QTL PROCESS

FAQ

Are these yeasts GMO yeast?
No. These yeasts are hybrid yeast. They are not GMO.

Do I risk having less stable wines after using one of these yeasts?
The SO_2 produced by yeast is normally bound, so there is no impact on the stability of the wines. The low acetaldehyde production can be beneficial, encouraging more efficient SO_2 binding at the end of alcoholic fermentation.

Do these yeasts consume SO_2 during alcoholic fermentation?
SO_2 is usually consumed by *Saccharomyces* yeast through the sulphate pathway metabolism. The specific metabolism of these yeasts utilizes SO_2 directly to synthesize two essential amino acids containing sulphur, thus avoiding the release of H_2S.

Can these yeasts dominate wild yeasts when no sulphite is added to the must?
These yeasts shows strong fermentative properties. Its quick onset of fermentation and good multiplication during the growth phase discourage the development of indigenous flora.

Due to its low SO_2 production, do these yeasts favor malolactic fermentation?
They do favor MLF. In the case of wines where MLF is not wanted, the winemaker should closely monitor the final phase of alcoholic fermentation and apply good SO_2 practices to avoid MLF.

The selection of these yeasts was largely made possible through a collaborative study between the ICV Group, Lallemand Oenology, SupAgro and INRA Montpellier. This study, using the QTL technique (Quantitative Trait Locus), was used during the thesis: Identification of the molecular basis of technological properties of wine yeast (Jessica Noble, Advisor: Bruno Blondin, 2011). This work resulted in a patent application filed by INRA and Montpellier SupAgro: "Method of control on the production of sulfites, hydrogen sulfur and acetaldehyde by yeast (Variants MET_2 / SKP_2) "This approach has enabled the development of an innovative selection technique for yeast which produces low levels of $S0_2$, H_2S and acetaldehyde. "

LALLEMAND

Lallemand is the only major supplier of wine yeast and bacteria that is a primary producer of both. The company owes its success to its constant pursuit of excellence, flexibility, ongoing investments in research and development, and to its wide range of high quality products.
www.lallemandwine.com

GROUPE ICV
L'art & l'expertise du vin

Institut Coopératif du Vin
The **ICV Group** offers professional services and products for each stage of the winemaking process.
La Jasse de Maurin, 34970 Lattes, France
www.icv.fr

INRA

Institut National de la Recherche Agronomique
The French National Institute for Agricultural Research produces scientific knowledge and works for economic and social innovation in the areas of food, agriculture and the environment.
2, place Pierre Viala, 34060 Montpellier CEDEX 2, France
www.montpellier.inra.fr

Montpellier SupAgro

Montpellier SupAgro offers a full range of training courses from bachelor (professional) degrees to PhDs, as well as several excellent engineer training programs. Initial and continuing training, research, international scientific and technical cooperation, and development represent the main missions in the areas of agriculture, food, environment and rural territories.
2, place Pierre Viala, 34060 Montpellier CEDEX 2, France
www.supagro.fr

Distributed by

Lallemand Australia Pty Ltd
23-25 Erudina Ave, Edwardstown, SA 5039 Australia
Tel: +61 8 8276 1200 | Fax: +61 8177 1802
Email: australiaoffice@lallemand.com

LALLEMAND

LALLEMAND OENOLOGY

INTEGRATED SULPHUR MANAGEMENT

QTL PROCESS

QTL PROCESS

Consumer awareness of SO_2 content in wine, particularly since the label "Contains sulphites" is mandatory, has resulted in a trend toward reducing the addition rate of this compound. Reducing SO_2 content, both added and total residual dose, is now a serious technical and commercial issue for wine producers. Formation of compounds such as acetaldehyde (SO_2-binding), and H_2S (wine fault, rotten-egg aroma), are also a worrisome concern during winemaking.

Wine yeast are at the heart of the SO_2, acetaldehyde and H_2S production as they can be synthesized during fermentation. There is great variability in SO_2 produced by wine yeast during fermentation.(figure 1)

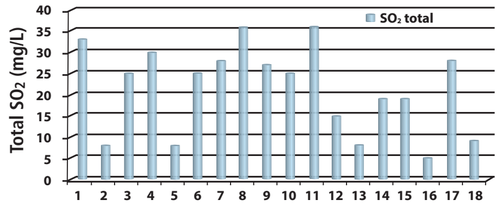


Figure 1. SO_2 produced by different wine yeasts

In a collaborative study we have identified the molecular basis of SO_2 production in yeast to eventually be able to reduce SO_2 production through the innovative QTL process. The QTL process involves identifying the genes for the desired trait (non-production of SO_2, acetaldehyde and H_2S) and naturally transferring it to another yeast chosen for its fermentation performance and other oenological qualities. Transferring the genes involved repeated crosses (backcrossing) between the low-SO_2 yeast and the target yeast. This is a non-GMO technique that can occur naturally in yeast. With this method, we obtained a yeast that produces very low to no concentrations of SO_2, H_2S and acetaldehyde.

