

IMPRESSUM

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SWITT

swiTT, the Swiss Technology Transfer Association, is the association of the professionals in Switzerland dealing with the interaction between public research and industry. swiTT currently has more than 100 members from all parts of Switzerland. Most of them work in technology transfer at public research institutions, others are employed in the private sector. For further information about swiTT, please refer to www.swiTT.ch.

Among other services, swiTT operates swiTTlist, a unique portal with current technology opportunities from Swiss public research institutions available for licensing and development by industry. For further information please refer to www.swiTTlist.ch.

SWITT MISSION

COOPERATION – DEVELOPMENT – SERVICES - DIALOGUE

- ▶ Facilitates and strengthens cooperation and technology transfer between Swiss public research institutions and the private sector; (COOPERATION)
- ▶ Offers professional development to its members and other practitioners involved in technology transfer within public institutions and the private sector; (DEVELOPMENT)
- ▶ Provides services of common interest to its members, their institutions and other stakeholders involved. (SERVICES)
- ▶ Maintains an active dialogue with research institutions, the private sector and the authorities to foster optimal processes and regulatory framework / regulations. (DIALOGUE)

SUMMARY

The annual survey „swiTTreport“ is the most comprehensive analysis of the technology transfer activities of Swiss public research institutions. The report covers two main areas, a) research collaborations of the participating institutions with private or public partners, and b) the activities for the economic exploitation of research results from these institutions. The Swiss public research institutions interact very actively with partners in the economy. These activities are collectively designated in the report as “technology transfer” (TT) activities. With regard to scientific disciplines, the report mainly focuses on the areas of life sciences, natural sciences and engineering sciences.

Data on technology transfer activities from seven cantonal universities and the two Federal institutes of technology (collectively Universities), from five universities of applied sciences (UAS), and three research institutions in the ETH domain (RI) were available for this years' report. However, some of the data were incomplete or fragmentary, and the figures presented in this report clearly underestimate the real situation. Data from several institutions were not available or were too fragmentary to be included in the report. In most figures, the data for 2011 are compared with the data from previous years although the institutional basis is not always the same.

The respondents reported their results to swiTT voluntarily, and the data presented in the report are on an “as-reported” basis. For reasons of confidentiality, the report mainly contains aggregated numbers. However, some of the key parameters are presented on an individual basis but only for those institutions that agreed to do so. On account of the difference in mission, organization and objectives of the three types of institution (Universities, UAS, RI), their data are reported separately.

Overall, the respondents reported the following key figures on technology transfer activities in 2011:

2872 new research projects with economic partners were initiated

482 invention disclosures were registered

240 priority patent applications were filed

203 license and option agreements were executed

68 start-up companies were created, of which 43 were based on a license or transfer of IP and 25 on know-how from the institutions

A conservative extrapolation of the partial data received shows that the institutions covered in this report overall started more than 4'000 new research projects with external business partners last year. Larger companies (>250 employees) are the most common cooperation partners of the Universities whereas the UAS most often cooperate with either public institutions or with small and medium-sized enterprises (SME). At the RI the majority of partners are public institutions.

Universities account for most of the commercialization activities reported, i.e. about 83% of all cases. Commercialization occurs most frequently with SME, including start-ups (61%). In about 25% of the cases the partner was a large company, in 13% it was another public institution.

Numerous international studies confirm the collaborative culture between academia and industry in Switzerland and the excellent technology transfer performance of Swiss universities and other public research institutions. Easy access to academic researchers and well defined technology transfer processes are important criteria for companies to relocate their business to Switzerland. Maintaining a system which is based on fair partnership between academia and industry together with the continuous optimization of processes will be important aspects to further strengthen Switzerland's leading position in the international context.

RÉSUMÉ

L'enquête annuelle «swiTTreport» est l'analyse la plus complète des activités de transfert de technologies réalisées par les institutions de recherche publiques suisses. Le rapport couvre deux domaines majeurs: a) la collaboration en matière de recherche des institutions participantes avec des partenaires privés ou publics et b) les activités liées à la commercialisation des résultats de recherche obtenus par ces institutions. Les institutions de recherche publiques suisses coopèrent très activement avec des partenaires économiques dans ce que le rapport désigne collectivement sous le terme d'activités de «transfert de technologies» (TT). S'agissant des disciplines scientifiques, l'accent est mis principalement sur les sciences de la vie, les sciences naturelles et l'ingénierie.

Le rapport de cette année s'est appuyé sur les données relatives aux activités de transfert de technologies de sept universités cantonales et deux écoles polytechniques fédérales (ci-après collectivement les «universités»), de cinq universités de sciences appliquées («UAS») et de trois institutions de recherche dans le domaine EPF («RI»). Certaines données étaient toutefois incomplètes ou fragmentaires si bien que les chiffres présentés dans ce rapport sous-estiment clairement la situation réelle. Par ailleurs, les données de plusieurs institutions n'étaient pas disponibles ou étaient trop fragmentaires pour être incluses dans le rapport. Dans la plupart des cas, les chiffres de 2011 sont comparés avec les données des années précédentes, bien que la base institutionnelle ne soit pas toujours la même.

Les personnes interrogées ont communiqué volontairement à swiTT leurs résultats qui sont présentés dans ce rapport tels que rapportés. Pour des raisons de confidentialité, le rapport contient principalement des chiffres agrégés. Certains des paramètres clés sont toutefois présentés individuellement si les institutions ont donné leur accord. Compte tenu des différences de mission, d'organisation et d'objectifs des trois types d'institutions (universités, UAS, RI), leurs données sont présentées séparément.

Dans l'ensemble, les personnes interrogées ont communiqué les chiffres clés suivants sur les activités de transfert de technologies en 2011:

- 2872 nouveaux projets de recherche ont été lancés avec des partenaires économiques
- 482 annonces d'inventions ont été enregistrées
- 240 demandes de brevet prioritaires ont été déposées
- 203 contrats de licence et d'option ont été exécutés
- 68 start-up ont été créées dont 43 étaient fondées sur une licence ou un transfert de PI et 25 sur le savoir-faire des institutions

D'après une extrapolation conservatrice des données partielles reçues, les institutions couvertes dans ce rapport ont dans l'ensemble démarré plus de 4000 nouveaux projets de recherche avec des partenaires d'affaires externes l'an dernier. Les sociétés de taille plus grande (>250 employés) sont les partenaires de coopération les plus communs des universités, tandis que les UAS coopèrent plus souvent avec des petites et moyennes entreprises (PME). Dans le cas des RI, la majorité des partenaires sont des institutions publiques.

Les universités sont responsables de la plupart des activités de commercialisation rapportées, à savoir environ 83%. Dans 61% des cas, leur partenaire était une PME ou une spin-off, dans environ 25% des cas, une grande société et dans 13% des cas, une autre institution publique.

D'innombrables études internationales confirment la culture de collaboration entre les milieux universitaires et économiques en Suisse et l'excellente performance des universités et autres institutions de recherche publiques suisses dans le domaine du transfert de technologies. La facilité d'accès aux chercheurs universitaires et l'existence de processus clairement définis en matière de transfert de technologies constituent des critères importants pour les entreprises envisageant de déménager leurs activités en Suisse. A cet égard, le maintien d'un système fondé sur un partenariat équitable entre les milieux universitaires et économiques, ainsi que l'optimisation continue des processus seront des aspects essentiels pour renforcer davantage la position de leader de la Suisse à l'échelle internationale.

ZUSAMMENFASSUNG

Der jährlich publizierte "swiTTreport" ist die umfassendste Analyse der Aktivitäten der öffentlichen Forschungsinstitutionen (PRO) in der Schweiz in den Bereichen Zusammenarbeit mit der Wirtschaft und wirtschaftliche Umsetzung von Forschungsergebnissen. Diese Aktivitäten werden häufig auch unter dem Begriff „Technologietransfer“ zusammengefasst. Der Bericht zeigt, dass die schweizerischen PRO sehr aktiv und erfolgreich mit der Wirtschaft interagieren. Die in der Analyse erhobenen Daten beziehen sich vorwiegend auf die Fachbereiche Life Sciences, Naturwissenschaften und Ingenieurwissenschaften.

