INTERNAL AUDIT
IAS
ADVISORY SERVICES

Internal Audit Report

INTELLECTUAL PROPERTY TECHNOLOGY TRANSFER

Report No. SC-11-08

July 2011

UC SANTA CRUZ

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July 25, 2011

ALISON GALLOWAY
Vice Provost/Executive Vice Chancellor

Re: Internal Audit Report No. SC-11-08 – Intellectual Property/Technology Transfer

Dear Alison:

Internal Audit & Advisory Services (IAS) has completed an audit of Intellectual Property/ Technology Transfer to evaluate the effectiveness of the University of California Santa Cruz (UCSC) in balancing and achieving the objectives of disseminating technologies for the public good, protecting the assets of the University of California, and recognizing potential commercialization opportunities.

Overall, the campus was effectively disseminating research results for the public good in the form of publications and citations, but lacked a level of commitment of resources, focus and activities needed to promote its intellectual and technology transfer function, and consequently may be missing commercialization opportunities outlined as a UC systemwide goal.

Five areas were identified that if addressed could improve on this condition, including the development of a strategic direction for the campus Intellectual Property/Technology Transfer program, facilitating the increase of disclosures of potential inventions, improving collaborative relationships between faculty and the Office for Management of Intellectual Property (OMIP), providing education on the Intellectual Property/Technology Transfer process for faculty, and taking steps for outreach into industry.

Agreement was reached on all of the report's recommendations. Normal follow-up activity will be performed to verify completion of the agreements.

We would like to express our appreciation to your office, the Office of Research and OMIP, and campus investigators for their cooperation and assistance throughout this engagement in the identification and development of corrective actions contained in this report.

Sincerely,

Barry Long, Director
Internal Audit & Advisory Services

Attachment

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INTELLECTUAL PROPERTY TECHNOLOGY TRANSFER

Report No. SC-11-08

July 2011

Brigitte Desouches
Senior Auditor

Approved:

Barry Long, Director
Internal Audit & Advisory Services

UC SANTA CRUZ

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I. EXECUTIVE SUMMARY

Internal Audit & Advisory Services (IAS) has completed an audit of Intellectual Property – Technology Transfer to evaluate the effectiveness of the University of California Santa Cruz (UCSC) in balancing and achieving the objectives of disseminating technologies for the public good, protecting the assets of the University of California , and recognizing potential commercialization opportunities.

Overall, the campus was effectively disseminating research results for the public good in the form of publications and citations. The Office for Management of Intellectual Property (OMIP) was vigilant in protecting university assets and ensuring compliance for disclosures received and other legal agreements they were administering.

However, as an institution, UCSC did not effectively transfer technology in the form of patents and licensing agreements. While the UCSC faculty had one of the highest rates of citations per publications submitted among its peers, they disclose very few inventions. Consequently, UCSC may be missing commercialization opportunities.

UCSC lacks a level of commitment of resources, focus and activities that are required for a campus to develop and promote its intellectual property and technology transfer function. The OMIP is not sufficiently resourced or diversified with skill sets needed to promote the technology transfer activity. As a result, OMIP does not reach out to industry to tap opportunities for commercialization of campus inventions or train faculty members of their role in the process. Faced with this lack of functionality, campus investigators may decide not to disclose their inventions to the university.

The following issues requiring management corrective action were identified during the review:

A. ***The campus does not have a strategic vision or intent to realize its potential to commercialize its inventions with industry. There is a system-wide initiative with recommendations for this purpose that the campus has never adopted.***

B. ***Intellectual property disclosure and intellectual property portfolio at UCSC have been among the lowest in the UC system.***

C. ***Difficult relationships exist between members of the faculty and the Office of Research that stifles the Intellectual Property and Technology Transfer campus activity.***

D. ***Faculty members often do not understand the University Intellectual Property and Technology Transfer process. This often results in unrealistic expectations and frustrations.***

E. ***In spite of Silicon Valley proximity and the pool of campus inventions OMIP is not building relationship with industry.***

Observations and related management corrective actions are described in greater detail in section III of this report. A comparative analysis of UCSC IP activity with the other UC campuses can be found in Appendix A., a link to each of the nine other UC campuses IP function websites is included in Appendix B; and a list of best practices to expand the transfer of technology is in Appendix C.

II. INTRODUCTION

A. Purpose

The purpose of this audit was to evaluate the effectiveness of the campus Intellectual Property – Technology Transfer program in balancing the objectives of disseminating technologies for the public good, protecting the University of California (UC) assets, and recognizing potential commercialization opportunities.

