Making Salzburg the start-up-friendliest region in Austria.

The Startup Salzburg initiative got underway at the beginning of 2016. Eight local partners – Salzburg state, innovation centre ITG Salzburg, Salzburg Chamber of Commerce, Salzburg University of Applied Sciences, University of Salzburg, Paracelsus Private Medical University, Coworking Salzburg and Techno-Z – all joined forces with a view to developing Salzburg into the start-up-friendliest region in Austria.

In its first year, the network initiative has already made positive strides, firmly anchoring its message in the public consciousness. More than 2,000 potential start-up founders have made use of Startup Salzburg’s events. The first point of contact for innovative start-up founders were service points set up at the network partners’ locations. A total of 40 start-ups received assistance in the pre-start-up phase, and five were included in the Startup Salzburg Factory. These are gradually brought to market maturity during the six-month incubation programme.

The main points of focus in this regard are the service points – now seven in total – at the partners’ locations, where innovative start-up founders are given advice and ongoing support. To provide the best possible assistance, Startup Salzburg has developed a support model geared towards the maturity and individual needs of each start-up. Broadly speaking, a distinction is made between three stages: the idea stage, the (pre-)start-up phase and the maturity phase.

In order to foster entrepreneurial spirit and to generate ideas, Startup Salzburg offers all creative and innovative minds a wide range of formats (challenges, canvas sessions, etc.) during the idea phase. Service points at the participating universities and colleges provide future start-up founders with expert advice, sharing entrepreneurship expertise and networking students.

Idea phase

In order to foster entrepreneurial spirit and to generate ideas, Startup Salzburg offers all creative and innovative minds a wide range of formats (challenges, canvas sessions, etc.) during the idea phase. Service points at the participating universities and colleges provide future start-up founders with expert advice, sharing entrepreneurship expertise and networking students.

(Pre-)start-up phase

Here, Startup Salzburg focuses in particular on developing a business idea (start-up support feedback format, Startup Salzburg Weekend), technical implementation and promoting networking and interaction with other start-up founders and established companies. Here, the focus is on subjecting business models to critical examination, learning from one another, receiving support for difficult phases and avoiding mistakes.

Maturity phase

Highly innovative start-ups in the maturity phase have the opportunity to take part in the Startup Salzburg Factory incubation programme. Among other things, they will be provided with individual assistance from start-up supervisors and experienced mentors from established business. The programme also includes exclusive training and pitches for accessing capital.

www.startup-salzburg.at
www.facebook.com/startupsalzburg
“80 percent of start-ups come to nothing” – this, according to Marie-Hélène Ametsreiter, partner at Investor Speedinvest and a speaker at the first Startup Salzburg New Year’s event in the city’s Panzerhalle venue, is the bad news. The good news: “Serial entrepreneurs – in other words, those who frequently set up companies and occasionally fail – end up being the more successful entrepreneurs.” In order for Austria to make up ground here, it needs to encourage a culture of innovation that is not afraid of failure.

The Startup Salzburg initiative was founded by eight partners with a view to promoting such a culture, establishing an ecosystem for new companies and increasing the likelihood of success. Innovative founders are to get the chance to learn from experienced entrepreneurs and to be put in contact with the right people.

48 hours devoted to start-ups

Held on a regular basis, the Startup Salzburg Weekend is a prime example of one such event. To date, the Startup Weekend format has been held in over 150 countries, involving more than 210,000 entrepreneurs and forming 23,000 teams. The Startup Weekend concept has its roots in US incubator TechStars. The 48 hours of the Startup Salzburg Weekend are devoted to “pitching” (i.e. giving brief presentations) and tackling individual challenges. The participants come with their business ideas in order to work on them in the group and with mentors. The purpose of this is to lay the foundation for a successful start-up. From formulating a sales concept for vegan burgers, creating a floating sauna landscape, programming a learning platform or setting up a system for individually adapting weight training devices, the range of sectors and questions is wide and the programme is extremely comprehensive. Business concepts take shape, customer feedback from the street is taken on board and presentations are honed again and again. Towards the end, a handful of start-up concepts are chosen to be worked on intensively.

Five start-ups for the Factory

A small number of hand-picked start-ups are given intensive supervision in the “Startup Salzburg Factory” incubation programme. To qualify for this, they must enter a pre-selection procedure and pitch their start-up idea. An independent panel of judges consisting of entrepreneurs and investors rate them with regard to innovativeness, market opportunities and market maturity. Three start-up founders with technology developments made it into the first round: Coati, a program that allows existing programming codes to be read and understood more quickly and more easily. Fact AI, an artificial intelligence that collects and evaluates online customer evaluations. Native Waves, a smartphone app that identifies films within seconds and makes them available in other languages. Also included were: EAST Bikes with a fully-fledged mountain bike that can be folded up and stowed away, and ReSensive, a care product for circumcised men.