Der Bericht umfasst die Aktivitäten von sieben kantonalen Universitäten und der beiden ETH's (zusammengefasst unter "Universitäten"), von fünf Fachhochschulen („UAS“) und von drei Forschungsinstitutionen des ETH-Bereichs („RI“). Allerdings waren von einigen Institutionen nur Teildaten aus einzelnen Bereichen bzw. generell sehr fragmentarische Angaben verfügbar, so dass die effektiven Aktivitäten substanziell höher sind, als in diesem Bericht zusammengefasst. Daten einiger Institutionen waren so unvollständig, dass sie gar nicht berücksichtigt werden konnten. Dies führt dazu, dass die Daten mit jenen von früheren Jahren teilweise nur beschränkt vergleichbar sind.

Die teilnehmenden Institutionen rapportierten die Resultate an swiTT auf freiwilliger Basis und die Daten wurden wie berichtet verwendet. Aus Vertraulichkeitsgründen enthält der Bericht vorwiegend aggregierte Zahlen. Einige Kennzahlen werden jedoch zum ersten Mal auf individueller Basis publiziert, allerdings nur für jene Institutionen, die einer solchen Publikation zugestimmt haben. Die Daten der unterschiedlichen Arten von Institutionen (Universitäten, UAS, RI) werden im Bericht separat zusammengefasst.

Insgesamt rapportierten die teilnehmenden Institutionen die folgenden Kennzahlen über ihre Technologietransferaktivitäten im Jahr 2011:

- 2872 neue Forschungsprojekte mit Wirtschaftspartnern gestartet
- 482 Erfindungsmeldungen registriert
- 240 Prioritäts-Patentanmeldungen eingereicht
- 203 Lizenz- und Optionsverträge bzw. IP-Verkäufe abgeschlossen
- 68 Start-up Firmen wurden gegründet, 43 davon auf Basis einer Nutzungsvereinbarung für geistiges Eigentum mit der entsprechenden Institution und 25 basierend auf Know-how

Da die Daten verschiedener Institutionen unvollständig sind, kann bei einer konservativen Extrapolation davon ausgegangen werden, dass an den teilnehmenden Institutionen 2011 über 4000 neue Projekte mit Wirtschaftspartnern gestartet wurden. Grosse Firmen (>250 Mitarbeiter) sind die häufigsten Kooperationspartner der Universitäten. Die UAS arbeiten am häufigsten mit KMU zusammen und die RI mit anderen öffentlichen Institutionen.

Die Universitäten sind für meisten Aktivitäten im Bereich der wirtschaftlichen Umsetzung von Forschungsergebnissen verantwortlich (83%). Bei den Partnern in diesem Bereich handelt es sich mehrheitlich um KMU, inkl. Start-ups (61%). In 25% der Fälle waren es grössere Firmen und in 13% Institutionen aus dem öffentlichen Bereich.

Diverse internationale Untersuchungen bestätigen die kooperative Kultur zwischen Industrie und Hochschulen in der Schweiz und die ausgezeichneten Transferleistungen der öffentlichen Forschungsinstitutionen. Der einfache Zugang zu akademischer Forschung und gut etablierte Transferprozesse sind auch ein wichtiges Kriterium für den Standortentscheid von Firmen. Die weitere Stärkung des partnerschaftlichen Verhältnisses zwischen Hochschulen und Industrie und der entsprechenden Prozesse sind wichtig, um die führende Rolle der Schweiz in diesem Bereich auch künftig beibehalten zu können.

1. INSTITUTIONS PARTICIPATING AND DATA COLLECTION

Nine universities and the two Swiss Federal Institutes of Technology (collectively ‘Universities’), seven Universities of Applied Sciences (UAS), and three research institutes (RI) in the ETH domain were contacted in spring of 2012 and asked to provide data on their technology transfer (TT) activities for the year 2011. The expression “technology transfer” used in this report covers the activities of these institutions with regard to research collaborations with partners from the economy and the commercialization of research results for the benefit of the economy and society overall.

The questionnaire was returned by seven Universities, individual departments of five UAS, and by three RI. However, the handling of research collaborations with economic partners and other technology transfer activities varies a lot among different institutions, and not all of them were able to provide comprehensive data in this field. **Thus, the data provided in this report are not complete and only summarize the figures reported, while the actual activities at the interface of academia and economy are considerably higher.** Table 1 on the next page shows the institutions that participated in the survey and comments on the comprehensiveness of the data provided.

Comments on data received by the different types of institutions:

Universities: At several Universities, contracts for collaborative research projects with economic partners need only to be signed by university management above a certain amount. Therefore, not all small projects were reported by such institutions. At some Universities, technology transfer offices (TTO) only handle a small part of the collaborative research projects with economic partners; and at some Universities, centralized TTO were created only recently. Activities in research and technology transfer at university hospitals are usually closely linked to the respective University, hence the services of these transfer offices are also available to researchers at the hospitals. Data from the hospitals are included in the report, but not all are complete. With several hospitals, especially clinical research activities are not included.

UAS: The management of technology transfer activities at the UAS varies widely. Some departments or schools have professionals working in centralized TTO (e.g. BFH and ZHAW) and are able to provide comprehensive data. At other departments or schools, no centralized support functions exist and data are fragmentary or are completely lacking.

RI: The research institutions that participated in the survey have centralized support functions providing technology transfer services for the researchers although the scope of services provided differ.

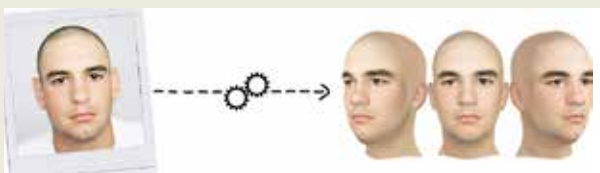
swiTTreport represents the most comprehensive study in Switzerland on technology transfer activities of academic and other public research institutions. The report mostly provides aggregate data for the three types of institutions covered in this survey. For those institutions that agreed to disclose individual data some key figures are listed on page 23.

3D BASEL FACE MODEL

Problem – Challenge

3D Morphable Models (3DMM) is a technology that can automatically generate 3D faces at any desired pose and illumination from one or more photographs. 3DMM may be used to perform various tasks such as face recognition, face image analysis (estimating the 3D shape from a single photograph), expression transfer between individuals, animation of faces and stimuli generation for psychological experiments.

However, the widespread use of 3DMMs has been held back by their difficult construction process, which requires a precise and fast 3D scanner, and the scanning of several hundreds of individuals.



Solution

The 3D Basel Face Model (BFM), which was published by the Computer Science department of the University of Basel (Prof. Vetter) is a standardized training data set that is based on face scans of 100 female and 100 male persons. When using the BFM for implementing 3DMM, the difficult construction process does not have to be performed anymore. This makes 3DMM much more attractive for commercial applications. BFM is provided under a free non-commercial license for research institutions, and a commercial license for companies. Several commercial licenses have been issued so far and the BFM is currently used or evaluated for applications in online shops (e.g. fitting of glasses), plastic surgery (face simulation) and visual effects in movies. In addition, the University of Basel has developed and patented an improved 3DMM called “Global-to-Local-Model”. Vizago, a spin-off company of the University of Basel, offers commercial applications and services based on this new model.



Table 1: Institutions contacted for the survey and comments on their data provided.

Institution	Technology Transfer Office (TTO)	Comments on data provided
Universities	(Total 11)	
ETH Zürich	ETH transfer	Complete data, research agreements <50kCHF only partly
EPF Lausanne	TTO	Complete data, research agreements <50kCHF only partly
Universität Basel / Universitätsspital Basel	Unitecra	Complete data only for the Medical, Natural Sciences and Psychology Faculties, partial data for hospital
Universität Bern / Inselspital	Unitecra	Complete data only for the Medical, Vetsuisse and Nat.Science Faculties, no data for research agreements of other faculties
University of Fribourg	TTO	Partial data available
Université de Genève / Hôpitaux Universitaires de Genève	Unitec	Complete data for commercialization activities, research contracts only partly handled by TTO
Université de Lausanne / Centre Hospitalier Universitaire Vaudois Lausanne	PACTT	Complete data for commercialization activities, research contracts only partly handled by TTO
Université de Neuchâtel	TTO	Fragmentary data, research contracts only partly handled by TTO
University of St. Gallen	TTO	No data available
Università della Svizzera italiana	TicinoTransfer	No data available
Universität Zürich / Universitätsspital	Unitecra	Complete data only for the Medical, Vetsuisse and Nat.Sciences Faculties, no data for research agreements of other faculties
Universities of Applied Sciences	(Total 7)	
Berner Fachhochschule	TTO	Complete Data (AHB,TI,WGS,HKB,HAFL)
Fachhochschule Nordwest- schweiz (FHNW)	TTO	Data available from the department 'Life Sciences', no data available for the department 'Technik'
Fachhochschule Ostschweiz	TTO	Partial data available
Zürcher Fachhochschule	ZHAW TTO	Data only available from 'Zürcher Hochschule für Angewandte Wissenschaften' (ZHAW)
Hochschule Luzern	ITZ - Innovations Transfer Zentra- lschweiz	No data available
Haute Ecole Spécialisée de Suisse occidentale (HES-SO)	TTO	Data available from HES-SO Valais and Tech Transfer Fribourg
Scuola Universitaria Professionale della Svizzera Italiana (SUPSI)	Ticino Transfer	No data available
Research Institutes	(Total 3)	
Paul Scherrer Institut	PSI TT - Office	Complete data on research projects, partial data on IP
Empa, Swiss Federal Institute for Materials Science and Technology	Empa-Eawag TT-Office	Complete data
Eawag, Swiss Federal Institute of Aquatic Science and Technology	Empa-Eawag TT-Office	Partial data available

