

18 January 2024



Australia Cystic Fibrosis Research Trust

Conquer Cystic Fibrosis Lung Health Transplant

**RE: Progress report: Transforming diagnosis of lung transplant rejection**

My study aims to investigate a non-invasive method that can accurately diagnosis of post lung transplant rejection. To date we have consented and recruited 10 patients who had lung transplants at the Fiona Stanley Hospital, Perth in 2023. The patients have consented to providing peripheral blood, bronchoalveolar lavage fluid and lung tissue biopsy samples which were taken at time of patient's routine post transplant follow up. We have optimised the isolation of cell free DNA from plasma and developed a simple direct fluorescent-based assay that could be used to quantify the cell free DNA concentration directly from the plasma without the need for extraction of cfDNA. Our preliminary analysis has shown that the use of a direct fluorescent assay could be a simple and cheap method to quantify cell free and may have application for use in clinic. We are evaluating the efficacy of this method in our clinical situation. We have also optimised the methodology for DNA methylation, in particular cell free methylated DNA immunoprecipitation and high throughput sequencing (cfMeDIP-seq). Analysis of preliminary experiments demonstrated that methylation profiling of cfDNA could be used as tool to detect tissue-specific markers in cfDNA.

We will continue recruiting participants who will have lung transplant surgery at the Fiona Stanley Hospital in 2024. I hope to recruit a further 10 patients. Biological samples will be collected during the patient's routine follow bronchoscopy that is performed during the first-year post transplant. In addition, we also recruiting participants with clinical evidence of lung rejection. This will allow us to explore the methylation profile in cfDNA and lung tissue with evidence of rejection and non-rejection.

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