The problem of respiratory pathogens in pneumonia relies on time-consuming culture-based techniques, first developed in the 1880s, while pneumonia remains a primary cause of morbidity, mortality, and healthcare expense. Delayed pathogen identification, unneeded antibiotic use, and dated culture-based techniques are major issues.

The solution involves developing a new protocol to identify pneumonia pathogens faster. This protocol uses the MinION (Oxford Nanopore Technologies, Oxford, UK), a new-to-market palm-sized DNA sequencer used for real-time detection of viral and bacterial pathogens. For pathogen identification, the MinION allows for rapid, accurate identification of pathogens, telling clinicians which bacteria are present in the lungs as well as the total bacterial burden. Streamlining the process to produce results in less than four hours for under $100 and potentially determining genetic information pertaining to antibiotic resistance and optimal antibiotic selection are also benefits.

The technology employed is novel ultrasensitive PCR detection techniques for rapid and precise quantification of pathogen burden, potentially clarifying the key clinical differences between health, colonization, and acute infection.