Australian scientists closer to finding new lung cancer treatments

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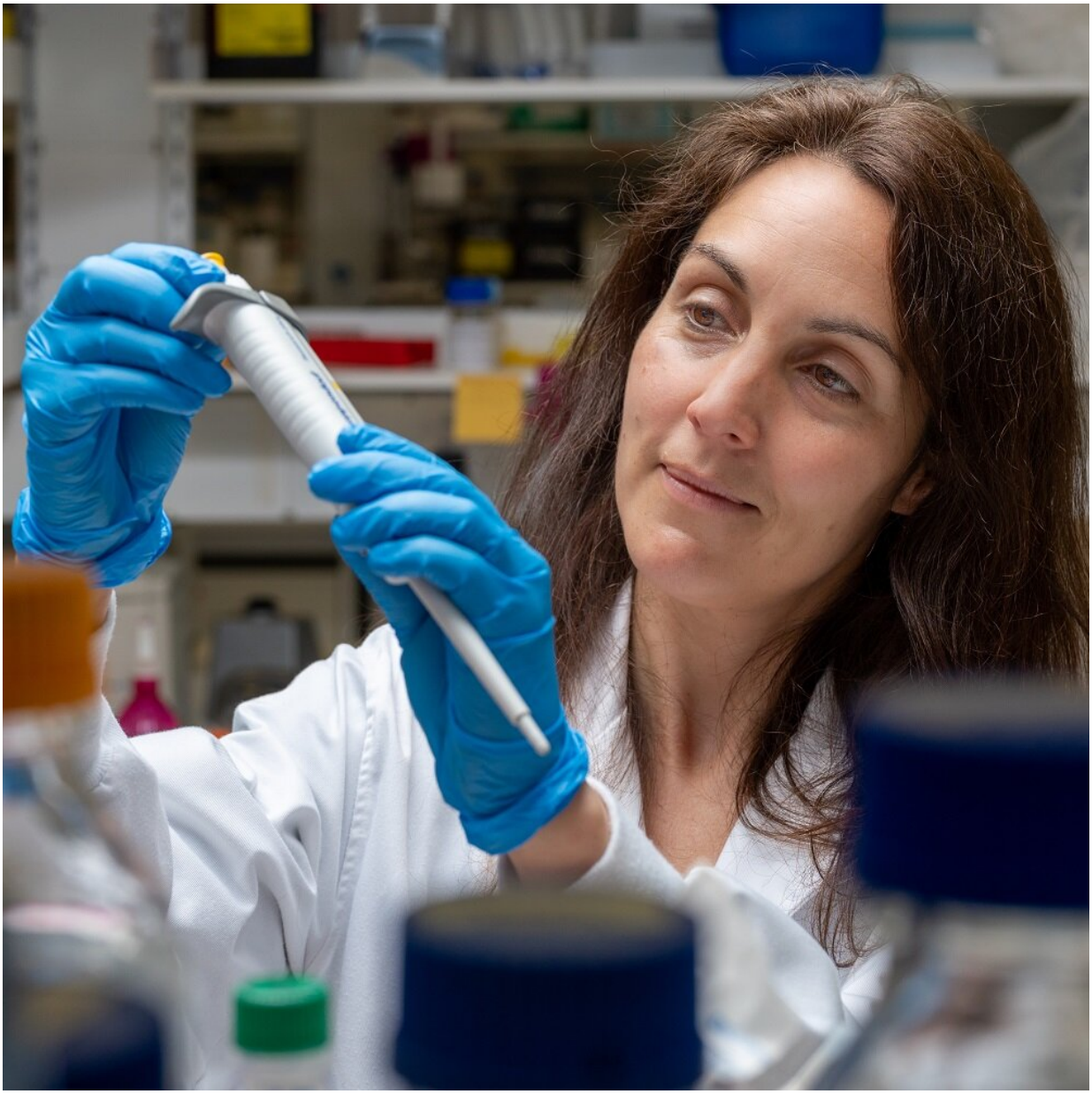

Associate Professor Marian Burr. Credit: Jamie Kidston/ANU

Scientists from The Australian National University (ANU) and the Peter MacCallum Cancer Centre have discovered that a protein, called Menin, contributes to abnormal deactivation of specific genes in cancer cells.

One of the hallmarks of cancer is that the normal regulation of genes is disrupted, and this causes cancer cells to look and behave differently to normal cells. Cancer cells can switch off certain genes, keeping them in a dormant state. By deactivating specific immune genes, some cancers are able to evade detection by the immune system, essentially becoming invisible. This allows the cancer to grow and become more aggressive.

By targeting the Menin protein using drug therapies, the researchers believe they can reactivate these genes, making the cancer cells once again visible and allowing the immune system to seek out and destroy them.

The findings, published in *Nature Cell Biology*, could lead to new and more effective treatments for lymphoma and lung cancer.

Professor Mark Dawson, from the Peter MacCallum Cancer Centre, said the findings help scientists learn more about how cells function.

"Our research discovery has major implications for many different fields of research because we need to understand how cells make decisions and change the way they act in order to find new ways to treat cancer," Professor Dawson said.

ANU Associate Professor Marian Burr, who is one of nine Snow Fellow researchers across the country and joint senior author, said the

researchers used gene-editing technology to delete the Menin protein from the cancer cells.

"Menin has been previously shown to activate genes. However, our research unexpectedly found that Menin functions to keeps these genes in an inactive dormant state," Associate Professor Burr said.

"This meant that by deleting Menin we could turn on the immune genes, which is essential to help the immune system to detect and kill the cancer cells.

"Importantly, specific drugs that inhibit Menin have been developed and are currently being tested in clinical trials for specific forms of leukaemia.

"Our findings expand the potential clinical uses of these drugs. We have shown that Menin inhibitors can be used in combination with other existing treatments to enhance killing of lymphoma and lung cancer cells in the laboratory.

"We believe that these drugs could also be effective in other types of cancer."

More information: Christina E. Sparbier et al, Targeting Menin disrupts the KMT2A/B and polycomb balance to paradoxically activate bivalent genes, *Nature Cell Biology* (2023). DOI: 10.1038/s41556-022-01056-x

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