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## Taste receptor (TAS) genes associated to the perception of three wine descriptors: A Mendelian randomization approach

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The perception of 3 wine descriptors of red wine such as bitterness, astringency and acidity has been associated to the perception of 6-n-propylthiouracil (PROP) which binds to a receptor encoded by the bitter taste gene TAS2R38. We have investigated the direct involvement of the genes of taste in the perception of wine descriptors using the approach of Mendelian randomization. 300 Italian and 300 Czech volunteers were enrolled for taste perception of sucrose, sodium chloride, lactic acid and salicin to determine the global taste acuity score (GTAS) together with PROP. Volunteers rated the 3 descriptors of the red wine Raboso del Piave. Wide inter-individual variability was observed for GTAS, PROP and wine descriptors. These latter cross correlated with GTAS and PROP bitterness. Volunteers were genotyped for 28 single nucleotide polymorphism (SNPs) tagging the genome regions where taste genes are clustered. Ordered logistic regression adjusting for age, gender, country of origin and GTAS revealed that wine bitterness is associated only to the TAS2R38 gene polymorphism, in spite many bitter compounds in red wine are known to bind *in vitro* to a variety of receptor encoded by other bitter taste genes. Astringency did not significantly ( $p < 0.05$ ) correlate with any of the tested SNPs, whereas acidity correlated with TAS2R16 polymorphism. A different drinking behavior was also associated to this gene. Age, gender and nationality had no significant effect suggesting that two wine descriptors are perceived disregarding these biological and ethnic variables. Other genes involved in anatomy and taste physiology are suspected to be involved.

### Biography

Roberto Barale is a Professor of Genetics since 1986. He was the Director of the Department of Evolutionary Biology of Ferrara (1991-93) and Department of Human Sciences and Environment at Pisa University (1995-2003). In 2010, he was the Vice-Chancellor for Research at the University of Pisa. His Scientific interests include molecular genetics of yeast, cytogenetics of germ cells and somatic type, human cytogenetic bio monitoring, environmental mutagenesis, population genetics, computational genetics, relationship between mutation and cancer at molecular level, genetic polymorphisms associated with susceptibility to human cancers and pharmacogenetics. Since 2006 he is working on the genetics of taste. Lately, he is interested to genes involved in alcohol metabolism and genes of attention and correlation effects in simulated driving. He is the author of over 190 publications in international journals and the Past-President of the Italian Society of Environmental Mutagenesis. In 2009 he was awarded the Order of the Cherubim at the University of Pisa for scientific and educational merits.

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