2. INSTITUTIONAL RESOURCES FOR TECHNOLOGY TRANSFER

2.1 Services Provided

All TTO at the Universities are handling contracts for research collaborations. However, at several Universities, the finalization of research agreements by the central office is only voluntary. All TTO deal with the management and commercialization of intellectual property (IP), which includes the evaluation of the economic value of research results, the protection and management of IP, and the licensing or sale of IP to industrial partners. Seven of nine TTO at Universities also provided support for the coaching of start-up projects and at two Universities such support is available through an incubator associated with the institution. At a few Universities TT programs still are very small and focus on few services.

The participating UAS and RI all offer support in research collaborations. Five UAS are dealing with IP management and commercialization. However, this does not apply to all individual departments or schools of the UAS. Two RI support the management and commercialization of IP. Coaching of start-up projects is offered by four UAS and one RI.

INNOVATIVE HANGING BRIDGE IN SIGRISWIL (CH)

Problem – Challenge

The area around the Lake of Thun, in the "Berner Oberland" is famous for its fantastic landscape and its breathtaking panorama.

In order to valorize these assets, the association "Panorama Rundweg Thunersee" is seeking to develop a unique and continuous hiking path around the Lake of Thun. In this hilly countryside, the path is still interrupted by various deep valleys making its crossing difficult and forcing the tourists to large detours.

Therefore, the association started a competition, to create six new bridges around the Lake. To link Sigriswil with Aeschlen over the Guntenbach asked for the development of a 340m hanging bridge spanning over a valley as deep as 180m.



Solution

The Berne University of Applied Sciences participated in the preparation of the competition and was mandated by the winning consortium to design and detail this unique construction. Architects and engineers worked closely together to develop this unique structure. Challenges such as safety, statics and dynamics have been faced and solved by the design crew. A stiff structure was developed that allows safe crossing for everyone.

This bridge creates a strong connection between the villages of Sigriswil and Aeschlen. It offers land art character to this path with its aerial and minimalistic structure. The bridge was inaugurated on the 14th of October 2012.

2.2 Staffing

Staffing refers to the number of full-time equivalents (FTE) employed for TT activities at an institution. These are people such as Licensing Officers, Intellectual Property Managers, Technology Managers or Research Contract Officers, whose main occupation is in the area of technology transfer. Their activities cover the drafting and negotiating of research and cooperation agreements, intellectual property management, licensing and other commercialization activities, and the coaching of start-up projects. TT activities must account for at least 20% in this person's job description.

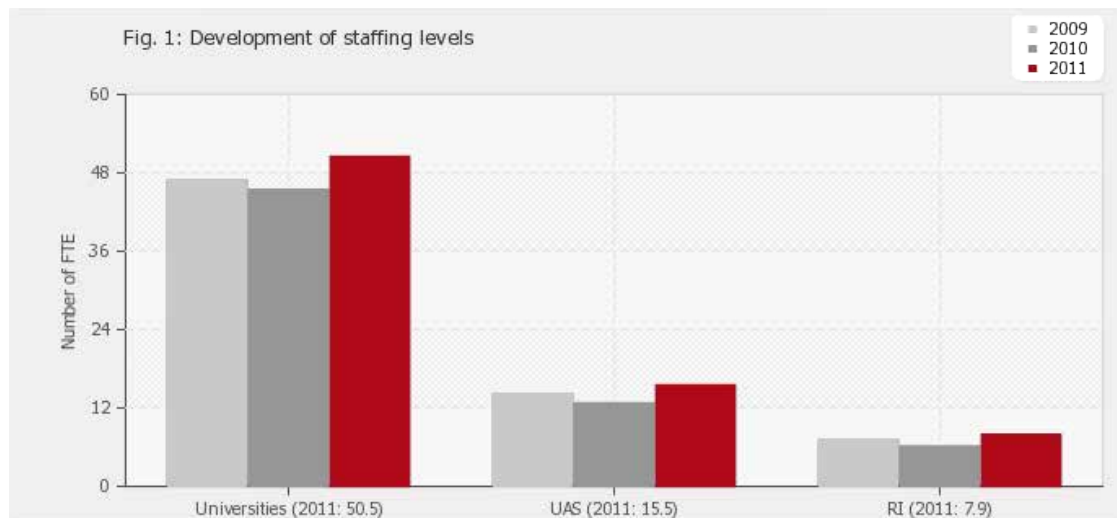


Fig. 1: Development of staffing levels.

The total number of FTE in technology transfer at the participating institutions was 74 compared to 64 in the previous year. The largest TTO had 14 FTE. The average size of the offices that responded is 4.3 FTE. Swiss TTO thus remain small in comparison to TTO in other countries if the size is normalized to the number of researchers. On the other hand, the Swiss TT professionals are on average better educated and possess more working experience in industry.

TTO usually collaborate with external patent attorneys in the drafting and filing of patent applications. Several TTO also outsource legal issues to external attorneys. At some institutions, start-up projects are handled by dedicated organizations such as a business incubators. Thus, the actual number of people supporting the transfer activities is larger than the number of FTE reported for the TTO.

3. RESEARCH COLLABORATIONS WITH PARTNERS FROM THE ECONOMY

3.1 Research Agreements Handled by the TTO

In 2011, the TTO handled contracts for a total number of 2872 research projects with economic partners. This number is lower than the number reported for the previous year (-5.4 %). However, in view of the incomplete data provided by the institutions the comparison of such figures remains difficult.

For the Universities the number of new co-operative research projects decreased slightly to 2158 (-5.5%). The RI reported 340 (+16 %) projects the participating UAS 374. A high percentage of UAS institutions have no central data available about their TT activities or at least are not willing to share the data. Therefore, the figure cannot be compared easily with previous years. The lack of data results in a significant underestimation of the real situation. The true number of collaborative research projects is a lot higher than reported here.

Research collaborations between academia and industry are a key aspect of TT, offering a multitude of potential benefits to both parties. They not only allow industry to access the know-how and infrastructure of academia, companies also gain access to young academic talents through such collaborations. At the same time, the academic partner can often take advantage of the know-how of the industrial partners. In addition, the funding of joint projects by industry and partners from the economy accounts for a significant part of the research budgets of public research institutions. In that perspective, research collaborations are the dominant and most attractive method of TT.

