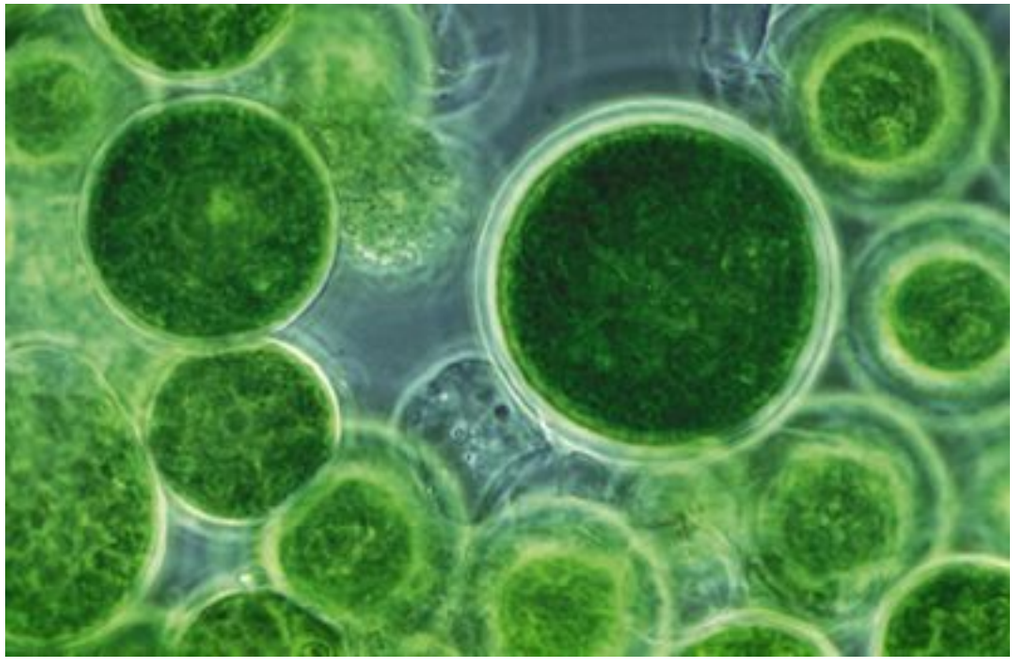
Algas Verdes / Green Algae

Cyanobacteria & Green Algae

One of the cyanobacteria's principle qualities is to use the sun's energy to transform CO2 (carbon dioxide) and H2O (water) into carbohydrates for itself, and into O2 and other molecules in the atmosphere as a by-product of photosynthetic.



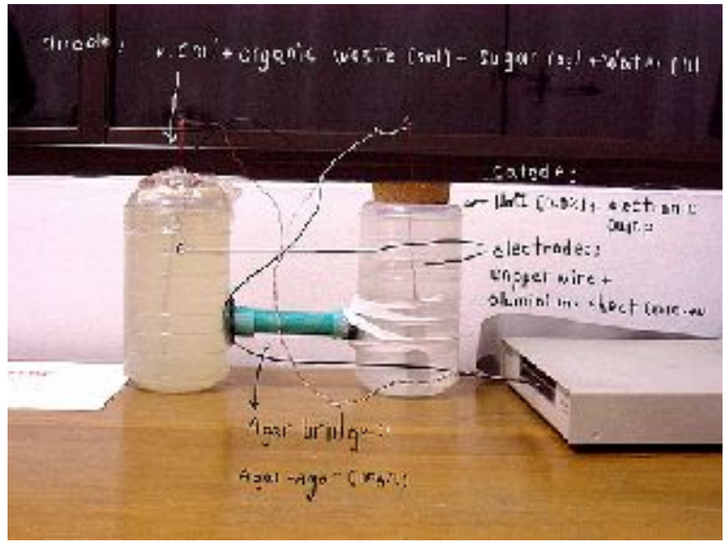
Green Algae from Bogotá.

