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Posters

Anja Taubert et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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From glycolate to methane – A new biofuel production concept

Anja Taubert, Christian Wilhelm and **Torsten Jakob**
Leipzig University, Germany

The decreasing reserves of fossil-based energy sources and the climate change enforce the usage of renewable energy and biofuels. Current microalgae-based approaches face the problem that the biological process of biomass production and the subsequent harvest and refinement of biomass strongly decrease the energetic and economic balance. A new algae-based concept aims to avoid biomass production; instead, an intermediate of algal metabolism (glycolate) is used for the methane production by anaerobic fermentation. In this way, metabolic costs and energetic costs for biomass harvest and refinement could be drastically reduced/avoided. Previous studies showed the ability of the green alga *Chlamydomonas reinhardtii* to produce and actively excrete glycolate under photo-respiratory conditions. It was proven that a microbial consortium can be adapted to use glycolate as main carbon source for biogas production. The aim of the present study is to evaluate optimum conditions for glycolate production in a photo-bioreactor under simulated natural conditions and to analyse the quantum efficiency of glycolate production in comparison to biomass formation. It is further aimed to couple the photo-bioreactor and the anaerobic fermenter in a pilot installation to prove the technical feasibility of this approach. From the obtained results, it can be concluded that a continuous production of glycolate is possible over a period of at least several days. The achieved glycolate concentration in the culture suspension is high enough to feed microbial fermentation. It was shown that the daily glycolate production (59 $mgL^{-1}d^{-1}$) is equivalent to that of algal biomass (62 $mgL^{-1}d^{-1}$).

Biography

Anja Taubert completed her Master of Science Degree in Biology with the focus on Biotechnology in 2015 at the Leipzig University. Within her Bachelor's and Master's thesis she attended, environmental biotechnological questions in miniaturized wetlands, called planted fixed bed reactors, at the Helmholtz Centre for Environmental Research (UFZ Leipzig) and contributed to two publications. She is currently a PhD student in the Department of Plant Physiology at the Leipzig University with the task to establish a self-contained system of autotrophic carbon allocation and heterotrophic production of biogas.

anja_ta@yahoo.de

Notes:

Soeren Schmechta et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Molecular characterization of *Chlamydomonas reinhardtii* for adaption to a technical biofilm

Soeren Schmechta and **Wilhelm Christian**
University of Leipzig, Germany

Conventional photobioreactors cultivate algae in suspension, hence to maintain optimum cultivation conditions, mixing is essential for delivery of inorganic carbon, nutrient and light. Since bioreactors have highest production rate at high biomass load per volume, cells are exposed to flickering light which is favorable for the photon usage efficiency. Energetic costs for mixing, harvesting and biomass refinement are too high for efficient energy conversion from light to biofuels. As an alternative approach, biofilm reactor had been discussed where the cells are fixed and cells on the surface are exposed permanently to full sunlight whereas cells in lower layers suffer from light limitation. This is due to the steep light gradient, a stack of 10 cells is enough to absorb 90% of the light intensity. Therefore, to find a solution to prevent photoinhibition at the surface and light limitation in deeper layers is necessary. Here, we want to mimic the geometry of higher plant leaves where the inner surfaces have different refractive indices, thereby light is distributed more homogenous inside the leaf. For technical biofilms, single cells can be cultivated in porous glass. The incoming light is then distributed due to the different refractive indices inside the glass. For this purpose, cells must be attached to a glass surface in defined distances and positions by introducing a glass anchor protein fixed by a native cell wall protein and the anchor interacts with the glass environment. This recombinant protein is combined with epitopes for further investigation (proof of success) and introduced by electroporation.

Biography

Soeren Schmechta is a PhD student at the University of Leipzig, Institute for Biology at the working group of Prof. Wilhelm. He completed his MSc in Biology with focus on Biotechnology at University of Leipzig. During his Bachelor's thesis, he was working on biotechnological application of algae. His master's thesis was about the topic Environmental and Biotechnology. Now, he is doing research in the field of renewable bioenergy from algae with special focus on *Chlamydomonas reinhardtii*.

psy09gpd@studserv.uni-leipzig.de

Notes:

Andreia de Araújo Morandim Giannetti et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Synthesis of alkydic resins by enzymatic alcoholysis

Andreia de Araújo Morandim Giannetti and **Renata Carvalho**
Centro Universitário da FEI, Brazil

