



SCS  
Swiss Chemical  
Society

## Community News

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### SWISS CHEMICAL SOCIETY NEWS

#### Kavli Prizes 2020: Call for Nominations



The Kavli Prize is awarded by The Norwegian Academy of Science and Letters for outstanding scientific achievements in Astrophysics, Nanoscience and Neuroscience by an individual. The Kavli Prize for each of the three fields consists of USD 1,000,000, a scroll and a gold medal.

Call for nominations:

The closing date for nominating candidates is December 1, 2019. The winners will be announced May 27, 2020 and the award ceremony will take place in Oslo, Norway on September 8, 2020. Nominations for the Kavli Prizes should be submitted to The Norwegian Academy of Science and Letters by way of the online nomination form obtained at [www.kavliprize.org](http://www.kavliprize.org).

[www.kavliprize.org](http://www.kavliprize.org)

#### FUTURE LABS LIVE, Basel, June 29–30, 2020



Congress Centre Basel, Switzerland  
June 29–30, 2020

##### What is FUTURE LABS LIVE?

The vision of FUTURE LABS LIVE is to create the world's most interesting, diverse, stimulating, rewarding and exciting event for the future of all labs. Start-ups and disruptors will meet lab heads

and lab techs together with the tech innovators and practice innovators of the future. The event aim to break down silos within and between organisations to bring people together to come up with the ideas, the tech and the processes that'll transform the lab of tomorrow.

##### Why do we need FUTURE LABS?

Those who don't adapt, change and get ahead of the enormous technologies changing the way labs function will be left behind. Organisations and business models are being transformed.

- New jobs are being created and old ones are being eviscerated.
- Many of our existing processes and business models are just not up to the challenges of the future
- Lab leaders of tomorrow will need different skills to be able to survive and thrive.
- We desperately need to break out of our silos and meet, talk and debate across function, industry and geography.

##### Your contribution

Save the date and contact Charlie Abrines if you like to contribute to FUTURE LABS LIVE as:

- Speaker of a keynote presentation
- Chair of a session
- Host of a roundtable
- Exhibitor
- Sponsor

##### Contact

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#### A Warm Welcome to Our New Members!



Period: 16.08.–17.09.2019

Paula Abdala, Zurich - Ricardo Alvarez, Zurich - Giuseppe Antoniazzi, Zurich - Alain Baiyoumy, Basel - Raphael Bissig, Zurich - Jacob Terence Blaskovits, Lausanne - Alexandre Bory, Zurich - Jonas Bösken, Zurich - Carolina Caso, Zurich - Zixuan Chen, Zurich - Manuel Cordova, Lausanne - Subal Dey, Zurich - Gabriel Di Lullo, Orpund - Melissa El Bitar

Nehme, Zurich - Diana Evstafeva, Zurich - Viktoria Gerken, Zurich - Anna Gulkowska, Bern - Daniel Harki, Minneapolis (US) - Sabine Horn, Zurich - Erik Jung, Basel - Pascal Knörr, Bern - Maciej Korzynski, Zurich - Maximilian Krödel, Zurich - Alexey Kurlov, Zurich - Annelies Landuyt, Zurich - Reichert Linus, Baden - Asma Mansouri, Paris (FR) - Artsiusheuski Mikalai, Zurich - Marthe Millen, Zurich - Ross Milton, Geneva - Maya Mischler, St. Imier - Advaita Panchagnula, Zurich - Sarbani Patra, Basel - Alexandre Perera, Zurich - Mohammad Peydayesh, Zurich - Mohammad Peydayesh, Zurich - Valentin Picard, St. Imier - Elias Polak, Geneva - Salome Püntener, Lausanne - Mikus Purins, Lausanne - Ella Rajaonson, St. Sulpice - Karoline Rehm, Schwerzenbach - Olga Sambalova, Dübendorf - Luca Sauser, Zurich - Luca Schraner, Laupen - Erfan Shirzadi, Sion - Bruno Simoes de Almeida, Lausanne - Bhattacharjee Sinjini, Lausanne - Cécilia Siri, Lausanne - Saiyyna Stepanova, Zurich - Kyle Stephens, Zurich - Yannick Stöferle, Zurich - Jan Thiede, Bern - Rubén Omar Torres Ochoa, Lausanne - Gisèle Truong, Zurich - Lijie Wang, Lausanne - Kongchang Wei, St. Gallen - Catherine Witteveen, Zurich - Yi-Hsuan Wu, Zurich - Yuan-Zi Xu, Zurich - Yongqing Xu, Zurich - Luisa Zartner, Basel - Nora Zimmerli, Zurich.

## HONORS, AWARDS, APPOINTMENTS

### SCS Award Ceremonies 2019 during the SCS Fall Meeting Dinner in Zürich

On the occasion of the SCS Fall Meeting 2019 dinner, Alain De Mesmaker, President of the Swiss Chemical Society awarded three individuals and one group for their outstanding scientific research activities. The ceremonies took place in the Zunfthaus zur Waag in Zürich on September 5 and the award lectures were held as plenary lectures at the SCS Fall Meeting 2019 at Irchel Campus of the University of Zürich.

The SCS Board and the Award Committee like to congratulate the winners again for their fantastic contributions.



**Dr. Fabrice Gallou**, Novartis Pharmaceuticals AG, Basel, received the **SCS Senior Industrial Science Award 2019** in recognition of his outstanding track record of innovation and creativity in the field of organic synthesis and for his leadership in coaching and mentoring of young scientists at Novartis. The prize is endowed with CHF 10,000.



**Dr. Christoph Boss**, Idorsia Pharmaceuticals Ltd., Allschwil, was awarded the **SCS Industrial Science Award 2019** to honor his outstanding contributions as medicinal chemists with remarkable analytical skills and an excellent flair for multidimensional lead optimization taking into consideration all aspects of modern medicinal chemistry. The prize is endowed with CHF 7,000.



