

SCS Foundation Swiss Chemical Society



# The Alfred Werner Excellence Scholarship Program

## Impact Report 2013-2021



### The Alfred Werner Excellence Scholarship Program

The program supports highly talented international students to perform their Master of Science (MSc) studies in Chemistry, Biochemistry or the Pharmaceutical Sciences in Switzerland.

Foreign students have a long history of being an asset to our community, and part of the success of chemistry in Switzerland is due to their presence. Alfred Werner himself is one of many examples. The Scholarship Program named after him seeks to further contribute to this tradition.

Initially, the stipends amounted to CHF 25'000. In 2020, they were increased to CHF 30'000. The program is supported by the Swiss chemical and pharmaceutical industry as well as by private donors.

The SCS Foundation actively supports the integration of the scholars, offering mentorships, visits at the program-supporting industrial partners, as well as free access to events of the Swiss Chemical Society.

Since 2013, 61 students from over 30 countries were granted an Alfred Werner Scholarship. As of 2021, six generations of students successfully completed their studies, some with distinction. A majority of them continued their career in Switzerland; others returned home, or went abroad again to experience more of this world. Some scholars now work for companies based in Switzerland.



The charts show where the scholars earned their BSc degrees, the gender balance, the university they enrolled at for their MSc studies, and their next career move. For more detailed statistical information please visit the Program Web site.

#### Origin of the Scholars

### The Alfred Werner Excellence Scholarship Program: A Success Story on Bringing Talented Students to Switzerland

It is my pleasure and great privilege to say a few words about the remarkable achievements of the Alfred Werner Excellence Scholarship Program established in 2013.

The aim of the Alfred Werner Excellence Scholarship Program of the SCS Foundation is to bring young, highly talented students of Chemistry, Biochemistry or the Pharmaceutical Sciences to Switzerland to perform their Master of Science studies at one of our universities or federal institutes of technology.



Dr. Alain De Mesmaeker President of the Swiss Chemical Society and the SCS Foundation

To date, the program has supported 61 young scientists, 30 women and 31 men, from 30 different countries. They all completed their studies, many of them with distinction, as this report will show. Whereas the majority of scholars continued their career in Switzerland, the others will be excellent ambassadors for our country and the quality of its university system.

The process of scholar nomination, selection and quality control builds on a fruitful collaboration with our academic partners, who welcome the scholars as a valuable addition to their student body. We have reached in 2021 a stage where the Alfred Werner Excellence Scholarship program gained international visibility and appreciation, attracting an increasing number of high-profile candidates. The feedback of our industry partners, who either welcomed scholars for internships or offered them employment, further illustrates the quality of the program.

The SCS Foundation is actively supporting the program throughout the entire process, including the integration of the scholars by offering mentorships, visits at the industrial partners, and by providing free access to all activities of the Swiss Chemical Society.

I would like to thank our academic, industrial and private partners most warmly for their excellent collaboration. I hope that many more students will have the opportunity to study in Switzerland through the Alfred Werner Excellence Scholarship Program. This, however, is only possible with the continuous financial support of our private and industrial partners. I would like to thank them again for their support and commitment. I also invite other donors to join us to reach yet another milestone of this very successful program.

With my most sincere congratulations and thanks to all the actors of this program.



SCS Foundation Swiss Chemical Society

### Contact

SCS Foundation c/o Swiss Chemical Society Haus der Akademien Laupenstrasse 7 3008 Bern Switzerland

info@scg-foundation.ch www.scs-foundation.ch

### Impressum

Text: Hans Peter Lüthi, David Spichiger, Céline Wittwer and contributing authors mentioned in the text. Pictures: Hans Peter Lüthi, David Spichiger and contributing authors.

