



Life Sciences and Facility Management

TRANSPARENCY

2016 issue

Facts and information on
Study Programmes – Continuing Education –
Research and Development – Services

Management and organisation

School of Life Sciences and Facility Management



Foto: Frank Bröderli

School management: Thomas Wehrmüller, Daniel Baumann, Margrit Büeler, Michael Kleinert, Urs Hilber, Christian Hinderling, Karin Altermatt, Jean-Bernard Bächtiger

Organisation:

- AWG Department of Foundation Studies in Science
Director: Karin Altermatt
- IAS Institute of Applied Simulation
Director: Prof. Marcel Burkhard
- ICBT Institute of Chemistry and Biotechnology
Director: Prof. Dr. Christian Hinderling
- IFM Institute of Facility Management
Director: Prof. Thomas Wehrmüller
- IILGI Institute of Food and Beverage Innovation
Director: Prof. Michael Kleinert
- IUNR Institute of Natural Resource Sciences
Director: Prof. Jean-Bernard Bächtiger

Senior management:

Prof. Dr. Urs Hilber, Dean ZHAW LSFM and Head of R&D ZHAW;
Margrit Büeler, Assistant to the Dean;
Prof. Dr. Daniel Baumann, Deputy Dean ZHAW LSFM, Head of Education,
Research and Resources

Moving forward with a clear vision

Dear readers

The School of Life Sciences and Facility Management is moving into the future with commitment and a strong vision. In 2015 we took some vital steps, including the merger of two of our institutes. We are also proud of our successes in national and international research, which reaffirm our level of expertise.

Wädenswil's expertise sought after in the world of research

Two more projects were acquired by Wädenswil in 2015 as part of the funding programme Horizon 2020: the first is ShareBox, in which chemists investigate cleaning and processing strategies that enable the exchange of materials. In the second project, 1Bd, our experts are working with miniaturized reactor technology, process analytics and a new concept for measuring the surface energy of solids. In addition, the ZHAW was admitted to the Swiss Institute for Bioinformatics (SIB), thanks to our special expertise in systems biology and bioinformatics. Another first is the ZHAW's selection as the 15th partner of SystemsX.ch: we are the only university of applied sciences in a group otherwise consisting of traditional universities and research organisations.

Popularity of our Bachelor's and Master's programmes

The Master's degree in Facility Management received its final accreditation from the Swiss Federation in 2015. This formal recognition confirms the value of this internationally popular study programme, which has now run for the fifth time. The Master's study programme in Life Sciences is also in demand: 51 students graduated in 2015, 19 more than in the previous year. The development of the Bachelor's programmes has remained stable: 419 students began their studies in 2015 (compared to 413 in the previous year).

Important decisions for the future

A milestone for our organization was the decision, effective from January 2016, to merge two former Institutes – Biotechnology, and Chemistry and Biological Chemistry – into the new Institute of Chemistry and Biotechnology ICBT. Many years of experience and technical expertise are combined in ICBT at a depth and com-

pleteness which is unique for Swiss universities of applied sciences. The institutions that founded the association 'Wine Centre Wädenswil' in autumn also demonstrated their strength of vision by enabling the energies of Swiss-German winemakers to be pooled. Members of the new association include Agroscope, the Office for Landscape and Nature of the Canton of Zurich (ALN / Strickhof), the industry association Swiss German Wine (BDW), and the ZHAW in Wädenswil. During the deployment phase from October 2015 to March 2017, the Institute of Natural Resource Sciences will be the head of office of this organization.

A hands-on university

Around 300 young people aged between 12 and 15 took part in the second Science Week in August 2015. They experienced the natural sciences first-hand and acquired interesting insights from a wide range of experiments. The ZHAW has been engaged in this practically-oriented programme, designed to promote the STEM disciplines of mathematics, computer science, natural sciences and technology, since 2014. For the third consecutive year the 'Hochschulspektakel' Association organised an ambitious public festival. The event aims to provide hands-on experience of the university and promote contact between local people and students. There was something for everyone to enjoy: a children's lab, chemistry shows, and a colourful music programme.

Practical relevance, creativity, passion and reflection are the inspiration for both thought and action. In the following pages you will find transparent facts and information on our study programmes, continuing education, research and development, and services. I wish you interesting and thought-provoking reading, and will be glad to answer any questions you may have.



Prof. Dr. Urs Hilber
Dean



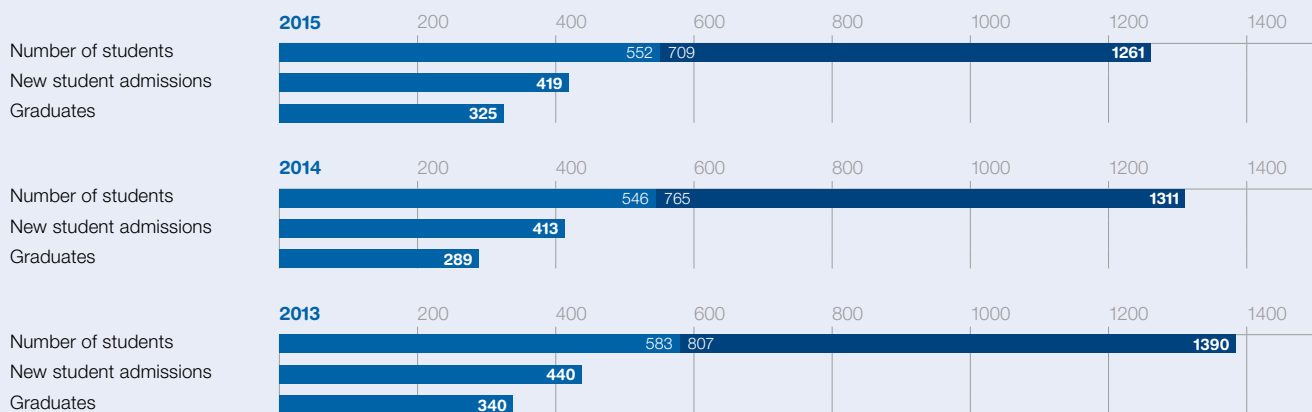
Environment | Food | Health | Society
Our competences in Life Sciences
and Facility Management.