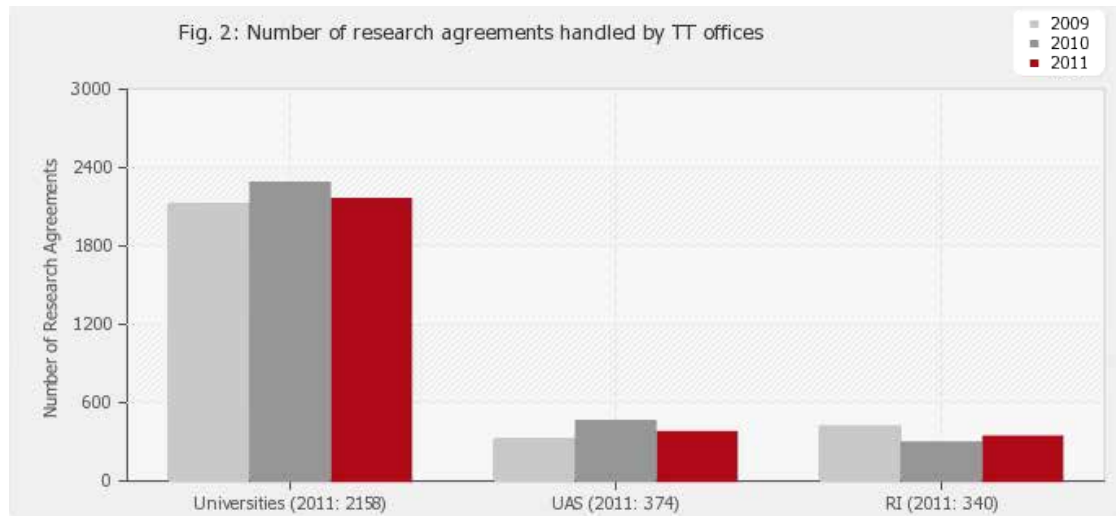


Fig. 2: Development of number of research agreements and EU contracts handled by the people responsible for TT.

For the collaborative research projects handled by the TTO, survey respondents reported total cash contributions from collaboration partners in 2011 of 329 mio CHF. The average cash payment per project is 120,000 CHF. The contribution per project at Universities and RI was about twice as high as for the projects at the UAS.

In addition to research collaborations, TTO handle other types of agreements which foster the cooperation between academia and economic partners, such as consulting agreements, material transfer agreements (MTA), and non-disclosure agreements (NDA). In 2011, the institutions reported altogether 2086 such other types of TT agreements.

THERAPEUTIC VIDEO GAME RICKY AND THE SPIDER



Universität Zürich

Problem – Challenge

International studies show that approximately 2% of all children suffer from obsessive-compulsive disorder (OCD). Without treatment, pediatric OCD often takes a turn for the worse. The longer the patient has been suffering from the disorder prior to diagnosis and the earlier OCD manifests itself, the worse the prognosis will be. Although cognitive behaviour therapy, eventually combined with medication, is the treatment of choice for OCD in children, there is a shortage of therapists available to treat pediatric OCD, as well as a lack of developmentally appropriate treatments that are tailored to the needs of younger children. Thus, enhancing the dissemination of evidence-based treatment strategies in the community is a considerable challenge. This is done by means of a therapeutic video game.

Solution

Ricky and the Spider was developed by Dr. Veronika Brezinka at the Center for Child and Adolescent Psychiatry of the University of Zurich to help support behavior therapists in their work with children who suffer from obsessive-compulsive disorder. It integrates the most important therapeutic treatment elements of cognitive behavior therapy in a playful manner. The game helps to facilitate the understanding of the illness, its consequences and its subsequent treatment by illustrating this metaphorically. *Ricky and the Spider* aims to encourage children to confront their OCD and offers support to behavior therapists treating children with OCD. The game is distributed by the University of Zurich and intended to be played with the guidance of a psychotherapist or child psychiatrist.



3.2 Type of Collaboration Partners

With regard to the type of collaboration partner, the small- and medium-sized enterprises (SME), i.e. companies with fewer than 250 employees, account for 25% of total projects reported. A higher number (35%) of projects were performed with large companies, and 40% with public institutions. If one considers only collaborative projects with the private sector SME account for more than one third of all projects (41.5%).

These ratios vary considerably among the different type of institutions surveyed as shown by Fig.3. At UAS the most important collaboration partner are public institutions (31%) and SME (31%). At the Universities large companies are the most frequent partner (39%) and the RI most frequently collaborate with other public institutions (37%)

