Special Meeting

University of Connecticut Board of Trustees
Committee for Research, Entrepreneurship and Innovation

Monday, November 16, 2020

Meeting held by Telephone:
Public Call in #: (415) 655-0002 US Toll
Access Code: 629 930 823##

(A recording of the meeting will be posted on the Board website
https://boardoftrustees.uconn.edu/ within seven days of the meeting.)

AGENDA

Call to order at 3:30 p.m.

1. Public Participation (limited to agenda items)

ACTION ITEM:

2. Approval of the minutes of the Special Meeting of the Research, Entrepreneurship and Innovation Committee Meeting of July 23, 2020, as circulated.

PRESENTATION/DISCUSSION ITEMS:

3. Opening Remarks – Dr. Philip Rubin

4. Updates - Dr. Radenka Maric, Vice President for Research, Innovation & Entrepreneurship

5. College of Agriculture, Health and Natural Resources (CAHNR) Vision to Addressing Challenges in Agriculture, Food, Health, and the Environment – Dr. Indrajeet Chaubey, Dean, CAHNR

6. Technology Commercialization Services Updates – Dr. Abhijit Banerjee, Associate Vice President for Research, Innovation & Entrepreneurship

7. Q&A and Closing Remarks

8. Executive Session as needed.

9. Adjournment

Please Note:
If you are an individual with a disability and require accommodations, please call the Board of Trustees Office at (860) 486-2333 prior to the meeting.
UConn: TIP Highlights

Fiscal Year 2020

1. New UConn TIP startup

$8.6M. Raised by UConn TIP startups

6. UConn companies that received SBIR grant funding

11. Entrepreneurs-in-Residence

43. TIP companies

208. Full and part-time employees in TIP Companies

$462.9M. Funds raised by TIP companies

New Faculty Startups

- General Biomics
- Sechel Therapeutics Inc
  - Diant Pharma
  - P3-EX

Stamford UPDATES

- Opening January 2021
- 7 Startups Identified/Vetted
- Manager Interviews Dec 2020
UConn: Technology Transfer Highlights

Fiscal Year 2020

- **128** US Patent Applications Filed
- **25** US Patents Issued
- **9** Options Executed
- **48** Outgoing Material Transfer Agreements
- **102** Invention Disclosures
- **7** Licenses executed
- **6** Licenses in Negotiation through FY21
- **$901K** Licensing Revenue

**PATENTS ISSUED BY SCHOOL**

- Pharmacy
- CLAS
- Dental Medicine
- Medicine
- Engineering

**LICENSES EXECUTED**

- Adv Trauma Solutions
- CT Biotech
- Pathware
- Movia Robotics
- Proteintech
- VIR Biotech
- Ionis Pharma

**LICENSES EXECUTED**

- Encapsulate
- 3BC
- 3DAT
- Biochrom Pharma
- Therapeutic Bandage Products
- ACW Analytics
- Diant Pharma
- Nami Therapeutics
- Proteintech
- VIR Biotech
- Ionis Pharma
## TCS Executive Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>FY 20</th>
<th>FY19</th>
<th>5 yr Avg 2015-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures</td>
<td>102</td>
<td>90</td>
<td>76.8</td>
</tr>
<tr>
<td>US Patent Application Filed</td>
<td>128</td>
<td>110</td>
<td>100.4</td>
</tr>
<tr>
<td>Patents Issued</td>
<td>25</td>
<td>34</td>
<td>36.4</td>
</tr>
<tr>
<td>Options &amp; Licenses Signed</td>
<td>15</td>
<td>24</td>
<td>16.2</td>
</tr>
<tr>
<td>Licensing Revenue</td>
<td>$901K</td>
<td>$582K</td>
<td>$974.4K</td>
</tr>
<tr>
<td>UConn Startups</td>
<td>4</td>
<td>5</td>
<td>6.8</td>
</tr>
<tr>
<td>TIP Startups</td>
<td>13</td>
<td>5</td>
<td>8.8</td>
</tr>
</tbody>
</table>
CAHNR Vision to Addressing Challenges in Agriculture, Food, Health, and Natural Resources

Presented at the Board of Trustees REI meeting November 16, 2020
Mission

We promote human, animal, and environmental sustainability for today and the future by addressing key challenges in agriculture, food, health, and the environment through scientific discovery, education, and community engagement.
CAHNOR Strategic Vision: 2020-2025

