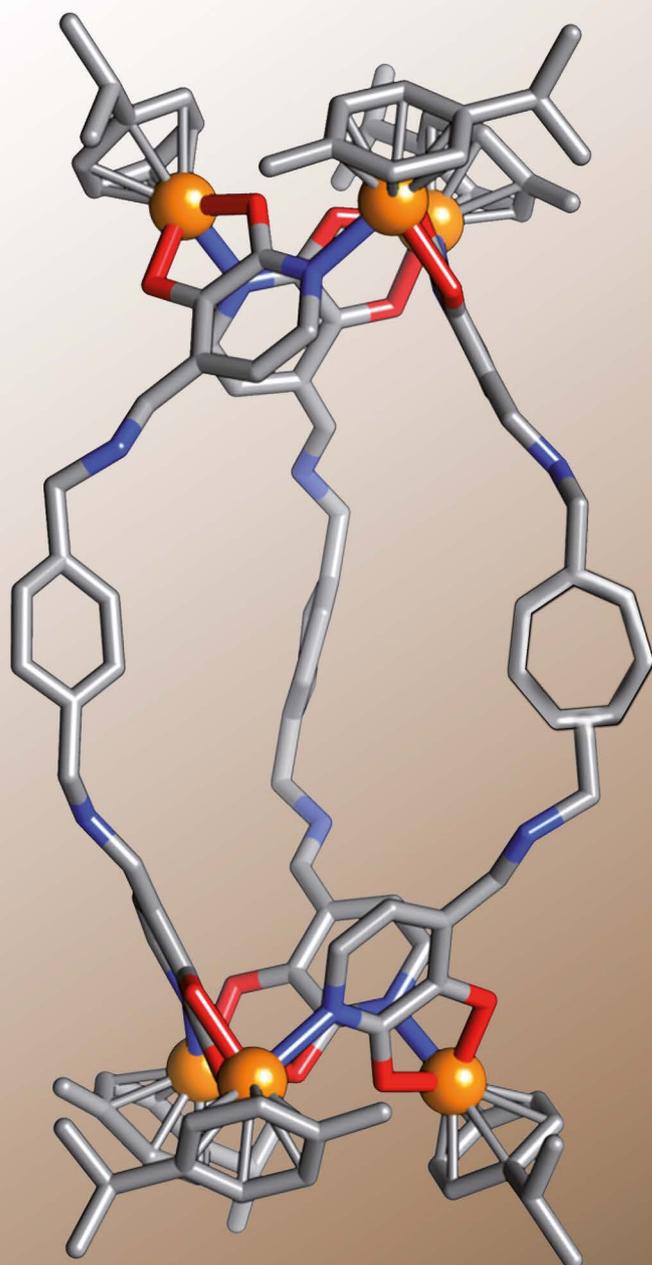
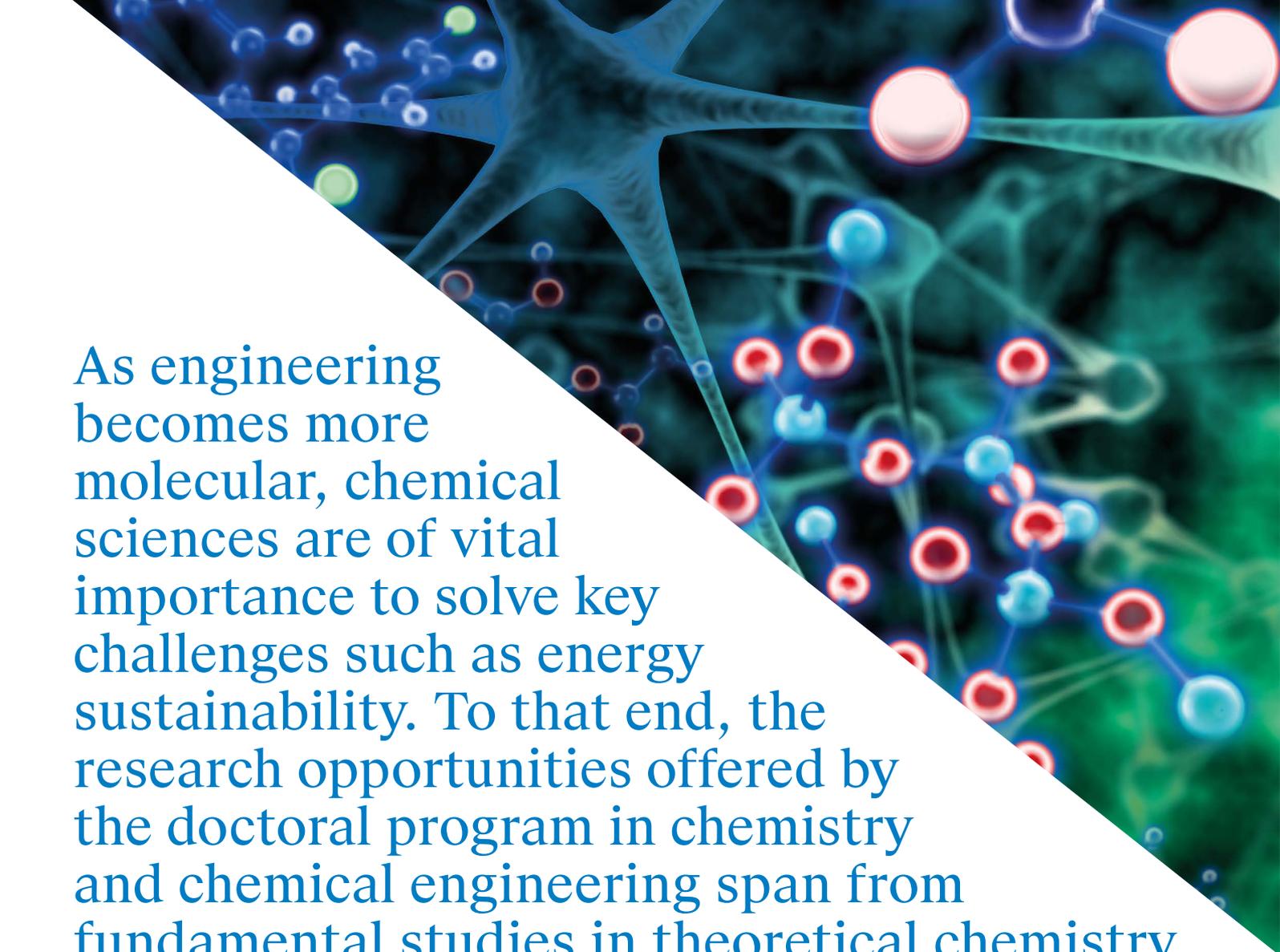


