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CHASING MYSTERIOUS RED WINE PIGMENTS BY MASS SPECTROMETRY

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Anthocyanins are one of the most important and widespread groups of pigments in plants and are known to be responsible for the colour of many flowers and fruits. Red grapes are no exception and the colour measurement is used by the Australian wine industry to assess grape quality.

The grape-derived anthocyanins become the prime pigments contributing to the colour of young red wines but they are short-lived even though the wine exhibits long lasting red colour. The decreasing level of the grape-derived anthocyanins is concomitant with giving birth to new pigments, which are formed by the reaction of anthocyanins with wine constituents such as yeast metabolites and proanthocyanidins.

The formation of new pigments occurs immediately after crushing grapes, accelerates during vinification and continues in ageing. Seemingly, it is a never-ending process. As a result, the structural diversity of wine pigments is thought to be enormously broad, and therefore the characterisation of pigments in red wines remains an analytical challenge.

The application of mass spectrometry had little impact on the characterisation of anthocyanins until ESI-MS and LC/ESI-MS techniques were described and became commercially available. In grape and wine research, ESI-MS has now become a common and indispensable analytical tool for the characterisation and identification of anthocyanins and their derivatives. The progress of wine pigment research conducted by the Australian Wine Research Institute will be presented.