• Committee of 25 CAHNOR faculty and staff
• 15 different listening sessions, including 5 throughout CT
• >200 individual interviews
  • UConn Leadership
  • Peer and aspirations institutions
  • Funding agencies
  • Key stakeholders
• > 10,000 data points generated and carefully considered to develop CAHNOR strategic vision
• https://cahnor.uconn.edu/visionandvalues/
CAHNR Strategic Initiatives

- Ensuring a Vibrant Agricultural Industry and Sustainable Food Supply
- Advancing Adaptation and Resilience in a Changing Climate
- Designing Sustainable Landscapes Across Urban-Rural Interfaces
- Enhancing Health and Well-Being Locally, Nationally and Globally
Example 1: Korey Stringer Institute (KSI) – a national leader in human performance and safety

The mission of the Korey Stringer Institute is to provide research, education, advocacy and consultation to maximize performance, optimize safety and prevent sudden death for the athlete, warfighter and laborer.
KSI Overview

• 80 employees (20 staff & 60 volunteers)
• Average of 1.5 million dollar total yearly operating budget
• Over 100 Presentations across the US from 2015-2019
• 28 book chapters and 109 journal publications since 2015
• Constructed the ~$750,000 new MISSION Heat Lab at UCONN’s KSI in 2017 (fundraised half of total)
• Offered physiological & performance testing for athletes
  • one of the few locations to provide heat tolerance testing for those recovering from heat stroke
KSI Research

• Topic areas include:
  • Hydration (physiological function and performance)
  • Heat acclimatization (health safety implications)
  • Athletic Clothing (to minimize heat stress)
  • Cooling (pre exercise, during and for recovery)
  • Heat stroke (survival, prevention, recovery)
  • Public Health Policy Changes
  • Best Practice Documents

• Includes research in the laboratory and field setting
Services (Groups KSI Has Assisted)
Example 2: Our faculty are leading vaccine development efforts

- **Plug-and-play vaccine platforms:**
  - Rapid development and updating of vaccines
  - Used for the generation of vaccines against COVID-19
  - Formation of SARS-CoV-2 Virus-Like Particles (VLPs)

- **SARS-CoV-2 Antiviral Coatings:**
  - Antiviral testing uses pseudotyped SARS-CoV-2 particles that do not require high level containment

- **COVID-19 Diagnostics**

- **Vaccines for vector-borne diseases, etc.**
Funding Sponsors, Partners, Collaborators

- **NIH**: Rapid point-of-care molecular detection for early diagnostics of COVID-19 *(with UConn Health, Dr. Changchun Liu)*

- **DARPA**: Robust Self-decontaminating Coatings for Defense Applications *(with Nanolonix, UConn TIP)*

- **BioPipeline CT**: Self-decontaminating Antiviral Coating for Medical Devices *(with Nanolonix)*

- **Others**: Schools of Pharmacy, Engineering, Boston University, etc.
Example 3: CAHNR Cannabis Research is one of the leading programs in the country

Research foci:
- Dr. Gerald Birkowitz, PSLA
- Cannabinoids (THC and CBD) are high-value components of cannabis
- Develop hemp that has CBD (medical uses) but no THC (psychoactive compound)
- We identify strategies to increase CBD synthesis
- Cannabinoids are produced in trichomes, the glandular hairs that coat flowers. We study molecular signals regulating trichome growth
- Test organic disease control in hemp
Cannabis Research Funding

Over $1.2 million in funding

• Curaleaf - $200,000
• CTPharma - $100,000
• Nature’s Way (VC) - $930,000
• Eric Zachs - $50,000
• David Levine (gift) - $25,000

UConn Cannabis Program Video:
https://www.youtube.com/watch?v=BKWdcjCsHnw
Example 4: Systems-based Integrated Program for Enhancing the Sustainability of Antibiotic-Restricted Poultry Production

PI – Kumar Venkitanarayanan, PhD
USDA-NIFA grant award – $10 million

Control Poultry Diseases
Identify Alternative Feed Ingredients
Enhance Bird Welfare

Educate and Equip the Future Agricultural Workforce with Skills for Sustainable Broiler Production

Develop and Evaluate a Comprehensive Outreach Program to Educate Stakeholders on Sustainable Poultry Production

Consumer Outreach and Education

Conduct Comprehensive Cost-Benefit Analysis

Enhance Broiler Food Safety
Control Antibiotic Resistance Dissemination in Poultry Production Environment

Recycling of Poultry Litter to Reduce Environmental Burden
Systems-based Integrated Program for Enhancing the Sustainability of Antibiotic-Restricted Poultry Production