CHEMISTRY AND CHEMICAL ENGINEERING





As engineering becomes more molecular, chemical sciences are of vital importance to solve key challenges such as energy sustainability. To that end, the research opportunities offered by the doctoral program in chemistry and chemical engineering span from fundamental studies in theoretical chemistry and biochemistry to applications in devices and engineering.

Mingling
entrepreneurship
and academic activities



I founded my company TIBIO in 2009 during the second year of biology at the University of Lausanne (UNIL) and I continued to develop my company in parallel to the MSc in medical biology at the UNIL and then during the PhD at the EPFL in the Group for functionalized biomaterials (Prof. Sandrine Gerber), EDCH program. TIBIO was originally active in the field of biochemistry and environmental microbiology. The first product of TIBIO was a bacteria strain able to eliminate some pollutants hydrocarbons, for the bioremediation of soils and materials. Currently, the activities of TIBIO are mainly in the field of scientific consulting in biochemistry and industrial biology. In parallel to my activities as CEO of TIBIO, in 2015 I was appointed Chief Scientific Officer of the company Scitec Research in Lausanne, one of the biggest analytical laboratory in Switzerland. Scitec Research provides chemical and microbiological analysis in several filed, from environment to pharmacology and toxicology. Since 2014, I'm a lecturer at the Faculty of Biology and Medicine of the University of Lausanne, teaching entrepreneurship and industrial biology.