Title page: Meet&Greet event at Syngenta in Stein (AG), 2017

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### The Alfred Werner Scholars Gallery

#### Alena Budinská

Native of the Czech Republic, Class of 2017-2019

#### Making it possible

The Alfred Werner Scholarship allowed me to fully focus on my studies, which I tailored to broaden my knowledge in different areas of chemistry. Being one of the scholars was highly motivating to maintain my academic results at an excellent level, and I am very happy that I was able to complete my studies with the Willi Studer Prize

Additionally, it was important for me to combine theoretical knowledge with hands-on experimental research. I carried out three research projects to gain expertise in different fields, two of which resulted in recent publications. The scholarship meetings with industrial partners also sparked my interest in applying for an internship at Roche, where I learned more about process chemistry.

I believe that the Alfred Werner Scholarship is an ideal platform for the personal, scientific and professional growth. It allowed me to gain further experience and facilitate my development from a student into a scientist. I am truly honoured I was given this opportunity.

**Awards:** Willi Studer Prize for the best Master's degree in chemistry at ETH Zürich , 2020

#### Career

BSc: University of Chemistry and Technology (UCT), Prague MSc: ETH Zürich,

Advisors: Prof. Antonio Togni, Dr. Dmitry Katayev Internship at the Roche Center for Excellence Catalysis PhD studies: Group of Prof. Helma Wennemers, ETH Zürich



#### Dragan Miladinov

Class of 2017-2019, Native of Serbia

#### Greener Chemistry - Brighter Future

As part of my research, we were able to show that for the synthesis of vitamins and their precursors, a scheme based on green resources such as air and visible light may replace the traditional process, which involves large quantities of metaloxides. These findings might lead to a drastic reduction of toxic industrial waste. I am very grateful to have been part of this "brighter chemistry for a greener future" venture.

Next to the exciting scientific collaborations with industry and the Alfred Werner Fund Meet&Greet events, another activity that broadened my interests, network, and career perspectives was my involvement with the youngSCS. As a youngSCS Senate member, I participated in organizing different events such as the Saas Fee Snow Symposium or (virtual) company visits.

I feel the benefit of this fantastic scholarship even now, during my PhD studies. I am looking forward to giving back by further contributing to the advancement of chemistry in Switzerland.

#### Career

BSc: University of Novi Sad MSc: University of Basel Department of Organic Chemistry Advisor: Prof. Christof Sparr University of Basel Delegate in the Senate of the youngSCS Patent applications filed with DSM on the oxygenation of phenols in a continuous-flow photoreactor PhD studies in Sparr research group on an NCCR Molecular Systems Engineering project with IBM Research



#### Heorhii V. Humeniuk

Class of 2016-2018, Native of the Ukraine

#### Exploring the Living Cell Membrane

I had the opportunity to participate in the NCCR Chemical Biology project Imaging mechanical forces in living systems. Its goal is to develop chemical sensors and biophysical tools to address living cells as physical objects. Our focus was on the development of tools for the detection of mechanical forces in cell membranes or even in tissues.

Our research allowed us to introduce a conceptually new class of environment-sensitive molecules we named "Papillon Mechano-phores".

I stayed in the same research group as a PhD student to broaden the scope of these structures and to design new ones. I believe that our work is highly relevant as it can reveal previously unknown information regarding cellular processes like membrane trafficking or cell division.

This scholarship gave me exposure to cutting-edge problems, the chance to acquire the skills to address them, and the opportunity to develop a solid background for my future professional career.

**Awards:** Prix de la meilleure maîtrise universitaire en chimie 2018 de l'Université de Genève

#### Career

BSc: University of Kyiv MSc: University of Geneva, Department of Organic Chemistry Advisor: Prof. Stefan Matile Current position: PhD student in Matile research group



#### Michelle A. Gaspard

Class of 2018-2020, Native of Canada

#### Understanding Vaccine Production

As an Alfred Werner Scholar, I was able to join a research group that aims to develop Surface Plasmon Resonance-based biosensors that can characterize cell cultures faster than current methods The main objective would be to succeed in quantifying vaccines during their production.

While volunteering as an essential worker in Canada during my thesis, I saw how hard it was for a developed country to respond to the vaccine demand without any adequate production facilities. I decided to enter the workforce and join a vaccine producing organization because I want to help improve the lives of others. I believe that it is important to better our response to any possible future epidemic. Eventually, I also want to aid underdeveloped countries that don't have the same resources.