B. Background

1997 President's Retreat on the University of California's Relationships with Industry in Research and Technology Transfer
In January 1997, UC held a retreat in Los Angeles regarding UC's relationships with industry for research and technology transfer. This retreat addressed two concerns:

> *Over the recent decades the dramatic increase in the number of university research projects and programs in which industry sought and found commercial applications had rendered some of UC's mechanisms for working with industry in need of careful re-examination. Also, it was clear that in the future, research universities would be called upon to do more, not less, to put ideas to work in the marketplace in order to transfer university research results for the public benefit.*

Five Years of Progress:
In 2002, UC issued a *"Five Years of Progress"* report that presented the resolutions stemming from the 1997 retreat and the actions taken by UC and its campuses since then. The following are a sample of points agreed upon at the retreat, on which further action was taken:

- Technology transfer means much more than the simple licensing of technology; it involves a range of research interactions with industry.
- The university must take a strong position of encouraging research partnerships with industry, and the university must become less risk averse in these relationships.
- The university should exercise more flexibility and take steps to become more user-friendly for industry and less complicated to work with.

- Recommendations were made for more sensitivity to the differences among disciplines and for local licensing offices to work more closely with faculty. For example, regarding differences, it was recognized that Electrical Engineering – Computer Sciences commercialization and related intellectual property needs are significantly different than Physical and Life Science disciplines (competitive market place, rapid development and short life time).

As a result of this initiative:

- Decentralization of IP management took place from OP to campuses depending on campuses' ability and needs. Where applicable, this resulted in a campus and faculty centered research and technology transfer administration.

- UC developed a number of policies to provide guidance for local decisions. Particularly, the new *University Principles Policy* explained to industry and faculty what university technology transfer was and why the terms in sponsored research agreements and technology licenses agreements are written the way they are.
- The 1997 retreat prompted many of the campuses to conduct a thorough review of their own campus/industry relations and their technology transfer policies and practices. Campuses that were able to, took the opportunity of the new guidance to move ahead and implement changes. Technology transfer staffs were increased to mine opportunities for sponsored research, industrial alliances and technology licensing.
- A new day had dawned in the university/industry research and technology transfer arena.

UC Santa Cruz (UCSC):

In 1997, the Baskin School of Engineering was just forming and intellectual property activity on campus was much lower. UCSC did not become a distributed campus and to this day shares IP governance with the UC Office of President (UCOP).

In 2002, the Office for Management of Intellectual Property (OMIP) was created for the first time on campus. Its leadership held a particular technology transfer philosophy of "technology commons" that consistently discouraged licensing activities.

In 2008, leadership at OMIP changed. By that time, budget constraints were a major factor in keeping the office at a two professional staff (2 FTE) capacity. UC Merced also has two intellectual property employees; however UC Riverside, the most comparable of the UC campuses to UCSC, has seven positions in its technology transfer office, including an Assistant Vice Chancellor and four licensing officers.

The UCSC paradox:
The following three indicators reveal a paradox regarding UCSC and its intellectual property and technology transfer function:

- UCSC is ranked fourth nationally in research impact, according to a Thomson-Reuters report in University Science Indicators, compared with all Association of American University schools. The measuring index is based on the set of scientists' papers most cited and the number of citations that they have received in other people's publications.
- When comparing the data in the UCOP Technology Transfer Annual Reports for the three previous fiscal years from 2007 to 2010 (FY2008, 2009 and 2010) with the number of faculty, we found UCSC behind other UC campuses in the amount of its disclosures, the size of its active invention and patent portfolios, and its number of start-up companies. (see Appendix A). Given the multiplicity of factors impacting an IP office level of activity, we believe this analysis is accurate enough to illustrate the need to increase the size of the UCSC portfolio, which suffered from the lack of campus response to the 1997 UC call and the years of past leadership who at best did not encourage active IP development.
- In the past three fiscal years, from FY2008 to FY2010, UCSC researchers disclosed very few inventions. The Baskin School of Engineering, for example, brought only a few to the OMIP each year.

This paradox raises questions about what obstacles prevent the campus from optimizing the balance between the need to protect the university's IP assets, the desire by faculty to publish and share ideas, and the opportunity for commercialization of IP assets. We hope to address these questions in this review.

