Università
della
Svizzera
italiana

USI Transfer
For Companies

We help research results make a difference

The mission of USI Transfer is to facilitate innovation, make USI's excellence and competencies available to companies, and ensure that fundamental research findings developed at USI are accessible and transferred to industry to promote strategic partnerships and transform them into innovative projects.

In this way USI, together with the affiliated Institutes (Institute for Research in Biomedicine - IRB, Institute for Oncology Research - IOR, and Istituto di Ricerche Solari "Aldo e Cele Daccò"- IRSOL Locarno) improves the competitiveness, in particular of Swiss companies, for the benefit of society.

Technology and knowledge transfer

The key parameters reflect the effective and efficient transfer of knowledge, technology, intellectual property and expertise to private sector for the benefit of society.

Data since 2018

How USI Transfer can help your company

1 **Find the right expert**
and get to know the latest trends

2 **Select the right tender programme**
for collaborative industrial R&D development with USI

3 **Establish relevant agreements**
to collaborate

Main research domains

Architecture	Construction and technology Culture of the territory Design History and theory of art and architecture Structure and exact sciences
Biomedical Sciences	Bioinformatics Cardiovascular Sciences Clinical studies Computational Biomedicine Immunology and cell biology Neurosciences Oncology and cancer biology Pharmacology and Drug design Public health Regenerative medicine
Communication	Business and financial communication Fashion and tourism communication Health communication Marketing Media management
Economics	Economics Finance Law Management and organization Public health Quantitative methods
Informatics	Artificial Intelligence Computational science Data Analysis and Visualization Internet of Things Machine Learning Mobile computing Software Engineering Visual computing

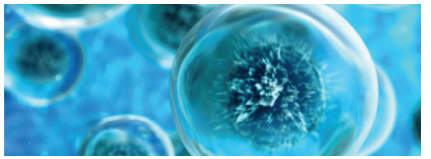
Facilities

Facilities are available for fee for service at the Institute of Research in Biomedicine and Institute of Oncology Research.

For more information visit the websites www.irb.usi.ch/facilities and www.ior.usi.ch/institute/facilities or contact USI Transfer.

Comparative Biology and Preclinical Imaging

Flow Cytometry

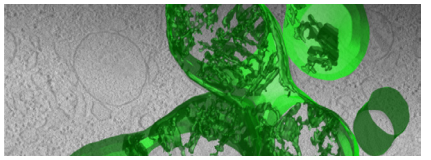


Genomics

Histology

Mass Spectrometry

Microscopy and Electron Microscopy



Success cases of collaboration with industry

Energy commodity trading

Expertise Area
Computational science

Faculty of Informatics

Problem
Developing forecasting models aimed at supporting trading decisions such as algorithmic techniques by using innovative AI and Machine Learning. Real-time responses of the pricing models, considering realistic engineering constraints encountered in power grid operations, are essential in modern trading environments and are not currently available in most trading software. There was a need to develop computational tools for simulating power market prices that meet the performance requirements of today trading environments.

Solution
The performance aimed at by the analytics tools lies in the combination of research advancements in terms of numerical methods, mathematical software tools, and in the efficient exploitation of modern computational infrastructures. The USI research group has contributed to the development of novel computational solutions, leveraging its extensive experience and relevant research performed in the domain of efficient solution strategies for large-scale optimization problems in the power grid domain, including problems spanning long time horizons and incorporating renewable energy sources, stochastic problems accounting for their intermittent nature, and considering numerous contingency events in the power grid operations.

Pest Prevention

Expertise Area
Machine Learning Algorithm

Faculty of Informatics

Problem
Advancing the state-of-the-art in the field of automatic insect classification and counting by using traps to reduce the use of pesticide in agriculture and for pest prevention. The aim of the project is to develop a novel type of smart traps that, by relying on cameras, sensors and machine learning, automatically identify and count specific insect species.

Solution
In collaboration with a leading company in the field of pest prevention, the solution consists of a hardware component, namely an automatic IoT trap with a high-resolution camera, software, namely a machine learning algorithm for automatic insect recognition and counting, and a predictive model that can predict infestation trends and therefore reduce the amount of pesticide.

