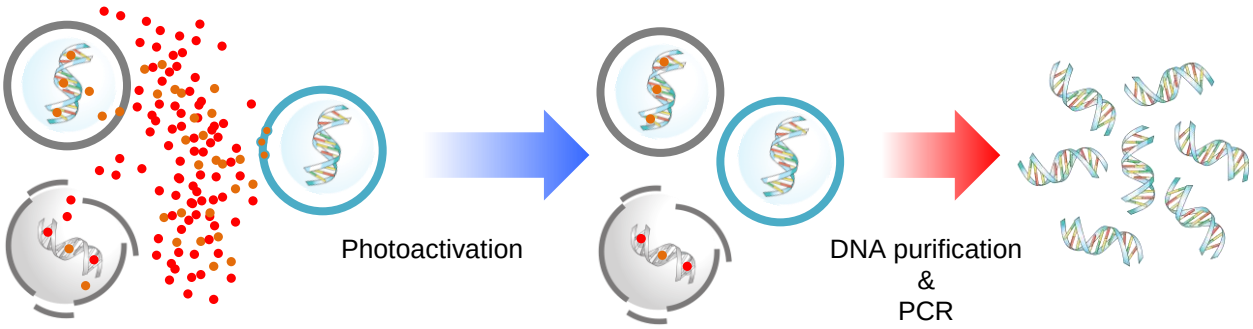
PEMAX Reagent, a new step forward in the detection of live cells by PCR

The PEMAX Reagent is a double dye technology developed by GenIUL, S.L. (Patent pending), in order to overcome the current limitations of viability PCR procedures. Nowadays, the paradigm is based in the cell membrane integrity of living cells as a unique differential factor from dead cells. However, as appointed in first reports, some disinfection procedures can induce cells death without compromising membrane integrity [1].

This new reagent, combined with the appropriate reaction buffer, extends the concept of viability PCR to cells with intact cell membrane structure but also with capability to actively maintain bacterial homeostasis, as a result of active metabolism [2].



Live cell: intact membrane, active metabolism

Dead cell: intact membrane, no metabolism

(No ATP turnover)

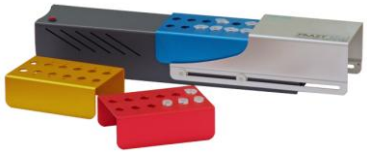
Dead cell: damaged membrane, no metabolism

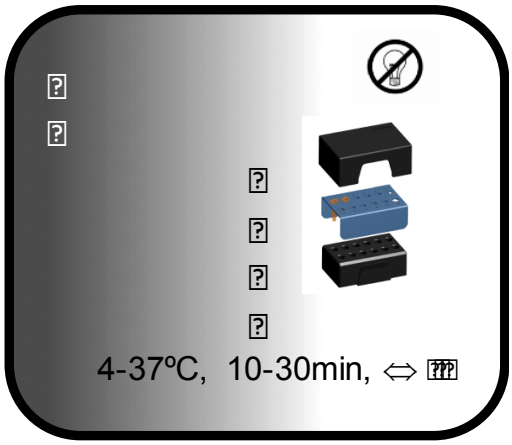
Double dye technology combines two photo-reactive molecules with different size and charge. The smaller molecule is capable of crossing cell membranes, but most of microorganism by the means of active efflux pumps, are able to revert this uptake.

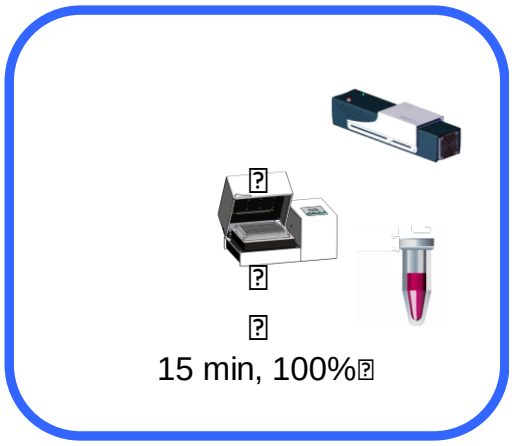
To allow the cells to maintain their homeostasis, are necessary larger incubation times and well defined reaction buffers. The second dye is needed to complete dead cell DNA neutralization when in the sample exist high amounts of dead cells.

Combining both dyes with the correct reaction buffer, the DNA from dead cells (with damaged or not damaged membranes) will be neutralized; therefore only DNA from live cells will be detected by PCR.

[1] Nocker A, Sossa KE, Camper AK. Molecular monitoring of disinfection efficacy using propidium monoazide in combination with quantitative PCR. J Microbiol Methods 2007; 70(2):252-60.
[2] Codony F, Agustí G, Allué-Guardia A. Cell membrane integrity and distinguishing between metabolically active and inactive cells as a means of improving viability PCR Molecular and Cellular Probes. 2015; 29(3):190-2.







Simple treatment previous to PCR workflow

Add the reagent to a sample aliquot dissolved in reaction, mix and incubate in the dark during at least 30 min. prior to photoactivation.

GenIUL, S.L. provides precise devices for reagent photoactivation.

Efficiency

PhAST Blue and PAUL System combine a high power LED with the proper optical alignment of the reaction containers in order to ensure the maximum efficiency in the binding of the reagent to DNA.

Reproducibility and Speed

Our instruments improve reproducibility and avoid variations due to manual photoactivation. They are thermally stable and provide a constant and uniform light dose, allowing simultaneous photoactivation of multiple samples in a simple and efficient manner in 10-15 min.

GenIUL Consumables and Accesories

Increase the photoactivaction efficiency using our reaction tubes. Compared to others, our reaction tubes could obtain up to twofold better ligth transmittance results.

Reaction Buffers are one of the key points in vPCR protocols. We provide specific solutions in order to improve the yield of sample pretreatment.

Dark Box Sytem protects from light your reaction mix during dark incubation.

ORDERING INFORMATION

PEMAX Reagent, 2 vials of 0,5mg	Cat. No. 4900013000	Reaction Buffer Standard	Cat. No. 4900018000
PEMAX Reagent 25 monodoses (TBC-Biomarker kit)	Cat. No. 4900013025	Reaction Buffer +	Cat. No. 4900018001
		Reaction Buffer Anaerobic	Cat. No. 4900018002
Reaction Tubes	Cat. No. 4900019000	PhAST Blue	Cat. No. 9000700
Dark Box System	Cat. No. 90001200	PAUL System	Cat. No. 90001400