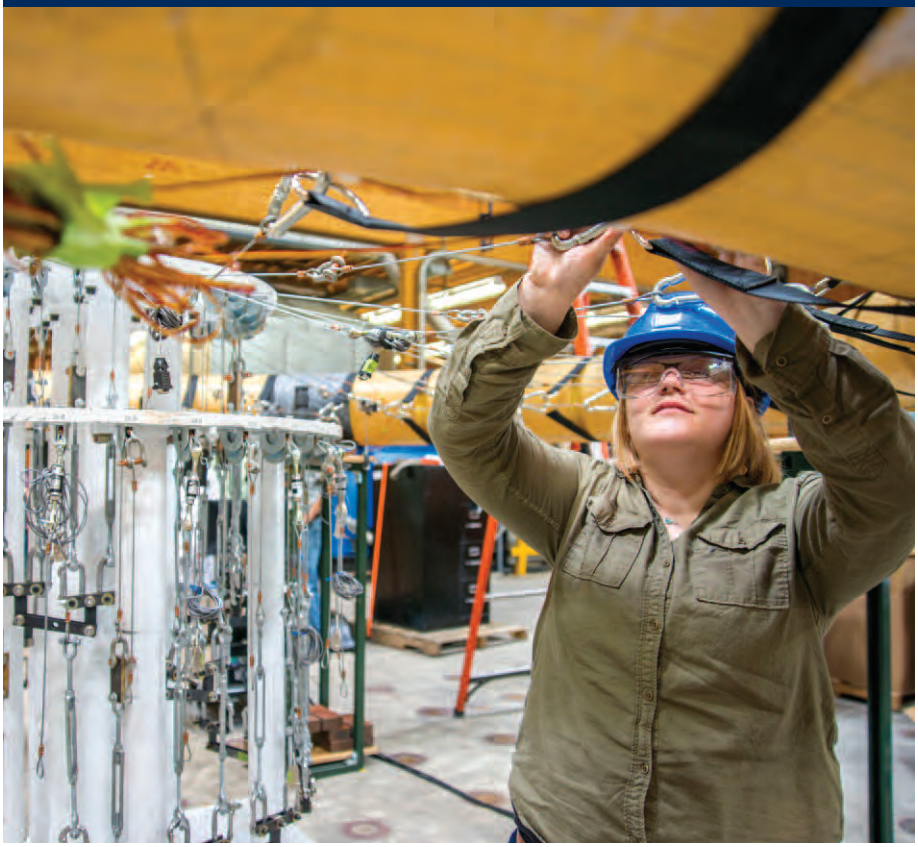
THE UNIVERSITY OF MAINE

Advancing Economic Development Through

Commercialization



Report to President Susan J. Hunter

August 1, 2017

THE UNIVERSITY OF MAINE

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Executive Summary

President Hunter charged Provost Hecker with convening a group to undertake a process of examining UMaine's policies, processes and structures as they relate to commercializing research, with the goal of modernizing our approach and moving to an enhanced level of leadership in this area. Provost Hecker convened the Commercialization Working Group to carry out the President's charge and guided the group through a yearlong process of discovery focused on four areas:

1.) **IP Portfolio Review**: External assessment of a portion of UMaine's intellectual property (IP) assets so that action plans to advance those without a clear path to commercialization could be developed, and to evaluate the process and services available for external evaluation and marketing.

2.) **Research Foundation or Other Structure**: Given UMaine's current structures, resources and opportunities, would the development of an independent entity such as a research foundation facilitate the commerialization?

3.) **Experience of Partners**: What are the current perceptions and experiences of university faculty vis-à-vis commercialization? What are the perceptions and experiences of recent industry partners and potential future partners?

4.) **Best Practices**: What can be learned from the experiences of other universities and experts in the field with respect to policies and procedures that support commercialization?

Executive Summary *continued*

Key Findings

- About 25% of the evaluated segment of UMaine's intellectual property portfolio has strong potential for commercialization and would benefit from additional investment.
- There is value in utilizing an independent third party to review intellectual property and to provide feedback to the researcher, evaluate the readiness for advancing to market and recommend next steps.
- There are a variety of functions that an independent research foundation can provide to the university to enhance commercialization, including as a vehicle for more flexible recruitment, retention and compensation practices for employees; improved marketing of UMaine resources to potential industry partners; greater service to faculty and staff researchers; and increased ability to adapt to changing business and industry landscapes.
- While the experiences of industry partners who have engaged with UMaine on commercialization activities have generally been positive, the university has a long way to go to create a culture that explicitly values and supports these activities.
- Business and industry partners highlighted the need for improved communication/marketing of services, improved service delivery and a wider array of services.
- UMaine faculty and staff express the need for clear policies, additional resources and aligned incentives supportive of commercialization and innovation.
- There are a variety of viable approaches to motivate faculty and staff to engage in commercialization activities, and to reward success.
- Best practices with respect to intellectual property ownership and management will require changes to University of Maine System policy.

Recommendations

1.) Create the *Innovation and Economic Development Council.* Composed of Cabinet-level and other campus leaders, the Council is charged with assuring that economic development is a strategic priority for the institution by monitoring policies and practices, and recommending changes that support commercialization. The Council will report to the President.

2.) Create a *Research Foundation* that provides support to faculty and staff, markets UMaine's resources to industry partners, manages the university's intellectual property portfolio and promotes industry-university relationships.

3.) Identify and secure resources to support the research foundation and other initiatives to support commercialization.

4.) Take immediate action to revamp the processes for industry engagement, and improve policies related to students and intellectual property.

COMMERCIALIZATION OF RESEARCH
AT THE UNIVERSITY OF MAINE

Final Report — July 31, 2017

President's Charge

President Hunter identified as a priority for the university "to move to an enhanced level of leadership focus and modernized policies, processes and structure" as they relate to commercialization of research. She charged Provost Hecker with guiding a process for achieving these goals. **Appendix A** — President's Charge to the Provost.

Approach

Shortly after the President issued her charge, the university engaged in a dialogue with the Harold Alfond Foundation (HAF) about commercialization at UMaine. The HAF signaled an interest in supporting the university in this area and a proposal was developed seeking support to address two challenges related to commercialization activity at UMaine: 1) to better understand how commercialization may be enhanced by pursuing alternate structures enabled through an external entity, such as a research foundation; 2) to assess UMaine's current intellectual property assets so that they may be prioritized and understood by interested parties, and to enable an associated action plan for each. On August 29, 2016, UMaine received official notification that the HAF would provide $100,000 to support the university's effort in addressing these two challenges.

With the anticipated support of the Harold Alfond Foundation, a plan was developed to carry out the President's charge. Provost Hecker formed the Commercialization Working Group (CWG) to advance the initiative. Membership included:

- **Jeffrey Hecker,** *Executive Vice President for Academic Affairs and Provost (Chair)*
- **Carol Kim,** *Vice President for Research and Dean of the Graduate School*
- **Jake Ward,** *Vice President for Innovation and Economic Development*
- **Kris Burton,** *Director of Technology Commercialization*
- **Larry Lewellen,** *Vice President for Human Resources*
- **Jim Thelen,** *UMS General Counsel and Chancellor's Chief of Staff*
- **Robin Delcourt,** *Special Assistant to the Executive Vice President for Academic Affairs and Provost*

Jake Ward and Kris Burton, the content experts of the group, made resources available to the CWG to familiarize the members with the vernacular, common challenges, national landscape and emerging issues related to commercialization of intellectual property. Two lessons learned from this literature review deserve mention here. First, the term "commercialization" refers to a range of activities that support the movement of a research finding from the "lab" to the "marketplace" (i.e., commercial production or public access). A variety of other terms, (e.g., knowledge transfer, technology transfer, technology translation, knowledge exchange) are used to refer to a range of activities that overlap considerably with commercialization.

Scope of Commercialization Activities

Business Development
- Direct outreach to companies to promote R&D collaborations

Partnership Management
- Project definition, contracting, cultivating long-term engagement

Faculty Engagement and Training
- To be able to respond to industry
- To pursue commercialization of research

Policy Development and Implementation
- Protection of IP
- Contracts industry engagement
- Manage conflicts of interest

Patents (protection and licensing)
- Strategy by technology, by patent family
- Evaluate ROI

Technology Acceleration-speed to market
- Customer discovery and product development cycles, coaching, seeking funds

Technology Evaluation
- Commercial, technical, IP

Licensing
- Identify licensee, valuation, negotiation and execution

Startup Management and Coaching
- Business incubation, coaching entrepreneurs, connections to mentors, team members, funding sources

Administration
- License/contract compliance
- Reports, income distribution
- Accounting and Project Management

External Stakeholder Engagement/ Sales and Marketing
- To companies, inventors, entrepreneurs
- To legislature, MTI, trade groups
- To economic development community to support companies

Impact/Metrics
- BOT Primary Outcomes
- MEIF Goals and Metrics
- Campus-based Strategic Plans
- MTI and Maine Science and Technology Plan
- Portfolio specific revenues and return

Second, there is no "best practice" with respect to university commercialization. Consequently, while there is some overlap among structures and practices, there is also considerable variability among research universities in how they foster collaboration between industry and university researchers. No two universities go about it in exactly the same way, and most adapt their policies and practices over time to take advantage of opportunities and manage challenges.

With a shared grounding and the Harold Alfond Foundation support in place, the CWG developed a work plan to address the charge laid out by the President. Four inter-related areas of foci were identified:

I.) **IP Portfolio Review**: External assessment of a portion of UMaine's intellectual property (IP) assets so that action plans to advance those without a clear path to commercialization could be developed, and to evaluate the process and services available for external evaluation and marketing.

II.) **Research Foundation or Other Structure**: Given UMaine's current structures, resources and opportunities, would the development of an independent entity such as a research foundation facilitate the movement of IP to market?

III.) **Experience of Partners**: What are the current perceptions and experiences of university faculty vis-à-vis commercialization? What are the perceptions and experience of recent industry partners and potential future partners?

IV.) **Best Practices**: What can be learned from the experiences of other universities and experts in the field with respect to policies and procedures that support commercialization?

Appendix B — Commercialization Working Group — Mid-Year Report.

Work Products

I. IP Portfolio Review

The goals and strategies for this work product follow: Provide an assessment of the value proposition for a number of not-yet commercialized technologies. Use external subject matter experts to provide an unbiased opinion on the technical and commercial merit, and on the likelihood of obtaining intellectual property protection. Where possible, the expert should provide contact information for potential development partners if the technology was recommended for further investment. Secondary goals are to test the value of using external reviewers and compare work product among services, and to begin designing a process to use third-party resources to increase efficiency and improve service to faculty and staff.

Methods

Portfolio Segmentation

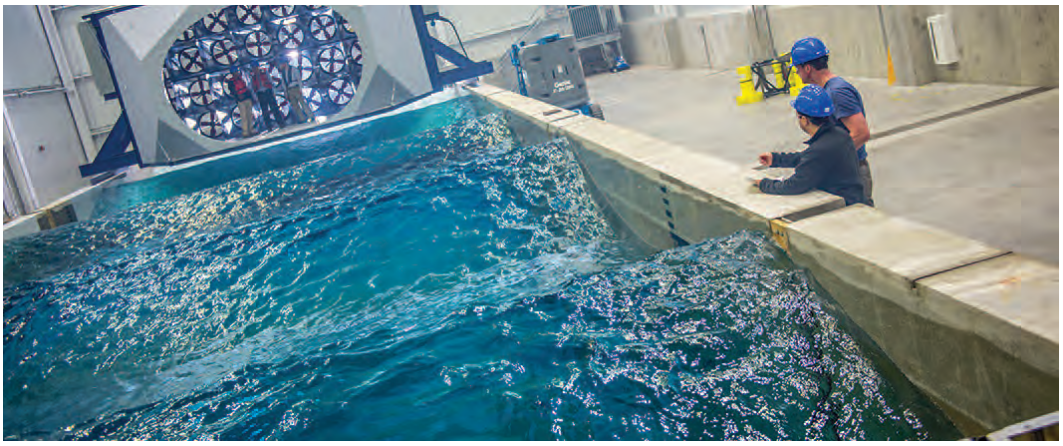
UMaine's patent portfolio was segmented into the following groups, and an appropriate assessment approach was elected for each:

a.) Core Research Portfolios. This group encompasses areas of research with substantial dedicated resources, ongoing external funding and multiple patent families. It includes offshore wind, cellulosic biofuels and cellulose nanomaterial production, for example.

b.) Active One-offs. These are technologies in non-core areas of research, generally with on-going external funding and having (or having the potential for) a single patent application and/or valuable, transferable know-how. Matters in this category have been assessed for technical and commercial potential to varying degrees in-house, and, in some cases, by potential commercial partners.

c.) Newly disclosed technologies. These may be core or one-off, but newly disclosed and minimally assessed.

d.) Twilight technologies. These are older matters that may or may not have current commercial, licensable value. The technology and applications are generally well understood, but dated, and a commercialization or development partner may not have been actively pursued in recent years. Some of these technologies are one-offs; some are related to core research, but generally are either without an active development project, or the project underway is expected to obsolesce the older work.



Consultation

TreMonti: A Request for Proposal (RFP) was distributed for an external consultant to assist with this work and TreMonti Consulting, LLC was selected. The company agreed to review up to 30 intellectual property assets with the goal of providing a commercial evaluation of each asset focused on its commercial opportunity. In addition, TreMonti developed a marketing document for each technology. Kris Burton worked with TreMonti to modify their assessment template to fit UMaine requirements. This included the addition of scoring categories, quantitative ratings, development next steps and identification of major business and technical hurdles to commercialization ("death threats").

As of June 30, 2017, TreMonti has completed half of the assessment. The remaining half will be completed by August 31, 2017.