***n*CO2 (carbon dioxide) + *n*H20 (water) + sun radiation = CH20 (carbohydrate) + *n*02 (oxygen)**.

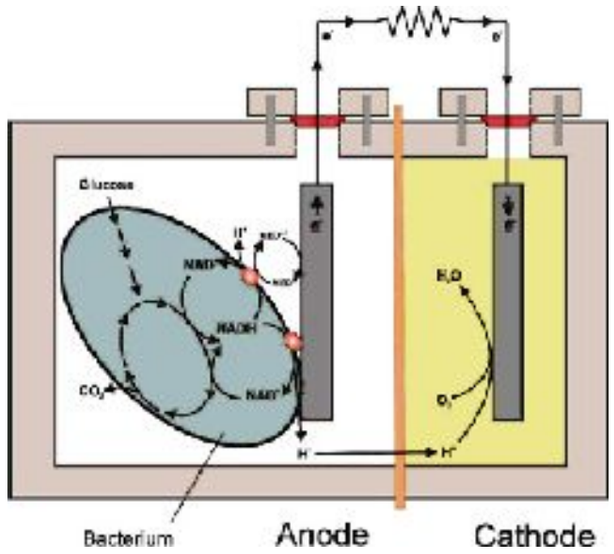
Microbial Fuel Cells MFC

A microbial fuel cell is a device that converts chemical energy to electrical energy by the catalytic reaction of microorganisms (Allen and Bennetto, 1993). A typical microbial fuel cell consists of anode and cathode compartments separated by a cation (positively charged ion) specif c membrane. In the anode compartment, fuel is oxidized by microorganisms, generating electrons and protons.

Wikipedia.



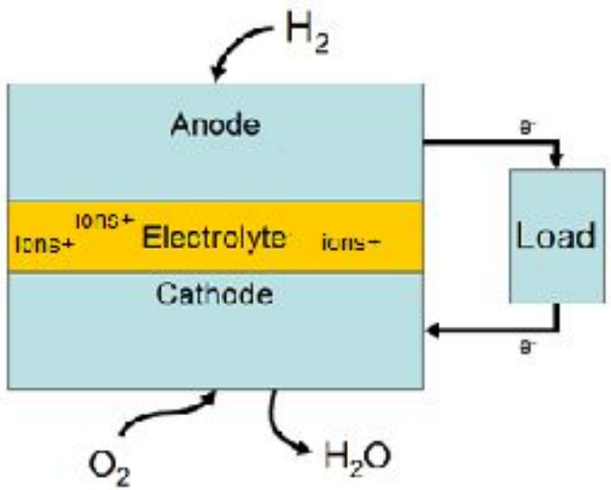
MFC prototype. Javeriana University. Bogota 2008



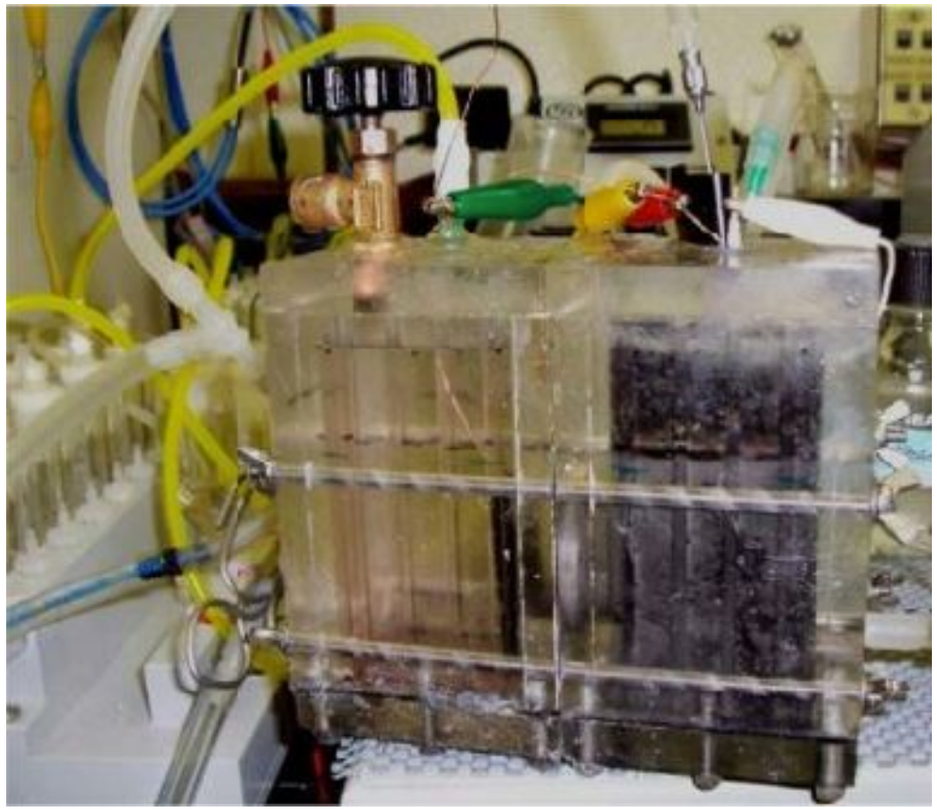
http://www.microbialfuelcell.org/www/index.php/General/General-priniciples-of-MFCs.html

MFC (DIWO) prototype. Pedagogica University practicing. Bogota 2008

Algae Fuel Cells?



