



Huck Institutes of the Life Sciences

Strategic Plan 2025-30

Table of Contents

Executive Summary	3
Identity Statement: Mission, Vision, Culture, Goals	3
Mission	4
Vision	4
Culture	4
Goals	4
Goal 1: Attract & Retain the Best	4
Identify and Cultivate New Leadership in the Life Sciences	5
Recruit, Support and Retain Faculty Co-Hires and Chairs	5
Support and Retain Non-Tenure Line Faculty and Staff	5
Increase Funding, Recognition, Awards and Training Opportunities for Graduate Students	5
Goal 2: Fund Bold Research	6
Identify Research Priorities That Will Drive Decision-Making and Resource Allocation	6
Increase Public Impact Research: Including Translation of Penn State Scholarship to Policymakers, to Communities (Community Engaged Research), and to the Market (Industry Partnerships, Research Commercialization)	7
Goal 3: Support Workforce Education	7
Offer Undergraduate and Graduate Student Training	8
Develop/Expand Opportunities for Industry and Other Stakeholder Groups' Training & Engagement	8
Goal 4: Connect for Progress	8
Engage Government, Industry and Foundation Leadership and Scientists	9
Provide Targeted Seed Funding to Support New Research or Strengthen Research Collaborations Across Institutions	9
Goal 5: Provide Experts & Facilities	9
Improve Core Facilities and Staff Training	9
Support and Retain Non-Tenure Line Faculty and Staff	10
Goal 6: Catalyze Collaboration	10
Strengthen Inter-Unit Collaborations	10
Provide Adequate Support for Multi-PI, Collaborative Grant Funding (Catalysis) Initiatives	11
Goal 7: Foster Healthy Innovation	11
Address Duplication of Efforts Among Huck Institutes and Centers	11
Restructure Huck's Leadership and Stakeholder Groups	11
Improve Huck's Visibility and Branding	12
Goal 8: Be An International Resource	12
Support National and International Engagements	13
Huck Interdisciplinary Research Themes	14
Future Foods	14
Health for Life	14
Emergent Intelligence in Organisms	14
Engineering Resilient Ecosystems	15
Cross-Cutting Research Themes	16
Translational Science & Public Impact	16

Life at All Scales	16
AI to Action	17
Huck Units Descriptions	18
Unit: Graduate Programs	18
Unit: Core Facilities.....	19
Unit: Strategic Initiatives	20
Unit: Administrative Offices	21
Unit: Communications & Engagement.....	21
Unit: SciArt.....	21
Strengths, Weaknesses, Opportunities, and Challenges (SWOT).....	22
Strengths	22
Weaknesses.....	24
Opportunities	24
Challenges/Threats.....	26
APPENDIX 1 Huck Organizational Chart	27
APPENDIX 2 Strategic Planning Process & Timeline.....	28
Timeline:.....	28
Phase I: Stakeholder Identification and Information Collection	29
Phase II: Dissemination of the Draft Strategic Plan to the Stakeholders.....	30
APPENDIX 3 Stakeholder Groups.....	31
Contact Information	33

Executive Summary

The Huck Institutes of the Life Sciences (Huck) is one of Penn State's largest and most impactful interdisciplinary research enterprises, uniting over 100 co-funded faculty across 8 colleges, including the College of Medicine, and connecting them through 3 institutes, 26 centers of excellence, 11 state-of-the-art core research facilities, 6 intercollege graduate degree programs and 1 professional master's degree program. With approximately \$30 million in annual expenditures, supported by an endowment, external funding, and strategic partnerships, Huck drives research that addresses fundamental questions in the life sciences and seeks to solve humanity's most pressing challenges, ranging from global health and food security to ecosystem resilience and biomedical innovation.

Our model is built on depth, breadth, and collaboration: integrating diverse expertise, fostering a culture of innovation, and training the next generation of scientists on cutting-edge instrumentation under the guidance of world-leading experts. Huck graduate and professional programs enroll over 250 PhD students and 35 professional master's students, whose advisors span the University's disciplinary landscape. Huck is supported by a team of over 60 dedicated staff and research faculty with more than 80,000 sq. ft. of high-performance laboratory space. Central to this ecosystem, 11 Huck Core Facilities house more than \$50 million of state-of-the-art instrumentation and provide unparalleled technical capabilities and expert support, enabling high-impact, interdisciplinary research that drives discovery across the life sciences.

Over the next five years (2025–2030), Huck will sharpen its focus on areas where Penn State can lead nationally and globally, advancing knowledge and creating tangible societal impact. We will concentrate resources and talent in four strategic research priorities:

- **Future Foods** - Innovating sustainable and resilient food systems.
- **Health for Life** - Transforming approaches to human, animal, and plant health.
- **Emergent Intelligence in Organisms** - Decoding adaptive and collective behaviors across biological systems.
- **Engineering Resilient Ecosystems** - Designing nature-based and technological solutions for environmental stability.

We will leverage three cross-cutting themes to ensure our research moves from discovery to deployment, connects fundamental and applied science, and leverages emerging technologies to solve real-world problems:

- **Translational Science & Public Impact**
- **Life at All Scales**
- **AI to Action**

Success should be measured not only by research productivity but also by graduate student and postdoctoral scholar placement outcomes, the stability and retention of staff, the strength of alumni and industry partnerships, expanded professional development for graduate students and postdoctoral scholars, and a long-term commitment to excellence in research. Huck's success will be measured not only by the volume of activity, but by the depth and reach of our impact in discoveries, strategic partnerships, talent development, and the public good.

Identity Statement: Mission, Vision, Culture, Goals

MISSION

To position Penn State as a leader in interdisciplinary life sciences, we unite diverse talent, world-class facilities, and bold ideas to advance discovery, train the next generation, and translate research into solutions that improve lives, strengthen ecosystems, and serve the public good.

VISION

We will be a driving force in life sciences research, education, and innovation, recognized nationally and globally for tackling fundamental questions in the life sciences and humanity's most pressing challenges through collaboration, creativity, and impact that extends from Pennsylvania to the world.

CULTURE

We integrate Penn State resources with a nimble mindset. Ever flexible, we leverage these resources in creative ways that extend our reach across the entire University system. We are a community that values innovation and risk-taking and with a mindset for growth. We build and support diverse teams of faculty, staff, students, and trainees, helping them to reach higher than they could on their own.

GOALS

Our eight strategic goals align with Penn State's strategic goals (PSU SG) and define where Huck will invest to amplify impact over the next five years.



PSU's Strategic Goals are:

1
Enhancing
Student Success

2
Growing (Inter)disciplinary
Research

3
Increasing Land-
Grant Impact

4
Fostering
DEIB

GOAL 1: ATTRACT & RETAIN THE BEST

Attract, support, and retain a diverse community of the best and brightest faculty, staff, graduate students, and postdoctoral scholars by providing an inspiring, collaborative working environment equipped with best-in-class facilities and instrumentation.

