CULTIVE AND CHARACTERIZATION OF ELECTROGENIC BACTERIA BY MEANS OF OPTICAL MICROSCOPY AND ATOMIC FORCE MICROSCOPY

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Electrogénics, Atomic Forces Microscopy celdas bacterianas.

Introduction.
Uncontrolled use of fossil fuels has given rise to an energetic global crisis and this fact is of great interest in the search of renewable sources of energy. Recently it has been observed that certain bacteria are capable of transform chemical energy into electrical energy which suggests a novel green energy[(1y2)].
Explotaition of this bacteriological energy constitutes an important challenge in the field of biotechnology in the next few years.

The main objective of this kind of research is the production of electric energy from the chemical energy in the anaerobic bacteria by means of electrochemical devices known as fuel cells.

Methods.
Previous to the experiment an anaerobic system was constructed in order to grow and isolate the anaerobic bacteria.

Bacteria samples were taken from sediment of Lagos river in Lagos de Moreno, Jalisco. Morphology of the samples was characterized through optic and atomic force microcopies. Later a bacteriological cell was elaborated in order to analyze the electrogenic features of these bacteria.

Results.
The bacteriological cultivation presents an optimal pH (6) and temperature (37°C), respectively, becoming Gram (-).

The cells bacteria, shown that the bacterian cultivation produces 3.9 V, and this generated energy is useful to turn a LED on. (Figure 3).

Fig.3 The cells bacteria.

For morphological analysis, the optic microscopy reveals a bacillus structure (Figure 2)

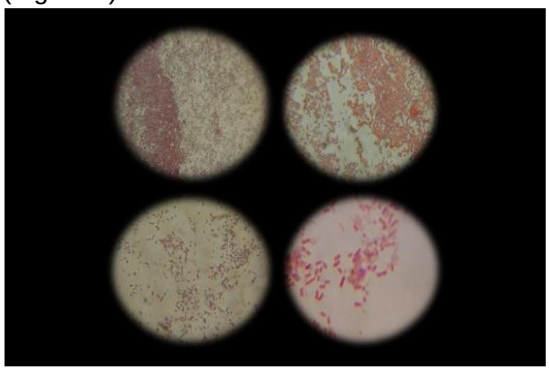

Fig.2 Image reveals the morphological bacteria .

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Respect to the atomic force microscopy, the optic microscopy confirms the bacillus form of the bacteria. Moreover, it reveals that the bacteria has a size of 1.5 µm (Figure 3).

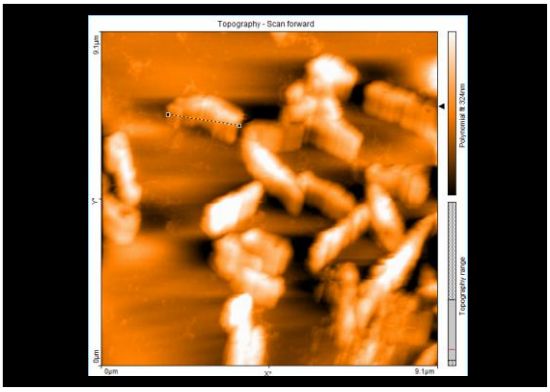

Fig.3 Image reveals the morphology and the size of the bacteria by means of atomic force microscopy.

Conclusions.

The set of bacteria studied in this work presents features of interest such as energy production. The optic force microscopy could be useful to reveal the morphology bacterian.

References.
1. Hubertus V. M. Hamelers, Annemiek Ter Heijne, Tom H. J. A. Sleutels, Adriaan W. Jeremiasse, David P. B. T. B. Strik and Cees J. N. Buisman. (2010). Appl Microbiol Biotechnol. 85:1673–1685.
2. Debabov V. G. (2008). Microbiology. 77(2): 123–131.