**Prof. David Sarlah**, University of Illinois, Urbana (USA), was invited to Switzerland to receive the **Grammaticakis-Neumann Award 2019** for his great achievements in the development of photochemical dearomatization of nonactivated arenes that allows for a rapid incorporation of oxygen, nitrogen and carbon functionality with exquisite stereocontrol. The prize is endowed with CHF 5,000.



**Dr. Michael Berg**, **Dr. Stephan Hug**, **Dr. Annette Johnson** (in memoriam), **Dr. Andreas Voegelin** and **Prof. Lenny Winkel**, from the Eawag, Dübendorf, won the **2019 Sandmeyer Award** for their experimental and modelling studies on drinking water contamination by arsenic and other geogenic elements with an enormous impact not only in

Switzerland but around the globe.

The prize is endowed with CHF 20,000.

### Prof. Yimon Aye, EPFL Lausanne, wins 2020 Eli Lilly Award



The 2020 Award has been given to **Prof. Yimon Aye**, who directs EPFL's Laboratory of electrophiles and genome operation, and is a member of the Swiss National Science Foundation's NCCR Steering Committee.

Established in 1934, the Eli Lilly Award in Biological Chemistry is given annually by the American Chemical Society's

Division of Biological Chemistry to "stimulate fundamental research in biological chemistry by scientists not over thirty-eight years of age". The Award itself consists of a bronze medal and an honorarium.

In an announcement, NCCR Chemical Biology referred to the ACS award letter which stated that Aye's "selection by a committee of peers speaks highly of her tremendous accomplishments as a scientist as well as her independence of thought and originality." The Award will be presented to Aye in the 2020 Eli Lilly Award Symposium, during the ACS 2020 Fall meeting in San Francisco.

Source: [actu.epfl.ch/news](http://actu.epfl.ch/news)

### EuChemS Lecture Award to be awarded to Prof. Raffaella Buonsanti, EPFL Lausanne



The Lecture Award aims to celebrate and recognise the major achievements of one junior scientist working in chemistry in a country with a EuChemS Member Organisation. The winner will receive a statuette and the opportunity to give a lecture at the next European Chemistry Congress (ECC).

The 2019 award goes to a **Prof. Raffaella Buonsanti**, a tenure-track Assistant Professor at EPFL Lausanne.

In her EuChemS Lecture, Raffaella will present recent efforts in her group towards the synthesis of Cu-based nanocrystals with different sizes, shapes and interfaces and their use as CO<sub>2</sub> reduction electro-catalysts. She will discuss their studies spanning from understanding the NC formation and their evolution during catalysis up to the implementation in devices which operate under commercially relevant conditions.

Source: [www.euchems.eu](http://www.euchems.eu)

### Prof. Donald Hilvert, ETHZ, receives the Ronald Breslow Award 2020



**Prof. Donald Hilvert** from the ETH Zurich receives the Ronald Breslow Award 2020 by the American Chemical Society. The award recognizes outstanding contributions to the field of biomimetic chemistry. The award ceremony will take place on Tuesday, March 24, 2020, in conjunction with the ACS Spring National Meeting in Philadelphia.

Source: [chab.ethz.ch](http://chab.ethz.ch)

## Winners of the Best Oral Presentation Awards at the SCS Fall Meeting 2019



In collaboration with Metrohm, SCS offered again the very attractive and prestigious Fall Meeting Best Oral Presentation Award program. We wish to express our sincere gratitude to Metrohm for their generous support and congratulate all winners for their fantastic contributions.

Markus Steinke, representative of Metrohm, awarded a total of 15 winners at the end of the SCS Fall Meeting at University of Zurich on September 6, 2019.

### Winners of the Best Oral Presentation Awards 2019

#### Analytical Sciences

Winner: Jerome Kaeslin, ETH Zurich

Runner-up: Irina Diukova, EPFL Lausanne

#### Catalysis Sciences & Engineering

Winner: Christopher Gordon, ETH Zurich

Runner-up: Rene Wick-Joliat, University of Zurich

#### Computational Chemistry

Winner: Alberto Fabrizio, EPFL Lausanne

Runner-up: Johan Runeson, ETH Zurich

#### Inorganic Chemistry

Winner: Jordan Meyet, ETH Zurich

Runner-up: Deepu Babu, EPFL Lausanne

#### Medicinal Chemistry

Winner: Kris Meier, University of Bern

#### Organic Chemistry

Winner: Nicole Hauser, ETH Zurich

Runner-up: Ronan Rocaboy, University of Basel

#### Physical Chemistry

Winner: Oliviero Cannelli, EPFL Lausanne

Runner-up: Evelyne Parmentier, ETH Zurich

#### Polymers, Colloids & Interfaces

Winner: Enzo Bomal, EPFL Lausanne

Runner-up: Fabienne Schwab, University of Fribourg

#### Prizes for Winners

- certificate and cash contribution of CHF 500.00
- travel voucher of CHF 1,000.00 to attend an international conference.
- invitation to present the research in the laureates issue of CHIMIA. Value CHF 650.00

#### Prizes for Runners' up

- certificate and cash contribution of CHF 400.00

## Winners of the Best Poster Presentation Awards at the SCS Fall Meeting 2019



The Best Poster Presentation Award Program of the SCS Fall Meeting 2019 was again supported by DSM Nutritional Products Ltd. Dr. Thomas Netscher, Principal Scientist at DSM and SCS Senior Industrial Science Award Winner, awarded a total of 23 winners at the end of the SCS Fall Meeting at University of Zurich on September 6, 2019.

