The Second International Conference for Applications of Biotechnology

2nd

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Faculty of Biotechnology

The Second International Conference for Applications of Biotechnology

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Faculty of Biotechnology,
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Abstracts Book

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Conference Program

Saturday 17th October, 2009

Registration	**9:30-10:00**
Opening Ceremony	**10:00-11:30**
Dr. Ayman A. Diab Faculty of Biotechnology, MSA Conference chairman	**10:00-10:15**
Prof. Khayri Abd El Hamid President of MSA University Conference president	**10:15-10:30**
Prof. Fathy Saad 6th October governor	**10:30-10:45**
Prof. Martin J. Snowden Head of School of Science Greenwich University-England	**10:45-11:00**
Ms. Cynthia Iglesias Senior Attaché – USA embassy	**11:00-11:15**
Coffee Break	**11:15-11:30**

Saturday 17th October, 2009

Session I Medical Biotechnology **Chairman: Prof. Sherif El Degwi** MSA University Vice president	**11:30 -1:30**
Dr. Birthe Nielsen School of Science, University of Greenwich **Development of a mass spectrometry method to detect and quantify salivary stress and neuropsychiatric markers**	**11:30-11:50**
Dr. G. T. M. Getti School Science, University of Greenwich **Survival mechanisms of Leishmania parasites**	**11:50-12:10**
Prof. Gamal Saadi Depatment of Internal medicine & Nephrology **Mesenchymal stem cells (MSCs) a rescue approach for regeneration of deteriorating kidney function**	**12:10-12-30**
Dr. Thanaa E.A Department of pathology, Faculty of Medicine, Ain-Shams University. **Immunohistochemical expression of Mismatch repair genes (hMSH2 and hMLH1) in Hepatocellular carcinoma in Egypt**	**12:30-12:50**
Lunch Break	**12:50-1:30**

Saturday 17th October, 2009

Session I Medical Biotechnology **Chairman: Prof. Sherif El Degwi** MSA University Vice president	**1:30 -3:10**
Dr. Gadallah F.H., Clinical Pathology Department, Cairo University **Sensitivity and Specificity of Multiplex RT-PCR in Acute Leukaemia**	**1:30-1:50**
Dr. Yasmine Ahmed Nassar Department of surgery, Oral and Dental medicine, Cairo University **Isolation of Osteoblast-like Cells from Adult Canine Alveolar Bone**	**1:50:2:10**
Dr. Ashraf A. Khalil Department of Protein Technology, Mubarak City for Scientific Research **Reactive oxygen species would induce idiopathic infertility in Egyptian males**	**2:10-2:30**
Dr. Rania Abou elnour Department of Clinical Pathology, Cairo University **Dendritic Cell Vaccine for the Treatment of Chronic Myeloid Leukemia**	**2:30-2:50**
Coffee Break	**2:50-3:10**

Saturday 17th October, 2009

Session II Pharmaceutical Biotechnology **Chairman Dr. Ibrahim Tahsin** Faculty of biotechnology, MSA university	**3:10-5:30**
Dr. Refaat A. Saber National organization for drug control & Research (NODCAR) **Herbal Extracts of *Capsella brusa-pastoris*, *Certain Silique* and *Onions Spinosa* Inhibit Crystallization of Calcium Oxalate monohydrate Crystals**	**3:10-3:30**
Dr. Salman, T Biochemistry Department, Faculty of Pharmacy, Al-Azhar University **Effect of Narcotic Addiction on Hypothalamic Pituitary Gonadal Axis Hormones**	**3:30-3:50**
Dr. Samah, F. Darwish Biotechnology Research Unit, Animal Reproduction Research Institute **Molecular detection and differentiation of Brucella species including S19 and RB51 vaccine strains using two different multiplex PCR assay**	**3:50:4:10**
Dr. Doaa A. Ghareeb Department of Biochemistry, Faculty of science, Alexandria University **From steatosis to steatohepatitis: is there any early diagnostic marker?**	**4:10-4:30**
Prof. Salman, T Biochemistry Department, Faculty of Pharmacy, MSA University **Oxidative Stress and Lipotoxicity of Bhang and Opium Addiction. Effects on Adrenal Gland Secretions**	**4:30-4:50**
Researchers and Students Poster Sessions	**4:50-5:30**

Sunday 18th October, 2009

Session III Agricultural Biotechnology Chairman: Prof. Osama Momtaz Agricultural Genetic Engineering Research Institute (AGERI)	9:30-12: 00
Dr. Osama A. Momtaz Deputy, Agricultural Genetic Engineering Research Institute **Nanotechnology Solutions for Agricultural biotechnology**	**9:30-9:50**
Nahed Abdel Ghaffar A. Ibrahim Agricultural Genetic Engineering Research Institute, ARC **Simultaneous detection of *Escherichia coli* 0157:H7, *Listeria monocytogenes*, *Salmonella typhimurium* by Multiplex PCR in food**	**9:50:10:10**
Dr. Atta, A.H. Department of Genetics, Faculty of Agriculture, Ain Shams University **Determination of QTLs for four Agronomic traits in maize (*Zea mays* L.) using SSR markers**	**10:10-10:30**
Dr. Zeiad Moussa Plant Pathology Research Institute, Agriculture Research Centre **Isolation, Identification and Use of *Streptomyces* in Biocontrol of Brown Rot Disease of Potato**	**10:30-10:50**
Dr. Bassem M.R. Biochemistry Department, National Research Centre **Antioxidant potency of *Angelica archangelic* root and its correlation with retinal cells damage induced by lead poisoning in rabbits**	**10:50-11:10**
Dr. Fayzalla E. A. Plant Pathology Department, Faculty of Agriculture, Mansoura University **Antifungal Potential of Extracellular Metabolites Produced by *Drechslera* spp. against Phytopathogenic Fungi**	**11:10-11:30**
Coffee Break	**11:30-12:00**

Sunday 18th October, 2009

Session IV Industrial & Environmental Biotechnology **Chairman: Prof. Ahmed Hegazi** **Secretary General, Council of Environmental and development research, Egyptian Academy of Science**	**12:00-2:30**
Prof. Ahmed Hegazi Secretary General, Council of Environmental and development research, Egyptian Academy of Science **Environmental Biotechnology, application and consideration**	**12:00-12:20**
Dr. Sherif Elnagdy Department of Genetics, University of Cambridge Botany Dept., Faculty of Sciences, Cairo University **The Killer Bacteria…!!!**	**12:20-12:40**
Dr. Osama M. M. Darwesh Agricultural Microbiology Department, National Research Center **Biodegradation of Reactive Red azo dye in anoxic/aerobic bioremediation system**	**12:40-1:00**
Dr. Wesam I. A. Saber Microbiology Department, Soils, Water and Environment Research Institute **Optimization of fermentation conditions for the biosynthesis of inulinase by the new source; *Aspergillus tamarii* and hydrolysis of some inulin containing agro-wastes**	**1:00-1:20**
Dr. Ehab Serour Protein research Department, Genetic engineering and biotechnology research institute(GEBRI) **Keratinases from new thermophilic Bacteria**	**1:20-1:40**
Lunch Break	**1:40-2:30**