Fuel cell schema Wikipedia



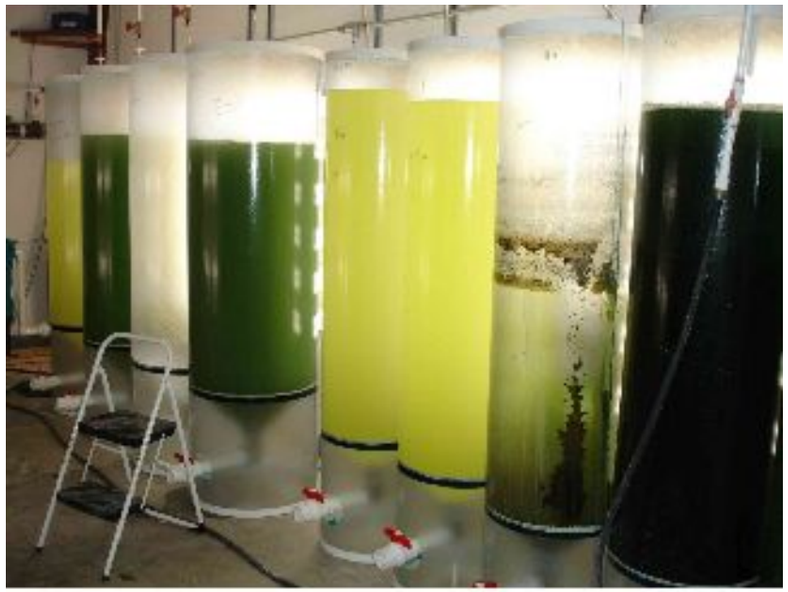
Biological hydrogen production using photosynthetic algae and bacteria can result in the generation of large amounts of waste biomass. This biomass can be used to produce hydrogen gas by modifying microbial fuel cell (MFC) technologies to produce hydrogen instead of electricity.

Bruce E. Logan. Hydrogen Energy Center, Penn State University, University Park, PA, 16802, USA. 2006

Photobioreactor (PBR)

Science direct Advances in Space Research 41 (2008) 742–747
The purpose of the research is to develop a photo-bioreactor which may produce algae protein and oxygen for future astronauts in comparatively long-term exploration, and remove carbon dioxide in a controlled ecological life support system.

Instructables.com – DIY prototipe



How to make a PBR?