Bachelor's degree programmes

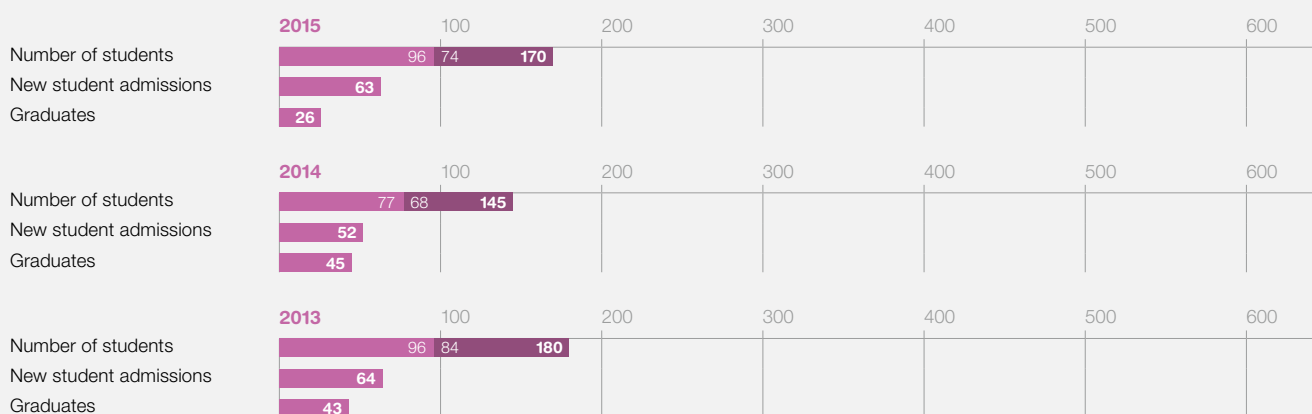
Developments from 2013 – 2015

Status as of 15.10.2015, based on SBFI report, number of persons

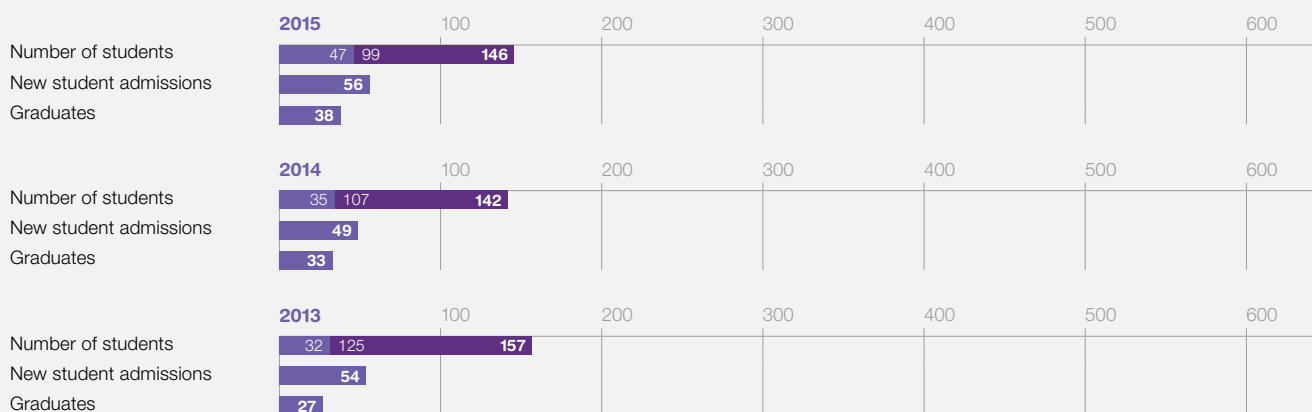
Overview



Biotechnology

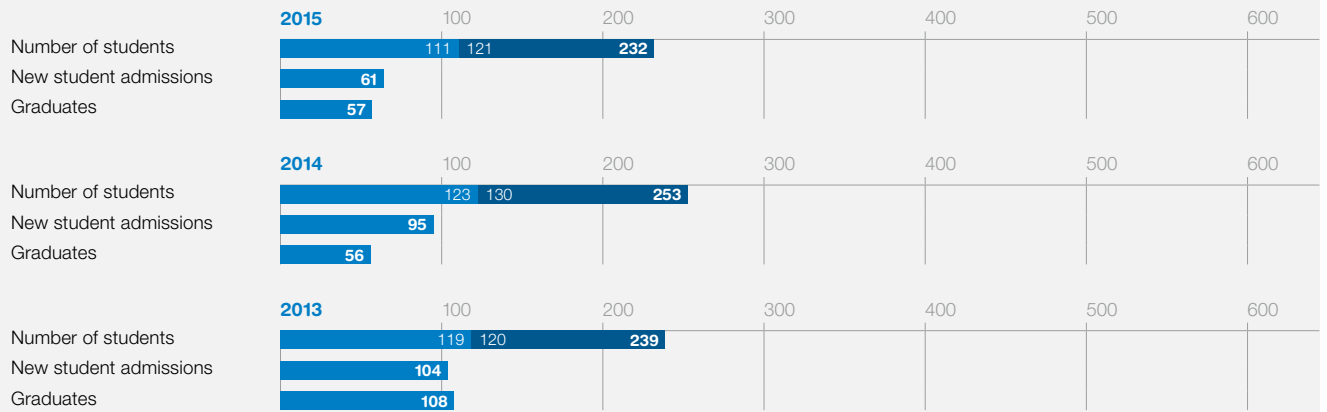


Chemistry

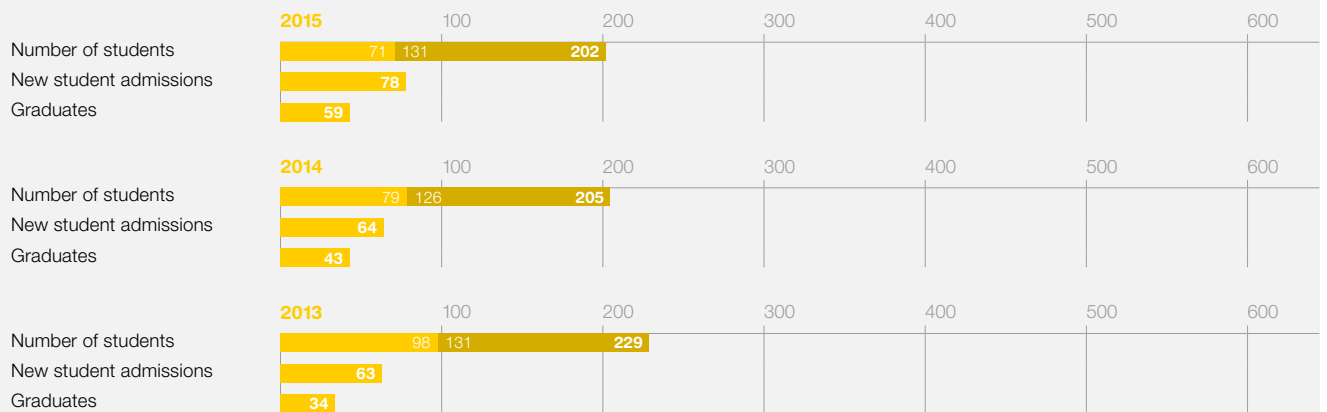


■ Women ■ Women ■ Women
■ Men ■ Men ■ Men

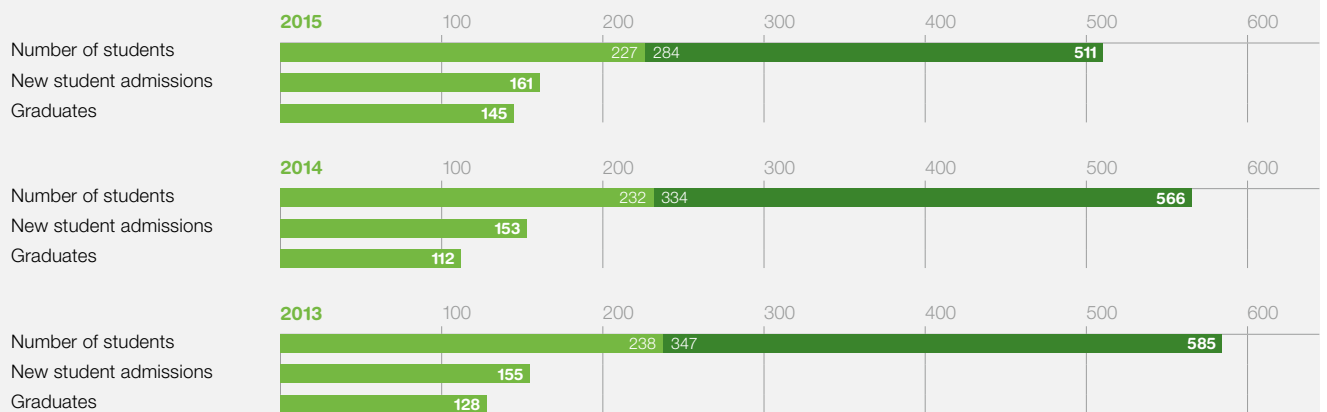
Facility Management



Food Technology



Natural Resource Sciences



■ Women ■ Women ■ Women
■ Men ■ Men ■ Men

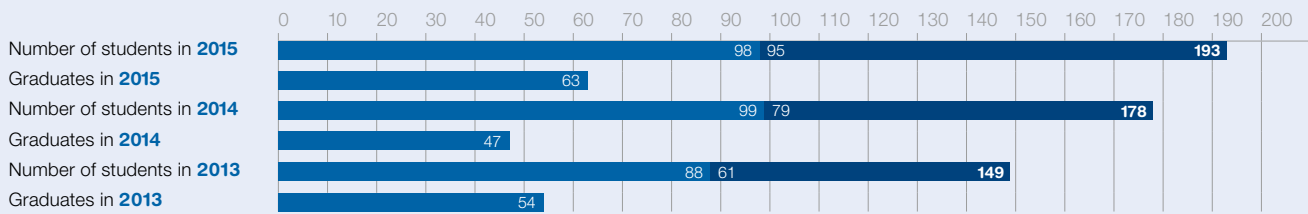