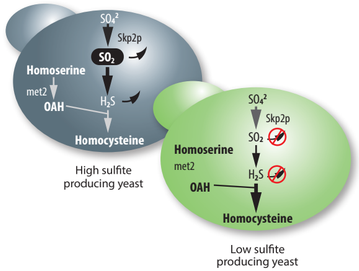


Figure 2. Simultaneous control on SO_2 and H_2S production by the combination of *SKP2* and *MET2* genes, and indirectly on acetaldehyde

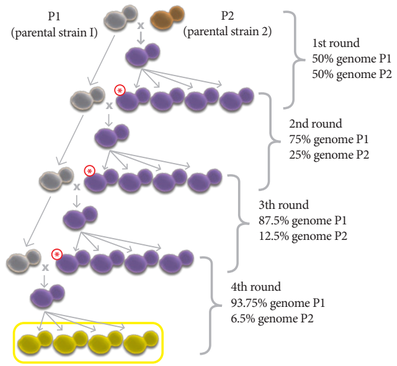
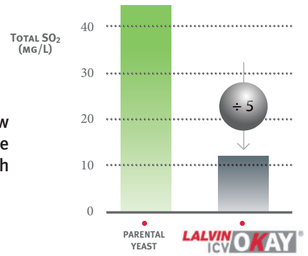


Figure 3. Yeast obtained with backcrossing, assisted by QTL markers

Looking to the future, the QTL innovative (and non-GMO) approach will be applied to other wine yeasts in our collection that are valued by winemakers for their enological properties but which may not always be considered due to concerns about sulphur compound production. The QTL process offers opportunities to bring out the best characteristics of naturally selected yeast.

LALVIN ICV OKAY®

For fresh aromatic and clean white and red wines with low to no SO_2, H_2S and acetaldehyde production in a wide range of winemaking conditions. Recommended for high sugar fermentations. A workhorse strain.

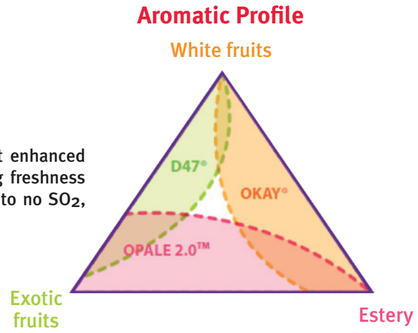


LALVIN™ sensy

Ideal for white varieties to promote varietal character, enhance aromatics and mouthfeel. A QTL yeast with low to no H_2S, SO_2 and acetaldehyde production. Recommended for Pinot Gris, Semillon, Chardonnay and Colombard.

ICV OPALE™ 2.0

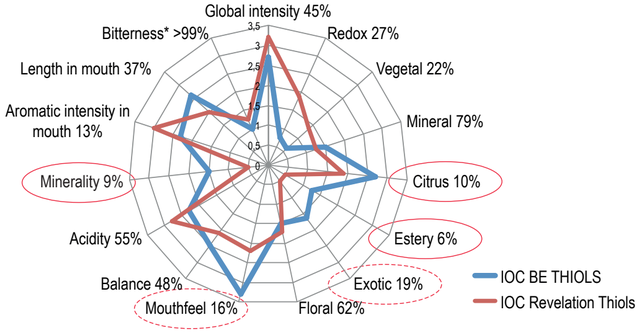
New wine yeast for rosé wines to bring out enhanced exotic and citrus aromas, while maintaining freshness sought after in rosés. A QTL yeast with low to no SO_2, H_2S and acetaldehyde production.



IOC BE THIOLS

Low SO_2 Solutions

Specific wine yeast for fruity thiols (exotic and citrus) in Sauvignon blanc. A QTL yeast with low to no H_2S, SO_2 and acetaldehyde production.



IOC BE FRUITS

Low SO_2 Solutions

Specific wine yeast to reveal fruity esters in white or rosé wines. A QTL yeast with low to no SO_2, H_2S and acetaldehyde production

This groundbreaking new selection technique (patent application PTC/IB220131050623) resulted in the wine yeasts: Lalvin ICV Okay™, Sensy™, Opale 2.0™, IOC Be Thiols™ and IOC Be Fruits™.

Lowering the production of negative S-related compounds by the QTL wine yeast to below the sensory threshold allows the aromatic fruit contribution to be expressed in the wine.