OBJECTIVES:

IDENTIFY AND CULTIVATE NEW LEADERSHIP IN THE LIFE SCIENCES

- Increase diversity of unit affiliations of faculty supported by internal funding (seed grants, chairs, etc.).
- Continue to offer the annual Huck Leadership Fellowship Program that has proven very successful in coaching new campus leaders (including one at College of Medicine).
- Continue to support faculty applications for career awards and scientific leadership (e.g., ORAU's Ralph E. Powe Junior Faculty Enhancement Awards, National Academies of Sciences Fellowships and awards, etc.).
- Identify and support faculty leadership for centers and institutes within Huck, including for key research priorities in plant science (PlantWorks), tick ecology and management (Tick Research Facility), and the development of a One Health Biorepository.

RECRUIT, SUPPORT AND RETAIN FACULTY CO-HIRES AND CHAIRS

- Increase engagement with Huck co-hires and chairs by organizing networking, scientific, and professional development events.
- Develop consistent metrics for reviewing success in life science research and collaborations.
- Identify key areas for recruitment of mid-career and senior faculty.

SUPPORT AND RETAIN NON-TENURE LINE FACULTY AND STAFF

- Enable and support non-tenure line and staff professional growth by funding conference participation, training, publications, grant writing, etc.
- Conduct transparent and fair annual reviews that identify positive potential for research growth and promotions.
- Provide faculty and staff with coaching opportunities across the institutes.

INCREASE FUNDING, RECOGNITION, AWARDS AND TRAINING OPPORTUNITIES FOR GRADUATE STUDENTS

- Sustain support from federal training grants for graduate students and programs.
- Offer workshops to support student success in applying for individual fellowships.
- Identify internship and training opportunities.

- Work with Penn State Development to secure additional funding for our graduate programs.
- Pilot (Fall 2025) a graduate assistantship for two of our core facilities and expand these opportunities in the future by securing additional funding.

Metrics:

- Evidence of external recognition, utilization, and dissemination of faculty, staff, and student research and expertise (external fellowships and awards, professional visibility). For students, we will evaluate alumni outcomes five years post-graduation.
- Number and diversity (unit-based) of faculty recruited and retained with Huck's support.
- Number of graduate student applications, evidence of students applying to peer or aspirational institutions, and number of students accepted.
- Staff retention rate, number participating in professional development and promotion, awards, and internal communication between staff and Huck executive committee.
- All: Performance indicators (publications, funding rates, citations), satisfaction scores from faculty, staff, and student surveys, graduate student annual reports.

PSU SG: #1, 2, 4

GOAL 2: FUND BOLD RESEARCH

Fund bold and transformative research in the life sciences at Penn State through internal seed grant programs that spur innovations in Future Foods, Health for Life, Emergent Intelligence in Organisms, Engineering Resilient Ecosystems, Translational Science and Public Impact, Life at All Scales, and AI to Action.

OBJECTIVES:

IDENTIFY RESEARCH PRIORITIES THAT WILL DRIVE DECISION-MAKING AND RESOURCE ALLOCATION

- Engage stakeholders in an open and transparent exercise to identify the priority research areas for Huck.
- Publish these research priority areas and tie them to Huck's investments in seed grants, strategic initiatives, core facilities, student, and graduate program support.
- Continue Huck's Catalysis initiative by bringing together, engaging, and guiding interdisciplinary teams towards the identification of impactful research questions that could not be achieved by single PIs or departments (even colleges) and to pursue external funding opportunities to support their implementation.
- Explore ethics, philosophy, and social science along life science to address public trust and responsible innovation.
- Lead the PlantWorks initiative by engaging multiple colleges (Agriculture, Science, Health and Human Development, Engineering, Arts & Architecture, etc.) as well as Penn State Development and Physical Plant Facilities in moving forward this ambitious project.

- Lead a new initiative to develop the Tick Research Facility and expand tick-associated ecology and public health research.
- Lead the development of a University-wide One Health Biorepository.

INCREASE PUBLIC IMPACT RESEARCH: INCLUDING TRANSLATION OF PENN STATE SCHOLARSHIP TO POLICYMAKERS, TO COMMUNITIES (COMMUNITY ENGAGED RESEARCH), AND TO THE MARKET (INDUSTRY PARTNERSHIPS, RESEARCH COMMERCIALIZATION)

- Identify and highlight Huck-affiliated faculty “Research Rockstars” whose research contributes to the public good.
- Partner with innovation, entrepreneurship, foundation, and development offices across Penn State colleges to amplify their messages and support translational research that matches Huck’s research priority areas (including large initiatives such as PlantWorks and the Tick Research Facility).
- Increase engagement of policymakers, stakeholders and industry groups with centers and institutes.
- Develop strategic opportunities for donor support and gifts (private, foundation, industry).
- For 2026-2027, identify individuals from government, stakeholder, and industry groups to serve on a Huck External Advisory Board.

Metrics:

- Evidence of progress on major research initiatives (steps achieved).
- Evidence of leadership of complex cross-unit or cross-institutional strategic partnerships (number and complexity), leading to white papers, grant proposals, and/or stronger ties.
- Number, value, and diversity of seed grant applications and awards.
- Number of submitted and awarded external proposals leveraged from internal investments within two years of finalizing the internal award.
- Evidence of initiation and participation in projects with community benefits across disciplines and units.

PSU SG: #2, 3

GOAL 3: SUPPORT WORKFORCE EDUCATION

Support workforce education to prepare the next generation of scientists and research administrators for impactful careers in academia, government, and the private sector. Leverage our world-class faculty, graduate and professional training programs, core facilities, and alumni to provide unique training opportunities.

OBJECTIVES:

OFFER UNDERGRADUATE AND GRADUATE STUDENT TRAINING

- Create new co-op opportunities for undergraduate and graduate students to work in Huck core facilities.
- Develop and offer hands-on, lab-based courses focused on marketable skills and techniques.
- Offer an annual postdoctoral grant writing seminar in collaboration with the OSVPR Office of Postdoctoral Affairs.

DEVELOP/EXPAND OPPORTUNITIES FOR INDUSTRY AND OTHER STAKEHOLDER GROUPS' TRAINING & ENGAGEMENT

- Provide workshops and bootcamps (virtual and in-person) in areas of interest to industry (e.g., fermentation, entrepreneurship, upstream and downstream techniques producing recombinant proteins, etc.).
- Continue to collaborate with the Smeal College of Business to offer the Business of Science Bootcamp through the Huck support of National Institutes of Health (NIH) T32 training grants.
- Offer facility tours to industry, government, and foundation representatives.

Metrics:

- Increased undergraduate and graduate student training and the addition of full-time co-op offerings at Huck Core Facilities.
- Increased training of individuals external to Penn State (industry) through technical workshops.
- Number and quality of unique asynchronous training opportunities for research administrators and early career faculty.
- Student alumni outcomes after 5 years.

