

## Consortium

The **GRAIL** members form one of the most competitive and international research and development teams in the EU. It combines academic researchers with a strong focus on real world industrial challenges and industrial researchers with interest in research based solutions that increase their competitiveness. The 14 research institutions and companies from 9 different countries work together to implement the science and engineering necessary to provide industrially relevant solutions to valorize and transform glycerol into valuable products under a biorefinery approach.



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## GRAIL Factsheet

### Project Full Title

Glycerol Biorefinery Approach for the Production of High Quality Products of Industrial Value

### Theme

Preventing and valorising bio-waste through bio-conversion technologies that transform glycerol into biofuels and innovative industrial chemicals.

### Start Date

November 2013

### Duration

48 months  
(until October 2017)

### Budget

7.9 million €

### Max EC Contribution

6 million €

### Coordinator

Dr. Josep Castells  
IUCT group

## More information



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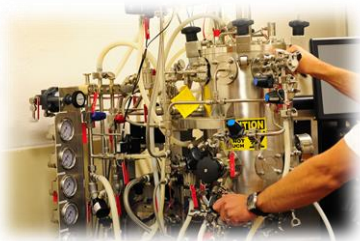
*Glycerol Biorefinery Approach for  
the Production of High Quality  
Products of Industrial Value*



This project has received funding from the European Union's Seventh Programme under grant agreement No 613667

## About the GRAIL Project

The **GRAIL** project is a 48-month Collaborative Project funded by the European Commission under FP7 Programme for Knowledge Based BioEconomy.



## Expected Impact

- The transformation of crude glycerin into a range of fuels and specialty chemicals is estimated to increase the operational margin of current biodiesel industries by a factor of 7.
- More than 150 biodiesel plants in the EU may benefit from such a re-configuration.
- The new biorefinery approach, developed under GRAIL project, can for the first time provide an integrated production process which is competitive in comparison with existing oil refineries.



## GRAIL Main Objectives

### Objective 1

Assessment of crude glycerin as the main feedstock in a biorefinery

- Analysis and evaluation of glycerol availability and supply.
- Characteristics of available glycerol.
- Setting performance specifications for the targeted products.
- Glycerol treatment for further processing in order to provide a protocol for the purification of glycerol with the required quality.
- Mass and energy balances for glycerol processing plant concepts in order to provide a good data base.

### Objective 2

Conversion of glycerol into biofuels

- Biotransformation of Glycerol into
- 
- hydrogen, ethanol;
  - biobutanol;
  - fatty acid glycerol formal esters (FAGEs).



### Objective 3

Conversion of glycerol into Green Chemicals

Chemical or Enzymatic Transformation of Glycerol into



- propanediol;
- component of resins and polymers;
- butyric acid;
- PolyHydroxyAlkanooates (PHA);
- cosmetic ingredients.



### Objective 4

Conversion of glycerol into food ingredients

Conversion of Glycerol into



- cyanocobalamin (Vitamin B12);
- $\beta$ -carotene;
- docosahexaenoic acid (DHA).