The Scholarship allowed me to learn about (and ultimately research and work in) the biotechnology industry in Switzerland, a biotech hub. I know that the skills acquired during my time there will be invaluable in my career, may it be in the industry or in academia.

#### Career

BEng: Polytechnique Montreal
BCom: McGill University (Desautels Faculty of Management)
MSc: EPFL Lausanne, School of Basic Sciences (Chemical
Engineering and Biotechnology)
Advisor: Prof. Horst Pick
6-month master's internship at Merck Serono in Aubonne
(VD): Quality Control Engineering on Injectables
Current position: Vaccines Future Leaders Program Associate
(Manufacturing Operations and Quality) at GSK



#### Jean Behaghel

Class of 2017-2019, Native of Belgium

#### Exploring New Horizons

Thanks to the Alfred Werner Scholarship, I had the opportunity to continue my studies in Switzerland and to discover a different learning environment. During my Master's degree studies, I was really amazed by the great diversity of profiles offered, with people coming from all around the world with different backgrounds.

Importantly, my Master's studies allowed me to strengthen my theoretical background and to apply my knowledge to concrete problems in industrial or academic research. I had the chance to work in the fragrance and flavour industry thanks to an internship at Firmenich, a company I discovered during an event organized by the Alfred Werner Scholarship Program.

After my Master's project in the field of biomass valorization, I joined an early stage spin off aiming to transfer a technology developed at EPFL into an industrial process. This experience allowed me to develop a strong entrepreneurial vision on chemical technologies.

Awards: BASF Monthey SA Award for the best Master project in Chemical Engineering at EPF Lausanne and Syngenta Monthey Award for the best Master degree in Chemical Engineering at EPF Lausanne

#### Career

BSc: Université Catholique de Louvain (UCL), Louvain la Neuve MSc: EPFL Lausanne, Institute of Chemical Science and Engineering Advisors: Prof. Jeremy Luterbacher, Dr. Wu Lan

Internship at Firmenich SA in process intensification PhD studies: Group of Prof. J. Luterbacher

#### Erik Jung

Class of 2019-2021, Native of Germany

#### Communicating Science

What brought me to Switzerland was a RiCH Internship in the Medicinal Chemistry department of F. Hoffmann-La Roche Ltd. There, I had the privilege to learn about the drug discovery process from incredible mentors.

After my one year stay in Basel, I knew that Switzerland is a perfect place to live and to do research, so I joined the group of Prof. Dr. Karl Gademann through the Specialized M.Sc. in Chemical and Molecular Sciences at the University of Zurich. I am deeply grateful to the Alfred Werner scholarship and the support by F. Hoffmann-La Roche Ltd, which gave me the freedom to focus my research on new antibiotics at the intersection of chemistry, drug discovery, and biology.

The way we present science is very important to me. Through my interest in graphical design, I hope to communicate science in a clear and interesting form to reach both, other scientists and the public.

**Awards:** Betty Sassella-Keller Undergraduate Award for Outstanding Academic Performance (2020) and Member of the University of Zurich iGEM Team Best New Application Project

#### Career

BSc: Albert-Ludwigs-University Freiburg, Germany MSc: University of Zurich, Chemical and Molecular Sciences Advisor: Prof. Dr. Karl Gademann Internship at F. Hoffmann-La Roche Ltd PhD studies: Group of Prof. Dr. Karl Gademann





#### Jane Marsden

Class of 2018-2020, Native of Ireland

#### Quality by Design

I am very grateful to have been given the opportunity to study in Switzerland for my Master's degree. I was able to enhance my analytical skills and develop new wet lab techniques using world-class instrumentation, while learning from experts in the various fields of chemical biology in the classrooms of UNIGe and EPFL.

Since graduating in January 2020, I had the opportunity to work with a start-up at the EPFL on an anti-coagulation peptide molecule. This was a hands-on experience where I was involved in the development, validation, and comercialisation journey of a therapeutic. I've since transitioned into the pharmaceutical industry. I now work as a quality specialist at Vifor Pharma in Fribourg, reviewing processes and identifying areas for improvement.