PSU SG: # 1, 2, 3

GOAL 4: CONNECT FOR PROGRESS

Connect our scientists with the broader community, locally and internationally, to ensure research programs address fundamental societal challenges.

OBJECTIVES:

ENGAGE GOVERNMENT, INDUSTRY AND FOUNDATION LEADERSHIP AND SCIENTISTS

- Organize leadership meetings between industry, government, and foundation representatives and Huck faculty to present research collaboration opportunities.
- Organize events and public lectures with external speakers in areas of interest.
- Collaborate with Penn State Development to engage with potential donors for strategic research initiatives.
- Leverage Pillar access and collaborate with Penn State Development Directors to identify companies with facility needs where Penn State alumni have active positions. Have Huck Core Facilities directors evaluate data and act upon it, as appropriate, to engage with identified alumni for potential collaborations.

PROVIDE TARGETED SEED FUNDING TO SUPPORT NEW RESEARCH OR STRENGTHEN RESEARCH COLLABORATIONS ACROSS INSTITUTIONS

- Partner with colleges to launch seed funding focused on research collaborations with African institutions.
- Collaborate with colleges and other institutes to launch seed funding or support initiatives in areas of growth (AI, aging, etc.).

Metrics:

- Engagement in public lectures and outreach in areas that address fundamental societal challenges.
- Seed grant-funded projects (including international collaborations) with stakeholder co-funding, engagement, and letters of support.
- Examples of direct impacts on specific stakeholder groups.
- Evidence of increased support from and engagement with donors, corporations, and foundations.

PSU SG: #2, 3

GOAL 5: PROVIDE EXPERTS & FACILITIES

Ensure Penn State researchers, students, and the broader scientific community have access to state-of-the-art instrumentation and facilities, and the expertise to design and conduct experiments that push forward the frontiers of science.

OBJECTIVES:

IMPROVE CORE FACILITIES AND STAFF TRAINING

- Continue to work with centralized offices to improve financial and accounting processes, where possible.
- Process improvement reviews and cross-department collaborations (i.e., facilities team and core facilities).
- Provide incentives (seed grants) for new facility users to support core facilities where there are opportunities to expand scope and scale.
- Continue to improve engagement with Huck staff and across departments.

- Identify areas where expertise may be lost due to retirements and develop contingency plans, including providing cross-training and succession planning.

SUPPORT AND RETAIN NON-TENURE LINE FACULTY AND STAFF

- Enable and support non-tenure line and staff professional growth by funding conference participation, training, publications, grant writing, etc.
- Conduct transparent and fair annual reviews that identify positive potential for research growth and promotions.
- Provide faculty/staff with coaching opportunities across the institutes.

Metrics:

- Increased numbers of faculty using core facility instrumentation and decreased subsidies for facilities.
- Increase in the number of publications acknowledging core facilities.
- Increased undergraduate and graduate student training offerings at facilities.
- Increased training of individuals (industry and research administrators) external to Penn State.
- Sustained investments in infrastructure and staff.
- Launching of new initiatives such as PlantWorks and the Tick Research Facility to position Penn State as a leader in research in plant sciences and tick ecology and management.

PSU SG: #1, 2

GOAL 6: CATALYZE COLLABORATION

Catalyze interdisciplinary collaborations across colleges through co-hires, centers and institutes, research, and teaching programs.

OBJECTIVES:

STRENGTHEN INTER-UNIT COLLABORATIONS

- Work with the OSVPR to better identify the distinct roles of the seven interdisciplinary institutes compared to other units on campus that carry the “institute” label.
- Help identify and cultivate better integration across institutes and centers under Huck’s umbrella as well as strengthen the collaborations with other OSVPR institutes for joint efforts around commonly agreed research themes and strategic initiatives.
- Organize annual institute and center directors’ retreats to identify convergence areas and new opportunities.

PROVIDE ADEQUATE SUPPORT FOR MULTI-PI, COLLABORATIVE GRANT FUNDING (CATALYSIS) INITIATIVES

- Offer consulting and editing services to faculty on grant proposal writing.
- Provide course buyouts and “concierge” support in collaboration with SIRO to faculty leading multi-PI, large initiatives towards external funding.

Metrics:

- Evidence of increase in the number and disciplinary diversity of faculty with cross-college appointments.
- Number and disciplinary diversity of colleges represented on the Huck executive committee and in each center and institute.
- Number of publications and grant submissions of co-hires and chairs where co-authors are from across multiple colleges.

PSU SG: #1, 2

GOAL 7: FOSTER HEALTHY INNOVATION

Continually improve administrative processes to foster healthy levels of innovation and risk-taking while maintaining security and stability across departments.

OBJECTIVES:

ADDRESS DUPLICATION OF EFFORTS AMONG HUCK INSTITUTES AND CENTERS

- Huck will evaluate the last three years of collected annual reports and have conversations with the appropriate stakeholders regarding active vs. inactive institutes and centers. Based on this data-driven approach, Huck will cycle out or rethink directions and leadership of inactive and low activity institutes and centers.

RESTRUCTURE HUCK’S LEADERSHIP AND STAKEHOLDER GROUPS

- Cycle out the institutes and center directors in the Huck Kitchen Cabinet to avoid duplication and allow for new and broader representation from colleges.
- Create a Huck Senior Advisory Group to act as a sounding board for Huck Director and Huck Executive boards while also serving as Huck ambassadors (to stakeholders in the community, policymakers, industries, government, etc.).
- Appoint new associate directors to fill the operations (core and shared facilities and CURE) and graduate program vacant positions and identify additional strategic areas where one or two more associate directors could lead initiatives and grow partnerships.
- Develop a Huck External Advisory Board to improve linkages with corporations, governmental agencies, other universities, and alumni.

IMPROVE HUCK'S VISIBILITY AND BRANDING

- Hire a new director of communications and engagement and rethink the current communication channels to standardize Huck's overall communication and outreach strategies and increase its internal and external visibility.
- Rebrand Huck's monthly newsletter and create a sequence of topics of the month (graduate programs, core facilities, etc.) to keep the community informed and celebrate successes.
- Include a funding flash section in the newsletter to list new funding opportunities, advertise the Catalysis program, and announce recently awarded grants. Diversify the funding by incorporating fellowships, foundation, seminars and workshops, entrepreneurial and training opportunities, and community highlights.
- Develop a new "engagement" focus to ensure that the Huck Institutes are represented at University, community, and national events and programs, and engagement with individuals and groups outside of Penn State is increased.
- Improve transparency in the communication of the Huck overall and awareness of the [Huck policies, processes and procedures](#) for naming chairs, co-hiring, selecting institutes and center directors, etc.

