THURSDAY, MAY 18, 2023
RESEARCH, INNOVATION & STRATEGIC PARTNERSHIPS COMMITTEE MEETING

Lewis Von Thaer, chair
Reginald A. Wilkinson
Juan Jose Perez
Tanner R. Hunt
Phillip Popovich
Hiroyuki Fujita (ex officio)

Location: Sanders Grand Lounge, Longaberger Alumni House
2200 Olentangy River Rd, Columbus, Ohio 43210

Time: 1:00 – 2:30 pm

Public Session

ITEMS FOR DISCUSSION

1. Committee Chair’s Remarks – Mr. Lou Von Thaer

2. George Washington Carver Science Park and Starlab Terrestrial Analog Facility Impacts on Research, Education and Economic Development – Dr. John Horack, Miss Cassidy Brozovich and Mr. Kenny McDonald

3. Pelotonia Research Center’s Future Impact on Societal Challenges – Dr. Peter Mohler, Dr. Russell Lonser and Dr. Sayoko Moroi

ITEM FOR ACTION

4. Approval of February 2023 Committee Meeting Minutes – Mr. Lou Von Thaer

Executive Session

1:45-2:30pm
Research Innovation & Strategic Partnerships Committee Meeting
George Washington Carver Science Park and Starlab Terrestrial Analog Facility: Impacts on research, education and economic development

John M. Horack, Professor and Neil Armstrong Chair in Aerospace Policy
Cassidy Brozovich, Undergraduate Student, Food, Agricultural and Biological Engineering
Kenny McDonald, President and CEO, Columbus Partnership
Spaceflight, Starlab, and The Ohio State University
An integrated strategy to build a path forward

John M. Horack, PhD - The Ohio State University
Professor and Neil Armstrong Chair in Aerospace Policy
College of Engineering and John H. Glenn College of Public Affairs
horack.1@osu.edu
The Ohio State University
May 2023
Spaceflight and Ohio - A unique history, present, and future
NASA is moving from **government-designed, owned, and operated** to **commercially-procured** launch services for people and cargo.

To that end, NASA made three awards in December 2021 for the development of commercial free-flying space stations in low-Earth orbit.
STARLAB
A NEXT-GENERATION COMMERCIAL SPACE STATION

- Voyager/Nanoracks awarded $160 million from NASA to develop Starlab
- NASA will be the anchor tenant
- Supports civil, commercial, national and security space domains
- Starlab is expected to deploy in a single launch in 2028

The Ohio State University is the lead university in the Starlab partnership.
More than a “Space Station” - a research ecosystem

George Washington Carver Science Park (GWCSNP) is the world’s first space-focused research park with assets on the ground and in space. As the home for the GWCSNP Terrestrial Analog Facility, Ohio State plays a critical role in testing missions, parallel research development and experimentation and unique learning opportunities.

Ohio State’s role in Starlab and GWCSNP provides a ~60-year leadership advantage for Ohio State, fortifying our land grant mission through commercial space research and innovation in low-Earth orbit.
George Washington Carver Science Park

Multi-domain research in space and on earth

- Human/Biological Research
- Agriculture/Plant Research
- Materials/Manufacturing
- Physical Sciences
- Earth/Space Sciences
- Open workbench areas
- External instrument hosting
- Commercial projects
- STEM Education
Ohio State's strategic roles in Starlab - GWCSP

- **Leading growth of the global research community** across university, industry, non-profit, and government entities.

- **Engaged in outreach and growth of STEM education activities**, starting in grade school in cooperation with DreamUp, community and other key partners.

- **Spearheading research commercialization**, start-up company development, incubation, and innovation derived from Starlab - GWCSP research.

- **Providing scientific leadership in specific areas, including agricultural and plant biological research** aboard Starlab – GWCSP.

- **Hosting the Starlab Terrestrial Analog Facility and anchor site of the GWCSP** to provide comprehensive payload, research, testing, and engineering ecosystem development for flight.
Thank You
Miss Cassidy Brozovich
Bachelor’s Degree (May 2023)
Food, Agricultural and Biological Engineering
Mr. Kenny McDonald
President and CEO
Columbus Partnership
Impact of the Pelotonia Research Center: Gene Therapy Institute

Peter Mohler, Interim Executive Vice President, Research, Innovation and Knowledge

Russell Lonser, Professor and Chair, Department of Neurological Surgery

Sayoko Moroi, Chair and Director of the Havener Eye Institute, Professor of Ophthalmology
Gene Therapy at Ohio State

Ohio State is home to the largest nervous system gene therapy clinical program in the world.