Invention Evaluator: Vortechs Group, owner of the Invention Evaluator software and service, contacted the university and informed us that its product has improved since the last time UMaine purchased this service. Vortechs offered its basic Invention Evaluator commercial/IP/technology assessment services for a reduced academic rate. We agreed to re-evaluate the product by purchasing a single assessment, and also test the process of allowing graduate students to lead the submission of their technologies directly, with coaching from Office of Innovation and Economic Development (OIED) staff.

Verrill Dana LLP. This law firm was selected to assess the content and prosecution history of a single patent from the offshore wind portfolio, and to provide a bid for assessing all of the related patent applications. Obtaining a second opinion on critical patent portfolios is a common practice for companies; given the importance of the offshore wind project, it is appropriate for the university to seek a second opinion in this case.

Key Findings

1.) In the initial offshore wind patent assessment, Verrill Dana discovered several matters that may need to be addressed. OIED is satisfied with Verrill Dana's work, and is currently seeking funding from Maine Technology Institute to complete the full assessment. It will include an overall plan to mitigate any identified deficiencies in patent content and prosecution strategy.

2.) About 25% of the reports received from TreMonti and Invention Evaluators were recommended for continued investment. For about 25%, the recommendation was strongly against any further investment. The remaining reports recommended investment with some reservations.

3.) The graduate student's response to the Invention Evaluator service was positive: "I really like their assessment on market analysis, which seems to be of most value to me. Many of the information provided under potential partners, industry information, etc., are new and helpful to me. However, with respect to Technology and IP analysis, I feel they could have done a better job. Almost all of their results (especially Google search results) are already available in the articles I shared with them, so I feel their contribution in this area was not substantial."

4.) The faculty responses to the reports from TreMonti LLC were generally positive and they found the reports more immediate and detailed than expected. The faculty participants appreciated the tangible feedback, which sparked further discussion and motivated greater faculty participation.

Example faculty responses follow:

a. *"Wow, what a great document. I really like it. It's like someone pretty much understood what I've been doing (not quite exactly, I have to say, but still), and is telling me what my next 3–5 yr. plan should be. Nice!"*

b. In one case, a faculty member requested permission to use the technology assessment document in upcoming employment negotiations to request more time to dedicate to commercialization-related research and activities.

c. In another case, the faculty member and commercial co-inventor strongly disagreed with the assessment and immediately took the time to draft a response. Having this process to compel inventors to communicate the value of the technology in such a way that both the expert assessor and university commercialization office did not previously understand is critically valuable.

d. *"I felt that the report confirmed things we already thought, but there is nothing intrinsically wrong with that. I appreciated the 'death threats' section, and also thought that the patent search for duplicates/similarities was useful."*

e. *"I think generally speaking that performing reviews such as these are beneficial (and agree that inventions not as far along would benefit significantly). I didn't find anything terribly compelling in this particular review … ."* The recipient goes on to refute issues raised in the review by citing literature and providing explanation, thus addressing matters that would likely emerge later during conversations with commercial partners.

f. *"The report format is straightforward and provides relevant information to make an informed go/no-go decision, which seems to be the intent of the activity. In particular, the list of potential partners to contact can be very useful for UMaine researchers to follow up with, if desired."*

II. Research Foundation or Other Affiliated Structures

The goal of this work was to explore the risks and opportunities of developing an independent research foundation, or similar entity, to support the transfer of university research to market. What reasons are there for creating such an entity? What are the risks and challenges (e.g., operational, legal, public perception)? What is the possible range of foundation activities? Compared to current UMaine operations:

- Which activities would merit transfer to a foundation?
- What is the ranked urgency and time frame for transfer?
- What are the assessment criteria and how should the decision be reassessed in the future?

Methods

Consultation

An RFP was published and TreMonti Consulting LLC was selected to review UMaine's current processes and activities related to commercialization, perform a comparison analysis against benchmarked peer institutions, and make recommendations regarding whether an independent research foundation or similar structure would facilitate commercialization activities, and what that structure should look like.

UMaine selected TreMonti Consulting for this project due to their extensive presence in research-related commercialization activities. TreMonti consults with more than 150 clients in nine countries, the majority of which are U.S. universities. This broad exposure and connectivity provided ease of access to peer institution leaders, as well as perspective on which activities and structures are successful and efficient in accomplishing commercialization and growth in industry engagement.

UMaine campus fact-finding

Heidjer Staecker, Partner, and Bethany Loftkin, Executive Director of TreMonti, visited the Orono campus on February 23–24, 2017. The meeting agenda included conversations with more than 30 campus stakeholders, as well as several from the broader community. TreMonti provided a presentation and discussion on the purposes and benefits of research foundations to President Hunter and the upper administration, and met with the following centers or groups to discuss needs and opportunities:

- Executive Vice President for Academic Affairs and Provost
- Vice President for Research and Dean of the Graduate School
- Vice President for Innovation and Economic Development
- Advanced Structures and Composites Center
- Process Development Center/Department of Chemical and Biological Engineering
- Forest Bioproducts Research Institute/Chemical and Biological Engineering
- Aquaculture Research Center
- Advanced Manufacturing Center/College of Engineering
- Electrical and Computer Engineering
- Laboratory for Surface Science and Technology
- Virtual Environment and Multimodal Interaction Laboratory
- Innovative Media Research and Commercialization Center
- Maine EPSCoR
- University of Maine System General Counsel
- University of Maine System Human Resources/Labor Relations
- Faculty entrepreneurs
- Foster Center for Student Innovation
- University of Maine Facilities Management
- University of Maine Foundation

Peer interviews

Senior leadership from a variety of peer and other campuses with active research foundations were interviewed during the execution of this study. Kris Burton attended the annual meeting of the Association of University Technology Managers (AUTM) for the purpose of interviewing, with Heidjer Staeker, leaders from the following institutions:

- University of Virginia Research Foundation
- University of Mississippi/Mississippi State University
- Kansas State Research Foundation
- Kansas State University
- University of Texas at Arlington
- Auburn University
- University of Iowa Research Foundation
- Wilkes University (also considering a foundation model)

Institutions interviewed subsequent to the AUTM meeting by TreMonti and/or UMaine include the following:

- Georgia Tech Research Foundation
- Virginia Tech
- University of New Hampshire
- Clemson University Research Foundation
- North Dakota State Research Foundation
- Purdue Research Foundation

Consultant's Report

Appendix C — TreMonti Report Regarding Independent Research Foundation.

Key Findings

1.) UMaine should establish an independent foundation to support commercialization of research. The benefits of an independent foundation include:

a. Allow more flexible and specialized recruitment, retention and compensation practices for employees;

b. More nimble product sales and payment practices;

c. Afford UMaine a vehicle for nontraditional, opportunistic investments, and research and commercialization efforts; and,

d. Position UMaine for continued growth of institutional infrastructure to adapt to changing environment.

2.) The structure of the foundation should include the following elements:

a. Independent of UMaine (i.e., independent 501c3).

b. Bound to UMaine by contract for services with milestones and deliverables.

c. Single employee (e.g., Provost or Vice President for Research) with a minimal salary.

d. Other staff "on loan" (contractually supported) from UMaine.

e. Small, nimble board of directors (~3–5 members) composed of at least 40% university representatives. This strong, yet minority, university representation on the board will enable an influential UMaine voice but independence of decision-making. External seats could leverage community interest/support.

f. An executive director, employed by UMaine but with signatory authority.

Given that policies, procedures and structures are designed to support the needs of stakeholders, the CWG sought answers to the following questions: What are the current perceptions and experiences of university faculty/staff related to commercialization? What are the perceptions and experience of industry partners and potential external partners?

Methods

The CWG contracted with Project Tipping Point LLC (Shanna Cox, Principal) to assist in collecting and aggregating information from UMaine faculty, as well as industry partners (and potential partners) to assess their experiences and perceptions of UMaine's support for commercialization. Cox employed a two-stage process to gather information. Parallel processes were used to collect information from faculty and industry partners: survey followed by focus groups. Shanna Cox facilitated a process whereby the CWG developed the survey and focus group questions. She administered the survey, conducted the focus groups and aggregated and summarized the findings.

Appendices D1 and D2 — Project Tipping Point Summaries of Themes.

Key Findings

1.) UMaine has a way to go to develop an internal culture in which commercialization or more broadly, knowledge transfer to the public sector is widely understood and valued. University leadership needs to develop and communicate a clear vision for commercialization and innovation, and a plan for realizing that vision should be articulated.

2.) The faculty highlighted the need for clear policies, additional resources and aligned incentives supportive of commercialization and innovation. Current impediments to commercialization include: 1) inconsistent understanding of the importance of public-private partnership to the land grant mission; 2) inconsistent understanding of the resources the university has in place to support commercialization; 3) inconsistency in the recognition of knowledge transfer activities in the incentive structures (e.g., promotion and tenure criteria); 4) insufficient resources (e.g., release time, monetary rewards, human resources) to support faculty engagement in commercialization activities; 5) insufficient marketing of UMaine R&D resources to potential industry or agency partners.

3.) Industry partners highlighted the need for improved communication/marketing of services, improved service delivery and a wider array of services. Concerns raised included: 1) Enhanced communication and marketing of UMaine's resources and opportunities are needed. Those business and industry partners who have engaged in partnerships with UMaine were generally satisfied with the experience, highlighting the quality of people with whom they worked and the facilities. However, even those who have engaged with UMaine had a limited understanding of the range of expertise available on campus. Most partners learn about services the university provides through word of mouth or their own self-guided exploration. Potential industry partners who participated in the survey and/or focus groups admitted to a lack of knowledge of what UMaine has to offer industry. 2) Current partners identified some issues with service delivery that are potential impediments to continued or expanded engagement. Potential partners identified similar concerns as reservations about working with UMaine. Service delivery concerns include response time (i.e., the need for quick turn-around), IP ownership concerns, coordination of services across units within the

university, regulatory hurdles and a need for clarity of terms (e.g., costs); 3) Finally, a minority of business and industry partners (and potential partners) would like to see a broader array of disciplinary expertise available to them. Health sciences and biomedical expertise were noted examples.

IV. Best Practices

What can be learned from the experiences of other universities and experts in the field with respect to policies and procedures that support commercialization?

Method

The members of the CWG reviewed literature and shared their ideas in discussions at biweekly meetings throughout the 2016–17 academic year. Specific focal areas of attention included the following:

- Jeffrey Hecker consulted Executive Advisory Board, a respected think-tank and higher education consultancy firm, to obtain literature and guidance. Among several documents of interest, a custom research brief, "Research Commercialization Incentives and Research Foundations," provided relevant information.

- Robin Delcourt completed an assessment of the web presence and information available for faculty and companies concerning commercialization, tech transfer and research.
- Larry Lewellen and Kris Burton, in consultation with General Counsel's Office, completed an assessment of best practices related to human resources. This included short-term issues (e.g., Stanford v. Roche compliance and related IP Policy updates), long-term projects (e.g., incentive options, inclusion of commercialization activities for tenure review) and foundation-specific opportunities (e.g., market-rate compensation).
- Kris Burton attended the following meetings: 1) National Association of College and University Attorneys workshop on Academic Sponsored Research and Technology Transfer in Washington, D.C.; A best/alternate practice discussion and white paper, "Streamlining the Process from Sponsored Research to Technology Licensing: The Promise and Reality," provided an assessment of strategies for consideration and implementation. 2) Education Advisory Board University Business Executive Roundtable: University Research Forum in Washington, D.C. Meeting materials and discussion included data-supported practices and strategies for growing nontraditional research opportunities (e.g., multi-institutional, foundation or industry-sponsored) and relationships.

Key Findings

Best practices and projects for implementation were identified. CWG prioritized faculty engagement and incentives, and intellectual property ownership risk mitigation for initial projects.

1.) Faculty engagement and Incentives

a. Financial Incentives

i. *IP Revenue Allocation*. There is marked variability with respect to percent of IP revenue allocated to inventor (20% to 50% across seven institutions).

ii. *IP Creators Paid First*. University strengthens incentive to commercialize by dispersing a one-time award to faculty member/IP creator before percentage takes effect (e.g., $10,000).

iii. *Graduated Revenue Sharing*. University's percent increase with net revenue increase (e.g., university gets a larger percentage once invention nets more than $1 million [allows for larger initial percentage to faculty/inventor]).

iv. *Raises for winning external funds*. One university base budgets $20,000 every year so that faculty members can earn a raise of up to 3% of base salary for successful grants (including corporate sponsored research grants).

b. Tenure and Promotion Criteria

i. Some universities include patents, startup companies and job creation as measures of "research impact" that is considered for promotion and tenure. "… although … central administration(s) promote such nontraditional research impact metrics at several institutions … department-level committees ultimately determine the quality and importance of each scholarly activity on a case-by-case basis."

c. Information Sharing

i. At one institution, the research foundation director meets with the college deans each month to provide an update on the IP portfolio and progress toward commercialization. Director also passes along requests for specific types of research or inventions received from industry. Deans update the director on faculty research that might soon join IP portfolio for commercialization.

ii. Research foundations conduct workshop series. Topics include licensing, IP, entrepreneurship, how to apply for technology maturation funds.

iii. Intensive professional development events for select faculty. Some universities offer intensive (one- to four-day) sessions that teach the basics of university-affiliated entrepreneurship.

d. Methods of Identifying IP with Commercial Potential

i. One university research foundation tracks developments in faculty members' research for commercialization potential. Foundation staff will request one-on-one meetings with relevant faculty members.

2.) IP and Data Ownership

The University of Maine System's policy governing patents and copyrights is dated February 22, 2002. In the 15 years since the policy was last updated, much has transpired and the landscape has changed. Notably, the U.S. Supreme Court decision in the Stanford University v. Roche Molecular System Inc., (Stanford v. Roche), the court determined that title in a patented invention conveys to

the inventor, even if the researcher is a university employee and the research is federally funded. In light of Stanford v. Roche, Larry Lewellen and Kris Burton, in consultation with UMS Assistant General Counsel Thomas Connolly, reviewed relevant literature and current UMaine policies and practices. Currently, appointment letters, which serve as a form of employment agreement, contain little or no IP ownership language and do not include language referring to UMS policies regarding IP. Larry Lewellen and Kris Burton recommend a three-step approach to improving policies and practices so that there is greater clarity and improved security of IP assignment to UMaine.