During the development of alkyd resin, parameters as acid value, the index saponification and medium molar mass of soybean oil were first determined. After that, the best solvent to be used during the alcoholysis step was established by comparing and determining the enzymatic activity of Lipozyme 435 enzyme in the presence of hexane, water, tetrahydrofuran and tert-butanol. Then, alcoholysis was performed using different concentrations of enzyme, oil/glycerin relations and temperature, to determine the best reaction conditions for obtaining the greatest concentration of monoacylglycerides and diacylglycerides. All samples were analyzed using CLAE and the results were evaluated in Statistica 12.0 program. After analysis of data, it was obtained as optimal reaction conditions a 9.36% concentration of enzyme, a weight ratio glycerol/oil of 1:3.5 (w/w) and a temperature of 56.73 °C. During the final step of obtaining resin, solvents were added (xylene and mineral spirit) and phthalic anhydride in specified amounts to give the resin at the end of the process viscosity characteristics and acid index as specified, without differences in the application of the usual resin produced by chemical catalyst. It was studied further the recovery of the enzyme, their reuse in the process and, consequently, cost savings, besides reducing solid waste generation, verifying that it showed significant amounts of enzyme activity after use and recovery.

Biography

Andreia de Araújo Morandim Giannetti has completed her PhD at Paulista State University and Postdoctoral studies from the same. She is a teacher at the FEI University Center. She has published more than 18 papers in reputed journals and has been serving as a reviewer in several renowned journals.

preamorandim@fei.edu.br

Notes:

Andreia de Araújo Morandim Giannetti et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Obtaining cellulose acetate from coir fiber subjected to treatment with the ionic liquid n-butylammonium acetate

Andreia de Araújo Morandim Giannetti, José Carlos de Andrade Neto, Andressa Carolina de Almeida, Camila dos Santos Machado, Daniella Olmo Coelho, Najib Mourad and **Natália Siqueira Teixeira**
Centro Universitário da FEI, Brazil

The coconut fiber is a lignocellulosic waste found in abundance; however, it is normally not reused even though, it is an important cellulose source. In this context, within the possible applications of cellulose that comes from this waste are: bioethanol, composites and biodegradable plastics, such as cellulose acetate. Therefore, knowing the importance of the application of this material in processes, the objective of the work is to purify the coir fiber and cellulose fiber with the aim of producing cellulose acetate. The process was initiated with the fiber's milling, followed by pulping and whitening that together resulted in a delignification of 66.37%. This also accomplished the synthesis and characterization of the ionic liquid n-butylammonium acetate that was proved to be the right one by nuclear magnetic resonance analysis. With the ionic liquid, the treatment of coir fiber followed by whitening was fulfilled resulting in a delignification of 0.82 and 6.10% respectively. After this, the esterification was accomplished generating cellulose triacetate that was characterized by Infrared Spectroscopy, Scanning Electron Microscope (SEM), X-Ray Diffraction (XRD) and Degree of Substitution. These methods gave related results, because the surface crystallinity and characteristic bands are similar in the triacetates produced by all the three materials. This means that when producing cellulose triacetate, the delignification treatment is not needed.

Biography

Andreia de Araújo Morandim Giannetti has completed her PhD at Paulista State University and Postdoctoral studies from the same. She is a teacher at the FEI University Center. She has published more than 18 papers in reputed journals and has been serving as a reviewer in several renowned journals.

preamorandim@fei.edu.br

Notes:

Yuzhu Luo et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Variation in the ovine and caprine keratin-associated protein 22-2 gene

Yuzhu Luo[1], **Shaobin Li**[1], **Huitong Zhou**[1,2], **Hua Gong**[1,2], **Fangfang Zhao**[1], **Jiqing Wang**[1], **Xiu Liu**[1] and **Jon G H Hickford**[1,2]
[1]Gansu Agricultural University, China
[2]Lincoln University, New Zealand