The Alfred Werner Scholarship helped me to realise my ambition to come to Switzerland and experience first-hand its innovative research culture and progressive life science industry. I am growing both on an intellectual and personal level, making life-long friends along the way. It has set me up with a solid foundation to build a fulfilling and successful career in the life sciences industry.

The Swiss Snow Symposium in Saas-Fee, combining skiing and studies, was a definite highlight for me. Being so close to the mountains meant I finally got to learn to ski!

#### Career

BSc: University of Limerick, Ireland MSc: University of Geneva and EPFL (NCCR Chemical Biology), Institute of Bioengineering @EPFL Advisor: Prof. Bruno Correia (LPDI) Current position: Vifor Pharma SA (Fribourg, Switzerland)



#### Loren Ban

Class of 2015-2017, Native of Croatia

A Journey Across the Scales of Physical Chemistry Chemistry Master's program at ETH has a great structure encouraging student research projects – the only thing one needs is an opportunity.

For me that was the financial support from the Alfred Werner Scholarship, which was crucial for a worriless transition to student life in Switzerland, providing the necessary independence to fully dive into my studies. As a result, I had a chance to participate in cutting-edge molecular spectroscopy research at the Laboratory of Physical Chemistry. The research ranged from the smallest molecule to nanometer-sized clusters and covered timescales down to attoseconds.

In my Master's thesis, these interests settled on understanding how ionizing radiation interacts with clusters of water molecules. We worked on understanding electron scattering processes, which can ultimately lead to DNA damage and ozone depletion.

This journey continued in the Signorell group at ETH where I am currently pursuing my doctoral degree. By studying even larger systems – submicrometer droplets – I investigate how electrons behave in the condensed phase. In the next steps of my journey, I want to explore in which way this fundamental research can contribute to everyday life.

Awards: ETH Medal for Outstanding Master's Thesis

#### Career

BSc: University of Zagreb MSc: ETH Zürich Advisor: Prof. Ruth Signorell Current position: PhD student in Signorell research group



### A Voice from Industry

For us in industry, highly talented university graduates are essential to build a robust pipeline of future scientists. We are a strong supporter of the Alfred Werner Excellence Scholarship Program as it helps to bring highly talented students around the globe to Switzerland for their Master's studies in chemistry, biochemistry and the life sciences.

The Alfred Werner Scholar Network offers the unique opportunity to connect with these talents early on and to provide them internships or trainee positions. After completion of their studies, the scholars are sought-after employees for top leading companies in the pharmaceutical and chemical industry in Switzerland. Not only are they highly trained and well integrated, but, thanks to their cultural background, they also bring new perspectives into an organization. This is a wonderful contribution to a more diverse and creative workforce. We are therefore thankful for the partnership and are happy to support the Alfred Werner Excellence Scholarship program also in the future.

### A Voice from Academia

The Master of Science studies mark the transition from reading science to doing science, and also the moment students wish to explore new opportunities. Swiss university chemistry has a long tradition of attracting outstanding scientists at all levels. At the MSc level, attractive conditions, besides the opportunity of doing great chemistry, also mean added recognition, integration, and financial support.

The Alfred Werner Excellence Scholarship Program has proven to be a response to this challenge. It is open to the best students throughout chemistry, it provides the financial support needed, particularly for students from abroad, and it excels with unique relations to industry. It has been very exciting to see the Scholarship Program grow into an internationally respected brand, bringing outstanding students to Swiss universities. Werner Scholars serve as stimulating role models in our research groups, some stay for a PhD and drive our research forward. Through the Werner network, they also have early contact with the Swiss chemical industry, which they might eventually join as most welcome future leaders after completion of their studies. In any case, wherever they choose to move on to, Werner Alumni continue to promote the reputation of Swiss chemistry in academia and industry among their friends all over the world. The entire community is immensely grateful to the SCS Foundation for this superb initiative.



Dr. Stefan Hildbrand, Head of Process Chemistry & Catalysis and Head of Oligonucleotides Technical Development at F. Hoffmann-La Roche Ltd.