Sunday 18th October, 2009

Session V Student session **Chairman: Dr. Samer S. El-daher** School of Science Greenwich University-England	**2:30-4:30**
George Newman University of Greenwich **Stem cell therapy/research in equine species**	**2:30-2:50**
Yasmine Mamdouh William Faculty of Biotechnology, MSA University **Multifunctional implantable chitosan scaffold for skin tissue engineering and wound healing.**	**2:50-3:10**
Marie Pettit University of Greenwich **Copying Nature: The Use of Recombinant Proteins in Nanoscale Gene Therapeutics**	**3:10-3:30**
Ahmed Mogawer Faculty of Biotechnology, MSA University ***In-vitro* Mesenchymal Stem Cells Differentiation into Hepatocytes in the presence and absence of the microenvironment**	**3:30-3:50**
Arwa Obada Kohela and Sara El-Laithy Biotechnology Program, Faculty of Science, Cairo University **Antibiotic targeting of *Wolbachia* endosymbiotic bacteria as a new approach to the treatment of filarial infection and disease**	**3:50-4:10**
Mirna Khater Faculty of Biotechnology, MSA University **Using the Molecular tools to diagnose Homochromatosis disease**	**4:10-4:30**

Medical Session

Presentations

Development of a mass spectrometry method to detect and quantify salivary stress and neuropsychiatric markers

Dr Birthe Nielsen
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Chatham Maritime, Kent ME4 4TB, UK

A biomarker can be a substance whose detection (or absence) indicates a particular disease state. Biomarkers present in biological fluids such as blood and urine are widely used as indicators for health and diseases. However, saliva as a source of biomarker has largely been ignored in spite of an easy and stress free collection protocol. Several steroids have been proposed to play a role in neuropsychiatric disorders such as stress, depression, anxiety, and schizophrenia: the action of steroids is based on their concentration and their quantification is done by immounassay, which is generally considered a sensitive method for estimating these compounds, however these are time consuming and rely on antibodies which are cross-reactive. Ongoing research at the University of Greenwich has suggested that mass spectrometry methods offer a sensitivity which is sufficient to allow biomarker quantification at concentrations of biological relevance. Detection and quantification of established relevant neuropsychiatric markers has the potential to be used clinically to screen for, diagnose, or monitor the activity of such disease but also in the field of sport and exercise where stress markers can provide indicators for health and physiology-related assessment pre- and post exercise. It is most unlikely that a single marker will have the sole decision to a diagnosis or prognosis of a particular disorder: a. constellation of markers will have a more predictive power. Therefore, ongoing work aims to develop novel mass spectrometry (LC-MS, GC-MS and MALDI-TOF) methodologies that primarily utilise saliva as a clinical tool for quantification of relevant biomarkers.

Survival mechanisms of Leishmania parasites.

G. T. M. Getti
School of Science, University of Greenwich at Medway

Leishmaniasis is a widespread disease with 350 million people in 88 counties at risk. Every year 500 000 new cases of the lethal visceral form and 1.5 million of the cutaneous form are notified (WHO, 2004). The parasite enters the host following a sandfly bite and establishes itself inside macrophages, key cells of the immune system. From the host macrophages it spreads either to the skin or to internal organs causing life-long disfigurations or death. The interactions between *Leishmania* and macrophages play a central role in the pathogenesis of the infection. It is currently believed that *Leishmania* simply spreads from macrophage to macrophage by killing the host cell leaving free parasites to bind to and be consumed by uninfected macrophages. We studied this mechanism in three cutaneous species (*L. major, L. aethiopica and L. Tropica*). Each of them was able to induce cell suicide (apoptosis). Three assays were used to detect different stages of apoptosis following infection. The results showed that two early features of the apoptotic process were present in the host cells 48 hours after infection. Since early signs of apoptosis act as signals for engulfment by neighbouring macrophages, we suggest that apoptosis induction actively stimulates the spread of the parasites into other cells and that apoptotic bodies with intact membranes containing parasites are released and taken up by previously uninfected macrophages. We believe that *Leishmania* parasites have evolved this ability to induce host cell suicide as a mechanism to facilitate their spread from cell to cell.

Mesenchymal stem cells (MSCs) a rescue approach for regeneration of deteriorating kidney function

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Stem cell (SC) therapy for end-stage renal failure is urgently needed. The role of MSCs in renal protection was first analyzed by Morigi et al. 2004(1). Our work aimed to isolate human MSCs from adult BM to improve kidney functions in patients with chronic kidney disease (CKD). In our study 20 patients with impaired kidney function; were included, their ages ranged from 22 to 68 years (mean value 48.20 ± 15.25 years). They included 10 renal transplantation cases (7 males and 3 females) and 10 inactive systemic lupus erythromatosus (SLE) patients (3 males and 7 females). Fifty ml of BM were aspirated from the iliac bone, for separation of MSCs. Flow cytometric analysis of Surface expression of MSCs revealed +ve CD271 and -ve CD34. There was highly statistically significant difference between CD271 before and after culture with increase of CD271 levels at end of culture, p value <0.01. Then 7-10 million MSCs in 5 ml saline were infused intravenously in 2 divided doses 1 week apart. There was highly statistically significant difference between each of serum creatinine levels and creatinine clearance levels before and after injection, p value <0.01. There was statistical significant difference between transplantation and SLE groups as regards creatinine fold decrease levels before and after MSCs injection with transplantation group showed a greater decline of their serum creatinine levels after injection than SLE cases, p value <0.05. In conclusion: MSCs therapy is a potential therapeutic modality for early phases of CKD.

Keywords
Chronic kidney disease, tissue repair, immunosuppression.

Immunohistochemical expression of Mismatch repair genes (hMSH2 and hMLH1) in Hepatocellular carcinoma in Egypt

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Background: Egypt has the highest prevalence rate of hepatitis C Virus (HCV) infection in the world. HCV contributes to development of about 70% of hepatocellular carcinoma (HCC) cases. Understanding the molecular basis of hepatocarcinogenesis is important for planning the therapeutic regimen for HCC .

Aim: To clarify the possible role of mismatch repair (MMR) genes in HCV– related HCC. Methods: We studied a total of 50 HCV-related HCC specimens (28 of which with adjacent non-cancerous cirrhotic liver tissue, ANCLT) and 30 specimens of chronic liver disease (CLD). All cases were examined immunohistochemically to demonstrate the protein expression of hMSH2 and hMLH1. Results: Thirty two (64%) and 35(70%) of HCCs revealed reduced expression of hMSH2 and hMLH1 respectively. Reduced expression of both proteins was obtained in 26(52%) of HCCs. The expression of hMSH2 and hMLH1 was reduced in 53.6% and 64.3% of ANCLT respectively with no significant difference between HCC and ANCLT. All 30 specimens of CLD had preserved expression of hMSH2 and hMLH1. Multivariate analysis showed that reduced expression of hMSH2 or hMLH1 was significantly associated with higher grades of the tumor .Conclusions: Reduced expression of hMSH2 and hMLH1 in both HCC and ANCLT suggests that this event occurs at early stages of HCV–related hepatocarcinogenesis. Moreover, the significant association between reduced expression of both MMR genes and poor histologic grades of the tumor claims that these proteins are involved in the process of cancer progression.