Metrics:

- Evidence of closure of low-activity institutes and centers and reorganization of remaining ones.
- Evidence of restructured leadership and advisory roles.
- Stakeholder satisfaction with restructured communication processes and cadence.
- Evidence of stakeholder satisfaction with administrative services.
- Evidence of staff satisfaction and retention.
- Quantity and quality of staff training.
- Evidence of consistent accuracy, transparency, and timeliness in administrative practices.
- Contribution to future administrative leadership (such as the Huck Leadership Fellows, chairs, etc.).
- Update and increase transparency of processes involved in approving co-hires and chairs, as well as policies for reappointments and life cycling.
- Other unit-specific metrics to be developed in collaboration with heads of departments within the Huck, such as IT-response time for incidents, vulnerability response times, and up time for critical IT infrastructure.

PSU SG: #2,3

GOAL 8: BE AN INTERNATIONAL RESOURCE

Serve as a model for other universities and institutions. Convene, enable, and support science across interdisciplinary boundaries. Extend educational impact beyond Penn State faculty and students.

OBJECTIVES:

SUPPORT NATIONAL AND INTERNATIONAL ENGAGEMENTS

- Engage with Big 10 Academic Alliance Research Institute organizations and lead/co-lead initiatives.
- Initiate new inter-institutional collaborations, including international organizations (universities, foundations, institutes, etc.).
- Collaborate with colleges and Penn State Global to identify and support areas of international collaboration and growth.

Metrics:

- Number and quality of engagements with Big 10 Academic Alliance Research Institute organizations.
- Collaborations (numbers and outputs) with other institutions, including international institutions.
- Number of public engagement events and attendees.
- Media mentions or coverage of Huck research in regional and national outlets.
- Number of Huck supported faculty participation in leadership or expertise positions in national and international societies or committees.
- Growth in participation from Pennsylvania communities in Huck-led initiatives.

PSU SG: #1,2,3,4.

Huck Interdisciplinary Research Themes

We have identified four strategic research priorities and three cross-cutting research themes that focus on fostering a diverse talent community, supporting innovative interdisciplinary life sciences research, and strengthening partnerships to advance global health, biotechnology, and biomedical discovery. These priorities guide our efforts to address complex biological and societal challenges through collaboration and cutting-edge science.

FUTURE FOODS

Ensuring access to abundant, nutritious foods in a changing world requires an integrated approach.

At the Huck Institutes of the Life Sciences, we take an integrated approach to food security by studying the interactions between genetics, microbiology, physiology, nutrition, and environmental factors that influence plant and animal health. Leveraging AI, remote sensing, and innovations in controlled environment agriculture, our researchers develop practical solutions to help farmers grow nutritious food and empower families to make informed dietary choices.



<https://www.huck.psu.edu/research/huck-institutes-strategic-research-priorities/future-foods>

HEALTH FOR LIFE

The health of plants, animals, and humans is impacted by experiences across the lifespan.

Huck researchers study how biological, environmental, and social experiences across the lifespan shape the long-term health of plants, animals, and humans – including effects that can span generations. By partnering with farmers, communities, and policy makers our researchers develop strategies to promote resilience and well-being at every stage of life.



<https://www.huck.psu.edu/research/huck-institutes-strategic-research-priorities/health-for-life>

EMERGENT INTELLIGENCE IN ORGANISMS

One of the most remarkable features of living things is their ability to adapt to and modify the world around them.

At the Huck Institutes of the Life Sciences, scientists explore how living organisms – from microbes to humans – adapt, learn, and respond to their environments by integrating internal and external signals. By studying how intelligence emerges from genes, cells, and neural networks, our researchers aim to advance brain health, understand cognition, and inspire innovations in artificial intelligence and biomimetic design.



<https://www.huck.psu.edu/research/huck-institutes-strategic-research-priorities/emergent-intelligence-in-organisms>

ENGINEERING RESILIENT ECOSYSTEMS

Ecological communities include microbes, plants and animals that interact with each other and environmental factors such as nutrients in the soil, water, and air.

Huck researchers study how microbes, plants, animals, and environmental factors interact to sustain healthy ecosystems. Using tools from genomics, ecology, engineering, and more, they identify vulnerable communities and develop strategies to protect, restore, and build resilience. In collaboration with conservation groups, governments, and communities, they translate science into practical solutions that support biodiversity and ecosystem services.



<https://www.huck.psu.edu/research/huck-institutes-strategic-research-priorities/engineering-resilient-ecosystems>

Cross-Cutting Research Themes

TRANSLATIONAL SCIENCE & PUBLIC IMPACT

Research at the Huck Institutes of Life Sciences bridges foundational discovery with real-world application.

Our scientists turn foundational biological discoveries into real-world solutions that improve health, sustainability, and public policy. From accelerating vaccine development and tracking disease outbreaks to advancing biorenewables and crop resilience, our interdisciplinary teams use cutting-edge tools and data integration to address global challenges. By engaging with stakeholders and communities, we ensure science informs decisions that benefit both people and the planet.

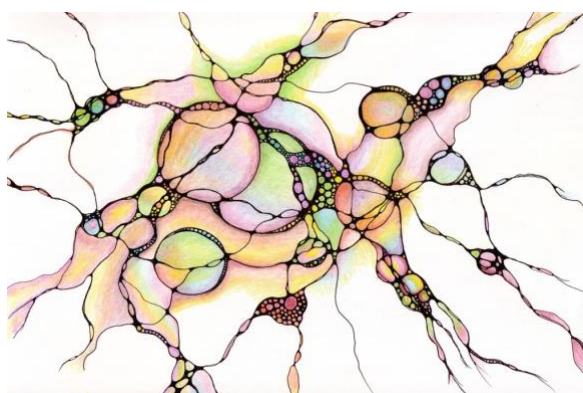


<https://www.huck.psu.edu/research/huck-institutes-strategic-research-priorities/translational-science-and-public-impact>

LIFE AT ALL SCALES

At the Huck Institutes of Life Sciences, we are using and developing innovative new strategies to view life from all angles and scales.

At the Huck Institutes of Life Sciences, researchers study life across all scales – from molecular interactions to ecosystem dynamics – using cutting-edge tools in technology, chemistry, and AI. By developing advanced sensors and analytical methods, we can detect changes in health and environment with unprecedented precision. This work enables innovative strategies to support the well-being of people, plants, and animals and ecosystems.



<https://www.huck.psu.edu/research/huck-institutes-strategic-research-priorities/life-at-all-scales>

AI TO ACTION

We are in a global data revolution, where it is possible to collect data at an unprecedented scale, spanning genomes to ecosystems, from archeological sites to real-time data collection from wearable devices.

Amid a global data revolution, Huck Institutes scientists are harnessing vast, diverse data streams – from genomes to ecosystems to real-time sensors – to uncover insights into biological processes and societal challenges. By integrating these complex datasets, they develop innovative strategies to advance health, understanding, and resilience across systems.



