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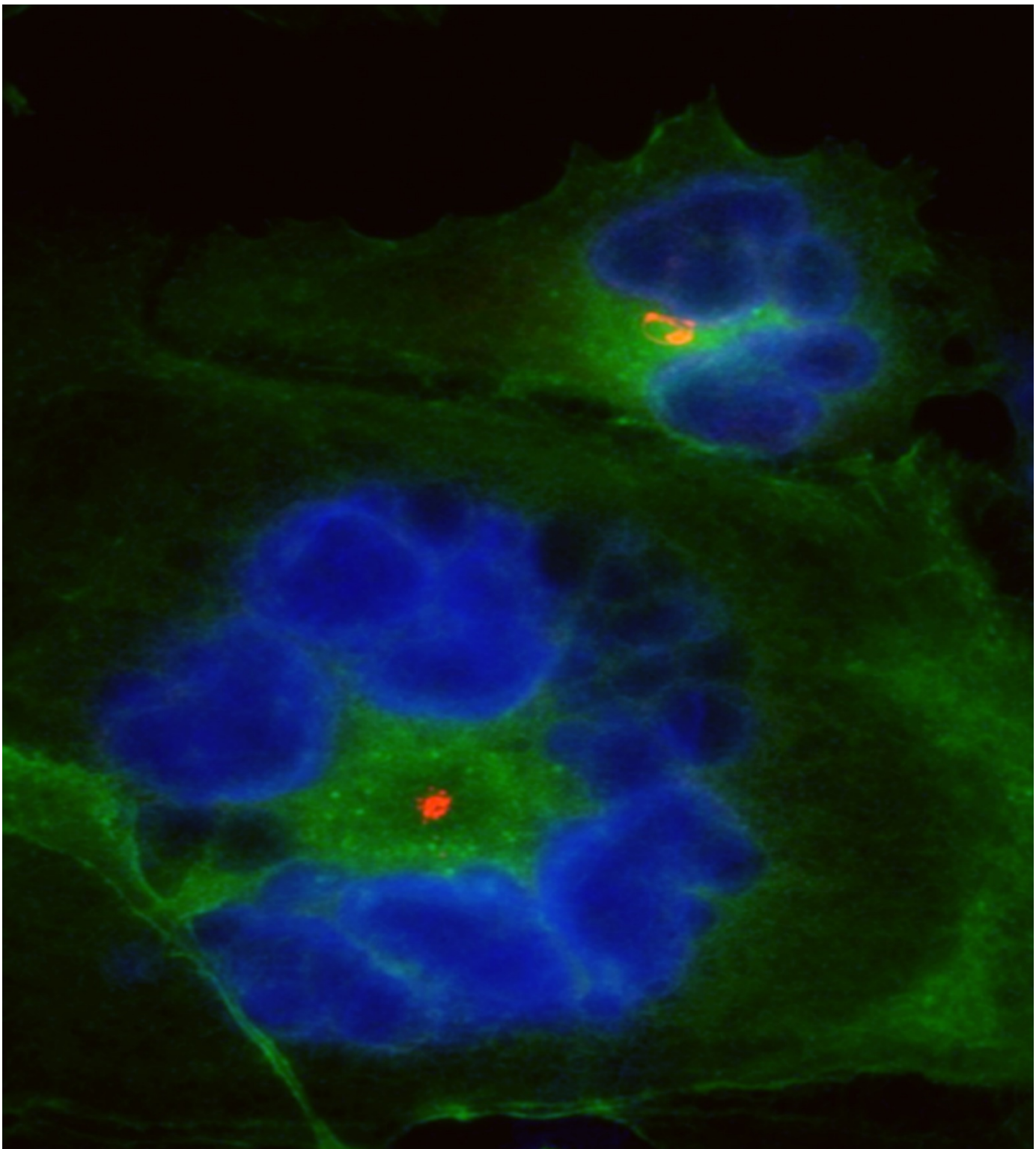

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Cover page: The Synthetic Lethal Rosette

Aberrant mitotic phenotype found in BRCA1-deficient cells treated with the PLK1 inhibitor Volasertib. Cells become giant and multinucleated and acquire a flower shape, with nuclei arranging in a circular disposition around a cluster of centrosomes. Blue (DAPI: nuclei), Green (FITC-phalloidin: actin cytoskeleton), Red (γ-Tubulin: centrosomes).