Sensitivity and Specificity of Multiplex RT-PCR in Acute Leukaemia

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Clinical Pathology Department, National Cancer Institute, Cairo University

The aim of the study was to validate the application of commercial standardised multiplex RT-PCR assay (Hema Vision®-7kit Aarhus, Denmark) as a routine molecular diagnostic approach and to compare multiplex RT-PCR (one arm) with cytogenetics complemented and confirmed by FISH and monoplex RT-PCR (as the other arm) as regards to its diagnostic sensitivity and specificity. The study included 82 newly diagnosed acute leukaemia patients, 42 AML, 37 ALL, 1 plasma cell leukaemia, 1 biphenotypic and 1 undifferentiated leukaemia. Patients were categorised into 3 distinctive groups : a positive retrospective group 1 (33 cases), a negative retrospective group 2 (33 cases) and a prospective group 3 (16 cases).All the cases in the three groups were subjected to complete blood picture , bone marrow examination, cytochemistry, immunophenotyping using flow cytometry, conventional cytogenetics according to(ISHCN), FISH (using Visis LSI and WCP probes), monoplex RT-PCR (Quiagen) and muliplex RT-PCR (HemaVision ®-7 kit). Group 1 : analysis of results between both arms revealed multiplex RT-PCR sensitivity to be 88.2% with a 95% CI of 70.1-70.9. Complete concordance was detected with t (15;17) 9 cases, t(8;21) 11 cases, t(9;22) 4 cases, t(4;11) 2 cases and t(12;21) 2 cases. However multiplex RT-PCR failed to detect one of the three cases with inv. 16 and all the three cases with t (1;19). Group 2 : analysis of results between both arms of the the study revealed a multiplex specificity of 97% with a 95% CI of 82%-99.8% .None of the cases that were negative for the seven translocations by cytogenetics (although had other clonal numerical and strucural anomalies) were positive for any of the fusion genes involved in the multiplex PCR reaction system . However an ETO-AML1 fusion gene (cryptic translocation) was detected by the multiplex RT-PCR and was then confirmed retrospectively by monoplex RT-PCR. Group 3 : none of the the 16 cases involved in this group had a previous cytogenetic result due to poor quality of metaphases. Multiplex RT-PCR detected only one case with an AF4-MLL fusion gene which was confirmed retrospectively by monoplex PCR and correlated with the hematopathologic data. In conclusion , the data derived from the various arms of this study indicate that the diagnostic sensitivity and specificity of mutiplex RT-PCR is similar to the other approaches, with the exceptions mentioned before, however its major advantage is to discern cryptic translocations. We beleive that multiplex PCR assay is clinically useful as an efficient and fast procedure for the screening of prognostically significant translocations in acute leukaemia but it should be used as a complementary not a substitutive approach to cytogenetic analysis.

Isolation of Osteoblast-like Cells from Adult Canine Alveolar Bone

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The scientific progress in bone engineering involves the three components; the scaffold, the osteoconductive factors and the cells to meet the gold standard for implants the autologous graft.

The present study included 7 mongrel adult dogs. The mandible was selected as a donor site for bone –forming cells. Three primary culture methods were investigated for isolation of cells; explant culture, enzymatic isolation and enzymatic treatment followed by explant culture. Cellular alkaline phosphatase activity and the formation of an extracellular matrix containing calcium phosphate were used as markers for osteoblast phenotype. Resorbable type I collagen sponges were seeded with osteoblast-like cells and kept in osteogenic medium, then examined by SEM.

Enzymatic treatment of bone biopsies followed by explant culture was the only successful primary culture method in all experiments. The cell yield obtained by the end of the first subculture was 2-2.4 x 107 cells. Most of the cells were positive for ALP activity as early as day 7 of subcultures. Mineralization of the ECM was evident by day 16 of subculture and increased with time as shown by Von Kossa stain.

The results indicate that the mandible is a good source of osteoblast-like cells with an average yield of 2-2.4 x 107 cells from a relatively small biopsy 1x1x 0.5 cm. Type I collagen scaffolds used were biocompatible and enhanced osteoblast differentiation as evidenced by formation of rough ECM covering the surfaces of cells after 10 days of incubation in osteogenic medium however the collagen scaffolds were very difficult to handle, easily fragmented and collapsed.

Key words: Bone engineering Osteoblast Dogs Collagen Scaffold

Reactive oxygen species would induce idiopathic infertility in Egyptian males

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Oxidative stress "OS" is a common pathology seen in approximately half of all infertile men. Recent evidence shows that OS can play a vital role in etiology of male infertility. Spermatozoa are highly susceptible to oxidative damage due to the high content of polyunsaturated fatty acids with their plasma membrane and such damage may underlie certain aspects of male infertility. It is well-known that male infertility lack adequate diagnostic markers with high specificity and sensitivity. In this investigation, we examine the detrimental effect of elevated reactive oxygen species "ROS" in the Egyptian idiopathic infertile men in order to exploit it as a diagnostic biomarker. Sperm samples were collected from Egyptian males ranged from 30 to 35 years old and then grouped into four groups as follows: 1st group was considered as a control; 2nd group was consisted of azospermia's patients; 3rd group was consisted of normospermic's patients with high immotile sperm and finally the 4th group was consisted of oligospermic's patients. The level of seminal prooxidant particles, a form of oxidative damage, was determined using thiobarbituric acid reactive species "TBARS "assay. Antioxidants status was tracked by estimation of activities of SOD, GST, GPX and GSH.

The levels of "TBARS" were significantly increased in male infertile patients (33.89% - 81.77%) than in the control healthy individuals. GST, SOD and GSH were significantly decreased by 33.33%, 39.655% and 53.16% respectively in oligospermic patients, while GPX increased by 87.5%. However, GSH and SOD activities declined by 50% in azospermic patients but GPX increased to its maximum activity (93.75%). For normospermic patients with high immotile sperm, SOD activity increased by 62.06% while both GSH and GPX decreased by 36.54% and 70.31% respectively. Our results are obviously emphasis the association between OS level of seminal plasma and the idiopathic male infertility incidence and progression in Egyptian infertile patients. Thus seminal ROS levels would be used as a specific and sensitive biomarker for idiopathic male infertility.

Key words: Oxidative stress, polyunsaturated fatty acids, reactive oxygen species, azospermia, oligospermia, thiobarbituric acid reactive species assay.

Dendritic Cell Vaccine for the Treatment of Chronic Myeloid Leukemia

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Department of Clinical Pathology* and Depatment of Internal medicine & Nephrology, Cairo University

Dendritic cells (DCs) are BM derived antigen-presenting cells (APCs) with a key role in immunity induction. This study aimed at generating a DC vaccine expressing leukemia associated Ag differentiated from myeloid blasts to boost the immune system and improve the clinical outcome of CML patients. Twenty ml of venous blood were obtained from each patient for generation of DCs by suspending them in liquid culture medium containing GM-CSF and IL-4 and activated by adding TNFα. Dcs were identified by CD83 expression using flow cytometry that showed significant increase after culture. Follow-up of patients by monitoring immunological response was done by flowcytometric assessment of CD8+ T-cells % before and after injection of DCs. This study included 22 patients diagnosed as chronic-CML and were divided into 2 groups. Group I was a pathological control group which included 13 age and sex matched CML patients that were not given the Dcs vaccine and injected with saline. Group II included 9 CML patients that were given the Dcs vaccine. In group II there was a highly statistically significant difference as regards the WBC count before and after vaccination with lowering of its mean value. Although there was no statistically significant difference in the median of CD8 level and absolute number of CD8 before and after vaccination, there was an actual increase in the percentages of both medians. In conclusion: DCs vaccine may be used as an adjuvant therapy alongside the CML patients' chemotherapeutic regimen.

Culture-Negative Infective Endocarditis: Diagnostic Strategies and Clinical Outcome

Ahmed El-Amragy, Hussein Rizk, Adel Azmy, Amany El-Kholy, Soheir Mahfouz, Mervat Al-enany, Dina Osama

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Objective: To evaluate the incidence, diagnostic strategies and clinical outcome of Culture-negative endocarditis (CNE).

Design: Prospective study

Materials and methods: 105 patients referred to Cairo University with suspected IE were enrolled. The patients were evaluated according to the modified Duke's criteria. History, clinical examination, electrocardiogram and routine laboratory workup were preformed. Three sets of blood cultures were obtained. Additionally, testing for antibodies against *C. burnetii, Bartonella., Brucella spp., Legionella pneumophila, M. pneumoniae, C. psittaci* and *M. pneumoniae* was performed. Testing for antibodies against *Aspergillus* was performed on clinical suspicion of fungal infection. Microbiologic and histoplathologic examination of the surgically excised specimens were done. Molecular detection of *Bartonella* spp and *Brucella* spp DNA was done using PCR.