The figures for students and graduates represent those enrolled on 15.10. They do not take into account the date of submission or completion of their Bachelor's thesis, and thus their date of graduation.

Master's degree programmes

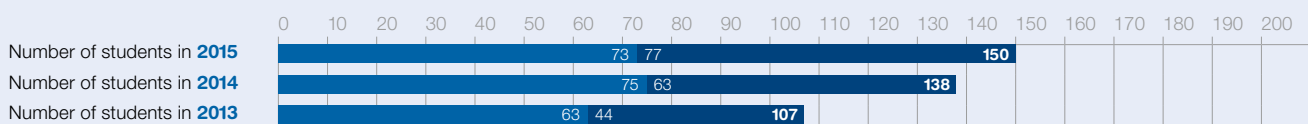
Developments from 2013–2015

Status as of 15.10.2015, based on SBFI report, number of persons

Overview of MSc LS & FM



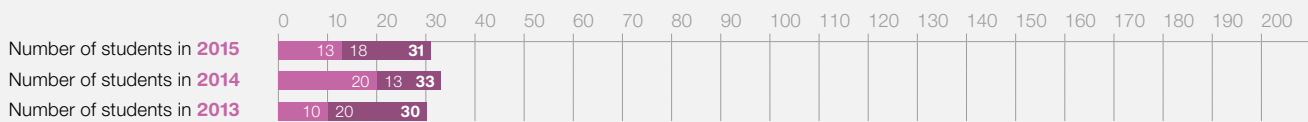
Overview of MSc LS



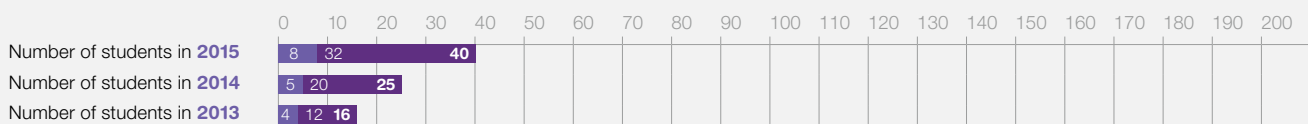
Overview of MSc FM



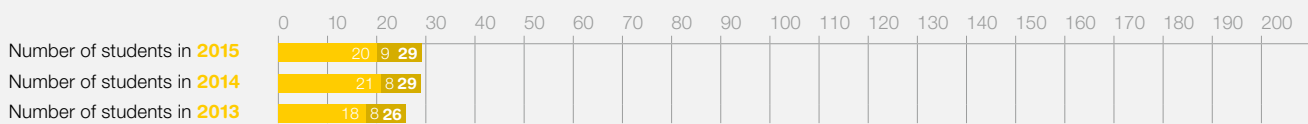
MSc LS – Specialisation in Pharmaceutical Biotechnology



