



401/D

Exploring the diagnostic potential of extracellular vesicles for tuberculosis

W.R.U.A. Bandara¹, D. Madegedara², W.A.I.P. Karunaratne³ and D.N. Magana-Arachchi^{1*}

¹Molecular Microbiology & Human Diseases project, National Institute of Fundamental Studies, Hantana Road, Kandy, Sri Lanka, ²Respiratory Disease Treatment Unit, General Teaching Hospital, Kandy, Sri Lanka, ³Department of Zoology, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*. Each year more than 10 million people become sick with TB, and TB kills more than 1.5 million. TB diagnostics are constantly evolving to end TB soon. Recent studies found that cells are constantly shedding small membrane-bound sac-like vesicles. These tiny sacs carry biologically essential molecules such as DNA, RNA, proteins, lipids, and nucleic acids and aid cell-to-cell communication. These vesicles are diverse in size and shape and are shed by healthy and diseased cells. Also, the outer cell wall composition can change depending on the diseased status. Based on these, scientists have found that studying these small vesicles could give valuable information for clinical applications. According to our knowledge, this is the first study conducted utilizing dynamic light scattering (DLS) technique in the context of TB using these small vesicles in Sri Lanka and globally. In this study, a low-cost polymer called polyethylene glycol and a filter are used to isolate these small vesicles from the serum of TB patients and healthy individuals. The isolated small particles were characterized based on the mean particle size and the spread of the particles, called the polydispersity index (PDI). According to the results, it is evident that particle size is an excellent parameter to differentiate TB patients from healthy individuals. However, the vesicle isolation and storage conditions should be carefully handled to avoid misinterpretation of the results. Despite a few drawbacks, this is a less harmful, easy, and rapid method to identify TB patients. Especially TB being a poor man's disease, this method could be a potential element in TB diagnosis in lower-middle income countries. However, analysis of more samples is needed for validation.

*dhammika.ma@nifs.ac.lk