UNIVERSITAT DE BARCELONA

- HYPOXIC ATMOSPHERE
- CELL CULTURE
- MEDICAL TECH

A SOLID BUSINESS CASE IN COLLABORATION WITH
THE "UNIVERSITAT DE BARCELONA "

GENERAL INFORMATION ABOUT THE PROJECT

TARGET OF THE PROJECT:
Cell Study - Mimicking Obstructive Sleep Apnea

DEPARTMENT:
Unitat de Biofísica i Bioenginyeria, Facultat de Medicina,

HEAD OF PROJECT MANAGEMENT:
Daniel Navajas

ROLE OF MCQ INSTRUMENTS:
To create and control specific hypoxic environments.

MORE INFORMATION ABOUT THE HEAD OF THE PROJECT

Daniel Navajas, Ph.D.
Professor of Physiology, Unit of Biophysics and Bioengineering, Department of Physiological Sciences I, School of Medicine, University of Barcelona.

Group Leader, Institute for Bioengineering of Catalonia (IBEC). Academic Director, Degree in Biomedical Engineering, University of Barcelona

DESCRIPTION OF THE APPLICATION AND THE TARGET

Intermittent hypoxia (IH), a hallmark of obstructive sleep apnea (OSA), plays a critical role in the pathogenesis of OSA associated morbidities, especially in the cardiovascular and respiratory systems.

Oxidative stress and inflammation induced by IH are suggested as main contributors of end-organ dysfunction in OSA patients and animal models. Since the molecular mechanisms underlying these in vivo pathological responses remain poorly understood, implementation of experimental in vitro cell-based systems capable of inducing high-frequency IH would be highly desirable. .

Rat bone marrow derived mesenchymal stem cells (MSCs) exposed to IH mimicking OSA and cyclic stretch at cardiac frequencies revealed that hypoxia-inducible factor 1a (HIF-1a) expression was increased in response to both stimuli. Thus, the chip provides a versatile tool for the study of cellular responses to cyclical hypoxia and stretch. We bought three gas blenders model 100 to have different test line. We use them to apply cyclic changes in PO2 to a PDMS chip subject cultured cells to intermittent hypoxia for several days. An inlet tubing of 0.3mm ID (1m long) was connected to a Gas Blender 100 able to provide fast changes in gas composition.

BENEFITS AND SAVINGS

A traditional method would require instruments that could NOT make possible bringing forward these experiments with easy and a precise, constant, management of the micro gas flows.
The Universitat de Barcelona were seeking a solution for their study about cells and intermittent hypoxia (low oxygen). Thanks to our instruments now it's possible to regulate low-flows of gases with basically NO CUT-OFF, throught the user-friendly software, the automation helps to set routines and to check the stability of the flows with great precision.
Our Gas Mixer makes the research into the effects of low oxygen (hypoxia) much easier and with a less complicated equipment setup., less space and cheaper budget.

GAS MIXER VS MASS FLOW:

The GAS MIXER channels it's more compact than typical flow controller meters and can be specifically calibrated on the mixture to be used.

WITHOUT MCQ? (HARD)

3 Mass Flow Controllers with Power control Unit, tubes, NO-Software and different Gas Mixture Cylinders.

TIME SAVINGS:

Instead of changing a calibration cylinder for each point, our Gas Mixer uses pure gas allowing the Universitat de Barcelona to set all the desired calibration points in just a few steps.

SOFTWARE AUTOMATION:

Thanks to our Software PRO version and its option "Automatic Program", now Universitat de Barcelona can bring forward experiments in automation, painlessly.

MICRO FLOWS - NO CUT OFF:

OUR GB100 Series allows you to control the flow in all the calibration range, from 0,1 ml/min to 500 ml/min with NO cut-off

FLOW STABILITY:

Thanks to our revolutionary method every gas flow has a great stability making possible to have a stable flow also for lower flow-range.

READY TO TALK ABOUT YOUR SOLUTION?

info@mcqinst.com - www.mcqinst.com