Tracking of medical waste

Expertise Area
Internet of Things (IoT)

Faculty of Informatics

Problem
Hospitals struggle to guarantee real time, complete tracking of the supply chain of their hazardous waste. There is a lack of a certified system capable of tracking the delivery of the sterilised containers, distribution within hospitals and related waste disposal. In view of the hazardous materials that need to be disposed is fundamental to have a complete overview of the waste disposal.

Solution
The tracking of containers used for the collection of this particular kind of waste is based on Internet of Things (IoT) technology, particularly with the provision of RFID (radio frequency identification system) antennas. Containers can be tracked while on the way, arrival and stationing until incinerated. The 'raw' data describing the history of each container is aggregated with respect to different criteria providing an overview of the process and allowing the identification of trends, patterns, and optimisation possibilities.

Digital Casting System in pre-fabrication

Expertise Area
Construction and technology

Academy of Architecture

Problem
For decades, Computer-Aided Design (CAD) has enabled architects and engineers to plan structurally optimised buildings, using less material for the structure. However, the added complexity of the design and formwork carries extra costs. The production of optimised concrete structures is slow, both in terms of hydration and demoulding time, and costly with no recyclable formworks, resulting in considerable fabrication waste and CO2 emissions.

Solution
In collaboration with a leading company in the field of cement production, the Digital Casting System (DCS) overcomes many of the ongoing challenges using a digital material process with a self-compacting set-on-demand concrete that enables control of the hardening of concrete on the fly of production. The key innovation of DCS is the chemically accelerated and digitally controlled mixing and casting of concrete. DCS can increase productivity by 50% for standard construction of conventionally reinforced and load-bearing elements, waste. By merging design, material properties, and construction/fabrication practices, it is possible to use less material and thus move towards a more sustainable construction culture.

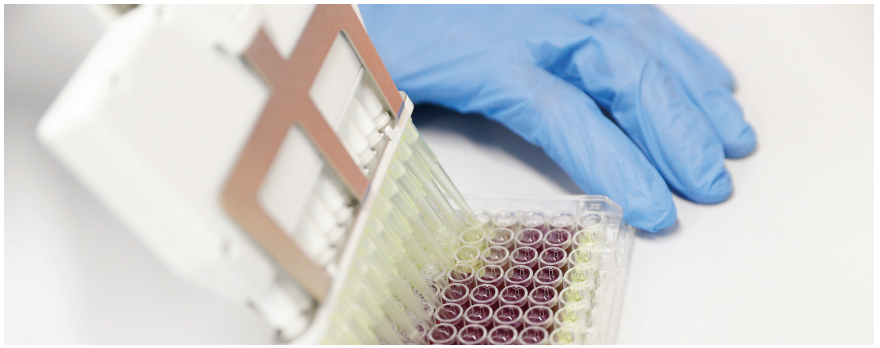
Cancer immunotherapy screening

Expertise Area
Immunology and microscopy

Faculty of Biomedical Sciences

Problem
Generating novel immunotherapies against cancer is a costly and time-consuming process that requires a significant investment from companies and research institutions. New biochemical technologies allowed the generation of multiple candidate drugs; however, selecting the most suitable compound slows the overall process of finding new cancer treatments.

Solution
Most immunotherapies activate the immune system's anti-tumoural cells. However, in vivo, many factors might alter the transport of the drug to the tumour area and the activation of the immune cells. Intravital 2-photon microscopy makes possible the visualization of the overall process allowing a direct measure of the new therapy's efficiency. By using this revolutionary technology, IRB researchers in collaboration with a biotechnology company succeeded in setting up a drug screening protocol that investigates targets and mechanisms of action before selecting the most valid therapy to introduce into cancer clinical trials.



Drug resistance in lymphoma

Expertise Area
Oncology and anti-cancer drug

Faculty of Biomedical Sciences

Problem
Drugs currently used for the treatment of lymphoma patients still have several issues, mainly the development of resistance but also side effects and toxicity, which limit their use in combination with other therapies. IOR's partner company developed a new generation compound with a novel mechanism of action that has shown improved safety and efficacy. This drug is currently being tested in patients as single agent and combination studies are starting. However, research is needed to identify the possible mechanisms of drug resistance and explore novel treatment combinations, which are critical to guide clinical decision-making.