<https://www.huck.psu.edu/research/huck-institutes-strategic-research-priorities/ai-to-action>

Huck Units Descriptions

UNIT: GRADUATE PROGRAMS

David Puts	Associate Director
Dana Coval Dinant	Graduate Program Coordinator
Donna Korzick	Director of Graduate Training Initiatives

Description:

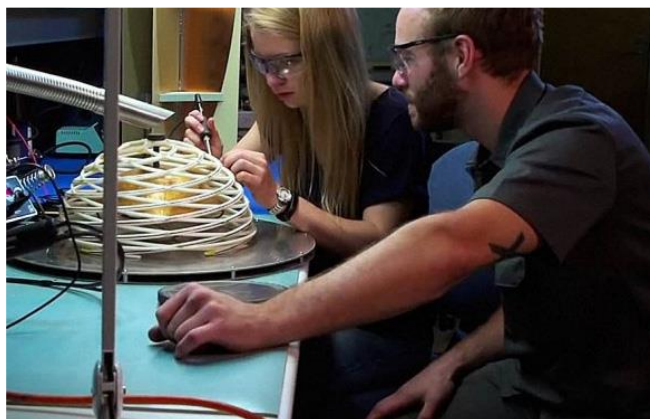
The Huck Institutes administers six Interdisciplinary Graduate Training Programs (IDGPs) which currently enroll over 250 students whose advisors span 8 colleges. The programs are Bioinformatics & Genomics; Molecular, Cellular & Integrative Biosciences; Integrative & Biomedical Physiology; Neuroscience; Plant Biology; and Ecology.

These IGDPs are supported by five NIH T32 Graduate Training Grants: Eukaryotic Gene Regulation; Integrative Analysis of Metabolic Phenotypes; Molecular Machines Mechanism and Structure; Physiological Adaptations to Stress; and Biotechnological and Integrative Opportunities in Microbiome Sciences, with additional T32 grants proposals in development.

The Huck Institutes also hosts the Professional Master's in Biotechnology Program, which currently enrolls 35 students.

These programs are supported by Associate Director of Graduate Education, Dr. David Puts, Director of Graduate Training Initiatives, Dr. Donna Korzick, seven program chairs spanning four colleges, and four staff members.

From 2013-2024, the programs graduated 349 PhD students, and 268 reported jobs with 197 employers in 36 states, with 90 remaining in Pennsylvania. 69 private sector companies employed graduates of our programs, including biotechnology, pharmaceutical, agriculture, food manufacturers, consulting, and law companies.



UNIT: CORE FACILITIES

Andrew Patterson Associate Director of Operations
Craig A. Paul Director of Core Facilities

Description:

The Huck Institutes of the Life Sciences administers 11 state-of-the-art core facilities, offering world-class research infrastructure and expertise that drive innovation across a diverse range of scientific disciplines. These facilities are critical assets and enablers of Penn State's research excellence, interdisciplinary collaborations, student training, and competitiveness for external funding. They include:

- Biomolecular Interactions Facility
- Cryo-Electron Microscopy Facility
- CSL Behring Fermentation Facility
- Flow Cytometry Facility
- Genomics Core Facility
- High-Field Magnetic Resonance Imaging Facility
- Metabolomics Core Facility
- Microscopy Facility
- Proteomics and Mass Spectrometry Core Facility
- Sartorius Cell Culture Facility
- X-Ray Crystallography and Scattering Facility

Collectively, these facilities house approximately \$50 million worth of advanced instrumentation and are staffed by 24 academic and professional team members, including 12 PhD-level scientists with a combined 205 years of Huck experience. Huck Core Facilities have an impressive record of scholarly impact, having co-authored 214 publications and been acknowledged in more than 200 additional studies. In 2024, they supported 808 unique projects from 297 different laboratories across multiple departments, colleges, and campuses, underscoring their central role in advancing high-impact, interdisciplinary life sciences research at Penn State.



UNIT: STRATEGIC INITIATIVES

Camelia Kantor Associate Director for Strategic Initiatives:
Brittany Grimes Project Manager

Description:

Strategic Initiatives drives high-impact, interdisciplinary collaborations through internal and external “Catalysis” projects that engage multiple faculty across colleges, campuses, institutes, and partner institutions. These projects frequently include cross-college, national, and international collaborations and align with research priorities of strategic importance to the Huck Institutes and Penn State. Strategic Initiatives also provides targeted support and services to life sciences faculty to advance transformative research.

The associate director of strategic initiatives leads the management of seed funding programs, co-develops key guidelines and policies, and oversees the annual performance assessments of the Huck Institutes and affiliated centers, ensuring alignment with institutional goals and continuous improvement.

Over the past three years, Strategic Initiatives has helped select and manage more than 35 seed grants, totaling over \$2.5 million. These seed grants included the Huck Innovative and Transformational Seed Fund (HITS), the Benkovic Research Initiative, the Interdisciplinary Partnerships for Driving Research (IPDR), as well as bridge grants, planning grants, course buyouts, and miscellaneous collaborative grants in education, biodevices, applied evolution (agriculture), arts and humanities, etc.

The Strategic Initiatives unit also enabled over 15 major proposals to federal agencies, including NSF, NIH, ARPA-H, DARPA, and CDC, with budgets ranging from approximately \$1M to \$6M annually. These faculty advising efforts contributed to over \$25M in awarded funding for interdisciplinary research in addition to multiple other single or multi-PI awards and faculty fellowships.

New leadership and engagement programs such as the Huck Leadership Fellowship, the postdoctoral seminars, the research administration and large grant proposal writing training offerings, and numerous faculty events and workshops have expanded faculty and staff development and diversity in research collaborations.



UNIT: ADMINISTRATIVE OFFICES

Emily Martell Managing Director

Description:

Huck’s administrative office oversees logistics, staffing, accounting and financial management, facilities, IT, and graduate program administration, ensuring efficient operations and full compliance with university and sponsor requirements to support the Huck Institutes’ mission.



UNIT: COMMUNICATIONS & ENGAGEMENT

Jessica Mondl Director

Description:

Huck’s Communications and Engagement office oversees marketing communications, digital and video creations, front-end web design and maintenance, and certain event aspects of the Huck. The team designs the weekly “Keep up with Huck” newsletter, produces research or graduate education-related news articles and videos and maintains Huck’s social media presence. The team also provides opportunities for internal and external engagement across Huck.



UNIT: SCIART

Daryl Branford Director

Description:

Huck SciArt advances Penn State’s land-grant mission by merging science, art, and technology to transform how complex research is communicated to the public. The initiative fosters interdisciplinary collaborations across the University to design, develop, and present interactive, research-based experiences that engage audiences far beyond traditional academic channels. Through installations, exhibitions, performances, and digital media, Huck SciArt makes cutting-edge science accessible, visual, and tangible - reinforcing the Huck Institutes’ commitment to innovation, communication, and impact.



