UNIVERSITY OF OXFORD

- OXYGEN REGULATED MICROSCOPE PERFUSION SYSTEM
- FLEXIBILITY, COST & SPACE SAVINGS
- DYNAMIC GAS MIXTURES

A SOLID BUSINESS CASE IN COLLABORATION WITH
UNIVERSITY OF OXFORD

GENERAL INFORMATION ABOUT THE PROJECT

TARGET OF THE PROJECT:
Oxygen regulated microscope perfusion system

DEPARTMENT:
Target Discovery Institute

HEAD OF PROJECT MANAGEMENT:
Tom Keele

ROLE OF MCQ INSTRUMENTS:
To generate gas mixtures containing a wide variety of physiologically relevant oxygen concentrations, with which superfusing solutions can be bubbled to equilibrate.

MORE INFORMATION ABOUT THE COMPANY

The University of Oxford is a collegiate research university in Oxford. There is evidence of teaching as early as 1096, making it the oldest university in the English-speaking world and the world's second-oldest university in continuous operation.
The university is made up of 39 semi-autonomous constituent colleges, six permanent private halls, and a range of academic departments which are organised into four divisions.

DESCRIPTION OF THE APPLICATION AND THE TARGET

University of Oxford is interested in understanding cellular responses to changes in oxygen levels, relevant to the study of diseases such as cancer, stroke, and in transplant medicine. The activity of human or mouse cells cultured in vitro is monitored using real-time fluorescent readouts of changes in intracellular Ca^{2+} or NADH levels, in response to a reduction in available O_2. In our setup, cells are superfused with medium pre-equilibrated to 5% CO_2 and a defined, variable pO_2, and fluorescence monitored by epifluorescence microscopy. To this end, Univerisity of Oxford required a method of generating gas mixtures containing a wide variety of physiologically relevant oxygen concentrations, with which superfusing solutions can be bubbled to equilibrate. This is traditionally achieved using pre-mixed compressed gas cylinders, though this requires substantial infrastructure and space, with offering limited flexibility in terms of available gas mixtures.

Moreover, obtaining custom mixtures containing less common O_2 concentrations can be costly, both financially and timely. With N_2 and CO_2 available via a central source within the building, electronic gas mixers offered a more flexible and user-friendly option to deliver custom gas mixtures.

BENEFITS AND SAVINGS

BENEFITS - Availability of customisable gas mixtures without any change in hardware or need for additional supplies.
COST SAVINGS - Using building supplies of N_2 and CO_2 will reduce the long-term running costs of the equipment, and will negate the need to order custom gas mixtures supplied in cylinders
TIME SAVINGS - The immediate availability of any gas mixture required (5% CO_2, 0-18% O_2) is a potentially substantial time saving feature, as ordering custom gas mixtures can take 1 month.

GAS MIXER VS GAS CYLINDER

The ability to blend O_2 simulations on-demand is an incredibly powerful tool in the development and provides a level of flexibility that gas cylinders cannot provide.

COSTS & SPACE SAVINGS:

Our GB100 Series allows Univerisity of Oxford to have a method of generating gas mixtures containing a wide variety of physiologically oxygen concentrations. This is traditionally achieved using pre-mixed compressed gas cylinders, though this requires substantial infrastructure and space, with offering limited flexibility in terms of available gas mixtures.

TIME SAVINGS: -70%

Easier setup management of the hardware.
Easier setup management of the software.

MICRO FLOW RATES:

NO CUT-OFF

Our GB100 Series allows the University of Oxford to control the flow in all the calibration range, from 0,1 ml/min to 500 ml/min with NO cut-off.

EASY TO USE SOFTWARE:

Thanks to our Software PRO Version and its easy-touse user interface, now the University of Oxford can easy set all the experiment through our software.

SUCCESSFUL ACHIEVEMENT:

GB100 Series offers a more flexible and user-friendly option to deliver custom gas mixtures to an oxygen regulated microscope perfusion system.

READY TO TALK ABOUT YOUR SOLUTION?

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