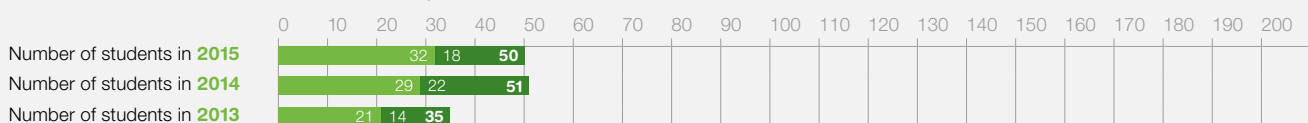
MSc LS – Specialisation in Chemistry for the Life Sciences



MSc LS – Specialisation in Food and Beverage Innovation



MSc LS – Specialisation in Natural Resource Sciences



Continuing education | Courses | Conferences

Development 2013–2015

What we offer

The range of continuing education activities at Wädenswil and the Technopark Zurich includes international conferences, continuing education courses (WBK), certificate and diploma courses (CAS, DAS) and graduate study programmes spanning several semesters (MAS). Our services are aimed at people who have a first degree, are professional practitioners, and want to expand or deepen their expertise.

Qualifications

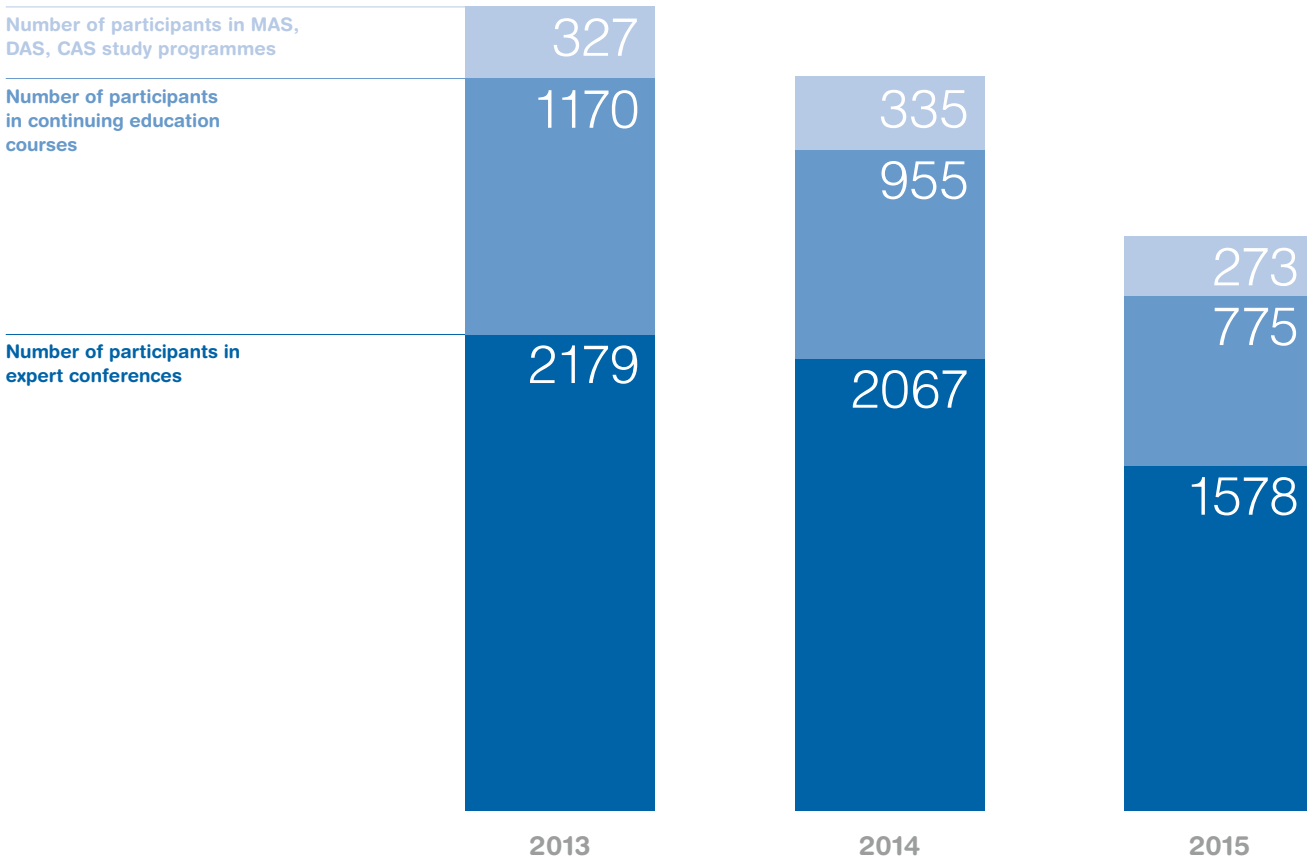
MAS: The Master of Advanced Studies (MAS) is the most comprehensive training programme and corresponds to 60 credits. The programme is part-time, usually modular in structure, and takes place over several semesters. Consisting of a number of partial qualifications, it concludes with a Master's thesis.

DAS: The diploma course Diploma of Advanced Studies (DAS) corresponds to 30 credits. It provides in-depth training in specific professional fields.

CAS: The Certificate of Advanced Studies is an independent qualification with 10–15 credits, which can also form part of an MAS or DAS.

Status as of 31.12.

Number of participants in continuing education courses and events (including expert conferences)	3676	3357	2626
Number of continuing education courses and events (including expert conferences)	72	89	68



Research and development

Our expertise



Bioprocess engineering laboratory, Grüental Campus, photo: Frank Brüderli

The disciplinary expertise in our five institutes provides a solid foundation for solving the problems brought to us by partners and customers, whose projects and mandates we carry out in practical and creative ways. Formats range from a specific Bachelor's thesis to interdisciplinary, multi-year research projects. We would be glad to support you.

