

# DEPENDABLE CULTIVATION OF ANAEROBE AND MICROAEROPHILIC GERMS

## Test of the new TRILAB-System

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Report from January 2002

### Introduction

The creation of an environment for the cultivation of anaerobe or microaerophilic bacteria can be done in practise in two different ways. On the one hand with chemical reaction sachets, which absorb O<sub>2</sub> and release CO<sub>2</sub>, on the other hand with evacuation and filling mix gas. Typically a mix gas with 10%H<sub>2</sub>, 10%CO<sub>2</sub> and 80%N<sub>2</sub>.

In 1996 the first test report showed that the evacuation and gas filling method is much more reliable than the chemical reaction sachets. (Imhof A. und I. Heinzer: Continuous Monitoring of Oxygen Concentrations in Several Systems for Cultivation of Anaerobic Bacteria, Journal of Clinical Microbiology, July 1996, p. 1646-1648).



### TRILAB (Jenny Medical)

This newly developed System is based on the evacuation and gas filling method. That means one- or multiple-evacuation and gas filling in a closed jar.

The compact unit with dimensions similar to a small coffee machine, contains a vacuum pump, gas connectors and an electronic control panel. On the front side is an opening to put in the TRITAINER (change jar) with the petri dishes inside.

Per press START button the TRITAINER will be automatically connected and the program runs itself. After about 2 minutes a peep signals the end of the program. The TRITAINER can be removed and put in an incubator for cultivation.

## Material and methods

Oxygen measurement	O <sub>2</sub> -Analyzer model 3600 (Orbisphere Laboratories)
Incubation	Incubator (Heraeus)
Gas	Mix gas, 80% N <sub>2</sub> , 10% CO <sub>2</sub> , 10% H <sub>2</sub> (Pan Gas)
Anaerobe system	TRILAB, TRITAINER with catalyst (Jenny Medical)
Chemical sachets	GasPack (BBL) Anaerocult A (Merck) AnaeroGen (Oxoid) Genbox (bioMérieux)

## Practical measurement conditions



To emulate the laboratory conditions very exactly, all the oxygen measurements were done in an incubator with a constant 37°C.

At the time the TRITAINER contained 10 blood agar petri dishes (no samples).

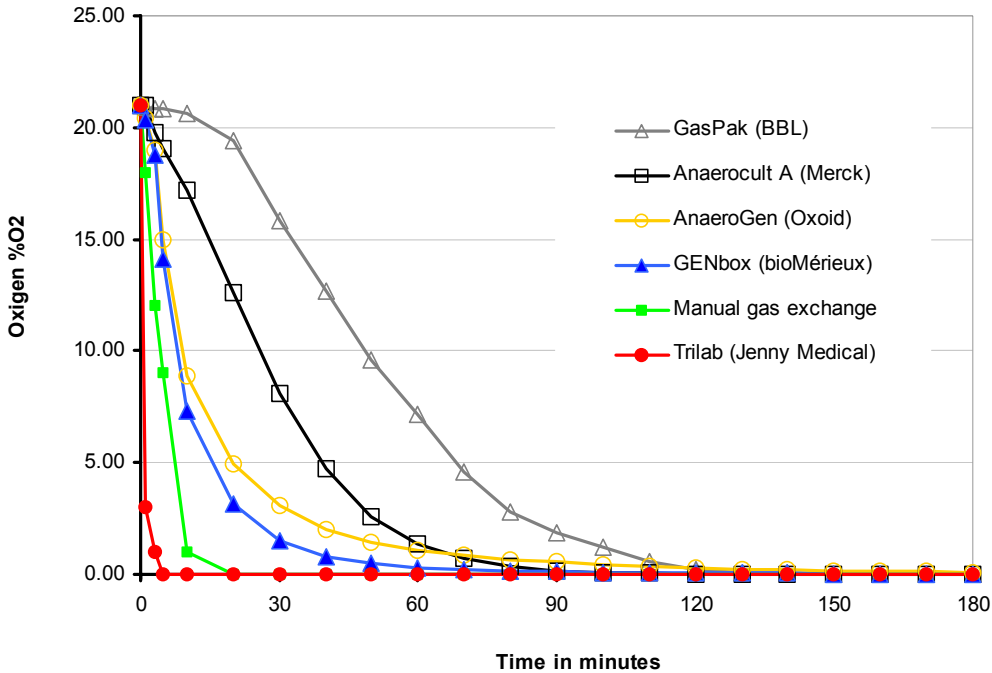
A specially created cable channel through the incubator allowed the measurement signals to be relayed to the outside for fully-automatic recording.

O<sub>2</sub> measurement sensor with the jar in the incubator

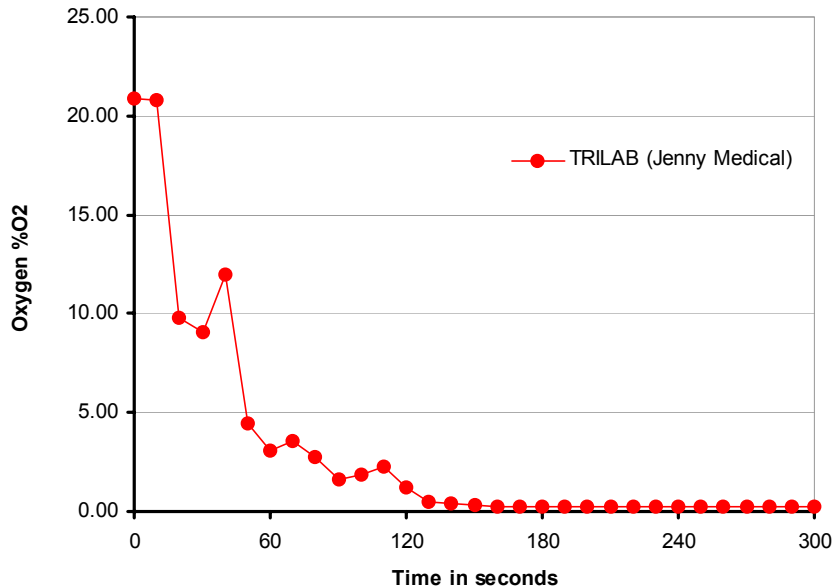
## Results

The graph below shows that the TRILAB (Jenny Medical) system and the manual gas exchange are clearly superior to the chemical reaction methods

A) Direct comparison of the different methods for creating anaerobic conditions



B) Detail TRILAB



## Discussion

Anaerobic germs from clinical inquiry probes should be safety treated, that means be put as fast as possible under anaerobic conditions. Chemical reaction systems, which have over 1% O<sub>2</sub> concentration after 60 minutes must be considered unusable to find sensitive germs. The system TRILAB is very fast and has the advantage in comparison to manual gas exchange that the anaerobic environment is created simply and exactly reproducible.

Faulty manipulations are virtually impossible. In contrast to the chemical reaction sachets no waste occurs.

On the grounds of the good test experiences we have decided to buy the TRILAB system for the microbiology laboratory at Kantonsspital Baden. It has now been running for 2 months to our full satisfaction.

## Running costs TRILAB

(Mix gas 80% N<sub>2</sub>, 10% CO<sub>2</sub>, 10% H<sub>2</sub>)

gas cost per filling anaerobe (10 dishes)	0,15 Euro
gas cost per filling microaerophilic (10 dishes)	0,05 Euro
Maintenance cost per year incl. 10 TRITAINER	ca 500 Euro

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