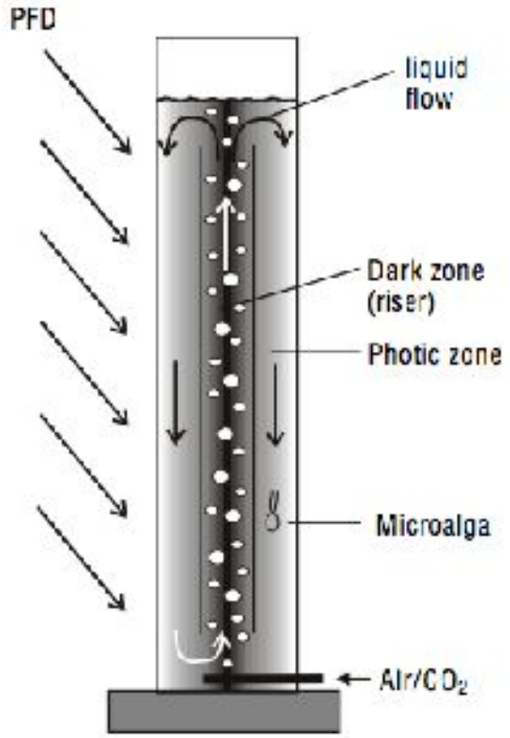
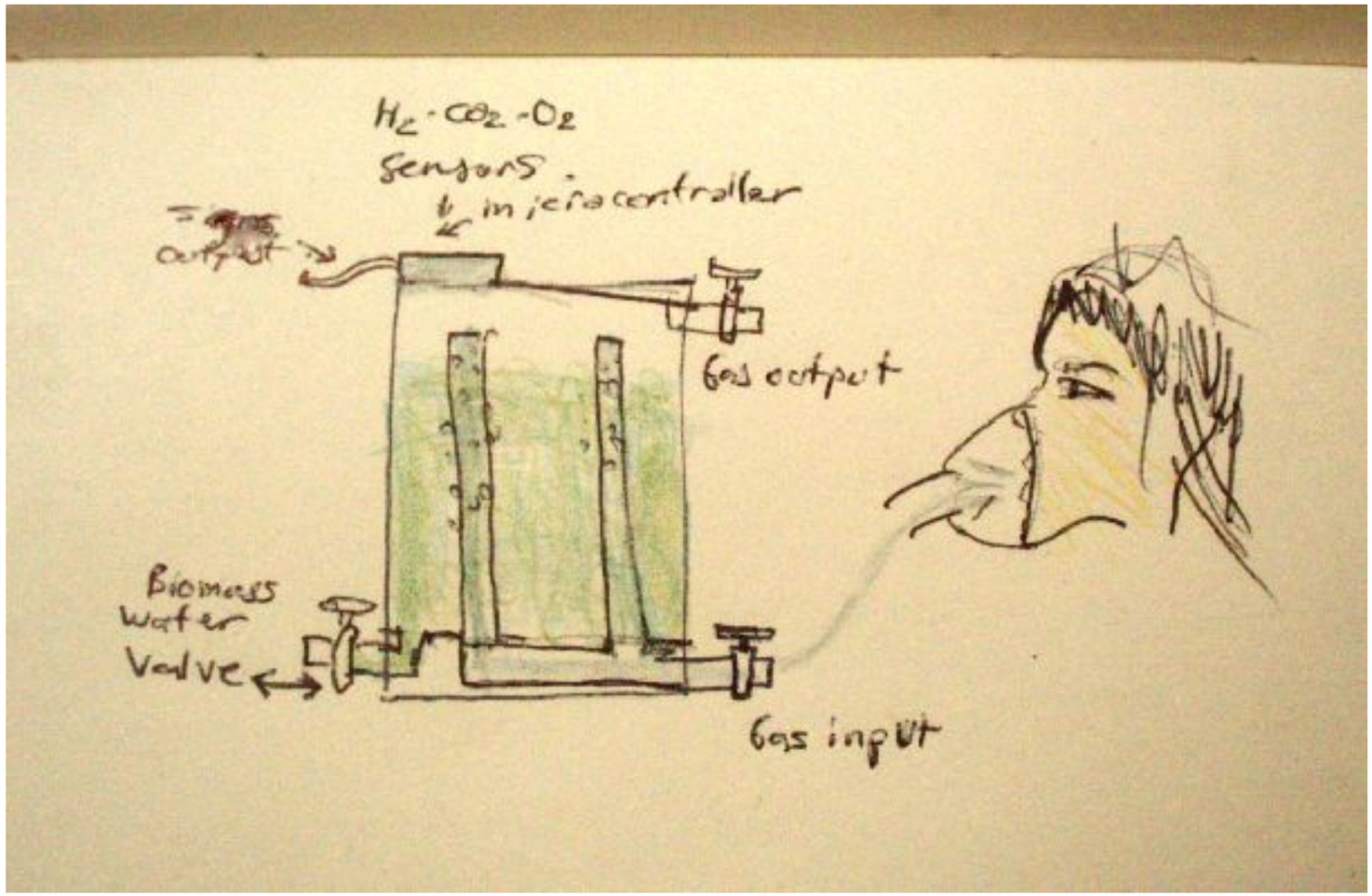


Figure 2.1. Air-lift loop reactor: liquid flow, light regime and resulting light gradient/dark cycles. PFD is the photon flux density.

* Algas verdes – **photobioreactor**

+ DIWO prototype. (with open-guide)
+ CO2 input (from breathe)
+ Biomass input-output
+ Atmosphere gas output
+ Everyday life-model
+ Harvest Algae



* Algas verdes – **Sensors**

+ Testing of different gas sensor:

+ **H2** – TGS821 (Figaro)

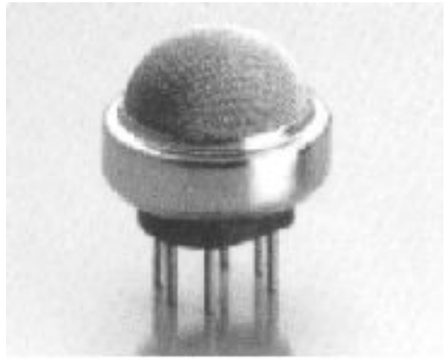
+ **CO2** - MG811

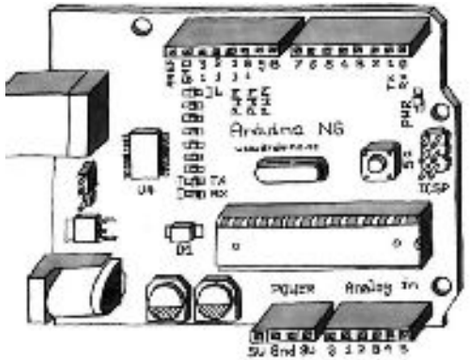
+ **O2** - KE-50 (Figaro)

