

## **VPAC Report on Faculty Perspective of Technology Transfer & Commercialization at CSU**

January 7, 2015

**Overview:** Entrepreneurship and innovation, including technology transfer (TT), are critical pieces of the overall mission of CSU and the Office of the Vice President for Research (OVPR) that includes capitalizing on opportunities to address global challenges. As such, the OVPR seeks to team with CSURF and CSU Ventures to build a culture of innovation through a partnership that promotes and encourages faculty and students to explore the patenting, licensing, and commercialization of their ideas and discoveries. To that end, the OVPR has enlisted the assistance of the VPR's faculty advisory committee (VPAC) to examine the current climate for technology transfer at CSU *from a faculty perspective*.

The information in this report from VPAC to the VPR arises from extensive communication with Ventures, review of best practices at other institutions, individual conversations and correspondence with faculty as well as an electronic survey sent to faculty and other senior researchers at CSU. The report contains three primary components: (1) a summary of the findings of a brief faculty survey conducted in November 2014 by VPAC/OVPR; (2) VPAC's recommendations for metrics to be used by OVPR and Ventures to track progress in the realm of technology transfer at CSU; and (3) recommendations from VPAC regarding potential steps forward to enhance and develop technology transfer and to build a strong culture of innovation and commercialization at CSU.

### **Part I: Summary of VPAC Tech Transfer Faculty Survey (November 2014)**

A survey was deployed to a PI user list maintained by the OVPR, which contains emails for ~650 faculty and senior researchers as well as a few administrators. The survey (attached to this report) was live for ~1 week and no reminder emails were sent out during the week the survey was active.

- The survey attracted broad representation in respondents:
  - Total of 178 responses were received (~27% return rate) with 161 completed surveys
  - All ranks of faculty, as well as senior researchers on campus were represented, with the largest cohort being Full Professors (48% of respondents). Of the entire cohort, 83% were faculty (either current, emeritus, or retired).
  - All 8 colleges were represented, with College of Natural Sciences, College of Veterinary Medicine and Biomedical Sciences, and Warner College of Natural Resources representing the top 3 and the Colleges of Engineering and Agricultural Sciences tied for fourth with respect to number of respondents.
- Technology transfer was overwhelmingly viewed by respondents as an important, fundamental priority of the University, with 87% of respondents ranking it as "important" to "very important".
- Respondents had some experience with invention disclosure (38%), and many reported having interacted with Ventures (53%), although ~6% were not sure on the latter question (e.g. knew about CSURF, but not Ventures).
- Of those who had interacted with Ventures, most had done so within the last 12 months (58%). In general, interactions with Ventures crossed all TT activities, with the most frequently cited activity being filing of invention disclosures (53%) and patent filings (34%), but only 10% of respondents had worked with Ventures on market analysis. Many reported other interactions, including, most frequently, consultations with Ventures staff, most often regarding possible invention disclosures.
- When asked to respond on their interactions with CSU Ventures, faculty had the following observations [numbers in parenthesis provide % of respondents selecting "agree" or "strongly

agree” on a 4 response scale (i.e. the other two responses were “disagree” or “strongly disagree”); this does not include respondents who selected N/A for a particular question]:

- The technology transfer process through Ventures was seen as fairly positive, with Ventures scoring high marks for being helpful in navigating protection of IP (75%) and useful in the patent process (78%); the Ventures staff are considered easy to interact with (84%) and are friendly and customer-service oriented (89%).
- However, Ventures staff were generally perceived as not having the appropriate or specific background and experience needed to help with marketing of inventions (46%) or to help with guiding inventions to the market (61%), with faculty also being split on whether it was easy to patent an invention (60%).
- The overwhelming majority of faculty feel the technology transfer process at the university should be focused on meeting the needs of CSU faculty in the tech transfer realm (97%), whereas a much smaller fraction feel that we should be focused on return-on-investment (ROI) (50%). Recognizing that it is important to maintain faculty and university integrity, some faculty reported feeling that Ventures staff may be placing too much emphasis on faculty conflict of interest (33%).
- Although the majority of faculty felt they understood invention disclosure and patent application processes (70%), many agreed that they would like to better understand these processes, but perhaps were not sure where to find appropriate resources (44%).
- Respondents also felt that the university should invest more capital in the protection of the intellectual property of faculty (69%), for example by increasing Ventures’ annual patent budget.
- Half of the respondents said they felt that the Ventures student ambassadors program was a good investment, but it should be noted that only 40 respondents chose to answer this question, suggesting a broad unfamiliarity with this relatively young Ventures program.
- From the open-ended question requesting feedback, comments, or any additional information, more insight was gained. Notably, 48 respondents provided comments, and although a few of these were simply “nothing to add” types of comments, many were much more wide-ranging in their content. Below are a few of the take home messages and faculty perceptions derived from these comments
  - Ventures is under staffed and/or under budgeted to perform appropriate technology transfer activities across the wide spectrum of research being performed at CSU
  - There are major gaps with respect to the knowledge base of technology transfer personnel and the infrastructure at CSU does not adequately support technology transfer and commercialization activities.
  - Not enough emphasis is placed on being service and education-oriented toward faculty inventors – additional training, educational programs, and assistance throughout the many stages of technology transfer is lacking. Overall, there is a sense from the comments that faculty are frustrated with their experiences and attempts at patenting and/or marketing their discoveries. That being said, there is also a sense that faculty would welcome true mentoring and education of every stage of the process.
  - There seems to be a great deal of murkiness among faculty with respect to Ventures functions, processes, who to contact about what and virtually every other aspect of working through technology transfer activities.
  - There is some consternation and frustration among faculty about time, effort, and financial resources being spent on activities that are not necessarily “counted” in the tenure and promotion process.

## **Part 2: Metrics for Tracking Success in the Technology Transfer Regime**

Through extensive conversations with Ventures, it is clear that Ventures had done a good job of using quantitative metrics to track the success of TT at CSU. Nevertheless, we recommend some adjustments to these and that new performance metrics be instituted to track the quality of support for technology transfer and innovation. In general, the VPAC members felt strongly that customer satisfaction and quality (and depth) of service to the faculty should be the top goal for the technology transfer operation at CSU. They also felt that ROI performance and efficiency should be a secondary priority goal. The overriding principle here is that the faculty would prefer to see that the mission/metrics of our technology transfer operations be focused on the raw metrics, but also demonstrate the impact of the scholarship associated with technology transfer. In particular, the VPAC are interested in seeing metrics that are not necessarily fiscal in nature being used to track technology transfer. For example, sometimes the intellectual property developed by faculty has a meaningful impact on society, without a huge financial return on the investment. Some of these also represent reputational enhancements to the University. Thus, the list below attempts to reflect financial metrics as well as other non-fiscal numerical and qualitative data.

In terms of timeframes for reporting, VPAC recommends that metrics be reported where possible both with annual figures and with a 5-year running average as TT is a long-term process, that often does not come to fruition in one year or even a couple of years.

### **Metrics to track & trend:**

1. Overall faculty satisfaction rating (10 point scale, based on aggregate score from annual survey to be developed jointly between CSU faculty and Ventures staff). This should tap into various aspects of the IP/TT process.

#### *Fiscal metrics:*

2. Metrics normalized against CSU research expenditures:
  - a. # of inventions disclosed
  - b. # of licenses and/or options granted
  - c. # of start-up companies
  - d. Aggregate licensing revenue
3. Metrics normalized against CSU Venture annual budget:
  - a. # of inventions disclosed
  - b. # of licenses and/or options granted
  - c. # of start-up companies
  - d. Aggregate licensing revenue
4. Metrics normalized against CSU Ventures patent expenditures:
  - a. # of inventions disclosed
  - b. # of licenses and/or options granted
  - c. # of start-up companies
  - d. Aggregate licensing revenue
5. Economic development metrics related to CSU start-ups:
  - a. Total SBIR/STTR/grant & contract revenue (aggregate)
  - b. New jobs created
  - c. Total private equity & debt raised (aggregate)
6. Creation of a composite scoring that normalizes against multiple factors such as both research expenditures and patent budget
  - a. Could provide an aggregate, multivariate score for overall tech transfer “health” at CSU