OMIP:
The Office for Management of Intellectual Property (OMIP) is included in the Office of Research. OMIP has primary responsibility for administering campus intellectual property from the point of idea disclosure to licensing. OMIP also administers copyrights and a variety of legal agreements such as material transfer agreements, licensing agreements and others. OMIP is composed of 2 FTE. OMIP shares its governance of technology transfer with UCOP. Once a license has been established, it moves under UCOP's purview. At that point, monitoring and enforcement of the agreement clauses as well as all associated accounting becomes UCOP's responsibility.

In its evaluation process, OMIP brings in the inventor and, as needed, an outside patent attorney from a pool recommended by UCOP. The OMIP director has herself thirteen years of experience in UC technology transfer with a strong previous background in both biotech research as a scientist and in biotechnology intellectual

property as an attorney. Patent prosecution, the interaction between applicants, their representatives, and a patent office, with regard to a patent or an application for a patent, can be complex, especially when involving several parties from different countries. Each aspect of the OMIP function has the purpose of protecting university assets, as well as the right of the inventor to pursue his/her research.

After disclosure, during the time of evaluation until the decision to file for patent, OMIP works with the inventor, explains how publication may limit the scope of available patent rights, and works with the publication schedule decided by the inventor. The foreign patenting rights are lost when an innovation is published, however domestic rights hold for one year after disclosure.

In FY11 (July 1, 2010 to June 30, 2011), OMIP has received 59 disclosures (doubling the amount of FY10), and has written agreements for 50 material transfers and 7 copyrights. This was a substantiated increase in workload for the two-person office..

Although research agreements are handled by the Office of Sponsored Projects (OSP), also included in the Office of Research, some collaborative research agreements require OMIP involvement as well as Campus Counsel.

The university prefers to file for provisional patents. These hold the IP rights for one year and give the inventor and OMIP time to watch how the invention will develop, estimate its position in the market, and its potential for licensing. At the end of the year, the invention is reconsidered and a choice is made to file for utility patent or abandon the project. The cost of provisional filing is between $1,000 and $2,000, considerably less than the utility patent filing cost of $12,000 or more. A utility patent holds the IP rights until a decision by the US Patent Office.

The university prefers to have a licensee before investing in a patent; however OMIP will sometimes file "at risk" meaning without a licensee on hand, if the technology has a good chance of being licensed.

For the last three fiscal years, the average campus annual gross income from IP revenue was $350,000 ($253,000 of which is provided by UARC software licensing fees).

Center for Entrepreneurship:
Faculty members are interested in commercializing their inventions, but many do not have entrepreneurial experience. Recognizing the opportunity of the Silicon Valley proximity, the need to increase commercialization of campus inventions and to help the investigators on this path, the Baskin School of Engineering is supporting the study of an innovative proposal, through the Center for Entrepreneurship, for

educational curriculum on entrepreneurship and for the creation of a start-ups incubator, both being done at minimal cost to the campus.

C. Scope

We conducted interviews with the Office of Research, OMIP and OSP; we also conducted interviews with faculty from the Baskin School of Engineering and the Physical & Biological Sciences Divisions, and with persons with IP expertise from other UC locations and from outside the university.

We reviewed the most recent annual reports published by UCOP on technology transfer (TT) activity, and the majority of the UC campus websites. We studied related UC policies and federal regulations, as well as documentation providing an historical perspective on the development of the IP function system-wide and on campus.

We reviewed the management systems used by OMIP to track their activities. We also studied the Center for Entrepreneurship proposal, and spoke with faculty members about it.

During the review, we compared and contrasted the UCSC campus with what other campuses have accomplished. We have retraced the last fourteen year history to place this review in the appropriate context and describe the legacy inherited by current OMIP staff. We have described what we saw missing compared to what could be done to underline the level of campus direction and commitment of resources necessary for UCSC to develop a dynamic intellectual property and technology transfer function.

D. Examples of Positive Observations

- OMIP staff adequately protects university assets and follows university policies and guiding principles.
- OMIP and OSP vigilantly respect the Accessibility of Research Purposes principle stated in the *UC Principles Policy* and protect campus researchers' rights in all IP negotiations: "Agreements with external parties shall ensure the ability of university researchers to utilize the results of their research to perform future research."
- The current OMIP director has brought order and adequate management systems to the infrastructure of the office.
- OMIP works closely with Campus Counsel.
- UCOP offers on-going professional training to all campus IP functions.

III. OBSERVATIONS REQUIRING MANAGEMENT CORRECTIVE ACTION

A. Lack of Strategic Vision and Plan

The campus does not have a strategic vision or intent to realize its potential to commercialize its inventions with industry. There is a system-wide initiative with recommendations for this purpose that the campus has never adopted.

