

18 October 2023

Tracey Rudd  
Australian Rheumatology Association  
Via email: [tracey.rudd@rheumatology.org.au](mailto:tracey.rudd@rheumatology.org.au)

Dear Tracey,

**Re: 2022 Arthritis Australia National Grants Research Programme, Ken Muirden Overseas Fellowship – Report**

I am writing confirm the outcomes from the Ken Muirden Overseas Fellowship awarded to Dr Aravinthan Loganathan for 2022.

I have set out below the project recipient and final report required which I hope is of interest.

Please convey our thanks to the ARA Research Trust for this generous donation which has enabled this work to be undertaken for the benefit of the consumers who we serve.

Please do not hesitate to contact me if you have any comments or questions.

Kind regards,



Jonathan Smithers  
**Chief Executive Officer**

## KEN MUIRDEN FELLOWSHIP RECIPIENT AND FINAL REPORT

Funded by:	ARA Trust (\$100,000.00)
Recipient:	Dr Aravinthan Loganathan
Intended Department:	Canberra Hospital, Rheumatology NSW/ACT Training program
Project:	Fellowship in Inflammatory Myositis, Interstitial Lung Disease and Data Science

We are very grateful for the grant funding received from Arthritis Australia in support of our project “Fellowship in Inflammatory Myositis, Interstitial Lung Disease and Data Science”.

### Overview

I completed an overseas research fellowship at the Royal National Hospital of Rheumatic Diseases Bath, United Kingdom and Department of Life Sciences, University of Bath, with the support of the Ken Muirden Fellowship and Arthritis Australia.

The Ken Muirden fellowship provided me with the opportunity to delve into the field of inflammatory myositis, an area experiencing dynamic growth within rheumatology due to the identification of new myositis antibodies and a deeper understanding of the disease's multi-systemic nature, encompassing cutaneous, pulmonary, and cardiac manifestations. My focus was inflammatory myositis and interstitial lung disease, significantly contributing to morbidity and mortality.

The collaboration with the University of Bath and the Royal National Hospital of Rheumatic Diseases provided a conducive environment for advancing my research and clinical capabilities. Throughout my fellowship, I engaged in research and clinical endeavours, improving my expertise and understanding of these complex conditions. Moreover, this fellowship allowed me to work with international experts and researchers in inflammatory myositis. Also, it allowed me to develop international research links, which I aim to utilise in future research projects.

Additionally, this fellowship presented the unique and invaluable opportunity to gain experience in laboratory work in autoantibody testing, gaining hands-on experience in the interpretation and basic science of various immunological tests utilised in rheumatology, specifically those about myositis. This exposure significantly enhanced my clinical reasoning and judgment, offering a more nuanced understanding of the strengths and limitations inherent in immunological antibody testing.

Detecting different myositis-specific and myositis-associated antibodies is pivotal to diagnosing diverse idiopathic inflammatory myopathies. Incorrect interpretation of these antibodies can lead to unnecessary investigations, follow-up and treatment. I aim to use the experiences this fellowship has provided me in my future practice.

### Research Accomplishments/Projects:

During my fellowship, I was involved in different research projects. I presented these research projects at conferences during my time in Bath at various meetings. My research projects, listed below, focussed on autoantibody detection in myositis and clinical management and evaluation of interstitial lung disease in myositis. These projects involved working with different international groups, allowing me to understand the differences in the clinical presentations in evaluating and treating myositis in other population groups.

#### *Global Conference on Myositis Prague 2022 (DOI: 10.55563/clinexprheumatol/zka1xq)*

- ***Abstract/Poster: Detection of Anti-Zo and Other rare anti-synthetase syndrome autoantibodies on research line blot immunoassays***
  - This project evaluated the accuracy of a new myositis research line blot immunoassay in detecting antibodies to anti-synthetase autoantibodies anti-Zo, Ha and Ks.
  - We used newly developed line blot immunoassays to detect these antibodies and successfully demonstrated that anti-Zo was detected in all cases; however, we could not detect cases of anti-KS and anti-Ha.

- ***Abstract/Poster: Detection of myositis autoantibodies in patients labelled with idiopathic interstitial lung disease***
  - Using line blot on sera samples of patients with idiopathic interstitial lung disease in which CTD had not been diagnosed. We demonstrated on IP and confirmed with the more commonly used line blot tests that antibodies associated with connective tissue disease and myositis were readily accessible, highlighting the importance of developing a testing strategy for cases of idiopathic ILD.

***British Society Rheumatology Annual Meeting 2023:  
(DOI:10.1093/rheumatology/kead104.195)***

- ***Abstract/Poster: Real-world audit of patients with idiopathic inflammatory myositis-related interstitial lung disease in a European population***
  - The RNHRD operates specialist clinics for scleroderma and lupus, but IIM patients are currently seen in a general CTD clinic. As part of work to establish a dedicated myositis clinic, we collated data on 71 patients under active follow-up with myositis spectrum disease deemed appropriate for follow-up within a specialist clinic.
  - We reviewed patients diagnosed with IIM-ILD and reviewed the serological immune profile, screening practices for pulmonary involvement, findings on CT/pulmonary function tests and pharmacological management.
  - Our review demonstrates that 65% of patients with adult IIM were screened for ILD. NSIP and OP were the most common radiological appearances. Half of our cohort required aggressive immunosuppression, cyclophosphamide being the most prescribed agent and mycophenolate being preferred for maintenance therapy. No patients were prescribed tacrolimus or ciclosporin. Despite treatment, 52% of patients had evidence of progressive disease on serial PFTs

