

## Salute to Novel Magnetic Nanotechnology for No More Cloudy White Wines!



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Sauvignon Blanc, Semillon, or Chardonnay – when you reach for your favourite white, it's the clean, clear sparkle that first catches your eye. Or does it? When white wines look cloudy it's a sign of protein instability, and a sure-fire way to turn customers away.

Ground-breaking research led by the [Australian Wine Research Institute](#) (AWRI) in partnership with the [University of South Australia](#) (UniSA), is ensuring white wines will always look their best as novel magnetic nanotechnology is proving to quickly and efficiently remove haze-forming proteins in white wine.

Funded by Wine [Australia](#), the research demonstrates an exemplary collaboration, combining the global standing of the AWRI in wine research and the world-class capabilities in surface nanoengineering developed at UniSA STEM.

Lead researcher, Dr Agnieszka Mierczynska-Vasilev says the [new technology](#) shows promise as a valuable and sustainable alternative to conventional bentonite fining treatments, potentially saving the wine industry millions.

“Protein haze is a serious problem for the wine industry. Not only because consumers see it as a defect, but also because conventional bentonite treatments can cause significant wine volume loss, which is also reflected in the bottom line,” Mierczynska-Vasilev says.

“In [Australia](#), the overall estimate of loss caused by bentonite fining is around \$100 million annually, and globally, this equates to approximately \$1 billion per year.

“Winemakers traditionally use bentonite to remove proteins and prevent haze formation, but as it is a clay, it swells in the wine solution and can lead to a loss of wine volume of approximately three per cent.

“Using this technology, winemakers could potentially remove haze-forming proteins safely and efficiently, without bentonite-associated volume loss, and importantly, could do so multiple times with the same nanoparticles.”

The new technology uses magnetic nanoparticles coated with acrylic acid polymers which, when placed in heat-unstable wine, attract and bind proteins to the nanoparticles’ surfaces. The particles are then drawn from the wine using a magnet, leaving behind a clarified product devoid of haze.

Tested on unfined\* 2017 Sauvignon Blanc, Semillon and Chardonnay from South [Australia](#), researchers found that the magnetic nanotechnology successfully removed 98 per cent of haze-forming proteins from wines in ten consecutive adsorption-desorption cycles, clearly indicating its ability for reuse.

“Unlike bentonite, a defining feature of this nanotechnology is its ability to be regenerated for re-application, without any adverse effects on the wine’s colour, aroma and texture compounds,” Mierczynska-Vasilev says.

“While there is still some way to go before the technology can be practically applied in wineries, and the need to obtain regulatory approval both in [Australia](#) and overseas, given the clear economic, sustainable and sensory benefits, this nanotechnology has a very strong potential for adoption – it’s absolutely a ‘watch this space’.”

\* unfined: unclarified by filtration.

Read the [original article](#) on the University of South [Australia](#).