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A comparison of the microbiomes of cystic fibrosis and bronchiectasis patient sputum by terminal restriction fragment length polymorphism and bacterial tag-encoded FLX amplicon pyrosequencing

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Background: Cystic fibrosis (CF) and bronchiectasis are diseases in which microbial lung infection plays a major role. A community of many bacterial species is often present in one patient. It is important to monitor the effect of interventions such as antibiotics on lung ecology. Traditional culture-based microbiological analysis cannot feasibly be used to monitor all bacterial species present in chronic lung disease. Molecular profiling methods such as terminal restriction fragment length polymorphism (TRFLP) and bacterial tag-encoded FLX amplicon pyrosequencing (bTEFAP) have emerged, which have the potential to identify different bacterial species and abundance present in each sample.

Materials & Methods: In this study, sputum samples from adult CF (n=18) and bronchiectasis (n=15) patients were subject to TRFLP and bTEFAP analysis and the microbiomes were compared.

Results: Of the common pathogens in CF and Bronchiectasis, Pseudomonas aeruginosa and Burkholderia cepacia were the most prevalent in both diseases. The overall microbiomes are similar between CF and bronchiectasis patient lungs with lower microbiome diversity in CF patients.

Conclusion: This comparison shows that some strong similarity between the two microbiomes, which may explain why many interventions that are demonstrated to be effective in CF have also been found to be effective in bronchiectasis. The accurate microbiome characterization for each disease can help to inform selection of therapies for both clinical and research purposes.

Biography

Honghua Hu has completed her PhD degree in 2005 from School of Molecular and Microbial Biosciences at The University of Sydney, Australia. After completing graduation, she has worked as a Research Academic in the Department of Infectious Disease and Immunology at The University of Sydney on projects associated with cystic fibrosis and bronchiectasis lung infections, including microbiome analysis. Since 2011, she has been working as a Research Fellow in Surgical Infection Research Group in Faculty of Medicine and Health Sciences at Macquarie University. She has worked on various bacterial biofilm related projects, including: Microbiome of bacterial biofilm in medical implants and devices and bacterial biofilm on healthcare environment. During her research career, she has achieved 25 refereed publications with expertise in both bacterial biofilm and molecular microbiology.

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