Wool keratin-associated proteins are a structural component of the wool fiber, which plays a role in defining the properties of the wool fiber. The keratin-associated protein family genes encode these proteins. This research is taken 150 sheep (Merino×Southdown lambs and New Zealand (NZ) Romney lambs) and 80 goats (Chaida Black goats, the Ziwuling Black goat, the Hexi Cashmere goat and the Inner Mongolia cashmere goat) as the research object, PCR-SSCP and sequencing method were used for detecting SNPs in the ovine and caprine keratin-associated proteins 22-2 gene. No mutations in ovine keratin-associated proteins 22-2 gene were detected in the Merino×Southdown-cross lambs and New Zealand Romney lambs. There were three SNPs and three alleles were detected in caprine keratin-associated proteins 22-2 gene on four goat breeds, one of SNPs was a non-synonymous mutation, which resulting in a mutation between arginine and glycine. *C* has a 6-bp insert, and an addition of 2 amino acids (arginine and cysteine). *AA* and *AB* are dominant genotypes. *A* is the dominant allele in these goat breeds. The significant difference on gene variation in keratin-associated proteins 22-2 gene may result from the different selection on the gene between the two species.

Biography

Yuzhu Luo is Professor of Gansu Agricultural University of China. He is the Director of Gansu Key Laboratory of Herbivorous Animal Biotechnology and Assistant President of Gansu Agricultural University. His research area includes four directions which are grazing animal genomes (functional gene selection) and molecular breeding, reproduction control, traceability and quality of meat and milk products, and biological reactor. He has published more than 190 papers.

luoyz@gsau.edu.cn

Notes:

M Cristina Diez et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Removal of metals from synthetic acid mine drainage (AMD) using an organic bio-mixture in continuous system

M Cristina Diez[1,2], **Marcela Levío**[1], **Danny Andrade**[1] and **Felipe Gallardo**[1,2]
[1]CIBAMA-BIOREN, Chile
[2]La Frontera University, Chile

Mining and extraction of specific metals is associated with pollution problems in the environment. An example of this is acid mine drainage (AMD). This corresponds to runoff of sulfate acid solutions, often with a significant content of dissolved metals. The treatment of water contaminated with these metals is significant for the protection of water resources and the environment in general. Therefore, in this work we evaluated the removal of Fe, Mn, Cu and Zn from a synthetic AMD through adsorption studies in continuous system using an organic bio-mixture. For the continuous system, glass columns (32 cm x 5 cm) packed with the bio-mixture (ρ 0.35 gmL^{-1}) was used for breakthrough curves determination. The synthetic effluent was prepared mixing: 102 mgL^{-1} of Cu, 25 mgL^{-1} of Mn, 142 mgL^{-1} of Zn and 456 mgL^{-1} of Fe. Columns were fed at different hydraulic loads (0.5, 1 and 1.5 mL per min). Lixiviates were collected and analyzed until the column saturation and data were analyzed and adjusted by the Thomas model. The adsorption in continuous system indicated that the bio-mixture has a high adsorption capacity for the metals and the parameters obtained through the Thomas model indicate that as the flow increases, the Thomas rate constant (Kt) is higher. In addition, the amount adsorbed (q_0) decreases as the flow increases. However, the amounts removed from the Cu, Zn, Mn and Fe metals were 86, 92, 90 and 95%. Thus, this bio-mixture could be used as a sustainable sorbent for the more expensive materials in mining effluent treatment due to its adsorptive properties, high availability, large quantities and low cost.

Biography

M Cristina Diez, has completed her PhD in 1993 from Universidad Estadual de Campinas, Brazil. She is a professor at Chemical Engineering Department and the Director of Biotechnological Research Center Applied to the Environment (CIBAMA-BIOREN) of La Frontera University. She has published more than 115 papers in reputed journals (ISI/WoS). She is a member of FONDECYT's technology board. She is serving as an Editorial Board Member of the *Journal of Soil Science and Plant Nutrition*.

cristina.diez@ufrontera.cl

Notes:

Ilona Jonuškienė, J Biotechnol Biomater 2017, 7:3(Suppl)
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Production of biopolymers by bacterial cells

