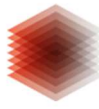




Leibniz-Institut
DSMZ-Deutsche Sammlung von
Mikroorganismen und Zellkulturen GmbH



TIB
LEIBNIZ-INFORMATIONSZENTRUM
TECHNIK UND NATURWISSENSCHAFTEN
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Information Centre
for Life Sciences

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When microbiology meets informatics

Research project DiASPora on bacterial biodiversity successful in Leibniz-competition

The project name DiASPora stands for ‘Digital Approaches for the Synthesis of Poorly Accessible Biodiversity Information’. DiASPora is a joint venture of the Leibniz Institute DSMZ-German Collection of Microorganisms and Cell Cultures, the TIB – Leibniz Information Centre for Science and Technology and ZB MED – Information Center for Life Sciences. The partners plan to use digital methods to find, bring together and publish information on the biodiversity of bacteria that is currently difficult to access but highly relevant. During a meeting on 26th November 2019, the Senate of the Leibniz-Community decided to sponsor the initiative over a three year period with roughly 1 million Euros with funds from the Leibniz Competition.

DiASPora aims to improve the integration, accessibility and manageability of information on bacterial biodiversity. To this end, currently available information is gathered and processed from a multitude of sources, including more than 150 scientific journals. “The project uses the established de.NBI database BacDive to link data in machine-readable form, making it easily accessible”, explains Prof. Dr. Jörg Overman, Scientific Director of the Leibniz-Institute DSMZ in Braunschweig and DiASPora coordinator. “At the same time, we are developing new bio-informatic tools that enable multidimensional analyses of these widely divergent molecular, phenotypical and ecologic data. Our ultimate goal here is to make bacterial properties predictable. This way, the project will make a valuable contribution to Life Sciences Research in Germany.”

Researchers from a multitude of disciplines will use their different methods to work together within the framework of the project. These experts provide competences in microbiology, informatics, semantic knowledge management, data sciences, software development, text mining and bio-informatics, linking various complementary approaches: manual curation, text mining, inferences by bio-informatic methods and machine learning. “In this project we will work both with established methods and with new tools to find, standardize and consequently link these diverse and heterogenous data”, continues Prof. Overmann. “The integration of these bio-diversity data by digitalization and the latest data-scientific methods will allow us to gain completely new scientific insights and, on that basis, ultimately discover innovative practical applications.”

Creating a semantic data network plays an important role in this respect, as Prof. Dr. Sören Auer of the TIB points out. “Vocabularies and ontologies let us

convert microbiologic data of the BacDive database into a machine-readable format with the help of the Resource Description Framework (RDF). The transformed data are consequently used to establish a Knowledge Graph, which enables innovative search possibilities to discover new scientific findings and data connections that were hidden until now.”

According to a statement by the Leibniz Senate Committee, DiASPora deals with a contemporary issue of great importance, covering a wide variety of areas from environmental protection to health care; the project was deemed to be both innovative and extraordinary as well as very convincing. Its interdisciplinary research consortium was found to be excellent, professionally complementary and to promise a high level of synergies. The partner organizations involved were highly distinguished and offered an outstanding, appropriate institutional framework. “We look forward to implementing this interdisciplinary project together with the DSMZ and TIB“, states Prof. Dr. Konrad Förstner, project manager at ZB MED. “We have put together a unique package of expertise. The joint application of text mining of academic literature and bioinformatic methods as well as the transfer of results into machine-readable formats to expand the Knowledge Graph has great potential to significantly increase our microbiological knowledge.”

The Leibniz Community has a competition procedure to support various programs that serve to reach strategic objectives within the framework of the pact for research and innovation. DiASPora is supported within the Leibniz Cooperative Excellence program. This year, 89 applicants have participated in the Leibniz Competition; 27 programs will be included in the sponsorship.

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