Results: Risk factors for IE included visiting a healthcare facility in the preceding 3 months (37.1%), IV line insertion (15.2%) , cardiac surgery (8.6%) and Intravenous drug users(6.7%). The incidence of CNE was 50.5% of all IE patients. Prior antibiotic therapy was reported by79.2% of patients. The pathogens were detected by serology in 13.7% and by PCR in 5.8% of CNE. *Aspergillus* was detected in 6, *Brucella* in 2, *Bartonella* in 4 and *C.burnetii* in 1 patient. The response of CNE patients to antibiotic therapy alone was low (26.4%); surgical intervention was a powerful predictor of in hospital survival (p value= 0.028).

Conclusion(s): CNE is very high in Egypt. Prior antibiotics was reported in 79.2%. Final diagnosis of pathogens could be reached in 13.7% by serology and PCR. Early surgical intervention is a major predictor of survival

A Comparison of the Cellular Response of Rat Bone Marrow-Derived Cells to Three Calcium Silicate-Based Cements

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3 Faculty of Veterinary Medicine, Cairo University

The aim of this study was to compare the cellular response of rat bone marrow-derived cells to three calcium silicate-based cements [Mineral trioxide aggregate (MTA), grey Portland cement (GPC) and white Portland cement (WPC)] regarding cell viability (CV), alkaline phosphatase (ALP) activity and cell proliferation (CP). Cells were obtained from the diaphysis of rat femur bones. Extracts of the materials were collected at three observation points (24h, 72h, 7days, 15days and 30days) and were serially diluted to obtain three concentrations (full, half and quarter) corresponding to three surface area/volume ratios: 316mm2/ml, 158mm2/ml and 79mm2/ml respectively. Cell viability was assessed using the MTT assay and ALP activity was assessed using the colorimetric endpoint ALP assay. Cell proliferation was assessed using the crystal violet assay for the half concentration extracts obtained after 72h. General linear model test with repeated measures showed that there was there was a statistically significant effect of the material type, concentration and observation point on CV and ALP activity ($p<0.05$). Tukey post hoc test showed a statistically significant difference in ALP activity between every two materials [WPC >GPC >MTA] ($p<0.05$). For CV, however, there was a statistically significant difference between WPC and MTA as well as between GPC and MTA but there was no significant difference between WPC and GPC. For CP, one-way ANOVA and post hoc tests showed that there was a significant difference between MTA and WPC, as well as between GPC and WPC ($p<0.05$) but not between MTA and GPC [MTA=GPC> WPC]. It could be concluded that both WPC and GPC could be alternatives to MTA in clinical endodontic applications involving direct contact with bone.

Key words: mineral trioxide aggregate, Portland cement, viability, alkaline phosphatase.

Medical Posters

Ameliorated effects of garlic (*Allium sativum*) on blood biomarkers of subchronic acrylamide hepatotoxicity and brain toxicity in rats.

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Acrylamide (ACR) exerts its toxicity through stimulation of the oxidative stress, yet its effect on brain and liver acetylcholinesterase has not been elucidated. This study was carried out to investigate the effects of ACR exposure on brain and hepatic tissues antioxidant enzymes activities and different markers such as, AChE, nitric oxide (NO), monoamine oxidase (MAO) and lipid profile, and to evaluate the protective effects of garlic against ACR toxicity. Male Sprague-Dawley rats were exposed to ACR (1 mg /kg body weight) with or without diet containing 1.5% of garlic powder for 40 days. ACR administration showed a decrease in AChE activity associated with an increase in MAO activity in both brain and hepatic tissues. In addition, ACR administration increased the lipid peroxidation and NO levels of both tissues while decreased the activities of glutathione (GSH), superoxiode dismutase (SOD) and glutathione-S-transferase (GST). On the other hand, the activities of GPx and catalase activities increased as consequence to GSH depletion after ACR exposure. Finally, ACR exposure increased the brain and liver lipid profile of cholesterol and triglycerides and total lipid while phospholipids level was decreased. Garlic supplementation significantly attenuated oxidative stress, MAO activity and inflammation in brain and hepatic tissues but did not ameliorate AChE activity. In conclusion, our results emphasized the role of garlic as a potential adjuvant therapy to prevent ACR-neurotoxicity and hepatotoxicity.

Homology modeling of NS3 Protease of Hepatitis C virus Genotype 4a

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Hepatitis C virus (HCV) was identified in 1989 as the etiological agent for non-A, non-B hepatitis, which is a lethal single positive-stranded RNA virus.1 An estimated 200 million cases of HCV infection exist worldwide.2 Of those infected, over 85% will develop chronic hepatitis, and 20% of the chronic infections progress to liver cirrhosis and hepatocellular carcinoma. Presently, there is no vaccine for HCV.

The amino acid sequence of the NS3 protease of hepatitis C virus genotype 4a was obtained from the SWISS_PROT database. The tertiary structure of NS3 protease of hepatitis C virus genotype 4a was modeled using Swiss-model server (i.e. Automatic homology modeling server). The % identity was greater than 86%. The model was validated using Prochek program. The results indicated that at least 89% of the amino acid residues are in the core region and 0% in the disallowed region.

Propolis alleviates aluminium-induced lipid peroxidation and biochemical parameters in male rats

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Aluminium is present in many manufactured foods and medicines and is also added to drinking water during purification purposes. Therefore, the present experiment was undertaken to determine the effectiveness of propolis in alleviating the toxicity of aluminium chloride (AlCl3) on biochemical parameters, antioxidant enzymes and lipid peroxidation of male Wistar Albino rats. Animals were assigned to 1 of 4 groups: control; 34 mg AlCl3/kg bw; 50 mg propolis/kg bw; AlCl3 (34 mg/kg bw) plus propolis (50 mg/kg bw), respectively. Rats were orally administered their respective doses daily for 70 days. The levels of thiobarbituric acid reactive substances (TBARS) was increased, and the activities of glutathione S-transferase, superoxide dismutase, catalase and glutathione peroxidase were decreased in liver, kidney and brain of rats treated with AlCl3. While, TBARS was decreased and the antioxidant enzymes were increased in rats treated with propolis alone. Plasma transaminases, lactate dehydrogenase, glucose, urea, creatinine, bilirubin, total lipid, cholesterol, triglyceride and LDL-c were increased, while total protein, albumin and high HDL-c were decreased due to AlCl3 administration. The presence of propolis with AlCl3 alleviated its toxic effects in rats treated with AlCl3. It can be concluded that propolis has beneficial influences and could be able to antagonize AlCl3 toxicity.

Mesenchymal stem cell (MSC) transfusion as a novel immunosuppressive regimen with possible induction of microchimerism

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Human MSCs have immunosuppressive capacities. Although their efficacy is currently studied in GVHD, their effect on alloreactivity in solid organ transplant patients is unknown. Our work aimed to use allogeneic donor specific MSCs (DS-MSCs) transfusion prior to renal transplantation as an immunosuppressive induction regimen. Our study included 4 groups of patients; all groups were diagnosed as chronic renal failure and had undergone renal transplantation. The 1st group included 7 patients and they received induction by DS-MSCs. The 2nd group included 6 patients and they received induction by ATG. The 3rd group included 6 patients and they received induction by anti CD25. The 4th group included 7 patients, and they received no induction. Immunosuppressive regimen was CsA, MMF and PRD for all patients. Ninety ml of BM were aspirated from the iliac bone, for separation of MSCs then about 10 million MSCs in 10 ml saline were infused intravenously in 2 divided doses 1 week apart. Our results showed lowest mean serum creatinine level in patients who received pre-transplantation DS-MSCs infusion than other groups after 1, 3, and 6 months. Also rejection was less frequent in patients of group I. Microchimerism of HLA class II antigens was documented pregrafting in one case of group I. In conclusion: MSCs escape immune recognition, can inhibit immune responses and prevent the development of cytotoxic T-cells so its transfusion may treat rejection of organ allograft and reduce immunosuppressive regimen after renal transplantation.

