Collaboration is a powerful new sustainable business model. Biowaste to Energy for Canada Integration Initiative (BECii) Corp. is an industry led, industry-focused initiative building a commercial scale Integrated Bio-Refinery™ demonstrating waste-to-profit strategies. Located in rural Hairy Hill, Alberta, this integrated technology cluster consists of a 2.5 MW biogas power plant and a 40 M L/year ethanol production facility co-located with a 36,000 head of cattle commercial feedlot operation. This Integrated Bio-Refinery™ is both an effective waste management strategy, processing over 260 tons/day of manure and municipal source separated organics (SSO) waste, and an example of an innovative model for rural sustainability. This collaborative framework produces cleaner air, lower cost energy, increased local employment opportunities, and provides the feedlot with benefits that allow it to be one of the lowest carbon footprint commercial feedlots in Canada. In this presentation, we will discuss the synergies involved in the Integrated Bio-Refinery™, some of the technical challenges encountered during integration, and the economics surrounding this collaborative model. In addition, we will briefly touch upon other innovative synergistic partnerships under consideration for addition to this Integrated Bio-Refinery™.

Potential of thin stillage as a low-cost medium for direct bioconversion of cellulose into ethanol and hydrogen

Rumana Islam, University of Manitoba

An ideal fermentation medium for commercial-scale production should be inexpensive, able to supply essential growth nutrients, and be readily available. Thin stillage (TS) generated in dry-grind ethanol facilities is rich in many essential macro- and micro-nutrients. Drying of TS to produce dried distillers grains with solubles (DDGS) consumes over half of the thermal energy required by an ethanol plant. Therefore utilization of TS was investigated as an alternative nutrient medium for Clostridium thermocellum DSM 1237 during direct fermentation of cellulosic substrates into ethanol and hydrogen. Various concentrations (5 - 400 g/L) of TS were used to support growth C. thermocellum on cellulose (10 g/L), replacing all ingredients of the regular growth medium except buffering agents. Cultures with 50 g/L TS showed the best performance representing 100% and 81% of H2 and ethanol respectively produced by cultures on the regular growth medium. Cell growth monitored using a quantitative polymerase chain reaction (qPCR) technique showed a slower growth of C. thermocellum with increasing concentration of TS in the culture media. Magnesium supplementation of 50 g/L TS medium resulted up to 59% more ethanol compared with the unsupplemented TS medium.
Microbial demetallization of metallic compounds in crude oil
Hossein Salehizadeh, University of Isfahan

Out of 19 microorganisms isolated from polluted soils of the Isfahan Refinery Company in the center of Iran, a strain identified as Aspergillus sp. (designated MS-100) was selected based on the capability of utilizing vanadium oxide octaethyl porphyrin (VOOEP) as sole carbon source. The degradation percentage of VOOEP before optimizing was 37% at 20 °C after 7 days. The optimum values for pH, temperature and VOOEP concentration obtained were 5.5, 30 °C and 20 mg/l, respectively. The UV-visible spectrophotometric experiments and HPLC analyses confirmed the degradability of VOOEP in crude oil up to 50-55% under optimum conditions during 7 days. The release of vanadium (0.96/2 mgl-1) into the aqueous phase was proved using atomic absorption spectroscopy. Briefly, Aspergillus sp. was exhibited a high potential to utilize VOOEP as a model for protoporphyrins metallic compounds in crude oil and released considerable amount of vanadium in aqueous phase.

Production of ethanol from corn stalks using an engineered strain of Saccharomyces cerevisiae
Qiuwei Zhao*, Institute of Microbiology, Chinese Academy of Sciences

Cellulosic ethanol has been widely regarded as an attractive alternative fuel, due to the sufficient supply of feedstocks, the rapid advance on pretreatment, and the decreased cost of biomass hydrolysis. Efficient co-utilization of xylose and glucose is critical for cellulosic ethanol production. Recently, many efforts had been made to introduce the xylose metabolic pathways into S. cerevisiae. However, most of the engineered S. cerevisiae strains cannot metabolize xylose well under anaerobic condition. In this study, we engineered S. cerevisiae by introducing xyl1 and xyl2 genes from Pichia stipitis and overexpressing its own xk gene. The engineered strain was subjected to continuous evolution with dissolved oxygen concentration gradually decreased. The resulted adaptive strain, S. cerevisiae W32N55, could efficiently metabolize xylose under static condition, and tolerate the inhibitors in cellulosic hydrolysate. Furthermore, a fermentation-membrane pervaporation coupling process was developed and applied in the fermentation of the hydrolysate of steam exploded corn stalks. Using such a process, the final ethanol concentration reached 70 g/L, with a yield of 220 kg ethanol per ton steam exploded stalks.