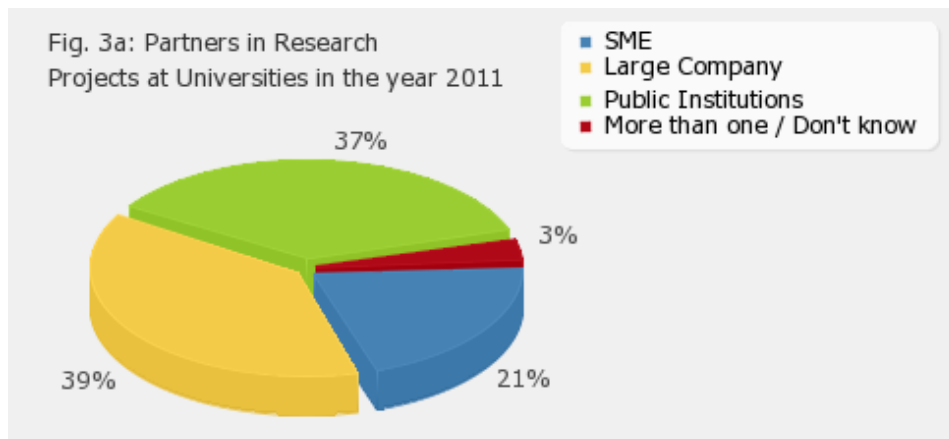


Fig. 3a: Partners in Research Projects at Universities

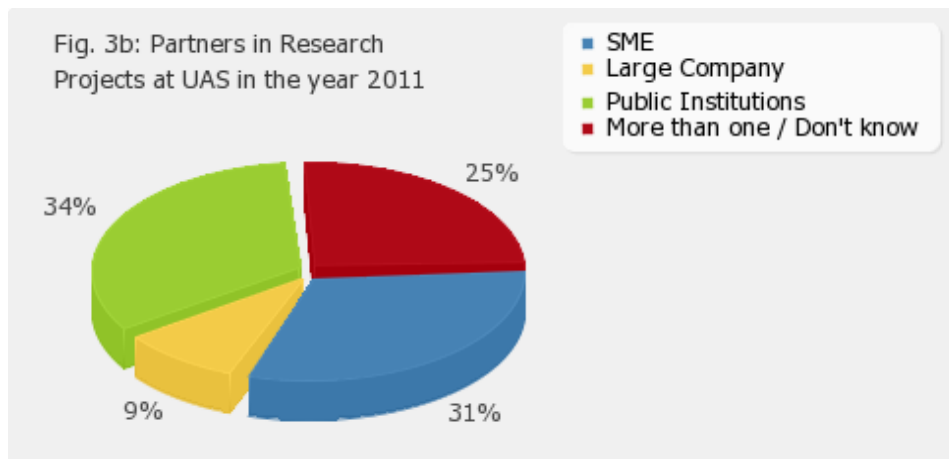


Fig. 3b: Partners in Research Projects at UAS

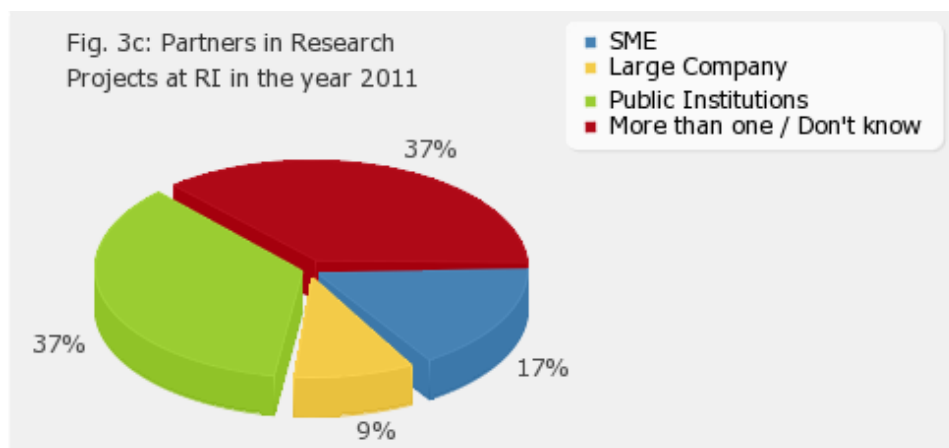


Fig. 3c: Partners in Research Projects at RI

4. COMMERCIALIZATION ACTIVITIES

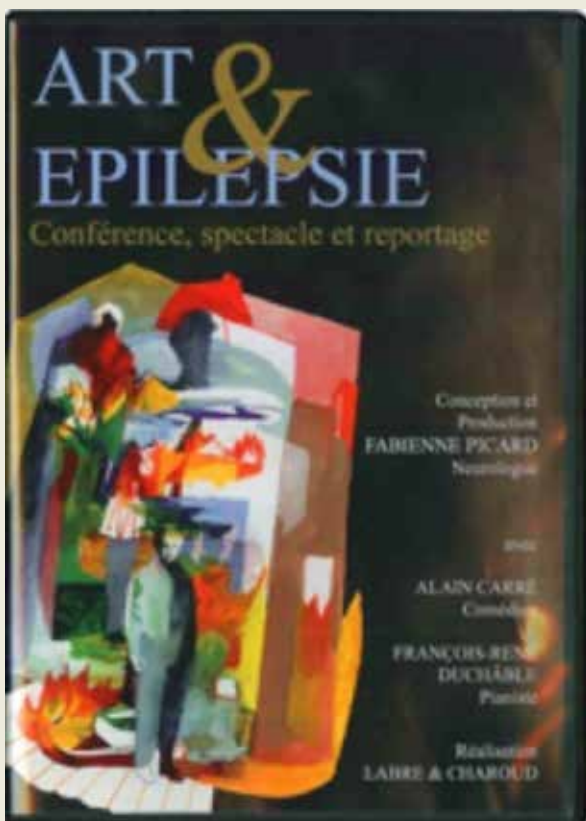
Research results of Universities, UAS and RI often form the basis for innovative products which are developed and later commercialised by companies based on the work performed at public research institutions. The public institutions strive to make available research results with an economic potential to the private sector. Most frequently this is done through licensing of technologies to companies. Relevant research results need to be identified, screened and where applicable protected by patents or other suitable measures. Without a good protection of the intellectual property industrial or financial investors in many industrial sectors will not consider investing.

This whole process involves the following main steps: identification and evaluation of research results through invention disclosures, filing of patent applications, negotiating license agreements with existing companies or newly created start-up companies. At many institutions, the creation of such start-up companies is supported by various additional services. In Sections 4.1 - 4.4., the main activities of the institutions participating in this report are described.

ART & EPILEPSY: CONFERENCE, PERFORMANCE, REPORT

Problem – Challenge

Epilepsy is a neurological disease that needs to be better known by the public in order to dispel prejudices that still exist. Many renowned historical figures who suffered from epilepsy were remarkable men and women who excelled in their fields despite their illness: Socrates, Molière, Newton, Napoleon Bonaparte, Dostoevsky, Flaubert, Van Gogh, Agatha Christie ...



Solution

Dr Fabienne Picard, who practises and performs research at HUG (Geneva University Hospitals) produced a DVD in order to reach her goal to dispel prejudices that still exist with Epilepsy.

The first part of the DVD is a scientific conference which explains Epilepsy. The second part is an artistic performance featuring a famous pianist (François-René Duchâble) and a famous performer, Alain Carré. Alain Carré reads texts written by famous artists which suffered from Epilepsy. The last part of the DVD is an investigative report with different interviews.

Unitec helped the producer of the DVD to clarify IP rights with the artists and sort out distribution issues. The DVD is now distributed by the the University of Geneva's Continuous Education Services:

www.epileps.ch

The DVD is available in French and English (voice-over). Subtitles in French, English, German, Spanish, Italian.



4.1 Invention Disclosures

A total number of 482 invention disclosures were reported for 2011 which is slightly more than in the previous year. The vast majority of invention disclosures were reported by Universities (87%). The three RI accounted for 6% of the invention disclosures, the UAS for 6.4%. Many UAS do not have a formal process for the protection of the research results. In addition, UAS often transfer the rights to research results created in the scope of collaborations to the industrial partner.

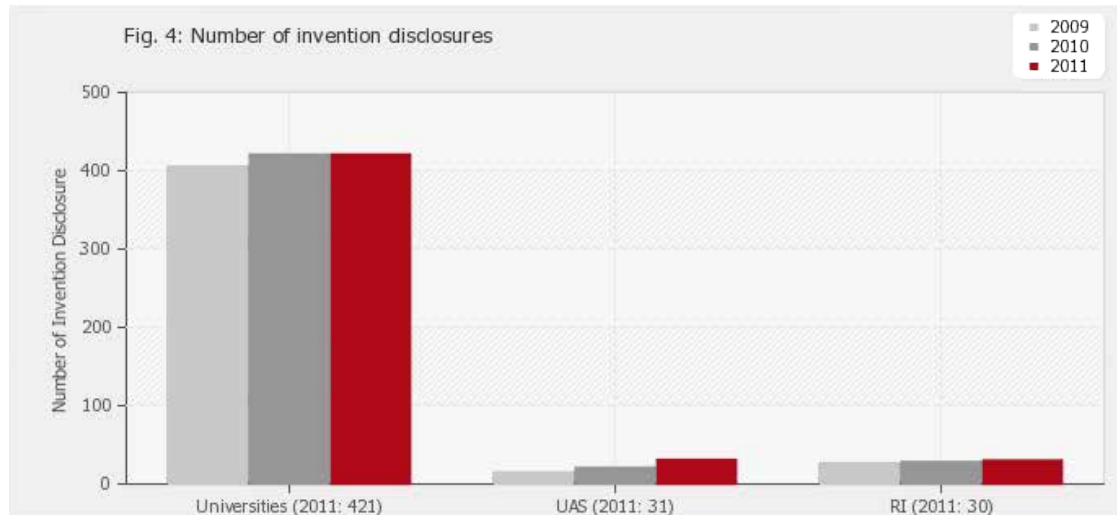


Fig. 4: Number of invention disclosures.

4.2 Patenting Activities

4.2.1 Priority Patent Applications

In 2011 the institutions reported 240 new priority patent applications. The majority of these applications were again filed by Universities (88%), followed by the RI (9.5%) and the UAS (2.5%). In total 75% of all patent applications were filed by the three TTO's; ETH Transfer, the TTO of EPFL and by Unitectra.

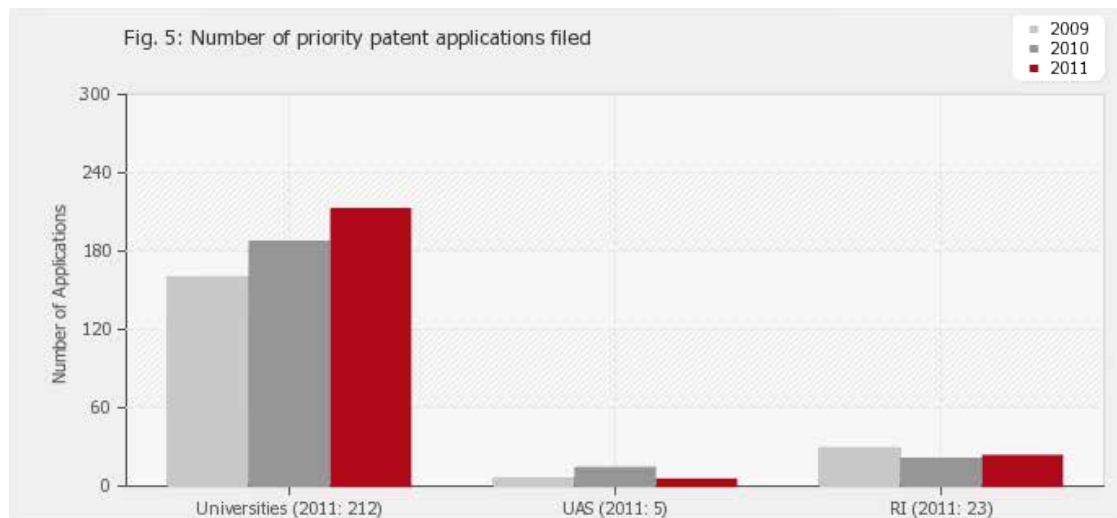


Fig. 5: Number of priority patent applications filed.

The protection of intellectual property in the form of patents is of great importance in many industrial sectors. This is particularly true for industries with high product development costs and long product life-cycles, e.g. biotech and pharma. The TTO at public research institutions must decide at an early stage about filing patent applications because patenting of an invention is no longer possible after the results have been published in scientific journals or through other channels.

Moreover, many companies will not consider evaluating a new technology if it is not protected by a patent. Thus, patenting activities of public research institutions can be a prerequisite for entering into a partnership with an industrial partner.