## Winners of the Best Poster Presentation Awards 2019

#### Analytical Sciences

Winner: Prerna Yadav, University of Zurich

Runner-up: Jacinta Xto, Paul Scherrer Institute, Villigen

#### Catalysis Sciences & Engineering

Winner: Matthias Frei, ETH Zurich

Runner-up: Evgeniya Vorobyeva, ETH Zurich

Scott Docherty, ETH Zurich

#### Computational Chemistry

Winner: Veronika Jurásková, EPFL Lausanne

Runner-up: Francesco Bosia, ETH Zurich

Charleen Don, University of Basel

#### Inorganic Chemistry

Winner: Mostapha Dakhchoune, EPFL Lausanne

Runner-up: Radmila Faizova, EPFL Lausanne

Jasper Clarysse, ETH Zurich

#### Medicinal Chemistry

Winner: Andrea Meier, University of Zurich

Runner-up: Chiara Borsari, University of Basel

#### Chemical Biology

Winner: Carlotta Cecchini, University of Geneva

Runner-up: Raphaël Simonet-Davin, EPFL Lausanne

#### Organic Chemistry

Winner: Johannes Diesel, EPFL Lausanne

Runner-up: Tatyana Grayfer, ETH Zurich

Yangbin Liu, University of Geneva

#### Physical Chemistry

Winner: Simon Scheidegger, ETH Zurich

Runner-up: Fabio Steffen, University of Zurich

Marie Bischoff, EPFL Lausanne

#### Polymers, Colloids & Interfaces

Winner: Agata Krywko-Cendrowska, CNRS

Runner-up: Michael Giffin, EPFL Lausanne

#### Prizes for Winners

- certificate and cash contribution of CHF 250.00
- travel voucher of CHF 750.00 to attend an international conference.
- invitation to present the research in the laureates issue of CHIMIA. Value CHF 650.00

#### Prizes for Runners' up

- certificate and cash contribution of CHF 200.00

## Helvetica Prize of the SCS 2019 awarded to Jovana Milic and Kevin Weiland



On the occasion of the SCS Fall Meeting 2019 Helvetica, represented by its editors in chief, Prof. Christophe Copéret and Prof. Jeff Bode, as well as Helvetica managing editor Dr. Richard Smith, awarded the Helvetica Prize of the Swiss Chemical Society for the best published papers of PhD/Postdocs 2018/19 in Helvetica Chimica Acta to **Jovana Milic** and **Kevin Weiland**. The prize is endowed with CHF 1,000 for the winner and CHF 500 for the runner up.

1<sup>st</sup> Prize: **Jovana V. Milic** (ETH Zurich, Group of Prof. François Diederich)

Title of the publication: «Thioether-Functionalized Quinone-Based Resorcin[4]arene Cavitands: Electroswitchable Molecular Actuators»

DOI: <https://doi.org/10.1002/hlca.201800225>

2<sup>nd</sup> Prize: **Kevin J. Weiland** (University of Basel, Group of Prof. Marcel Mayor)

Title of the publication: «A Chiral Macrocyclic Oligothiophene with Broken Conjugation – Rapid Racemization through Internal Rotation»

DOI: <https://doi.org/10.1002/hlca.201800205>

It's the first time that the journal in collaboration with the SCS awards this distinction. It highlights scientific excellence of two young researchers and both of them gave a 3 minutes short communication at the SCS Fall Meeting 2019 at University of Zurich on September 6, 2019

## JOURNAL NEWS

### CHIMIA will become a Platinum Open Access journal from January 2020



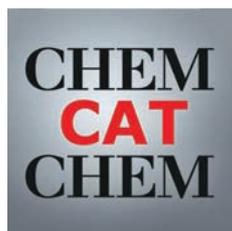
The Swiss Chemical Society as the publisher of CHIMIA, and the CHIMIA Editorial Board are very pleased to inform you that CHIMIA will become a Platinum Open Access journal from the beginning of 2020.

Platinum Open Access means permanent and free access to published scientific works for readers and no publica-

tion fees (i.e. no article publishing charges (APCs)) for authors. This change will apply to the scientific, peer-reviewed, special topic articles. All articles will be published under the CC\_BY license. Authors retain copyright of their work and allow it to be shared and reused provided that it is correctly cited. Readers may download, share or reuse the work, free of charge.

<https://chimia.ch>

### ChemCatChem: Special Issue on Women of Catalysis



ChemCatChem's Special Issue Women of Catalysis is a venue to celebrate the achievements of female-led research groups in the field and highlight some of the best research developed by women. Guest edited by Deryn E. Fogg, Petra E. de Jongh, and Li-Zhu Wu, this Special Issue seeks to promote a more balanced female representation in invited speaker

lists, conference and editorial boards, and as leaders in research consortia. Read the Editorial and meet the Women of Catalysis! Enjoy free access until the end of October 2019.

<https://onlinelibrary.wiley.com/toc/18673899/2019/11/16>

### ChemPlusChem: Special Issue on $\pi$ -Conjugated (Macro)molecules and their Applications

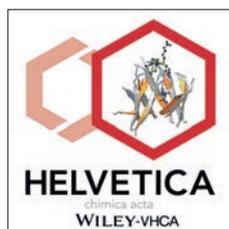


ChemPlusChem has just published its latest Special Issue on  $\pi$ -Conjugated (Macro)molecules and their Applications in collaboration with Guest Editors Paolo Samorì (Université de Strasbourg), Xinliang Feng (Technische Universität Dresden), and Davide Bonifazi (Cardiff University). It highlights some of the many approaches toward the syn-

thesis of novel conjugated (macro)molecules. A particular focus of the issue is the special properties that arise from the  $\pi$ -conjugation, including self-assembly at surfaces and integration into optoelectronic, photovoltaic, and other devices. Enjoy free access until the end of October 2019.

