Review of Habilitation Thesis

Thesis Title: Healthcare-associated infections and antimicrobial resistance: surveillance, epidemiology, and novel approaches to infection control

Candidate: MUDr. Yashar Jalali, PhD.

The submitted habilitation thesis by MUDr. Yashar Jalali, PhD., deals with the highly relevant topic of healthcare-associated infections and the issue of antimicrobial resistance. The thesis is conceived as a collection of the author's original scientific papers, preceded by an in-depth theoretical introduction. The total extent of 193 pages and its logical arrangement testify to the candidate's high level of preparedness and his ability to synthesize complex epidemiological data.

In the theoretical introduction, the author expertly defines the problem of growing antibiotic resistance, with particular emphasis on the period since 2020, when the global pandemic significantly influenced trends in this area. The author details the most important current pathogens, such as *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, representatives of the order *Enterobacterales*, and vancomycin-resistant enterococci (VRE).

I particularly appreciate the comprehensive elaboration of the mechanisms of resistance and the clinical significance of these pathogens. The theoretical part smoothly transitions to prevention options, where the author focuses on antibiotic stewardship strategies, environmental hygiene, and hand hygiene in hospital settings. It also includes an analysis of surveillance methods and an introduction to innovative diagnostic and therapeutic strategies. The entire introduction is written very clearly while maintaining a high professional standard and providing the reader with an exhaustive insight into the issue.

The practical part of the thesis consists of a collection of six scientific and publication outputs by the author, which logically follow the theoretical background and apply it in a real clinical setting, primarily within the conditions of the University Hospital Bratislava (UNB).

A significant part of the candidate's research is devoted to the issue of infections caused by the bacterium *Acinetobacter baumannii*. The author not only contributed to an international monograph on the global epidemic of antimicrobial resistance with a comprehensive chapter on this pathogen, but also published several original scientific papers. In these, he analyzed four-year trends in the occurrence of its multidrug-resistant strains at the department of internal medicine and demonstrated a direct epidemiological and clinical connection between carbapenem resistance of *A. baumannii* and increased patient mortality.

Another group of papers focuses on both Gram-negative and Gram-positive threats in the context of recent challenges and antimicrobial drug consumption. The candidate processed a three-year prevalence study of ESBL-producing enterobacteria, where the original linking of the proportion of individual resistance phenotypes with data on overall antibiotic consumption is a particularly valuable contribution. From both a clinical and crisis-management perspective, his priority report on the first nosocomial outbreak caused by vancomycin-resistant enterococci (VRE) in patients with COVID-19 is also of exceptional importance.

Last but not least, the author goes beyond passive surveillance in his work and actively seeks and verifies solutions to reduce the microbial burden in hospital premises. This is proven by his study focused on the effectiveness of hospital environment decontamination using the innovative method of dry fogging, where, based on a comparative analysis of environmental samples, he demonstrably confirmed its efficacy in inpatient wards.

The author's original scientific outputs were published in prestigious scientific journals indexed in Web of Science, such as Antibiotics, Pharmaceuticals, and the Bratislava Medical Journal. This confirms that his research has undergone a rigorous peer-review process and is recognized on both a national and international level.

The thesis relies on 262 literature references, with the author citing predominantly recent sources from prestigious scientific journals published over the last decade.

Conclusion and Recommendation

The habilitation thesis of MUDr. Yashar Jalali, PhD., documents his exceptionally rich and systematic publication activity. His contribution to the development of scientific knowledge in the field of antibiotic resistance in hospital settings is indisputable. The thesis not only aptly describes developments and trends but also provides concrete local data essential for personalizing "antibiotic stewardship" programs and implementing modern preventive methods into practice.

Given the high scientific and professional level of the submitted thesis, the fulfillment of all relevant criteria, and the author's undeniable contribution to infectiology and epidemiology, **I recommend the thesis for defense** and propose that MUDr. Yashar Jalali, PhD., be awarded the academic title of Associate Professor (docent).

Bratislava, April 29, 2026

Doc. MUDr. Peter Sabaka, PhD.