

# CeBiTec – Quarterly

*Autumn 2017*

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## Industrial biotechnology with algae – 7<sup>th</sup> International CeBiTec Research Conference Bielefeld

A large variety of unicellular microalgae exists on our planet that can use sunlight energy for growth, therefore representing renewable resources for biomass and high-value product generation. Prospects and challenges for the development of algal industrial biotechnology was the theme of the 7<sup>th</sup> International CeBiTec Research Conference Bielefeld (ICRC), which took place from September 24 to 27, 2017, at the Center for Interdisciplinary Research (ZiF) of Bielefeld University.

Prof. Dr. Olaf Kruse was able to enlist the internationally renowned experts Prof. Dr. Matthew C. Posewitz (Colorado School of Mines, USA), Prof. Dr. Saul Purton (University College London, United Kingdom) and Dr. Maria Barbosa (Wageningen University, the Netherlands) as conference chairs. Approved by the Scientific Advisory Board, comprised of Prof. Dr. Peter Lindblad (Uppsala University, Sweden), Prof. Dr. Alison Smith (University of Cambridge, United Kingdom), Prof. Dr. René H. Wijffels (Wageningen University and Research, the Netherlands) and Prof. Kruse, twelve distinguished experts of the field from eight different countries were invited and agreed to give keynote presentations. The scientific program was completed by 18 selected talks and 46 poster presentations.

Biotechnological utilization of algae for the generation of bioenergy, applications as green cell factories for the renewable production of valuable compounds, large-scale cultivation and genetic cell line engineering were some of the topics in the main focus. The whole spectrum of microalgal biotechnology, from technical solutions for isolation of suitable cell lines to cell harvest and product purification, was represented in this conference. A total of 116 scientists from 18 countries joined the ICRC2017 conference and made the event a great success.

The ICRC conference series at the ZiF takes place once a year since 2010 and intends to cover the biotechnological topics relevant for the CeBiTec institute.

[www.cebitec.uni-bielefeld.de/algal-biotech-2017](http://www.cebitec.uni-bielefeld.de/algal-biotech-2017)



## CeBiTec and *teutolab*-biotechnologie at GENIALE 2017

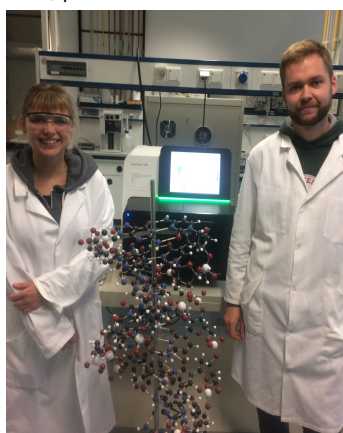
The CeBiTec and the *teutolab*-biotechnologie took main stage at the Grand Opening of GENIALE 2017. The GENIALE is a Science Festival organized by the city of Bielefeld and Bielefeld University every three years. This year the molecule DNA was in the limelight and the CeBiTec actively participated in promoting DNA-based science to the open public.

The Grand Opening of GENIALE 2017 was held on August 18, 2017, in the city hall with an audience of 1500 young and old citizens of Bielefeld. At the beginning of the evening, Prof. Dr. Olaf Kruse highlighted the importance of DNA-based research at the CeBiTec for modern day biotechnology in a podium discussion with, amongst

others, the mayor Pit Clausen and the vice rector Prof. Dr. Reinhold Decker from Bielefeld University. The comedian Vince Ebert acted as host of the event which featured three acts of the musical 'Das Molekül' of the Theater Bielefeld.



M. Panhorst, W. Meyer, K. Röhlke and A. Wenzel of *teutolab*-biotechnologie in the main hall of the University at GENIALE 2017



Dr. Vera Ortseifen (left) and David Brandt (right) guided the CeBiTec tour of the technology platform (missing members Julia Voss, Andreas Albersmeier)