Prof. Stefan Matile, Department of Organic Chemistry, University of Geneva. Founding member of the two National Centers of Competence in Research (NCCR) Chemical Biology and Molecular Systems Engineering.

### Keys to Success: Nomination and Selection Process

The SCS Foundation does not accept applications from individuals. Instead, the scholarships are granted to nominees presented by the academic partner institutions, who admitted the students to their Master of Science Excellence Programs.

The nominations are reviewed by the Alfred Werner Fund Allocation Committee. The sixteen members of the Committee represent the program supporting companies and the academic partner institutions.

The stipends of the scholars selected are transferred to their universities for administration. The Alfred Werner Scholars thus must all go through a two-step selection processes.

Applications to university MSc study excellence programs Nominations for Alfred Werner Scholarships by the universities Receipt and examination of all nominations by the SCS Foundation Review of nominations by the Allocation Committee Notification of universities and transfer of stipends Notice to applicants by the SCS Foundation and the universities.

### Integration of the Scholars in the Community

#### The Meet&Greet Events

Once a year, the Werner Scholars are invited by one of the program-supporting companies to visit their laboratories and to meet researchers, HR representatives, and other company officials. In return, the Werner Scholars will greet their hosts by introducing themselves and the research projects they are involved in. After holding Meet&Greet events at Lonza, Syngenta, Firmenich, and F. Hoffmann-La Roche Ltd, the program will continue with visits at Givaudan and Novartis in 2022.

#### Mentoring Program

The mentoring program established by the Swiss Women in Chemistry network of the SCS is an important resource for the integration of the female Werner scholars. A similar program is being developed in collaboration with partners from industry and academia for all scholars.

#### The Alfred Werner Scholars Network

The scholars, current and past ("alumni"), are connected through a LinkedIn Group. The purpose of this network is to facilitate the exchange of information (studies, everyday life) and to provide a point of contact between scholars and the representatives of the program-supporting companies.



Meet&Greet at Firmenich in Geneva, 2018, with Drs. Christian Chapuis (Host; left; Principal Scientist) and Christoph Täschler (Lonza; right; initiator of the program)



Meet&Greet at F. Hoffmann-La Roche Ltd in Basel, 2019, with Dr. Volker Herdtweck (Host; Talent Acquisition)

### Provision of Platforms to Develop Skills and Visibility

#### Participation in SCS Events

As courtesy members of the SCS, they have free access to the Spring- and Fall Meetings to connect with the community. The Werner Scholars are invited to participate in events such as the Saas Fee Snow Symposium of the youngSCS.

#### Involvement in the youngSCS

The youngSCS, the community of SCS members under age 36, provides opportunities for involvement in extracurricular activities such as event organization, or to become active as a member of the Board of this network. The current president of the youngSCS, Lluc Farrera (University of Geneva), is a former Werner Scholar.

#### Reports on the Scholars' MSc theses in CHIMIA

For every class, summaries of the MSc theses of the Werner Scholars are published in CHIMIA. They are available for download from the journal website (www.chimia.ch):

- Class 2019-2021: CHIMIA 12/2021, 1073
- Class 2018-2020: CHIMIA 1-2/2021, 113
- Class 2017-2019: CHIMIA 10/2019, A844
- Class 2016-2018: CHIMIA 9/2018, A668
- Class 2015-2017: CHIMIA 7-8/2017, A614
- Class 2013-2015: CHIMIA 7-8/2015, A496

### About the SCS Foundation: Mission, Goals and Board

#### **Mission and Goals**

The purpose of the SCS Foundation is to promote and support both research and education in the natural sciences, in particular within the fields of chemistry and biochemistry. The Foundation offers scholarships, award-programs, and provides other measures and activities supporting students on their journey to a professional career. The Foundation is politically and denominationally unaffiliated. It does not seek to make a profit. All activities of the SCS Foundation are funded by donations.

