

Raise your glass: New nanotech clears haze from white wine

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Sauvignon blanc, semillon, or chardonnay—when you reach for your favorite 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, 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's Future Industries Institute.

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 percent.

"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 unrefined (unclarified by filtration) 2017 Sauvignon Blanc, Semillon and Chardonnay from South Australia, researchers found that the magnetic nanotechnology successfully removed 98 percent 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 color, 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.'"

More information: Agnieszka Mierczynska-Vasilev et al. Regeneration of Magnetic Nanoparticles Used in the Removal of Pathogenesis-Related Proteins from White Wines, *Foods* (2019). [DOI: 10.3390/foods9010001](https://doi.org/10.3390/foods9010001)

Provided by University of South Australia

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