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A novel continuous oil seed extraction method for jet fuel production
Kasiviswanathan Muthukumarappan, South Dakota State University

The majority of oil seeds are extracted using hexane; however, this method has major drawbacks. Hexane emissions negatively impact the environment, and hexane’s low flash point, explosive vapor, and toxic residuals create costly safety issues. Thus, finding an alternative oil extraction method to achieve the lowest environmental impacts and to further develop green chemistry is of utmost importance. A novel continuous oil seed extraction process will be carried out by simultaneous application of a single-screw extruder and two biodegradable solvents, d-Limonene from citrus peels and a-Pinene from pine gum, for three types of oil seeds. A 23 full factorial design for the 2 levels of barrel temperature (T) (80 and 120 °C), 2 levels of screw speed (SS) (80 and 150 rpm), and 2 levels of solvent to oil-seed ratio (R) (10 and 15% w/w) were conducted for the two proposed solvents separately to investigate the effect of extrusion condition and R on the oil content of the extruded seeds. Oil content was determined using an appropriate apparatus depending on the solvent boiling points and quality of the extracted oil in terms of free fatty acid profile, heating value, and Elemental analysis were determined using GC, Bomb calorimeter, and Elemental analyzer, respectively. It was clearly observed that at higher SS of 100 rpm and T of 120 °C, application of 10% Ethanol led to 28% and 8% increase in oil contents of the one-time extruded seed and doubled extruded seeds, respectively compared to those of the seeds extruded at the same condition without Ethanol treatment.

Renewable Chemical Platforms and Biobased Material

Method of preparative scale production of immobilized lipases destined for bioconversion, biotransformations and biorefining processes
Lukasz Stanczyk, Institute of Technical Biochemistry, Lodz University of Technology

Lipases are one of the most important and promising groups of catalysts used in industrial biotechnological processes. They are particularly attractive since they catalyze various reactions in aqueous and non-aqueous conditions, and exhibit the high catalytic activity and exquisite substrate selectivity, stereoselectivity and enantioselectivity. Furthermore, immobilised lipases can be reused, e.g., in continuous manufacturing processes often lasting several months, thereby saving energy and reducing wastes. The potential of lipases has been only partially exploited, mainly because of high costs of their purified preparations. Robust and inexpensive lipolytic preparations, well suited to technological conditions have been still prospected for. Certain whole-cell biocatalysts, like mycelium-bound lipases, which are presented in this work,
meet these requirements. The main objective of presented project is the development of a method of large laboratory scale production of microbial lipase preparations, e.g. from lipolytic Mucor circinelloides and Mucor racemosus strains, originating from pure culture collection at ITB LUT. At ITB LUT it was developed the method of production of two forms of immobilized lipases, potentially useful in various branches of industry: cosmetic, pharmaceutical, production of biofuels, food processing etc. Their properties were also characterized. These immobilized whole-cell preparations are as follows: 1. Mycelium of Mucor filamentous fungi, immobilized in a porous carrier in the form of uniform thin foams with open porosity and the large internal surface – for industrial applications this lipase may be adapted to the needs of a user. 2. Dehydrated and ground Mucor mycelium (particles of around 3 µm in diameter), additionally stabilized - for industrial applications in the form of water and/or organic solvents-insoluble powder. Key elements of the technology include: - activation of fungal strains for efficient production of the lipase (for transesterification of lipids with aliphatic alcohols and hydrolysis of lipids) – biosynthesis of the mycelium-bound enzyme is induced using selected esters, - selection of porous carriers (pore size, shape and dimensions of the porous carrier) useful for the immobilization of Mucor strains and checking the usefulness of the immobilized lipase preparations in selected manufacturing processes; - optimization of culture medium composition, and agitation and aeration modes, - development of methods of preparation and standardization of lipase preparations (conditions of mycelium de-fatting and de-hydration)

Specialty Chemicals, Pharma Intermediates, Food In

Antiparasite Activity of Chitosan Prepared from Shrimp Shell Waste
Rym Salah-Tazdait, Mouloud Mammeri University of Tizi-Ouzou, Algeria