One for all, all for one: Start-ups in Salzburg
An innovation strategy for Salzburg

Under the direction of the state of Salzburg, university and non-university research institutions, companies and social partners have been involved in preparing an extensive Science and Innovation Strategy for Salzburg (WISS) 2025. Interview with governor Wilfried Haslauer.

What was the key factor that prompted the decision to implement a Science and Innovation Strategy for Salzburg?

Haslauer: The fact that science, research and innovation are key factors contributing to the future development of Salzburg state from an economic, social and cultural perspective. Accordingly, a greater focus on science, research and innovation in Salzburg can help to maintain and increase its competitiveness, quality of life and attractiveness as a location. This was also reflected in the process for drawing up the strategy, in which research institutions, companies and social partners were involved to a great extent, laying the groundwork for later implementation measures.

The strategy focuses again and again on “strengthening our strengths”. Where and how can Salzburg put this into practice?

Haslauer: In keeping with the concept of intelligent specialisation, our goal is firstly to build up nationally and internationally visible critical masses in Salzburg and secondly to gear ourselves towards the needs of local business and society when expanding such structures. This analysis gives rise to five areas for an intelligent specialisation, our goal is firstly to build up nationally and internationally visible critical masses in Salzburg and secondly to gear ourselves towards the needs of local business and society when expanding such structures. This was also reflected in the process for drawing up the strategy, in which research institutions, companies and social partners were involved to a great extent, laying the groundwork for later implementation measures.

How is Salzburg 2025 positioned? What effects do you expect to see?

Haslauer: A vibrant and highly networked company and research landscape in the defined key areas – one that is internationally successful and competitive as well as offering high-quality jobs. We have already taken a major step in the right direction with “Startup Salzburg”, where we provide specific assistance to founders with innovative ideas.

We expect WISS to give a boost to innovation in Salzburg. How is Salzburg state involved?

Haslauer: Quite simply, with financial and structural support. For instance, in addition to the regularly budgeted funds for 2017 and 2018, my economics department will be providing up to €5 million for implementing projects. Up until 2020, a further €10 million can be called up through Salzburg’s involvement in European programmes, especially the European Regional Development Fund (ERDF). In order to implement WISS 2025, the government commissioned the provincial authorities and ITG with the task of developing – in close cooperation with the Salzburg Science and Research Council – a roadmap for the measures and key projects and with the task of implementing this roadmap. This also includes active implementation management and professional supervision of projects. In this regard, ITG has a key role.

Five principles

In all measures implemented as part of WISS 2025 in coming years, Salzburg state will be focusing on five principles:

- Science, research and innovation are to be key factors boosting Salzburg’s competitiveness and further developing the state from a social, economic and cultural perspective.
- Specialisation and cooperation, both internal and external. Specialisation means setting development priorities in those areas in which existing knowledge, technologies and possible users are expected to create added value for the region.
- Internationalisation: Actively networking Salzburg with other countries and regions and incorporating it into European and international expertise and technology networks is important for companies and for educational, scientific and research institutions.
- Training, further education and career opportunities: Expanding scientific and technical educational programmes and, at the same time, increasing the number of graduates and intensifying efforts to promote a new generation of scientific talent. The location should be rendered more attractive for international specialists.
- Coordination of implementation measures. This refers to the strategic use of public funds, efficient implementation control and ongoing monitoring of results.

www.salzburg.gv.at/wiss

Example of WISS in action

At the new university location in Itzling, material research is being expanded as a mainstay of WISS 2025 with the support of Salzburg state and the Interreg programme. This applies to both personnel and infrastructure. One example is a transmission electron microscope. As Nicola Hüsing, Head of Chemistry and Physics of Materials, explains: “Unlike light microscopes, the maximum resolution of which is a few hundred nanometres owing to the wavelength of light, this microscope works with electrons, meaning up to about 1,000 times greater magnification. This in turn means that arrangements of atoms or the tiniest structures can be imaged and identified.” Many material properties are determined by these arrangements and it is only by using high-grade microscopes that the relationships between structure and properties can be established. As well as many other materials, this refers to alloys that are researched in Salzburg but that are also used in industry for lightweight construction. To date, researchers have had to send samples to Vienna or Graz. From 2017 onwards, they will now be able to use their own microscope.
In a federal state such as Austria, research and innovation policy needs to be balanced between the federal and the regional levels. While the federal RTI-strategy provides an orientation framework, regional strategies are designed to give a clear profile to the region. It is essential to note that the different levels cooperate and coordinate not only in developing but also in implementing and financing the respective strategies.

Salzburg has – as one of the last of the nine Austrian states - presented a regional research and innovation strategy early in 2016. It follows the concept of smart specialisation and is based on a very well-developed, yet heterogeneous and fragmented, regional research landscape. On the corporate side the level of research and innovation expenditure in the region is below-average. This is attributable to the region-specific industry structures in non-technology areas and to the large number of small business enterprises.