#### *Non-fiscal metrics*

1. Interactions with faculty and students
  - a. # faculty consultations by Ventures staff
  - b. # student consultations by Ventures staff
  - c. # presentations/group interactions by Ventures staff (e.g. attended faculty meeting in Dept. X to discuss TT/IP issues)
  - d. Interactions/activities by Ventures Student Ambassadors with either students or faculty
2. Stories/outreach/impact of TT/IP generated by faculty
  - a. Reputational enhancement

### **Part 3: Preliminary Recommendations:**

*General:* A culture of entrepreneurship and innovation in a university setting is not likely to reside in a single entity. At CSU, it can be found in multiple colleges (e.g. the College of Business' Institute for Entrepreneurship) as well as within the Office of the Vice President for Research and at CSU Ventures. VPAC believes it is not the responsibility of a single entity, but rather shared stewardship that will allow the discovery and innovation ship to sail farthest. Furthermore, as the university is a key steward of education and knowledge, we must be careful to not lose the public trust in one of our primary missions, namely to generate new knowledge, in the pursuit of potential monetary returns via TT that may disappear if findings (or products) do not materialize. We must, therefore, seek an appropriate balance between these two important institutional missions.

Below are some recommendations developed by VPAC based on the faculty feedback we received via the survey as well as through multiple conversations with faculty and others involved in the technology transfer process at CSU and elsewhere.

1. Additional emphasis should be placed on education and training of both faculty and trainees (graduate students and postdoctoral associates). Many researchers do not have a clear idea of what it takes to get an idea through the IP/TT process or when/why one might chose to do this. For example, faculty and students within the College of Liberal Arts have expressed interest in learning more about possibilities for startups with which they could relate (whether from CSU or other academic institutions) to provide ideas of what might be possible in the IP/TT world. In some instances, faculty overvalue their ideas relative to the cost of commercialization which can create expectations that are difficult to meet. In addition, many faculty are likely to be naïve about the legal ramifications of signing invention disclosures as well as the subsequent steps in the process. *Having regularly scheduled trainings as well as deliberate reaching out to specific groups of faculty on campus would enhance the overall technology transfer "IQ" of the campus.*
2. In general, many of the activities associated with the technology transfer process are intertwined between the Office of Sponsored Programs (OSP), Ventures, and OVPR. Often it is difficult for faculty to navigate these offices in an effective and efficient manner. *Better integration of these offices, especially around the TT process, would significantly enhance the climate for entrepreneurship on campus.*
3. One of the key themes that has arisen from VPAC's discussions with faculty is that there is an overwhelming sense that the TT process at CSU should be faculty focused with a service mentality wherein the faculty (and other inventors) are the customers. It is generally recognized that not all IP generated at the university represents an opportunity for significant return on investment; however, creating a culture of entrepreneurship requires that the mechanisms by which inventors explore the opportunities offered by their discoveries be open, transparent, and inventor-centered, rather than an attitude of gatekeeping at each stage of the process. *Accountability and internal processes to receive and address feedback and concerns from clients*

*should be developed and faculty should be made aware of these processes. Ideally, there would be a faculty liaison/advocate to manage these concerns (see recommendation 5). These internal processes and outcomes should be reported as part of the annual metrics and faculty satisfaction survey mechanism proposed in Section 2 of this report.*