Chitin is found especially in the structure of the shell of crustacean, cuticles of insects and cell walls of fungi. The waste of this natural polymer is a major source of surface pollution in coastal areas. Chitosan is obtained by the thermochemical deacetylation of chitin. It has been proved to be biologically renewable, biodegradable, biocompatible, non-antigenic, non-toxic and biofunctional. In the present study, chitin was chemically extracted from shrimp shells. The obtained chitin was deacetylated by NaOH to prepare chitosan. Then, chitin and chitosan were characterized. Further, antiparasite activity of chitosan was evaluated using Leishmania infantum LIPA 137 and Leishmania infantum LIPA 155/10, two reference strains isolated from patients in Pasteur institute from Algeria. The results showed effective antileishmanial activity of against Leishmania infantum LIPA 137, but no antileishmanial activity of chitosan against Leishmania infantum LIPA 155/10. It was also demonstrate that Leishmania infantum LIPA
155/10 is resistant to leishmaniasis drug glucantime® and Leishmania infantum LIPA 137 is sensitive to glucantime®. Further studies are necessary to determine the in vivo activities and applications of chitin and derivatives, in particular, in the design of new lines of drugs for use in the treatment of leishmaniasis and hopefully eradication. Keywords: antiparasite, chitin, chitosan, Leishmania infantum, leishmaniasis, waste.

**Immobilization of tomato (Lycopersicon esculentum) pectinmethylesterase in calcium alginate beads and its application in fruit juice clarification**

*Pushpa Bogra, Seth Jai Parkash Mukand Lal Institute of Engineering*

Clarity of fruit juices is desirable to maintain an aesthetically pleasing quality and international standards. The most commonly used enzymes in juice industries are pectinases. A partially-purified pectinmethylesterase from tomato was entrapped in calcium alginate beads and used for juice clarification. The activity yield was maximum at 1% (w/v) CaCl2 and 2.5% (w/v) alginate. The immobilized enzyme retained ~ 55% of its initial activity (5.68 x10^-2 units) after more than ten successive batch reactions. The Km, pH and temperature optima were increased after immobilization. The most effective clarification of fruit juice (%T620 ~ 60%) by immobilized enzyme was at 4 °C with a holding time of 20 min. A viscosity drop of 56 % and an increase of 264% in filterability were observed. The juice remains clear after two months of storage at 4 °C.

**Construction of reductive pathway in Saccharomyces cerevisiae for effective succinic acid fermentation at low pH value**

*Jianmin Xing, Institute of Process Engineering, Chinese Academy of Sciences*

Succinic acid is an important precursor for the synthesis of high-value-added products. *Saccharomyces cerevisiae* is a suitable platform for succinic acid production because of its high tolerance towards acidity. In this study, a modified pathway for succinate production was established and investigated in *S. cerevisiae*. The engineered strain could produce up to 6.17 ± 0.34 g/L of succinate through the constructed pathway. The succinate titer was further improved to 8.09 ± 0.28 g/L by the deletion of GPD1 and even higher to 9.98 ± 0.23 g/L with a yield of 0.32 mol/mol glucose through regulation of biotin and urea levels. Under optimal supplemental CO2 conditions in a bioreactor, the engineered strain produced 12.97 ± 0.42 g/L succinate with a yield of 0.21 mol/mol glucose at pH 3.8. These results demonstrated that the proposed engineering strategy was efficient for succinic acid production at low pH value.

**Synthetic Biology and Genomics Research**
Many important biochemical reactions are catalyzed by reductases or dehydrogenases, whose activities are dependent on the availability of NADH and the ratio of NADH to NAD+. In a previous study, we found that the intracellular NADH/NAD+ ratio was sensitive to the level of extracellular redox potential (also named oxidoreductive potential, ORP). To investigate the mechanism of ORP control, we applied comparative proteomic analysis and genomic-level metabolic flux analysis. Using Klebsiella oxytoca as a model, we found that the proteomic profiling was changed in response to the extracellular ORP level. Furthermore, we found that the metabolic flux via pyruvate dehydrogenase increased significantly under low-ORP condition. It might result in increased availability of NADH. The combined analyses revealed the relationship between ORP control and metabolism alteration. Controlling redox potential during the anaerobic and micro-aerobic fermentation processes was shown an efficient strategy to accelerate microbial metabolism. It has successfully improved the fermentative production of 1,3-propanediol by Klebsiella oxytoca, butanol by Clostridium acetobutylicum, and increased the biomass yields of Lactobacillus and Bifidobacterium.