1.) *Initiate process to change UMS policy*. It is recommended that additional language be added to the UMS policy to clarify IP ownership. **Appendix E** — Assistant General Counsel Thomas Connolly's recommendations for additions to policy language.

2.) *Improve language in existing forms*. Improve language, in line with Thomas Connolly's recommendations, in disclosure forms, grant documents and adoption of signature forms for student involvement in research projects.

3.) *Consider global approach to appending employment agreements with language reference governance of UMS policies*. Implement an annual policy update process universitywide, covering policy governance (inclusive of IP ownership, but not specifically focusing on this issue). This can be a significant best practice that would be an annual electronic message to all faculty and staff; reference and remind about all system policies; outline any policy changes in the past year; and require an electronic sign-off of some kind.

3.) Information Access

An emergent theme from the work of Project Tipping Point was the need to effectively "market" to both internal and external constituents. Robin Delcourt reviewed information on commercialization-related websites at identified UMaine peer institutions, America East Academic Consortium schools and New England land grants. The goal was to find examples of websites employing best practices, namely websites that are intuitive and easily accessed, that answer the "why" of faculty efforts at commercialization, and provide appropriate information on policies/procedures. The University of New Hampshire (UNH), Stony Brook University, University of Vermont and University of Idaho were highlighted as good examples. Notably, webpages specifically designed with the needs of business and industry were not broadly available across the institutions, but UNH's business page stands out as an exemplary model located one click from the front page of UNH's website. Additionally, Robin Delcourt found evidence of research foundations at University of Rhode Island and North Dakota State University.

Converging Opportunities

Over the course of the year during which the CWG convened, the research and development landscape in Maine has evolved. In the coming year, there will be new opportunities to advance the goal of enhancing commercialization activity at UMaine.

University of Maine System: *In the summer 2016, the UMS Board of Trustees identified "Support Maine Through Research and Economic Development" as one of its four priority outcomes for the next five years. Furthermore, the Board's commitment to the Research Reinvestment Fund (RRF) concludes at the end of the 2018–19 academic year, thus creating an opportunity to revisit this investment: What has been return on the RRF investment? Should the RRF continue? If so, how should funds be allocated? Are there ways to use RRF to support implementation of the recommendations described below?*

State Support for R&D: In June 2017, Maine citizens voted to support a $50 million R&D bond. These funds support acquisition of facilities and equipment, and will be administered by the Maine Technology Institute and distributed on a competitive basis. Historically, UMaine researchers have competed successfully for similar funds with awards up to $5 million per grant. How can UMaine strategically prioritize proposals that will best support advancement of commercialization?

Private Support: The Harold Alfond Foundation has demonstrated interest in supporting commercialization of research at UMaine through recent gifts to the university. In addition to the grant used to partially fund the work summarized in this report, the Harold Alfond Foundation gave its first significant R&D-related gift to UMaine to support the Alfond W_2 Ocean Engineering Lab. The Harold Alfond Foundation has signaled interest in providing additional support to UMaine's efforts to bring research products to market.

Integration and Recommendations[1]

Based upon the information gathered through the four inter-related focus areas, the Commercialization Working Group identified the following goals for advancing commercialization activity at the University of Maine. First, commercialization needs to become a more visible and valued component of the UMaine culture. Second, the university needs to align its incentive and reward structures, as well as its policies and practices, so that they better promote and support activities related to commercialization. Third, the university needs to bring additional resources to the table to advance industry-university partnerships and other forms of commercialization. The Working Group recommends the following actions in order to advance these goals.

1.) Create the *Innovation and Economic Development Council*

The formation of a unit at the top of the university's organizational hierarchy devoted to supporting and advancing commercialization is a step toward developing a culture that values commercialization and ensures that the institution's policies, procedures and practices align with this value. The Working Group recommends that the President create the Innovation and Economic Development Council.

[1]Kody Varahramyan became Vice President for Research and Dean of Graduate School on July 1, 2017 and replaced Carol Kim on the Commercialization Working Group for the final meeting during which recommendations were refined.

The Innovation and Economic Development Council will be **advisory to the President.** Composed of Cabinet-level and other campus leaders, the Council is charged with assuring that economic development is a strategic priority for the institution. The Council advises the President who, in turn, charges members of her Cabinet to implement those recommendations that she accepts. The Council will **monitor policies and practices** related to commercialization and **recommend changes to policies and practices** so that they support commercialization. Based on the work of the past year, the Working Group recommends the following tasks for the Council's first year. The activities are listed in priority order.

i. Develop a vision for economic development for the university.

ii. Develop an action plan to implement the IP policy and practice changes recommended above (see IP and Data Ownership section above).

iii. Develop a plan for integrating information about commercialization and economic development into new faculty orientation, and chairs and directors training curricula.

iv. Develop a plan for marketing UMaine's research and economic development resources to potential business, industry and community partners.

v. Develop a plan for revamping the university's web presence so that information about innovation, economic development, industry-university partnerships and commercialization are more visible and easily identified via search.

vi. Develop recommendations for increasing incentives for faculty and staff to engage in commercialization activities and move university intellectual property to "market."

vii. Develop recommendations for reviewing promotion and tenure criteria in key disciplinary areas to ensure that commercialization related activity is recognized.

The above list of activities is, of course, not exhaustive. The intent is for the Innovation and Economic Develop Council to collect and review information related to commercialization regularly, and to use the data to inform discussion and recommendations. The vision for the Council is that it will develop a culture of reviewing, recommending, and reassessing in a perpetual cycle incrementally improving policies and practices.

The following membership for the Innovation and Economic Development Council is recommended to assure that there is adequate breadth of expertise and perspective:

- Vice President for Innovation and Economic Development (Chair)
- Vice President for Research and Dean of the Graduate School
- Executive Vice President for Academic Affairs and Provost (or designee)
- Vice President for Human Resources (or designee)
- Assistant Vice President for Innovation and Economic Development
- Director of Technology Commercialization
- Dean's Council — two representatives (selected by Provost)
- Research Center Directors — two representatives (selective by VPRDGS)
- Professional Staff Member (selected by VPIED)
- Faculty — two representatives (one selected by Faculty Senate; one selected by Council)
- UMS General Counsel (or designee)
- Research Foundation representative

The Working Group recommends that the President establish the Innovation and Economic Development Council in fall 2017.

2.) Implement Research Foundation

The University of Maine System Research and Development Foundation was approved by the UMS Board of Trustees and created as a legally incorporated entity in 2013, but has been inactive. The Commercialization Working Group recommends that the President charge the VPIED and the VPRDGS to develop a plan for modifying the current Research Foundation so that it becomes active and supports commercialization activities. Specifically, the CWG recommends that the VPIED and the VPRDGS develop **bylaws,** an **operating agreement** and **business plan** for the research foundation, considering the Key Findings drawn from the TreMonti consultation report. These draft documents should be developed early in fall 2017.

The Council's vision for the University of Maine Research Foundation is that it be charged with carrying out the following responsibilities:

i. *Support faculty and staff:* The Research Foundation will support the faculty and staff researchers by educating them about opportunities for collaborations with industry; supporting flexible retention and compensation practices; and guiding researchers through relevant university, government and industry policies

ii. *Market to industry:* The Research Foundation will actively market UMaine's economic development assets to business, industry and community partners.

iii. *Promote and support researcher-industry relationships:* The Research Foundation will "match" industry needs with faculty and staff expertise, and will serve as a liaison between the faculty and industry partners.

iv. *Manage IP:* The Research Foundation will develop a system for soliciting independent review of IP, evaluating commercialization potential and accelerating the movement of high-potential IP to market.

3.) Secure Resources

Advancing commercialization activity at UMaine will require additional and/or reallocated resources. The Commercialization Working Group recommends exploring three avenues for securing support to accelerate commercialization activity

i. The *Research Reinvestment Fund (RRF)* was created by the University of Maine System Board of Trustees in 2012 to strengthen research and development activities that are tied to Maine businesses and industries that are critical to the future of Maine. The Board committed an initial $10.5 million to this initiative ($2.1 million/year for five years). To date, the RRF has been used to fund seed grants (i.e., funding for pilot research), planning grants (i.e., funding for new collaborations) and student assistantships to support research and development activities. These funds have been awarded on a competitive basis. The BOT commitment to fund the RRF expires at the end of this fiscal year.

   To date, RRF funds have been focused on the early stages of the commercialization life cycle, forming collaborations and supporting pilot initiatives. The Working Group recommends that the President charge the VPIED and the VPRDGS with proposing a restructuring of how the RRF funds are used so that there is targeted support for bringing established IP to market and accelerating company partnerships that enhance their willingness to invest in commercial development. The proposed changes should be developed by October so that they can be applied in soliciting and evaluating proposals for FY2018.

ii. The *Harold Alfond Foundation* supported the work of the Commercialization Working Group and has signaled interest in partnering with UMaine to advance research and economic development. The proposed activation of the Research Foundation will require startup funding. The business plan for the Research Foundation to be developed by the VPIED and VPRDGS (see previous) will include a proposal for startup funding to be presented to the Harold Alfond Foundation. In addition, the Director of Technology Commercialization will prepare a proposed budget for investing in intellectual property recommended for investment by the independent consultants. This budget will be included in the HAF proposal.

iii. With the passage of the $50 million state R&D bond, the university will have opportunities to compete for funds that will support economic development. The Council recommends that President Hunter direct the VPIED and the VPRDGS to create an internal competition process that will strategically prioritize proposals that will support advancement of economic development through enhanced commercialization of intellectual property.

4.) Best Practice Implementation — Immediate Actions

There are two activities identified through the work of the Commercialization Working Group that the Office of Innovation and Economic Development (OIED) will undertake immediately, regardless of the President's decision about the first two recommendations.

a. Student IP policy improvements

i. The OIED will draft guidelines for the management of student IP to be presented to the Dean's Council at its September 5 meeting. The guidelines are currently being developed with the assistance of the General Counsel's office.

b. Enhanced industry engagement process

i. Prepare and publicize up front, apparent information and contracting options to increase the speed, transparency and flexibility for industry research partners. This will allow OIED staff to explore a broader relationship with companies, including nonresearch engagement opportunities, early in the relationship.

ii. Draft policy and materials will be completed in August. OIED will solicit feedback from key faculty members and industry partners prior to rolling out the up-front engagement process to all faculty and staff.

Appendix A

Office of the President

THE UNIVERSITY OF MAINE
Celebrating 150 years

5703 Alumni Hall
Orono, Maine 04469-5703
Tel: 207.581.1512
Fax: 207.581.1517
umaine.edu

June 1, 2016

TO: Jeffrey Hecker
Executive Vice President for Academic Affairs & Provost

FR: Susan J. Hunter Ph.D.
President

RE: Commercialization of Research at University of Maine

As we continue to define our future, one of the areas in which I take great pride is our research productivity, and especially in emerging opportunities for commercializing our research. University of Maine has a strong history of commercializing research, and is now poised to move from a geometric to a "beyond-algebraic" progression of growth.

With this opportunity comes increased interest of our Boards, legislature, key partners, and other interested parties. As one of my priorities during my tenure, I would like UMaine to move to an enhanced level of leadership focus and modernized policies, processes and structure.

Some of the important elements to consider include the following:

- Identifying appropriate leaders and/or content experts who should be tasked to support this enhancement
- Considering a governance structure which can be inclusive but highly efficient in guiding our growth and progression
- Modernizing policies and processes as needed, and in particular ensuring any priorities involving faculty collective bargaining are identified and included in our next round of collective bargaining
- Evaluating different structures, such as affiliated corporations or enterprises, which could enhance our agility and opportunities and reduce organizational risk

Jeff, please convene whomever you may need to undertake this process under your guidance. Once you have done so, a wonderful first step would be an update at Cabinet as to how this will proceed and the potential timeline.

I am very excited about our future and grateful for your leadership in this arena.

Appendix B

Office of the Executive Vice President
for Academic Affairs & Provost

1865 THE UNIVERSITY OF MAINE

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Fax: 207.581.1633
umaine.edu

To: Susan Hunter
President

From: Jeffrey Hecker
Executive Vice President for Academic Affairs & Provost

Re: Commercialization of Research at University of Maine

Date: January13, 2017

cc: Carol Kim, Larry Lewellen, Jake Ward, Kris Burton, Jim Thelan, Robin Delcourt

In June 2016, you charged me with undertaking a process to move UMaine to an enhanced level of focus and modernized policies, processes and structure with regard to commercialization of research (attached please find a copy the charge). Please consider this memo a report on progress.

Approach

External Support
Shortly after receiving your charge, UMaine engaged in a dialogue with the Harold Alfond Foundation (HAF) about commercialization at UMaine. The HAF signaled an interest in supporting the university in this area and a proposal was developed seeking support to address two challenges related to commercialization activity at UMaine: 1) to better understand how commercialization may be enhanced by pursuing alternate structures enabled through an external entity, such as a research foundation; 2) to assess UMaine's current intellectual property assets so that they may be prioritized and understood by interested parties, and to enable an associated action plan for each. On August 29, 2016 UMaine was officially notified that the HAF would provide $100,000 to support the university's effort in addressing these two challenges (attached please find the HAF award notification).