Therefore the further development and strengthening of science, research and innovation in the state of Salzburg must essentially be brought into being through cooperation, through using existing areas of synergy potential, and through focusing on the principle of further strengthening the strengths.

In terms of supporting measures, the strategy for improving Salzburg’s innovation system focuses on three priority areas:

- Strengthening the structures for science and research (Salzburg as “knowledge location”)
- Capitalising on results obtained in/from science and research for businesses and society (Salzburg as “start-up location”)
- Expanding and activating research and innovation sustained by private companies (Salzburg as “innovation location”)

With an additional budget for 2017 and 2018 and a newly adopted funding scheme (Trans4Tech), the gap to the national and European programmes for knowledge gain and transfer between research and enterprises should be closed. The programme also promotes career opportunities for researchers and helps establish clear profiles for the various locations within the region’s science institutions. Support for the Salzburg Cancer Cluster, a cooperative research and development initiative with PLUS, PMU and SALK, provides a good example for bundling competencies, gaining visibility, offering career opportunities and attracting the interest of - and ultimately investment from - companies.

Cross-border and transnational ERDF programmes provide for the funding of measures to extend the critical mass of research facilities and enterprises and to develop partnerships across the regional borders – one of the declared major objectives of the science and innovation strategy. Interreg programmes are increasingly used to start research co-operations and to facilitate innovation topics in the triangle of research – enterprises and innovation agencies.

Quite a number of initiatives and actions have been initiated in the last few months and it will need the combined efforts of all involved stakeholders as well as a strong governance to safeguard success. European programmes, well-embedded in the regional S3 strategy, will play an important role in innovation policy, but it has to be clearly stated that their tasks must be seen as complementary to national and regional programmes.
# Projects: European support for innovation in Salzburg

## Research and Innovation network (R&I) Alpine Construction

A main driver of the economy in the project region of Upper Bavaria/Salzburg/Tirol is the construction sector, which largely consists of small and medium-sized enterprises (skilled crafts and trades, planning, services - also extending beyond the building industry). They are increasingly having to deal with innovation issues as a result of the challenges presented by construction guidelines, changing climatic conditions, new technologies and the increasingly competitive environment. The “Alpine construction R&I network” develops and procures any missing expertise, methods and skills through cooperation with regional research facilities. At the same time, the research and transfer programme is tailored to meet the companies’ requirements. What is described here as „Alpine construction“ is the competence of SMEs in combining regional building materials, building techniques, expertise and sustainability with Alpine building tradition.

**Funding:** Interreg Austria-Bavaria 2014-2020

---

## Trail for Health Nord

Research facilities such as Paracelsus Medical University, tourist regions and ITG Salzburg are collaborating on the project “Trail for Health Nord” with the aim of developing new cross-border concepts for health tourism. Increasing urbanisation, the loss of experiences in nature, demographic change as well as the rise in lifestyle diseases have led to an increased demand for health tourism. This results in great opportunities for raising the profile of the region at the foothill of the Alps. The potential offered by its health-promoting natural spaces and natural therapies form the basis for the sustainable, cross-border regional development of health tourism within the “Trail for Health Nord” project.

**Funding:** Interreg Austria-Bavaria 2014-2020

---

## Innovative solutions through bionics in the transnational interplay between business and science (ILBitZ)

Bionics is suitable above all for SMEs as a new type of innovation strategy that is to be implemented realistically. Bionics is suitable above all for SMEs as a new type of innovation strategy that is to be implemented realistically. It concerns the abstraction and transfer of natural principles to technology. However, as a creative and systematic process, it is a new way of thinking that can also be introduced into virtually all sectors. Company structures and processes can be optimised based on models found in nature. Accordingly, the project focuses primarily on exchanging and transferring the latest scientific findings from R&D facilities to companies.

**Funding:** Interreg Austria-Bavaria 2014-2020

---

## DIGITRANS – Digital Transformation in the Danube Region

Digitalisation has made its influence felt in all areas of life. Companies can also expect to see trends towards Industry 4.0 and the Internet of Things. Challenges and opportunities exist in all areas involving order entry, production or marketing. In future, success will also depend on entirely new types of business models. Many companies – above all small and medium-sized ones – are not sufficiently prepared for these changes or, in some cases, are not prepared at all. The “Digitrans” project is developing a new innovation method for SMEs which allows them to draw up competitive business models and processes. Here, the focus is above all on SMEs from creative industries, healthcare and advanced manufacturing.

**Funding:** Interreg Danube Transnational Programme

---

## SMART-SPACE

The EU manufacturing sector is the second largest sector in terms of people employed and turnover and the first contributor to the non-financial business economy. Exports consist mainly of manufactured products. Nowadays, lack of automation, synergies and obsolete management systems cause a loss of competitiveness with respect to emerging markets. Smart manufacturing technologies can help industries to be better connected and better able to connect their own assets (physical, human resources, information and internal and external data), resulting in gains in competitiveness, productivity and safety. The SMART-SPACE project intends to strengthen the cooperation within the field of innovation and to promote smart digital solutions to traditional industrial sectors. An Alpine Strategic partnership will be set up to implement a common action plan to be supported by a Digital Innovation Hub, a competence centre designed to assist all innovation actors to trigger Alpine growth and wellness.

