



16TH INTERNATIONAL  
**CONGRESS ON YEASTS**  
*-Cape Town 2024-*  
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**CONGRESS ABSTRACTS**

## The expression of STR3 and IRC7 are differently affected by oxygen addition during fermentation

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Traditionally, oxygen supplementation during fermentation has been more strongly associated with yeast vitality and sugar consumption kinetics than with aroma metabolism. This study investigated the effects of oxygen addition during the exponential growth phase of yeast cells on the polyfunctional thiol profile of wine. Using quantitative real-time RT-PCR, the expression of five genes related to amino acid and peptide uptake, as well as two genes encoding  $\beta$ -lyase activity, was analyzed. UPLC/MS-MS was employed to quantify thiol precursors and volatile thiols in must and wine. The results revealed that oxygen upregulated the expression of genes involved in amino acid and peptide uptake, including GAP1, OPT1, OPT2, PTR2, DAL5, and FOT3, some of which are known as thiol precursor permeases. Overexpression of these genes in oxygenated trials was correlated with a reduction in thiol precursor residues in wines, particularly GSH-3MH, which was depleted before entry into the stationary phase. Additionally, the expression of the IRC7, gene responsible for thiol-releasing  $\beta$ -lyases in yeasts, was positively correlated with 4-mercapto-4-methylpentan-2-one (4MMP), which was more concentrated in oxygenated trials. However, oxygen downregulated STR3, affecting 3-mercaptohexan-1-ol (3MH) release, despite the increased precursor intake.