Children harvesting their oral mucosa cells at the *teutolab*-biotechnologie



Wendisch Lab representing CeBiTec at Grand Opening of GENIALE 2017

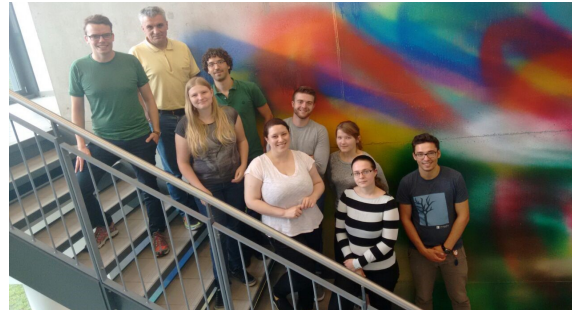
Taking up the thread of the musical on the discovery of DNA and on sequencing the human genome, Prof. Dr. Volker F. Wendisch gave a lecture on landmark experiments pinpointing DNA as the molecule carrying genetic information. The lay audience had ample opportunity to meet and discuss with researchers of the CeBiTec and the *teutolab*-biotechnologie before and after the stage performance.

On August 22 and 23, 2017, the CeBiTec and the *teutolab*-biotechnologie actively contributed to GENIALE Campus Days at three venues of Bielefeld University. In the entrance hall, the general public was informed about molecular biotechnology. For example, molecular genetic animal differentiation was introduced on the basis of theoretical and practical backgrounds, e.g. sausage samples and barcoding of orchids. Interested families were invited to visit CeBiTec. Here, they had the opportunity in an hour-long workshop to extract their own DNA from oral mucosa cells and make them visible. In addition, the CeBiTec technology platform was presented on every omics level in one-hour tours offered twice daily. These offers met a great positive response: the *teutolab*-biotechnologie counted 140 participants while more than 60 visitors took part in the tour. The GENIALE was a great chance to get in touch with citizens of the region and bring them closer to science and research in biotechnology.

[www.uni-bielefeld.de/geniale/2017/dna.html](http://www.uni-bielefeld.de/geniale/2017/dna.html)

## iGEM 2017 Workshop – Expanding the Genetic Code

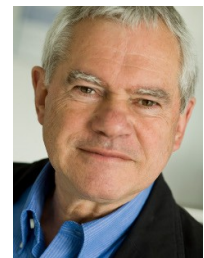
On the August 4, 2017, this year's iGEM team hosted a workshop entitled 'Expanding the Genetic Code'. The workshop aimed at providing insights into current research related to genetic code innovation, namely the incorporation of non-canonical amino acids and unnatural base pairs. At first, the project of this year's team Bielefeld-CeBiTec 2017 was presented with all its facets, theoretical background and preliminary results. As expert speakers on this topic Iker Valle Aramburu (EMBL Heidelberg, Lemke Lab) and Prof. Dr. Nediljko Budisa (TU Berlin) were invited. Mr. Aramburu's presentation dealt with 'The Plasticity of FG-Nucleoporins and NTR Interactions' in which he described the structural and functional identification of this specific nucleoporins with the help of incorporation of non-canonical amino acids to establish a small molecular FRET system, next to other approaches. Prof. Budisa's talk provided an overview about the field of xenobiology, expansion of the genetic code, and an in-depth look into the many research areas of his laboratory. After the following discussions, ideas were exchanged with the invited experts, much insight was gained into possible problems and practical executions, and helpful feedback was received. During this exchange, Prof. Budisa invited members of the iGEM team to join his lab to learn more about distinct methodological approaches needed for the project. As a result, Olga Schmidt joined the Budisa Lab at the TU Berlin for one week at the end of September to practice the handling of the selection of the aminoacyl-tRNA synthetases. The iGEM Team would like to thank everyone who attended the workshop and participated in the discussion.



Guest speakers and part of the iGEM team Bielefeld-CeBiTec 2017: (left to right, back) Prof. Dr. Nediljko Budisa, Iker Valle Aramburu, Yannic Kerkhoff, Saskia Dymek, Christopher Whitford, (left to right, front) Markus Haak, Michelle Liebers, Olga Schmidt, Denise Kerkhoff