4. One mechanism that was recognized as being key to creating a culture of entrepreneurship that is faculty centered revolves around streamlining of business processes within the technology transfer operation. *Specifically, it is recommended that templates for all technology transfer and commercialization processes be streamlined and that more transparent processes and procedures be created and communicated broadly to the campus community. In particular, the template for licensing to a CSU startup is complex, focused on maximizing revenue and does not appear supportive of CSU startups. Note that other academic institutions have addressed this with good results (see for example, UNC's model: <http://www.xconomy.com/national/2010/09/21/a-one-size-fits-all-license-agreement-the-holy-grail-of-tech-transfer/>). Negotiation processes can appear to be adversarial in nature rather than a partnership building enterprise. As noted elsewhere, this approach does not support the creation of a culture of innovation and entrepreneurship.*
5. The faculty recognize there are some natural friction points that are inevitable when decisions need to be made about whether to financially support specific inventions. Given the limited resources available to push forward inventions from a financial standpoint as well as the need to support and mentor faculty through the process, Ventures personnel should have clearly defined and articulated roles responsibilities. *Creating a structure within Ventures that provides (1) primary points-of-contact for faculty that largely serve in a mentorship/liaison and faculty (inventor) advocate role, but who are also involved in legal discussions and (2) mechanisms for separate personnel (and not just attorneys) to manage legal negotiations for licensing or startups. (3) Explore options for advisors outside CSU that could help inform faculty when and why CSU is not going to financially support an invention (see recommendation 10 below).*
6. Technology transfer is not a “one-size fits all” enterprise. In many instances, it is not always clear what the end result is or should be (e.g. should a startup company be formed or a not-for-profit entity?). In a university setting, creativity and flexibility should be highly valued and cultivated, suggesting money does not have to be the only form of compensation in a commercialization trade (i.e. reagents, lab equipment, etc. could also be considered). *Thus, each technology (and/or potential startup) should be approached with an open model. Licensing agreements should be reasonably negotiable with the overall aim being to develop an agreement that moves the technology forward and provides the most-long term value for the university and the inventor(s) and/or the greatest impact. The environment for licensing technology should include support for faculty who wish to commercialize their IP via a startup. Again, the approach here should be one of partnership with respect to the inventor(s), the IP created, and the encouragement of formation of startup companies. It is further recommended that some of the longstanding legal interpretations of rules/processes regarding revenue generation and licensing processes should be revisited to increase flexibility in the system. Additionally, to protect department resources and faculty workloads, department chairs/heads should be explicitly involved in the processes around formation of startup companies.*
7. A key element to the IP/TT process includes appropriate marketing of an invention. This was identified by faculty as a potentially large gap in the process at CSU. Clearly, it would be impossible for an operation the size of Ventures to have precisely the expertise needed to properly evaluate the market potential of all disclosed technologies. *Nevertheless, additional resources should be focused on providing Ventures with support to do just this. As part of this effort, faculty need to be mentored in how to effectively evaluate market potential as well. The TT*

*process would be greatly facilitated by having both Ventures staff and faculty who understand the importance of product-market fit along with instruction/information provided in the context of the university technology transfer process. Regular workshops on IP, customer discovery, etc. specifically focused on marketing of discoveries should be held by Ventures staff, perhaps in partnership with members of the College of Business.*

8. Another piece of the IP/TT process is the process of founding and running startup companies, not just in licensing technologies to existing companies. *Formation of a separate team focused on this aspect of technology transfer would be useful. Alternatively it could be outsourced to an industry advisory board (not unlike boards currently used by a number of departments on campus). The current Ventures board could serve in this capacity if it has the requisite knowledge base in startups and small business development.*
9. Although many faculty believe the Ventures Student Ambassadors program is highly valuable, there is also some concern that perhaps the students are not being utilized to their full advantage and/or are being relied on too heavily for outreach. *Further development of this program should be encouraged, but Ventures staff should be directly involved in their activities to ensure that students are not being placed in difficult situations. Involving faculty with interests in the IP/TT process in the student ambassadors program could also help optimize this program to provide maximum benefit for both the students and the technology transfer community at CSU.*
10. An effective partnership requires clear communication and inclusive opportunities to provide feedback. Moreover, developing stronger ties between OVPR and Ventures to truly enhance invention and discovery at CSU and advance the strategic research mission of the university will require many voices at the Table. *To that end, it is recommended that Ventures evaluate and expand its advisory entities. Specifically, VPAC has three recommendations in this regard. (1) The current makeup of the Ventures advisory board should be evaluated and potentially changed/expanded to accommodate diverse members of the business community where “diverse” recognizes the many different types of businesses as well as demographic diversity. (2) Working with OVPR, a joint faculty-Ventures advisory committee should be established that bridges between CSU researchers and Ventures. It is envisioned that this committee could provide feedback on processes, the Student Ambassadors program, annual technology transfer metrics evaluation, and overall climate for entrepreneurship at CSU. (3) A patent committee be established with a dedicated patent officer and faculty membership as well as representation from Ventures and potentially the business community. Ideally, this patent committee could operate in a variety of ways including providing (a) a confidential process by which faculty could present ideas and get feedback on their potential viability before a formal disclosure and/or as part of the disclosure process; (b) input/feedback to Ventures with respect to invention disclosures filed with the office; (c) suggestions and potential direction with respect to marketing of inventions; and (d) assistance with faculty training and education efforts in areas such as first-hand accounts of formation of startup companies, licensing technologies to existing businesses, bringing a product to market, etc.*