**COLLABORATING PARTNERS**

**Academic/Research Institutions**
- Penn State Univ
- USDA-ARS-AK, MS and MD
- Univ of Maryland
- NC State Univ
- NC A&T State Univ
- Iowa State Univ
- Appalachian State Univ
- Univ of Georgia
- Prairie View A&M Univ
- Univ of Minnesota
- Univ of Arkansas
- UNA de México
- Nat Council for Research in Meat, India

**Farmer/Professional Organizations**
- Farmer Collaborators
- Poultry Science Association
- Midwest Poultry Federation
- Extension Agencies on Sustainable Agriculture

**Poultry Industry**
- Perdue Farms Inc.
- Tyson New Holland
- Cobb-Vantress
- Butterball
- Mountaire Farms of Delaware
- Novus International
UConn Extension helps CT citizens utilize research to achieve economic development

Active Extension Programs in Connecticut Towns

Number of Programs
- 7-11
- 12-15
- 16-20
- 21-24
- 25-31

UCONN
COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES
FOOD
232,708 students in 81 school districts across the state participate in our Put Local on Your Tray Program.
1,024 participants in our commercial vegetable and fruit production programs.

HEALTH
5,821 low-income families served through community nutrition and empowerment programs.
24,589 weekly trail users at 15 sites throughout CT, monitored by UConn.
378 families engaged on using trails for healthy lifestyles at pop-up events in Meriden and Groton.

SUSTAINABILITY
29,269 unique users to the Connecticut Environmental Conditions Online (CT ECO) mapping website.
626 plants analyzed at the Plant Diagnostics Lab.
12,474 soil samples analyzed from 169 Connecticut towns and 21 U.S. states.

by the Numbers 2019
127,573 citizens engaged in UConn Extension’s Food, Health, and Sustainability programs.
An Update to the Board of Trustees
REI Committee
Abhijit Banerjee
AVP, Innovation & Entrepreneurship

November 16, 2020
In July 2020, I presented the plans to the Board of Trustees, REI Committee for TCS which also included addressing requirements under Public Act 19-154

Presentation today is to provide an update to the committee on accomplishments since July 2020, and being on track for addressing some objectives under Public Act 19-154

I will present:
- Results of TCS survey
- Needs Assessment that shows bottle necks within TCS is and solutions that are recommended
- Outcomes from Planning and Prioritization meeting and commitment of TCS for 2020-2022
- Activities to address certain objectives under Public Act 19-154
- Entrepreneurs-in Residence (EIR) and their expanding roles
• 529 surveys respondents; Only 112 (or 32%) have heard of or work with TCS
• There is interest from non-traditional schools
• Need for more prototyping funds expressed
• Outreach through on-line resources & face to face meetings
• High satisfaction with performance for TCS
• More than 50% respondents willing to help with commercialization efforts
TIP SURVEY: FACTORS THAT INFLUENCE COMPANY’S DECISION TO JOIN TIP

- Networking...
- To be part of start-up...
- Proximity to UConn...
- Economic (cost of...
- Proximity to...
- Access to UConn's...
- Mentorship/advice
- Access to investment
- Recommendation...
- Access to animal...
- Proximity to Jackson...

Graph showing factors:
- Excellent
- Satisfactory
- Needs Improvement
Review of current and future needs of TCS:
- Determine the bottle-necks
- Workload and time commitment
- Gaps in Licensing, Venture Development
- Current & future Investment requirement

Conclusion:
- Licensing team spends >50% time on patent management
  - Only 20% time for licensing and technology marketing
  - Limited time dedicated to meeting faculty
- Venture Development inadequate staffing
  - Currently more than 30 existing and 50+ prospective startups in pipeline
  - Plan for UConn Venture Fund (Public Act 19-154)
  - Impact EIR and Intern programs (Public Act 19-154)
PROPOSED SOLUTION

Licensing FTE Need:

Impact:
- Release of bottle-neck
- Better management of:
  - patent portfolio
  - patent reimbursement
  - cost management with law firms
- IP support function for UConn faculty

Venture Development FTE Need:
- Hire Director of Venture Development
  - 75% Venture Development
  - 25% EIR and Internship management