Ilona Jonuškiene
Kaunas University of Technology, Lithuania

In recent years, microorganism-based biopolymers have shown promise as nontoxic, biodegradable and biocompatible nanomaterials. Polysaccharide-based biopolymers have emerged as the most promising drug carriers for achieving prolonged circulation time, reducing drug toxicity and protecting them from enzymatic degradation, enhancing antitumor capacity and controlling drug release. The main objective of the present study is to investigate the different media composition for *Xanthomonas campestris* and *Azotobacter vinelandii* growth and to select optimal conditions for purification of xanthan gum and alginate. Optimal conditions for xanthan gum synthesis using different carbon sources, nitrogen sources were examined. Xanthan gum production is influenced by several factors that include medium composition, cultivation conditions (temperature, pH, stirrer speed), fermentation time, and post-fermentation conditions (heat treatment, recovery, purification). The present work revealed that the growth medium and organic solvents are the main factors impacting the xanthan gum production. The properties that enable the application of xanthan gum in pharmaceutical industries are emulsifying, thickening, stabilizing, film forming and gelling nature. Alginates are group of polysaccharides occurring as structural components or as capsular materials in the cell wall of soil bacteria. *Azotobacter vinelandii* was used to produce alginate. Exopolysaccharide production by *Azotobacter* in media supplemented with carbohydrates and some phenolic compounds was investigated. Bacterial polysaccharides are produced on industrial scales and used as raw materials for food processing and medical and industrial preparations. Alginate is a biomaterial that has found numerous applications in biomedical science and engineering due to its favorable properties, including biocompatibility and ease of gelation.

Biography

Ilona Jonuškienė has completed her PhD from Kaunas University of Technology, Lithuania. She had training at Swedish University of Agricultural Sciences and Copenhagen University. She is an Associate Professor and Chief of Bachelor and Master study programmes of Industrial Biotechnology at Kaunas University of Technology, Faculty of Chemical technology. She has published more than 15 articles in reputed journals.

ilona.jonuskiene@ktu.lt

Notes:

Ronald Skewes et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Production of the antioxidant ascorbyl palmitate by an innovative process of synthesis and purification

Ronald Skewes, Vanessa Campos and **Lorena Wilson**
Pontifical University Catholic of Valparaiso, Chile

Ascorbyl palmitate, an antioxidant derived from ascorbic acid, represents a feasible alternative to petrochemical compounds such as BHT, BHA and TBHQ, which are used in the food, pharmaceutical and cosmetic industries. The process developed in this proposal considers an enzymatic synthesis of this compound using commercial lipase novozyme 435 in nonconventional medium at 60°C, achieving 65% conversion. The main advantage is the absence of secondary compounds that occur when this antioxidant is synthesized chemically, making the purification associated with the antioxidant to be simpler and cheaper, unlike the process currently used in the industry, which corresponds to a chemical synthesis. The purification process contemplated in this proposal comprises five-unit operations, considering a stage of recovery of the solvents used, to be a more environmental friendly process. The ascorbyl palmitate obtained from this process meets the quality standards necessary for its use at industrial level, since it is contemplated the use of solvents allowed by FAO in the manufacture of food additives, in addition to achieving a high purity, over 99%. Therefore, the process developed to obtain this antioxidant represents a highly competitive alternative at the industrial level.

Biography

Ronald Skewes is a Biochemical Engineer and Bachelor in Engineering Sciences from Pontifical University Catholic of Valparaiso, Chile. He is co-founder of in-Biotech Spa, a small company dedicated to the research and development of biotechnological projects. This company comes from project VIU 15E0095 Production of the antioxidant ascorbyl palmitate through an innovative process of synthesis and purification.

roskewes@gmail.com

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Ksenija Taški-Ajduković et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Genetic diversity of alfalfa breeding populations revealed by SSR markers

Ksenija Taški-Ajduković, Nevena Nagl, Dragan Milić, Đura Karagić and **Slobodan Katić**
Institute of Field and Vegetable Crops, Serbia

Genetic diversity studies are important for the selection of parents with a greater combination capacity which, when crossed, increase the chances of obtaining superior genotypes. Thus, genetic diversity of 50 individual samples of five alfalfa populations selected from the breeding program of the Institute of Field and Vegetable Crops, Novi Sad, Serbia was characterized based on 27 polymorphic SSR loci. A total of 224 alleles were obtained with mean value of 8.77 alleles per population. Mean effective number of alleles ranged from 2.45 for population Ghareh to 2.66 for population Zuzana, while the mean observed heterozygosity ranged from 0.65 for population Ghareh to 0.73 for population Zuzana. Low levels of genetic differentiation among the populations of alfalfa were detected by Nei's Gst = 0.079. It is further confirmed by PCoA and Bayesian model-based clustering approach that could not reveal a clear separation between populations, although individuals from population RSI 20 were clearly differentiated to other populations. Analysis of molecular variance showed that 89.0% of the total genetic variability was attributed to variation among individuals within tested alfalfa populations, and only 11% was found between populations. The obtained results provided a better understanding of individual identities and relationships of alfalfa germplasm, and it could contribute to their more efficient utilization in breeding.