## 1. What is your current rank?

- Assistant Professor
- Associate Professor
- Professor
- Other (please specify)

## 2. Which of the following do you consider your home college?

## 3. In your opinion, how important is technology transfer as a fundamental priority [i.e. recurring use of time and money to support this activity] of the university?

- Not at all important
- Slightly important
- Important
- Fairly important
- Very important

## 4. Have you ever filed an invention disclosure (with CSU or another institution)?

- Yes
- No

# Ventures - Faculty

## 5. If you answered yes to the previous question, why did you file? (Check all that apply.)

- Interested in starting a company
- Protection of intellectual property
- Interested in generating revenue
- Educating students
- N/A
- Other (please specify)

## 6. In thinking about the benefits of having the university involved in technology transfer activities, how would you rank the relative benefit of each of these potential outcomes?

	1 (of low or no benefit)	2	3	4	5 (enormously beneficial)
Increased institutional reputation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased individual PI (inventor) reputation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial income for the institution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial income for the inventor(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protection of intellectual property generated by university employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Job creation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Placing inventions in the marketplace for people to utilize (societal benefit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training of students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

## 7. Have you had any interactions with CSU Ventures?

- Yes
- No
- Not sure



## Ventures - Faculty

### 8. If you answered yes to the previous question, when was the last time you interacted with Ventures?

- Within the last 6 months
- Within the last year
- Within the last 2 years
- Within the last 5 years
- More than 5 years ago
- N/A

### 9. With which of the following activities have you had interactions with Ventures? (Check all that apply.)

- Invention disclosures
- Patent filings
- Company start-up
- Licensing agreements
- Market analysis
- Other (please specify)

# Ventures - Faculty

## 10. Based on your collective interactions with CSU Ventures (Ventures), evaluate the following statements

	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
Ventures is very helpful to faculty in navigating the protection of intellectual property.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ventures offers faculty useful help with the process of patent filings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy to interact with the Ventures Staff.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ventures has staff that have the appropriate background to help guide my inventions to the market.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ventures has staff with appropriate background and experience to help me market my invention to potential licensees.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy for me to work through Ventures to patent my invention(s).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The university should invest more capital in the protection of the intellectual property of the faculty (e.g. increase funding for filing of patent applications).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ventures staff are friendly and customer-service oriented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Ventures student ambassadors program is a good investment on the part of Ventures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I understand the invention disclosure and patent application processes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to better understand the invention disclosure and patent application process, but don't know where I can find these resources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think Ventures should be focused on the financial return on the investment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Ventures - Faculty

from technology transfer.

I think Ventures should be focused on meeting the needs of CSU faculty when it comes to protection of intellectual property, development of technology and translation to the market.

    

Ventures is too concerned about faculty conflict of interest (COI)

    

**11. Do you have any other comments, questions, or feedback for the VPR's Faculty Advisory Committee (VPAC) regarding technology transfer activities (broadly defined) and the role Ventures plays in these activities?**