Solution
By using several advanced biological approaches, IOR will contribute to clarifying the drug resistance mechanism and test treatment combinations that might benefit specific subsets of patients. Researchers will identify potential new indicators to assess the direct anti-tumour activity. The scientific evidence collected at IOR will support the design of the next clinical trial for this new drug and will help bringing new combinatory therapies to the market for the benefit of lymphoma patients.

University-industry connection and networking

USI Visits Industry

The event, designed to stimulate direct dialogue and introduce new points of discussion with companies, offers USI professors the opportunity to take a closer look and step into corporate reality. The visit facilitates idea exchanges, enhances the understanding of practical concept application, thereby promoting dialogue and fostering potential collaborative projects.

Innovation Roundtable

A roundtable discussion between key experts from a USI faculty and interested companies to explore emerging technologies, research opportunities, latest research and market trends, and challenges. Participants share knowledge and discuss innovative solutions to meet industrial needs, leveraging USI's expertise and resources.

USI Meets Industry

USI Meets Industry is a dynamic event bringing academia and companies together to strengthen connections and explore opportunities for collaboration, featuring one-to-one meetings between top academics and industry leaders.

Highlighted sessions

- Speed Meetings:
  companies meet professors and researcher group leaders from different faculties and institutes in a series of brief individual exchanges.
- USI Transfer - forum:
  tech transfer activities, academia-industry partnership (types of collaboration) and recent success cases.
- USI Startup Centre - forum:
  initiatives aimed at fostering collaboration between startups and established companies.

Types of partnership with private companies

1 **Sponsored Research**
Scientific research project carried out by USI with budget and timelines. Company covers for the project cost in exchange for access to results and a time-limited option to negotiate exclusivity.

2 **Contract Research**
Scientific research project carried out by USI with budget and timelines, according to the specification given by the Company. Exclusivity and possible inventions generated within the project belong to the Company in exchange for higher costs.

3 **Service agreement**
USI provides consulting and service on a case-by-case basis, typically with no research activities involved. Results will be owned by customer in exchange for commercial fees.

4 **National and international innovation tenders**
USI advises companies on the most suitable tender for joint projects, such as Innosuisse and European programmes.

5 **Educational partnership programmes**
USI offers the following collaboration opportunities: Field Projects, Bachelor and Master Projects, Master Thesis, industrial PhD, Internship.

6 **Incubation and support programmes for startups**
USI Startup Centre (www.startup.usi.ch) provides strategic support in the development of early-stage science-driven startups with a link to the local academic environment.

Q&A
Working with USI as a company

My company is trying to innovate on one of our products, but we are facing technological problems. Can you help?
Sure, contact USI Transfer, we will put you in touch with the relevant research group leader to help you solve your problem and develop your product.

Are there financing opportunities to help my company work with the University?
There are cantonal and federal incentives and subsidies to help your company staying on top of technological development. These incentives can help in financing the research collaboration with USI, such as Innosuisse. USI Transfer will help you identifying the most relevant.

Can my company finance research topics that are of our interest?
Yes, if there is a match with the research that we conduct, your company can sponsor a USI research group and access to their results and eventually negotiate exclusivity of the intellectual property generated.

We want the University to conduct research on specific topics of our interest, are there other options than sponsor research?
Absolutely, in that case we can stipulate a research contract and execute it at the specifications given by your company. In contrast to sponsored research, exclusivity and possible inventions generated within the project belong to the company, in exchange for higher costs.

Can my company ask USI for a specific service, with no research activities involved but more for applied research consulting activities?
Yes, if the University focuses on research and its application outside of labs, we can perform service activities on a case-by-case basis. Please contact USI Transfer to discuss it.

Get in touch

Our team and tech transfer experts are available to help you.

Email us at usitransfer@usi.ch, we would be happy to answer your questions and set up a meeting with you.

For general information, visit our website www.usi.ch/usi-transfer

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