Biography

Ksenija Taški-Ajduković is employed in the Institute of Field and Vegetable Crops, Novi Sad, Serbia, as the Scientific Advisor. Her research is focused on the application of protein and DNA markers in breeding of field crops, plant genetic resources and plant protection. She has completed her PhD in 2005 at the Faculty of Biology, Belgrade. She is co-author of over 200 publications in international and national journals, conferences and book chapters. She is a member of the Variety Committee of the International Seed Testing Association (ISTA) and Editorial Boards of several peer-reviewed scientific journals.

ksenija.ajdukovic@nsseme.com

Notes:

Hyun Young Song et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Differential expression of anthocyanin biosynthesis genes and transcription factors determines coloration patterns in gerbera flowers

Hyun Young Song, Aung Htay Naing and **Chang Kil Kim**
Kyungpook National University, Korea

Diverse flower colors exist in different gerbera cultivars. To elucidate the different coloration patterns in two commercial cultivars 'Nathasha and Rosalin', expressions of anthocyanin biosynthesis genes and transcription factors associated with varying anthocyanin contents during different developmental stages (S1 to S5) were investigated. In addition, role of different temperatures in anthocyanin biosynthesis were also investigated by detecting anthocyanin content and gene expression levels. Accumulation of anthocyanin in both cultivars started at S1 and reached a maximum at both of S2 and S3 or only S3 depending on the cultivars. Enhancement of anthocyanin in cv. Nathasha was associated with up-regulation of *ANS* and *MYB10,* while *CHS1* and MYC were likely to be responsible for this in cv. Rosalin. Low temperature (6 °C) could enhance the anthocyanin contents than 22 °C by stronger up-regulation of *CHS1* and MYB10 in cv. Nathasha or of *CHS1* and MYC in cv. Rosalin, regardless of the flower stages. However, the difference of contents between the two cultivars was found to be influenced by expression levels of all biosynthesis genes and TFs, regardless of flower stages and temperature conditions. Hence, it was suggested that the expression patterns of biosynthesis genes and TFs are involved in the differential regulation mechanisms of anthocyanin biosynthesis and coloration pattern between the two cultivars, although further functional studies of the key genes still need to be explored.

Biography

Hyun Young Song is doing Master Degree at Kyungpook National University, South Korea.

aunghtaynaing2005@gmail.com

Notes:

Aung Htay Naing et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Overexpression of snapdragon *Delila (Del)* gene in tobacco enhances anthocyanin accumulation and abiotic stress tolerance

Aung Htay Naing and **Chang Kil Kim**
Kyungpook National University, South Korea

Rosea1 (*Ros1*) and Del (*Delila*) co-expression controls anthocyanin accumulation in snapdragon flowers, while their overexpression in tomato strongly induces anthocyanin accumulation. However, little data exist on how Del expression alone influences anthocyanin accumulation. In tobacco (*Nicotiana tabacum 'Xanthi'*), Del expression enhanced leaf and flower anthocyanin production through regulating *NtCHS, NtCHI, NtF3H, NtDFR,* and *NtANS* transcript levels. Transgenic lines displayed different anthocyanin colors (e.g., pale red: T_0-P, red: T_0-R, and strong red: T_0-S), resulting from varying levels of biosynthetic gene transcripts. Under salt stress, the T2 generation had higher total polyphenol content, radical (DPPH, ABTS) scavenging activities, antioxidant-related gene expression, as well as overall greater salt and drought tolerance than wild type. We propose that Del overexpression elevates transcript levels of anthocyanin biosynthetic and antioxidant-related genes, leading to enhanced anthocyanin production and antioxidant activity. The resultant increase of anthocyanin and antioxidant activity improves abiotic stress tolerance.

