

## Evaluation of the prevalence and molecular characterization of *Pneumocystis jirovecii* in patients with a variety of respiratory diseases

Magdalena Sokulska<sup>1</sup>, Marta Kicia<sup>1</sup>, Paweł Piesiak<sup>2</sup>, Olga Matos<sup>3</sup>,  
Maria Luísa Lobo<sup>3</sup>, Żaneta Kopacz<sup>1</sup>, Maria Wesółowska<sup>1</sup>, Andrzej B. Hendrich<sup>1</sup>

<sup>1</sup>Department of Biology and Medical Parasitology, Wrocław Medical University, J. Mikulicza-Radeckiego 9, 50-345 Wrocław, Poland

<sup>2</sup>Department of Pulmonology and Lung Cancer, Wrocław Medical University, Grabiszyńska 105, 53-439 Wrocław, Poland

<sup>3</sup>Instituto de Higiene e Medicina Tropical, Universidade NOVA de Lisboa, Rua da Junqueira N.º 96, 1349-008 Lisboa, Portugal

Corresponding Author: Magdalena Sokulska; e-mail: madzkas@op.pl

*Pneumocystis jirovecii* is a unicellular fungal species occurring in human lungs, most commonly among immunosuppressed individuals in whom infection may lead to the development of *Pneumocystis* pneumonia (PcP) symptoms. In turn, although the presence of *Pneumocystis* in immunocompetent subjects does not usually trigger any clinical signs, it may, however, result in asymptomatic carriage, defined as colonization. This phenomenon has been described *inter alia* among patients with various lung diseases, with the susceptibility of these individuals likely being associated with the lung damage caused by the host inflammatory reaction in response to the latent fungus in the respiratory tract. Importantly, as research on this organism is further complicated by the fact that it cannot be cultured *in vitro*, epidemiological tracing requires the molecular analysis of *Pneumocystis* isolates collected from colonized people. Therefore, the aim of our study was to determine the prevalence of *P. jirovecii* in bronchial washing specimens collected from patients with various pulmonary diseases attending the Department of Pulmonology and Lung Cancers at Wrocław Medical University. The microscopic diagnosis and detection of *Pneumocystis* DNA in samples were followed by molecular characterization of multilocus genotypes in the identified isolates.

PCR-based examination found the prevalence of *P. jirovecii* to be 17.5 % in the tested subjects, indicating them to be at risk of *Pneumocystis* colonization. This finding is consistent with those from other countries and is a particularly important one, since these individuals constitute the reservoir of the pathogen for susceptible, immunocompromised hosts. Furthermore, should the immune status of the carrier deteriorate, colonization may develop into symptomatic pneumonia.

Molecular identification of *Pneumocystis* multilocus genotypes occurring in the specific study group is relevant due to the epidemiological issues, and divergent genotypic patterns are detected in various locations. Different climatic characteristics or patterns of prophylaxis used in the designated geographical area may, in fact, influence specific features of pathogen infection, including its prevalence in various populations.