MUNI

Annex No. 11 to the MU Directive on Habilitation Procedures and Professor Appointment Procedures

PUBLIC LECTURE EVALUATION

Masaryk University

Faculty	Faculty of Science
Procedure field	Microbiology
Applicant	**Mag. Biol. Mag biol. Dr. techn. Simon Karl-Maria Rasso Rittmann, Bakk. Biol.**
Lecture date	7. November 2025 10:00
Lecture topic	**Proteinogenic amino acid production by methanogenic archaea**
Persons present (number)	20 (13 on site, 7 on line)
Designated evaluators (board members)	prof. RNDr. Luděk Bláha, Ph.D. (on site) Masaryk university, Faculty of Science, RECETOX, CZ prof. RNDr. Leona Buňková, Ph.D. (online) Tomas Bata University in Zlín, Zlín, CZ prof. Ing. Stanislav Obruča, Ph.D. (online) Brno University of Technology, Brno, CZ prof. RNDr. Jiří Doškař, CSc. (on site) Masaryk university, Faculty of Science, Brno, CZ prof. Christine Moissl-Eichinger, Dr. rer. nat. (online) Medical University Graz, Graz, AT

The public scientific lecture of Dr. Simon Rittmann was a comprehensive and captivating presentation, which clearly demonstrated his complex knowledge within the broader field of microbiology.

Dr. Rittmann successfully attracted the attention of the audience through clear presentation summarizing state of the art as well as own original results. The presentation was clearly structured into three interconnected sections.

In the opening part of the lecture, Dr. Rittmann introduced general characteristics of methanogenic archaea (methanogens), presented morphological characteristics accompanied by microscopic and electron microscopic images. Further, presentation addressed important factors such as growth characteristics including the record-holder for high-temperature growth, *Methanopyrus kandleri*, and illustrations of natural and artificial habitats where methanogens contribute to methane emissions to the atmosphere as well as the potential for methane production by cultures of methanogens.

The main part concerned proteinogenic amino acid production by methanogens covering the original research of the applicant in three sections (i) production of amino acids under variable cultivation conditions in closed batches of (hyper)thermophilic methanogens, (ii) production by *M. marburgensis* using molecular nitrogen and ammonium as nitrogen sources and application of the genetic system for examining isoleucine production through different pathways, and (iii) leucine overproduction by employing random mutagenesis and rational design in *M. marburgensis* .

The lecture was finished by linking the results from leucine overproduction and scale-up by *M. marburgensis* to global economic indicators such as the amino acid market size volumes in relation to high volume production technologies using methanogenic bacteria.

Dr. Rittmann efficiently used practical examples and case studies accompanied by clear and educative schemes, illustrations and images. The lecture was well structured and logically organized.

The questions after the lecture focused on following points:

- Diversity of amino acids produced by methanogens
- Batch vs continuous cultivation yields and associated issues
- Bacterial contamination of the cultivation systems
- Techniques of purification of the final product (e.g. leucine)
- Regulation of use of GMO methanogens in the production systems
- Production of sulfate-containing amino acids in methanogens

While answering the questions, Dr. Rittmann proved to be respected expert in the field and thus affirmed his qualification for habilitation.

Conclusion

The lecture delivered by Dr. Simon Rittmann " Proteinogenic amino acid production by methanogenic archaea" demonstrated scholarly qualifications and pedagogical capabilities expected of the applicants participating in a habilitation procedure in the field of Microbiology.

The lecture took place in a hybrid form on November 7th, 2025, from 10 a.m. CET at the MU Campus Bohunice, lecture room B11/306 + online via Teams. All members of the habilitation committee attended the lecture as well as two international reviewers. All designated evaluators are familiar with the text of the evaluation and agree with it.

Date: 7.11.2025

Luděk Bláha

Jiří Doškař

Leona Buňková

Stanislav Obruča

C. Moissl-Eichnger