Working Group
To assist me in carrying out the charge, I formed the Commercialization Working Group (CWG):

Jeffrey Hecker, Executive Vice President for Academic Affairs and Provost
Carol Kim, Vice President for Research and Dean of the Graduate School
Jake Ward, Vice President for Innovation and Economic Development
Kris Burton, Director of Technology Commercialization
Larry Lewellen, Vice President for Human Resources

Appendix B

Jim Thelan, UMS General Counsel and Chancellor's Chief of Staff
Robin Delcourt, Special Assistant to the Executive Vice President for Academic Affairs and Provost

Work Plan

The CWG organized the work into four areas:

1) Review of UMaine intellectual property with the goal of prioritizing among those with the greatest commercial feasibility.
2) Evaluation of the structure and future activities of the University of Maine System Research and Development Foundation.
3) Understand the experiences of UMaine faculty/staff as well as industry partners and ecosystem supports regarding commercialization
4) Determine best practices with respect to policies, processes, and practices to support university commercialization of intellectual properties.

Progress

1) Review of UMaine intellectual property with the goal of prioritizing among those with the greatest commercial feasibility.

Kris Burton scheduled and completed interviews with several consulting firms appropriate for tasks 1) and 2) at a meeting of the Association of University Technology Managers in Philadelphia in September, 2016. She requested, received and recommends acceptance of proposals from TreMonti Consulting, LLC, of Oakton, VA for both tasks. TreMonti is well regarded in the industry, serving numerous small and large university clients and has been engaged by Kris in positions held prior to UMaine.

The subset of the technology portfolio which will be appropriated for external review are those technologies which meet one or more of the following criteria:

- are unlicensed;
- are not part of a larger platform portfolio (offshore wind, for example);
- have had limited recent marketing to industry;
- demonstrate potential for commercial application and IP enforcement;
- have a reasonably defined path for continued development.

Submission to TreMonti of up to thirty technologies in this subset by Kris Burton, with consultation by the CWG, will begin January 10. A technical subject matter expert will be assigned to prepare a 4-5 page report for each technology. Reports will include highlights of commercial applications, a market assessment and IP analysis, recommendations for next steps, and a targeted list of companies and

Appendix B

contacts who may be interested in licensing or partnering for development. In addition, TreMonti will work with UMaine to prepare a marketing brief for each technology. Reports require 2-3 weeks for completion.

The initial TreMonti proposal is attached. Prior to acceptance, UMaine will request that an additional task be added within the budget for TreMonti to comparatively rate all submitted technologies on relative commercial opportunity and stage of development / uncertainty.

2) Evaluation of the structure and future activities of the University of Maine System Research and Development Foundation.

Jake Ward and Kris Burton conducted a follow-up interview with TreMonti in November. They are currently finalizing negotiations, with input from the CWG, concerning TreMonti's proposal (initial draft attached) to expand and increase the specificity of deliverables. In brief, the project is outlined as follows:

- Phase I – Process and Goal Review
  - Identify and review UMaine processes and activities;
  - Interview key stakeholders;
- Phase II – Peer Institution Benchmarking
  - Confirm, ID & implement best practices identified in peer institutions;
  - ID & implement unique practices, if any, suitable to UMaine;
- Phase III – Recommendations
  - TreMonti to provide a written report outlining a foundation structure and metrics tied to achievable success.

This projected completion date of this project is ninety days from start; anticipated start date is 23 Jan 2017.

3) Understand the experiences of UMaine faculty/staff as well as industry partners and ecosystem supports regarding commercialization.

The CWG determined that it would be important to understand the experiences of UMaine faculty and staff related to commercialization as well as the experiences of industry and other partners. To be clear, I use the term "experience" here quite broadly to include understanding of, interest in, valuation of commercialization. Similarly, "commercialization" refers to a broad array of activities that support innovation that leads to new ideas, products, or services.

As important as understanding the experience of faculty and staff, the CWG determined that understanding the experience of actual and potential industry/agency partners would be crucial to achieving our goals.

Appendix B

We engaged Shanna Cox, Principal & Founder of Project Tipping Point, to work with us to gather information from faculty/staff and industry/agency partners. Working with the CWG, Shanna developed a two-stage strategy for gathering information. Initially, information will be collected using a brief online survey. Then, using the survey results as a guide, Shanna will conduct focus groups to gather qualitative information. The survey was sent to 595 faculty and staff members and 450 industry/agency partners. Survey results will be aggregated and interpreted in January 2017 and focus groups will be conducted in the last week of the month.

4) Determine best practices with respect to policies, processes, and practices to support university commercialization of intellectual properties.

The CWG has been gathering information including publications, websites, and presentations dealing with knowledge transfer and commercialization. Kris Burton has taken the lead on gathering information and is using her professional network to identify individuals with whom the CWG may carry out guided discussions. One document, in particular, has guided the group's thinking about this work: *University Knowledge Exchange (KE) Framework: good practice in technology transfer, report of the UK higher education sector and HEFCE by the McMillan group* (September, 2016).

Moving Forward

Progress in the four areas will continue through the spring semester. Shanna Cox will provide a report on her work by the end of March 2017. The CWG will complete its literature review at about the same time. My intent is to integrate this work, as well as the reports regarding IP prioritization and the research foundation, into a single report and set of recommendations for you by May 31, 2017. Currently, the CWG anticipates that the recommendations will include immediate actions that can be taken to address identified concerns, a prioritized list of investments, and structural/organizational recommendations that will provide the infrastructure to continuously assess and improve the university's support for innovations that lead to new ideas, products, and services.

Thank you for giving me this interesting assignment. I look forward to providing you a full report in the coming month.

Appendix C

The full report is online:

umaine.edu/provost/tremontireport


TreMonti

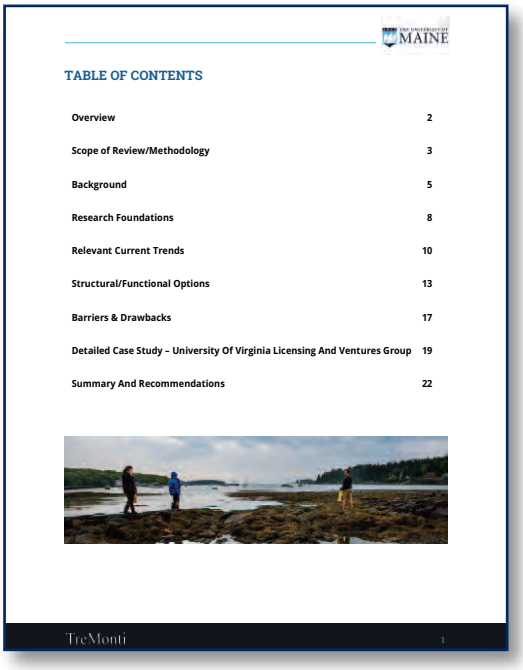
2017

RESEARCH FOUNDATION OVERVIEW

Recommendations for Establishing a Non-Profit Foundation

Prepared For

1865 THE UNIVERSITY OF MAINE


THE UNIVERSITY OF MAINE

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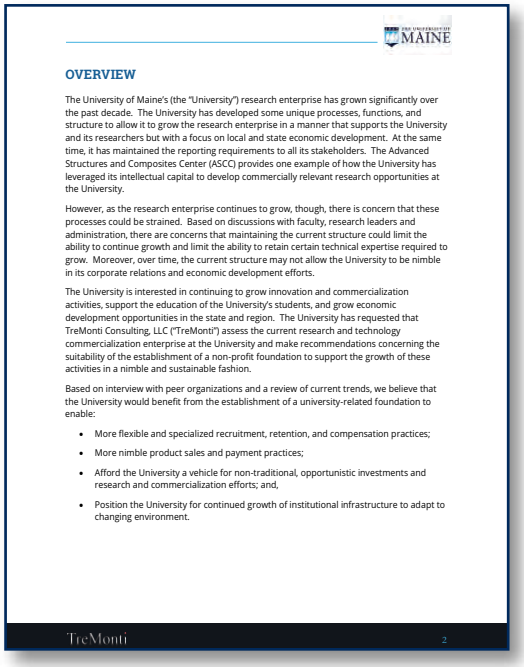

THE UNIVERSITY OF MAINE

OVERVIEW

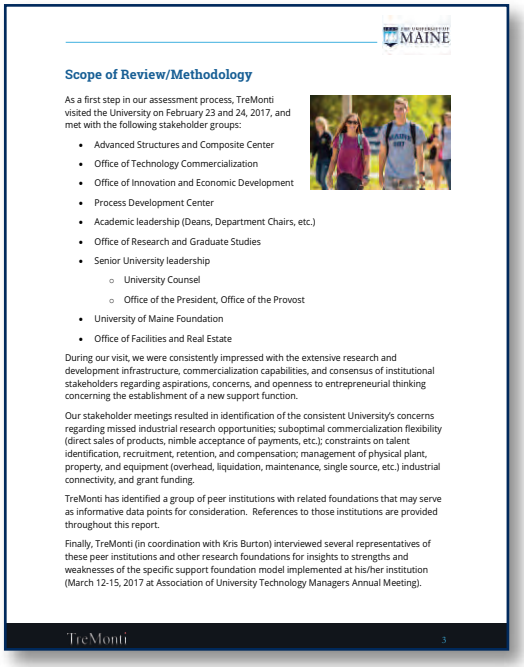
The University of Maine's (the "University") research enterprise has grown significantly over the past decade. The University has developed some unique processes, functions, and structure to allow it to grow the research enterprise in a manner that supports the University and its researchers but with a focus on local and state economic development. At the same time, it has maintained the reporting requirements to all its stakeholders. The Advanced Structures and Composites Center (ASCC) provides one example of how the University has leveraged its intellectual capital to develop commercially relevant research opportunities at the University.

However, as the research enterprise continues to grow, though, there is concern that these processes could be strained. Based on discussions with faculty, research leaders and administration, there are concerns that maintaining the current structure could limit the ability to continue growth and limit the ability to retain certain technical expertise required to grow. Moreover, over time, the current structure may not allow the University to be nimble in its corporate relations and economic development efforts.

The University is interested in continuing to grow innovation and commercialization activities, support the education of the University's students, and grow economic development opportunities in the state and region. The University has requested that TreMonti Consulting, LLC ("TreMonti") assess the current research and technology commercialization enterprise at the University and make recommendations concerning the suitability of the establishment of a non-profit foundation to support the growth of these activities in a nimble and sustainable fashion.

Based on interview with peer organizations and a review of current trends, we believe that the University would benefit from the establishment of a university-related foundation to enable:

- More flexible and specialized recruitment, retention, and compensation practices;
- More nimble product sales and payment practices;
- Afford the University a vehicle for non-traditional, opportunistic investments and research and commercialization efforts; and,
- Position the University for continued growth of institutional infrastructure to adapt to changing environment.


THE UNIVERSITY OF MAINE

Scope of Review/Methodology

As a first step in our assessment process, TreMonti visited the University on February 23 and 24, 2017, and met with the following stakeholder groups:

- Advanced Structures and Composite Center
- Office of Technology Commercialization
- Office of Innovation and Economic Development
- Process Development Center
- Academic leadership (Deans, Department Chairs, etc.)
- Office of Research and Graduate Studies
- Senior University leadership
  - University Counsel
  - Office of the President, Office of the Provost
- University of Maine Foundation
- Office of Facilities and Real Estate

During our visit, we were consistently impressed with the extensive research and development infrastructure, commercialization capabilities, and consensus of institutional stakeholders regarding aspirations, concerns, and openness to entrepreneurial thinking concerning the establishment of a new support function.

Our stakeholder meetings resulted in identification of the consistent University's concerns regarding missed industrial research opportunities; suboptimal commercialization flexibility (direct sales of products, nimble acceptance of payments, etc.); constraints on talent identification, recruitment, retention, and compensation; management of physical plant, property, and equipment (overhead, liquidation, maintenance, single source, etc.) industrial connectivity, and grant funding.

TreMonti has identified a group of peer institutions with related foundations that may serve as informative data points for consideration. References to those institutions are provided throughout this report.

Finally, TreMonti (in coordination with Kris Burton) interviewed several representatives of these peer institutions and other research foundations for insights to strengths and weaknesses of the specific support foundation model implemented at his/her institution (March 12-15, 2017 at Association of University Technology Managers Annual Meeting).

Appendix C

In view of this stakeholder analysis and our review of peer institutions, in this report TreMonti will provide:

1. An overview of the historical context for the establishment of foundations at universities;
2. A snapshot of current trends in university research and administration;
3. An overview of the structural and functional options;
4. A summary of structure and functional practices at relevant peer institutions;
5. A discussion of potential drawbacks;
6. A detailed case study for one such representative foundation - University of Virginia Licensing & Ventures Group; and
7. A summary and recommendations specific to the University of Maine.

Pricing schemes and academic indirect costs rates – In our experience, university prescribed cost rates can be too high (most often in cases of rendered services) or too low when only time and material costs can be billed to a client.

- ***Ownership and management of non-traditional academic assets***

  Many institutions have established foundations to manage real-estate assets on behalf of the university. This practice is most common for the establishment of research parks. In cases in which such real-estate assets can also be built with private funds, some constraints on their management and utilization are eased in this structure.

- ***Entrepreneurial flexibility***

  The Wisconsin Alumni Research Foundation (WARF) established in 1925 to protect and commercialize an invention by a university faculty member. The standard practice at the time was not to protect such discoveries by academicians.

  Today, intellectual property management and commercialization is commonplace, but many institutions are still prohibited from opportunistically pursuing more entrepreneurial commercialization endeavors such as holding equity in privately-held companies.

- ***Insulation from institutional academic/political hierarchy***

  In our experience, the administration of many universities is, perhaps rightly so, relatively egalitarian. All contracts, space requests, resource allocation, etc. is administered as equally as possible. If any preferential treatment is offered, it is likely a result of institutional evaluation of academic performance via promotion and tenure processes (in most cases exclusive of commercial activity). The establishment of a separate foundation with a different charge may enable a different prioritization of certain activities (commercialization, industry engagement, etc.) and associated disproportionate resource allocation on different mission-oriented priorities.

clients including 150 Maine companies, and formed 14 spinoff companies through licensing agreements of patents or trade secrets. Although all of the centers are active in research and innovation, the greatest balance of activity is in the Advanced Manufacturing Center, the Forest Bioproducts Research Institute, the ASCC, and the Aquaculture Research Institute.