## CeBiTec-Articles dominate a special issue published in the Journal of Biotechnology

In September 2017, the Journal of Biotechnology published a Special Issue dedicated to Prof. Dr. Alfred Pühler, the former Chief Editor of the Journal. This Special Issue comprises 27 articles and half of the articles are in direct connection to CeBiTec researchers. The primary motivation to compile this Special Issue by his former and present coworkers, colleagues, scientific friends and fellow edi-



tors was A. Pühler's 75<sup>th</sup> birthday which took place in September 2015. In addition, A. Pühler resigned from the Chief Editor's position of Journal of Biotechnology with the beginning of 2017. Originally, he took over the Chief Editor's position from the late Prof. Dr. Armin Fiechter, Professor at ETH Zürich, Switzerland, in the year 1997 and kept this position for 20 years. In this time period, he has overseen the evaluation process of thousands of manuscripts and edited nearly 500 issues of the Journal. The actual Chief Editor, Prof. Dr. Christoph Sensen from TU Graz, Austria, wrote "Alf has developed Journal of Biotechnology into one of the leading Journals in the field". Having left the Journal allows A. Pühler to focus his efforts on the de.NBI initiative, the German Network for Bioinformatics Infrastructure funded by the BMBF which he is coordinating since March 2015.



## 6<sup>th</sup> CeBiTec Students Academy – Synthetic Biology/Biotechnology

The 6<sup>th</sup> CeBiTec Students Academy 'Synthetic Biology/Biotechnology' was held at the CeBiTec from July 24 to 28, 2017. The Students Academy is a joint project of the CeBiTec, the District Council Detmold as well as the Osthusenrich-Stiftung, which provides the essential financial support. The academy is organized by Honorary Prof. Dr. Walter Arnold, Prof. Dr. Alfred Pühler and Dr. Werner Selbitschka. The one-week course is directed towards gifted and talented students living in Ostwestfalen-Lippe of Northrhine-Westfalia who will finish their *Abitur* in one-years time.

From nearly 30 applications, 20 participants were accepted to the academy. All of the attendees had excellent grades in natural sciences. It is worth noting that 8 of the 20 participants had excellent grades in all natural science school subjects i.e. Biology, Chemistry, Mathematics and Physics. As observed during previous courses, more than half of the attendees were female. Lectures which were held by members of the Faculty of Biology and the Technical Faculty addressed various aspects of modern biotechnology. Relevant subjects were industrial biotechnology, modern plant breeding, industrial production of pharmaceuticals, as well as synthetic biology. The CRISPR/CAS technique was also presented to the students.

The experimental part was organized by members of the CeBiTec and dealt with the isolation, amplification as well as the sequencing of DNA. In addition, proteomics studies were conducted. The knowledge acquired by the students was used for the taxonomic identification of bacterial communities employing bioinformatics tools, MALDI-TOF based identification of *Xanthomonas campestris* pv. *campestris* proteins, and finally for the analysis of regulatory networks constructed by synthetic biology approaches. The Heart and Diabetes Center NRW in Bad Oeynhausen was visited within the framework of the Students Academy.

The 6<sup>th</sup> CeBiTec Students Academy was the last course during the 6 years funding period. As already reported in the previous CeBiTec Newsletter however, the Osthusenrich-Stiftung supports a follow-up project of the CeBiTec Students Academy Synthetic Biology/Biotechnology for a further three years funding period (2018 – 2020). By analogy to Citizen Science, the courses are designed as Scholar Science projects during forthcoming years.



## 4<sup>th</sup> CeBiTec Retreat at a new location

More than 60 members of the CeBiTec went on the way to the 4<sup>th</sup> CeBiTec Retreat in Bad Sassendorf. During the two-day meeting (September 11 to 12, 2017) 18 PhD students of 10 different CeBiTec research groups presented their scientific work and results, followed by fruitful and interesting discussions. After the first day a get-together was an excellent opportunity to strengthen networking until late in the night. This year the CeBiTec Retreat took place in Haus Düsse, the seat of the Landwirtschaftskammer NRW (Chamber of Agriculture of North Rhine-Westphalia).



## Upcoming Events

- October 23–25, 2017 | Center for Interdisciplinary Research (ZiF), Bielefeld University  
de.NBI Symposium – The Collaboration of the de.NBI and ELIXIR Networks
- March 19–21, 2018 | Center for Interdisciplinary Research (ZiF), Bielefeld University  
12<sup>th</sup> CeBiTec Symposium – Big Data in Medicine and Biotechnology
- April 9–11, 2018 | Center for Interdisciplinary Research (ZiF), Bielefeld University  
[8<sup>th</sup> International CeBiTec Research Conference Bielefeld](#) – Reaction concepts for industrial biocatalysis
- further events are announced on the [CeBiTec web page](#)