Author: María Laura Guantay (CONICET fellow; Director: Gaston Soria)

Centro de Investigaciones en Bioquímica Clínica e Inmunología (CIBICI-CONICET), Facultad de Ciencias Químicas (Universidad Nacional de Córdoba).

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IN MEMORIAM

HORACIO G. PONTIS
(1928–2019)

Horacio Guillermo Pontis, born in Mendoza (1928), graduated in chemistry and obtained the Ph.D. (1953; Dir.: V. Deulofeu) from the University of Buenos Aires. After working for three years with Dr Luis F. Leloir—where he approached to carbohydrate metabolism—he stayed successively at King College (UK), Durham University (UK) and finally at Karolinska Institutet and University of Stockholm—where his attention turned to enzymology studies. After returning to Leloir´s lab (1960), he embarked on plant biochemistry studies. In his search for clues about fructans, Dr. Pontis´ lab synthesized not only UDP-fructose but also fructose-2-phosphate, which two decades later cleared the way for the chemical synthesis of fructose-2,6-bisphosphate (a key glycolysis modulator).

From 1968 to1977, he was the director of Dept. of Biology – Fundación Bariloche. In Nov. 1971, Bariloche hosted the SAIB Annual Meeting, being elected Dr. Pontis the President of SAIB (1972).

This reunion was followed by the Symposium "*Biochemistry of the glycosidic linkage*" with the presence of four Nobel Prizes (C. Cori (1947), G. Cori (1947), F. Lynen (1964), L. F. Leloir (1970)). However, his "*mi mejor experimento y experiencia de formación"* came to a halt-in when the Bariloche lab was closed (1977).

In 1979, Dr. Pontis moved to Mar del Plata where over time his outstanding capacity for innovation launched Instituto de Investigaciones Biológicas (IIB) – U. N. Mar del Plata, Fundación de Investigaciones Científicas (FIBA) and Centro de Investigaciones Biológicas (CIB).

In any site, Dr. Pontis maintained active research groups that trained graduate and post-graduate students generating a steady flow of important contributions to plant biochemistry. The research international community acknowledged these accomplishments, such as American Society of Plant Biologists that named him Correspondent Member. In his scientific activities, Dr. Pontis has been member of the National Research Council of Argentina (1961; CONICET), and Biochemistry Professor –at the UBA and at Universidad Nacional de Mar del Plata. The former and the later institutions recognized his academic performance designating him Emeritus Investigator and Emeritus Professor, respectively.

Dr. Pontis' story rose from limited beginnings—in Deulofeu´s and Leloir´s labs—to international scientific prestige. In this context, the challenge to overcome adversity during shameful periods in Argentine history honors not only his willingness but also his enthusiasm.

Ricardo Wolosiuk

Schedule	Tuesday November 5			Wednesday November 6	Thursday November 7	Friday November 8
8:30-9:00	**WORKSHOPS** **Workshop Accreditation**					
9:00-11:00	**Biochemistry Education Workshop**	**1st Workshop On Drug Discovery**		**Oral Communications** **Room Jacaranda** PL-C01, PL-C02, PL-C04 to PL-C06, PL-C09, PL-C12, ST-02, BT-C02 **Room Los Ceibos** CB-C01 to CB-C04, CB-C07 to CB-C10, ST-C01	**Conferences** ***Ro*om Lapacho** *Robert Gennis* *Francisco Barrantes*	**Oral Communications** **Room Jacaranda** PL-C03, PL-C07, PL-C08, PL-C10, PL-C11, PL-C13, PL-C14, PL-C15 **Room Los Ceibos** MI-C01 a MI-C06, BT-C01, CB-C06 **Room Lapacho** LI-C01 to LI-C05, ST-C03, CB-C11, CB-C05
11:00-11:30				**COFFEE-BREAK**		
11:30-12:30				**Plenary lecture** *Bruno Amati* **Room Lapacho**	**IUBMB Jubilee Lecture** *Philip D. Stahl* **Room Lapacho**	**"Hector Torres" Plenary Lecture** *Alejandro Colman Lerner* **Room Lapacho**
12:30-14:30				**LUNCH TIME**		
14:30-16:30			**Congress Accreditation**	**Symposia** *Lipids* **Room Jacaranda** *Plants* **Room Los Ceibos** *Signal Transduction* **Room Lapacho**	**Symposia** *Cell Biology* **Room Jacaranda** *RNA* **Room Los Ceibos**	**Symposia** *Microbiology* **Room Los Ceibos** *PABMB Young Investigators* **Room Jacaramda**
16:30-17:00				**COFFEE –BREAK**		
16:30-18:30			**Opening Ceremony** **Room Lapacho** ***In memoriam* of** Horacio Pontis **Room Lapacho**	**POSTERS** BT-P01 to BT-P06 CB-P01 to CB-P15 MI-P01 to MI-P18 PL-P01 to PL-P15 ST-P01 to ST-P13	**POSTERS** BT-P07 to BT-P12 CB-P16 to CB-P31 EN-P01 to EN-P11 MI-P19 to MI-P37 PL-P16 to PL-P32	**POSTERS** BT-P13 to BT-P19 CB-P32 to CB-P47 LI-P01 to LI-P15 MI-P38 to MI-P49 PL-P33 to PL-P48
18:30-19:30			**"Alberto Sols" Plenary Lecture** **Room Lapacho** *Encarnación Martinez Salas*	**EMBO Keynote Lecture** *F. Gisou van der Goot* **Room Lapacho**	**"Ranwel Caputto" Plenary Lecture** *Maria Elena Alvarez* **Room Lapacho**	**Closing Ceremony** **Room Lapacho**
			Cocktail 20:00 hs		**SAIB Assembly 19:45 hs**	**Dinner 20:00 hs**