One unique feature of the ASCC is that it maintains salaried researchers and engineers that are not tenured positions. These positions are there to support translational research and development for external contracts and for the development of promising innovations developed at the University.

Innovation, Technology Commercialization, and Economic Development

The Office of Innovation and Economic Development (OIED) at the University is responsible for supporting innovative research at the University as well as attracting and working with corporate sponsors. Additionally, OIED works to support new ventures in the community. OIED covers several programs including technology transfer (Department of Industrial Cooperation), new ventures, and economic development.

Structuring Sustainable Growth

As indicated above, the University has developed a robust research and innovation infrastructure that has focused on practical student education, supporting economic development in the state of Maine, and technology commercialization. However, as the technology commercialization and economic development opportunities increase, the University wants to make sure that it can effectively and sustainably support such growth.

Since universities have traditionally focused on education and research, their structure and tax status have limitations when it comes to engaging in commercial or economic development activities. Depending on whether the institution is public or private, state legal requirements, and the level of their research activities, a university may be able to work around these issues using existing structures. For example, many universities now have the infrastructure to deal with the commercialization of intellectual property developed through their research, although this type of activity was never considered when the university was initially founded. However, as the variety of research actives grows and the expectations on the university to support economic development activities, existing structures may start to limit opportunities or expose the institution to increased risk.

One method of addressing these institutional limitations has been to develop a separate, nonprofit corporation to manage the institutions intellectual property estate and associated research opportunities. One of the first to do this was the University of Wisconsin, which created the Wisconsin Alumni Research Foundation in 1925 to support the commercialization of the process for using ultraviolet radiation to add vitamin D to milk and other foods. WARF has been a leader in using this structure consistently in line with its original mandate: "the business and purpose of the corporation shall be to promote, encourage and aid scientific investigation and research at the University of Wisconsin by the faculty, staff, alumni and students thereof, and those associated therewith."

The University of Maine is in somewhat of a different situation from other peer institutions in that a research foundation does not currently appear to be necessary to work around structural issues. However, the University wants to contemplate whether the creation of a research foundation will facilitate the development and commercialization of technologies emerging from ASCC and other University research centers. Moreover, the use of a research foundation may mitigate the development of issues that might expose the University to risk or hinder the commercialization of technologies, such as:

- Engaging in the sales of products or materials
- Ability to accept certain types of donations
- Providing market rate compensation for talented employees
- Flexibility in accepting research arrangements with commercial partners.

Appendix C

RESEARCH FOUNDATIONS

Historical Context

University related research foundations and corporations have existed for many years. In most cases, they were established for one or more of the following reasons:

- ***Segregation of public and private funds***

  Chief among the reasons associated with the establishment of university related foundations is the desire of many institutions to segregate public funds administered by the university (federal expenditures, state appropriations, etc.) from private funds (donor gifts, endowment proceeds, etc.). Unlike federal and state funds, universities may more flexibly deploy private funds. Co-mingling of these funds likely results in all activity being governed by the constraints of the federal and/or state portion. Accordingly, clear separation of these assets may ease their administration.

- ***Risk management***

  Following the passage of the Bayh-Dole Act in 1980 (and in some cases immediately prior), many universities began engaging in intellectual property management and technology commercialization. As this was a new field (at least on the surface) fraught with new risks and liabilities (product liability, infringement liability, etc.), universities sought to build a "corporate veil" or layer of insulation between the new organizations engaging in this activity and university resources/endowments.

- ***General flexibility and efficiency***

  In addition to the enhanced flexibility associated with private funds administration, a private foundation may also insulate the practices of the foundation from certain governmental and/or policy constraints. The constraints that are most frequently cited as challenges include:

  State and Federal Freedom of Information Act (FOIA) – Many foundations believe that the private foundation structure may insulate it from requests for disclosure of "public" information related to business development activity, proprietary information, confidential contracts, donor databases, etc.

  State and institutional procurement practices – Such practices may include sole-source justification requirements, selection from approved vendor lists (particularly for the engagement of legal counsel including patent counsel), etc.

  State employment practices – May include academic salary grading, required posting periods, mandatory term appointments, and constrained incentive compensation capability.

Pricing schemes and academic indirect costs rates – In our experience, university prescribed cost rates can be too high (most often in cases of rendered services) or too low when only time and material costs can be billed to a client.

- ***Ownership and management of non-traditional academic assets***

  Many institutions have established foundations to manage real-estate assets on behalf of the university. This practice is most common for the establishment of research parks. In cases in which such real-estate assets can also be built with private funds, some constraints on their management and utilization are eased in this structure.

- ***Entrepreneurial flexibility***

  The Wisconsin Alumni Research Foundation (WARF) established in 1925 to protect and commercialize an invention by a university faculty member. The standard practice at the time was not to protect such discoveries by academicians.

  Today, intellectual property management and commercialization is commonplace, but many institutions are still prohibited from opportunistically pursuing more entrepreneurial commercialization endeavors such as holding equity in privately-held companies.

- ***Insulation from institutional academic/political hierarchy***

  In our experience, the administration of many universities is, perhaps rightly so, relatively egalitarian. All contracts, space requests, resource allocation, etc. is administered as equally as possible. If any preferential treatment is offered, it is likely a result of institutional evaluation of academic performance via promotion and tenure processes (in most cases exclusive of commercial activity). The establishment of a separate foundation with a different charge may enable a different prioritization of certain activities (commercialization, industry engagement, etc.) and associated disproportionate resource allocation on different mission-oriented priorities.

RELEVANT CURRENT TRENDS

It is also important to consider the establishment of an affiliated foundation in view of current trends that may affect research and commercialization activities in higher education.

The relevant trends include:

- **Shift in emphasis for existing federal research expenditures**

  During the last 10-15 years, federal research expenditures have become increasingly oriented to more "translational and applied" research. Even traditionally "basic" research funding agencies have started to require descriptions of commercial and/or clinical impact in proposals.

- **Stagnation of federal research expenditure growth**

  Growth of federal research expenditures has stagnated after artificial, economic stimulus driven spending. As a result, competitiveness for federal grants has increased tremendously, with some funding lines hovering in the single digits. The current administration has announced that it will seek approximately 10% cuts in the federal research enterprise, including NSF.

  These trends have resulted in tremendous urgency and pressure on universities to diversity institutional research expenditures away from current dependence on federal sources (particularly the NIH and NSF). The available alternative sources of funding (venture philanthropy, industrial, etc.) are increasingly translational and commercialization oriented.

  In contrast, Department of Defense expenditures on research may remain strong. These funds are typically administered via contract, not grant, and are also oriented to improving the technology readiness level of the subject research.

- **Consolidation of venture funds and movement away from early stage**

  According to the Association of University Technology Managers Licensing Survey, university start-up formation grew by 11% in 2015. In our experience, too, start-ups are becoming an increasingly common commercialization outlet.

  At the same time, the venture capital investment markets have fully recovered from recession lows. However, since that time, there has been significant consolidation (fewer, larger funds remain) in this asset class. Further, the number of investments in early-stage companies remains at historic lows.

  As a result, universities are continuously seeking ways to further resource the "de-risking" of university technology assets to drive ultimate commercial adoption.

- **Decreasing state appropriations for university operating budgets**

  The recent economic recession, increasing costs of state-administered health care, increasing enrollment, and increased institutional operating costs have resulted in decreases in state appropriations as a percent of institutional operating budgets.

- **Increased pressure from state governments for universities to drive economic development**

  Despite recent decreases in the percent support for higher education, state legislatures are increasingly seeking university contribution to economic growth.

- **Heightened intensity in competition for top faculty, staff, and students**

  Competition for top faculty and staff is at an all-time high. Our university clients have indicated that such recruits are increasingly requesting interviews with translational research, industry relations, and technology commercialization officers at the university prior to accepting a position.

  This trend is also very apparent among top student applicants. Schools with significant research expenditures, but also strong commercialization and entrepreneurship environments are most competitive for this top talent.

This confluence of trends has led many universities to seek to strengthen their capacity to effectively engage with industry, to support translation and commercialization, and to opportunistically launch new ventures from the university portfolio.

In our experience, universities are increasing resource allocation to units at the university that engage in supporting activities, are launching new units to fill voids in current infrastructure, and consolidating units to present a "front door" to industrial and entrepreneurial engagement.

Specific examples of this increased activity are the newly launched Business Engagement Center at Virginia Tech[1], University of California-Irvine Applied Innovation[2], and the Purdue Research Foundation[3].

[1] - https://vtnews.vt.edu/articles/2017/01/research-engagementcenter.html
[2] - http://innovation.uci.edu/
[3] - https://prf.org

Appendix C

Institutional function/units that are candidates for integration include:

- Intellectual property management
- Grants/contracts administration
- Compliance
- Research Parks
- New Ventures support activities
- Research Support
- Industry Consortia
- Translational Research
- Commercial Research & Development
- Investment Fund Management (Seed and Venture funding)
- Corporate/Foundation Relations
- Research Endowment management (WARF)

We believe there will be continued growth in the trend toward establishment of affiliated foundations to consolidate and support these functions/units.

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STRUCTURAL/FUNCTIONAL OPTIONS

Legal incorporation (Strong Consensus)

The majority of foundations established at peer institutions (see Table 1) are established as non-profit corporations established pursuant to Section 501(c)(3) of the Internal Revenue Code[4]. On this point, there is considerable accord among institutions.

Charitable Purpose(s) (Strong Consensus)

Similarly, the charitable purpose of nearly all research foundations establishes that the foundation exists solely for the benefit of the "parent" university/institution.

Degrees of Institutional Oversight (High Variability)

In contrast with the legal incorporation status and charitable purposes, there is considerable variation among peer foundations in the degree of institutional oversight/independence. For the purposes of this report, institutional oversight is defined as the review, authorization, and support of the activities, operations, finances, and legal administration of the foundation.

Many factors contribute to the degree of oversight sought and achieved by a university in the establishment of a support foundation. Further, the degree of oversight may change/evolve over time. Accordingly, in our experience, it is useful to consider the degree of oversight on a continuum from an integrated functional unit of the university on one end to an unrelated, independent organization on the other.

In our experience, the key criteria to consider in establishing the foundation is the degree of desired oversight by the University, not necessarily that level desired by the foundation. While we acknowledge that one of the goals of a foundation is to become less encumbered by state and institutional policy, legal, and bureaucratic constraint; we believe a certain level of institutional oversight is prudent. The degree of such oversight sought is determined by institution officials in view of risk tolerance, etc.

Institutional oversight is typically sought and achieved through some combination of the following:

- ***Policy (High Variability)***

  The university, state, or governing board may create a policy governing the establishment, oversight, and administration of such related foundations. Such policies, particularly common at institutions with more than one related foundation, frequently memorialize expectations of the foundation with respect to lines of business, accounting practices, etc.

[4] - http://treasurer.virginia.edu/university-foundation-relations

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- ***Governance (Strong Consensus/High Variability)***

  Nearly all foundations we considered have established a board of directors for the oversight of the activities and finances of the foundation. Similarly, in nearly all of these foundations, certain institutional officials assume seats on this board. It is not uncommon for an executive such as the president of the university, the vice president for research, the vice president for economic development, and/or the vice president for development to assume a role on these boards.

  There is, however, considerable variation among the voting status of these officials. There is also considerable variation among the number of independent board members (and thus the internal/external voting control of the board) appointed to the board.

- ***Contractual (High Variability)***

  Rather than or in addition to policy and governance oversight, universities may elect to contract with a related foundation to render certain services to the university or on its behalf. In this scenario, the legal agreement between the parties governs the relationship.

- ***Resource Allocation/Financial Support (High Variability)***

  Consistent with the objective to operate solely for the benefit of the supported university, most universities have established guidelines for the delegation of funds to and from related foundations. In those foundations with considerable financial and physical assets under management, emphasis is placed on funds return to the university. In those foundations with more limited functional responsibilities, practices concerning allocation of university resources to support the foundations are more prevalent.

  Such resource allocations and financial support can be implemented by policy or by contract.

Foundation	Board Composition	Policy/Contract/Other
Clemson University Research Foundation	13-25 (One more external than internal)	Operating agreement (5 year renewable contract)
North Dakota State University Research Foundation	13 (5 university)	State policy, University policy, and annual contract
University of Virginia Licensing & Ventures Group	12 (40% university)	University policy, annual contract
University of Iowa Research Foundation	19 (15 university)	Policy
Georgia Tech Research Corporation (GTRC)	12 (3 university)	Contract

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Staffing (High Variability)

Foundations can be staffed with either employees of the foundation or employees of the supported university. Maintaining an "in-house" staff requires additional managerial infrastructure and expense (payroll, benefits, human resources policies/practices, etc.). Leveraging employees of the university (via contract or otherwise) has administrative advantages, but limits flexibility for recruitment, retention, and compensation. In some instances, a foundation may only employ (either full-time or part-time) an executive director to administer business of the foundation.

Foundation	Employees
Clemson University Research Foundation	Yes (Invoiced to University)
North Dakota State University Research Foundation	Yes, 1/2 salary/fringe support
University of Virginia Licensing & Ventures Group	Yes
University of Iowa Research Foundation	No. Employees of state
Georgia Tech Research Corporation (GTRC)	No. Employees of university

Ownership of Assets (High Variability)

Many foundations own and control certain assets. Examples include privately financed research buildings and equipment and corporate research parks. In some instances, the university may also assign certain or all intellectual property assets to the foundation.