Strengths, Weaknesses, Opportunities, and Challenges (SWOT)

STRENGTHS

OPERATIONAL EXCELLENCE

- Demonstrated resilience in maintaining operations during significant shifts in federal funding, ensuring continuity of research support for the life sciences community.
- Proven ability to adapt quickly to evolving federal regulations and compliance requirements.
- Effective hybrid/remote work capabilities and streamlined administrative functions through well-coordinated staffing.
- Infrastructure and expertise to support large grant proposal development, including planning grants and course buyouts/equivalents.

RESEARCH REPUTATION

- Strong reputation among faculty seeking seed and large-grant funding support.
- Strong standing in national research rankings (HERD), reflecting research excellence and impact.
- Recognized leader in life sciences interdisciplinarity, with approaches and structures often replicated by peer institutions.
- Strong national and international reputation in the following research areas: genomics, molecular and cellular biology, infectious disease biology, neurobiology, plant science, microbiome, metabolism, chemical ecology, and pollinator biology.

INTERDISCIPLINARY RESEARCH CENTERS, INSTITUTES

- Strong, collaborative partnerships with institutes and center directors, other interdisciplinary institutes directors, deans, and the Office of the Senior Vice President for Research (OSVPR).
- Shared vision and aligned expectations across Huck leadership and OSVPR.
- Several Huck centers and institutes are internationally recognized, making Huck highly attractive to top junior hires.

STATE-OF-THE-ART FACILITIES

- Leading-edge instrumentation and specialized technologies that provide researchers with unique capabilities and enhance competitiveness for faculty recruitment and research funding.
- Highly skilled facility directors and technical staff who ensure optimal use of resources and deliver innovative solutions to complex research challenges.
- Centralized resources that promote collaboration across departments and colleges, accelerating discovery and innovation.
- Significant return on investment through enhanced research productivity, competitive grant funding, and elevated institutional reputation.

STRATEGIC SEED FUNDING

- Flexible seed grant programs aligned with newly defined themes to stimulate high-impact research.
- Targeted bridge funding for critical needs such as core facility operations, animal maintenance, and graduate student support.
- Targeted planning grants to support efforts to build partnerships, strengthen core areas, and prepare for external funding from forthcoming opportunities.
- Ability to pivot quickly toward emerging funding opportunities and form complex partnerships that lead to large-scale external awards.

DIVERSE FUNDING BASE

- Endowment: Huck benefits from an endowment from the Huck family to support the Dorothy Foehr Huck and J. Lloyd Huck Institutes of the Life Sciences and the Dorothy Foehr Huck and J. Lloyd Huck Directorship in the Huck Institutes (almost \$45M). The funds primarily support the Huck directorship and the over 35 endowed chairs.
- Federal/State: Direct funding from NSF (STAIR and NCEMS programs), Gates Foundation (in addition to financing to faculty).
- Industry: Growing strategic partnerships that use core facilities, attend workforce training, and participate in collaborative research.

STUDENT RESEARCH AND TRAINING

- Nationally recognized interdisciplinary, intercollege graduate training programs.
- Substantial funding for graduate education from competitive federal grants and awards.
- Growing support of postdoctoral fellowships through seed funding and professional development.
- Robust experiential learning opportunities across diverse disciplines, preparing graduates for varied careers.

WEAKNESSES

ORGANIZATIONAL COMPLEXITY

- Large and multifaceted overall organizational structure can slow decision-making and limit agility in pursuing emerging opportunities, especially in areas such as translational research and industry collaborations.
- Risk-averse units across Penn State (ORP, HR, legal) that impact innovation and agility needed to be competitive (e.g., hiring, patents, IRB).

INFRASTRUCTURE CONSTRAINTS

- Upgrading or expanding facilities, including core facilities, instrumentation maintenance, wet labs, and faculty office space, requires diplomacy and negotiation as well as substantial funding.
- Rapidly growing technology could render many of our “state-of-the-art” facilities obsolete at a faster rate than in previous strategic years.
- Limited flexibility in capital budgets to address urgent infrastructure needs.

FINANCIAL UNCERTAINTY

- Concerns over research funding stability make it challenging to take bold risks or commit to multi-year high-investment projects.
- User fees in core facilities cannot fully cover the cost of state-of-the-art equipment and expert staff.

OPERATIONAL GAPS

- Vulnerability to significant disruptions in planned budgets due to external funding fluctuations.
- Limited career advancement pathways leading to staff and non-tenure line faculty turnover.
- Single points of failure when only one person has specialized expertise.

OPPORTUNITIES

TALENT ACQUISITION AND RETENTION

- Ability to recruit highly successful faculty in targeted strategic areas where Huck has a competitive advantage.
- Ability to mentor and support non-tenure line faculty and staff career advancement.

INDUSTRY AND GOVERNMENT ENGAGEMENT

- Potential to deepen partnerships with industry, the Department of Defense (DoD), and federal agencies, leveraging collaborations with Applied Research Laboratories and the Penn State National Security Institute.
- Opportunity to expand relationships with federal program directors to shape and align with funding priorities.
- Volume discounts and shared infrastructure for large-scale projects.
- Industry partnerships for co-sponsored equipment and service agreements.
- Use Pillar and Development support to identify industries with Penn State alumni and research needs.

RESEARCH AND COMMERCIALIZATION GROWTH

- Modernizing technology transfer, commercialization strategies, and multi-faceted research agreements to accelerate innovation in collaboration with the OSVPR and colleges.
- Expanded use of research analytics to assess competitive position, identify growth areas, and strengthen proposal development.

ENHANCED RESEARCH SUPPORT

- Potential to leverage SIRO functions to pursue larger awards, including greater project management and proposal development capacity.
- Leverage NSF-funded STAIR program to innovate in research administration and faculty support.

PHILANTHROPIC EXPANSION

- Growing donor interest in interdisciplinary research, innovation hubs, and public impact projects.
- Increase donor support targeted at core facilities.

STRATEGIC MESSAGING

- Strengthen communication with sponsors, alumni, industry, and policymakers to highlight Huck's value, achievements, and societal contributions.

CHALLENGES/THREATS

FUNDING PRESSURES

- Declining societal trust in science.
- Threats to graduate student recruitment from multiple directions (federal funding challenges, increasing cost of supporting students, declining interest in research careers).
- Declining federal research awards and revenues, coupled with increasing competition for large-scale grants and all grants overall.

WORKFORCE SUSTAINABILITY

- Difficulty in maintaining competitive compensation for faculty and staff, risking talent loss.
- Need to sustain morale in a high-demand, resource-constrained environment.
- Staff centralization leading to reduced capacity to support and sustain existing programs and pursue new initiatives.

INFRASTRUCTURE MAINTENANCE

- Limited funding to keep all core facilities state-of-the-art and competitive.

