



Instituto de Tecnologia Química e Biológica
Universidade Nova de Lisboa

MASTERS PROJECT

BIOLOGICAL HYDROGEN PRODUCTION BY ANAEROBIC BACTERIA

Area: Microbiology/Biochemistry

Laboratory: Microbial Biochemistry

Supervisor: Dr.^ª Inês Cardoso Pereira

Hydrogen is a promising energy resource/energy carrier as future alternative to fossil fuels. Nowadays, hydrogen is mainly produced from carbon-containing non-renewable sources, in processes that are not sustainable or environmentally friendly. Thus, development of a sustainable hydrogen production system is of the utmost importance. Biological production of hydrogen is a very interesting alternative as it requires a very low energy input and is sustainable if using waste or renewable substrates. In this project we propose to study an anaerobic sulfate-reducing bacterium, *Desulfovibrio vulgaris* Hildenborough, as an alternative hydrogen producer under fermentative conditions, to replace methanogenic organisms in the second step of anaerobic digestion processes. Sulfate-reducing bacteria are notorious for expressing very high levels of hydrogenases (Hases), the enzymes responsible for hydrogen production and/or consumption. The genome of *D. vulgaris* has been sequenced and encodes for six different Hases. Some of these are hydrogen-producing and others are hydrogen-consuming. The project will comprise the study of conditions to optimize the hydrogen producing ability of *D. vulgaris* wild type as well as single and double deletion mutants of the hydrogen-consuming Hases. This work will develop expertises in several areas such as: Microbial Technology, Microbiology, Biochemistry, Bioinformatic analysis and others.

For more information contact:

Dr.^ª Inês Cardoso Pereira

Instituto de Tecnologia Química e Biológica

Universidade Nova de Lisboa

Av. da República - EAN,

2780-157 Oeiras

Tel.: 214469327/5

Fax: 214411277

E-mail: ipereira@itqb.unl.pt

www.itqb.unl.pt/mb