Foundation	Assignment of IP	Functions Housed
Kansas State University Research Foundation	Yes	Licensing/New Ventures, funding for research
Clemson University Research Foundation	Yes	Licensing/New Ventures, Internal "maturation" fund administration ($300K)
North Dakota State University Research Foundation	Yes, on "pursue" decision	Licensing/New Ventures
Virginia Tech Intellectual Properties	Yes	Licensing/New Ventures
University of Virginia Licensing & Ventures Group	Yes	Licensing/New Ventures
University of Iowa Research Foundation	Yes	Licensing/New Ventures
Purdue Research Foundation	Yes	Licensing/New ventures, Manage Research Park, accept gifts, administer trusts, acquire property, negotiate research contracts
Georgia Tech Research Corporation (GTRC)	Yes	Operational and Researcher Support, Accounting & Reporting, Licensing/New Ventures

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Legal (High Variability)

In those instances, in which risk management factored heavily in to the establishment of the foundation (and particularly in those instances with strong institutional oversight of foundation activities), the general counsel of the university may require certain contractual review and approval. Such review and approval may manifest in signature approval by university general counsel, limited delegated contractual authority (e.g. financial materiality thresholds), and/or legal "guardrails" on required provisions (e.g. indemnification, retained rights, warranty disclaimers).

Resource Allocation (High Variability)

There is no single funding model that dominates amongst research foundations. As noted above, often the funding model is driven by the size of the assets held by the foundation and the level of institutional oversight. However, in our discussions with peer institutions, it was noted that funding in many foundations, whose primary purpose is to support technology commercialization efforts, was solely from licensing income. Invariably, the foundations had been developed as a work around to existing structures, but the funding had not been adequately anticipated. As a result, these foundations may struggle financially to achieve the functions set out in their charter.

Foundation	Funding Model
Kansas State University Research Foundation	Licensing Revenue
Clemson University Research Foundation	University/Licensing Revenue (15%)
North Dakota State University Research Foundation	University/Licensing Revenue
Virginia Tech Intellectual Properties	University/Licensing Revenue
University of Virginia Licensing & Ventures Group	University
University of Iowa Research Foundation	Licensing Revenue
Georgia Tech Research Corporation (GTRC)	Research overhead (21.7%)

BARRIERS & DRAWBACKS

There may be several potential drawbacks associated with the establishment and operation of a separate foundation. Most of these drawbacks, however, appear more frequently as foundations exist and behave more independent of the university. Accordingly, awareness of the potential drawback in advance likely enables construction of the foundation to minimize the practical impact of each drawback.

Administrative redundancy and expenses

There are several required expenses associated with the establishment and maintenance of a non-profit foundation. In addition to the obvious legal expenses to incorporate and apply for non-profit status, a tax-exempt organization must prepare and submit a form 990 tax return annually.

Many of the foundations we engaged are also obligated by policy to perform certain annual audits – financial accounting, license compliance, or other in order to comply with institutional policies on related foundations. These audits/reviews can be time-intensive and costly. Other, potentially costly requirements may include insurance policies,

Further, in at least one institution, we are aware that the university office of general counsel will not provide legal guidance, support, or interpretation to the foundation because there is no client relationship with the foundation (only with the university proper). This position necessitates the foundation's procurement of outside legal services (once delivered by the general counsel) (administrative redundancy) and the foundation's expense (additional expense).

If/When a foundation becomes the formal employer of staff, the foundation must administer payroll, benefits, human resources services, etc. The infrastructure required to perform this routine activity must be built (or as recommended procured) and is redundant (with an added expense) to that available inside the university.

"You are not us" mentality

In situations in which the foundation is established with very apparent separation from the university in one of structure or function, this separation may result in a confusion or (worse) a belief among the faculty, staff, and students that the foundation's interests are not aligned with the university. This is a natural conflict that already exists in technology commercialization in an academic enterprise, but it may be compounded by the establishment of a separate organization to perform this function.

Sovereign immunity before the Patent Trial and Appeal Board (PTAB)

Just this year, the University of Florida Research Foundation prevailed in an application of sovereign immunity to defend an *inter partes review* before the United States Patent & Trademark Office's PTAB. These reviews have become the first venue for patent invalidity arguments by alleged infringers. Before the PTAB, a strong majority of claims are held invalid. Accordingly, the ability of an "arm of the state" to claim immunity from such proceedings bolsters both the strength and potential value of its patent portfolio. In the case of the University of Florida Research Foundation, several criteria ("Manders criteria") were applied to evaluate the separate foundations connectivity to the state. If a foundation is established that does not meet with at least some of these criteria, this useful advantage of state-owned intellectual property may be lost.

DETAILED CASE STUDY – UNIVERSITY OF VIRGINIA LICENSING AND VENTURES GROUP

One exemplary foundation for consideration/comparison (with which we have extensive experience) is the University of Virginia Licensing & Ventures Group (UVA LVG).

Establishment/Organization

Founded by the University of Virginia in 1977 as the University of Virginia Alumni Patents Foundation (UVAPF), and subsequently renamed the University of Virginia Licensing & Ventures Group, UVA LVG is a Virginia non-stock corporation and 501(c)(3) pursuant to the Internal Revenue Code.

UVA LVG was established for three primary reasons:

1. Risk management – At the time of its founding, university technology commercialization was in its infancy, and distancing such (perceived) high-risk activities from the academic enterprise (and associated endowments) was deemed prudent by institutional stakeholders.
2. Efficiency – As an arm of the state, any University of Virginia legal counsel is provided by the Commonwealth of Virginia Office of the Attorney General and their approved vendors. For intellectual property matters, this list of approved vendors is limited.
3. Insulation from other state agency constraints – FOIA, COIA, etc.

Several layers of institutional oversight govern the activities of the UVA LVG.

Policy

The University of Virginia maintains 27 affiliated foundations[5] and each is subject to the UVA Policy on University-Related Foundations[6]. Pursuant to this policy, related foundations are "established and organized solely for the University's benefit." In exchange for the University's formal recognition and utilization of University's name, the University requires each foundation comply with the policy. The policy requires one voting board seat for each of (i) one member of the Board of Visitors of UVA and (ii) one person appointed by the President of the University. It requires University an annual independent audit of each foundation's finances and an annual report on compliance with the policy. Further, the University must approve establishment and alteration of foundation bylaws, financial strategies (assuming indebtedness), and any material changes in the activities of the

[5] - http://treasurer.virginia.edu/university-foundation-relations
[6] - https://uapolicy.virginia.edu/policy/BOV-008

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foundation. Further, the University must approve the selection and contract of the Executive Director.

Governance

Pursuant to its bylaws, UVA LVG is governed by a board of directors currently comprised of 12 members.[7] In addition to the seats required by the policy, the bylaws also stipulate *ex-officio* seats for (i) UVA's Executive Vice President for Health Affairs and (ii) UVA's Vice President for Research. The bylaws further require that sufficient appointments to UVA LVG's board are granted to the President of the University to ensure that University representation on the board exceeds at least 40% of the voting membership.

Contract

In 2011, UVA and UVA LVG reached agreement on a Memorandum of Understanding for the operation and administration of UVA LVG. This five-year MOU (amended for subsequent five year terms on mutual agreement of the parties) requires that UVA LVG submit to UVA (via the Office of the Vice President for Research) an annual statement of work, budget, and draft contract for services each year at least ninety days prior to the start of a new fiscal year. Pursuant to each annual contract for services, UVA LVG delivers intellectual property management, licensing, new ventures, industry contracts, research compliance support (Bayh-Dole and other sponsored research agreements), seed/venture fund investment services, incubator management, and limited physical space management. All intellectual property assigned to UVA per the University's intellectual property policy is assigned to UVA LVG for management.

Legal

Each annual contract for services affords the University, via its Office of General Counsel, the ability to establish the legal "guardrails" for UVA LVG's activities in the contract year. In this agreement, the University dictates its positions on retained rights and risk management (e.g. indemnification of UVA).

Resource Allocation

UVA covers all operating costs of UVA LVG via the annual services contract (via University procurement). In exchange, UVA LVG returns all proceeds that result from such activities to the University in accordance with the University's Innovation Revenue Distribution Formula or other appropriate agreement.

[7] - http://lvg.virginia.edu/about/board-of-directors

Staffing

All activities performed by UVA LVG in accordance with the annual services contract are rendered by employees of UVA LVG. UVA approves salary allocations only in the aggregate (exclusive of the Executive Director). UVA LVG's Executive Director (as delegated by the Board of Directors) is responsible for recruitment, retention, and compensation/benefits. Notwithstanding the foregoing, however, UVA LVG employees are entitled to many of the privileges of being an employee of the university (university identification cards, physical access to university facilities, other benefits, etc.). UVA LVG also maintains a budget allocation for outside consultants and experts.

Other Relevant UVA LVG Operational Notes

- UVA LVG manages its finances via QuickBooks™.
- UVA LVG distributes "products"[8] directly to end-users and maintains some (minimal) product liability insurance.
- UVA LVG accepts credit cards for payment via Square, Stripe, or PAYEZEE (SunTrust).
- UVA LVG has utilized at-large board appointments to leverage considerable external talent.[9]

[8] - Software, Apps, etc.
[9] - http://lvg.virginia.edu/about/board-of-directors

SUMMARY AND RECOMMENDATIONS

The University of Maine is contemplating whether the creation of a research foundation will facilitate the development and commercialization of technologies emerging from ASCC and other University research centers.

Institutions have generally established related foundations to engineer around specific inefficiencies in the university environment and to capitalize on business opportunities. Beyond this similarity, every situation is different and every institution that was reviewed has installed a different foundation (structure and function) to meet their unique needs. The result is that there is no single model can be set forth as "the one model" that will work for everyone.

Moreover, these issues are tempered with concerns about the extent of a foundation's activities (i.e., all of Sponsored Research vs. Limited functions such as Technology Commercialization), the effect of independence on ownership of "University" assets, and staffing questions.

Based on our discussions with University staff and our interviews with other foundations, we believe a university related foundation would be a valuable asset for the University of Maine that would support the development and commercialization of technologies emerging from ASCC and other University research centers and also support the growth of the University's economic development activities in Maine.

Functions

There are numerous functions that could be supported by this structure, such as:

- Research support services
- Stakeholder reporting
- Holding equity
- Holding intellectual assets
- Intellectual Property management and commercialization
- Industrial contracts
- Charitable vehicle for research support
- Research park development
- Prototype fund/Venture funding

Of course, functions could be expanded or limited depending on the charter of the foundation. We would recommend drafting the charter as broadly as possible, even if initially the foundation would only provide limited functions.

Summary of Research Foundation Functions

Table I: Intellectual Property Management & Commercialization

Function/Services	Cost Level	Timeline	Impact Notes
Patenting & Holding IP	Medium to High	0-12 months	Allows for flexibility in supporting key assets and releasing non-performing IP.
Marketing & Communications	Low to Medium	0-6 months	Greater speed and ease in updating marketing materials and engaging with stakeholders.
Holding Equity	Low	Immediate	Can hold equity from deals with equity provisions.
Flexibility in Deal Terms	Low	Immediate	Can agree to deal provisions that might not be acceptable to the university.
Ability to Transfer Materials	Low	Immediate	Direct customer sales allowed; not just for research services; Variety of payment solutions possible.
Seed/Venture Fund	High	12-18+ months	Seed/venture fund to support University (or even community) start-ups and ventures will have impact on attracting additional funding to the region.

Table II: Industrial/Partner Contracts & Donations

Function/Services	Cost Level	Timeline	Impact Notes
Speed of Contracting	Low	Immediate	Greater speed and flexibility in contracting with potential partners.
Marketing campaigns	Low	0-6 months	Educate internal and external stakeholders about activities and foci.
Donations	Low	Immediate	Flexibility in accepting non-targeted research donations or materials.
Flexibility Partnership Arrangements	Low	Immediate	Flexibility in funding and partnering agreements.

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Table III: HR & Other

Function/Services	Cost Level	Timeline	Impact Notes
Market Rate Compensation	Medium	6-12 months	Alternative compensation structures can be developed outside of the University HR structure to allow for compensation of high value employees.
Strategic Hires	Medium	Variable	Hiring of specific talent either on an as need or full time basis without limitations imposed by University H/R infrastructure, timelines, or best principles.
Prototyping fund	Medium	6-12 months	Small scale funding to develop initial proof of concept. Sometimes can be hard to find for researchers.

The timeline of demonstrated results associated with successful implementation of the recommendations referenced above varies widely. The scale used is meant to show best-case scenarios, but as is often the case, a variety of factors may influence those timelines.

Structuring

Initial Steps

1. Perform a thorough review of state law and existing institutional precedent (University of Maine/University of Maine Foundation Memorandum of Agreement).

State law

In several states, state law establishes guidance for the creation of related foundations. For example, in the state of Florida, state law establishes guidance for "direct service organizations".[10]

Institutional Policy/Precedent

At the University of Maine, some institutional precedence appears to exist with the Memorandum of Agreement between the University of Maine and the University of Maine Foundation.

[9] - https://www.flrules.org/gateway/ChapterHome.asp?Chapter=27O-1

2. Establish a 501(c)(3) foundation and related infrastructure.

Consistent with the practices of all universities cited in this report, we recommend that the University establish a 501(c)(3) foundation with the express, stated mission of enhancing the research and commercialization enterprise at the University. It is critical that this mission and the foundation's charter clearly convey that the foundation exists solely for the benefit of the University.

Specific Structures

The specific structure chosen will be determined by the goals of the University. As indicated, a large number of existing foundations were built as the result of a need to work around existing university processes and regulations. Since the University has already developed processes to address limitations in current structures, this need may not be as pronounced. Instead the structure can be used to capitalize on near term business opportunities and provide a vehicle for long term planning.

Although it will ultimately be the University's comfort level with the structure (in addition to any state legal requirements), a foundation/research corporation with the following structure could achieve the University's goals:

- Independent from university
- Bound to the university by contract
- Single employee (Provost/Senior Research Administration) with a minimal salary
- Other staff "on loan" from the University
- Small, nimble board of directors (~3-5 members) comprised of at least 40% University representatives. This strong, yet minority, University representation on the board will enables an influential University voice but independence of decision-making. External seats could leverage community interest/support
- An executive director, likely employed by the University but with signatory authority for the foundation, is also recommended.