Impact:
- Fill the gap in Venture Development
- Continuity of EIR and internship program
- Support 30 existing startups and accelerate 50 potential startups
- EIR and Intern program support
<table>
<thead>
<tr>
<th>Teams</th>
<th>Goals</th>
<th>Actions</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inventions &amp; Patents</strong></td>
<td>o  Increase invention disclosures &amp; assessment</td>
<td>o  Increase faculty awareness of TCS</td>
<td>o  Increase in invention disclosures received (10% YoY)</td>
</tr>
<tr>
<td></td>
<td>o  Rigor in Patent portfolio management &amp; expense</td>
<td>o  Clearly define Technology market need prior to patenting</td>
<td>o  Increased patent reimbursement from licensees by end 2021</td>
</tr>
<tr>
<td></td>
<td>o  Engage faculty for commercialization</td>
<td>o  Maximize patent budget</td>
<td>o  Proportionally match patent applications filed per year with increase in invention disclosures</td>
</tr>
<tr>
<td><strong>Technology Licensing</strong></td>
<td>o  Improve licensing process</td>
<td>o  Increasing licensing revenue (10% YoY)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o  Have impactful licenses</td>
<td>o  Increase impact of UConn technology on ecosystem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o  Licensing revenue increase</td>
<td></td>
<td>Number of licenses &amp; options</td>
</tr>
<tr>
<td></td>
<td>o  Streamline startup license</td>
<td></td>
<td>Number of licenses to CT company</td>
</tr>
<tr>
<td><strong>Venture Development &amp; TIP</strong></td>
<td>o  Entrepreneurial mindset and skills - ecosystem</td>
<td>o  Tiered support to maximize startup success</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o  Support startup through its life cycle</td>
<td>o  Diversification of support across all schools</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o  Assess pipeline and help faculty launch new startups</td>
<td>o  Enhance EIR program and engage early</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o  Maintain high standard on company incubation at TIP</td>
<td>o  Renew external events, outreach and alumni relations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o  UConn Fund</td>
<td>o  TIP - launching pad for CT companies</td>
<td></td>
</tr>
<tr>
<td><strong>Outreach, Communication &amp; Marketing</strong></td>
<td>o  TCS brand identity</td>
<td>o  Optimize digital presence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o  Increase internal &amp; external awareness</td>
<td>o  Targeted coverage of UConn innovation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o  Engage non-traditional innovators</td>
<td>o  Build sustainable and paid internship</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o  Increase impact of technology marketing</td>
<td>o  Enhance internal and external awareness of TCS – website and other coverages</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>o  Launch of new website</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>o  Build partnership with UConn Foundation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>o  Launch of TCS internship program 2020</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>o  Partnership with SPS and Finance</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>o  Launch of media campaign 2021</td>
<td></td>
</tr>
<tr>
<td>Objectives</td>
<td>Execution</td>
<td>Status</td>
<td>Comments</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>Alignment of TCS and VD operations to increase UConn startup</td>
<td>Re-allocating a dual role for Venture Development and Licensing to allow seamless transition and synergy</td>
<td>On Track</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unified approach to reviewing inventions and participation of EIRs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Implement triage process for UConn startup – External help to provide support and vetting of startup – EIRs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications – Frequent, transparent and informative</td>
<td>TCS Website and social media</td>
<td>On Track</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Identify success in startup and promote that through structured communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty inventors and entrepreneurs – Increase number of faculty experienced in industry partnership and entrepreneurship</td>
<td>Data science initiative and incubator – Stamford</td>
<td>On Track</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Campus wide collaboration for engaging in Commercially relevant research</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>New industry partnerships and leverage old partnerships</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exploring Partnership with Foundation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tracking both UConn and Non-UConn startup</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expand EIR program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology marketing, increase corporate and community awareness of UConn research and faculty for startup and licensing</td>
<td>Paid Internship program to support technology marketing</td>
<td>On Track</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Build relationship with UConn strategic communications, external public sector partners to increase media coverage for UConn</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EIR MENTORS

Kathleen Adams | kqadams@gmail.com | 201.317.0063

Sri Divakaruni | Divakaruni.sri@gmail.com

Konstantine Drakonakis | kdrakonakis@gmail.com | 203.809.2376

Thomas Gerson | teg6854@gmail.com | 203.868.9249

Jonathan Gertler, M.D. | jgertler@bblsa.com

Eric Knight | eknight@remarkabletechnologies.com

MaryJane Rafii, Ph.D. | mjr afii@gmail.com | 978.935.8491

Pete Sena | pete@digitalsurgeons.com | 203.672.6201 x105

Vijay Jayachandran | Vijay.Jayachandran@gmail.com | 860.371.8872
THANK YOU