Biography

Aung Htay Naing has completed his PhD from Kyungpook National University, South Korea. He has published more than 30 papers in SCI/E in journals and has been serving as an Editorial Board Member of some plant science journals.

aunghtaynaing2005@gmail.com

Notes:

Meziani Reda et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Effects of plants growth regulators and carbon sources on *in vitro* shoot elongation, rooting, and plantlet acclimatization of date palm (*Phoenix dactylifera* L.) cv. Mejhoul

Meziani Reda[1,2], **Mazri Mouaad Amine**[1] and **Jaiti Fatima**[2]
[1]Institut National de la Recherche Agronomique, Morocco
[2]Faculté des sciences et techniques, Errachidia, Morocco

Date palm (*Phoenix dactylifera* L.) is an agronomically, ecologically and socio-economically important fruit tree in many countries. This species is mainly propagated by somatic embryogenesis. However, this technique may result in somaclonal variation within regenerants. Recently, date palm micro-propagation through organogenesis has gained much interest since it allows to produce true-to-type plantlets. Organogenesis is the technique by which adventitious buds are formed directly on the explant. It comprises numerous steps: initiation of vegetative buds, bud multiplication, shoot elongation and rooting then plantlet acclimatization. In previous works, we evaluated the effects of numerous factors on bud initiation and multiplication. Thus, the purpose of this study was to evaluate the effects of different plant growth regulator combinations and carbon sources on shoot elongation, rooting and plantlet acclimatization of date palm cv. Mejhoul. The results of this study showed that the combination of 1 mg/L NAA, 1 mg/L BAP and 1 mg/L KIN resulted in the highest leaf length with an average of 19.2 cm. The use of KIN alone in the culture medium resulted in leaf lengths ranging from 12 to 14 cm. Root formation was strongly stimulated using NAA alone or in combination with IBA. Regarding leaf greening, the PGR-free medium gave the highest chlorophyll content with 6.78 CCI. After one month in the glasshouse, the plantlet survival rate was higher within those that have been grown on PGR-free medium. On the other hand, the carbon source (sucrose, mannitol, sorbitol or commercial granular sugar) showed a significant effect on shoot development and plantlet acclimatization. The use of sucrose gave the best results *in vitro* and *ex vitro*, with an average shoot length of 13.6 cm, a high chlorophyll content (10.04 CCI), and a high survival rate after acclimatization 80%. The use of commercial sugar as carbon source has also given satisfactory results, with a survival rate of 70 %.

Biography

Meziani Reda has obtained his Engineer Degree from the National School of Agriculture of Meknes in 2009. He is currently a PhD student in University Moulay Ismail, Faculty of Science and Technology of Errachidia. His research is focused on the micro-propagation of date palm. He has published many papers in reputed journals and participated to many international congresses in numerous countries.

redameziani@yahoo.fr.

Notes:

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The effects of sucrose on *in vitro* tuberization of potato cultivars

Iveta Megrelishvili, Maia Kukhaleishvili, Ekaterine Bulauri and **Tamar Chipashvili**
Georgian Technical University, Georgia

Two potato varieties: "Sebago" and "Carola" were tested for *in vitro* tuberization response under three different MS mediums: 1. MS+60g/l sucrose (6% MS medium) 2. MS+80g/l Sucrose (8%MS medium) 3. MS+100g/l Sucrose (10% MS medium). As a control, basal MS medium (3% MS medium) was used. The objective was to determine optimum concentration of sucrose for *in vitro* tuberization. Three parameters were observed in response to treatment, number, weight and diameter of microtuber. In both cultivars, among the three concentrations of sucrose, Murashige and Skoog (MS) medium supplemented with 100g/L sucrose showed a better value of microtuber number, diameter and weight than the other concentrations. Morphological characterization of micro tubers of two potato cultivars on 10% MS medium was a bit different. Accordingly, this medium gave an average value of microtuber number (3.98±0.04), microtuber diameter (9.9±0.02mm), and weight (0.09±0.003g) of microtuberian variety Sebago after 54.8±0.87 days of *in vitro* cultivation. Average microtuber number (2.8±0.02), microtuber diameter (9.4±0.03mm) and weight (0.087±0.002g) was showed by cultivars Carola. Microtubers were not developed on 6% and 8% MS medium (only embryonal microtubers). Finally, 10% MS medium was selected as an optimal MS medium for *in vitro* micro tuberization in two cultivars of potato (Sebago, Carola) after 54.8±0.87 days of *in vitro* cultivation.