A structure such as this could provide the independence from the University to achieve certain functions (i.e., hold equity, etc.), preserve existing University H/R functions and benefits for the staff, and have direct coordination with the research and innovation functions of the University. Moreover, the structure would provide a level of risk management for the University by placing for profit business in a separate entity.

Functions

There are numerous functions that could be supported by this structure, such as:

- Research support services
- Stakeholder reporting
- Holding equity
- Holding intellectual assets
- Intellectual Property management and commercialization
- Industrial contracts
- Charitable vehicle for research support
- Research park development
- Prototype fund/Venture funding

Of course, functions could be expanded or limited depending on the charter of the foundation. We would recommend drafting the charter as broadly as possible, even if initially the foundation would only provide limited functions.

Funding

Until present, the University's innovation and economic development funding has been derived from the overhead on corporate sponsored research at the University. The change in structure should not initially change funding requirements. We would recommend that the foundation be funded through a budget line item that covers the activities of the Foundation. However, the University may want to re-evaluate the funding levels and sources in order to build up a reserve for certain existing functions or to develop new services to support the University's research enterprise (i.e., prototype fund, venture fund, research grants, etc.).

University of Maine Commercialization and Innovation Discovery

Summary of Business and Industry Themes

Context

In an effort to increase public-private partnerships supporting innovation, commercialization, and entrepreneurial activities, at the University of Maine; a Commercialization Work Group (CWG) was convened. The CWG sought input from faculty, staff, businesses and industry leaders to inform their process and recommendations. Working with Shanna Cox of Project Tipping Point, the CWG decided to use a two-phase approach- the administration of an electronic survey tool and engaging in-person with stakeholders. The survey was used to gain preliminary insight and inform the question sets used with focus groups. This summary outlines the themes from the business and industry stakeholders during the in-person discovery efforts, and represents 23 individuals' responses from three focus groups and three interviews with key informants.

University of Maine Innovation Related Services

Awareness of Services

Discussion in focus groups reflected that most individuals were only aware of the services they had themselves used, and often participants were surprised to learn of additional services, facilities, and programs offered through the discussion. The private sector participants noted an awareness of innovation related services in three predominant areas:

- **The facilities at UMaine-** Composites facility, Advanced Manufacturing Center (AMC) and a wide range of specific labs.
- **The people of UMaine**- Specific employees, close working relationships, and student internships and externships.
- **Specific programs and services-** Testing, prototyping, business planning and 3D printing.

When asked how they became aware of innovation related services, participants most frequently noted personal relationships and industry events. It is important to note many participants responded by stating a general lack of awareness exists about UMaine commercialization and innovation activities and services. One individual stated "As a graduate, I didn't know [about the services], but our marketing director reached out to ask. He didn't know either." Another long-term partner stated "I am not on any mailing lists- I have to see it on Twitter. I have been a partner for 6 years." The most noted ways in which participants become aware of UMaine's services included:

- **Personal relationships-** Specific UMaine employees, undergraduate and graduate students, and colleagues and teammates of the participants.
- **Ecosystem partners and events**- Maine Technology Institute, Maine International Trade Center and industry specific organizations were often noted.

Service additions and improvements

Participants were asked to identify services they would like to learn more about, or to see added to UMaine's offerings. The most common responses revealed that participants would like the University to consistently connect and coordinate across departments and disciplines. Requests for additional or enhanced services included:

- **Coordination of services**- The most noted examples included adding a liaison or navigator to aid business and industry clients in navigating the process, departments and disciplines.
- **Additional programs or facilities** - Marketing, business planning, market research, programming, electrical engineering, and adding facilities in southern Maine.
- **Increased outreach and information**- Proactive outreach from UMaine that informs the business and industry sectors about current projects, patents available for licensing, and University wide activities and successes.
- **Connections to resources**- Participants desire connections for themselves and UMaine staff to grants, funds and aligned businesses.

When participants were asked to identify improvements to their public-private partnership experiences, they noted a desire to see cross-discipline integration, consistency across departments, and tailored services and experiences. Requests for improvements included:

- **Consistency and integration-** Participants noted great disparity in experiences from department to department, and disconnects between departments and disciplines that are barriers to their success.
- **Tailored services-** Services that account for cross-discipline projects, business size and maturity, while providing a breadth of expertise.
- **Non-compete clarity**- Multiple participants noted that UMaine's services can be in direct competition with Maine businesses- often businesses engaged in public-private partnerships. Participants believe clear policy and transparency would improve relationships.
- **Including disciplines in commercialization**- Participants noted the needed addition of health sciences, biomedical, electrical engineering and programming into UMaine's commercialization activities.

University of Maine Public-Private Partnerships
Critical Factors

Participants were asked to describe the critical factors they consider before entering into a public-private partnership, as well as defining the criteria they gauge a successful partnership experience. The most important factor in a public-private partnership was the pace of work- participants desired a clear timeline of the project and gauged success by the level of urgency and responsiveness they experience. One participant asks before entering a partnership, "can they do it on a business timeline- are we on a student schedule". The critical factors, in order of frequency, include:

- **Pace of work**- The responsiveness, length of contracting process and sense of urgency.

- **Intellectual property**- Clarity regarding ownership of IP, handling of trade secrets, access to patents and licensing.
- **Costs and revenue**- Determining and adhering to a cost, potential for revenue from commercializing, and return on investment.
- **Access to expertise, technology and support systems**- The participants noted a desire to access experts, current technology and facilities at UMaine, as well as UMaine's network of connections.
- **Satisfaction**- Participants desire a personal approach, and consider if the services were recommended to them, and if they would recommend UMaine to others.

Successes

Participants were asked to describe their best experiences partnering with UMaine. They were quick to note personal relationships and personal approaches as major contributors to their success and satisfaction. Components of business and industry participant's best experiences included:

- **People and personal relationships**- Including Mike Bilodeau, John Belding, Jake Ward and Mike Nason.
- **Facilities and infrastructure-** Investments in, and excellence of infrastructure and facilities included positive remarks about the Foster Center, Advanced Manufacturing Center, testing facilities and food and nutrition science facilities.
- **Available expertise-** The ability to connect with subject matter experts, with one participant noting "the best results have come with finding the right subject matter expert. The University has hundreds of experts- finding the right one is what adds value."
- **Connections to networks-** This included other businesses, supply chain supports and industry specific contacts.

Opportunities for Further Exploration

Consider UMaine's role in workforce development

Business and industry participants view UMaine students as one of the University's greatest contributions to innovation and their businesses. Considerations included:

- **Connecting students to businesses-** Expanding and promoting internships and externships, working to fill open positions, and preparing students with field experience.
- **The ripple effect-** Contracting with local manufacturing businesses and the manufacturing association to connect local jobs to innovations at UMaine.

Consider how to move patents to market

Participants noted that some UMaine employees think negatively of commercialization and prefer to stop at research. Others noted that moving patents to commercialization should be a high priority. Considerations included:

- **Incentivize and support employees-** Support UMaine staff and faculty in understanding commercialization and innovation efforts, and incentivize research resulting in patents.
- **Create a tech transfer system-** Include patent attorney supports for researchers, and staff dedicated to promoting and matching patent licensing opportunities.

Consider increasing communication and connectivity

Participants noted the greatest area to improve was communication that connects the business industry to the University, and throughout the University.

- **Market services directly to the private sector**- Clarify services offered, access points for services, and pathways to commercialization at UMaine.
- **Emphasize the role of patenting and intellectual property-** Communicate the current or future services offered, and identify patents available for licensing.
- **Outreach directly to business and industry-** Use traditional marketing, and continue to connect through social networking events, targeted conversations, and ongoing relationship building.
- **Increase understanding**- Support faculty in understanding the connection between academic work, innovation and commercialization, and create inter-disciplinary teams tailored to projects.

Improving processes used in partnering with UMaine

- **Reduce response time** from UMaine faculty and support staff.
- **Build and strengthen relationships** with the private sector, using personal approaches and customer centered policies, procedure, and methods.
- **Explore ways to minimize paperwork,** for both side of the public-private partnership.
- **Increase the staff time** spent supporting partnership processes and activities, including adding administrative staff in the DIC, and adding teaching/lecturing staff to support faculty.

Appendix D2

University of Maine Commercialization and Innovation Discovery

Summary of Internal Themes

Context

In an effort to increase public-private partnerships supporting innovation, commercialization, and entrepreneurial activities, at the University of Maine; a Commercialization Work Group (CWG) was convened. The CWG sought input from faculty, staff, businesses and industry leaders to inform their process and recommendations. Working with Shanna Cox of Project Tipping Point, the CWG decided to use a two-phase approach- the administration of an electronic survey tool and engaging in-person with stakeholders. The survey was used to gain preliminary insight and inform the question sets used with focus groups. This summary outlines the themes from faculty and staff stakeholders during the in-person discovery efforts, and represents 34 individuals' responses from three focus groups.

University of Maine Innovation Related Services

Awareness of Services

Discussion in focus groups reflected that most individuals were aware only of the services they had themselves used, and often participants were surprised to learn of additional services, facilities and programs offered through the discussion. Faculty and staff noted an awareness of innovation related facilities, and expertise, notably:

- **The facilities at UMaine-** Department of Industrial Cooperation, laboratories and business centers.
- **The expertise at UMaine**- Research programs and private sector advisors.

It is important to note nearly half of faculty and staff responses indicated a negative perception of innovation related services when asked about their awareness of services. Negative perceptions included:

- **Intellectual property (IP)-** One focus group unanimously stated a lack of support dealing with intellectual property. Other repeated comments included lack of trust and transparency regarding IP as a barrier to public-private partnerships.
- **UMaine as a barrier to innovation-** Inconsistencies across the University, lack of supports for larger businesses and internal disconnection were cited as barriers to innovation services.

When asked how they became aware of innovation related services, participants most frequently noted awareness was a result of self-guided discovery. It is important to note many participants responded by stating a general lack of awareness exists about UMaine commercialization and innovation activities and services. The most noted ways in which participants become aware of UMaine's services included:

- **Self-guided discovery-** Faculty and staff often ask colleagues and community members about available services, and usually as a result of necessity.
- **Faculty and mentors**- Working with faculty and mentors on innovation projects resulted in increased familiarity.
- **Department of Industrial Cooperation**- A minority of responses noted contact initiated by the DIC, often

after they had received funding.

Faculty and staff were asked what role, if any, they might have in increasing awareness. The majority of responses indicate that faculty and staff feel they don't have and/or shouldn't have a role in increasing awareness. Their responses fell into three clear categories:

- **Faculty and staff don't have a role-** Participants noted increased awareness is the University's role, ideally through increased marketing. Many participants noted a strong negative response, stating "Don't give us another assignment".
- **Ambassadors off campus-** Participants noted a desire to be available to attend off campus opportunities at trade shows and conferences, and directly with companies. A small number of participants commented on current social media and web activities being taken to increase awareness.
- **Ambassadors on or from campus-** Participants noted engagement in current activities and a willingness to engage in future on campus activities, including public programming and events. Participant's also note that publishing and sharing research is an on-campus activity that results in increased awareness.

University of Maine Culture of Innovation

The current culture at UMaine

Faculty and staff were asked to describe UMaine's current culture supporting innovation and public-private partnership. The responses were limited, with participants quickly describing opportunities to improve the culture. The two common responses describing the current culture were:

- **Specific programmatic supports-** Participants described specific programs, centers and student efforts that cultivate a culture of innovation, including capstone and internships and the Innovation Center.
- **Inconsistency of culture-** Participants noted inconsistencies throughout UMaine that prohibit a cohesive culture. This included differences by department regarding the promotion and tenure criteria, adaptability and willingness to change, and levels of support for innovation activities.

Opportunities to improve the culture

Faculty and staff focus groups spent a disproportionately higher amount of time offering suggestions and identifying barriers to achieving a strong culture of innovation. Most notably, more than half of the responses regarded additional resources. Faculty and staff noted these opportunities to improve the innovation culture:

- **Provide additional resources-** As the most significant theme among participants, additional resources included:
  - Additional staff supports for faculty and staff
  - Additional staff supports for commercialization and the DIC
  - Providing coordination between centers, staff, faculty and private sector contacts
  - Providing financial supports, including monetary rewards, funds for technology and funding for programs
  - Providing time away from teaching responsibilities for engaging in commercialization activities

- **Clarify purpose and policies**- Faculty and staff would like to better understand UMaine's vision for innovation and commercialization, see the vision reflected in clarified promotion and tenure policies, and see transparent consistent policies throughout the University.
- **Adapt to private sector needs**- Participants stated increasing adaptability to the needs of businesses would support a desire to increase public-private partnerships.
- **Provide recognition**- Participants noted a desire to feel valued and recognized, both internally and externally, including increased marketing of UMaine innovations and successes to the public.

University of Maine Public-Private Partnerships
Critical Factors

Participants were asked to describe the critical factors they consider before entering into a public-private partnership, as well as defining the criteria they gauge a successful partnership experience. The most important factor in a public-private partnership was the availability of resources. The critical factors, in order of frequency, include:

- **Available resources**- Faculty and staff consider the available time, financial resources and students before taking on a public-private partnership. When gauging a partnerships' success, a small number of faculty and staff consider impact to future earnings, and revenue or resources brought into the University.
- **The benefits and impact to UMaine and Maine**- Participants consider the potential or realized impact to education and students at UMaine, Maine companies and Maine's economy, and potential publicity for UMaine.
- **The impact on promotion and tenure**- Participants consider the ownership of IP, ability to patent, and the ability to publish; as well as the impact on their promotion and tenure track.