levels, HOMA-IR, and atherogenic indices of rats, improving the effects of goat yogurt or yacon flour alone ($p < 0.05$). Our results showed conclusive evidence indicating that goat yogurt + yacon is an excellent functional food that avoids the metabolic impact of high-fat feeding, representing a novel food product for the management of obesity.

BT-P15
EVALUATION OF ENZYMATIC ACTIVITIES IN LINDANE-CONTAMINATED SOILS DURING THEIR RESTORATION BY BIOREMEDIATION TECHNIQUES

Raimondo EE[1,2], Costa Gutierrez [SB1], Sineli PE[1], Fuentes M S[1], Benimeli CS[1,3]
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Lindane is an organochlorine pesticide that, due to its persistence in the environment, is still detected in different matrices. Bioremediation using actinobacteria consortia and agriculture residues proved to be successful for the restoration of lindane-contaminated soils. Furthermore, soil enzymatic activities, including oxidoreductases and hydrolases, are used as sensitive indicators to evaluate the soil quality, due to their participation in a range of biochemical reactions that take place in the environment. The aim of this work was to select soil enzymatic activities in order to be used as indicators of efficiency during the bioremediation of lindane-contaminated soils. Bioremediation tests were carried out in microcosms formulated with different soil types, contaminated with 2 mg kg^{-1} of lindane, bioaugmented with 2 g kg^{-1} of an actinobacteria consortium, and biostimulated with sugarcane bagasse or filter cake in the following soil:amendment proportions (100:0, 98:2, 90:10), under previously optimized conditions. The microcosms were incubated at 30°C for 14 days, and periodic samples were taken to determine residual lindane by gas chromatography and enzymatic activities using the traditional techniques reported in the literature with slight variations. All appropriated controls were performed. At the end of the assay, the pesticide removal percentages were different among the treatments and soil types, and the enzymatic activities were greater at day 14 than at day 0. In bioaugmented soils, the enzymatic activities were greater than in non-bioaugmented controls. In addition, biostimulation of bioaugmented and non-bioaugmented microcosms increased the values of these biological parameters. However, it was observed that lindane had an inhibitory effect on dehydrogenase, fluorescein diacetate hydrolysis, acid and alkaline phosphatases activities, while catalase was stimulated by the pesticide. Urease was slightly inhibited or not affected by the presence of the pesticide, depending on the evaluated condition. Based on their sensitivity, catalase, fluorescein diacetate hydrolysis, and acid phosphatase were selected as appropriate indicators to assess the effectiveness of the bioremediation process in subsequent studies. The obtained results demonstrated that the simultaneous use of the actinobacteria consortium and the agro-industrial residues was suitable for the treatment of soils of different textural classes contaminated with lindane, which led to an increase in the enzymatic activities values, with a consequent improvement in the quality of bioremediated soils.

