

# FIBRES

Connecting ADRI Friends to Research



DECEMBER 2018

## Welcome from ADRI Director

Dear ADRI Friends,

I am pleased to be able to connect ADRI Friends with research through this December issue of Fibres and to have this opportunity to thank you for your support.

In February 2017 I was honoured to have been appointed the Director of ADRI and to be able to build on the Institute's past success. I would like to share with you a little of our achievements this year and of my vision for the future of ADRI in which we will continue our progress towards improving the diagnosis and treatment of asbestos-related diseases and at the same time to contribute to more effective measures to prevent exposure to asbestos.

To achieve a balanced approach in asbestos-related diseases research, our team at ADRI are now including work on public health and prevention, developing laboratory research and clinical studies and providing support services. In this issue of Fibres we highlight a number of projects in each of these areas from standardising methodologies for measuring asbestos in the environment, the development of non-invasive biomarkers through to the support and educational activities provided by our Mesothelioma Support Coordinators.



Despite a complete asbestos ban being implemented almost fifteen years ago in Australia, asbestos remains a significant issue in the built environment. In 2017 over 700 Australians were diagnosed with asbestos-related diseases and whilst we continue to look for better treatment options for mesothelioma it is also important to raise the awareness of the dangers of asbestos to prevent others from being exposed. We greatly appreciate and hope that your knowledge and support will also raise awareness of the dangers of asbestos and of the importance of asbestos-related diseases.

Thank everyone

Ken Takahashi, MD, PhD, MPH



From the team at ADRI we would like to thank you for your support and wish you a safe and **Happy Christmas**

## 2018 Asbestos Safety and Eradication Agency (ASEA) Conference



ADRI research was featured in the Day 2 Workshop “Research Directions,” presided by Ms. Carolyn Davis who also chairs the Technical Research Advisory Committee at ASEA. In the workshop, ADRI presented together with the National Health & Medical Research Council of Australia (Dr. Elaine Stone, Assistant Director, Public Health Section, NH&MRC). ADRI’s presentation “From Bench to Public: Another Direction of Translational Research” was presented by Dr. Ken Takahashi (ADRI Director), Dr. Yuen-Yee Cheng (Principal Scientist) and Dr. Matthew Soeberg (Epidemiologist). ADRI’s overall message on asbestos-related diseases is to *aspire to contribute to public health as well as the bench to bedside* research. ADRI was honoured to share the packed workshop with a member from the most prestigious funding organization in Australia, NHMRC.

### A measurable indicator of malignant mesothelioma

Malignant pleural mesothelioma (MPM) is a deadly cancer that is caused by asbestos exposure and has

limited treatment options available for patients. Mesothelioma is difficult to diagnose as there is a lack of specific biomarkers which can be used as measurable indicators of disease and its symptoms closely resemble those of lung cancer. A misdiagnosis of MPM can jeopardize the patient's survival and quality of life. The current standard of diagnosis for MPM requires the testing of multiple immunohistochemical biomarkers on formalin-fixed paraffin-embedded tissue to differentiate MPM from other lung malignancies. To date, no single biomarker has been found to provide a definitive diagnosis. Our researchers at ADRI have developed an assay to detect genomic deletion as a diagnostic tool for MPM and results indicate that this assay may provide a more accurate biomarker for MPM diagnosis in the future.

### A novel 3D cell model of mesothelioma

Current first-line drug screening techniques for cancer are heavily dependent on conventional 2D cell culture systems where cells are grown on a flat dish typically made of plastic. Although 2D-based screening systems show promising outcomes in preclinical studies, their low efficacy in the tumour microenvironment often hinders positive outcomes in clinical trials. The behaviour and characteristics of 2D cells can be very different to their actual form, behavior, ability to thrive, survive and die in a natural tumour microenvironment in the body. Dr Yuen Yee Cheng has utilised her experience of 3D cell culture over the last 8 years to develop a novel 3D tumour model using an extracellular matrix scaffold of pig lung seeded with mesothelioma cells. Preliminary data has demonstrated that cancer cells in this 3D model closely resemble the conditions of a natural tumour microenvironment compared to 2D culture. We therefore, plan to further exploit this novel 3D model to investigate cancer biology and drug responses. This novel 3D cell model approach will provide researchers with an easy and economical method to study *in vitro* systems in an environment that closely resembles real tumour biology.

Photo: (R-L) Jocelyn McLean (ADRI), Victoria Keena (ADRI), Catherine Wegener (AVA SA), Lesley Sears (AVA SA), Ken Takahashi (ADRI)

## Mesothelioma Support

### Group meetings, individual support, walks and educational webinar

The ADRI Mesothelioma support service continues to assist around 180 families a year by way of telephone, email, face to face meetings and other activities.