Opportunities for Further Exploration
Set a clear vision and strategy

Participants want to better understand the defined role of commercialization at the University, and the strategy the University is using to support innovation. Their comments included a desire for the strategy to address:

- **Geographical focus**- Clearly defining a desire to impact innovation in Maine expanding past the I-95 corridor.
- **Faculty and staff training and orientation** – Setting a system for creating consistency in knowledge and awareness of services throughout the University.
- **Addressing the seven sectors**- Determine the relationship between the seven sectors and UMaine's programs, departments and disciplines.

Consider increasing communication and connectivity

Participants noted the greatest area to improve is in communication that connects the business industry to the University, and throughout the University.

- **Market services directly to the private sector**- Clarify services offered, access points for services, and pathways to commercialization at UMaine.
- **Emphasize the role of patenting and intellectual property-** Communicate the current or future services offered, and identify patents available for licensing.
- **Outreach directly to business and industry-** Use traditional marketing, and continue to connect through social networking events, targeted conversations and ongoing relationship building.
- **Increase understanding**- Support faculty in understanding the connection between academic work, innovation and commercialization, and create inter-disciplinary teams tailored to projects.

Align and increase resources with innovation goals or strategy

Participants require additional resources to support any goals UMaine has for increased public-private partnerships, and increased innovation and commercialization. These include:

- **Additional human resources**- Add staff in the DIC, add administrative supports to faculty and research departments, and supply navigators or coordinators that improve the connections within the University, as well as improve the connections between faculty and the private sector.
- **Additional time for innovation activities**- Consider the competition for faculty's time from teaching, advising, researching and publishing demands.
- **Provide financial resources**- Faculty would like to see financial resources that improve technology in their departments, supports their department's or center's budget, or compensate them for their efforts.

Engage faculty and staff in this improvement process

Participants voiced concern their time providing input in the survey and focus groups would not add value or create any changes. They desired:

- **Feedback indicating their value-** Including recognition of what was heard in the process, and individual recognition in their efforts to support innovation and commercialization.
- **Transparency-** Requesting transparent outcomes and information from the process.
- **Clear next steps-** Requesting information about what changes might occur, their role in implementation and what value they are expected to add.

Appendix E

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UNIVERSITY OF MAINE SYSTEM

From: Thomas Connolly, Assistant General Counsel
To: Larry Lewellen, Vice President for Human Resources
RE: University Ownership of Intellectual Property

Mr. Lewellen,

You requested for our office to provide a review and advice regarding the University's policy of ownership of Intellectual Property developed by faculty, particularly in light of recent case law imposing new requirements on such policies. The following presents a brief description of the background for this topic, the issues faced by the University, and discussion on suggested steps to take and potential challenges to implementing them.

Background

In 2011, the Supreme Court held in the case of Stanford v. Roche that language used in an employment contract with the university wherein faculty "agree to assign" their intellectual property (specifically patent) rights did not create automatic assignment of the faculty's invention patent rights, but rather a promise to assign those rights in the future. The Court determined that superior language was used in third-party contract entered into by the faculty member – "I will and do hereby assign." The Court determined that this language resulted in the creation of a present future assignment that is valid and binding. The Court further discussed how a claim of ownership can only be fully secure against Bona Fide Purchaser (one who pays for an item without knowledge of any other person's claim to that item) if a future assignment has been recorded with the Patent Office, but that online posting of an IP policy may be asserted as constructive notice to BFPs of the University's superior rights in IP.

The University of Maine System Intellectual Property Policy

The current IP policy claims to automatically vest ownership of patent and some copyright rights in the System, but does not contain valid present-future assignment language, as identified in Stanford v. Roche. In the current policy, ownership is tied to a faculty member's employment responsibilities, the funding of the research project, and/or the degree of use of University Resources. Ownership transfer is mandated whenever faculty participates in sponsored projects, makes significant use of University Resources, and/or engages in teaching/research/service projects. If funded by grant, the policy dictates ownership is based on terms of the grant as negotiated by the University. A written exception to the policy is needed before entering into an agreement with a third party that changes the ownership rights established by the policy. Individual ownership by the faculty member is allowed only where developed independently from University functions and funding and when only incidental use of University Resources occurs in its invention.

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Policy Recommendations

An IP policy with correct present-future assignment language is enough to give effect to such assignments without the signature of the inventor. But, the terms of employment in either a letter or agreement should have language directly subjecting the employee to the policy, similar to the language used in the Applicability section of the current policy. As such, it is recommended that the policy be revised to include this assignment language and employment agreements and/or letters of appointment be reviewed to ensure employees are being properly subjected to University policies. To this end, please find attached with this memo a document containing excerpts from the IP Policy with suggested language for addition.

Additional Policy Considerations

Since the policy includes the right of the University to negotiate its own agreements with sponsoring organizations, we may want to consider including a statement of our rights in any outside consulting agreements that we negotiate, although this is not necessary to include in the written policy.
We may also want to consider training faculty in language appearing in contracts with third parties that should be brought under scrutiny to avoid unintentional assignments.
Finally, consider this possible faculty position: having a catch-all automatic ownership policy is considered by some to be impinging academic freedom of faculty. Similarly, while employment agreements can have a term requiring assignment of all IP rights, such is generally considered a harsh term that also infringes academic freedom.

Conclusion

In light of the holding of Stanford v. Roche, it is clear that the current policy used by the System would most likely be considered ineffective at assigning Intellectual Property rights to the University. As such, the suggested revision should be considered for addition to the Intellectual Property Policy to cover this legal gap. Additional steps may be taken to ensure security of ownership as well and will help to avoid accidental assignments to third-parties by faculty. Altogether, the University's interests in IP rights should be balanced against the impact such a policy may have on University employees.

If you are in need of additional information or have any questions regarding this memo, please do not hesitate to ask.

Regards,

Tom Connolly, Assistant General Counsel

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VI. PRINCIPLES OF OWNERSHIP

Inventions:

An Invention resulting from activities related to an individual's employment responsibilities, with support from University-administered funds, and/or from significant use of University Resources shall be owned by the University. Developer agrees to assign and does hereby assign all rights, title, and interest that he/she may have, both present and future, to any and all Inventions subject to this paragraph.

An Invention unrelated to an individual's employment responsibilities that is developed on his or her own time without University support or with only incidental use of University Resources is owned by the inventor.

Ownership of an Invention developed in the course of or resulting from research supported by a grant or contract with a federal, state, local or foreign government (or an agency thereof), or a not-for-profit or for-profit non-governmental entity, shall be determined in accordance with the terms of the sponsored grant or contract, or in the absence of such terms, shall be owned by the University.

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Tangible Research Property:

The University owns all right, title, and interest in Tangible Research Property related to an individual's employment responsibilities and/or developed with support from University Resources. An employee shall turn over or make available any and all Tangible Research Property including but not limited to research data, records, and any associated materials in their possession to the Intellectual Property Office prior to and upon the completion of their employment. Depending on the nature of the work, employees may be authorized to retain a copy of such data or materials.

In general, Tangible Research Property shall be managed as an Invention with the distribution of income from the licensing and/or commercialization of such Tangible Research Property made in accordance with the distribution of income schedule outlined herein.

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The administration of the policies set forth in this document is the responsibility of the Chancellor through the University's Intellectual Property Office.

The Intellectual Property Office provides assistance to University developers relative to the implementation of patent and copyright policies, provides counsel on intellectual property matters, and assists faculty and administrators with conflict-of-interest issues related to technology transfer and entrepreneurial activities. The rights and obligations of developers and the University are described herein. Cognizant University administrators have a primary role in monitoring adherence to, and advising personnel on, University policies in these areas. In turn, administrators are encouraged to avail themselves of Intellectual Property Office services, particularly on the more complex issues. To enhance awareness of University policies and procedures, the Intellectual Property Office conducts an ongoing series of information meetings on intellectual property matters, conflict-of-interest, and technology transfer aspects of outside activities.

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GENERAL PRACTICES AND PROCEDURES

Inventions:

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University personnel who believe they may have developed an invention should immediately notify the cognizant University administrators and the Intellectual Property Office. They will be asked to complete an invention disclosure form by the Intellectual Property Office. The invention disclosure defines the nature of, and provides the basis for a legal claim to, the invention in question. Invention disclosures are evaluated for patentability and market potential by the Intellectual Property Office. A preliminary patent search is generally performed using the computer facilities of the University Libraries. If this process suggests that the invention has significant commercial potential, the following sequence is set in motion.

1) The University has a contractual obligation to inform sponsoring agencies of inventions. Upon disclosure, the Intellectual Property Office will review contractual obligations to sponsors for: (a) invention reporting obligations; (b) the timely filing of patents; and, (c) election of title consistent with terms of the contract.

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Related Issues:

The commercial exploitation of inventions, in the form of products and processes for business and industry, is a highly competitive enterprise. It is therefore critical that inventors begin the disclosure process as soon as the possibility of an invention becomes evident. Delays give others an opportunity to establish a claim, which may deprive an original inventor of his/her rightful recognition and compensation. Some other considerations follow.

1) In general, it is prudent to delay the oral disclosure or publication of research details that are specific to an invention until such time as the invention has been evaluated and, as appropriate, protected. Such decisions, however, should not be allowed to adversely affect the progress of students toward their degrees. In most cases the omission of information from publications that would compromise a commercial application does not impede the free flow of fundamental knowledge. In particular, inventions in a University setting are usually practical manifestations of an underlying body of fundamental knowledge. As such, one can frequently engage in the free exchange of basic ideas without compromising the practical application. If inventors have questions about the disclosure or publication of research, they are encouraged to discuss the matter with the Intellectual Property Office.

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6) Consulting contracts sometimes contain provisions that limit the disposition of research results, including intellectual property, in promising research areas. They should be examined to ensure that the assignment of rights to intellectual property evolving from consulting activities does not conflict with the patent agreement signed by all University employees. Language included in consulting agreements may seek to assign rights to intellectual property where organizations engaging faculty services have legitimate prior claims to the development(s) in question. Examples include consulting activity leading to the refinement of an existing product or process, or to a development for which background patents or prior art claims exist. In any case, faculty should bring all institutional consulting contracts to the attention of cognizant University administrators prior to executing them. No assignment of intellectual property rights of any kind may be made without University approval.

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IX. RESPONSIBILITIES OF THE PARTIES

Appendix E

Responsibilities of the Inventor or Author:

Responsibility for timely disclosure of Intellectual Property subject to this policy rests with the developer(s) who shall take all reasonable steps, including the execution of assignments where necessary, to permit prompt evaluation of the Intellectual Property and perfection of patent or other rights.

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Employees of the University who believe that they have invented items outside the scope of this policy shall not file, or permit others to file in their name, patent applications without providing at least thirty days notice and a statement of the circumstances of the invention to the University through the Intellectual Property Office. Upon request, additional information as to the nature and circumstances under which the item was developed and a copy of the invention disclosure shall be provided.

Individuals planning to engage in consulting or business activities, and those charged with approving such plans on behalf of the University are responsible for ensuring that any related agreements with external entities are not in conflict with this policy or other commitments involving the University. All consulting contracts shall be reviewed by cognizant University administrators for the potential of such conflicts prior to their execution.

Written approval from the University's Intellectual Property Office must be obtained before Tangible Research Property associated with products of University research is transferred to any person or entity for commercial purposes. Tangible Research Property belonging to the University includes, but is not limited to, models, devices, designs, computer programs, cell lines, antibodies, recombinant materials, chemical compounds, compositions, formulations, plant varieties, records concerning inventions or discoveries, and collections.

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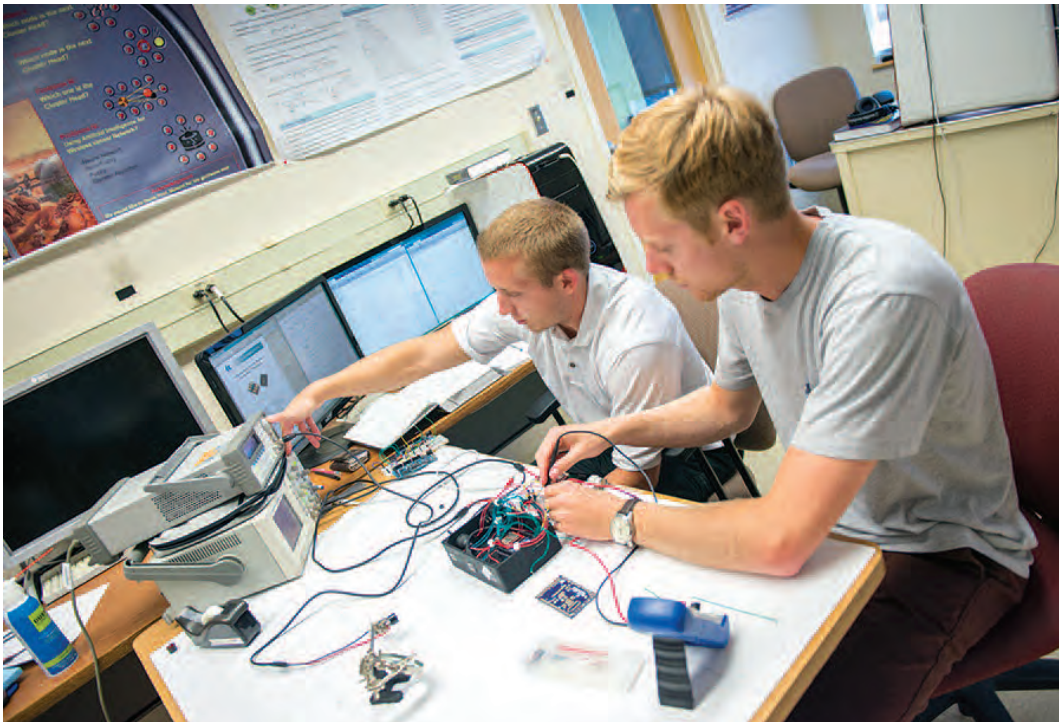

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