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**Academic Research Presentations**

*A novel perfusion system for enhanced therapeutic protein production from mammalian cells*

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The demand for therapeutic proteins has been increasing at a pace faster than that at which the new production technologies are being developed. Among the various production technologies presently being used, perfusion culture technology is preferred over others because it enables selective cell retention for achieving high cell density and consistent product quality. In addition, it improves productivity and the economic outlook of the process. However, there is scope for improving perfusion technology to achieve higher protein production as the existing cell retention modules are prone to clogging during long term operations. Considering this, we developed a novel spinfilter module using a silk membrane possessing superior cell retention properties. With this module, we achieved higher viable cell retention and lesser fouling compared to stainless steel modules that are normally used for
such processes. It was possible to operate the perfusion culture of hybridoma cells (HB8696) for monoclonal antibody production uninterrupted for more than 200 h with the silk spinfilter. A performance comparison of silk spinfilter with the stainless steel spinfilter showed a 57.4% increase in monoclonal antibody production. The spinfilter module is suitable for perfusion culture of both adherent and non-adherent mammalian cells.

**Biopolymers Production by Xanthomonas campestris PV campestris From Glicerine, by-products of biodiesel production**

Francisca Pessoa de França, Universidade Federal do Rio de Janeiro

The growing interest for biofuels makes to biodiesel a renewable alternative, biodiesel came to supply part of the expectations of the energy segment, however, its production has increased in recent years, generating as a consequence, large amounts of glycerol, the main by-product of the biodiesel production process; Glycerol, can replace carbohydrates usually employed as a source of carbon, in the cultivation and growth of some microorganisms for the production of bio-products. The xanthan gum is an extracellular biopolimero consisting of glucose, mannose, and glucuronic acid, high molecular weight anionic, capable of forming high-viscosity aqueous solutions, produced by Xanthomonas campestris pv campestris, The biosurfactant are compounds of microbial origin, produced extracellularly or as part of the cell membrane by different microorganisms. This work aimed to evaluate the effect of substituting, supplementing and potentiality of glycerol as carbon source on production of xanthan gum and biosurfactante. The medium of production were composed of different concentrations of glucose and glycerol (g / L) in 100 ml of mineral medium, as a carbon source, with stirring speed of 180 rpm at 28° C for 96 hours, using the bacteria Xanthomonas campestris pv campestris. The study was done using experimental planning 22 with 4 experimental conditions and 3 central points, in order to evaluate various components such as the gum production (g/L), and the biosurfactant, that was evaluated through the index of emulsification and 24%. The study demonstrated that the maximum production of gum (6.48 g/L) was at a concentration of 1.5% glucose and glycerol. When the mineral medium had a low content of glucose, the gum production was reduced, however, the formation of biosurfactant was relatively high with 55% for emulsification index with an aviation kerosene. The observed results indicated a possible application of the bacteria using waste by-products from biodiesel industry.

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**Malathion Biodegredation: Evaluation of its use as phosphorous and sulphur sources**

Djaber Tazdait, Mouloud Mammeri University of Tizi-Ouzou
Malathion S-[1, 2-di(ethoxycarbonyl) ethyl] dimethyl phosphorothiolothionate; CAS No 121-75-5; C10 H19 O6 PS2] is one of the most widely used organophosphate insecticides throughout the world. It is commonly used to control mosquitoes and a variety of insects that attack fruits, vegetables, landscaping plants and shrubs. Removal of this pesticide can be attained by physical-chemical and biological processes. Several studies have examined the degradation of malathion by microbes and most of these studies were carried out using pure cultures. Little information is available concerning degradation of malathion by activated sludge culture. In most studies of xenobiotic degradation in general, and malathion degradation in particular, the compounds under consideration have been supplied to microorganisms exclusively as sources of carbon. But their utilization as source of phosphorus and sulphur has been less well studied until now. Therefore, in this study, the biodegradation of malathion using acclimated activated sludge culture was achieved. The ability of mixed microbial community to use malathion as a source of phosphorus and sulphur nutrition was also evaluated. The result showed the potential for using local activated sludge for malathion biodegradation. On the other hand, the acclimated activated sludge could use malathion as its sole phosphorus source but could not use it as its sulphur source.

