# DEVELOPMENT OF A MICROBIOREACTOR WITH AN INTERNAL PH SENSOR

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Microbioreactors are currently a very important tool in the processes of fermentation, cultivation of cells, microorganisms and viruses. As well as helping to optimize the different processes of productivity [1], in the industries of: health, agriculture, chemistry, ecology, food processing, and in the fermentation of products among other processes.

The growth in use of bioreactors in the mentioned industries, makes necessary the development of new bioreactor systems that facilitate the studies in a faster and more inexpensive way. Since the current bioreactors consume many resources in reagents and equipment sterilization time [2], they also have difficulties in obtaining real time parameters such as pH value and oxygen solution. These sensors are also too robust and costly.

One solution is the construction of microbioreactors (MBRs) using new technologies such as polymers, 3D printer, photolithography and laser technology that facilitate the construction of MBRs, reducing cost in construction and sterilization, since they are single-use MBRs.

The simulations of these MBRs have given us results that are similar to those obtained in other larger bioreactors, at lower costs. As of now results are only obtained in real time from the pH measurement [3].

The measurement of the pH is carried out by optical means, achieving the measurement of this parameter in real time within the Lab-chip system in the ranges of 6-8 pH and the results can be saved for analysis. This facilitates the monitoring and study of the pH in the processes.

The microbioreactor was manufactured using PMMA technology. Its molding was performed with laser technology. Embedded in the middle of the two layers of PMMA the microbioreaction vessel made of PDMS material resides. The volume was calculated at 0.9 ml.

**References**

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