4.2.2 Patent Portfolio - Active Patent Cases End of 2011

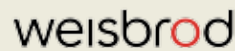
At the end of 2011, the institutions participating in the survey reported more than 1600 active patent cases which were either licensed to a company or for which they were searching for a licensee. Marketing of such technology opportunities is done by the research institutions through various channels. The existing contacts of researchers are often used to approach companies. To support the research institutions in this promotion and to provide a quick and easy overview of current technology opportunities for industry, the association swiTT established the national portal *swiTTlist* (www.swittlist.ch). Through their TTO, the Swiss public research institutions list technologies on this portal which have an economic potential and which are available for licensing and development by industry. With the help of an automatic alert system, company representatives are informed immediately each time a new technology is available in their field of interest.

CASE

CASE

CASE

FINEST SILK – PUREST GOLD



Problem – Challenge

Until recently only a very old method to produce gilded yarn was available: the fiber was wrapped by a metal ribbon. But these yarns were rough, not easy to handle and needed a lot of gold.

Textile specialists at Empa in St Gallen had been researching for several years to find a method of finely dividing titanium, aluminium, steel, copper, silver and finally gold and then allowing these powdered metals in atomic form to rain onto polyester fibers. Together with three partners from industrie Empa started a CTI-Project to make this technology market-ready.

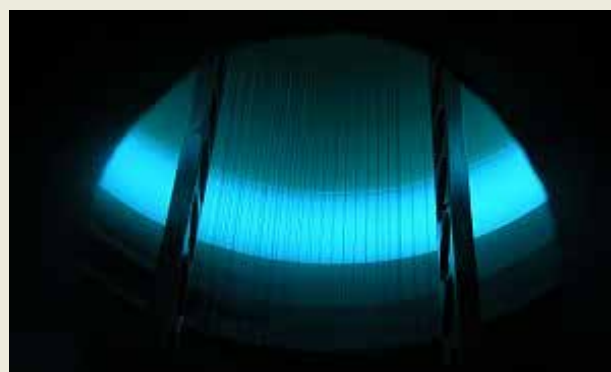


Traditional method

Solution

The plasma coating plant, which is about as large as a household refrigerator, can be found today on the premises of the Tersuisse spinning mill in Emmenbrücke. Inside the apparatus a piece of gold is bombarded with fast moving argon ions which knock atoms off the metal surface. These gold atoms fly off and land on a polyester fiber which is slowly pulled through the machine. This is the beginning of the production process which for the first time in the world creates a textile material permanently coated with a durable layer of gold. The precious metal remains attached to the fiber even when it is rolled, kinked, woven in a loom and given a final wash.

Nowadays production in the coating plant has reached a stable level. The first kilometer was generated in the summer of 2011 and in 2012 production is expected to increase further. Further handling of the fiber is done by two project partners, the Weisbrod-Zuerrer AG in Hausen am Albis and the embroidery firm Jakob Schlaepfer in St. Gallen.



New coating system

4.3 Licensing

4.3.1 Licenses and Sales of Intellectual Property (IP)

The number of reported IP agreements, usually licenses, was slightly higher than in the previous year. Overall 203 deals were reported, 83% of them by Universities, 9% by RI and 8% by UAS. In a few cases the agreements involved a sale of the IP rather than a license. In total 72% of all agreements were handled by three TTO's; EPFL, ETHZ and unitectra.

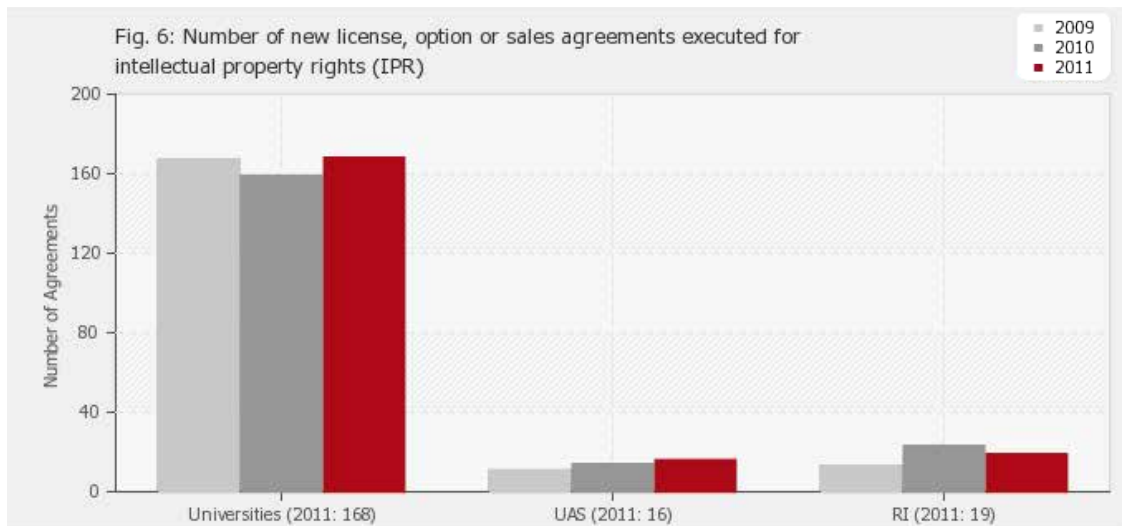


Fig. 6: Number of new license, option or sales agreements executed for intellectual property rights (IPR).

NEW TECHNOLOGY FOR IMPROVED INDUSTRIAL PRODUCTION

Problem - Challenge

Industrial coatings are a multi-billion Euro business including liquid paint and powder coating in automotive and architectural industries as well as thermal spraying in energy and aero industries. Annually, an estimated 100 billion Euro worth of coating material is processed. Around 10%-20% of this coating-material is wasted due to over-coating because reliable and unproblematic process control of the coating thickness is unavailable. However, even more critical and cost intensive is the lack of integrated process and quality control to detect deficient products directly after fabrication. Growing shortages of resources as well as ecological and quality awareness is moving process-integrated control into the focus of decision makers.



Solution

Our revolutionary CoatMaster measurement system determines the coating thickness during production allowing a closed-loop control of the coating process. This enables the coating industry to save money and to take ecological responsibility as well as to protect itself against liability claims. The CoatMaster distinguishes itself by its safe, fast, noncontact and nondestructive operation. Our customers use the CoatMaster to modernize existing production lines, allowing rapid response to process deviations. This saves them production time and prevents defective goods. Using the CoatMaster the run-in time for new coating materials is decreased dramatically and the personnel necessary to operate the coating line is significantly reduced. The consumption of coating material and the environmental footprint is optimized to the minimum. The CoatMaster is developed in collaboration with our industrial partners Wagner and Akzo Nobel.

CASE

4.3.2 Type of Licensing Partners

As in previous years the majority of the licenses granted in 2011 went to SME (62%). This is mainly due to two reasons. On one hand, SME are often more interested in and more flexible to in-licensing and developing technologies from academia. Large companies have their own R&D programs and will only in-license technologies which will complement their existing portfolio. On the other hand, public research institutions regularly license technologies to their start-up companies. Thus, start-up companies play an important role in developing university technologies. Depending on the industry segment and on the particular product these companies will either market the final products themselves or will sublicense the technologies to larger companies that have the necessary know-how and resources to bring the product successfully on to the market.

4.3.3 License Portfolio and License Income

The number of active licenses under management at the end of 2011 was reported as 1249 cases, slightly higher than the previous year. Thereof, 91 % of active licenses were handled by the Universities, 8 % by the RI and 1 % by the UAS.

Of these active licenses 299 cases resulted in license income to the institutions and the researchers involved. In 164 cases such license income came from product sales. This figure has increased continuously in the past years in line with the growing number of products sold on the market that are based on research results of public research institutions. In the other cases income resulted from other type of license fees, e.g.

CRISALIX – 3D WEB-BASED TECHNOLOGY FOR PLASTIC SURGERY

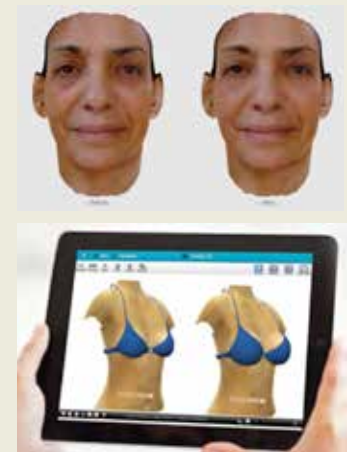


Problem – Challenge

In cosmetic surgery, as opposed to conventional medical procedures, the patient is not ill and therefore the diagnosis, treatment and outcome are all dominated by the patient's subjective assessment of an elective surgical procedure. The most common question in all these patients is "How could I look after the aesthetic procedure?", and failing to answer this question can lead to patient dissatisfaction. Failure to meet patient's expectations can lead to the need for re-operations and additional costs to the surgeon. Furthermore the market dynamics of cosmetic surgery are strongly driven by patient referrals, which again are based upon patient satisfaction. It is therefore essential that the patient is intimately involved in the process of implant selection.