BT-P16
IRON AS A MULTIFUNCTIONAL FACTOR IN *ASPERGILLUS NIGER* MYA 135: FUNGAL MORPHOLOGY, LIPASE PRODUCTION AND LIPASE ENHANCER

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Filamentous fungi have been broadly used in biotechnological processes as cell factories due to their metabolic versatility. They are able to secrete high levels of enzymes, antibiotics, vitamins, polysaccharides, and organic acids. However, one particular obstacle with these kinds of microorganisms focuses on their morphological form. They can show linear filaments to highly branched structures, and in submerged culture, growth morphologies varying from compact pellets to dispersed mycelia. In turn, several fungal processes can be directly or indirectly affected. Those growth morphological patterns are generally induced by extracellular factors and accomplished by genetic and biochemical factors. In this connection, we previously reported that $FeCl_3$ decreases the mycelium-bound β-N-Acetyl-D-glucosaminidase activity (a relative marker of the wall lytic potential) from *Aspergillus niger* ATCC MYA 135 and yields a dispersed mycelium in its presence. Here, both the fungal morphology and the lipase activity obtained in the presence of an optimized culture medium supplemented with $FeCl_3$ were analyzed. The role of this salt as a lipase enhancer was assessed as well. Firstly, the extracellular lipase production was conducted in an orbital shaker at 30°C during 192 h by using a mineral medium supplemented with 1 g/L $FeCl_3$ and a final conidial concentration of about 10^5 conidia per mL. After 24 h of fermentation, 2 % (v/v) of olive oil was added as an inducer. Thus, the highest specific activity (15.51 ± 0.78 U/mg) was obtained at 96 h of cultivation. This activity value was 10-fold compared with its control without $FeCl_3$ supplementation. Secondly, a new fermentation of 96 h was conducted. The mycelium was examined by scanning electron microscopy displaying clumps structures with scarce ramified hyphae. The supernatant, collected by filtration, was also evaluated as a biocatalyst in hydrolytic and synthetic reactions as follows. The role of iron as a lipase enhancer was studied in native PAGE by using 1.3 mM of α-naphthyl acetate as a substrate. Released naphthol was bound with 1 mM Fast Blue to give a colored product. Preincubation of lipase bands during 30 min in the presence of 0.1 g/L $FeCl_3$ resulted in a significant increase of the activity signal. Additionally, the extracellular lipase activity was immobilized in silica gel by adsorption. The elemental analysis performed under SEM-EDX (Energy-dispersive X-ray spectroscopy) evidenced the presence of iron. This biocatalyst was assayed to produce biodiesel compounds in a solvent-free system using soybean oil and butanol (1:4) as substrates. After a three-stepwise addition of butanol, a biodiesel conversion of 93.36 % was reached. Therefore, it can be concluded that $FeCl_3$ acted by altering fungal morphology, increasing lipase production, and improving the performance of the enzymatic activity. This research was supported by the following funding sources: FONCYT (PICT 2015-2596) CONICET (P-UE 2016-0012) and UNT (PIUNT D606).

BT-P17
BIOAUGMENTATION OF A BIOMIXTURE WITH ACTINOBACTERIA FOR ATRAZINE REMOVAL

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Biopurification systems (BPS) are simple and economical constructions designed to retain and degrade pesticides, in order to reduce or avoid point-source contamination. An organic biomixture (BM) constitutes the most abundant and important component of a BPS. The bioaugmentation of the BM with pesticide-degrading microorganisms is a very interesting approach to optimize its efficiency. Atrazine (ATZ) is a selective herbicide commonly applied to control the appearance of weeds in crops, mainly corn, sorghum, and sugarcane. The aims of this study were to select actinobacteria capable of removing ATZ and to evaluate the effect of the bioaugmentation of a BM with the selected actinobacteria on ATZ dissipation. A qualitative determination of tolerance to ATZ was performed by streaking 14 actinobacteria strains on Petri dishes containing starch casein agar medium with a central channel containing the ATZ solution (1000 mg L^{-1} and 50000 mg L^{-1}). The tolerant strains were used to perform a quantitative determination of their ability to grow in the presence of ATZ (50 mg L^{-1}) and to remove it from liquid minimal medium (MM). Controls were carried out in MM supplemented with glucose (1 g L^{-1}). Microbial growth (dry weight) and residual concentration of ATZ (gas chromatography, GC) were determined after 96 h. The actinobacterium which presented the highest removal of ATZ and did not show growth inhibition in the presence of ATZ was used to inoculate a BM composed of soil, straw, and agricultural sugarcane crop residue (25:25:50). Periodic samples were collected to determine residual ATZ, total heterotrophic microorganisms (CFU g^{-1} BM), fluorescein diacetate hydrolysis (FDA) and acid phosphatase (AP) activities. All actinobacteria were highly tolerant to 1000 mg L^{-1} of ATZ and moderately tolerant to 50000 mg L^{-1} of ATZ. All of them were able to grow in MM supplemented with ATZ, however, most of them reached statistically lower biomass than the obtained with glucose as a carbon source, with the exception of *Streptomyces* sp. A2, A11, and M7. These strains were able to use ATZ as carbon source and to remove it from MM, presenting removal values ranging between 10% and 75%. Based on the microbial growth and ATZ removal, *Streptomyces* sp. M7 was selected to bioaugment the BM. The inoculation of the BM with *Streptomyces* sp. M7 improved significantly the ATZ removal (58%) respect to the non-bioaugmented BM (38%) after 28 days of incubation. The total heterotrophic population in the bioaugmented and contaminated BM (4.55×10^7 CFU g^{-1}) did not present statistical variation respect to non-inoculated control, nor non-contaminated control. Enzymatic activities obtained in these systems ranged between 44.9 ± 0.03 and 87.2 ± 20.3 µg fluorescein g^{-1} h^{-1} for FDA and 91.82 ± 5.7 and 159.0 ± 9.0 µg p-nitrophenol g^{-1} h^{-1} for AP. These results suggest that the bioaugmentation of BM with *Streptomyces* sp. M7 represents a promising tool to reduce ATZ concentration in BPS.

