services Provided:** By MSU to Natural Therapeutics: none under contemplated agreement

By Natural Therapeutics to MSU: none under contemplated agreement

**Use of University Facilities/Personnel:**

None under contemplated agreement

**Organization Type:** Limited liability company based in Ann Arbor, MI

**Personnel Interest:** Dr. Muraleedharan G. Nair, a Professor in the Department of Horticulture, and his family own or have options to buy an ownership interest of more than 1% of the company. Dr. Nair is also an officer of Natural Therapeutics, LLC.

**SPONSORED RESEARCH CONTRACT TERM SHEET**

**Party:** Ubiquitous Energy, Inc.

**Contracts:** Sponsored research agreement  
“Transparent Molecular Photovoltaic Devices”

**Term:** From the effective date of the agreement to August 31, 2016

**Payment Terms:** \$92,455

**Services Provided:** By MSU to Ubiquitous: Research regarding power-producing window technology, including transparent molecular photovoltaic devices

By Ubiquitous to MSU: none

**Use of University Facilities/Personnel:** Use of MSU facilities/personnel by Ubiquitous Energy, Inc., provided at relevant standard rates for sponsored research

**Organization Type:** Delaware corporation based in Menlo Park, California

**Personnel Interest:** Dr. Richard Lunt, an Assistant Professor in the Department of Chemical Engineering and Materials Science, and his family own or have options to buy an ownership interest of more than 1% of the company.