<https://onlinelibrary.wiley.com/toc/21926506/2019/84/9>

### Helvetica, Volume 102, Issue 9, September 2019



#### Full Papers

A Short Sequence for the Iterative Synthesis of Fused Polyethers

*Frédéric Elustondo, Venkaiah Chintalapudi, J. Stephen Clark*

Metal Olefin Complexes: Revisiting the Dewar–Chatt–Duncanson Model and Deriving Reactivity Patterns from Carbon-13 NMR Chemical Shift

*Christopher P. Gordon, Richard A. Andersen, Christophe Copéret*

Retro-Corey–Chaykovsky Epoxidation: Converting Geminal Disubstituted Epoxides to Ketones

*Siqi Li, Pingfan Li, Jiayi Xu*

Mechanistic Insights on Reduction of Carboxamides by Diisobutylaluminum Hydride and Sodium Hydride–Iodide Composite

*Derek Yiren Ong, Kohei Watanabe, Ryo Takita, Shunsuke Chiba*

Synthesis of Benzazepinones via Intramolecular Cyclization Involving Ketene Iminium Intermediates

*Amandine Kolleth, Dylan Dagonneau, Pierre Quinodoz, Alexandre Lumbroso, Mickael Avanthay, Saron Catak, Sarah Sulzer-Mossé, Alain De Mesmaeker*

X-Ray Crystal Structure of a Second-Generation Peptide Dendrimer in Complex with *Pseudomonas aeruginosa* Lectin LecB

*Stéphane Baeriswyl, Sacha Javor, Achim Stocker, Tamis Darbre, Jean-Louis Reymond*

<https://onlinelibrary.wiley.com/journal/15222675/>

## INDUSTRIAL NEWS

Source: [www.chemanager-online.com](http://www.chemanager-online.com)

### Clariant Expands Catalyst Output in China

August 29, 2019: Clariant is planning a “significant” expansion of its catalyst production in Panjin, Liaoning province, northeast China. The Swiss specialty chemicals producer said the double-digit million Swiss franc investment sum will cover further optimization of an existing facility and enable the creation of a new state-of-the-art production line for its SynDane maleic anhydride (MA) catalyst. Chief operating officer Hans Bohnen said the project supports Clariant's strategy of focusing on its core high-value specialty businesses to intensify growth, especially in major growth markets such as Asia-Pacific, in particular China. The Swiss group added that the upgrade will help its customers meet the “dynamically growing” global demand for MA, for which production is expected to jump from 1.75 million t/y in 2018 to 2.07 million t/y in 2022. The SynDane catalysts are said to be optimized for cost-efficient MA production via selective oxidation of n-butane in fixed-bed tubular reactors. Clariant

said the catalysts' superior yield, selectivity and operating stability greatly reduce the formation of byproducts such as acrylic acid and acetic acid as well as their downstream polymerization, thus minimizing downtime for equipment. Since 2007, Clariant has produced the MA catalysts at Panjin in a joint venture with leading Chinese petrochemical producer North Huajin Chemical Industries. The Panjin site employs more than 140 people producing catalysts and adsorbents for production of butane-based maleic anhydride, ammonia, hydrogen, and methanol, as well as for other applications.

### Innovation in Pharma Manufacturing

September 3, 2019: Established in 2004 by the International Society for Pharmaceutical Engineering (ISPE), the Facility of the Year Awards (FOYA) recognize innovation and creativity in manufacturing facilities serving the regulated healthcare industry. The award-winning projects selected by the FOYA program set the standard for pharmaceutical facilities of the future by demonstrating excellence in facility design, construction, and operations. The FOYA program each year recognizes state-of-the-art projects utilizing new, innovative technologies to improve the quality of products, reduce the cost of producing high-quality medicines, and demonstrate advances in project delivery. This year, the category winners were announced at the ISPE Europe Annual Conference in Dublin, Ireland, in April. The overall winner will be revealed at the ISPE Annual Meeting to be held in Las Vegas in October "The 2019 Facility of the Year Awards category winners are at the forefront of not only setting the standard for pharmaceutical facilities of the future, but also creating new opportunities to enhance patient health and safety worldwide." said John Bournas, ISPE CEO and president. "We are pleased to spotlight the dedication of these companies who epitomize the future of global innovation and facility design." Antonio "Tony" Crincoli, chair of the FOYA judging committee and senior director, Upjohn Global Engineering, Pfizer, adds: The FOYA program represents the best of the best – what we call benchmarking. All companies want to know what is happening on the forefront of technology, innovation, and equipment. ISPE's FOYA program lets the industry know what is happening all in one place, what is truly exceptional. According to Crincoli, who feels privileged to work in an industry that improves the lives of patients, it is a myth to dispel, that only large complex projects win these awards. Most are actually smaller projects that improve quality and efficiency, reduce cost, improve transfer of new products, or implement new information technology solutions.

#### 2019 FOYA Category Award Winners

*Celgene* is the winner of the Sustainability Category Award for its Green Fairy project (La Fée Verte) for their manufacturing facility in Couvet, Switzerland. One of the main objectives for the new facility was to implement an environmentally responsible and sustainable site in-line with their corporate principles.

*Eli Lilly* won the Process Innovation Category Award for its IE2 small volume continuous facility in Kinsale, County Cork, Ireland. This innovative facility and the process design concepts incorporated advance the industry in three specific areas; process analytical technologies and advanced automation, development of new continuous technologies, and significant improvement in process safety and environmental impacts.

The Equipment Innovation Category was awarded to *Janssen Cilag* for their project Dosepak Equipment which entailed the design, installation, and qualification of state-of-art equipment at their manufacturing facility in Latina, Italy. The facility integrated advanced robotics and automation into a standard pack-

aging process steps and enabled lean, flexible, and sustainable manufacturing.

*Moderna* is the winner of the Facility of the Future Category Award for its New cGMP clinical manufacturing facility in Norwood, Massachusetts USA which was designed to be highly-flexible, adaptable and capable of manufacturing both for clinic and research. The digital production environment was designed to enable high throughput with a robust and diverse set of products.