**Funding:** Interreg Alpine Space

---

## n2m – nano-to-macro

Upper Austria, Salzburg, Lower Bavaria and Upper Bavaria are border regions with a strong focus on the lightweight construction sector. There is also a high density of automotive producers and their suppliers in the border area. In order to expand these strengths and raise their profile, a joint n2m centre is being developed by the University of Salzburg and the University of Applied Sciences Landshut. This will serve to expand possible ways of characterising materials and to develop efficient production technologies. These key areas of lightweight construction serve to safeguard the sustainability, durability, recyclability and functional expansion of lightweight structures while minimising the consumption of materials and energy. In addition to joint research, the laboratories will be expanded based on existing offers and state-of-the-art research equipment procured.

**Funding:** Interreg Austria-Bavaria 2014-2020
Digitalisation is happening!

The term “Industry 4.0” was invented in Germany and refers to the possibilities created by digitalisation. It offers tangible opportunities for high-wage countries not to fall behind.

Production processes, logistics and even distribution channels can be optimised through the correct use of data. For instance, data can be collected by means of sensors or simulations. With this information, machines can identify their own weak points, optimise their processes, reorder goods and much more besides. The term “Industry 4.0” has come to stand for all of these opportunities together.

Trend or revolution?

Because it originated in Germany, the term Industry 4.0 is only used in the German-speaking world and is often assumed to be a buzzword, a marketing gag or a fleeting trend. However, the fact of the matter is that technical developments are growing exponentially; disk space is becoming cheaper, and initial experiments with artificial intelligence have already borne fruit. As early as 2014, the first computer passed what is known as the “Turing test”. In other words, it was able to give the impression that it was a thinking person. Referring to this as a “trend” falls well short of the mark. The same can be said of “Industry 4.0” too. Digital possibilities have long since penetrated all areas of life and business, even outside production, changing the way we communicate and work. In spite of this, the greatest revolution – particularly where most Austrian companies are concerned – has yet to come. Many of them are failing to investigate the full range of possibilities offered by digitalisation – possibilities that exist for smaller companies as well. Rainer Steindler, location developer at innovation service ITG, explains: “It is not always a question of making a complete change, of moving forward in giant steps. Small and medium-sized companies in particular should take a close look at what they wish to optimise and see if they are already producing the data they need for this or where they can get hold of this data. It makes sense to approach this gradually. The important thing is to take action now.”

Opportunities for companies of all sizes

In spite of the general reluctance towards digitalisation, there are nonetheless companies that have experience in this area and that show how it is done. One of these is weinberger-hölz in the Austrian market town of Abtenau, which produces wood products for the engineered wood market. This company embraced digitalisation after demand moved towards smaller and smaller lot sizes which needed to be produced at shorter notice and to more individual requirements. In practice, customers now configure and order, for example, a commission list for the roof structure they require. Staff in weinberger-hölz’s electronic order processing department plan the order so that it fits on the truck using a minimum of space. For the most part, production is automated – human expertise is required primarily for process planning, process input and quality control. As Managing Director Johann Alfred Weinberger puts it: “Essentially, digitised processes can be used wherever there are monotonous, unchanging processes. This means that we have more time for quality control, new ideas and creativity.” Another advantage is that mistakes that inevitably creep into monotonous work can be avoided.

Pioneering operations like Hagleitner Hygiene in the Zell am See district of Salzburg state have already incorporated intelligent processes into their production activities to a great extent. Here, the automation rate in the chemical/technical area is already 95 percent. It is above all the products themselves that have smart additional functions – consumption and fault information is reported automatically, as are soap distributors that need to be replenished. In this way, Hagleitner is in a position to offer a number of downstream services in addition to its products.

Digitalisation in Salzburg

With the “ICT Region Salzburg” project, ITG Salzburg and Salzburg state help companies to generate knowledge and to find a way to make the best possible use of digitalisation opportunities. In addition, the qualification network WEST – Work-Enabling Systems & Technologies – was founded by Salzburg University of Applied Sciences, the University of Innsbruck and Vorarlberg University of Applied Sciences together with two affiliated organisations: location agency Standortagentur Tirol and service organisation WISTO Vorarlberg. “Q-WEST” will train a total of 179 employees from 21 companies in the hands-on application of Industry 4.0 technologies. The participating companies from Salzburg are BILTON International GmbH, Advanced Engineering Industrie Automation GmbH, W&H Dentalwerk Bürmoos GmbH, Ing. Punzenberger COPA-DATA GmbH, IcoSense GmbH, Atomic / Amersports and SKidata AG.

