Ladies and gentlemen,

It is a pleasure to welcome all of you to the 12th CeBiTec Symposium on “Big Data in Medicine and Biotechnology” at Bielefeld University!

This year’s symposium has been jointly organized with our Bielefeld Center for Data Science as well as the German Network for Bioinformatics Infrastructure – also called de.nbi – and not without good reason. Almost to the day three years ago on the occasion of the 10th CeBiTec Symposium I had the chance to welcome the representatives of the newly established de.nbi network. Back then I emphasized the benefits and impact such a network would have for society, as only by joining forces researchers would be able to effectively handle the huge amount of data life science produces.

Today, the challenge of “Big Data” in life science is ever more present: Consequently, the German network de.nbi has meanwhile integrated into the European-wide network ELIXIR which brings together more than 180 research organizations from 21 different European countries. ELIXIR’s goal is to form a single European-wide infrastructure which makes it easier to share data, exchange expertise and agree on best practices. This is a huge endeavor and I wish all of you who are involved in ELIXIR the necessary stamina to lead ELIXIR to success! To effectively tackle the complex field of Big Data in Life Sciences, ELIXIR works with use cases which concentrate on specific domains and bring together experts specialized in these domains. Because of the importance of this work, almost all day tomorrow will be dedicated to ELIXIR’s use cases and I am sure, this will lead to most inspiring discussions.
Today however, you will focus on Big Data in Medicine. I suppose the organizers have not chosen this focus randomly. Bielefeld University is currently setting up a Medical Faculty and obviously there will be lots of questions that CeBiTec and Medical Faculty can collaborate on and the new faculty will definitely benefit from CeBiTec’s expertise with the latest state-of-the-art methodologies. To name but one field: especially when it comes to personalized / precision medicine biomolecular technologies will have huge impact and in consequence change the analysis and treatment of human disease.

However, in order to make this happen, massive amounts of data have to be managed: In a workshop run a while ago (Nov. 2016) in London and organized by the European Medicines Agency, experts estimated that clinical data one single individual generates per lifetime amounts to 0.4 terabytes, genomics data to about 6 terabytes and additional related data to 1,100 terabytes. It was also said there that by 2020 health-related data gathered in total would double every 73 days.¹ The mere quantity of data is beyond imagination, not even considering the speed of growth!

When data is involved, legal and ethical questions are always implied. This is every more true when we talk about personal data. We cannot work with or on medical data without discussing data privacy protection and ethical implications. The symposium takes responsibility and does not back off these difficult questions which sometimes seem to contradict our scientific interest: Two distinguished lectures will shed light on ethical and legal aspects of medical data and the symposium will end with an expert round table discussion on these aspects which has been organized by the Bielefeld Center for Data Science. I would like to add a few words on this initiative: One of Bielefeld University’s founding

principles is interdisciplinarity and we have been thinking and living interdisciplinary for almost 50 years now, as I like to say: interdisciplinarity has become part of our university’s DNA. BiCDaS is no exception – it combines expertise in statistics, machine learning, research data management as well as various – more or less evident – application areas such as biology, business administration, computer science, data management, economics, information technology, digital humanities, law, librarianship, linguistics, physics, psychology, public health and sociology. With data being present and influencing every aspect of our personal and professional lives, nothing else makes sense than bringing together all disciplines to evaluate challenges and chances for different areas and while avoiding the worst making the best out of data!

Well, I do not want to make you wait any longer. As in the past this symposium has chosen vital and “hot” topics and I suppose everyone here is eager to plunge in and get started. So, I wish all of you intriguing discussions and a pleasant stay here in Bielefeld.
Ladies and gentlemen,

- **welcome** to 12th CeBiTec Symposium on “Big Data in Medicine and Biotechnology”

- this year: **jointly organized** with Bielefeld Center for Data Science (BiCDaS) and German Network for Bioinformatics Infrastructure (de.nbi)

- not without good reason.

  **three years ago**, 10th CeBiTec Symposium

  I welcomed de.nbi representatives, newly established network

  back then I emphasized **benefits and impact of network** for society:

  only by **joining forces** researchers **effectively handle**

  huge amount of **data** life science produces.

- Today: **challenge** of “**Big Data**” in life science **ever more present**:

  Consequently: German network de.nbi integrated into **European-wide network ELIXIR**

  bringing together more than 180 research organizations, 21 countries

- **ELIXIR’s goal**: form a single **European-wide infrastructure**

  easier to **share data**, **exchange expertise**, agree on **best practices**

  **huge endeavor**: wish everyone involved in ELIXIR necessary stamina to lead ELIXIR to success!

- Effectively tackle complex field of Big Data in Life Sciences

  ELIXIR works with **use cases**

  **concentrating** on specific **domains**
bringing together experts specialized in these domains

Important work! Therefore: almost all day tomorrow dedicated to use
cases I am sure: this will lead to most inspiring discussions

• Today however: focus on Big Data in Medicine
  suppose this focus not randomly chosen

Bielefeld University currently setting up a Medical Faculty
obviously lots of topics CeBiTec / Medical Faculty can collaborate
on new faculty will benefit from CeBiTec’s expertise
latest state-of-the-art methodologies
to name but one field: especially personalized / precision medicine

biomolecular technologies huge impact and
in consequence change analysis / treatment of human disease

• However: to make this happen,
  massive amounts of data have to be managed

workshop run a while ago (Nov. 2016) in London
organized by the European Medicines Agency,
experts estimated
  clinical data 1 individual per lifetime: 0.4 terabytes
  genomics data 1 individual per lifetime: 6 terabytes
  additional related data 1 individual per lifetime: 1,100 terabytes!

Also: by 2020 total health-related data doubles every 73 days
mere quantity of data beyond imagination
not considering the speed of growth!

• When data involved
  legal and ethical questions implied
  every more true personal data
cannot work with / on medical data without discussing data privacy protection / ethical implications. Symposium takes responsibility, does not back off these questions even if sometimes seem to contradict scientific interest.

2 distinguished lectures shed light on ethical / legal aspects. Symposium will end with expert round table discussion on these aspects. Round table organized by Bielefeld Center for Data Science.

- add a few words on BiCDaS initiative:

  Bielefeld University's founding principles: interdisciplinarity. We have been thinking and living interdisciplinary for almost 50 years. I like to say: interdisciplinarity part of our university's DNA. BiCDaS no exception – combines expertise in statistics, machine learning, research data management as well as various – more or less evident – application areas such as biology, business administration, computer science, data management, economics, information technology, digital humanities, law, librarianship, linguistics, physics, psychology, public health and sociology. Data being present and influencing every aspect of life. Nothing else makes sense than bringing together all disciplines to evaluate challenges / chances for different areas while avoiding the worst making the best out of data for everyone!

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