

Redefining *Pediococcus* and *Lactobacillus* Detection

Sample to results in under 3 hours at the winery



On-site PCR testing for spoilage organisms that can impact wine quality

vinoPAL combines proven diagnostic principles with innovative, proprietary PCR technology to enable accurate, rapid, and early detection of *Pediococcus* and *Lactobacillus* species at the winery.

Lactic acid bacteria are especially concerning early in the process, often leading to stuck or sluggish fermentations. These microbes have the ability to quickly multiply and cause problems in a matter of days. Rapid identification of lactic acid bacteria with vinoPAL during malolactic fermentation will allow winemakers to pursue targeted use of a reduction in cold soak or additive enzymes to assure the wine develops as intended.

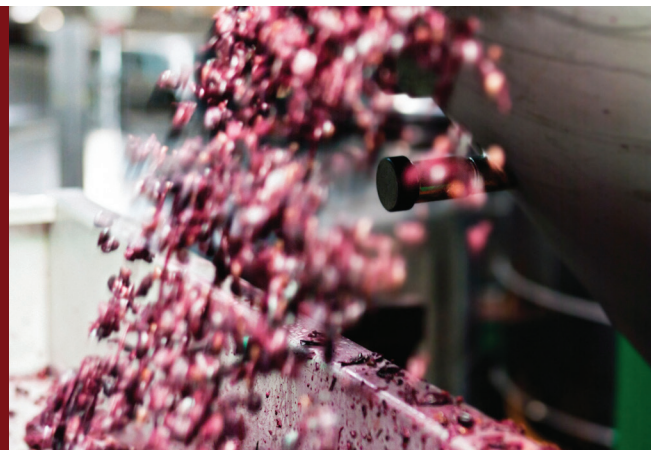
Methods to prevent organisms from entering the winery are not clear-cut. Early detection of unwanted organisms provides winemakers the opportunity to control the problem and mitigate damaging effects.

Key benefits of implementing vinoPAL in a proactive quality management program

- Affordable on-site analysis in less than 3 hours
- Accurate and sensitive to *Pediococcus* and *Lactobacillus* even at low thresholds in juice and young wines
- Early detection minimizes negative impacts on wine
- Sample prep is simple, with minimal training required
- Leverages the vinoBRETT quality management platform equipment

“Identifying the presence of *Lactobacillus* as soon as possible is a critical concern for me. This organism can multiply rapidly, and before you know it the fermentation can become sluggish, with possibility of high volatile acidity being formed. Early detection with vinoPAL will allow us to intervene quickly and prevent the loss of wine quality.”

— Eric Baugher, Vice President of Winemaking, Ridge Vineyards



Both vinoBRETT and vinoPAL wine quality detection tools from Invisible Sentinel can be implemented throughout the wine making process

Fermentation



Racking



Topping Wines



Finishing



Bottling



TEST PROTOCOL



COLLECT

Collect sample and centrifuge. Resuspend sample using provided proprietary Buffer A.

START - MINIMAL SAMPLE PREP



AMPLIFY (PCR)

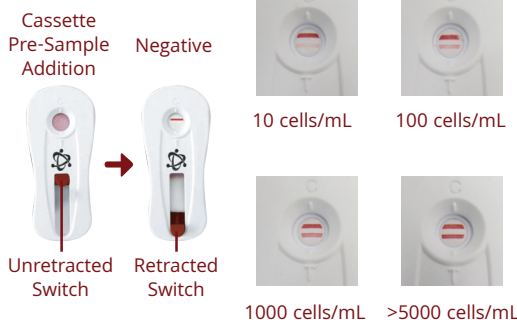
Transfer 5 ul of resuspended sample into provided PCR reagent tube. Place tube into Thermocycler and run program.

2.5 HOUR AMPLIFICATION



ANALYZE

Remove PCR Tube from Thermocycler and add proprietary Buffer B. Dispense PCR Tube contents onto test cassette window. Wait 3 minutes and retract test cassette switch to reveal test results. One line indicates negative result, two lines indicates semi-quantitative positive results.



Veriflow DNA Signature Capturing Technology	
DNA Amplification	Proprietary reagents eliminate need for sample purification
DNA Identification	Proprietary DNA signature detection specifically targeting <i>Lactobacillus</i> and <i>Pediococcus</i>
Visualization of Results	Vertical flow mediated visualization of results for easy interpretation via hand-held cassette
Sample Preparation	No enrichment or purification steps required
Certification	AOAC International Certified for foodborne pathogen detection
Current utilization	Food and juice manufacturers, premium wineries, craft breweries; global 3rd party testing labs; U.S. and international

vinoPAL Performance Specifications	
Sensitivity (LOD)	10-100 cfu/mL
Time to results	< 3 hours
Matrix compatibility	Wine, colony PCR, enrichment broth
Assay configuration	Qualitative and quantitative
Target selection	Ribosomal Deoxyribonucleic Acid (rDNA) gene
Specificity	<i>Lactobacillus</i> species: <i>L. fructivorans</i> , <i>L. backii</i> , <i>L. brevis</i> , <i>L. buchneri</i> , <i>L. hilgardii</i> , <i>L. kunkeei</i> , <i>L. lindneri</i> , <i>L. mali</i> , <i>L. nagelii</i> , <i>L. oeni</i> , <i>L. paracollinoides</i> , <i>L. rhamnosus</i> , <i>L. vini</i>
	<i>Pediococcus</i> species: <i>P. damnosus</i> , <i>P. inopinatus</i> , <i>P. pentosaceus</i>

vinoPAL utilizes the same Veriflow Thermocycler and simple workflow as vinoBRETT

ITEM #	DESCRIPTION	SIZE
IS1014	vinoBRETT Complete Test System	1 Kit, 24 Tests
IS1033	vinoPAL Complete Test System	1 Kit, 24 Tests
ISTC002	Veriflow Thermocycler	1 Unit

For more information or to place an order, please contact Invisible Sentinel at 215.966.6118 or www.invisiblesentinel.com

All test kits include Mastermix Reagents, Cassettes, Buffers

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