Australian Respiratory Council Research Support Grants 2024/2025 Funding

Project Title: Understanding the Genetic Basis of Bushfire Particulate Matter Induced Toxicity

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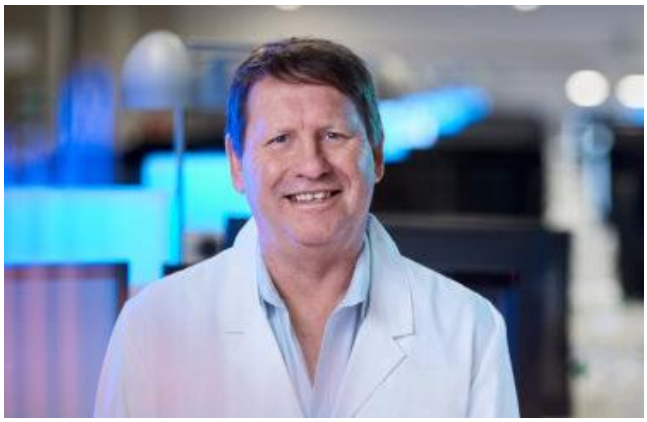
Bushfires are becoming more frequent and severe, particularly in Australia, posing serious public health risks. While bushfire particulate matter (PM) is known to cause inflammation, oxidative stress, and cell death in the lungs, the specific genes and pathways involved in cellular response and resistance remain unclear. To address these gaps, the research team will use whole genome CRISPR screening to knock out approximately 20,000 genes in lung epithelial cells exposed to bushfire PM. This will help identify genes essential for cellular protection or those that exacerbate damage, paving the way for new therapeutic strategies to mitigate the health impacts of bushfire PM.

Dr Keshav Raj Paudel

The research projects aims are to:

- Identify genes essential for cellular survival and function in response to bushfire PM exposure.
- Understand the molecular mechanisms of resistance to bushfire PM-induced damage.
- Discover potential therapeutic targets to mitigate the harmful effects of these pollutants on health.

Ultimately, this project aims to uncover genetic factors that could lead to novel therapies for respiratory diseases caused by environmental exposures.



Professor Philip Hansbro

Dr Tayyaba Sadaf