*Kantonsapotheke Zürich* won the Operational Excellence Award Category for its new compounding pharmacy for Canton Zürich Hospitals – a leap forward for hospital pharmacy compounding operations. The project (photo) realized jointly with design-build partner Exyte, Stuttgart, Germany, demonstrates a transformational step in hospital compounding operations and establishes a new norm for future facilities in this important step of patient therapy.

The Facility Integration Category was awarded to *Pfizer* for the biotechnology center built in the Hangzhou Economic Development Area (HEDA) in Hangzhou, China. The HEDA site was transformed from a strawberry field in March 2016, to producing mAbs development batches twenty-five months later. Pfizer was also awarded the Project Execution Category Award for the construction of the Pfizer Biotechnology Center. The \$195 million project was the culmination of an unprecedented construction schedule, efficient cost control measures, and an unmatched safety record in China.

*Avexis* received an Honorable Mention for its manufacturing facility for its next-generation medicine. To manufacture its proprietary investigational gene replacement therapy, Avexis built a 49,000-square-foot state-of-the-art manufacturing facility in suburban Chicago, Illinois.

An Honorable Mention was also given to *Takeda* (formerly Shire) for its new 1.1 million-square-foot Georgia manufacturing facility near Covington, Georgia. Planned within a 160-acre site, this state-of-the-art facility integrates the technical requirements of both upstream and downstream manufacturing, while achieving optimal adjacencies between process areas and creating an environment that positively impacts the wellness of employees.

The 2019 Facility of the Year Awards Category Winners will be formally recognized at the ISPE Facility of the Year Awards Banquet and Dinner on October 26 in Las Vegas, Nevada USA. Held in conjunction with the 2019 ISPE Annual Meeting & Expo, the banquet will feature acceptance speeches from the FOYA recipients and presentations from noted industry leaders. The 2019 Facility of the Year Awards overall winner will be announced at the conference during the Membership and Awards Breakfast.

### Syngenta Closes Cropio Buy

September 4, 2019: Syngenta has completed its acquisition of the Cropio Group, gaining access to a technology platform that allows farmers to monitor their crops and field operations. The Swiss agrochemicals giant said approximately 10 million hectares of crops are currently managed using Cropio software. "This acquisition marks a turning point in Syngenta's digital strategy for agriculture. Cropio is a leading player in the Eastern European digital agriculture market, and Syngenta is gaining a hub for Ag Tech innovation in Europe that will help increase farmer sustainability, productivity, efficiency and profitability," said Syngenta's chief information and digital officer Greg Meyers. "We anticipate significant opportunities for collaboration across the other Syngenta digital assets." Syngenta said it is now the only agricultural company to have access to leading management platforms in the top four agriculture markets: USA with

Land.db, Brazil with Strider, China with the Modern Agricultural Platform and now eastern Europe with Cropio. The Swiss group added that, combined, more than 40 million hectares globally will now be managed using a Syngenta digital tool, with plans to double that by the end of 2020. Financial terms of the transaction were not disclosed.

### Lonza to Produce Biosimilar for Celltrion

September 5, 2019: Swiss fine chemicals producer Lonza has signed a contract manufacturing agreement with Korea-based biosimilars producer Celltrion to supply a drug substance for Remsima, a biosimilar that is approved by the European Medicines Agency (EMA) and the US Food and Drug Administration (FDA) for a number of autoimmune diseases including Crohn's disease and rheumatoid arthritis. Basis of the agreement, Lonza said, is to allow Celltrion to complement its existing capacity of 190,000 l of drug substance per year from two plants in Korea and to diversify its supply base. By tapping the resources of the Basel-based contract drug manufacturer, the Korean firm will be better able to meet the increasing demands of the biosimilar market. Lonza said the partnership will provide cost-effective biologics for the greater benefit of patients worldwide. Output of the Remsima drug substance, which will be produced at Lonza's commercial facility in Singapore, will cover market needs for the biosimilar in Europe and North America. During this year's first quarter, the two companies worked together on the validation process at the Singapore plant and have already applied to the EMA for approval of the products. Subsequently, the two companies will also seek approval from the FDA.

### Incitec Pivot Reviews Asian Fertilizers Arm

September 9, 2019: Top Australian fertilizer producer Incitec Pivot is undertaking a strategic review of its Fertilizers Asia Pacific business. The company will assess various options, including a potential sale, a demerger or retaining the business and continuing to invest for growth. Incitec has appointed Swiss investment bank and financial services group UBS as its advisor for the review, which is expected to continue during 2020 and will be driven by optimal capital allocation and maximizing shareholder value, Incitec said. The company added that there are attractive growth opportunities available and it is a logical time to assess the future of the business and the optimal path to realize its potential. Commenting on the move, Incitec Pivot's managing director and CEO Jeanne Johns said: "Under the new leadership of Stephan Titze, the fertilizer business has made good progress in advancing a number of important strategic priorities and growth opportunities. Now is a logical time to initiate a strategic review, with the business well positioned to benefit from the emergence of ag tech and to leverage its strong platform in the Australian market." Titze was appointed as president of Incitec Pivot Fertilisers on Jan. 16, 2019. Incitec said its fertilizer business has made good progress on a number of strategic milestones and

operational issues during 2019. These include negotiating various gas supply and other arrangements to allow manufacturing operations to continue at Gibson Island; rationalizing its single super phosphates production at Geelong; and returning to reliable production at Phosphate Hill in Queensland.

