Memmert backs COSIR project by providing CO2 incubator

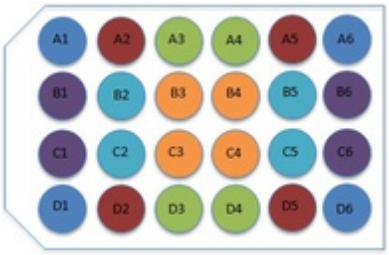
With assistance of the Institute of Bioprocess Engineering at Erlangen university, the COSIR project is currently in progress. Results of the project are eagerly awaited in the field of cell biology. At the beginning of the project, the Memmert CO2 incubator, in which several different tests were performed for the study, was evaluated. The result showed that the active humidification system decreases evaporation inside the chamber considerably as compared with common incubators with passive humidification.


Memmert CO2 incubator at the Institute of Bioprocess Engineering

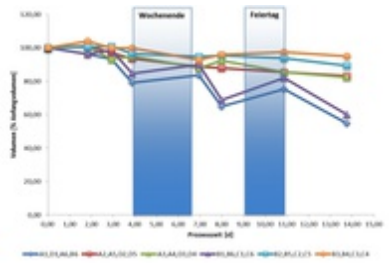
The COSIR project (combination of chemical-optical sensors and image recognition), which is backed by the Bavarian Research Foundation, is tackling an important challenge in the field of cell cultivation in the laboratory: the evaluation of cell growth without external intervention such as sampling. With assistance from the Institute of Bioprocess Engineering at Erlangen university, project partners from industry are testing an online monitoring system for pH values and

oxygen content using chemical-optical sensors in combination with optical checks and documentation. Memmert contributed to the success of the project by providing an INC108med CO2 incubator.

Scientific volume constancy test with multiwell plates



In general, relevant scientific research focuses on media optimisation and toxicity studies using a multiwell plate system. Before Björn Sommerfeldt, doctoral student and a member of the COSIR project team at the Institute of Bioprocess Engineering, started his actual research, he documented the humidity and CO2 content in the Memmert CO2 incubator over a period of 10 days; this allowed him to rule out influences the appliance might have on test results. In cell cultivation in multiwell plates, evaporation and condensation cause fluctuations in the concentration, which may significantly falsify test results. It is therefore essential that volume constancy in the well is guaranteed. As is common at universities, the Memmert CO2 incubator was used by different employees during evaluation, with the door frequently opened over the course of the experiment.



Cell viability after 10 days in the Memmert CO2 incubator

Active humidification prevents the formation of condensation and evaporation

In order to determine cell viability, a clear saline solution (PBS) was coloured using Trypan blue, with 600 µl of the solution being added to each well. The well plate was deliberately not covered with parafilm. High dynamics, that is the responsiveness of the INC108med to the continuous change of the gas mixture in the chamber humidified to 95 % rh, became apparent after the 10 days of testing. Caused by the frequent opening of the door, the outer well rows had lost about 40 % of their humidity content, while the inner rows had only lost about 10 %. On non-workdays, volume constancy and an increase in humidity content were determined.

Since the tests intended for the COSIR studies only take 24 or 48 hours, no significant limitations of the incubator or choice of wells could be determined, nor is the use of parafilm required. Although it was still possible to evaluate the wells after the 14-day test period, the researcher considers this to be the limit for valid studies in the above-mentioned conditions with frequent opening of the incubator door, or even beyond the limit. For long-term testing, Björn Sommerfeldt recommends only working with the inner rows of wells in cases where no incubator microscope is available, that is.

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The ideal incubator for cell culture

Interview with Professor Gerhard Unteregger about the requirements for cell culture of a CO2 incubator.

more information

An overview of the main topics

- Cell cultivation, cell growth
- CO2 incubator
- Institute of Bioprocess Engineering
- Erlangen university
- Active humidifying
- O2 content, pH value

Laboratory equipment for incubation

Incubator I
Cooled incubator ICP
Peltier-cooled incubator IPP
CO2 incubator INCOmed
Cooled storage incubator IPS

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