Clinical and laboratory diagnosis of piroplasmids in naturally infected cattle in Egypt

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The present study provides clinical and laboratory information regarding infection by *Theileria* and *Babesia* piroplasmids in 54 cattle. Prevalence of the clinical signs revealed high percentage of the infected animals showed pale mucous membrane (42.59%) and fever (38.88%), while low percentage showed swelling of lymph nodes and hematuria (18.51%). PCR result discovered the majority of *Babesia* spp infection (26%), most of them infected by *B. bigemina* (16.6%). The percentages of positive animals for *Theileria annulata* were 13% of total 22% *Theileria* infection. The use of PCR resulted in significantly higher efficacy of detection of bovine piroplasmids compared to microscopical examination of blood smears and allowed the specific discrimination between pathogenic and non-pathogenic *Theileria* spp which cannot be accomplished by traditional diagnosis. ELISA revealed higher babesiosis and theileriosis infection percentage than that of PCR, (39% or 27.7%) respectively, that was attributed to cross reactivity. The hematological and biochemical changes are demonstrated in this study.

Studying the Role of cyclins A and E in Endometrial carcinogeneis as a result of Tamoxifen administration in Breast Cancer Patients

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In a previous study we demonstrated that tamoxifen may induce aneuploidy and cell cycle disturbance in the endometrial cells from mice receiving tamoxifen.

The aim of the present study is to study the role of cell cycle regulators cyclins A and E in the carcinogenesis of endometrium as a result of tamoxifen administration in breast cancer patients.

The present study included a total of 37 cases with breast cancer who had radical mastectomy as well as post operative (adjuvant) chemotherapy. All cases were positive for ER & PR. Patients received tamoxifen for a period from 5 to 60 months. Cells were collected from the endometrium. Slides from each sample were prepared. The slides were subjected for routine cytology. Immunocytochemical detection of cyclins A and E were done for each case.

6 to 8 weeks female mice were orally administerred tamoxifen at a dose 20mg/kg for 6 weeks. Control animals were treated with normal saline for 6 weeks. Animals were sacrificed and the endometrial tissues were removed fixed and slides were done. The slides were subjected for histopathological examination as well as immunohostochemical detection of Cyclins A and E.

The results indicated that all the cellular changes of the endometrium are associated wih immunoreactivity for one or both of cyclins.

The present study indicate that cyclins A and E are implicated in the early carcinogenesis steps of the endometrial cells in breast cancer patients receiving tamoxifen.

Follow up of these patients is clearly need to assess the malignant transformation that may results in these cases

p53-Protein Expression in Egyptian Patients with Hepatocellular Carcinoma: Relationships To Viral Infection and Prognostic Markers

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Hepatocellular carcinoma (HCC) is one of the most common malignant tumours in the world. In Egypt, it is the second most common malignancy in males and the fifth in females.

The study aimed at identifying the frequency of p53 oncoprotein using immunohistochemistry technique and to assess its relation with HCV, HBV infections. The study was done on 50 patients; of these 34 malignant liver cases and 16 cirrhotic liver cases.

In the malignant cases HBV was detected in 8 patients (23.5%), HCV infection was confirmed by (RT-PCR) in 31 patients (91.2%). Coinfection with both viruses was found in 6 patients (17.6%)

Immunohistochemical expression of p53 was detected in 12/34 patients (35.3%), all the 16 cases of cirrhosis showed no expression.

P53 expression was not significantly correlated to patient's age, sex, ALT, AFP, tumour grade nor HCV infection. However, the most striking findings were the significant correlation between p53 expression and HBV and coinfection with HCV/HBV.

Keywords: p53, hepatocellular carcinoma, hepatics C virus, Hepatitis B virus.

Pharmaceutical Session

Presentations

Herbal Extracts of Capsella brusa-pastoris, Certain Silique and Onions Spinosa Inhibit Crystallization of Calcium Oxalate monohydrate Crystals

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The majority of human urinary stones are primarily composed of calcium salts. Calcium oxalate monohydrate (COM) crystal is considered as the main inorganic crystalline compound of human urinary stones. The crystallization of calcium oxalate monohydrate (COM) crystal was investigated in absence and presence of aqueous extracts of capsella brusa-pastoris (CBP), certain silique (CS), Onions Spinosa (OS) at pH 6.5 ± 0.05, t = 37 ˚C and I = 0.15 mol dm-3 NaCl by constant composition techniques. The rate of reaction expressed in terms of super saturation show experimental an effective order n ≈ 2 suggesting surface controlled mechanism. The experimental showed that the presence of trace amount of aqueous extracts of natural product of medicinal plants in super saturation solution inhibit the rate of crystallization process. The results show that the order of inhibition are Cbp > CS > OS. These aqueous extract have strong inhibitory effect on crystallization of calcium oxalate monohydrate crystal.

Keywords: kinetics, human urinary stones, medicinal plants, aqueous extracts.

Effect of Narcotic Addiction on Hypothalamic Pituitary Gonadal Axis Hormones

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Background: Drug abuse was considered one of the serious problems that worry both the people and government. It may lead to many problems such as social maladaptation, decreased work productivity and job loss. Beside the loss of control, drug abuse in the form of an enhanced intake is also due to the development of tolerance, demanding the consumption of higher doses to experience the same stimulating effect. An addiction to drugs has been recognized as a neurological disease. Therefore, this study was carried out to investigate the effect of bhang and opium addiction on hypothalamic pituitary gonadal axis hormones.

Subjects and Methods: This study was performed on 83 individuals, their age ranged from 23 to 35 years classified into 6 groups. Group A male subjects addict to opium (N = 15), group B female subjects addict to opium (N = 14), group C male subjects addict to bhang (N = 15), group D female subjects addict to bhang (N = 15), group E control male subjects (N = 12) and group F control female subjects (N = 12). Blood sampling from female groups (addicts and control) were taken during the follicular phase. Blood samples were withdrawn after overnight fasting; serum was separated for determination of serum testosterone, estradiol, follicle stimulating hormone (FSH), leutinizing hormone (LH) and prolactin.

Results: The results of our research revealed a significant decrease in serum testosterone (51.4 %, 35.4 %), FSH (54.7%, 53.7), LH (53.7 %, 59.5%) and prolactin (64.3 %, 64.3%) in male addicts (opium and bhang respectively) in relation to control group. However, the decrease in serum estradiol in male addicts non significant when compared to control group. Moreover, the results shows a significant decrease in serum testosterone (71.0 %, 57.9 %), estradiol (53.5 %, 65.4%), FSH (45.4 %, 43.9 %,), LH (60.4 %, 57.8 %) and prolacin (53.3 %, 46.0 %) levels in female addicts (opium and bhang respectively) when compared to control group.

Conclusion: Opium and bhang addiction affect hypothalamic pituitary gonadal axis hormones, leads to undesirable changes, increased risk of cardiovascular diseases and central suppression of hypothalamic secretion of gonadotropin-releasing hormone leading to loss of libido, infertility, impotence in men and menstrual irregularities in women.