Ohio State is pioneering new ways to more effectively deliver gene therapy. Teams are working to tackle diseases like Parkinson’s disease, Huntington's disease, multiple vision disorders, Alzheimer's disease and even addiction.
Nervous system disorders require “next generation” gene therapy
Gene Therapy Institute objectives

- Foster interdisciplinary community in gene therapy science and transformative care
- Create infrastructure to accelerate gene therapy science and cures for complex diseases
- Develop business model to ensure long-term sustainability
- Generate IP, new companies and outside partnerships
- Train the next generation of scientists and physicians in gene therapeutics
- Support Ohio as the destination for clinical gene therapy
Gene Therapy Institute

Vertically integrated from basic and applied science research through clinical trials, training, and clinical treatment.

63 Faculty engaged from the colleges of Medicine, Law, Business, Engineering, Nursing, Pharmacy, Veterinary Medicine, Arts and Sciences.
Clinical results

Dyskinesias occurred in all patients after treatment and resolved within 12 to 24 months.

### External Partners Key for Success

**Industry – Foundations - Federal/FDA – Universities - Philanthropy**

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Program</th>
<th>Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic/Translational Research</td>
<td>Multiple</td>
<td>Investigator, Biogen, Eikonklastes, Allen Institute, Battelle, Neucore Bio, UC Berkeley</td>
</tr>
<tr>
<td>Plasmid and vector development</td>
<td>Multiple</td>
<td>Investigator, Forge Therapeutics, Andelyn Biosciences, Allen Institute</td>
</tr>
<tr>
<td>Clinical trials</td>
<td>Multiple</td>
<td>Investigator, Voyager, uniQure, Regenix Bio, Aviado Bio, Biogen, Neucore Bio, Battelle, Bayer, UC San Diego, Brodno (Warsaw)</td>
</tr>
<tr>
<td>Device development</td>
<td>Ball joint guide array</td>
<td>Investigator</td>
</tr>
<tr>
<td>Device development</td>
<td>Robotics</td>
<td>Medtronic</td>
</tr>
<tr>
<td>Imaging and work-flow</td>
<td>Portable Imaging</td>
<td>Hyperfine</td>
</tr>
<tr>
<td>Gene infusion training</td>
<td>Training</td>
<td>Ohio State</td>
</tr>
<tr>
<td>Gene therapy treatment sites</td>
<td>Ambulatory Sites</td>
<td>Ohio State</td>
</tr>
</tbody>
</table>
Krys Bankiewicz, MD, PhD
Daniel Gallego-Perez, PhD
Sy Moroi, MD, PhD
Natalia Higuita-Castro, PhD
Raymond Gao, PhD
Paco Herson, PhD
Yin Ren, MD, PhD

19 institute-affiliated faculty are basic/translational science investigators.

$12.4M in NIH Awards in FY2022
CRISPR Program: Correction via allele-specific excision of pathogenic repeats (Huntington’s disease and Amyotrophic Lateral Sclerosis)
Vector Production & Delivery

- Training site
- Technology development
- Device development
- Research
- Defined treatment site
- Clinical trials
- Vector production

Victor Van Laar, PhD
Lei Cao, PhD
Daniel Gallego-Perez, PhD
Natalia Higuita-Castro, PhD

Neucore Bio

FORGE Therapeutics
Andelyn BIOSCIENCES

May 2023
Device Development

- Training site
- Defined treatment site
- Technology development
- Clinical trials
- Device development
- Vector production
- Research

Lluis Samaranch, PhD  J. Bradley Elder, MD

HYPERFINE

THE OHIO STATE UNIVERSITY
Clinical Trials: First in Human

Ohio State leads the country in nervous system clinical trials.

Clinical Trials: First in Human

Mark Tuszynski, MD, PhD  
Krystof Bankiewicz, MD, PhD

Research  
Vector production  
Device development  
Technology development  
Defined treatment site  
Clinical trials  
Training site

uniQure  
Mark Tuszniki, MD, PhD

Matthew Ohr, MD

Sandra Kostyk, MD

J. Bradley Elder, MD

The Ohio State University

May 2023
### Current Trials

<table>
<thead>
<tr>
<th>Disease</th>
<th>Origin</th>
<th>Clinical Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macular degeneration</td>
<td>Regenix Bio</td>
<td>Phase III</td>
</tr>
<tr>
<td>Parkinson’s disease (regenerative)</td>
<td>Investigator (OSU)</td>
<td>Phase I</td>
</tr>
<tr>
<td>Parkinson’s disease (symptomatic)</td>
<td>Investigator (OSU)</td>
<td>Phase I</td>
</tr>
<tr>
<td>Multisystem atrophy</td>
<td>Investigator (OSU)</td>
<td>Phase I</td>
</tr>
<tr>
<td>Huntington’s disease</td>
<td>UniQure</td>
<td>Phase I</td>
</tr>
<tr>
<td>Alzheimer’s disease</td>
<td>Investigator (UCSD)</td>
<td>Phase I</td>
</tr>
<tr>
<td>AADC-deficiency</td>
<td>Investigator</td>
<td>Phase I</td>
</tr>
<tr>
<td>Malignant glioma (multiple)</td>
<td>Industry</td>
<td>Phase I</td>
</tr>
</tbody>
</table>

