

# BIOFUELS LABORATORY

- **OBJECTIVES:**

The research carried out in this laboratory aims to:

- increase cereal-to-ethanol output
- use agricultural, wood and biomass waste for methanol production
- use methanol in waste water treatment plants
- increase direct-methanol fuel cells output
- turn the draft resulted from alcohol to good account

- **ACTIVITIES:**

- Cereal enzymatic hydrolysis
- Destructive distillation of high cellulose organic wastes
- Acid hydrolysis of wood wastes to produce sugars

- **MAIN EQUIPMENT:**

Microscope, CO<sub>2</sub> and O<sub>2</sub> sensors, bioreactor, distilling column, HPLC



*Stereo Microscope*



*CO<sub>2</sub> Sensor*

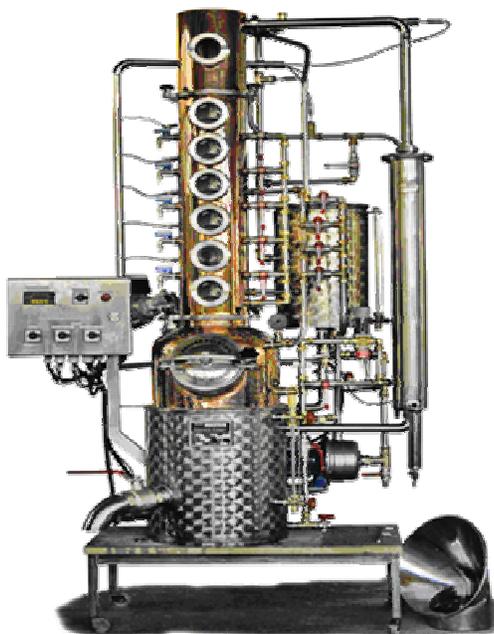
*Oxygene Sensor*



*Bioreactor*



*HPLC*



***Distilling column***

- **MAIN RESEARCH THEMES:**

- Alcohol output is influenced by the leaven hydrolyzing capacity, therefore the factors influencing the hydrolyzing capacity of enzymes used to obtain bioalcohol as fuel, as well as the optimum enzyme intake and performing combinations, optimum pH of leaven and temperature are taken into consideration. The chemical hydrolysis allows us to compare the two methods and choose the optimum technological conditions for fermentation process;
- To establish optimum conditions for agricultural and wood waste to-biomethanol production
- To study different membranes permeability of direct-methanol fuel cells
- Turning the draft to good account is necessary both for environment protection and revaluation of nutritive substances it contains. Draft proteins and salts are turned to good account for animal feed in the form of supplements, increasing the technological process efficiency. Environment pollution with organic substances from alcohol production plants is reduced to the minimum.

- **LABORATORY**

**PERMANENT STAFF:**

**Head of the research team:**

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**Scientific production 2005-2007** 4 ISI indexed papers 1, Books, 1 research grant. 7 patents

**Main collaborations:** Laboratory of Enzymes et Derivates Romania, Yurii Fedkovici University, Chernivtsy - Ukraine, Technische Universitate Aalen-Germany, Hohenheim University – Germany, Genencor- Danisco – Netherlands, Platform for biofuels, BIOCARO - Romania  
**<http://www.fia.usv.ro/laboratoare>**