

Researchers in Australia develop blood-based marker to identify sleep deprivation

March 12, 2024 | News

Sleep deprivation increases the risk of serious injury or fatality in safety critical situations



A blood test that can accurately detect when someone has not slept for 24 hours has been developed by a Monash University-led team in Australia.

The biomarker used a combination of markers found in the blood of healthy volunteers. Together, these markers accurately predicted when the study volunteers had been awake for more than 24 hours under controlled laboratory conditions.

The biomarker detected whether individuals had been awake for 24 hours with a 99.2 percent probability of being correct, when compared to their own well-rested sample. When a single sample was considered without the well-rested comparison (similar to a diagnostic blood test), it dropped to 89.1 per cent, which was still very high.

With about 20 per cent of Australia's road accidents caused by sleep deprivation, researchers hope the discovery may inform future tests to quickly and simply identify sleep deprived drivers. The biomarker could also be developed for other situations where sleep deprivation may lead to catastrophic consequences, such as in safety-critical workplaces.

The test may be also ideal for future forensic use but further validation is required. First author Dr Katy Jeppe, from the Monash Proteomics and Metabolomics Platform, previously from the School of Psychological Sciences, said it was difficult to say how soon the test could be developed for post-accident use.

"Next steps would be to test it in a less controlled environment and maybe under forensic conditions, particularly if it was to be used as evidence for crashes involving drivers falling asleep," Dr Jeppe said.

This sleep deprivation biomarker is based on 24 hours or more awake, but can detect down to 18 hours awake. A biomarker for limited sleep over the previous night could be developed but more research is required to combine the time since sleep with the amount of sleep in the predictions.