***EULAR 2023 (DOI:10.1136/annrhumdis-2023-eular.2218)***

- ***Abstract (Publication Only): Clinical Phenotype and Antibody Correlations using Immunoprecipitation in Indian patients with idiopathic inflammatory myopathies from the Myocyte cohort.***
  - We reviewed the clinic-serological profile of 148 patients from a well-characterised MyoCite cohort of juvenile and adult patients with IIM from Lucknow, India, to determine significant clinical characteristics associated with different myositis-specific antibodies.
  - Conclusion: Autoantibodies are present in nearly two-thirds of Indian patients with IIM, although the prevalence of individual MSA differs. The frequency of ILD is closer to those previously reported in European cohorts than in East Asian populations.
  - Most MSAs exhibited association with prominent cutaneous manifestations, including mechanic hands, heliotrope rash, Gottron's sign, V-sign, hyperpigmentation and erythematous changes.
  - These differences in antibody profile and clinical characteristics from the MyoCite cohort compared to those of different geographical and ethnic populations previously reported suggest the potential influence of genetics and/or environmental factors.

***Journal Article: Frontiers in Immunology (DOI: 10.3389/fimmu.2022.975939)***

- ***Title: The use of ELISA is comparable to immunoprecipitation in the detection of selected myositis-specific autoantibodies in a European population***
- We evaluated the use of ELISA in comparison to IP for different myositis-specific antibodies (Mi2, MDA5, Jo1, EJ, KS, PL7, PL12)

- Our paper demonstrated a very good agreement between ELISA and IP, suggesting that ELISA can detect these antibodies and aid diagnosis and is comparable to the reference standard immunoprecipitation.

### **Research Accomplishments/Projects to be completed:**

Regrettably, I could not conclude all the projects initiated during my fellowship. Some of these projects are presently in the review process with various collaborators and are slated for submission to pertinent journals. Here is a concise summary of these ongoing projects:

#### **CLASS Project (Junior Researcher):**

1. "Agreement between local and central anti-synthetase antibodies detection: results from the CLASS project biobank."
2. Evaluation of patients with Interstitial Lung Disease (ILD) in Anti-Synthetase syndrome within the CLASS database – currently undergoing evaluation/research.
3. Evaluation of muscle biopsy findings in patients with the anti-synthetase syndrome – currently undergoing evaluation/research.

#### **MyoCite Research Group:**

Assessing the Sensitivity and Specificity of Myositis-Specific and Associated Autoantibodies: A Sub-study from the MyoCite cohort

#### **Royal National Hospital of Rheumatic Diseases:**

ILD and use of Patient Reported Outcome Measures – Engaged in a systematic review of diverse scoring systems employed to assess symptoms in evaluating ILD – work in progress and to be completed.

### **Clinical Skills & Data Science:**

This fellowship gave me a unique opportunity to enhance my clinical proficiency and broaden my myositis, general rheumatology, and data science skillset. Additionally, it afforded me valuable experience in establishing a new clinical service. In greater detail, these experiences encompassed:

#### **1. *Musculoskeletal Ultrasound:***

- Proficient in conducting ultrasound scans, with expertise in detecting subclinical synovitis in the hands and feet

#### **2. *Setting up follow-up clinics and clinical database:***

- Helped establish a patient-initiated follow-up clinic, extending outpatient follow-up appointments for rheumatology in order to address the delayed waiting list times post COVID-19. This pathway provided a safe avenue for clinicians to delay the follow-up of stable patients, allowing patients who were overdue or needed earlier to review to be seen more quickly. The RNHRD was the first centre to enrol 5% of its outpatient follow-up patients in a PIFU pathway in the NHS.
- Experience in collaborating with key stakeholders such as medical staff, hospital administration, coding/statistical staff, nursing & outpatient staff, and General Practitioners.
- Creation of follow-up pathways, including arrangements for patients requiring expedited follow-up and providing training and education to staff members who were likely to be the point of contact for patients needing earlier follow-up
- Implemented a comprehensive database for data collection, identifying suitable patients specifically for the myositis clinic at the RNHRD.

#### **3. *Data Science***

- Experience in performing statistical analysis in evaluating the performance of different antibodies as well as performing calculations to find significant associations for different variables associated with different antibodies.

#### **4. *Muscle Biopsy:***

- Experience performing open muscle biopsies on lower limbs for diagnostic purposes.

**5. *Clinical Experiences:***

- Participated in combined rheumatology/respiratory clinic meetings to enhance understanding and treatment of CTD-ILD, focusing on myositis-related ILD.
- Worked in rheumatology connective tissue disease at the RNHRD, Bath, gaining valuable experience treating myositis.

**6. *Laboratory Experience:***

- Developed proficiency in performing various immunological tests, including ELISA and line blot, and gained observational experience in immunoprecipitation procedures.
- Deepened understanding of the scientific principles underlying these tests and acquired insights into the potential pitfalls in their clinical application

**Summary:**

I am grateful for the support extended to me by Arthritis Australia and the Ken Muirden fellowship during my overseas fellowship. This invaluable experience has laid a robust foundation for my research and clinical career. I am committed to utilising the skills gained to enhance the care provided to individuals with inflammatory myositis and other rheumatological conditions.