### Biomade Peptides

September 9, 2019: Peptides make up around 8% of all active pharmaceutical ingredients (APIs). Those molecules are short polymers formed from the linking of  $\leq 100$  amino acids. They comprise some of the most basic, yet key components of biological processes. Several peptides are significant commercial or pharmaceutical products, ranging from the sugar substitute aspartame to clinically relevant hormones, such as oxytocin and insulin. Today, the peptide market is valued at around \$20 billion annually with a compound annual growth rate (CAGR) of 9.4%. However, the peptide manufacturing industry is in a state of change. In recent years peptides – as new chemical entities (NCEs) – have raised the interest of the pharma industry due to their unique therapeutic properties: high target affinity, specificity and potency, low toxicity and reduced antigenicity. Thus, the number of peptide-based drugs entering clinical trials is rising each year, leading to an increasing demand of peptides as APIs. However, this growth is hampered by challenges in the available peptide manufacturing processes such as production costs (e.g. inefficient processes and high need for expensive raw materials), scalability issues and sustainability. As a result, there is an unmet need for cost-efficient scalable technologies specifically designed for peptide production.

### Current State of Peptide Manufacturing

With a growing demand, the production of peptides at commercial scale has become a barrier to the industry because limited production capacity exists. Thus, there is a shortage of peptides in the market (as stated by the 2019 Peptide Therapeutics Opportunity Assessment) as a result of the limitations imposed by current peptide production processes, which fall into two types. One is chemical synthesis, which is responsible for 85% of peptide production. It requires high amounts of expensive and partly toxic raw materials and is rather unaffordable for the production of peptides at large scale, especially for peptides over 30 amino acids in size. The other are bioprocesses (recombinant production) as alternative methods for peptide production that use genetically modified microorganisms. However, they entail three major technological hurdles: peptide degradation by proteases; peptide aggregation; and toxic effects of the peptides on the production host. These factors can result in low production titers as well as lengthy and risky development, making this approach often inefficient and less popular than chemical synthesis. Bioprocesses are, however, very successfully applied for the production of larger molecules such as proteins. As proteins have a very complex folding pattern, their structure protects them

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against fast proteolytic degradation. The major players in the contract manufacturing business of peptides, such as the Sweden-based PolyPeptide group or Bachem from Switzerland, have set their focus on chemical synthesis. The reason for that could be as simple as that truly overcoming named hurdles in recombinant production of peptides remains unsolved. Yet, according to a recent annual report of Bachem, recombinant production is a topic that the company keeps an eye on. For good reason: the industry is certainly facing some changes.

#### *Bioproduction Breakthrough*

In 2015, the German Ministry of Economic Affairs and Energy approved a grant called “EXIST Forschungstransfer” to a group of young scientists around Christian Schwarz of the Heinrich-Heine-University in Düsseldorf. The target of the funded project was to further develop a technology that can be regarded as a breakthrough for the bioproduction of peptides. Schwarz could convince the jury, that the peptide-related technical challenges in production could potentially be solved based on discoveries he made during his doctoral thesis at the Institute of Biochemistry. He found a way to secrete specific molecules efficiently using gram-negative *Escherichia coli* bacteria. Secretion describes the transport of a molecule from the interior of a cell to its external environment. From there it can be harvested. While this process is rather easy to achieve with gram-positive bacteria, it is challenging for gram-negative strains due to their complex cell membrane. As this transport is difficult for any molecule, meaning also unwanted impurities or proteases, the surrounding of *E. coli* is very pure, free of proteases and therefore a “safe harbor” for peptides. What Schwarz did precisely is that he modified a type-1 secretion system of *E. coli* and added a tag to the peptide, which contains a transport signal. As a result, the tag including the peptide as a cargo is efficiently secreted. The fusion construct is subsequently cleaved, leaving the pure peptide ready for the downstream processing. Apart from efficiency in regard to production titers, another crucial aspect is reliability of the system, especially when it comes to NCEs. Drug development projects face a tight schedule, moving from the discovery to pre-clinical and then to clinical phases. Even though a bioproduction of the API can have a major positive impact on the commercial stage business case, lengthy development times for setting up the manufacturing have to be avoided by all means. The technology now available has success rates that are comparable or even superior to those of chemical synthesis and development times are reduced from months or even years to weeks. The university project has been a success and the technology could be scaled up and diversified delivering promising results in regard to a commercial use for peptide production. In 2017, the project spun out of the university, attracted prominent investors such as Evonik Venture Capital and is since then growing its peptide manufacturing business under the firm Numaferm.

#### *Outlook*

Apart from the manufacturing of generics or NCEs, there are other hot topics in pharma that further drive the demand for efficient, quick and reliable peptide production. One example are antimicrobial peptides, which play an important role in the development of new antibiotics. Another example can be found in the field of immuno-oncology, where personalized peptide vaccines (PPV) are one major strategy. PPVs are cocktails of peptides that help stimulate the body’s immune system to attack tumor cells.

With growing demands and additional technologies emerging – like the recombinant approach of Numaferm, enzymatic ligation of shorter peptide fragments or synthetic biology – the peptide production industry is undergoing a major change. A complete substitution of one technology with the other may not be the case. The real opportunity lies in their combination.

#### **Clariant Opens HTE Lab in Houston**

September 11, 2019: Clariant has opened a new High Throughput Experimentation (HTE) laboratory in Houston, Texas, USA. The Swiss specialty chemicals producer said the location in the heart of the US energy and petrochemicals belt is key as the new facility will be the first of its kind supporting the oil & gas industry. The setup in Texas, which comes shortly after the group’s recent investment in its Midland, Texas, and Clinton, Oklahoma facilities, is part of its global initiative to expand HTE capabilities to all of its business worldwide. While the innovative HTE approach and methodology, in which automated instrumentation, specialized software tools and alternative techniques provide optimized formulations in a rapid timeframe, has been widely used in other industries for many years, Clariant said it is the first company to adopt this technology for the oil & gas industry as a standard tool. As a new addition to the existing lab located at Clariant Oil Services headquarters, the new Houston facility will help to meet current and outstanding needs in the oil & gas industry, with special emphasis on pour point depressants, hydrate inhibitors, asphaltene inhibitors, corrosion inhibitors and scale inhibitors, the Swiss group said. Jonathan Wylde, head of innovation and application development at Clariant Oil and Mining Services, said that with the new state-of-the-art equipment in the lab, along with advanced research concepts and potential customization for specific projects, the chemical producer’s researchers are now able to identify new formulations and synergistic blends for specific customer crudes, ultimately reducing the time to market for new products.