### Emerging Trials

<table>
<thead>
<tr>
<th>Disease</th>
<th>Origin</th>
<th>Clinical Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontotemporal dementia</td>
<td>AviadoBio</td>
<td>Phase I</td>
</tr>
<tr>
<td>Amyotrophic lateral sclerosis</td>
<td>Eikonklastes</td>
<td>Phase I</td>
</tr>
<tr>
<td>Drug addiction</td>
<td>Investigator (OSU)</td>
<td>Phase I</td>
</tr>
<tr>
<td>Obesity</td>
<td>Investigator (OSU)</td>
<td>Phase I</td>
</tr>
<tr>
<td>Leukodystrophy</td>
<td>Investigator (OSU)</td>
<td>Phase I</td>
</tr>
</tbody>
</table>
Technology Development and Commercialization

- Research
  - Device development
  - Device production
  - Clinical trials
  - Defined treatment site
  - Training site

$14.6 million NIH award will accelerate gene therapy research for rare disorder

Bayer Acquires AskBio for Up to $4 Billion to Expand Gene Therapy Platform

Aravind Chandrasekaran, PhD
Rebecca Wolitz, JD, PhD
Patricia J. Zettler, JD
Efthimios Parasidis, JD
Paul Rose, JD

Fisher College of Business
Moritz College of Law

The Ohio State University

May 2023
Clinical Treatment and Destination Medicine

- Training site
- Technology development
- Device development
- Research
- Defined treatment site
- Clinical trials
- Vector production

Largest nervous system gene therapy clinical program worldwide

Gene therapy is 'nothing short of a miracle' for 6-year-old with rare health condition

“This is nothing short of a miracle,” mom Shante Stagg told TODAY of a gene therapy that has helped her son who has a rare health condition.

THE Ohio State University
Clinical Training Site

- AADC-deficiency treated with AAV-AADC gene therapy
- Substantia Nigra
- Ventral tegmental area
The Impact of Ohio State Teams

Global impact of Ohio State science: Science and training to impact patients across the globe
SUMMARY OF ACTIONS TAKEN

February 16, 2023 – Research, Innovation & Strategic Partnerships Committee

Members Present:

Lewis Von Thaer
Reginald A. Wilkinson
Alexander R. Fischer (late)

Juan Jose Perez
Tanner R. Hunt
Phillip Popovich

Hiroyuki Fujita (ex officio)

Members Present via Zoom:

N/A

Members Absent:

N/A

The Research, Innovation & Strategic Partnerships Committee of The Ohio State University Board of Trustees convened on Thursday, February 16, 2022, in person at Longaberger Alumni House on the Columbus campus. Committee Chair Lewis Von Thaer called the meeting to order at 12:59 p.m.

PUBLIC SESSION

Items for Discussion

1. Committee Chair’s Remarks: Mr. Von Thaer kicked off the meeting by welcoming trustee, John Perez, to the committee. He also took a moment to publicly acknowledge and thank Grace Wang for her service to Ohio State as she moves on to be the 17th president of the Worcester Polytechnic Institute. Mr. Von Thaer recognized Peter Mohler for stepping in as interim executive vice president for the Enterprise for Research, Innovation and Knowledge.

2. Highlights of New Research, Innovation and Knowledge Achievements: Dr. Grace Wang, provided a report highlighting research, innovation and knowledge achievements in four strategic priority areas over the last quarter.

(See Attachment X for background information, page number XX)

3. Research and Development Expenditures Update: Dr. Peter Mohler, provided an update on Ohio State’s research and development expenditures for Fiscal Year 2022 as well as information on Ohio State’s rankings for FY2021 that were recently released as part of the National Science Foundation’s Higher Education Research and Development (HERD) survey.

(See Attachment X for background information, page number XX)

Items for Action

4. Approval of Minutes: No changes were requested to the November 17, 2022, meeting minutes; therefore, a formal vote was not required, and the minutes were considered approved.
EXECUTIVE SESSION

It was moved by Mr. Von Thaer, and seconded by Dr. Fujita, that the committee recess into executive session to consider business-sensitive trade secrets required to be kept confidential by federal and state statutes, and to consult with legal counsel regarding pending or imminent litigation.

A roll call vote was taken, and the committee voted to go into executive session with the following members present and voting: Mr. Von Thaer, Dr. Wilkinson, Mr. Perez, Mr. Hunt, Dr. Popovich, and Dr. Fujita. Mr. Fischer was not present for this vote.

The committee entered executive session at 1:29 p.m. and the meeting adjourned at 2:20 p.m.