Campus leadership will need to decide the level of priority to give to the development of the present intellectual property function and to the commercialization of campus inventions.

Comments:
There is no present strategic vision or plan to realize the campus potential to commercialize its inventions with industry. The campus did not respond to the system-wide initiative from the 1997 President's Retreat. When OMIP was established in 2002, it did not proactively establish relations with industry, as other UC campuses did. The UC initiative encouraged research partnerships with industry, with less risk-aversion, more flexibility, and less complications for industry to work with. This was to facilitate an increase in technology transfer activity, such as licensing, creating start-ups, and collaborating with industry on projects and research agreements.

OMIP has never been to this day provisioned for the scale of technology transfer envisioned by that retreat.

UCSC, with almost four times more instructional faculty than UC Merced, has the same IP office size of two employees. All other UC IP functions are populated by a staff from seven to thirty-six employees. UC Riverside (UCR), comparable in size to UCSC, has seven IP positions and an active invention portfolio almost twice as large as UCSC's; and an active patents portfolio more than twice as large.

In a comparative analysis of the number of IP portfolios and startup companies to the number of faculty and IP staff in the UC system, we found that a sufficiently staffed IP operation is crucial to increase the volume of technology commercialization *(see Appendix A).*

All faculty members we interviewed deplored how much OMIP was understaffed. Some expressed interest in participating in developing a new vision for the campus IP function and the commercialization of inventions.

Agreements:

1. The EVC will assemble a task force composed of committed senior faculty and administrative leaders to formulate a strategic vision and plan for the future direction of the UCSC IP & TT program by 11/1/11.
2. The EVC will seek advice from other UC campuses to lay out a model for successful technology transfer program by 12/31/11.

B. Low Number of UCSC Disclosures

Intellectual property disclosure and intellectual property portfolio at UCSC have been among the lowest in the UC system.

The underlying causes of this situation needs to be identified and addressed by both the Office of Research and by the faculty.

Comments:

Intellectual property disclosure occurs when a researcher formally presents an invention to OMIP. During the three fiscal years FY08 – FY10, OMIP received 24, 27, and 31 disclosures for an average of 27 invention disclosures per year from an instructional faculty of 800. Disclosures and license agreements at UCSC are low in the UC system, even when analyzed in proportion to the number of faculty *(See Appendix A)*. This low rate contrasts with the high rate of publication citations of the UCSC faculty.

Recently published figures for FY11 show a noticeable increase in the number of disclosures, 59, almost doubling the previous year's number of 31. This is an encouraging sign at a time when campus senior management concurs in their commitment to increase UCSC IP activity.

There is a publication/disclosure dilemma: although required by university employment, the disclosure of inventions may delay the publication of research, which is essential to the career of researchers; while the prompt publication of research without first securing patent rights may adversely affect the patent potential of inventions.

Other UC campuses have addressed this dilemma by thoroughly explaining this requirement to their investigators and requesting disclosures from them "as soon as they first have their technology in hand." Early disclosure provides IP offices the time required for evaluation of technology without interfering with publication schedules.

There is reluctance among UCSC faculty members to disclose their inventions to OMIP and enter its patent evaluation process. Faculty members elect to promptly

publish their research and in some cases set up their own companies. The university itself encourages entrepreneurial initiative by the faculty, but requires full disclosure for an equitable share of asset ownership. Faculty members may also act as consultants to industry. It is unknown at this point what impact these external activities have on the UC IP portfolio. OMIP advises these investigators to make it explicit in their private agreements that the UC Patent Policy overrides any consulting agreements.

Agreements:

1. The EVC, in coordination with the deans, will communicate to faculty the importance of disclosing their innovations in a timely manner to OMIP by 11/1/11.
2. The VC for Research and OMIP director will develop a plan to address any impact on workload due to the increase in disclosures by 9/30/11.

C. Difficult Relationship between the Faculty and OMIP

Difficult relationships exist between members of the faculty and the Office of Research that stifles the Intellectual Property and Technology Transfer campus activity.

The Office of Research, OMIP and faculty need to improve their collaborative relationship.

Comments:

Although a certain level of disagreement can be expected in any human enterprise, we have observed a significant lack of confidence between members of the faculty and the Office of Research.

One reason for this was the previous OMIP leadership philosophy of discouraging licensing activities; this left a negative impression of the office in the minds of faculty members.

Some professors we spoke to told us that they avoided projects, even if lucrative for the campus, to avoid dealing with this OMIP. A few made the same comment with regards to OSP and awards with related IP components.

