PreSens
PRECISION SENSING

Dear Dr. Max Mustermann

Online monitoring of O_2, pH and / or CO_2 is essential for the results in numerous millifluidic and microfluidic applications - evidenced by the exciting application notes that we received as part of our SensorPlug Competition. Scientists had the chance to test this new sensor format (Mini-Luer based version) on chip designs, Lab-on-a-Chip and Organ-on-a-Chip applications.

The participants of our competition confronted our team of experts with difficult decisions with their excellent scientific work, giving them a hard time selecting the winners. Immerse yourself in our three award-winning application reports!

You have not yet heard of the SensorPlugs by PreSens? Then have a closer look at our product details.

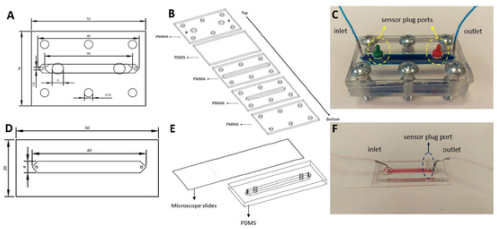
Enjoy reading and we are always keen on your feedback!

Your PreSens Team

Our Winners' Podium

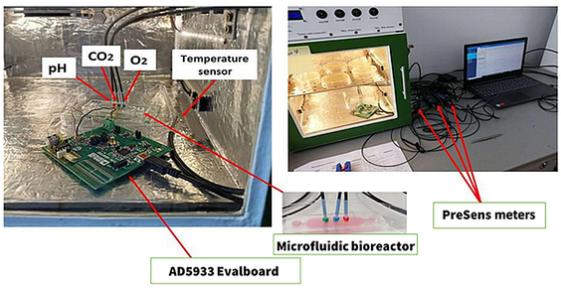
1st Place:

A Microfluidic Platform for Real-time Non-invasive Monitoring of Microglia Polarization



In this study, a team of researchers from the Izmir Biomedicine and Genome Center, the Dokuz Eylul University and the Ankara University, Turkey, hypothesized that sensor systems can be utilized for non-invasive real-time monitoring in microglia metabolism to further elucidate the polarization levels towards a specific phenotype under dynamic microenvironment. They designed and fabricated a microfluidic chip to culture microglia under continuous flow and correlate changes in oxygen and pH with polarization state upon activation.

>> Read the entire application note ...



2nd Place:

Cultivated Meat Bioprocess Optimization -

O2, pH and CO2 Monitoring in *E.coli* Culture with PreSens SensorPlugs

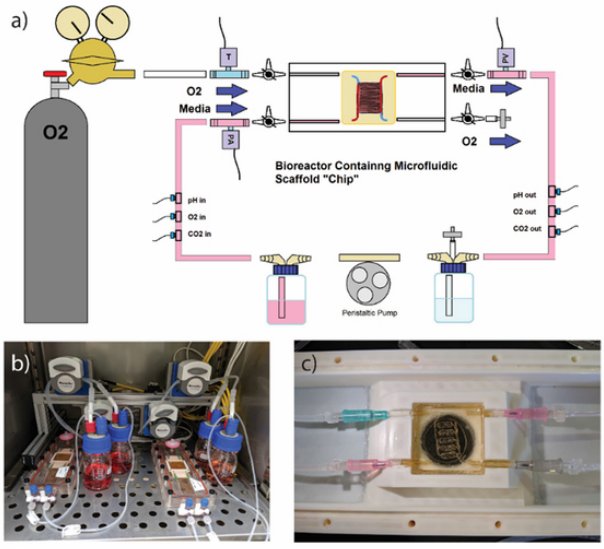
A team of researchers from the BioSense Institute in Novi Sad, Serbia, tested the efficacy of PreSens SensorPlugs for monitoring bacterial cultures in microfluidic bioreactors (MBs), which is important in the context of monitoring potential contamination in the culture meat bioprocess. *Escherichia coli* (ATCC® 25922™) was cultivated inside a custom-made MB with integrated SensorPlugs. The optical measurements showed the characteristic course of *E. coli* growth, and allowed precise assessment of current culture status at all times.

>> Read the entire application note ...

3rd Place:

Development of Biomimetic Lung-on-a-Chip Platform

Oxygen transfer measurements with SensorPlugs at the inlet and outlet



The goal of this project by researchers of IVIVA Medical, Beverly, MA, USA, was to provide a biomimetic lung-on-a-chip platform for tissue engineering and specifically for investigations of disease pathology. They first established long-term culture in a 3D lung model and measured baseline values for oxygen transfer and fluid filtration across the porous membrane in their model, both of which are known to be affected by viral infection *in vivo*.

To measure oxygen transfer, they used PreSens' optical oxygen sensors placed directly in the fluid perfusion pathway both at the inlet and outlet of the scaffold. Using this set-up, they have shown that their lung-on-a-chip model achieves similar rates of oxygen transfer, when normalized by gas exchange surface area, as that seen in commercial oxygenators.

>> Read the entire application note ...

Product Information on SensorPlugs

With the appropriate chip and port design, the SensorPlugs can be integrated at one or several positions on your microfluidic device. An optical sensor is attached to an e.g. Mini-Luer based plug, which can easily be integrated in your chip via the corresponding port. The plug is connected to a single-channel meter for oxygen, pH or CO_2 via a polymer optical fiber (1 mm diameter) and the sensor is read out non-invasively, so there is no risk of contamination. SensorPlugs are delivered beta irradiated and pre-calibrated so you can start your measurements right away. We offer customized SensorPlug formats as well as support for chip and port designs including the VisiSens 2D imaging system for preliminary evaluation of your chip.

- Non-invasive pH, O_2 & CO_2 monitoring in millifluidic & microfluidic chips
- Pre-calibrated sensors, plug & play
- Beta irradiated
- Compatible with PreSens Measurement Studio2, standard PreSens meters and EOMs

The following types of SensorPlugs are available:

- O2 SensorPlug (measurement range: 0 - 100 % O2)
- pH SensorPlug (measurement range: pH 5.5 - 8.5)
- CO2 SensorPlug (measurement range: 1 - 25 % CO2 at atmospheric pressure (1013 hPa)

You would like to learn more about PreSens Precision Sensing? Please visit our homepage www.presens.de and don't hesitate to contact us. Any feedback will be appreciated.

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Communications

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PRECISION SENSING

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