BT-P18
EXPRESSION AND CHARACTERIZATION OF AN ASPARTIC PROTEASE FROM *SOLANUM TUBEROSUM* IN *KLUYVEROMYCES LACTIS*

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In the last years, the gradual decrease of cow population, the increasing global demands for cheese, the ethical problems associated with the isolation of the animal rennet, and the incidence of bovine spongiform encephalopathy (BSE) have reduced both supply and demand for bovine rennet. Therefore, much research has been focused on discovering new natural milk-clotting enzymes from microorganisms and plants that would successfully replace the calf rennet in cheese manufacture. Previously, we have isolated and characterized an aspartic protease from *Solanum tuberosum* named *St*AP3. *St*AP3 is able to clot bovine milk and to degrade bovine casein subunits. In this work, we report the development of a new *St*AP3-derived produced in the generally regarded as safe (GRAS) yeast *Kluyveromyces lactis*. Using a stepwise optimization strategy – consisting of culture media screening, complemented with chromatography in a pepstatin A–agarose column step – we successfully improve *St*AP3 production in *K. lactis* (r*St*AP3). As *St*AP3, r*St*AP3 has caseinolytic and milk clotting activity with an optimum MCA value in accordance with those used in the industrial manufacture of cheeses (pH 6–6.2 and temperature 40–42 ºC). These results, in terms of milk-clotting activity, suggest the suitability of *rSt*AP3 to producing milk clots and the possibility of using these proteases in the artisanal and industrial cheese production.

BT-P19
HIGH CELL DENSITY *ESCHERICHIA COLI* COCULTURE SYSTEM FOR *DE NOVO* PRODUCTION OF MULTI-METHYL-BRANCHED ESTERS

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Microbial lipid production represents a potential alternative feedstock for oleochemical industries. In our laboratory, we managed to turn *Escherichia coli* into a biofactory, by the heterologous expression of a polyketide synthase (PKS)-based biosynthetic pathway from *Mycobacterium tuberculosis* and redefinition of its biological role towards the production of a variety of multi-methyl-branched esters (MBE). The final step of this pathway involves the transesterification of a multi-methyl-branched fatty acid, synthetized by the PKS Mas, to an acceptor alcohol that was supplemented into the culture media. With the aim to develop a whole *de novo* bioprocess (i.e. without adding exogenous alcohol), an *E. coli* co-culture system was designed, where the MBE producing strain (RQ5 *pMB23*) is grown with another *E. coli* strain engineered to produce the branched alcohol isobutanol (CB1 *pIAA11*). Previous results indicated that the consortium CB1/RQ5, at intermediate inoculation ratios (~1:1) in batch cocultures of M9 medium, had a very closed productivity to the one exhibited by a monoculture based on the single-cell RQ5 *pMB23* with the external addition of isobutanol to the growth media. Based on this evidence, in this work, we decided to scale-up this coculture system for the *de novo* production of MBE of isobutanol, so we undertook the optimization of a high cell density fed-batch fermentation process. To set the