The Vice Chancellor for Research was concerned that faculty investigators who were not disclosing their inventions were not complying with their agreements with the university, and that there was a lack of understanding by faculty of the IP process, which gave rise to unreasonable expectations and frustration.

Faculty members who were critical of the Office of Research made the following comments, often based on their experience:

- OMIP is too small and not equipped to deal promptly and efficiently with their inventions.
- OMIP does not have sufficient diversity of scientific knowledge to evaluate the wide range of inventions that UCSC researchers could disclose.
- The Office of Research and OMIP are too risk averse and too focused on legal analysis. Their attention is focused more on policy enforcement than on working in partnership with researchers to find creative solutions to IP expansion problems; they are viewed as an obstacle to IP expansion.
- There is a lack of communication of problems and explanation of delays.
- OSP assertion of IP rights seems at times inappropriate. Delays are created by the lack of coordination among campus units involved in the contract process of research projects with IP components. Faculty members are frustrated by the lack of feedback and by the futility of their own efforts to secure large funding opportunities for the campus.
- For these investigators, the Office of Research lacks critical customer service skills and a helpful and cooperative attitude.

In all fairness, this negative experience was not shared by all faculty members we spoke to. We heard positive reports from professors who worked successfully with OMIP and the Office of Research.

A fresh, open minded dialogue is needed to explore how improvements can be made to the relationship between faculty members and the OMIP.

The new OSP director is aware of faculty frustration and the difficulties faced by research projects with IP components. His response is to foster closer communication with faculty and provide regular updates on the development of special contract/projects. He is engaged in creating a staff position to liaise with faculty and coordinate special contracts/projects, with the intention of substantially reducing delays and increasing updates to faculty.

Agreements:

1. The EVC will request the Task Force to evaluate whether or not the OMIP is too focused on the preservation of UC assets and policies compliance, at the expense of collaboration with faculty in realizing opportunities for commercialization by 11/1/11.

2. The EVC will request the Task Force to evaluate whether or not the OMIP can provide locally enough of the scientific diversity needed to evaluate inventions from the varied disciplines by 11/1/11.
3. The OSP director will follow-up on his plan to create a new position of liaison/coordinator for "special research contracts/projects with IP components" to monitor the progress of the work being done and keep faculty updated by 9/30/11.

D. Lack of Understanding of the University Intellectual Property Process by Faculty

Faculty members often do not understand the University Intellectual Property and Technology Transfer process. This often results in unrealistic expectations and frustrations.

The faculty needs to be more educated on intellectual property and technology transfer and to understand the difference of IP interests by higher education and industry.

Comments:
Faculty members who expressed satisfaction with OMIP services were convinced that the lack of understanding by their colleagues of the principles underlying intellectual property and technology transfer in higher education was the source of their unfavorable assessments of OMIP and the cause of their frustration with that office. They commented that there is no problem with faculty having the ability to understand these principles, and that having sufficient education and discussion on the subject would facilitate such understanding and help reduce the frustration.

Some investigators we spoke with expressed a need to have the IP process explained and documented, describing the roles of each party in the various steps of the process. Others thought that the informal setting of an academic department meeting would be a good place for an IP learning segment. One professor expressed a desire for a more transparent presentation of royalties and equity sharing with the university.

The OMIP website does not provide information to faculty about the technology transfer process, except for giving the links to the UC policy on disclosure and the UCOP disclosure form.

A review of the other UC campuses' intellectual property and technology transfer websites revealed such features as:

- Explanation of the intellectual property and technology transfer process in detail, covering each step of the process and letting faculty know what they

should expect, what the offices are expecting from them, and why the expectation exists.

- Access to various policies governing intellectual property and technology transfer
- Questions & answers.

The faculty would benefit from having similar features available on the OMIP website to refer to, including clarification on UC royalties and equity sharing policies.

OMIP does not have to create such information from scratch, as it can use other campuses' work. We noticed that the new Merced campus used another campus's description of the intellectual property and technology transfer process and has a link to the UC technology transfer website.

The OMIP director indicated that in terms of making information available about the technology transfer process, OMIP has met with the Academic Senate Committee on Research and presented three Intellectual Property/UC Patent Policy forums for faculty. She also indicated that with only 2 FTE's in her office, a regular schedule of presentations would be impossible to maintain.