#### The SCS Foundation Board

Dr. Alain De Mesmaeker, President Retired from Syngenta Crop Protection AG Prof. Peter Chen, Vice President, ETH Zurich Dr. Hans Peter Lüthi, Director, SCS Foundation David Spichiger, Treasurer, Swiss Chemical Society Prof. Beat Ernst, University of Basel Prof. em. Titus Jenny, University of Fribourg Dr. Gerardo Ramos Tombo, Syngenta Crop Protection AG Prof. em. Ulrich W. Suter, ETH Zurich and SATW Dr. Reto Naef, Topadur Pharma AG



Snippets of the MSc thesis summaries of four Werner Scholars published in CHIMIA in 2021

# Alfred Werner: Nobel Laureate and Promoter of Excellence

Alfred Werner, born in Mulhouse (Alsace), was a student at ETH Zurich and professor at the University of Zurich. He won the Nobel Prize in Chemistry in 1913 for proposing the octahedral configuration of transition metal complexes. Werner developed the basis for modern coordination chemistry. Among his students, there were future Nobel Laureate Paul Karrer and Chana Weizman, the sister of the future first president of Israel.



Alfred Werner with his students. See: Conrad. H. Eugster, CHIMIA 62 (2008) 75 - 102

### The Alfred Werner Excellence Scholarship Program: How a Foundation Responded to the Changing Needs for the Support of Talented Young Scientists in Switzerland

Today, the aim of the Alfred Werner Excellence Scholarship Program is to bring talented Master students to Switzerland, and to facilitate their next career steps. It is an excellent example for partnership between industry and academia. It also shows how a foundation, created nearly 80 years ago, managed to adjust its mission to respond to the changing needs of the chemistry community.

It began in 1944, when the Schweizerische Gesellschaft für Chemische Industrie realized that almost without exception, the professors at Swiss universities and the ETH came from abroad. To inspire the Swiss students to consider an academic career, rather than to seek employment in a booming industry, the Stiftung für Stipendien auf dem Gebiet der Chemie was established1. Nobel Laureate Paul Karrer, former student of Alfred Werner's at the University of Zürich, was its first president.

A number of distinguished Swiss chemists emerged from this stipend program, which supported post-graduate research appointments at Swiss or foreign universities.

In 1990, the foundation board, led by Ernst Schumacher, adapted the scope of the program to the changing needs. The newly established Alfred Werner Stipends supported young chemists to start an academic career as assistant professors at Swiss universities. Again, this stipend was a steppingstone for many careers. Among the Alfred Werner Fellows, you find a number of Swiss university professors[1].

Around 2010, the foundation board, based on an evaluation of the program, decided on taking the following measures:

- Broaden the scope of disciplines covered for stronger support of the Life Sciences
- Increase the number of stipends and partner universities as hosts of the supported talents
- Stronger focus on gender balance
- Accessing the global talent pool to invite young scientists to perform their Master's studies in Switzerland, and to become part of the next generation of Swiss chemists
- Joining forces with the SCS Foundation

This transformation was implemented end of 2013, with the creation of the Alfred Werner Excellence Scholarship Program as we know it today.

Looking back, the partnership between academia and industry was exemplary, and the programs developed were a success. They became role models for funding agencies, including the Swiss National Science Foundation (SNF). For a limited timeperiod, the SNF supported the Alfred Werner Stipends. Given the success of the Alfred Werner Excellence Scholarship Program, I am convinced that the financial contributions of our private and industrial partners are a great and timely investment in support of our next generation scientists in Switzerland.

It is my honour to serve for such an excellent foundation, and I like to thank all people and organisations contributing to these programs.

[1] Paul Müller, Stiftung für Stipendien auf dem Gebiete der Chemie, CHIMIA 51 (1997) 233-234



Dr. Reto Naef Former Secretary of the Alfred Werner Foundation and Board Member of the SCS Foundation



SCS Foundation c/o Swiss Chemical Society Haus der Akademien Laupenstrasse 7 3008 Bern Switzerland

info@scg-foundation.ch www.scs-foundation.ch

### **Donations**

**Bank Account** SCS Foundation, 3008 Bern Privatbank Von Graffenried AG Spitalgasse 3, 3011 Bern Clearing: 8564 IBAN: CH60 0856 4002 0669 7010 1

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