Molecular detection and differentiation of *Brucella* species including S19 and RB51 vaccine strains using two different multiplex PCR assays

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The aim of this study was to optimize and evaluate two different multiplex PCR assays for both molecular detection and differentiation of *Brucella* species. The first assay was able to differentiate between the vaccine strains (S19 & RB51) and other Brucellae. It utilized three different pairs of primers in multiplex PCR assay. The other one was able to differentiate between the most common virulent Brucella species (*B. abortus* biotypes 1, 2 & 4 and *B. melitensis*). It involved the use of three primers of the previously reported AMOS-PCR assay. Both assays were successfully applied on Brucella references, vaccinal and field isolate strains as well as clinical samples including milk and aborted foeti of both cows and buffalos.

Keywords: *Brucella* species, PCR, Detection, differentiation, milk, aborted foeti, cow, buffalo,diagnosis, brucellosis.

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From steatosis to steatohepatitis: is there any early diagnostic marker?

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Nonalcoholic fatty liver disease (NAFLD) accounts to a wide spectrum of liver damage that ranges from simple steatosis to steatohepatitis and subsequent progression to advanced fibrosis and finally cirrhosis. Several predisposing factors have been related to NAFLD such as obesity, diabetes, dyslipidemia, drugs and parenteral nutrition. However, the pathogenesis of NAFLD and its progression to fibrosis and chronic liver disease remains still unknown. Being asymptomatic, fatty liver is often undetected, and since there is no accurate laboratory diagnostic tool for it, the disease is either detected by chance when the patient is subjected to abdominal scanning examination or when steatohepatitis takes place and signs of the disease as well as alteration in blood parameters begin to appear which makes the treatment efficiency highly limited.

The current study was carried out to follow up the disease progression by broad screening measurements in order to discover a new biomarker that can help early detection and diagnosis. Moreover, we also investigated the secondary complications of hepatic failure on the nervous system and incidence of neuro-disorders by measuring neurotransmitters catabolic enzymes activities as an index of the neurotransmitters level. Liver damage was induced in rats by intraperitoneal injections of Carbon tetrachloride (CCl4) with a dose of 20µl/kg three times a week for 4 weeks. pro-oxidants/ antioxidants status, status of insulin resistance, inflammatory markers and energy producing enzymes at biochemical level (colorimeteric, spectroscopy and ELISA techniques), protein profile and DNA expression (qPCR) were assayed. Results were supported by histopathological examination of the liver.

Keywords: fatty liver, inflammatory markers, neurotransmitter catabolic enzymes, oxidative stress, 2D electrophoresis, carbon tetrachloride.

Oxidative Stress and Lipotoxicity of Bhang and Opium Addiction. Effects on Adrenal Gland Secretions

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Background: The harmful effect of free radicals causing potential biological damage is termed oxidative stress and nitrosative stress. This occurs in biological systems when there is an overproduction of reactive oxygen species/reactive nitrogen species on one side and a deficiency of enzymatic and non-enzymatic antioxidants on the other. The endocannabinoid system appears to play a very important regulatory role in the secretion of hormones related to reproductive functions and to stress response. High level of endocannabinoids seems to negatively affct reproduction by acting at different sites. On the other hand endocannabinoids are important modilator in the ohysiological response of hypothalamic pituitary adrenal axis hormones. Therefore, this study was carried out to investigate the effect of bhang and opium addiction on hypothalamic pituitary adrenal axis hormones and role of free radicals in lipotoxicity induced by bhang and opium addiction.

Subjects and Methods: This study was performed on 83 individuals, their age ranged from 23 to 35 years classified into 6 groups. Group A male subjects addict to opium (N = 15), group B female subjects addict to opium (N = 14), group C male subjects addict to bhang (N = 15), group D female subjects addict to bhang (N = 15), group E control male subjects (N = 12) and group F control female subjects (N = 12). Blood sampling from female groups (addicts and control) were taken during the follicular phase. Blood samples were withdrawn after overnight fasting; plasma and serum were separated for determination of total cholesterol, triacylglycerol (TAG), HDL-cholesterol, LDL-cholesterol, serotonin, dopamine, adrenaline, catalase, TBA-RS, protein oxidation and protein thiols.

Results: The results of our research revealed a significant increase in serum total cholesterol (42.9 %, 50.4 %, 50.7 %, and 47.4 %), TAG (83.7 %, 88.2 %, 107 %, and 99.1 %) and LDL-cholesterol (81.8 %, 89.7 %, 79.7 %, and 73.9 %) in male opiumand bhang and female opium and bhang addicts respectively in relation to control group. However, the decrease in serum HDL-cholesterol in male and female addicts non significant when compared to control group. Moreover, the results shows a significant increase in serotonin (21.2 %, 22.0 %, 21.9 %, and 22.3 %), dopamine (59.9 %, 52.0 %, 58.8 %, and 48.2 %), adrenaline (52.3 %, 51.6 %, 60.2 %, and 63.7 %) levels in male opium and bhang and female opium and bhang addicts respectively when compared to control group. In addition, there is significant increase in oxidative stress markers, TBA-RS (90.1 %, 91.9 %, 101 %, and 112 %), and protein oxidation (73.8 %, 95.9 %, 105 %, and 97.1 %) and decrease in antioxidants, catalase (42.5 %, 42.3 %, 42.0 %, and 44.4 %) and protein thiols (36.0 %, 37.3 %, 38.9 %, and 40.9 %) in male opium and bhang and female opium and bhang addicts respectively in relation to control group.

Conclusion: Opium and bhang addiction affect hypothalamic pituitary adrenal axis hormones, leads to undesirable changes in lipid profile and enhanced oxidative and nitosative stress which can leads to increased risk of cardiovascular diseases. Moreover, sudden abstinence induces changes in neurotransmitters and stress hormones.

Pharmaceutical Posters

pH induced flocculation of microgel particles & its applications

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Microgels were first reported over seventy years ago and are still attracting the attention of many scientists and researchers. This is due to its wide field of applications which invades many sectors, such as the medical sector (treatment of dentinal hypersensitivity, design of more efficient wound dressings & improving its biocompatibility, the use of microgels as regenerative medicine becomes very promising 1), pharmaceutical (new drug delivery systems), cosmetics & personal care products, environmental (water purification, waste water treatment & treatment of oil contamination), biotechnology (protein binding and enzyme activity) and also the industrial sector (oil recovery 2, printing technology, surface coating industry3 ceramic synthesis & synthesis of nano-particles).

Microgels are cross linked colloidal polymers with particle sizes between 100 nm and 1µm. The most extensively studied is the poly N-isopropylacrylamide (pNIPAM) microgel with a hydrodynamic diameter of 200-600 nm. These types of microgels are highly affected by the surrounding environmental conditions (smart materials) and undergo reversible conformational changes, altering the particle size and surface charge density 3.

The beauty of microgels lies in its flexibility, where a microgel designer can make a specific microgel to suite the required application. This can be achieved using a variety of designing tools, such as the type and concentration of the monomer and co-monomer(s), the degree of cross linking, presence or absence of an electrolyte and its concentration (if any) and other factors. This work aims to study the behaviour of temperature responsive pNIPAM and temperature/pH responsive pNIPAM/Acrylic acid (AAc) microgels, with different concentrations of AAc in different ionic strengths and different pH. Dynamic light scattering (DLS) is used to study the particle size of the microgels, indicating the swelling/deswelling and flocculation/deflocculation behaviour of the particles. This is to be applied in both oil recovery and dentinal hypersensitivity treatment research.

