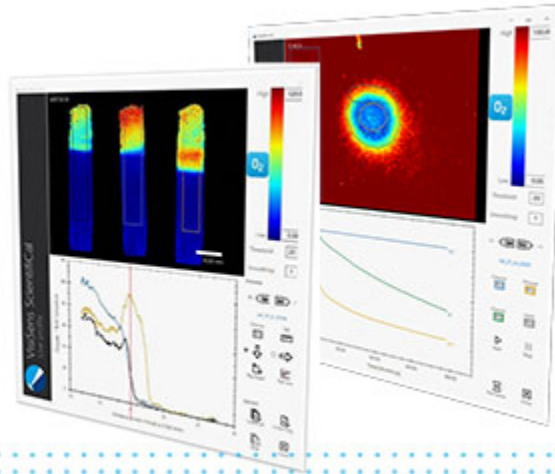




## New Live Plugins

2D insights on O<sub>2</sub>, pH  
and CO<sub>2</sub> distribution



Dear Dr. Max Mustermann

You need to know the amount of oxygen in your biological system? Are the effects of irradiation on different cell types in in vitro cell cultures your research area? Or would you want to use cell based assays as an indispensable tool for your work?

Then gain more information in 2D! The modular imaging system [VisiSens TD](#) with its new software including the live evaluation plugins allows you e. g. to compare a multitude of regions of interest within one measurement. Thereby you can directly benchmark your sample with blanks or investigate different samples in one experiment. Even combinations of different analytes are possible. The new live plugins of the revised software for the VisiSens TD ease the access to your relevant data. Besides the essential product information this newsletter also invites you to read some of our matching [application examples](#).

Any questions to your set-up? Contact your expert [Dr. Robert Meier](#)!

Your PreSens Team

## VisiSens TD - The Modular System for O<sub>2</sub>, pH and CO<sub>2</sub> Mapping

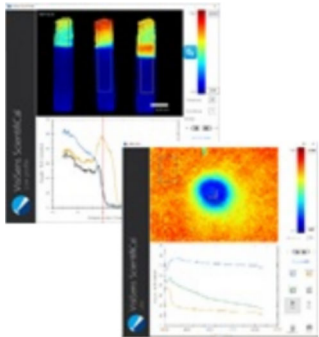
The [VisiSens TD](#) is a modular imaging system that can read out up to three analytes in one system. Planar sensors are placed on the sample area or in different cavities and the fluorescent sensor signals are read out pixel by pixel with a camera. Choose the options that you need for your experiment:

- multiple sensor types combinable in one field of view
- variable sensor and measurement geometry
- 12-bit detector
- adaptable field of view, microscopic, 4 x 4 cm<sup>2</sup> or up to 30 x 25 cm<sup>2</sup>
- time-lapse slide shows or recordings



>> [Learn more](#) about the measurement principle of our imaging technology, methods to control and investigate concentration gradients or inhomogeneity, as well as possible set-ups, according to your application.

## Software-Update: VisiSens ScientifiCal and VisiSens Plugins



The new VisiSens ScientifiCal software contains a starter pack with several evaluation plugins ranging from:

- simple live 2D pseudocolor representation with statistics
- to live multi ROI evaluation with plotting
- to live multi gradient profiling as well as
- a video creator and a raw extractor for further processing of the data in a 3rd party image software.

>> HOW<sub>2</sub> ... Use the Live Plot Plugin for VisiSens ScientifiCal ([video link](#))

Compare different regions of interest (e. g. inner, peripheral and media)

>> HOW<sub>2</sub> ... Use the Live Profile Plugin for VisiSens ScientifiCal ([video link](#))

Gradients over 3D cell culture, spheroids, etc.

## Accessories to the VisiSens TD

- [VisiSens TD Big Area Imaging Kit](#):

Enables large area imaging & includes excitation lights for O<sub>2</sub>, pH and CO<sub>2</sub> imaging

- [VisiSens TD MIC Kit](#):

Optics and an excitation light source to adapt the VisiSens TD Basic System for microscopic oxygen imaging

- [VisiSens TD Mounting Rack](#):

Secure mounting of VisiSens TD Big Area Imaging Kit & quick-lock levers for fast modification of the set-up

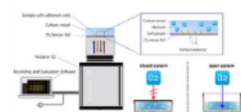
- [Imaging Sensor Plate Adapter Tubus](#):

Specifically designed for ISP24 and ISP96 imaging sensor plates due to easy attachment to VisiSens TD Basic Set

## Application Examples:

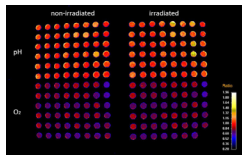
### Oxygen Consumption Rates of Adherent MDCK II Monolayer Cells

A Comparison of Open and Closed Systems Using the VisiSens TD Imaging System



Oxygen is a molecule of utmost importance for biological systems because it is necessary for life but may also induce detrimental damage. Thus, the local  $O_2$  concentration is an important analytical parameter to describe the conditions and metabolic activity of biosystems. The oxygen consumption rate (OCR) of cells and tissues may be used e. g. as surrogate parameter for studying the effects of drugs. In this application note we show how optical  $O_2$  sensors and the VisiSens imaging system can be used to investigate OCR in open and closed vessels.

[>> Read more ...](#)



## Imaging of pH and $pO_2$ on Irradiated Fibroblasts and Oral Squamous Carcinoma Cells

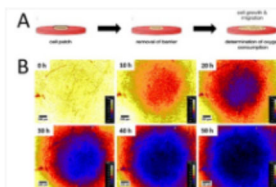
Dual Read-out of pH and  $pO_2$  in 96 Well Plates with VisiSens TD

One of the major challenges in radiation therapy is the interference with tissue repair processes. In this context, chronic wounds show hypoxic characteristics. However, sufficient oxygenation is mandatory for cell proliferation, granulation, migration, as well as protein synthesis during tissue repair. Additionally, pH is particularly important in signaling within damaged tissues and therefore precisely regulated. In this study, we investigated the effects of irradiation on different cell types in in vitro cell cultures. We used biocompatible pH and  $O_2$  sensor foil equipped 96 well plates along with dual analyte 2D readout with the VisiSens TD system.

[>> Read the entire application note ...](#)

## Spatio-temporal $O_2$ Gradients in the Microenvironment of an Outgrowing Cell Patch

Oxygen Imaging in Micro-Scale with the VisiSens TD MIC System



Cell-based assays have emerged to an indispensable tool in all areas of the biomedical sciences. However, cell culture experiments in a laboratory environment are always questioned for their physiological relevance in general and their compliance with the physiological microenvironment in particular.

Oxygenation for example is not routinely controlled in 2D cell culture experiments, although hypoxia, i.e.  $O_2$  values lower than air saturation, is common to many types of tissue in the animal body. Most cell culture is performed, however, under 'standard conditions' (95 % air, 5 %  $CO_2$ , 37 °C) so that oxygen levels in the cell culture fluid are non physiological. Static cell cultures build up a cell-type dependent microenvironment, which is the result of cellular respiration, proliferation and the finite diffusion rates in static media. It was the aim of this study to measure the local  $O_2$  concentration in the microenvironment of adherent cell patches that are allowed to proliferate and migrate.

[>> Read more ...](#)

You would like to learn even more about PreSens Precision Sensing? Please visit our homepage [www.presens.de](http://www.presens.de) and don't hesitate to contact us. Any feedback will be appreciated.

With kind regards

**Christina Schlauderer**  
Communications

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