We spoke with the director of a very successful UC campus intellectual property and technology transfer department and learned that education of faculty was for him a continuous process. His department,

- Faces the same challenges of faculty members not understanding the IP process, and reluctance to learn until there is a pressing need.
- Understands and accepts academic investigators' issues and priorities, and provides a variety of training opportunities, such as:
  - Organizing regular presentations even if not very well attended by faculty and more attended by post-docs and students.
  - Welcoming one-on-one instruction when investigators were pressed by the need to know.
- Found that faculty members who understand the process are much easier to work with and therefore, the department took every opportunity to provide training.

In the previous three years, that campus's disclosure ratio relative to its instructional faculty is more than three times that of UCSC it is ranked #3 among the ten UC campuses for disclosures.

That director did not have any difficulty with UC policies when negotiating with industry; he found the university provided a very broad canvas of possibilities that allowed him to find ways to make a deal work.

The openness of other UC campuses to share their experiences led us to believe that UCSC can take advantage of the wealth of information and resources already developed at other campuses, above and beyond the level of interaction and mutual support already happening through participation on monthly Directors' calls and other *ad hoc* correspondences.

Agreements:

1. The OMIP director will upgrade the OMIP website to help educate the faculty on the IP process by 3/31/12.
2. The OMIP director will, in collaboration with the academic chairs, establish a protocol which includes on-going educational interactions with faculty on the IP subject by 2/1/12.

E. Absence of Outreach to Industry

In spite of Silicon Valley proximity and the pool of campus inventions OMIP is not building relationship with industry.

If UCSC wants to expand the transfer of its technology, it needs to actively engage in building relationships with industry.

Comments:

OMIP is focused on matters such as patenting, licensing, material transfers & copyrights; it does not actively conduct industry outreach activities.
There is a general sense among faculty that not engaging with industry when UCSC is located so close to Silicon Valley, is a critical missed opportunity. The OMIP director indicated she is interested in reaching out to industry, but is prevented from doing so because of the lack of resources.

There are a few things that could be done to help:

- Post a list of current technologies available to license (available technologies) on the UCSC campus website. Although these are posted with all other UC current technologies on the UCOP website, we have found the search system not conducive to easy exposure. In addition, UCSC is the only UC campus that has not included its new technologies on its website.
- Create a "For Industry" section on the OMIP website to welcome industry interest in UCSC inventions and describe how to work with the university.
- Provide *Non-Confidential Disclosures* on available technologies to industry.

A review of other UC campuses' intellectual property and technology transfer websites (Appendix B) demonstrated the promotion of their inventions and their welcome of industry with features such as:

- An easy link to their current available technologies.
- A segment for industry, with sections such as: working with the campus, campus licensees, sample agreements and UC policies.
- A number of campuses feature their inventions and their research activities on their IP office main page or their campus home page.

Again, other UC campus office websites could be tapped to upgrade the OMIP website. Additionally, we have gathered a number of suggestions and best practices for developing the IP function. These are captured in *Appendix C.*

Center for Entrepreneurship:
As we mentioned above, the newly created Center for Entrepreneurship, with the support of the Baskin School of Engineering, is an attempt to improve the volume of campus technology transfer. The plan is complex and has merit, but is young and far from secure in its realization. Investigators we spoke with had various comments about it, from very positive to quite negative. However, because it is a genuine movement in a positive direction, we believe this effort worthy of serious consideration and recommend that it be evaluated by the task force as a viable option for expanding the commercialization of inventions.

Agreements:

1. The EVC, Task Force, UC expertise, and Campus Counsel will evaluate the Center for Entrepreneurship and the ways to incorporate this effort in a campus plan by 1/15/12.
2. The OMIP director should/will make available on its website the list of current UCSC available technologies and their corresponding Non-Confidential Disclosures by 2/1/12.
3. The OMIP director should/will set up a protocol for distribution of current Non-Confidential Disclosures to potentially interested industries by 2/1/12.

***

Activity markers: **1) disclosure of inventions 2) active inventions portfolio 3) active US patent portfolio 4) active foreign patent portfolio 5) start-up companies created**

Instructional Faculty data was retrieved from the Common Data Set of each campus for FY10, except for UC Santa Barbara FY11
IP activity data was retrieved from the UC Technology Transfer Annual Reports
For each of the activity we divided the 3 years average of FY08, 09 & 10, by the total number of Instructional Faculty