REGULATORY DEMANDS

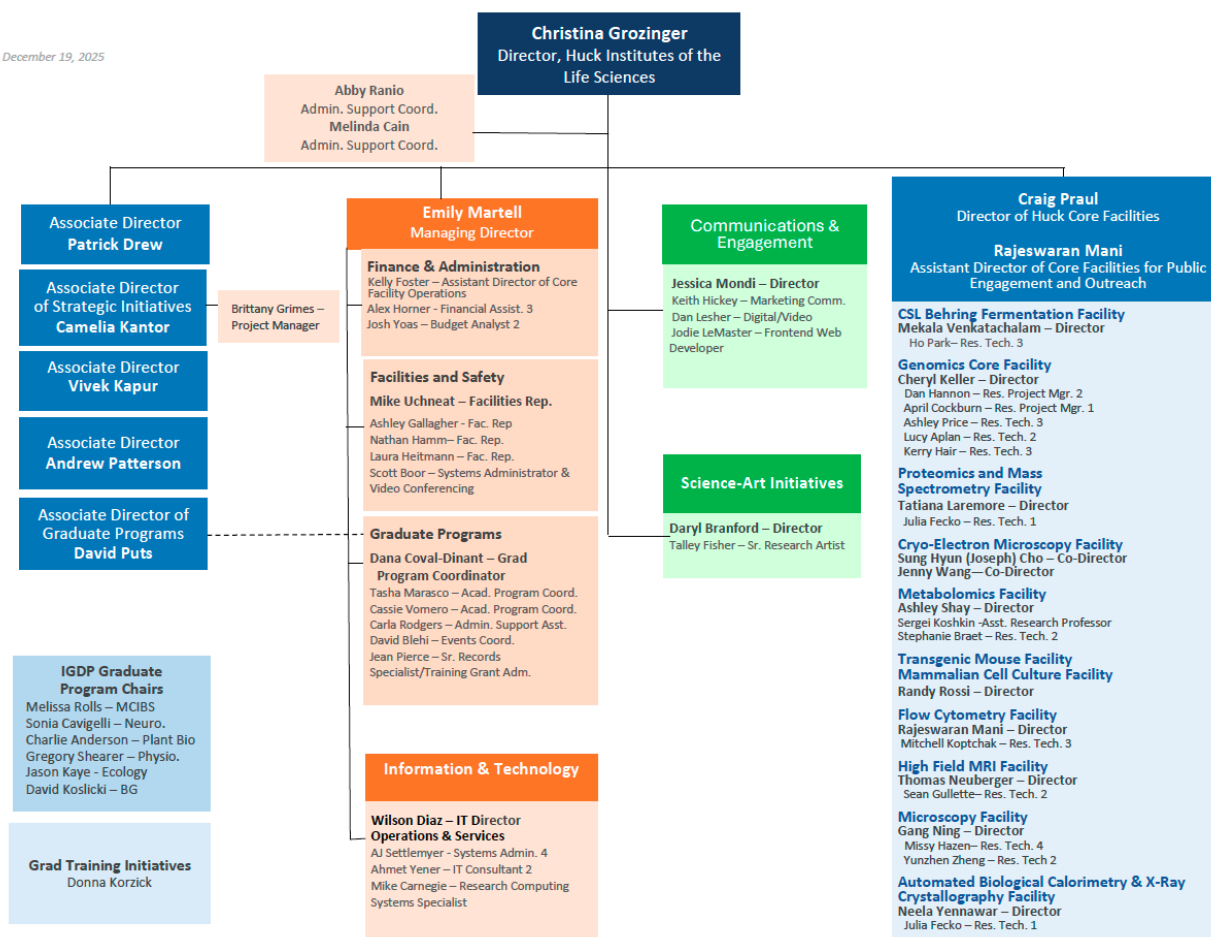
- Growing administrative and compliance requirements from federal agencies, increasing workload and complexity.

INTERDISCIPLINARY INCENTIVES

- Demonstrating the short-term impact of interdisciplinary research and incentivizing sustained collaboration remain ongoing challenges.
- Risk of over-emphasizing AI at the expense of other life science areas.

APPENDIX 1 Huck Organizational Chart

December 19, 2025



APPENDIX 2 Strategic Planning Process & Timeline

Strategic Planning often sparks skepticism, especially when it is time for an update. Many people dismiss it as just “words,” citing books, articles, or viral videos that question its value. But as General Russel Honoré aptly put it: “Leadership is working with goals and vision; Management is working with objectives.” Without a clear vision, aligned goals, and measurable objectives, an organization’s ability to operate effectively, grow, and demonstrate success, impact, and value to its stakeholders is inevitably compromised. While the timing of this Strategic Plan may seem less than ideal given the current climate of uncertainty and rapid change at both national and global levels, it is precisely during such times that strategic reflection becomes most essential. This exercise provides an opportunity to reassess direction, understand emerging threats and opportunities, and gather meaningful input from those we aim to serve every day.

Since the Spring of 2025, we have been speaking with and received feedback from over 120 people (faculty, faculty leadership, staff leadership, and staff) representing all the Penn State colleges and Huck units and departments (see timeline and details below). The input was then reviewed and incorporated into the plan, as appropriate.

TIMELINE:

Stakeholder Group 1. Huck Leadership Working Group.

This informal group is formed of representatives of the institutes and centers housed in Huck that are highly successful in institute and center leadership and stakeholder engagement. This group was initiated in the Fall of 2024.

Pre-Planning Meeting February 25, 2025. The group discussed a SWOT analysis for Huck Institutes, things to consider when identifying the themes of interest (human, physical, financial resources, activities and processes, past experiences, stakeholders, competition, where we can be the best, and what we should do less of). As a result, 12 topics have been listed as potential areas of targeted investment.

- Live biotherapeutics /advanced feedstocks
- Precision health (connect to #1)- childhood obesity/diseases
- Omics of wellness – student population focus; health conditions of PA citizens (nicotine, cancer, obesity); wearables; plants.
- Evolutionary medicine (in agriculture/medicine)/Applied Evolution
- Building resilience (environmental- bio, ecology, engineering, and AI)- sensing, bioprospecting, biomarkers
- Quality of food (plants, animal)- nutrient focus
- Nutrition genomics
- Biorobotics – bioinspired design, for health.
- Molecular bioengineering (chemical to transgenic eng. of systems)
- Sensing
- LS in space(astrobiology)
- Animal behavior models

Furthermore, the following threads have been considered:

- Thread 1: Workforce development
- Thread 2: Make humans healthier
- Thread 3: National security
- Thread 4: Rapid response and prevention

The Strategic Plan process officially begins in April 2025.

We began this process in April 2025, immediately before the new change in the Huck leadership. Given the short timeframe (due date in August 2025), the new Huck director (Dr. Christina Grozinger) and Kantor decided to leverage our complex but also extensive stakeholder groups to help us formulate our revised vision, goals, and objectives, as well as identify the top thematic areas where Huck should focus investment within the next 4-5 years. We started from the recently updated University Strategic Goals, focusing on leveraging the university-provided infrastructure and initiatives to avoid effort redundancy while remaining complimentary to ongoing efforts.

PHASE I: STAKEHOLDER IDENTIFICATION AND INFORMATION COLLECTION

As a first step of the process, we identified the stakeholder groups, drafted a timeline, and devised a methodology for seeking input at multiple levels.