**Microwave-assisted synthesis of n-butanol directly from bioethanol using bulk MgO**

Busiswa Ndaba, North West University

Bio-butanol is an attractive alternative drop-in fuel as replacement for fossil-based petroleum in internal combustion engines. The application of bulk magnesium oxide (MgO) catalyst for n-butanol production was investigated in this study. The phase purity of the catalyst was confirmed by X-ray diffraction (XRD). Transmission Electron Microscope (TEM) was used to observe the morphology and size of the catalyst. Nitrogen adsorption and CO2 desorption using Brunauer-Emmet-Teller (BET) analysis were done to confirm the surface area of nanoparticles of the MgO. Thermogravimetric analysis (TGA) provided insight into the decomposition process of the catalyst at different temperatures. The effect of the catalyst on n-butanol yield was studied by varying the mass loading (0.1-0.5 g), and the microwave temperature (50-250°C). The average particle diameter for MgO ranged between 50-200 nm. The MgO surface area obtained from BET studies was found to 44 m2/g. Ultimately, the microwave method was compared to n-butanol production using a hot plate thermostat at different temperatures (50-250°C). The study will highlight the effect of different amounts of MgO as a catalyst on microwave-assisted butanol productivity from bioethanol. Keywords: Bulk MgO, Microwave, n-butanol

**Aerobic methane-oxidizing communities in saline alkaline and arable soils**

Nancy Serrano Silva, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, México
The former lake of Texcoco is located in the Valley of Mexico City (Mexico). This is a unique and extreme soil, highly saline-sodic, with electrolytic conductivity (EC) up to 150 dS m⁻¹ and pH up to 10.5. The composition of aerobic methane-oxidizing bacteria (MOB) communities was studied in three soils from the former lake Texcoco (Mexico) and compared to that in two arable soils. The MOB were identified on the basis of comparative sequence analysis of the pmoA gene, that encodes for a subunit of the particulate methane monooxygenase, a key enzyme in the aerobic methane oxidation process. The sequences from the arable soils belonged to type I and II methanotrophs. The clones were closely related to JR-2, JR-3, USC-? and USC-a clusters, that have previously been detected in upland soils. In the saline alkaline soils, a novel group of sequences related to the Nitrosococcus-like clade was detected (> 92% of clones sequenced). These data indicated that the methanotrophic communities in the soil from the former lake Texcoco differed from those in arable soils and further experiments are needed to confirm that the methanotrophic community found in Texcoco soils oxidizes methane under adverse conditions.

Biomass as a source of feedstocks for the preparation of environmentally friendly polymer materials

Gabriela Dziworska, Lodz University of Technology, Lodz, Poland

This poster presentation contains the main ideas of the POIG project BIOMASA partially financed by the European Union within the European Regional Development Fund. The aim of the project is utilization of various kinds of plant biomass and textile waste materials by their transformation with biotechnological methods, involving either enzymatic or microbial processes, into fibrous polymer materials. Cellulose nanofibres For the preparation of cellulose nanofibres, a cellulose-rich plant biomass is being utilized, including grass and straw of various cereals as well as waste fibres from textile industry (cotton, linen). The biomass is first pretreated with physical and/or chemical methods including boiling, steam-explosion or treatment with certain chemicals. Multienzyme complex obtained from Aspergillus niger mould is utilized as the main enzymatic tool. The fibrous materials and composites prepared within this project on the basis of abovementioned intermediates will be further utilized for obtaining new functional textiles and nonwovens with potential sanitary or technical applications, such as sweat-absorbing textile inserts, sanitary textiles, filtration materials, geotextiles and agrotextiles. Within this project, the processes of ageing and controlled biodegradation of prepared materials will be studied, as well as the conditions of their recycling and possible use of degradation products in agriculture. Tactic polylactide The synthesis of tactic polylactide is being performed by chemical polymerization of L,L-lactide, prepared from L-lactic acid. The latter is obtained by stereoselective fermentation of plant biomass, after its saccharization by appropriate enzymes (Aspergillus niger preparations). The microorganisms (bacteria), used for
the fermentation, were selected by classical microbiology methods from the environment. In this case potatoes, cereal grains or beet pulp are employed as starting biomass. The tactic polylactide will be further utilized for fiber formation and thermoforming. Co-polystyrenes