Solution

Crisalix is solving both the patient's critical need to see how she would look after the surgery and the surgeon's need to respond to the patient's concern, allowing driving customer conversion and positive referrals in a time- and money-efficient manner. Crisalix is the pioneer in 3D web-based simulation of aesthetic procedures, with clients in more than 70 countries, with its revolutionary technology developed in collaboration with the Institute for Surgical Technology and Biomechanics ISTB from the University of Bern (CTI projects). With only 3 photos of the patient, Crisalix' technology can generate, in a quick and easy process through the web, the 3D model of the patient and help surgeon and patient to decide about the outcome of the surgery by providing a simulation system to see the future result before surgery.



license issue fees or milestone payments for products still in the development process.

These figures reflect the typical situation of licenses granted to industry by public research institutions. Many of the licensed technologies are at an early stage and require extensive development by the licensee. It often takes several years until a product reaches the market. Moreover, due to the early stage, the development risk is often high, and a significant number of projects are stopped before a marketable product is ready. Further, the figures are also typical for a still rather young license portfolio because many of the Swiss TTO have only been in operation for a relatively short period of time.

Data on license income are incomplete and were reported only by about half of the institutions participating in this survey. The total license income of these institutions amounted to 7.7 mio CHF slightly lower than in the previous year.

Mainly when licensing to start-up companies, some institutions may accept equity in such companies as a partial compensation for the licensing of technology. Such equity transactions usually replace down-payments or early milestone payments in order to avoid any cash drain from the start-up through license fee payments at the early stage of development. For the institutions, this results in a deferral of license revenues from such licenses until the shares in such start-up companies are sold by the institutions. In 2011, the institutions reported equity transactions for 12 of the 43 new start-up companies created that involved a license (see Section 4.4). In the past years more institutions started to accept equity as part of their license deals.

4.4 Start-up Companies

The number of newly created start-up companies from public research institutions remains at a high level. In 2011 the institutions reported a total of 68 new start-up companies, whereby 43 of these companies relied on a license or a contractual transfer of intellectual property from a public research institution. The remaining 25 companies were created on the basis of know-how developed at the research institutions, but without a formal license.

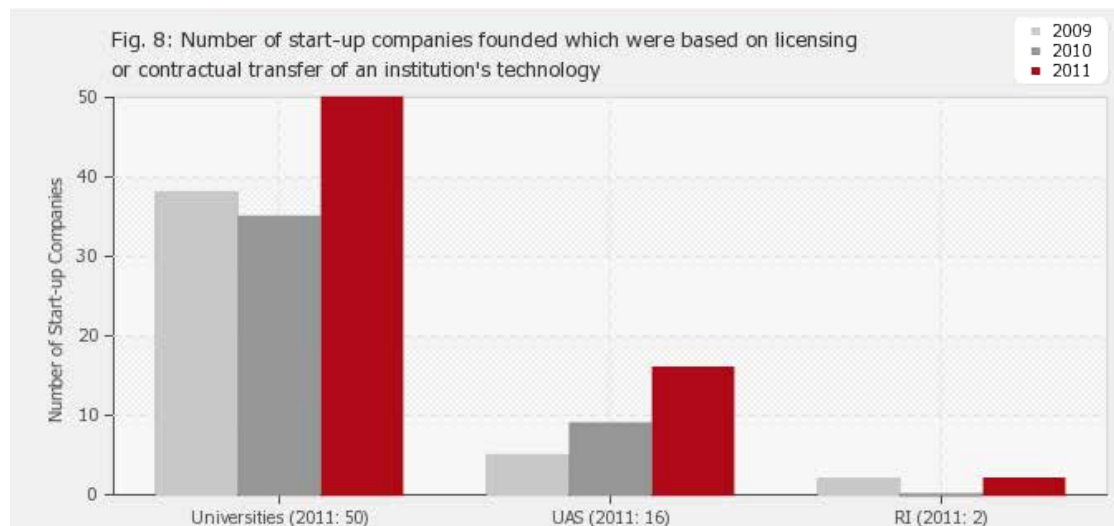


Fig. 8: Number of start-up companies founded which were based on licensing or contractual transfer of an institution's technology.

APPENDIX 1 – DETAILED DATA 2007-2011

Note: The number of institutions that participated in the survey varies between years.				
All respondents	2008	2009	2010	2011
Full-time equivalents (FTE)	63	68	64	74
Research contracts (incl. EU contracts)	2745	2855	3035	2872
Invention disclosures	431	446	470	482
Priority patent applications	194	195	224	240
Active patent cases end of the year	924	1512	1573	1606
License agreements	271	191	196	203
Active license agreements end of the year	1079	1143	1237	1249
kCHF of net licensing revenues	9479	8197	8533	7665
License agreements with revenues in respective year	271	289	288	299
New start-ups on basis of formal license	39	45	44	43
Universities	2008	2009	2010	2011
Full-time equivalents (FTE)	42	47	45	50.5
Research contracts (incl. EU contracts)	1895	2120	2285	2158
Invention disclosures	378	405	421	421
Priority patent applications	167	160	187	212
Active patent cases end of the year	779	1355	1356	1459
License agreements	190	167	159	168
Active license agreements end of the year	1013	1058	1135	1131
kCHF of net licensing revenues	8338	7686	7829	7029
License agreements with revenues in respective year	252	268	258	257
New start-ups on basis of formal license	31	38	34	33
RI	2008	2009	2010	2011
Full-time equivalents (FTE)	7	7	6	8
Research contracts (incl. EU contracts)	395	416	293	340
Invention disclosures	37	26	28	30
Priority patent applications	17	29	21	23
Active patent cases end of the year	97	110	141	112
License agreements	14	13	23	19
Active license agreements end of the year	61	81	90	103
kCHF of net licensing revenues	961	337	190	170
License agreements with revenues in respective year	16	20	17	19
New start-ups on basis of formal license	3	2	0	2
UAS	2008	2009	2010	2011
Full-time equivalents (FTE)	14	14	13	15.5
Research contracts (incl. EU contracts)	455	319	457	374
Invention disclosures	16	15	21	31
Priority patent applications	10	6	16	5
Active patent cases end of the year	48	47	56	35
License agreements	4	11	14	16
Active license agreements end of the year	5	4	12	15
kCHF of net licensing revenues	180	174	514	466
License agreements with revenues in respective year	3	1	13	23
New start-ups on basis of formal license	5	5	9	8

APPENDIX 2 – KEY PARAMETERS FOR INDIVIDUAL INSTITUTIONS

This table lists individual data of those institutions that agreed to publish them.

Institution	Name TTO	Start TTO	3.2 TTO FTE	4.1 Total # of research contracts	5.1 # of invention disclosures	5.2 # of priority applications	7.1 # of IP agreements
Universities							
EPFL	SRI (TTO of EPFL)	1993	8.1	257	95	52	50
ETH	Transfer	1995	14	582	123	50	48
Uni Basel	Unitectra*	1998	10.9	67	35	15	13
Uni Bern	Unitectra*	1999		464	25	10	8
Uni Zurich	Unitectra*	1996		532	68	51	27
Uni Geneva	Unitec	1998	7.6	74	47	22	11
Uni Lausanne	PACTT	2000	7.5	148	24	11	5
RI							
Empa	TT Office	2005	3.3	142	19	12	15
PSI	TT Office	1999	3.6	126	11	11	4
UAS							
BFH	TT Office	2005	12.5	235	25	0	1

* Unitectra is the joint TTO of the Universities of Basel, Bern and Zurich

GLOSSARY

swiTT	Swiss Technology Transfer Association
Universities	Cantonal Universities and Swiss Federal Institutes of Technology
UAS	Universities of Applied Sciences
RI	Swiss Federal Research Institutions in the ETH domain
TT	Technology Transfer
TTO	Technology Transfer Office(s)
FTE	Full Time Equivalent (for the number of employees)
IP	Intellectual Property
SME	Small- and Medium-sized Enterprises (<250 employees)
Start-up	Newly established company founded or co-founded by researchers from the respective institution and which either relies on a formal license of IP or on know-how developed at the institution

APPENDIX 3 – THE QUESTIONNAIRE

swiTT Technology Transfer Survey 2011 (online survey)

Preliminary Notes:

- All questions refer to the calendar year 2011. Please make your statements accordingly.
- If no answer is available for certain questions, please indicate with n.a. Questions for which your office or your institution does not collect data should be left open (n.a.) and should not be answered by giving an estimate.