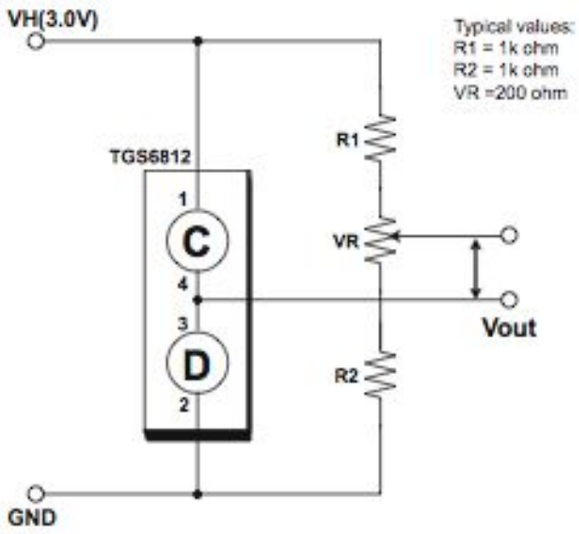
+ Design of calibrating circuits

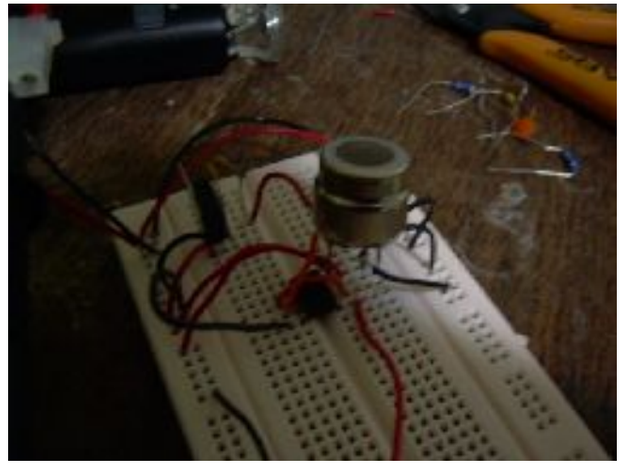
+ Program those in Arduino microcontroller.

+ Scientist-aesthetic output (?)









* Algas verdes – **Algae Culture**

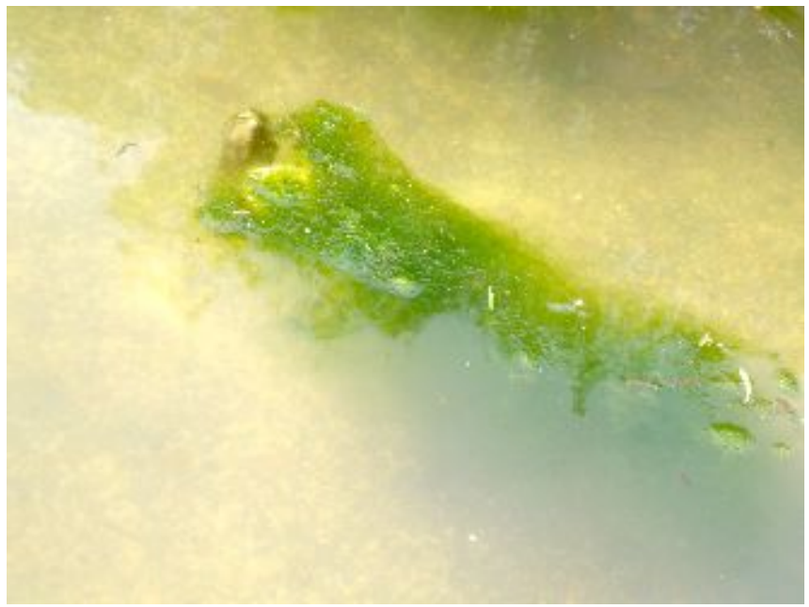
+ Collecting Green Algae from cities.

- Where are the Algae?
- What are the environmental conditions like where they live?

+ Mapping locations

+ How could we collect and incubate Algae?

+ What kind of tools and instruments do we need?



Green Algae from Bogota. Eje ambiental)

Thank you!