The third path involves utilization of various oil-plant biomass, which on sequential treatment with lipase preparations obtained from Mucor circinelloides and Mucor racemosus moulds (transesterification with 2-methylbutanol) and dimerization of obtained esters (cycloadition) are transformed into dimeric esters containing fatty acid residues. These will be co-polymerized with appropriate reagents in order to produce new biodegradable aliphatic-aromatic co-polystyrenes. The polystyrenes will be utilized as fillers for the preparation of various fibrous polymers and composites. Concluding remarks The project is being realized by Polish Consortium with the Lodz University of Technology being the leader. The methods of preparation of polymer fibrous materials and composites elaborated within this project will positively influence development of knowledge-based economy and will increase the innovativeness of connected areas of research and production. The main recipients of elaborated methods will be producers of fibers and nonwovens from thermoplastic materials, sanitary textiles, filtration materials, geotextiles, agrotextiles and packing materials.

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Technical Presentations

*Enhanced Biofuels Production from Lignocellulosic Biomass by Microwave-assisted Pretreatment*

*Wei Huang, Beijing Research Institute for Nutritional Resource*

Lignocellulosic biomass are not easily utilized by microorganisms due to their physical shielding of cellulose imparted by the non-digestible lignin. Therefore, there is a great interest to develop an efficient pretreatment technique to disrupt recalcitrant structures of lignocellulosic biomass and improve renewable energy production. Microwave energy can efficiently penetrate plant materials and produce a volumetrically distributed heat source, and the highly localized temperature and pressure can cause serious destructive effect of cellulose structure, and therefore enhance resolvability of lignocellulosic materials. Microwave irradiation has been successfully integrated with alkali/acid pretreatment process to enhance enzymatic hydrolysis of lignocellulosic biomass for ethanol fermentation and biogas production. The aim of this poster is to identify the problems related to the microwave assisted pretreatment process with emphasis placed on developing novel strategies for biogas production from lignocellulosic biomass.
Bioeconomy has been one of the most dynamically developing sectors of EU economy. Its basic goal is the replacement of fossil fuels with biomass as a renewable source of valuable products and/or feedstocks for industry. Foundation of the industry on natural resources and bioprocesses is the prerequisite of sustainable development. Presented results were achieved within the frames of a research project with an acronym: Biomass, entitled “Application of biomass in production of environmentally friendly polymer materials”, which has been realized by a consortium of several research institutions in Poland: Lodz University of Technology, Institute of Biopolymers and Chemical Fibers in Lodz, Centre of Molecular and Macromolecular Studies of Polish Academy of Science, University of Agriculture in Krakow and Central Mining Institute in Katowice. One of objectives of tasks 2.2 & 3.2 of this project is the development of a chemo-enzymatic method of oleaginous biomass conversion into biodegradable components of aliphatic-aromatic polymers for fabrication of agro-textiles. The team from the Institute of Technical Biochemistry (ITB) LUT devised a biocatalyst, which is inexpensive and highly active in non-aqueous systems (task 2.2), and optimized conditions of its effective usage in processes of oil bioconversion (mainly rapeseed, sunflower, soybean and waste oils) into esters of aliphatic primary alcohols (also branched) or structured SUS-type triacylglycerols (saturated-unsaturated-saturated acid bound to glycerol) (task 3.2). The latter may be further converted into dimers and macrodiols, which will be used in polymerization processes. Immobilized in porous carriers, whole-cell (mycelial) preparations of intracellular lipases produced by oleaginous and lipolytic fungal strains from the culture collection at ITB, which are robust and highly active in non-aqueous systems, have been used to develop semi-continuous transesterification processes, e.g. plant oil alcoholysis by 2-methylbutan-1-ol (or other medium-chain alcohols) and acidolysis by saturated fatty acids (especially palmitic and stearic). Operational stability of these biocatalysts in column PBR reactors (working volume of 0.2-0.5L) either with petroleum ether used as a solvent (or without it), under suitable process (acidolysis and alcoholysis) parameters reaches about half a year (or more) without any decrease in bioconversion yield. Identification of crucial parameters deciding of transesterification processes efficiency and high stability of the biocatalyst guarantees the successful up-scaling of these processes. Keywords: bioconversion, alcoholysis, acidolysis, whole-cell lipase preparation, high operational stability Acknowledgement The project BIOMASA (POIG 01.01.02-10-123/09) is co-financed by the European Union within the European Regional Development Fund (in the frames of Operation Program Innovative Economy 2007-2014).