#### **Injecting Growth and Innovation**

September 13, 2019: Abbvie takes over Allergan, Pfizer merges its generics business with Mylan, Takeda integrates Shire – the pharmaceutical industry is making a name for itself in 2019 with several billion-dollar acquisitions. This is an attempt to find new active ingredients, but also to develop a remedy against rising costs and increasing price pressure. In the pharmaceutical and biotech industry, takeovers are part of the business model. If a company’s own research and development (R&D) department does not produce enough new promising drugs, it may be possible to succeed with the products of a competitor. Conversations and negotiations about cooperations, mergers, and acquisitions therefore constantly take place everywhere in the pharmaceutical and biotech industries. However, such processes become more pronounced on a regular basis when the need for new input raises. In such times, transactions are driven to record values. And 2019 could be another year like this. In January 2019, industry giant Bristol-Myers Squibb (BMS) announced its intention to acquire the cancer specialist Celgene for \$74 billion. If the deal is concluded, it would be one of the largest takeovers in the pharmaceutical industry. BMS CEO Giovanni Caforio is flirting with the deal in order to strengthen his company’s position in the lucrative cancer immunotherapy business. With an estimated sales volume of €20 billion, the US player would thus be ranked number two in the oncology sector behind Swiss market leader Roche.

*“The era of billion-dollar blockbusters is coming to an end.”*

However, BMS is currently battling for antitrust approval of the deal. To get the green light, BMS intends to sell Celgene’s psoriasis drug Otezla. After it was previously planned that the acquisition could be completed in the third quarter of 2019, the BMS management now expects the acquisition to be finished at the end of 2019 or beginning of 2020 due to the antitrust delays. Also at the beginning of the year, Japanese pharmaceutical group Takeda signed a deal to acquire Irish competitor Shire for \$62 billion. Shire is the largest foreign acquisition to date by a Japanese company. Takeda is particularly attracted by Shire’s cancer

products. The Irish also have medicines for the gastrointestinal tract and the nervous system in their portfolio.

#### *Abbvie Has an Eye on Allergan*

Finally so far, in June, US pharmaceutical group Abbvie announced its plan to acquire competitor Allergan for around \$63 billion. In doing so, Abbvie, headquartered in North Chicago, Illinois, aims to reduce its dependence on the blockbuster drug Humira. The drug, which had its origins in the Ludwigshafen laboratories of the former BASF subsidiary Knoll, has in recent years been the world's largest sales driver in the pharmaceuticals business: In 2018 the product reached sales of about \$20 billion. This means that the company achieved 60% of its total revenues of almost \$33 billion with the rheumatism drug alone. But the days of the almost inexhaustible cash flow for Abbvie are probably over for now. Last fall, patent protection for Humira expired in Europe, and since then several biosimilars were launched on the market. In order to compensate for the associated decline in sales, Abbvie urgently needs new promising active ingredients. The management hopes to find them in Allergan's product portfolio and pipeline.

*"In the pharmaceutical and biotech industry, takeovers are part of the business model."*

Allergan is best known for Botox. The anti-wrinkle product is used in cosmetic surgery as well as in neuromedicine. Even though the patent protection for Botox has long since expired, Allergan still generates \$2.4 billion per year. Since this product is also coming under increasing competitive pressure, Allergan has been working on the development of new drugs in recent years, and Abbvie is now targeting them. If it succeeds in overcoming the antitrust hurdles, the takeover will create a new industry giant with a total turnover of \$49 billion, which is placed in the view of industry leader Pfizer (\$53.6 billion).

#### *Reorganization of the Generics Market*

Weights are also being rebalanced on the global generics market. At the end of July, the world's largest pharmaceutical group Pfizer and its Dutch competitor Mylan agreed to establish a joint group for patent-free drugs. While Pfizer plans to divest its generics business with brands such as Lipitor, Celebrex, and Viagra under the umbrella of Upjohn and take over the majority of the new company, Mylan is to be fully integrated into the new company. This will create a new industry leader with an annual turnover of about \$20 billion and a profit before taxes and depreciation of about \$8 billion. Last but not least, the industry is making a name for itself in the current year through "smaller" consolidations and acquisitions. Pfizer has announced its intention to acquire Array Biopharma for \$11 billion. Pfizer's ambitions may have been driven by good results Array has announced for combined therapy in patients with metastatic colorectal cancer. At an industry meeting at the beginning of June, the company also convinced with new data from a combination against a special advanced form of breast cancer. Eli Lilly also took money into its hands. For \$8 billion, the Indianapolis-based company bought its cancer research partner Loxo Oncology – an indication that the precision oncology research field is in great demand.

#### *Just the Beginning*

"This is just the beginning of a series of mergers to come," said Sarat Sethi of investment house Douglas C. Lane on CNBC television. That's 47% above the \$170.2 billion combined value of the top 10 M&A deals during the first six months of 2018, highlighted in a "Top 10 M&A deals" of Genetic Engineering & Biotechnology News, a specialized information source for the industry. With further deals in the second half of the year, 2019 could close with record volumes after two years of weaker M&A activity.