ITG also offers assistance to all other Salzburg-based companies in their implementation activities, for instance when it comes to looking for a suitable research partner or developing projects to make use of support programmes.

The “ICT Region Salzburg” project is funded by Salzburg state.
Salzburg: a digital location

As governor Wilfried Haslauer explains: “Information and communication technologies are already of enormous importance for Salzburg as a business location. Accordingly, this area is one of five development focal points that we have defined in our Science and Innovation Strategy for Salzburg 2025. Based on an in-depth analysis, we will implement measures here that will prime Salzburg for the future.”

As part of the groundwork for this, Salzburg state commissioned the study “Innovation and Research Master Plan – ICT Salzburg 2016”. This study examined the importance of ICT for Salzburg as well as the research orientation, training situation and the needs of local business.

Importance of ICT for Salzburg

Some 600 companies are active in the areas of IT services and data processing equipment production alone, employing an estimated 3,400 people. The study showed that, in the production of data processing equipment, the value created per employee in Salzburg was roughly twice as high as it was in accommodation services, for example. The same goes for sales revenue per employee. While these figures refer only to the identified and surveyed ICT companies, ICT also plays a major role in most other sectors such as tourism, trade or healthcare. Statistically speaking, they are not recognised in these other sectors. In addition, Salzburg has key areas of focus in research and training that need to be reinforced over the coming years.

Research

Salzburg University of Applied Sciences, Paris Lodron University Salzburg (PLUS), state-owned research organisation Salzburg Research and Research Studios Austria are all active in the ICT sector. The top research areas with the highest headcount are:

- Geo-information systems
- Human-machine interfaces
- Energy informatics
- Software engineering and networks
- Internet of Things

As well as this, on-site researchers are working on the following areas:

- Network security and secure energy networks
- Intelligence maintenance
- Improved usability of IT systems
- Improved multimedia communication
- Geographic information systems
- Software for secure technical systems.

Initial measures are being prepared for 2017 with a view to achieving international visibility and therefore attracting researchers and companies: In the area of HCI (Human Computer Interaction), an additional junior professorship is being established through state funding. Furthermore, highly qualified young research talent is to be trained as part of an attractive programme for doctoral candidates.

Training

Although Salzburg offers a good range of training, even more specialists are required. There is an especially great need for personnel in general IT, business informatics and other IT-related vocational fields. In the area of Research & Development, specialists in technical and construction disciplines, e.g. computer engineering or software design, are in particular demand. To meet this need, it is necessary to begin targeting potential new talent before they commence university studies or apprenticeships. A concept is currently being developed for kindergartens and schools that are geared towards the MINT subjects (mathematics, information technology, natural sciences and technology), which aims to generate interest in these areas at an early stage. There are also plans to expand the existing summer taster programme that gives children the chance to experience what it is like to work in IT and technology companies and research facilities. Even at this stage, the level of interest is especially high.

As Gerhard Jöchtl, Head of Information Technology & Systems Management at Salzburg University of Applied Sciences, emphasises: “It is important for training not to jump on bandwagons but rather to continue to offer a healthy balance between well-founded theory and practical knowledge and to respond to sustainable developments and needs.” Adapting flexibly to the needs of business ensures that higher education retains the practical focus that it needs. In Jöchtl’s view, however, the future will also depend above all on safeguarding suitable new talent in the technical field: “The strength of an IT region will not depend on the volume of courses it offers but rather on the number and quality of well-trained and motivated graduates.”

Business

When it comes to digital technologies, local companies have a lot to offer. Accordingly, they are also contributing to efforts to raise the profile of Salzburg as an ICT location. Building a positive image is seen as being important for recruiting potential employees. Networking between companies and research institutions is felt to be essential for this. Good working relationships already exist with local scientific institutions. Their projects give high priority to areas such as industrial networks, software development, usability, CRM, big data and smart grids.

A prime example of a successful cooperation between research and business in Salzburg’s ICT landscapes is a digitalisation project at Atomic in Altenmarkt, a small town in Salzburg state. Together with software developer COPA-DATA, startup company Authentic Vision and the Research studios Austria, Industrial 4.0 is not a theoretical future concept but one that is already being implemented at Atomic. COPA-DATA: “The joint project at Atomic shows that Industry 4.0 has the potential for industrial production in the future as well as the economic benefits for our customers. The project is a great opportunity for the growth of our company.”

To meet the challenges, Salzburg’s first step involves coordination, research and promoting new talent. This includes deploying a state-wide IT coordinator, expanding MINT programmes and financing new professorships.
Pioneering research, a growing number of companies in the areas of pharmaceuticals, biotech and medical technology, and a new development laboratory for biochips – all of this make Salzburg into a small but exceptional Life Sciences location with a highly effective network.