Steps:

- Draft initial template. Embed existent (vision, goals, mission, etc.) and new information (revised Huck executive summary, proposed thematic areas, Strategic Planning Process & Timeline) - Drs. Grozinger & Kantor.
- Identify and list Stakeholder Groups - Drs. Grozinger & Kantor.
- Develop stakeholder input survey - Drs. Grozinger & Kantor.
- Revise all aforementioned documents – Huck Exec Discussion during weekly meeting June 10, 2025.
- Stakeholder group Huck Kitchen Cabinet Meeting April 14:
 - This informal group of around 30 thought leaders in life sciences research at Penn State meets monthly to advise the Huck director and [Executive Team](#) on policy, opportunities, and benchmarking.
- Stakeholder group Huck co-hires and endowed chairs:
 - The survey was shared with all the Huck co-hires and endowed chairs. Collected input was used to draft the new set of research themes.
- Stakeholder group Huck Deans Council:
 - This group of Penn State College Deans and VPs meets once per semester to help the Huck Institutes to effectively catalyze trans-disciplinary research collaborations across the University.

- A preamble to the Strategic Planning themes and possible directions has been shared by Dr. Grozinger during the March 26 annual meeting. The follow-up survey was shared with the Deans Council along with personalized emails requesting access to share College research priorities to ensure alignment (to the extent possible).
- Stakeholder group Core Huck:
 - This group drafting and refining research themes (Christina Grozinger, Camelia Kantor, Nikki Crowley, Andrew Patterson, Seth Bordenstein, Orfeu Buxton, Jill Hamilton).
- May 16 Publication of 2025 thematic priorities on the Huck website, along with the launch of seed grants within these priorities. <https://www.huck.psu.edu/seed-funding-large-proposal-catalysis/seed-funding/seed-grants/2025-thematic-priorities>
- Continued to collect input, updated draft, finalized draft.

PHASE II: DISSEMINATION OF THE DRAFT STRATEGIC PLAN TO THE STAKEHOLDERS

Organized focus groups to seed input from:

- Huck executive (including leadership fellows) – August 13, 2025.
- Huck Graduate Programs – Focus group August 18, 2025.
- Huck Kitchen Cabinet – Focus group August 19, 2025.
- Huck Institutes & Centers Directors – Focus Group August 20, 2025.
- Huck Core Facilities Directors – Focus Group August 21, 2025.
- Huck Co-Chairs and Co-Hires – Focus Group August 22, 2025.
- Data compilation and integration – initial.
- Huck Heads of Departments and staff – Focus Group September 3, 2025.
- Send new draft to the Deans – September 5.
- Huck Deans Council – submitted for feedback via email on September 8, 2025, and for discussion at meeting on September 22, 2025 (post OSVPR submission).

Phase III Strategic Plan Dissemination

- Posted on Huck website with survey for comments and suggestions.
- Shared via Huck newsletter.
- Shared via social media.

APPENDIX 3 Stakeholder Groups

Huck Executive Group

Christina Grozinger	James Marden (retired)	Andrew Patterson
Camelia Kantor	Patrick Drew	David Puts
Vivek Kapur	Emily Martell	

Huck Leadership Fellows

Jill Hamilton	Wenrui Hao	Scott Medina
Gustavo Nader	Dino Ravnic	Lingzhou Xue

Huck Leadership Working Group

Mark Guiltinan	Jared Ali	Kateryna Makova
Seth Bordenstein	Christina Grozinger	Scott Medina
James Marden	Lingzhou Xue	Camelia Kantor
Nikki Crowley	Patrick Drew	Emily Martell
Matt Ferrari		

Strategic Planning Focus Group #1 - Huck Graduate Programs

David Koslicki	Jason Kaye	Dana Coval-Dinant
Jean Pierce	David Puts	Tasha Marasco
Gregory Shearer	Melissa Rolls	Charles Anderson

Strategic Planning Focus Group #2 – Institute/Center Directors

Robert Sainburg	Seth Bordenstein	Moriah Szpara
Gustavo Nader	Katsu Murakami	Manuel Llinás
Scott Lindner	Sonia Cavigelli	Jared Ali
Matt Ferrari	Charles Anderson	Paul Babitzke
Nikki Crowley	Mark Guiltinan,	Philip Bevilacqua
Heather Hines	Siela Maximova	Jill Hamilton
Dan Hayes	Ed O'Brien	Leonid Berlyand
Girish Kirimanjeswara	Bruce Gluckman	Gary Perdew
Francesca Chiaromonte		

Strategic Planning Focus Group #3 – Core Facilities Directors

Randall M. Rossi
 Tatiana Laremore
 Neela Yennawar
 Cheryl Keller

Rajeswaran Mani
 Craig Praul
 Ashley Shay
 Joseph Cho

Greg Ning
 Mekala Venkatachalam
 Neela Yennawar

Strategic Planning Focus Group #4 – Huck Chairs & Co-Hires

Vishal Singh
 Xiangming Ji
 Jeffrey M. Peters
 Xiaogang Hu
 Le Bao
 Aleksandra (Sesa) Slavkovic
 Laura Y. Cabrera
 Dipanjan Pan
 Josh Kellogg
 Nicole Lazar
 Jess Grembi
 Erika Ganda

Peter Hudson
 Sagan Friant
 Jason Rasgon
 Jessica Conway
 K. Sandeep Prabhu
 George Perry
 Justin Pritchard
 Hong Ma
 Michael Axtell
 Isabella Cattadori
 Emily Davenport

Yong Wang
 Nanyin Zhang
 Dipanjan Pan
 Robert Paulson
 Santhosh Girirajan
 Taewon Kim
 Joyce Jose
 Arthur Berg
 C. Denise Okafor
 Beth McGraw
 Jordan Bisanz

Strategic Planning Focus Group #5 – Huck Heads of Departments

Wilson Diaz
 Ahmet Yener
 Mike Uchneat

Nathan Hamm
 Daryl Branford
 Brittany Grimes

Dan Leshner
 Jodie LeMaster

Strategic Planning Focus Group #6 – Huck Kitchen Cabinet

Teh-hui Kao
 Gustavo Nader
 George Perry
 Guy Townsend
 Dipanjan Pan
 Justin Silverman

Erin Connolly
 Kimberly VanHaitsma
 Justin Pritchard
 Vasant Honavar
 Travis Flohr
 Mehrdad Mahdavi

Orfeu M. Buxton
 Vishal Singh
 Katherine H. Freeman
 John E. Hayes
 Michael Axtell

Contact Information

Huck Institutes of the Life Sciences
432 Science Drive
101 Huck Life Sciences Building
State College, PA 16802
814-863-3650

Dr. Christina Grozinger
Director
cmg25@psu.edu

Dr. Camelia Kantor
Associate Director, Strategic Initiatives
cmk6719@psu.edu