Dr. Davide Staedler, Alumni

Characterizing new porous materials with X-ray crystallography

Upon completion of my Master level studies in Chemistry at the Adam Mickiewicz University in Poznań, Poland, I chose to pursue my PhD thesis at the Institute of Chemical Sciences and Engineering at EPFL Valais Wallis. EPFL Valais Wallis is a new satellite campus of EPF Lausanne located in Sion and its research focus is based on energy. I chose to work within the Laboratory of Molecular Simulation (LSMO) because of its dynamic nature comprising two teams with advanced computational and strong experimental skills. My project is supervised by Dr. K. C. Stylianou and Prof. B. Smit, and encompasses the rational design, synthesis and characterization of new porous materials, namely metal organic frameworks for advanced applications. Among my many scientific interests, my not-so-secret passion is towards the X-ray crystallography – a useful tool that allows me to better understand the structure–property relationships of these crystalline materials. As a proof of this passion, during the Zurich School of Crystallography earlier in 2017, I was awarded with the prize for the best young crystallographer (the photograph represents me working at the microscope during the School). Apart from the deep fundamental insight we can gain using X-ray crystallography, I am also eager to find practical applications based on the properties of the materials I synthesize and characterize. For example, in one of our recent accounts, we reported a new framework material capable of efficiently detecting and capturing vapor ammonia: even at very low concentrations of this harmful yet widely used gas, a conspicuous color change can be directly appreciated; for more information, please have a look at: A. Gładysiak et al., Chem. Eur. J., 23, 13602–13606, (2017).

Andrzej Gladysiak,
PhD student at the Laboratory of Molecular Simulation



An interdisciplinary project for cancer detection

After traveling for a month in South America, I joined the group of Prof. Ferenc Krausz, which is based both in Max Planck Institute of Quantum Optics and LMU München. I was actually accepted for a postdoc position back in June, before I even had started to write my PhD thesis. On top of it, SNF informed me that they have awarded me with an early postdoc fellowship for 18 months!

The general idea of a big interdisciplinary project that I joined is to apply broadband infrared diagnostics to cancer detection, and develop new approaches in time-resolved infrared spectroscopy in general.

Given my background in analysis of biomolecules in the gas phase, I am supposed to bring a new perspective to the group, which has been mainly focused on laser physics up to now. I am not alone in this mission, I belong to small group led by Dr. Mihaela Zigman and work closely with a talented PhD student. We plan to combine infrared molecular fingerprinting with other analytical techniques in order to improve the sensitivity and selectivity of spectroscopic screening of biological liquids and eventually to create an effective tool useful to medical community.

Dr. Lucy Voronina, Alumni



Research opportunities

Analytical chemistry

Chemical biology

Chemical engineering

Computational chemistry

Inorganic chemistry

Organic chemistry

Physical chemistry

Renewable energy

Interdisciplinary research

At the interface between basic sciences and applications, the doctoral program in Chemistry and Chemical Engineering fosters interdisciplinary research projects with other fields such as physics and life sciences. It is one of EPFL biggest doctoral program and all our PhD students can benefit from cutting-edge facilities to conduct their measurements on-site. Candidates interested in sustainable development projects can join our Energypolis campus in Sion where about 10% of our doctoral students are assigned.

The Institute of Chemical Sciences and Engineering in Valais

At the heart of the EPFL Valais Wallis project is a research institute in Sion with a major focus on renewable energy, sustainable chemistry, materials for environmental protection and also with a strong focus on analytical chemistry. Those interested in conducting research in Sion should contact the professors directly, and doctoral students also need to apply to the Doctoral School.

[More information at epfl.ch/schools/sb/research/isic/valais/](http://epfl.ch/schools/sb/research/isic/valais/)

Sample of popular courses offered in the frame of the EDCH program

Principles and Applications of X-ray Diffraction

Leading research in Chemical Engineering

Scientific Writing

Basic and advanced NMR - two levels

Perspectives in Modern Organic Chemistry

Seminars in Physical Chemistry

Current Topics in Chemical Biology

Mass spectrometry, principles and applications

Chemical Probes for Imaging in Biology

Admission guidelines

At the time of enrollment in the doctoral program, a student must have a master's degree (or exceptionally a 4- or 5-year bachelor's degree) + **min. 6 months of research**.

Candidates are invited to submit their applications **prior to January 15th, April 30th or September 15th**.

Need more information? Visit us at

go.epfl.ch/phd-edch

and find out about the current opportunities, application instructions, and more...

Contact: edch@epfl.ch