1. Confidentiality			
Do you agree to the publication of the individual data collected in the questions marked *[pub] under your institution's name? All other data will only be published in the aggregated format by type of institution? <i>All other data will only be published in the aggregated format by type of institution.</i>			<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Background Information			
2.1 Name of the academic institution/s			
2.2 Is your institution associated with an university hospital? <i>(If yes, please note that all figures given below should include the numbers of the hospital, too.)</i>			<input type="checkbox"/> Yes <input type="checkbox"/> No
2.3 Does your institution have a dedicated office / responsible person for TT activities (TTO)?			<input type="checkbox"/> Yes <input type="checkbox"/> No
If yes, which year did the TT program start?		[pub]	
2.4 Name of responsible for TT program			
Name of responsible for survey data			
2.5 TTO address and contact information			
Office Name		Telephone	
Street		e-mail	
City		Postal code	
3. Activities and FTEs			
3.1 What are the activities of your TTO?			
(A) Research contracts (drafting, negotiating, controlling)			<input type="checkbox"/> Yes <input type="checkbox"/> No
(B) Evaluation, protection and management of IP			<input type="checkbox"/> Yes <input type="checkbox"/> No
(C) Commercialisation of IP (licensing, marketing)			<input type="checkbox"/> Yes <input type="checkbox"/> No
(D) Coaching of start-up projects			<input type="checkbox"/> Yes <input type="checkbox"/> No
(F) Financial administration of research projects			<input type="checkbox"/> Yes <input type="checkbox"/> No
3.2 How many full time equivalents FTE were employed in your TTO on December 31st 2011? <i>(Do NOT include researchers working as project managers in transfer projects in this number)</i>		FTE [pub]	
3.3 Of these FTE, how many were employed to work on			
(A) Technology transfer activities <i>(Staff with main occupations (> 20%) in the area of technology transfer, such as 'Licensing Officers', 'Intellectual Property Managers', 'Technology Managers' or 'Research Contract Officers'. Do NOT include project managers carrying out transfer projects)</i>		FTE	
(B) Administration and general management			
Comments to 3.1 - 3.3 <i>(e.g. if additional people outside your TTO but inside your institution are also working in technology transfer activities according to 3.1, special organisation with specific faculties, centralized/decentralized organisations)</i>		FTE	
4. Research and Development			
4.1 Total number of new research contracts handled by your TTO <i>(Collaboration agreements, service agreements, clinical trial agreements, CTI complementary and EU agreements, NO MTA, NO NDA or other TT contracts (see 4.3) and NO SNSF contracts)</i>		[pub]	
Of these research contracts, how many were executed with small and medium enterprises (SME), how many with large companies and how many with public partners? <i>(Definition: SME are companies with 250 or less employees.)</i>		A) SME: B) Large Company C) Public Institutions: <i>(Sum shall equal 4.1!)</i>	
4.2 Amount of cash payments due to your institution from research contracts that were handled by your TTO according to 4.1 <i>(Please give the amount of cash due to your institution, NO material asset e.g. for machinery and NOT the total amount of Research Project, e.g. if an EU project adds up to 3 Mio. EUR but your institution gets only 200'000 thereof, the latter shall be given. Do not split the amount, if the contract is covering several years but report the full amount in the year the contract is signed.)</i>		CHF	
4.3 Number of other technology transfer contracts handled by your TTO <i>(Non Disclosure Agreements (NDA), Material Transfer Agreements (MTA), consulting contracts, inter-institutional contracts, sponsoring, donations, but NO licenses, options, sales)</i>			

Comments to 4.1 – 4.3 (e.g. restrictions/regulations at your institution, knowledge of ALL contracts or only contracts above a certain amount)	
5. Patent-Related Activity	
5.1 How many invention disclosures were received by your TTO?	[pub]
5.2 How many priority applications were filed by your TTO? (Priority application being the very first application for a new technology in any patent office of the world.)	[pub]
(A) Of these, how many are based on research significantly funded by SNSF.	
5.3 What was the overall number of active patent cases at the end of 2011 managed by your TTO? (Active patents cases are pending or granted patents on a technically unique invention (patent family). Applications in various countries on ONE technically unique invention count as ONE patent case.)	
6. Patenting Costs and Legal Fees	
6.1 Amount spent by your TTO/institution on patenting costs and external legal fees? (Including all external costs for patent filing, prosecution, maintenance, litigation expenses or costs for drafting or support in negotiation of contracts.)	CHF
6.2 Amount of patenting costs and legal fees invoiced to commercialization partners? (Does NOT include patenting costs or legal fees paid DIRECTLY to the patent attorney or other service providers by licensees or external partners.)	CHF
7. License, Option and Sales Agreements	
7.1 How many licenses/options/sales of protected or unprotected IP did your TTO execute? (Count only the agreements for different technologies, i.e. 30 licenses for the same software library count as ONE. If a license agreement is combined with a research agreement (e.g. advanced sale of the results of a research project), this contract shall count only as research contract and NOT be included in this question unless the invention/software that is licensed/sold, exists already at the execution date of the research contract.)	[pub]
Of these licenses/options/sales, how many were licensed to SME, how many to large companies or public institutions? (Definition: SME are companies with 250 or fewer employees)	(A) SME: (B) Large Company: (C) Public Institutions: (Sum shall equal 7.1!)
(D) Of these licenses/options/sales how many are based on research significantly funded by SNSF?	
7.2 How many licenses/options/sales included equity? (Equity meaning the ownership of interest in a company such as shares, options, warrants, etc. in consideration for granting a license or sale of IP.)	
7.3 How many licenses/options were active as of December 31, 2011?	
Comments to 7.1 – 7.3 (e.g. large variations to previous years, special situations, i.e. with free software licenses OpenBSD, etc)	
8. License Income	
8.1 What was the total number of licenses/options/sales yielding revenue?	
8.2 How many licenses/options/sales yielded running royalties? (Running royalties are based on product sales and are only due after the launch of a product in the market)	
8.3 What was the total amount of license/option/sales revenue received at your institution? (WITHOUT patent cost and fees invoiced in 6.2.)	CHF
9. Start-up Companies	
9.1 Total number of start-up companies formed at your institution	
(A) Of these start-up companies, how many are dependent on licensing or transfer of your institutions technology?	
(B) Of these start-up companies, how many are dependent on unprotected know-how or technology of your institution (without license agreement)?	
(C) Of these start-up companies, how many are based on research significantly funded by SNSF?	
9.2 In how many of the new start-up companies does your institution hold equity?	
10. Post-Licensing Activities	
10.1 Did one or more of your institution's licensed technologies become available for consumer or commercial use in 2011?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If yes, how many?	
10.2 Information about the launched products (Please give a short title of each product success story and the e-mail of the contact person for additional information.)	[Title, Contact Person]
Comments	
(If you want to bring any additional comments or suggestions to the attention of the team of the swiTTreport, please post them here)	

Thank your for your input!

OVERVIEW



Contact

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swiTT - Swiss Technology Transfer Association

swiTT is the association of professionals in Switzerland dealing with the interaction between public research and industry.

Mission

Cooperation - Development - Services - Dialogue
Foster innovation through co-operation and technology transfer between Swiss public research institutions and the private sector.

Services

swiTTlist (www.swiTTlist.ch)

The unique national platform for technology opportunities from Swiss public research institutions provides companies with a quick overview of current technologies and the necessary contact information. Subscription to automatic alerts is free of charge.

swiTTreport

The annual survey gives an overview of the technology transfer activities of the major universities and other public research institutions. It also highlights success stories from different sectors. The report can be ordered through swiTT Office.

swiTTacademy

swiTT regularly organizes educational events on a variety of topics for its members. Some of the events are also open for non-members.

swiTTtalk

The member's forum allows to easily draw on the know-how and expertise of other members on specific topics of interest.

www.switt.ch

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