The Life Sciences sector (pharmaceuticals, biotechnology and medical technology) is going from strength to strength in Salzburg. The core of Salzburg’s Life Sciences sector now consists of over thirty companies and several research institutions. As well as lead institute Paracelsus Private Medical University Salzburg (PLUS), Salzburg University Hospital (SALK) and Salzburg University of Applied Sciences, Paracelsus Private Medical University (PMU) has become a strong research partner. In addition to its existing areas of expertise, the Institute for Ecomedicine was established here in September 2015. The institute conducts application-oriented research and development on the interface between business, ecology and medicine. This refers to the change in influences on human health and possible responses to this. As a result of rapid urbanisation, people are exposed more and more to unnatural signals that do not come from their natural environment. These include physical inactivity, insufficient or incorrect microbial signals for maturing children’s immune systems, crowd-induced stress and many other aspects that also cause civilisation diseases. One of the Institute’s functions is to conduct independent clinical studies and fundamental research on the effectiveness of natural healthcare resources and products in preventing and healing chronic (civilisation) diseases. As a research and innovation platform, it is designed to integrate scientific bases into regional business. Companies from the areas of timber construction, hygiene, mattress production and tourism are already working together with the institute on product development questions.

Cooperative research

The research institutions are collaborating with one another and with companies and producing excellent results. As Salzburg is a small city with short communication channels, all players know each other personally. This concentration means that the city’s small size – which might otherwise be seen as a disadvantage – is proving to be a distinct advantage when it comes to producing excellent research. The Cancer Cluster Salzburg network is a case in point. Here, the laboratory founded by Richard Greil for immunological and molecular cancer research has joined forces with SALK, PLUS and PMU to research the causes of cancer and new forms of therapy.

New laboratory for biochip technology

Standard methods in medical diagnostics use wet-chemical analytical methods that are already capable of being automated today. One way of achieving this is by using “lab-on-a-chip”. Biochips are tiny laboratories in which diseases can be identified or genetic material analysed. All that is needed is a drop of blood. Critical conditions such as blood poisoning, which take several days to identify using conventional means, can now be diagnosed immediately using biochip analysis. Since autumn 2016, research institutions and companies have been able to produce this kind of state-of-the-art biochip in the University of Salzburg’s spoc laboratories (system precision on chip) and have them tested there. In the past, it was very expensive to produce biochips and could only be done on an industrial scale. Now that it is possible to produce anything from single biochips to small-volume series in Salzburg, a significant gap in the market has been closed. As Günter Lepperdinger, head of spoc laboratories at the University of Salzburg, explains: “We want to produce highly standardised chips for specific and very sensitive tests. We would like to be able to identify diseases like cancer or senility in a single drop of blood. Miniature laboratories on tiny plastic or glass panels are the first step towards this. But we are also working on using these technologies to reproduce blood filters or entire organs so that, for example, we can then conduct tests for medical research into new treatment methods or medication.”

Various disciplines

Producing this kind of chip calls for a number of different experts who work together in the spoc laboratories in close and interdisciplinary cooperation. Doctors, biologists and technicians are all included in the development process. In this way, the University of Salzburg would like to continue its approach of working together with the business community to improve people’s lives and to apply scientific findings to real-life situations.

The process of creating a prototype from the original design on a PC only takes a few days. Quality assurance – i.e. testing whether the prototype works as expected – is also conducted here. Possible cooperation partners for the laboratory are medical technology and pharmaceutical companies, but also the growing number of suppliers and...
medPhoton is a spin-off of PMU and one of the medical technology companies that make Salzburg’s life science landscape what it is. This project aims to perfect radiotherapy against malignant tumours. Daniel Schaffarzick, who is responsible for quality management at medPhoton, explains: “The procedure used to be that a tumour was localised and marked by a CT or MRI a few days before therapy and radiation was used later. The fact is, however, that the position of tumours can change slightly, particularly in soft tissue like the breast or prostate. Our device makes it possible to localise tumours directly before radiation is applied.” The advantage of this is that the radiation dose can be increased, thus boosting the effectiveness. Previously, a lower dose was always used to avoid damaging the surrounding tissue because of the chance that the position of the tumour might change. This is possible by combining a positioning system and a digital imaging system. The digital imaging provides up-to-date information on the position and size of the tumour and the movable table allows the patient to be positioned perfectly.

The device is to be used for the first time in the medAustron therapy centre in Wiener Neustadt, a city located south of Vienna, in which the first patients are expected to be treated as of November 2016. “The next step will be to perfect the positioning in such a way that it follows small movements made by the patient. This means that a lung tumour can be irradiated with complete precision even when the patient is breathing normally.”
Alpine construction

Construction in the Alpine region faces many challenges. In Salzburg, these are countered with hands-on research projects involving local companies.