Biography

Iveta Megrelishvili has completed her PhD from Ivane Javakhishvili Tbilisi State University. She is the main Research Scientist of Georgian Technical University, Biotechnology Center and Head of Virology Lab, Scientific-Research Center of Agriculture. He has published more than 12 papers in reputed journals and has a vast experience in Plant Biotechnology sphere.

ivetameg@yahoo.com

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Maia Kukhaleishvili et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Determination of phytotron optimal condition for *in vitro* potato ontogenesis

Maia Kukhaleishvili, Ekaterine Bulauri, Tamar Chipashvili, Tamar Shamatava and **Iveta Megrelishvili**
Georgian Technical University, Georgia

Three type of combinations with light, temperature, humidity and photoperiod was made: 1. 22-23 °C, 4000 lux, humidity 70%, 16h. 2. 24-25 °C, 5000 lux, humidity 75%, 18h. 3. 26-27 °C, 6000 lux, humidity 80 %, 20h. These were studied on *in vitro* cultivation of potato cultivars: Sebago, Russet Burbank, Katahdin and Carola for 21-24 days. All *in vitro* potato cultivars morphological characterization was variable depending on the type of *in vitro* condition combination. It was revealed that all researched potato varieties had maximum potential for *in vitro* propagation (Green leaves, rooting 90% and shoot formation 94%) on combination of: 24-25 °C, 5000 lux, humidity 75% and 18h after 17 days of cultivation. Plant development (Green leaves, rooting 87% and shoot formation 92%) on the *in vitro* condition combination: 22-230C, 4000lux, humidity 70% and 16h was completed after 21 days. And *in vitro* shoot and root formation (light green leaves, rooting 89% and shoot formation 78%) on combination of: 26-27 °C, 6000 lux, humidity 80% and 20h was presented after 14 days of cultivation. Best combination (26-27 °C, 6000 lux, humidity 80% and 20h) of *in vitro* condition for all researched potato varieties *in vitro* cultivation was selected for their leave colors, rooting, and shoot formation.

Biography

Maia Kukhaleishvili has completed her PhD from ST. Andrew the First Called Georgian University of the Patriarchate of Georgia. She is the Director of Georgian Technical University, Biotechnology Center- Scientific-Research Center. She has published more than 15 papers in reputed journals and has a vast experience in Agriculture and Biotechnology sphere.

maia.kukh@gmail.com

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Mojgan Naghitorabi et al., J Biotechnol Biomater 2017, 7:3(Suppl)
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Study of the role of siRNA mediated promoter methylation in DNMT3B knockdown and alteration of promoter methylation of CDH1, GSTP1 genes in MDA-MB -453 cell line

Mojgan Naghitorabi[1], **Hamid Mir Mohammad Sadeghi**[2], **Javad Mohammadi Asl**[1], **Mohammad Rabbani**[2] and **Abbas Jafarian-Dehkordi**[2]
[1]Ahvaz Jundishapur University of Medical Sciences, Iran
[2]Isfahan University of Medical Sciences, Iran

Promoter methylation is one of the main epigenetic mechanisms that leads to the inactivation of tumor suppressor genes during carcinogenesis. Due to the reversible nature of DNA methylation, many studies have been performed to correct theses epigenetic defects by inhibiting DNA methyltransferases (DNMTs). In this case novel therapeutics especially siRNA oligonucleotides have been used to specifically knock down the DNMTs at mRNA level. Also many studies have focused on transcriptional gene silencing in mammalian cells via siRNA mediated promoter methylation. The present study was designed to assess the role of siRNA mediated promoter methylation in DNMT3B knockdown and alteration of promoter methylation of Cadherin-1 (CDH1), Glutathione S-Transferase Pi 1(GSTP1), and DNMT3B genes in MDA-MB-453 cell line. MDA-MB-453 cells were transfected with siDNMT targeting DNMT3B promoter and harvested at 24 and 48 h post transfection to monitor gene silencing and promoter methylation. DNMT3B expression was monitored by quantitative RT-PCR method. Promoter methylation was quantitatively evaluated using differential high resolution melting analysis. A non-significant 20% reduction in DNMT3B mRNA level was shown only after first transfection with siDNMT. Promoter methylation levels of DNMT3B, CDH1, and GSTP1 were detected at about 15%, 70% and 10% respectively, in the MDA-MB-453 cell line, with no significant change after transfection.Our results indicated that siDNMT sequence were not able to affect promoter methylation and silencing of DNMT3B in MDA-MB-453 cells. However, quantitation of methylation confirmed a hypermethylated phenotype at CDH1 and GSTP1 promoters as well as a differential methylation pattern at DNMT3B promoter in breast cancer.