■ Main research areas in the IAS Institute of Applied Simulation

- Bio-inspired modelling and forecast models
- Computer-aided genomics and biomedical simulation
- Process simulation and optimisation
- Knowledge engineering

■ Main research areas in the ICBT Institute of Chemistry and Biotechnology

- Micro-, molecular and cell biology, tissue engineering
- Chemical and biotechnological processes and systems
- Syntheses and new materials
- Medicinal chemistry, phytopharmacy and pharmaceutical technology
- Analytical chemistry
- Biochemistry, protein technology and bioanalytics
- Chemical and biotechnological processes

■ Main research areas in the IFM Institute of Facility Management

- Workplace
- FM in health care
- Consumer FM
- Corporate and public real estate operations

■ Main research areas in the ILGI Institute of Food and Beverage Innovation

- Food technology
- Beverage technology and aroma research
- Food quality and safety
- Consumer behaviour and nutrition

■ Main research areas in the IUNR Institute of Natural Resource Sciences

- Education and communication
- Landscape and tourism
- Urban green spaces
- Organic agriculture
- Ecological engineering
- Integrative ecology

Publications

Sample of publications in 2015

Scientific publications are an important element in the transfer of knowledge between research and practice. The list below is a sample of our key publications in 2015. A complete list of all the publications of the School of Life Sciences and Facility Management can be found at www.zhaw.ch/lsfm/research.

IAS

Anisimova, M., Pecerska, J. & Schaper, E. (2015). Statistical approaches to detecting and analyzing tandem repeats in genomic sequences. *Frontiers Bioeng Biotech*: 3, 31.

Gil, M., Anisimova, M. (2015). Methodologies for Phylogenetic Inference. *Encyclopedia of Life Sciences eLS*: 1–5.

Schwendner, P., Schüle, M., Ott, T. & Hillebrand, M. (2015). European government bond dynamics and stability policies: taming contagion risks. *Journal of Network Theory in Finance*, 1, 4.

IBT*

González, G., Vogel, H., Razmilic, I. & Wolfram, E. (2015). Polyphenol, anthocyanin and antioxidant content in different parts of maqui fruits (*Aristotelia chilensis*) during ripening and conservation treatments after harvest. *Industrial Crops and Products*, 76, 158–165.

Frasson, D., Sievers, M. (2015). *Glaciimonas alpina* sp. nov. isolated from alpine glaciers and reclassification of *Glaciimonas immobilis* Cr9-12 as *Glaciimonas alpina*. *International Journal of Systematic and Evolutionary Microbiology*, 65(6), 1779–1785.

Trendafilova, A., Todorova, M., Danova, K., Simmons, L., Wolfram, E., Riedl, R., Meier, B. & Evstatieva, L. (2015). Highly oxygenated sesquiterpenes in *Artemisia alba* Turra. *Phytochemistry*, 110, 140–149.

ICBC*

Lanz, J., Riedl, R. (2015). Merging Allosteric and Active Site Binding Motifs: De novo Generation of Target Selectivity and Potency via Natural-Product-Derived Fragments. *ChemMedChem*. (in press).

Reber, M., Brühwiler, D. (2015). Bimodal mesoporous silica with bottleneck pores. *Dalton Transactions*, 44, 17960–17967.

Smrke, S., Kroslovakova, I., Glöss, A. & Yeretizian, C. (2015). Differentiation of degrees of ripeness of Catuai and Tipica green coffee by chromatographical and statistical techniques. *Food Chemistry*, 174, 637–642.

IFM

Ashworth, S., Druhmman, C. (2015). Integration of FM and asset management expertise in digital 3D building models. *Journal für Facility Management: Wissenschaft trifft Praxis*, 10, 38–52.

Gerber, N., Hofer, S. (2015). Towards a Comprehensive Key Performance Indicators Reference Model for non-medical Support Services / Facility Management in Hospitals. *International Journal of Facility Management*, 6, 1.

Windlinger Inversini, L., Gersberg, N. & Konkol, J. (2015). Unterstützung mobil-flexibler Arbeit durch aktivitätsorientierte Gestaltung von Büroräumen. *Wirtschaftspsychologie*, 1-2015, 83–95.

ILGI

Pedan, V., Fischer, N. & Rohn, S. (2015). An online NP-HPLC-DPPH method for the determination of the antioxidant activity of condensed polyphenols in cocoa. *Food Research International*. (in press).

Schwendimann, L.M., Kauf, P., Fieseler, L., Gantenbein-Demarchi, C. & Miescher Schwenninger, S. (2015). Development of a quantitative PCR assay for rapid detection of *Lactobacillus plantarum* and *Lactobacillus fermentum* in cocoa bean fermentation. *Journal of Microbiological Methods*, 115, 94–99.

Yildirim, S., Röcker, B. & Rüegg, N. (2015). Development of Palladium-based Oxygen Scavenger: Optimization of Substrate and Palladium Layer Thickness. *Packaging Technology and Science*, 28, 710–718.

IUNR

Baur, P. (2015). Marktöffnung als Weg in eine zukunftsfähige Schweizer Ernährungs- und Landwirtschaft – Chancen, Herausforderungen und Lösungsansätze: Studie im Auftrag von economiesuisse. Schlussbericht.

Eymann, L., Stucki, M., König, A., Scharfy, D. & von Blottnitz, H. (2015). LCA of clean technologies in food value chains of emerging economies. In: *Conference Proceedings: International conference on Life Cycle Assessment as reference methodology for assessing supply chains and supporting global sustainability challenges LCA for "Feeding the Planet and Energy for Life"*. (167–170). Stresa/Milano: ENEA.

Pietsch, C., Kersten, S., Valenta, H., Dänicke, S., Schulz, C., Burkhardt-Holm, P. & Junge, R. (2015). Effects of dietary exposure to zearalenone (ZEN) on carp (*Cyprinus carpio* L.). *Toxins* 7(9), 3465–3480.

* The IBT and ICBC merged in January 2016 to form the new ICBT: Institute of Chemistry and Biotechnology.

Finances

Development 2013–2015

Demographic changes, a strong Swiss franc and competitive markets were significant challenges in 2015 and the School proved its mettle in this difficult environment. The number of undergraduate enrolments declined compared to the previous year (1261 in 2015, 1311 in 2014), but the number of Master's students showed a gratifying increase (193 enrolled in 2015, 178 in 2014).