		Instructional Faculty			Number of Disclosures						
Disclosures	IP Staff	Full Time	Part Time	Total	FY08	FY09	FY10	3 year average	% disclosure/faculty	Rank	Rank in number of staff
Los Angeles	36	1998	597	2595	314	333	379	342	13.18%	2	1
Berkeley	16	1582	500	2082	155	131	142	143	6.87%	8	4
Irvine	13	1464	428	1892	159	112	125	132	6.98%	7	6
Davis	19	1673	205	1878	181	172	245	199	10.60%	4	3
San Francisco	15	818	748	1566	200	151	152	168	10.73%	3	5
San Diego	32	979	211	1190	330	396	367	364	30.59%	1	2
Santa Barbara	11	886	166	1052	103	92	71	89	8.46%	5	7
Riverside	7	708	161	869	53	60	54	56	6.44%	9	8
Santa Cruz	2	563	236	799	24	27	31	27	3.38%	10	9
Merced	2	184	33	217	12	21	22	18	8.29%	6	9

		Instructional Faculty			Number of Active Inventions						
Active Invention Portfolio	IP Staff	Full Time	Part Time	Total	FY08	FY09	FY10	3 year average	% active portfolio /faculty	Rank	Rank in number of staff
Los Angeles	36	1998	597	2595	1,560	1,700	1,837	1699	65.47%	3	1
Berkeley	16	1582	500	2082	1,107	1,067	1,173	1116	53.60%	5	4
Irvine	13	1464	428	1892	753	782	803	779	41.17%	7	6
Davis	19	1673	205	1878	918	913	1,017	949	50.53%	6	3
San Francisco	15	818	748	1566	1,422	1,350	1,416	1396	89.14%	2	5
San Diego	32	979	211	1190	2,355	2,610	2,660	2452	206.05%	1	2
Santa Barbara	11	886	166	1052	611	615	631	619	58.84%	4	7
Riverside	7	708	161	869	245	260	288	264	30.38%	8	8
Santa Cruz	2	563	236	799	140	154	163	152	19.02%	10	9
Merced	2	184	33	217	25	43	60	43	19.82%	9	9

		Instructional Faculty			Number of Active US Patents						
Active US Patents Portfolio	IP Staff	Full Time	Part Time	Total	FY08	FY09	FY10	3 year average	% active portfolio /faculty	Rank	Rank in number of staff
Los Angeles	36	1998	597	2595	536	581	590	569	21.93%	6	1
Berkeley	16	1582	500	2082	562	569	611	581	27.91%	4	4
Irvine	13	1464	428	1892	250	267	302	273	14.43%	7	6
Davis	19	1673	205	1878	409	414	419	414	22.04%	5	3
San Francisco	15	818	748	1566	770	744	711	742	47.38%	2	5
San Diego	32	979	211	1190	573	611	706	630	52.94%	1	2
Santa Barbara	11	886	166	1052	316	325	361	334	31.75%	3	7
Riverside	7	708	161	869	79	84	88	84	9.67%	8	8
Santa Cruz	2	563	236	799	66	72	77	72	9.01%	9	9
Merced	2	184	33	217	0	0	0	0			

		Instructional Faculty			Number of Active Foreign Patents						
Active Foreign Patents Portfolio	IP Staff	Full Time	Part Time	Total	FY08	FY09	FY10	3 years average	% active portfolio /faculty	Rank	Rank in number of staff
Los Angeles	36	1998	597	2595	537	584	604	575	22.16%	3	1
Berkeley	16	1582	500	2082	394	465	476	445	21.37%	5	4
Irvine	13	1464	428	1892	382	435	360	392	20.72%	6	6
Davis	19	1673	205	1878	436	399	403	413	21.99%	4	3
San Francisco	15	818	748	1566	881	847	835	854	54.53%	2	5
San Diego	32	979	211	1190	812	799	808	806	67.73%	1	2
Santa Barbara	11	886	166	1052	62	60	61	61	5.80%	8	7
Riverside	7	708	161	869	126	128	139	131	15.07%	7	8
Santa Cruz	2	563	236	799	16	20	21	19	2.38%	9	9
Merced	2	184	33	217	0	0	0	0			

		Instructional Faculty			Number of Start-Up Companies created per year						
Start-Up Companies	IP Staff	Full Time	Part Time	Total	FY08	FY09	FY10	2 years average	% start-up / faculty	Rank	Rank in number of staff
Los Angeles	36	1998	597	2595		22	27	24.5	0.94%	2	1
Berkeley	16	1582	500	2082		9	6	7.5	0.29%	7	4
Irvine	13	1464	428	1892		1	7	4	0.37%	6	6
Davis	19	1673	205	1878		2	9	5.5	0.48%	4	3
San Francisco	15	818	748	1566		0	7	3.5	0.45%	5	5
San Diego	32	979	211	1190		7	13	10	1.09%	1	2
Santa Barbara	11	886	166	1052		4	6	5	0.57%	3	7
Riverside	7	708	161	869		0	2	1	0.23%	8	8
Santa Cruz	2	563	236	799		0	0	0	0.00%	9	9
Merced	2	184	33	217		1	0	0.5	0.00%	9	9

Appendix B: UC Campuses Intellectual Property and Technology Transfer Websites.