Biography

Mojgan Naghitorabi is an Assistant Professor of the School of Pharmacy at Ahvaz Jundishapur University of Medical Sciences, Iran. She received her Pharm D and PhD degrees from the School of Pharmacy and Pharmaceutical Sciences at Isfahan University of Medical Sciences, Iran. Her research interests lie in the area of epigenetics, regulation of gene expression, RNA interference, and cancer. She has published four papers in her research field.

mnaghitorabi@gmail.com

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The effects of subculture methods on browning of callus derived from *Corylus* avellana L cotyledons

Sara Alsadat Rahpeyma[1], **Mona Raeispour Shirazi**[1], **Sajad Rashidi Monfared**[2] and **Jafar Zolala**[1]
[1]Shahid Bahonar University, Iran
[2]Tarbiat Modares University, Iran

Hazel has been reported as a taxol-producing species, which is a potent antimitotic drug employed in many different cancer treatments, through bioprospection among angiosperms. Plant cell culture is considered as one of the most promising approaches to provide a stable supply of taxol and related compounds, generally named taxanes. Callus browning is a major problem of callus cultures derived from the cotyledon of *C. avellana* L. Brown callus results in decreasing regenerative ability, poor growth and even death, especially through the first subculture. In this study, we investigated the effect of subculture methods on reduction of callus browning. Two subculture methods were applied: consecutive subculture the cotyledons callus in the same solid medium for 4 weeks; subculture the cotyledons callus in the liquid medium with the same composition and then immobilized the cells on the solid medium. The results indicated that subculture the callus in the liquid and then solid medium can practically reduce callus browning and increase the viability of callus.

Biography

Sara Rahpeyma is an Assistant Professor of Plant Breeding Engineering in Department of Agricultural Biotechnology at Shahid Bahonar University of Kerman, Iran. Her research programs have been on plant secondary metabolites and also, her graduate work focused on enhancing the production of paclitaxel in cell suspension culture of *Corylus avellana*.

s.rahpeyma@uk.ac.ir

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Inhibition of *Shigella flexneri* virulence regulator VirF

Veerendra Koppolu
University of Kansas, USA

VirF is an AraC family transcriptional activator that is required for the expression of virulence genes associated with invasion and cell-to-cell spread by including multiple components of the type three secretion system (T3SS) machinery and effectors. We tested a small-molecule compound, SE-1 (formerly designated OSSL_051168), which we had identified as an effective inhibitor of the AraC family proteins RhaS and RhaR, for its ability to inhibit VirF. Cell-based reporter gene assays with *Escherichia coli* and Shigella, as well as *in vitro* DNA binding assays with purified VirF, demonstrated that SE-1 inhibited DNA binding and transcription activation (likely by blocking DNA binding) by VirF. Analysis of mRNA levels using real-time quantitative reverse transcription-PCR (qRT-PCR) further demonstrated that SE-1 reduced the expression of the VirF-dependent virulence genes *icsA, virB, icsB, and ipaB* in Shigella. We also performed eukaryotic cell invasion assays and found that SE-1 reduced invasion by Shigella. The effect of SE-1 on invasion required pre-incubation of Shigella with SE-1, in agreement with the hypothesis that SE-1 inhibited the expression of VirF-activated genes required for the formation of the T3SS apparatus and invasion. We found that the same concentrations of SE-1 had no detectable effects on the growth or metabolism of the bacterial cells or the eukaryotic host cells, respectively, indicating that the inhibition of invasion was not due to general toxicity. Overall, SE-1 appears to inhibit transcription activation by VirF, exhibits selectivity toward AraC family proteins, and has the potential to be developed into a novel antibacterial agent.

Biography

Veerendra Koppolu is a Senior Scientist in Department of Biologics Development at AstraZeneca in Gaithersburg, Maryland, USA. He completed his Doctoral degree from University of Kansas, USA. He is an honorary faculty member at non-profit organization Novel Global Community Education Foundation (NGCEF) focused in guiding doctoral students. He has published over 46 papers including research article, review articles, abstracts, book chapters, and books. He is serving as Reviewer/Editor of 25 peer-reviewed international journals covering oncology and infectious disease areas. He is a member of American Association of Cancer Research (AACR), American Chemical Society (ACS) and American Association of Microbiology (ASM). His research interests include Pre-clinical and clinical development of monoclonal antibodies and novel small molecules as breakthrough therapies for cancer and infectious diseases.

veeru.bios@gmail.com

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