In addition, our strong position in research and development (R & D) was further strengthened. In 2015, accounts closed with an income of CHF 17.1 million from R & D (excluding the Canton of Zurich), just under CHF 1 million more than in the previous year. Revenues from services were slightly below the level of the previous year, at around CHF 3.3 million. This was due to the strong Swiss franc, among other reasons.

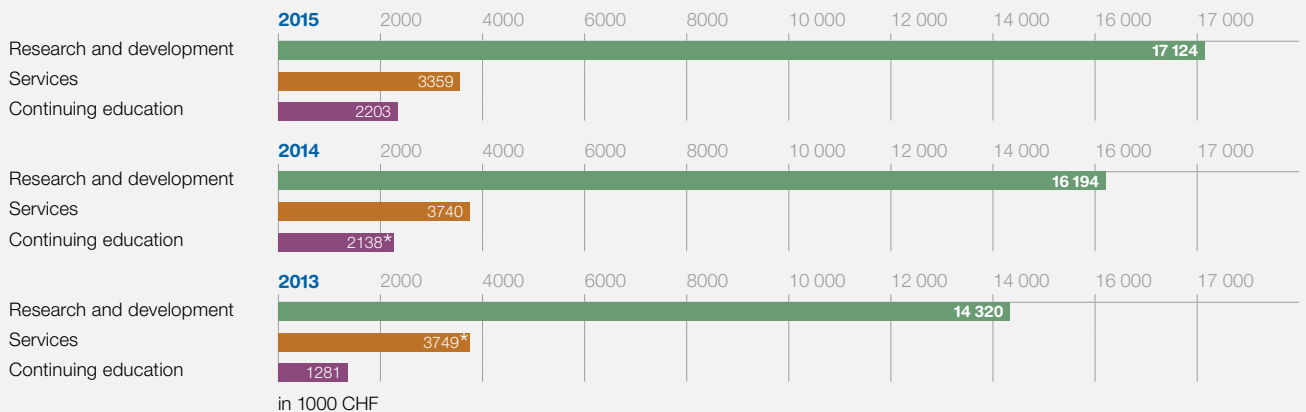
In continuing education, the conditions affecting the disciplines of Chemistry/Life Sciences still represent a major challenge. Our financial statements show slight growth, despite lower participant numbers: CHF 2.2 million in 2015 compared to CHF 2.1 million in 2014 (see page 7). There are several reasons for this increase, including the fact that the CAS (Certificate of Advanced Studies) format for the acquisition of competences, compared to short training courses without formal qualifications, is an increasingly attractive option for continuing education candidates. We highly appreciate the importance of 'lifelong learning' and intend to position our professional continuing education even more effectively in the future.

The ZHAW is still the largest employer in Wädenswil and an important player in the Zurich Parkside region. With 612 staff (457

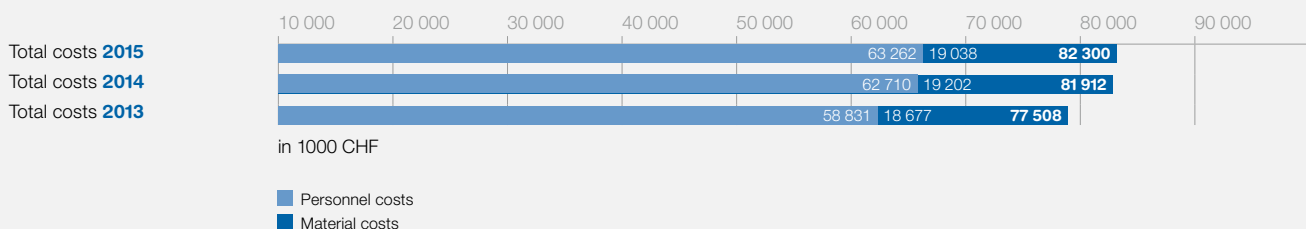
full-time positions), we are only slightly below the previous year (621 staff, 471 full-time positions). A further encouraging feature is the well-balanced gender distribution, showing a slight advantage for women (313 women and 299 men).

The economic and financial situation deteriorated markedly in 2015, which was also a challenge for us. Nevertheless, we are responding to the new situation, which David Bosshart has aptly called 'The Age of Less', by bringing our strengths into play: practicality, creativity, the ability to reflect, and passion. Education and research are the foundation for the further development of our country. All Swiss universities, including the ZHAW and our School, make a significant contribution to this development. We appreciate the confidence that the public authorities and the private sector place in us.

Total revenue (not including contributions from the Canton of Zurich)