With a volume of around €1 billion, construction is one of the largest industries in Salzburg, adding more value than almost any other. However, construction in the Alpine region is faced with a number of challenges at the same time. For one, buildings in the Alpine region are exposed to periods of extreme heat, cold and heavy rainfall more than other regions, a situation that is exacerbated by climate change. In future, above-average temperature increases are expected in the Alps: observations and model simulations indicate that, by the end of the 21st century, temperatures in the Alpine region might well increase between three and five degrees Celsius in the summer and between four and six in the winter. This point also affects the construction sector: hotter summers mean that the need to cool buildings is greater than ever. The same amount of energy is used to reduce the temperature by one degree by electrical cooling as it is to heat it up by four degrees. That means that the question of saving energy, of using regional materials and intelligent technologies in new buildings – and, above all, rehabilitating old buildings – remains highly topical.

Another problem is the limited settlement area due to the mountains. In future, new land use planning concepts and innovative solutions will be needed to avoid taking over additional space, to become more resource-friendly and, last but not least, to remain affordable.

In order to counter these challenges, Salzburg Chamber of Commerce and Salzburg state came together with local construction companies, architects and research institutions to focus on research projects with a hands-on orientation. One key starting point was the BAU innovation and research centre at the Lehrbauhof-BAUakademie Salzburg building academy, which receives financial support from the European Regional Development Fund (ERDF). Here, a small research park was set up with five test buildings. These are equipped with state-of-the-art construction and energy solutions, allowing entire company networks to work together on research topics and building concepts. The recently completed project “Alternative Approaches for a Zero-Energy House” concerned itself with energy-efficient construction methods that come about by combining raw materials from the region with low-energy systems.

Gunther Graupner, head of the BAU innovation and research centre, explains: “This project aims above all to create construction solutions without insulation. Particularly in the case of insulation, it is often felt that more is always better. However, we now have to deal with many different oil-based insulation materials that we are as yet unable to recycle. This means that it makes sense to opt for regional building materials and holistic systems.”

Cooperation as a basis for innovation

Taking a holistic approach is becoming more and more important for modern construction. The aim is to be able to meet the ever-growing requirements in energy- and eco-efficiency but at the same time to ensure affordable construction solutions that meet the needs of the residents and use local resources. As well as the interaction of building components, effective cooperation among the participating companies is essential. As Walter Haas, Managing Director of local innovation service ITG Salzburg, emphasises: “With the Salzburg projects, large and small companies along the entire value chain and from different regions and areas are all working together. This means that it is possible to tackle innovative questions together in spite of the competition element.”
Construction research – made in Salzburg

Example 1
Thermal activation – solar heating and cooling with concrete

Thermo-active building systems make full use of the inherent ability of concrete to store heat and cold exceptionally well. Concrete is heated or cooled to the required temperature by means of embedded water pipes and radiates it to its surroundings in a sustained and steady manner. Just how efficient this process is in reality was tested with the aid of a simulated space.

In collaboration with the Vienna University of Technology and expert Harald Kuster, the ARGE „Nachhaltige BAUTEILAktivierung“ team investigated a wide range of parameters within the simulation space, including temperature and energy flows. The primary objective of the trials was to verify the energy efficiency of the simulation space and therefore of buildings with thermo-active building systems. The results speak for themselves: concrete is an extremely reliable thermal storage medium. During the first winter in the test period, the heating in the simulation space was turned off for five days during which the room temperature dropped by just 3 degrees. And that was despite the fact that it remained overcast and cold outside.

This demonstrates that the results can be extrapolated to living spaces during a typical Austrian winter. In addition, the solar heat concentrated in the concrete was released to the surrounding environment in a particularly even manner. The so-called geothermal spread, i.e., the temperature gradient between the heated and non-heated parts of the building, was just 0.7 degrees centigrade. As a rule, within a given space, people tend to find radiated heat more pleasant when emitted via a large radiation surface, as opposed to hot spots such as traditional radiators or heaters, due to the lack of air eddies and noticeable temperature differences within the space. For centuries people have experienced this same principle with their tiled stoves.

Example 2
The future is brick – Thermal comfort with brick and concrete

The ARGE ZIEGEL BAU ZUKUNFT tested the efficiency of simple brick-built rooms without additional insulation of the outside wall using two simulation rooms. This is because insulation materials are not always harmless. Materials made from crude oil, such as the frequently used polystyrene, contain toxic substances and therefore create problems when it comes to disposal. The aim of the research project was to demonstrate that brick structures are ideally suited for combining with thermo-active building systems and to show that a comfortable and energy-efficient living space can be created from bricks without any additional insulation of the walls. Mission accomplished: even when the outdoor temperature fell well below zero it was still possible to maintain a pleasant room temperature of above 20°C inside the simulation rooms through solar heating alone. The brick wall kept the temperature in the interior largely constant.

Reliable calculation core

The project results from the simulation space were particularly pleasing when compared with the calculated values of the actual temperatures. The modeling algorithm developed for the project simulated the reality almost identically. It can therefore be used in future for the planning of building projects. In future it will be used by structural engineers to calculate the optimum thermal performance of thermally activated buildings during the planning phase.

