



Scientific/Technical offer for licensing



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Electricity production by microbial cultures

Ref. OTRI

201205R-Porcar, M

Knowledge area

Biotechnology
Microbiology
Renewable energy

Collaboration

Technology available for licensing
Other collaborations may be considered

Technology available for licensing

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Background: One of the major problems our society faces today is the steady worldwide growing energy demand. Alternative technologies, not fossil and not nuclear, are promising energy sources although they are not wholly competitive. There are biological systems allowing direct conversion of biomass into electricity by electrogenic bacteria -that produce electrons when oxidize organic matter-, they are known as Microbial Fuel Cell (MFC). The electric yield of MFCs has significantly improved in recent years, mainly by increasing the ratio electrode area/ reactor volume. However, the best results have been obtained for small-scale (in devices of volumes lower than 1 liter). Therefore, the development of technological improvements in procedures for electricity production by microbial cultures is needed.

The invention: Researchers from University of Valencia have revealed electricity production from exothermic microbial culture by thermoelectric or Peltier-Seebeck effect, that is to say, by conversion of heat produced by microbial growth to electric power. Furthermore, they have developed the device required to achieve efficiently that energetic transformation. This conversion of heat produced by exothermic microbial growth to electricity allows designing devices and coupling them to existing microbial reactors. Besides, it is possible to obtain an electricity source competent for local electricity production and heat recycling that could be incorporated in future developments of cellular electric installations, based on microbiology.

Applications: The main application of the technology is in **biotechnology**, for electricity production by microbial growth in different applications (alcoholic fermentations, bioremediation, waste treatment, autotrophic thermal aerobic digestion, etc).

Advantages: The most remarkable advantages provided by this technology are:

- Taking advantage of an undesirable by-product, the metabolic heat generated by microbial fermentations.
- The culture survival is prolonged since this method controls the internal temperature of the microbial process.
- It is universal, can be applied to all exothermic microbial culture.

OTRI oficina de transferència
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