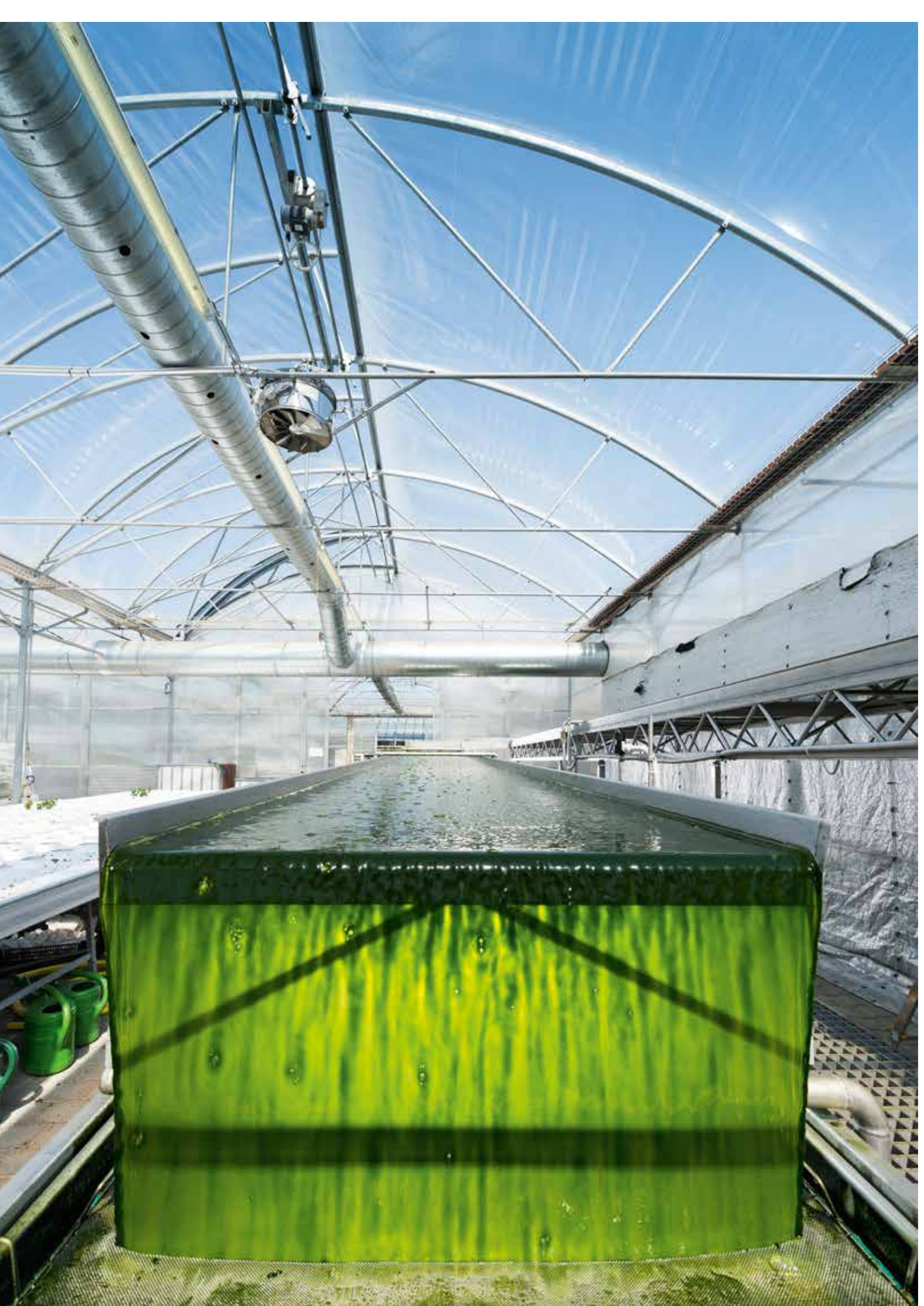


ZHAW LFSM costs



* including continuing education courses – the higher revenue from continuing education compared to the previous year (without an increase in numbers of participants) is due to the fact that in previous years continuing education courses (CHF 700,000) were listed under 'Services', whereas they are now included with 'Continuing education'.

Picture right ►
Cultivation plant for microalgae production, Grüental Campus, photo: Frank Brüderli

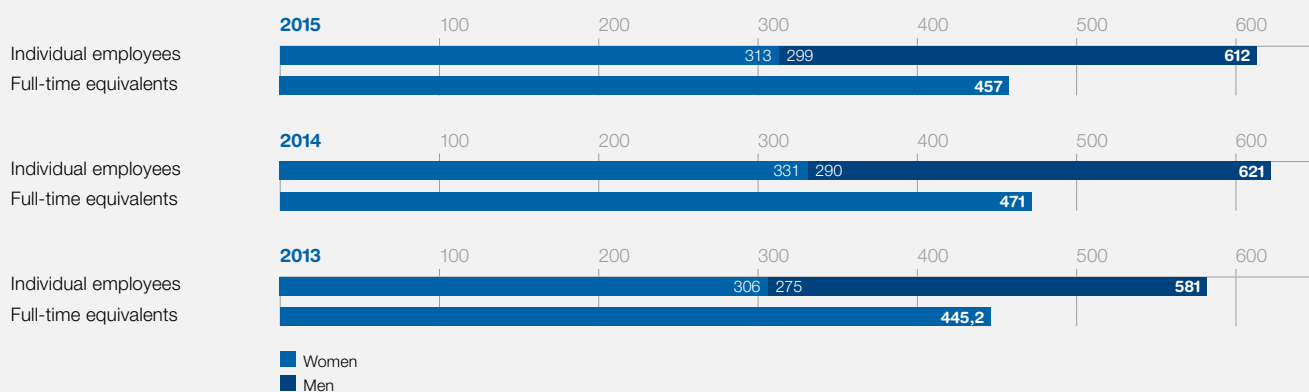


Employees

School of LSFM

Status as of 31.12.

Personnel



Employees by organisational units

	2013	2014	2015
IAS	29	30	35
IBT	72	72	74
ICBC	82	92	100
IFM	55	57	51
ILGI	84	89	86
IUNR	186	202	189
AWG	25	26	26
Management/Administrative staff for education, research and resources	48	53	50

Employees by personnel category

	2013	2014	2015
Professors and lecturers	155	160	162
Research associates	160	179	188
Assistants	140	146	140
Administration, technology and operations personnel	112	116	111
Interns	10	14	4
Trainees	4	6	7

Foundations | Boards

Foundations

The School of Life Sciences and Facility Management (LSFM) supports various foundations with expertise and personnel, from which we also benefit:

Stiftung Technische Obstverwertung, (Foundation for technical fruit processing) Wädenswil

Representative:

– Prof. Dr. Urs Hilber, Dean, ZHAW LSFM

Stiftung Gartenbau (Foundation for horticulture), Wädenswil

Representative:

– Prof. Jean-Bernard Bächtiger, Director of the Institute of Natural Resource Sciences, ZHAW

grow, Gründerorganisation (Founder organisation) Wädenswil

Representatives:

– Prof. Dr. Urs Hilber, Dean, ZHAW LSFM, Board member

– Catherine Kroll, Head of the Technology Transfer Office, ZHAW LSFM in the executive management

Generationen-Dialog (Generational dialogue)

Representative:

– Prof. Dr. Urs Hilber, Dean, ZHAW LSFM

Alumnus organisations

Representatives from the School of Life Sciences and Facility Management:

ZHAW Facility Management alumni

– Barbara Keller Foletti, Institute of Facility Management, ZHAW, President

– Prof. Thomas Wehrmüller, Director of the Institute of Facility Management, ZHAW, Member

ZHAW Life Sciences alumni

Prof. Dr. Daniel Baumann, Head of Education, Research and Resources, LSFM ZHAW

Network of Wädenswil alumni

Prof. Dr. Daniel Baumann, Head of Education, Research and Resources, LSFM ZHAW

Advisory boards

To secure the practical relevance and quality of our education and application-oriented research and development, many representatives of relevant sectors and professional associations serve on our advisory boards.

■ **Advisory board of the ICBT, Institute of Chemistry and Biotechnology**

– Prof. Dieter Beckmann, Institut für Bioprocess- und Analysenmesstechnik e.V.