Alpines Bauen network

The challenges involved in Alpine construction are becoming ever more complex and knowledge-intensive due to stricter requirements in the field of climatic, energy and eco-efficiency, due to new, rapidly changing technologies and due to an increasingly competitive environment caused by global construction industries and technology manufacturers. Cost pressure is also rising. For companies, this means looking into innovation and research questions and further developing existing Alpine construction expertise. With this in mind, the Alpines Bauen network was formed in Salzburg by representatives of local business, research and education. The network tackles these challenges and develops solutions. Cooperative efforts with partners from Bavaria and Tyrol have also been stepped up for this purpose. The expert symposium is the annual highlight of this joint undertaking, this year, it will once again be sharing know-how from various research projects and real-life situations.

At present, the network is also focusing on implementing a project funded by EU programme Interreg, in which research institutions develop new renovation solutions together with small and medium-sized companies. As Walter Haas, Managing Director of local innovation service ITG and coordinator of the project, puts it: “Renovation is a large market and, thanks to new energy solutions, it is above all a growing one. There is still plenty of room here for new concepts and technologies for future developing alpine building stock by intelligent means. For SMEs in particular, this creates opportunities for meeting previously neglected market demand such as the gradual renovation of smaller buildings.” This would allow them to further develop their role as specialists in alpine construction, thus adding value and safeguarding jobs in the region.

www.alpines-bauen.com

BAU innovation and research centre for construction research

Salzburg Chamber of Commerce and Salzburg state came together with local construction companies, architects and research institutions to focus on projects with a hands-on orientation. The BAU innovation and research centre at the Lehrbauhof-BAUakademie Salzburg building academy, which receives financial support from the European Regional Development Fund (ERDF). The five simulation rooms located there are equipped with state-of-the-art construction and energy solutions, allowing entire company networks to work together on research topics and building concepts.

www.forschungsstelle.at

Network partners
- ITG - Innovationsservice für Salzburg
- Salzburg Chamber of Commerce, Construction Guild
- Salzburg University of Applied Sciences
- Holzcluster Salzburg wood industry network
- Chamber of Architects and Consulting Engineers for Upper Austria and Salzburg
- Salzburg Institute for Regional Planning and Housing (3IR)
- Studio SPACE (Research Studios Austria Forschungsgesellschaft)
- umwelt service salzburg environmental consulting
- Energieberatung des Landes Salzburg energy consulting
- University of Innsbruck
- Chamber of Trades for Munich and Upper Bavaria
- University of Applied Sciences Rosenheim

The network is sponsored by Interreg Austria-Bavaria 2014-2020.
ITG - Innovation Service for Salzburg: innovation consulting and regional development

ITG is Salzburg's innovation centre. As Salzburg's regional development agency, ITG coordinates and implements the technology and innovation-related policies of the regional government, especially through SME support, Cluster Networks and knowledge/technology transfer into SMEs. We raise awareness about promising future-oriented business fields and bring these to businesses in Salzburg. We advance Salzburg's existing economic strengths in cooperation with other institutions and are thus an important partner for implementing Salzburg state's economic model.

We are currently focusing on:

- Alpine construction
- Health care management & life sciences
- Information & communication technology
- Creative industries
- Synthetics & automotive
- Research & transfer
- Innovation competence
- Economic sustainability
- Innovation in tourism

Business support

ITG provides expertise in the realization of innovative projects and the establishment of businesses, fosters collaboration, activates regional hubs and provides consulting services. Businesses are accompanied throughout the entire innovation process, new methods are introduced via workshops and one-to-one meetings.

We offer full and tailored assistance to businesses in their innovation projects:

- Project and funding consultancy
- Finding co-operation partners and / or
- Property law consultancy.

Cooperation and innovation

Sharing experience, short communication channels, division of responsibilities and hands-on assistance with a minimum of red tape – these are the undisputed benefits of a partner network. ITG not only works closely together with the local innovation network but also sets its sights beyond regional borders: interregional projects allow us to learn from the experiences of other organisations (and vice versa); by working together with funding bodies, we are always optimally informed; and contact with research institutions helps us to find the scientific partners who are needed for innovative projects. Needless to say, our customers also benefit from this.

A successful start in Salzburg: STANDORT AGENTUR SALZBURG GmbH

The investment promotion and investor service agency of the province and city of Salzburg is always at your side to facilitate the investment process, establish contacts, prepare useful information, give important advice, connect with experts and serve as a consultant on any business location issues. The Welcome&Expat-Service-Center provides information and assistance for international high potentials and their families so as to ensure a successful start in Salzburg. www.salzburgagentur.at

Contact:

ITG - Innovation Service für Salzburg
info@itg-salzburg.at, +43 662 254 300-0
www.itg-salzburg.at