UC Los Angeles - *Office of Intellectual Property*:
https://oip.ucla.edu/

UC Berkeley - *Office of Intellectual Property & Industry Research Alliances:*
http://ipira.berkeley.edu/office-technology-licensing
http://ipira.berkeley.edu/industry-alliances-office

UC Irvine - Office of Technology Alliances:
http://www.ota.uci.edu/

UC Davis - Innovation Access:
http://innovationaccess.ucdavis.edu/home.cfm?id=OVC,23

UC San Francisco - Office of Technology Management:
http://otm.ucsf.edu/

UC San Diego – Technology Transfer Office:
http://invent.ucsd.edu/

UC Santa Barbara – Technology & Industry Alliances:
http://tia.ucsb.edu/index.aspx

UC Riverside – Office of Technology Commercialization:
http://or.ucr.edu/otc.aspx

UC Santa Cruz – Office for Management of Intellectual Property:
http://research.ucsc.edu/intel_prop.shtml

UC Merced – Office of Technology Transfer:
http://research.ucsc.edu/intel_prop.shtml

Appendix C: Some Best Practices in Developing an IP and TT program.

The following list of best practices was gathered from persons with IP expertise and experience at other UC locations and from the outside of the university:

From a successful IP & TT office director in the UC system

Success factors to advance opportunities of technology transfer:

- **Quality of the invention.** The invention has to be a valuable technology in order to lead to commercialization. The OMIP office needs to be able to recognize and educate faculty on what is a licensable invention. It is much easier to work with investigators who understand this concept and who have the funding and collaboration necessary to continue their research.

- **Quality of people in the office**. Having the staff with the right expertise can make a big difference on how the invention is perceived by outside industry. Some universities do not have a good reputation with industry who might find them too rule bound or otherwise difficult to deal with. IP staff needs to possess expertise and knowledge in the field of science and technology, contract negotiations, marketing and business, and be able to effectively utilize all of these skills.

- **Start-up companies are easier** to create when they originate from engineering inventions, compared to life science inventions. The later are riskier, more costly and under regulatory compliance. Stanford University was given as a point in case: of its 12 start-ups from last year, only 3 of them were in life sciences.

Example of best practices:

- Create visibility; develop the awareness of the IP & TT function on campus.

- Continuous education of faculty – educated investigators are much easier to work with. Need to educate by conducting lectures, panels, events, one on one meetings. Must be willing to understand the nature of the academic investigators and the priorities they have. When they invent something, they want very much to go public, but UC needs to evaluate and protect. Investigators need to understand that.

- Their OMIP office does a 360 degree examination of the invention after which they inform the inventors whether or not the invention will be filed for patent. OMIP must be willing to be the bearer of the bad news.

- Negotiation with industry:
  - ✓ UC policies are actually easy to work with; they are more like guidelines. There is just one law that requires absolute compliance and that is the Labor Law, which states that the employer has a right to own what its employees invent.
  - ✓ UC policies have never prevented his office from making a deal that he wanted to make. Negotiation is a human relationship in the making and depends on the skills of the negotiator. It is not so much what you say but how you say it that is important.
  - ✓ This director instructed his staff to never invoke policy in a negotiation. One must understands what is behind the policy, rather than to say "no" because of the policy.

From Biotech Business Development Expert and Owner of a Licensing Firm

How could UCSC organize itself to make itself more attractive to the industry?

- Must be entrepreneurial and pro-active:
  - ✓ in mining the inventions out of the university.
  - ✓ in seeking funding and ensuring sufficient infrastructure is in place: money, faculty time, etc… to be able to identify, secure and spin-off ideas into start-ups.
  - ✓ Contact alumni to help.

- Partner with someone in the business development group in an industry

- Sponsor a summit: an afternoon of intellectual exchange, meeting with top scientists of University and Industry. Organize visits of UCSC labs.

- Have standing agreements with industry, such as the master agreement UCSF / Genentech that allows both parties to identify opportunities to advance sciences without having to go through negotiation each time.