#### *Patents, Cost Pressure, Competition*

The reasons for the intensive efforts of large pharmaceutical companies this year can be found in the pipelines and balance sheets of the corporations. Patents are expiring, cost pressure is increasing, the era of billion-dollar blockbusters is coming to an end and is being replaced by highly specialized products developed for smaller patient groups. In addition, there is competition from chemical and biological imitation products and the efforts of politicians and health insurance companies to keep prices under control. During the past 1.5 years, for example, the US government took various measures to lower drug prices and limit co-payments by patients. In addition, the financial return on R&D activities at biopharmaceutical companies is declining. This means that per each euro or dollar spent, companies often generate less turnover or profit than before. All in all, these developments are reflected in stagnating or declining sales. On the other hand, as the pharmaceutical companies grow in size by acquisitions, they can achieve efficiency gains, for example in research and development, but also in administration and sales.

*"This is just the beginning of a series of mergers to come." Sarat Sethi, Douglas C. Lane*

In addition, US pharmaceutical companies in particular often have plenty of cash at their disposal, due among other things to the reduction in corporate taxes in 2017.

#### *Weak Takeover Activity in 2018*

In contrast to the good M&A year 2019 to date, pharmaceutical companies have lagged significantly behind their opportunities on the transaction market in the past year: Although the acquisition volume increased by 11% to \$198 billion compared to 2017, however, the sum was around \$90 billion less than the average amount invested between 2014 and 2016. This is the conclusion of the auditing and consulting firm EY (Ernst & Young), that conducted and published a study on the financial data of the largest pharmaceutical, biotech, and specialty pharmaceutical companies earlier this year. EY's "Firepower Index" measures the purchasing power of biotech and pharmaceutical companies in M&A transactions on the basis of their market capitalization, cash, and debt capacity. Companies would certainly be able to do more: the firepower – the funds that companies can mobilize for acquisitions – amounted to more than \$1.2 trillion. However, only 16% of this was used in 2018. In 2014, companies still invested 27% of the funds available for mergers and acquisitions. The most common reasons for this reluctance were primarily the high prices that were called for takeover candidates and the global geopolitical and trade uncertainties.

#### *German Companies not in First Place*

By the way, German pharmaceutical companies only play a minor role in the takeover concert of the big players. In terms of sales, they also lag behind the global industry leaders, partly because lucrative oncological drugs often come from the USA or Switzerland. While the global market leaders from the USA and Switzerland increased their sales considerably last year, the local representatives dropped back. In 2018, the 22 companies surveyed by EY increased their pharmaceutical sales by 0.9% to €460.8 billion. However, German pharmaceutical companies can still boast one plus for themselves: they invest a lot of money on research. Merck and Boehringer Ingelheim, for example, spend more than the global average.

#### *Purdue Files for Bankruptcy*

September 17, 2019: Purdue Pharma, the drugmaker under fire for triggering an opioid crisis in the US, has filed for Chapter 11 bankruptcy protection in a New York court after reaching a tentative agreement with both state and local governments that

is worth up to \$12 billion. The maker of OxyContin has reached a deal with 24 states and five US territories, although another 24 states are said to remain opposed to the proposed settlement. Under the terms of the agreement, Purdue is to be dissolved and the monies raised, estimated at \$10 billion to \$12 billion, will be used toward settling the lawsuits. The Sackler family, owners of the pharma group, will also personally contribute \$3 billion, which will be paid out over seven years. An additional \$1.5 billion is anticipated from the eventual sale of Mundipharma, another company the Sacklers own. Purdue's proposal is that it would emerge as a trust that would contribute at no or low cost tens of millions of drug doses developed to reverse or treat opioid overdoses and addiction. "This settlement framework avoids wasting hundreds of millions of dollars and years on protracted litigation and instead will provide billions of dollars and critical resources to communities across the country trying to cope with the opioid crisis," said Seve Miller, chairman of Purdue's board of directors. "We will continue to work with state attorneys general and other plaintiff representatives to finalize and implement this agreement as quickly as possible." Media reports say states including Massachusetts, New York and Connecticut want the Sacklers to guarantee more of their own money will go toward a settlement, also questioning how Purdue came up with the contribution figure. New York state prosecutors have also accused the Sacklers of moving billions of dollars offshore, including to accounts in Switzerland. According to New York Attorney General Letitia James, the family has made about \$1 billion in transfers among themselves and their shell companies while they were "draining Purdue of its opioids proceeds". However, a family spokesman said the "decade-old" transfers were perfectly legal and appropriate. Lawsuits allege that Purdue and the Sacklers have fuelled the opioid crisis by using deceptive practices to sell the drugs and downplaying their addictive qualities. Purdue has denied the allegations, arguing that the US Food and Drug Administration had approved labels for OxyContin warning about the risks.

### DSM Bidding for DuPont Nutrition Business?

September 19, 2019: Dutch health, nutrition and materials company DSM could be bidding for DuPont's nutrition and biosciences business, according to a Bloomberg report. The business, which generated revenue of just over \$3 billion revenue for the six months ended Jun. 30, makes food ingredients, personal care products and other specialty chemicals. Laurence Alexander, an analyst with New York-based Jefferies, said the deal, which could be worth as much as \$20.8 billion, could be a plus for both companies. "Each could also see valuations step higher if the market continues to favor focus over diversification," Alexander said, adding that an asset swap may also make sense. "DSM's ... materials business could be an attractive complement for [DuPont's] aramids and thermoplastics." Other suitors that DuPont has reportedly reached out to include Ireland's Kerry Group and Swiss flavors and fragrances group Givaudan. Bloomberg said DuPont has sent confidentially agreements to prospective buyers and hopes to conclude a review by the end of the year. Sources said back in August that DuPont was considering a sale or spin-off of its nutrition business as well as looking into a Reverse Morris Trust, essentially a tax-free merger with another company. Aside from the nutrition and biosciences division, DuPont is said to have earmarked \$2 billion worth of revenue as noncore assets likely to be divested. These include photovoltaics, biomaterials and the Hemlock semiconductor joint venture.



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