Spectrophotometric Determination of some Serotonin 5-HT1D Receptor Agonists in Pure Forms and in Pharmaceutical Formulations

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A simple, rapid, and extractive spectrophotometric methods was developed for the determination of some serotonin 5-HT1D receptor agonists; zolmitriptan (ZMT) and *Sumatriptan succinate* (SMT) in pure forms and pharmaceutical formulations. The developed methods are based on the formation of yellow colored chloroform ion-pair complexes between the basic nitrogen of the drugs and acid dyes, namely; bromocresol green (BCG), bromocresol purple (BCP) bromophenol blue (BPB) and methyl orange (MO), in acetate buffer of pH range (3.0-3.5) in case of ZMT and in potassium hydrogen phthalate-HCl buffer of pH 3.0 for SMT. The formed complexes were extracted with chloroform and measured at 415, 410, 414 and 425 nm for ZMT and at 418, 409, 415, and 427 nm for SMT using BCG, BCP, BPB and MO, respectively. The analytical parameters and their effects on the reported systems are investigated. Beer's law was obeyed in the range 1.0–24 µg mL−1 with correlation coefficient (n = 6) ≥ 0.9991. The molar absorpitivity, Sandell sensitivity, detection and quantification limits were also calculated. The composition of the ion associates was found 1:1 by Job's method in all cases and the conditional stability constant (Kf) of the complexes have been calculated. The proposed methods have been applied successfully for the analysis of the studied drugs in pure forms and pharmaceutical formulations. The results of analysis were validated statistically and through recovery studies. The results were in good agreement and compared with those obtained with reported methods. The proposed methods are simple, sensitive, accurate and suitable for quality control applications.

Key Words: Zolmitriptan; *Sumatriptan succinate*; Spectrophotometry; Ion pair complex; Acid dyes.

Agricultural Session

Presentations

Nanotechnology Solutions for Agricultural biotechnology

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Nanotechnology is being used in every sector of food production. Manufactured nanomaterials are already used in some food products, nutritional supplements, many packaging and food storage applications and some agricultural inputs (e.g. fertilisers and pesticides.)". The current debate around nanotechnology is all too frequently polarised into two opposing camps. On the one hand are those scientists, engineers and investors who are keen to promote the field as a source of new products and processes, promising that these will lead to changes as revolutionary as those triggered by the explosion of information and communications technologies (ICTs) in recent decades. On the other are environmentalist critics and others who warn that the potential health and environmental hazards of nanotechnology remain unknown — some even demanding a moratorium on new developments in the area. Too often, such a one-dimensional debate between proponents and opponents of a new technology deflects attention from a third issue: what steps can be taken to ensure that the technology develops in a way that lets it meet its full potential to address the needs of the poor across the world. The issue is not specific to nanotechnology; those involved in any market-driven innovation will inevitably be drawn to regions and markets where profits are likely to be highest, which tends to be rich countries (or rich groups within poor countries). Those concerned about the potential side effects of nanotechnology should spend more time worrying about ways of ensuring that it meets the needs of the poor.

Nanotechnology holds major implications in agriculture and food systems such as, nanostructure-enhanced electron transfer devices for agricultural applications, nanosensor arrays for real-time monitoring of agricultural pollutants, and nanotechnology for water purification products. It also Offers: the tools to understand and transform biosystems, strong impact on sub-cellular dynamics; Regeneration mechanisms; Genome description; Food characterization, solutions to agriculture and food industry: Diagnostics and treatment; Synthesis of chemical for agriculture; More effective chemicals and biodegradable; Food preparation and conservation; Sensors and control, and a new platform for new developments: Nanoscale-based chemical treatment; Bio-engineering and bio-processing, bio-nanomechanical systems, biochips, filtration, fluidics, green manufacturing (waste treatment, biocompatibilityand biocomplexity aspect); New nanoscale materials and processes; automation using nanoelectronics and nanosensors.

Can Nanotechnology Provide The Innovations for a Second Green Revolution in Egyptian Agricultural Biotechnology?

Simultaneous detection of *Escherichia coli* 0157:H7, *Listeria monocytogenes*, *Salmonella typhimurium* by Multiplex PCR in food

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Foods that are uncooked or undercooked after manufacture make feasible targets for intentional contamination. E. Coli 0157:H7, *L. monocytogenes* and *S. Typhimurium* have been identified as major food-borne pathogens worldwide. E. Coli 0157:H7 are recognized as the primary cause of haemorrhagic diarrhoea and haemolytic uraemic syndrome. *Listeria monocytogenes* is a pathogen that causes severe illness, listeriosis, to population at risk. While salmonellosis was the most frequently disease countered during the most of worldwide food-borne outbreaks. Conventional microbiological techniques for the detection of bacterial pathogens in food, including isolation on selective media and biochemical identification of the bacteria are time consuming and laborious; it takes from 7 to 10 days to give confirmed results. In recent years, PCR (polymerase chain reaction) based methods have been reported as a rapid, specific and sensitive. Multiplex PCR allows the simultaneous detection of more than one target sequence in a single PCR reaction saving considerable time and effort and a lot of reactions to be performed in order to assess the possible presence of food-borne pathogens in a food sample. The aim of this work is to develop an efficient system to detect these three pathogens for food safety in the local market and for transportation.

Determination of QTLs for four Agronomic traits in maize (*Zea mays* L.) using SSR markers

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The natural variation of many agronomic traits is controlled by multiple genes, which interact with the environment to determine the ultimate phenotype of any individual. Identification of QTLs is based upon the numerous positional data now being accumulated through molecular marker analyses. Using the recombinant inbred (B73 x Mo17), we characterized QTLs for four agronomic traits, namely, leaf area (LA), plant height (PH), shoot fresh weight (SFW) and shoot dry weight (SDW) under a hydroponic system.

Out of 61 SSR markers and one morphological marker (Rxo), 21 loci distributed on chromosomes 1, 2, 3, 4, 5, 6, 7, 8 and 9 were significantly associated with these traits. Alleles of the higher phenotypic performance parent (B73) increased trait values and generally contributed the largest effects for most QTLs, while alleles of the lower phenotypic performance parent (Mo17) increased the SDW values at only two loci on chromosomes 3 and 9. Cluster of three or more significant loci were detected on chromosomes 5, 6 and 7 for these traits suggesting the presence of QTL with large effects at these locations. The phenomenon of significant associations of molecular markers with more than one trait were observed with thirteen marker loci on chromosomes 1, 2, 3, 4, 5, 6 and 7 suggesting either pleiotropic effect of the same gene or effects of two or more tightly linked genes.

Key words: Agronomic trait, hydroponic system, molecular marker, linkage analysis, SSR, QTL.

Isolation, Identification and Use of Streptomyces in Biocontrol of Brown Rot Disease of Potato

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Brown rot disease of potato is a worldwide disease that is threaten potato plantation. This investigation is a trial for biocontrol of this disease by actinomycetes. Forty actinomycete isolates were isolated from the root zone of healthy potato fields collected from Dakahlia and Dameitta Governorates, Egypt. The antagonistic ability of these isolates was tested against *Ralstonia solanacearum* (the causal agent of brown rot disease of potato). The application of double layer method revealed that four isolates inhibited the growth of *R. solanacearum* (A11, A36, A39 and A84), while the application of disc agar method revealed that only one isolate (A11) inhibited the growth of *R. solanacearum*. The four active isolates were identified and classified as the following; A11: *Streptomyces mutabilis*, A36: *S. sparogenes*, A39: *S. luridus* and A84: *S. pyridomyceticus*. The antagonistic efficiency of most active strain (*S. mutabilis*) was tested under greenhouse and field conditions as a biocontrol agent to the brown rot disease of potato. *S. mutabilis* caused significant increase in productivity of potato plants and significant decrease in disease incidence and percentage of infected potato tubers.