In February we celebrated the award of an Order of Australia to Mrs Serafina Salucci who is a tireless advocate for awareness about the dangers of asbestos and supports our research Institute.



We have held 6 general support groups at Revesby Workers Club, 3 EPP (Extrapleural pneumonectomy) groups at Drummoyne Sailing club, 2 bereavement morning teas at ADRI and the Annual Carers Thank you day in October. We were also very proud to host an educational Q&A session where 12 mesothelioma experts answered questions from an adjudicator and the floor. This informative event was recorded and is available on our website <http://adri.org.au/watch-ga-adri-style-10am-on-monday-7th-may-livestreamed/> This year our annual walk, 'Meso March In May: Make Mesothelioma History' was held at Queen Elizabeth Park in Concord, with morning tea at Briars Sports Club. Over sixty walkers and families participated and a large group wore Midnight Oil t-shirts in memory of Wayne Morrow (Photo right).

Photo above: (R-L) Ken Takahashi (ADRI), Jocelyn McLean (ADRI), Serafina and Frank Salucci, Clare Collins (Insight Communications) Karen Selmon (ADRI).



Just 18 months following an EPP, Sandie Foreman (Photo above) walked with her family in the City to Surf raising much needed funds for ADRI. A truly amazing effort. Sandie regularly participates in Park Runs/Walks across Sydney and beyond - something to think about for fitness and wellbeing in 2019.

### Can we help you?

ADRI's Mesothelioma Support Coordinators, Jocelyn McLean and Joanne Roseman, utilise their knowledge and extensive experience of patient care, supporting carers to provide telephone, face-to-face and group meeting support to people who have been diagnosed with mesothelioma and their families. Jocelyn and Joanne work with established professional agencies, health professionals and local communities across NSW to provide current evidence-based clinical information and support. Through current survivorship and carer need research they address the needs of patients with malignant mesothelioma and support their families.

If you need support or if you would like to attend one of the group meeting, please contact Jocelyn or Joanne on (02 97679854 or [support@adri.org.au](mailto:support@adri.org.au)) or if you could like to attend one of the group meetings.





## Working with the WHO Organization to eliminate asbestos-related diseases

To assist governments of developing countries to stop using asbestos, ADRI Director Dr. Ken Takahashi has served on two WHO consultancy missions in 2018 in Vietnam and Lao PDR. These two countries continue to manufacture construction materials from chrysotile asbestos and record among the highest per capita volume of asbestos use. In Vietnam, Dr Takahashi contributed to the high-level meeting involving the Vice Minister of Health, Vice Minister of Construction and the WHO Representative of Vietnam (Photo above). In Lao PDR, he met the Minister of Health and the Australian Ambassador to discuss relevant issues. In the multi-sectoral workshop for developing the national action plan for the elimination of asbestos-related diseases, he presented on behalf of WHO and worked closely with Australian partners, the Union Aid Abroad APHEDA, as well as the Asbestos Safety and Eradication Agency (ASEA). Australia is taking international leadership to eliminate asbestos-related diseases from the world. ADRI is proud to be a leading party of this endeavour.

## A novel immune-chemo-microRNA approach to treat mesothelioma

As there are limited treatment options available for malignant pleural mesothelioma (MPM), a number of immunotherapies have been investigated. Antibodies

that block the interaction between proteins on the surface of the cell (PD-1 and PD-L1) have produced meaningful responses in cancer patients by activating the immune system. Recently, this treatment has been administered in mesothelioma patients in clinical trials and has shown promising results, but the response rates were not absolute. However there are strategies for MPM to develop anti-tumoural immune responses using immunotherapy to enhance chemotherapy toxicity to cells. ADRI researchers, Dr Steven Kao, Dr Yuen Yee Cheng and Dr Marissa Williams have investigated tumour suppressor microRNAs and found that there was a reduced response in tumours with high PD-L1 MPM patient samples, and restoration of these microRNAs led to the inability of PD-L1 to work in lab studies. These findings pave the way for a combined therapy with immunotherapy and chemotherapy to improve treatment strategies in MPM.

## Measurement of asbestos exposure used in the environment

Field studies have indicated that one out of three Australian houses built before the 1990s contain asbestos. However there is little information available on the asbestos content in all aspects of the environment, which poses a potential public health hazard. It is therefore important to identify asbestos in the built environment to prevent further exposure. Understanding the relevance of a wide range of current asbestos detection methods is the first step to establish a standardised measurement method. ADRI researcher, Ms ML Yuen, an industrial hygienist, is investigating available techniques and devices to identify asbestos and collate this information to establish standardised methodologies for future asbestos measurement. These findings will be available to health professionals in a readily-available online booklet to facilitate the identification of asbestos in our surrounding environment; optimistically leading to the prevention of asbestos-related diseases in the future.

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