– Dr. Gunter Festel, Owner of FESTEL CAPITAL

– Prof. Dr. Christian Hinderling, Director of the ICBT, ZHAW

– Dr. Erich Hochuli, formerly of F. Hoffmann-La Roche Ltd.

– Christof Jud, Member of the Board and responsible for educational policy at the Schweizerischer Verband Diplomierter Chemiker FH (SVC)

– Dr. Michael Mathes, scienceindustries, Chemistry pharma biotech professional association

– Dr. Ferruccio Messi, Cell Culture Technologies Ltd. liab Co

– Hans-Peter Meyer, HES-SO

– Dr. Thomas Münch, Givaudan Switzerland AG

– Dr. Martin Riediker, Expert at the promotional agency for innovation CTI

– Dr. Philippe Steiert, CSEM, Swiss Center for Electronics and Microtechnology

– Markus Tanner, Werthenstein Biopharma GmbH

– Prof. Dr. Marcus Textor, Department of Materials, ETH Zürich

– Dr. Pius Waldmeier, Head of Synthesis & Process Research Group, F. Hoffmann-La Roche Ltd.

– Dr. Roland Wohlgemuth, Sigma-Aldrich

■ **Advisory board of the IFM, Institute of Facility Management**

– Ricarda Berg, CEO, Treos AG

– Claudia Bossart, Head of Facility Management, Limmattal Hospital

– Renate Gröger, Director of Operations, Universitätsspital Zürich

– Prof. Dr. Jan Jarre, Fachhochschule Münster

– Wolfgang Stiebellehner, Head of Operations, Livit AG, Zürich

– Prof. Thomas Wehrmüller, Director of the IFM, ZHAW

– Dr. Jürg Werner, CEO, Metall Zug AG

– Daniel Zbinden, Director of Energy Contracting, EKZ, Dietikon

■ **Advisory board of the ILGI, Institute of Food and Beverage Technology**

– Dr. Hans-Peter Bachmann, Head of the Institute for Food Science, Agroscope

– Dr. Michael Beer, Head of the Department of Food and Nutrition, BLV

– Dr. Thomas Büeler, Head of Innovation & Process Intelligence, Emmi Management AG

– Dr. Karl W. Gschwend, Managing Director Operations, Hochdorf Swiss Nutrition AG

– Prof. Michael Kleinert, Director of the ILGI, ZHAW

– Cédric Ochsner, Head of Operations, GL-Mitglied MIDOR AG

– Andreas Schwab, Head of Production, Member of the Board, Rapelli SA

– Prof. Dr. Erich Windhab, Professor of Food Processing Technology, ETH Zürich

■ **Advisory Board of the IUNR, Institute of Natural Resource Sciences**

– Prof. Jean-Bernard Bächtiger, Director of the IUNR, ZHAW

– Ursin Ginsig, CEO for Contaminated Sites, Eberhard Recycling AG

– Christian Guggisberg, CEO, Gastro Star AG

– Karin Hindenlang, Director, Wildnispark Zürich

– Dr. Tove Larsen, Member of the Board of Directors, EAWAG

– Prof. Dr. Urs Niggli, Director, Research Institute of Organic Agriculture FiBL, Frick

– Dr. Raimund Rodewald, CEO, Stiftung Landschaftsschutz Schweiz SL

The ZHAW in Wädenswil

The ZHAW at a glance

Eight schools are united under the umbrella of the Zurich University of Applied Sciences. With around 11,500 students in 26 Bachelor's and 14 Master's degree programmes and more than 6,000 annual participants in continuing education, the ZHAW is one of the leading Swiss Universities of Applied Sciences. All the ZHAW locations – Wädenswil, Winterthur and Zurich – are situated in the economically strong greater Zurich area. They offer a high quality of life for both study and work and are easily accessible by public transport.

www.zhaw.ch

Attractive campus facilities and locations

The Grüental and Reidbach campuses, which include the RA building on the Seestrasse, are situated in a beautiful location on the left bank of Lake Zurich. The teaching and working areas, laboratories and pilot plants are equipped with the latest technology, and the green spaces around the Grüental campus are not only learning and research sites, but also inspire the public with their extensive collection of plants. The continuing education courses of

the Institute of Facility Management take place at the centrally located Technopark in Zurich. The research group 'Tourism and Sustainable Development' is on the frontline at the Center da Capricorns in Wergenstein (Graubünden).

Local and regional roots

Wädenswil is positioning itself as an educational and research town, and actively supports the ZHAW. Regional networking of science and industry is also reflected in the ZHAW's long-term and close cooperation with the University of Zurich, Swiss Federal Institute of Technology (ETH) Zurich, and Zurich Parkside, the regional development organisation, as well as Agroscope. Every autumn the 'Hochschul-spektakel' event on the Seeplatz brings the public and students together.

International orientation

The ZHAW offers its students the opportunity to spend a semester abroad in order to equip them for international competition in their future careers. In addition, many of the Institutes' research projects and specialist conferences at the ZHAW Wädenswil as well as their Summer and Winter Schools are internationally orien-

tated. The specialist focus of these events brings scientists and students from around the world to Wädenswil.

Promoting entrepreneurship

Together with other initiators, the ZHAW is actively involved in Wädenswil's founder organisation *Wädenswil grow*. Consulting, inexpensive premises and proximity to the university facilitate the step into starting a company, turning students into entrepreneurs and ideas into products. Today *grow* consists of 20 organizations and around 60 people. With the support programme 'Innovation to Business', the university also provides a contact and counselling centre for employees interested in founding start-ups.

Our history in brief

1942 Swiss Technical School for Fruit Processing Wädenswil

1950 Swiss Fruit and Wine Technical School (SOW)

1975 Wädenswil School of Engineering (ISW)

1998 University of Applied Sciences Wädenswil (HSW)

since 2007 School of Life Sciences and Facility Management of the ZHAW



2



3



4



5



- 1 RA Building, Wädenswil
- 2 Grüental Campus, Wädenswil
- 3 Reidbach Campus, Wädenswil
- 4 Technopark, Zurich
- 5 Center da Capricorns, Wergenstein/GR

ZHAW Campus Reidbach / Einsiedlerstrasse

ZHAW Campus Reidbach / Seestrasse

ZHAW Campus Grüental

Contact details

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