Keywords: Potato, Brown rot disease, Biocontrol, *Actinomycetes*, *Streptomyces*

Antioxidant potency of Angelica archangelic root and its correlation with retinal cells damage induced by lead poisoning in rabbits

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This work was targeted to evaluate the correlation between the antioxidant potency of these roots and the correction of retinal damage induced by lead poisoning. Animals were used in accordance to the ARVO (Association for Research in Vision and Ophthalmology) statement for the use of Animals in Ophthalmic and Vision Research. The experiment was approved by the ethical committee. All through the experiment duration, the animals were housed in separate cages, fed standard laboratory food and allowed free access to water in room lightening with a 12 hour light-dark cycle in animal house of Research Institute of Ophthalmology.

Eighteen New Zealand albino rabbits weighing between 2.5 and 3 kg, aged two months, of both sexes were used for this study. The rabbits were divided into four groups : control group consists of 6 rabbits (12 eyes) were received distilled water for 30 days. Group I consists of 8 rabbits (16 eyes) were received oral lead acetate (in water with concentration of 12.5 mg / kg B.W) for 15 days, 4 rabbits were subjected to Electro Retino Graphic (ERG) and light microscopy (LM) examination (group IA), while the other 4 rabbits left free untreated for another 15 days to study the possible recovery (group IB). Group II consists of 3 rabbits (6 eyes) received two times per day both of Angelica archangelica roots powder water extraction (in water with concentration of 0.11 gm / kg body weight) and lead acetate for 15 days. Group III consists of 3 rabbits (6 eyes) were received lead acetate for 15 days, and then treated with Angelica archangelica roots powder water extraction for another 15 days with no further lead. Blood lead concentration, Electroretinogram (ERG), retina histological examination, Super oxide dismutase and glutathione peroxidase activity was measured in all groups.

Results showed a great damage of retinal cells after application of lead intoxication that is reversible after application of the herbal chelation, as well as a valuable enhancement of the retinal structure and function after treatment. This enhancement was positively correlated with the antioxidants activity. Retinal structure disorders and the damage reversibility were strongly verified by the histological imaging.

Keywords : ***Angelica archangelica – lead poisoning – cell damage reversibility – Oxidative stress***

Antifungal Potential of Extracellular Metabolites Produced by *Drechslera* spp. against Phytopathogenic Fungi

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Culture filtrates of nine *Drechslera* isolates (*D. australiensis, D. cactivora, D. cynodontis, D. ellisii, D. hawaiensis, D. maydis, D. neergaardii, D. poae and D. spicifera*) used at concentrations of 30, 50 and 70%, were evaluated *in vitro* against mycelial growth and spore germination of eight plant pathogenic fungi (*Alternaria solani, Botrytis cinerea, Botrytis fabae, Fusarium oxysporum, Fusarium solani, Rhizoctonia solani, Sclerotinia sclerotiorum* and *Sclerotium cepivorum*). Among the tested culture filtrates, only *D. cynodontis* culture filtrate was highly effective growth inhibitor against all tested fungi, it reducing the fungal growth from 51.1% to 86.7%, and it is the strongest inhibitors to spore germination which inhibited spore germination of all tested fungi by 92% to 98%. Chloroform extract of *Drechslera cynodontis* culture filtrates was the supreme growth inhibitor against all tested fungi, whereas it inhibited the fungal growth from 66.7% (*R. solani*) to 88.9% (*S. cepivorum*) at concentration of 30 mg/ml. Also, chloroform extract was highly effective in suppressing spore germination of all tested fungi at all concentrations. In greenhouse experiments, chloroform extract was the highest effect in controlling the damping-off disease caused by *F. solani* and *S. sclerotiorum* on bean (93.4% control). Ethyl acetate extract was the second best (80% control for *S. sclerotiorum* and 66.7% for *R. solani*). Two sesquiterpenes, Dihydrobipolaroxin (1) and Sorokinianin (2), have been isolated from culture filtrates of *D. cynodontis*. Compound 1 was highly effective growth inhibitor against *A. solani, F. oxysporum* and *S. sclerotiorum* (66.7%) at concentration of 100 µg/ml. Compound 2 decreased the fungal growth of all tested fungi which ranged from 22.2% to 61.1%. Compound 1 highly decreased spore germination of *A. solani* and *F. solani* by 80 and 77% at concentration of 100 µg/ml. Compound 2 was highly effective in suppressing spore germination of *F. solani* (75%) at concentration of 100 µg/ml.

Keywords: *Drechslera*, biological control, antifungal activity, plant pathogenic fungi

Agricultural Posters

Dermatophyte resistance in the seed coat extract of Almond

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Background : Dermal infection caused by fungi and bacteria in man and animals. Mycoses, are common harmful problem for health throughout the world. Ringworm infection as one of the most dermatomycoses caused by species of pathogenic fungi such as Epidermatophyton. Trichophyton and Microsporum. (1).The potential of biotechnology providing health protection through medicnal plants because it also facilitates the earilier detection of various ailments by new biotechnological techniques. Almond posses a variety of benefical pharmacological properties affecting most notably cancer, high blood pressure; infectious disease and diabeties(2).In recent times different parts of almond has been detected for biological and biochemical studies but in our study, we have used first time seed coat extract of almond for the evalution of antioxidant ,; and antimicrobial potential against selected pathogenic microorganisims .

RESULTS .The total antioxidant activity varied from 93.32 to94.40 % and total phenolic content was found 3.422 mg\gm in almond katha extract .Seed coat extract of almond was found to be most effective as an antifungal and antibacterial agent against human pathogenic fungi Candida albicans,Candida tropicals,Candida lusilanae penicillium, Actinomyctes; Fusarium and Aspergillus niger .The bacterial species were examined; E.coli, staph uraus. Finaly the results provide a therupatic potential for microbial infections .Crude seed coat extract were highly effective against all bacterial strains tested with the MIC ranging from 1.42 mm to 2.145 mm whearse all fungal samples showed good inhibitory effect.

CONCLUSION:-Finaly the results provide therapeutic potential of seed extract of almond for treating skin fungal infections,there by providing a effective and safe treatment to the patients.Of great importance ,this extract can be used for their more chemically investigations.For its major objective,that seed coat extract of almond can be alternate against leshmania,,ring worm, aczema

Key words:-Almond, antimicrobial, Phenolic content, DPPH antioxidant activity

Identification of Polymorphism and Genetic Diversity in Sugarcane Based on Biotechnological Tools

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The present work was conducted at the El-Mattana Agricultural Research Station, Quena Governorate during the 2006/2007 and 2007/2008 seasons to assess genetic diversity of 6 sugarcane genotypes Saccharum sp. (G.T54-9, G.84-47, G.98-28, G.95-21, G.95-19 and Phil8013) and detect polymorphism among these genotypes.

Three primers only produced polymorphic amplification products. These were OP-A01, OP-A07 and OP-B07. Samples of the six sugarcane cultivars exhibited different polymorphic bands. These bands can be used as positive or negative molecular markers for brix, sucrose, sugar recovery, cane yield and sugar yield.

Results showed that three primers gave polymorphism. The genetic diversity studies of the 6 sugarcane genotypes divided them in four clusters. Results showed that genetic diversity was lower within G.T. 95-21 and G 95-19, and it was relatively wide between the two genotypes currently grown commercially (G.T.54-9 and Phi1 80-13).

The RAPD-derived genetic similarity indices ranged from 10 % between G.T.54-9 and Phi1 8013 to 87 % between G.T. 95-21 and G 95-19. G 84-47 and Phi1 8013 share 23 % of their genomes, while G.T. 54-9 and G. 84-47 share about 35 % of their genomes. These results suggested a (G.T.54-9 and Phi1 8013).

This paper revealed that biotechnological tools like RAPD analysis were useful tool to estimate genetic diversity among sugarcane genotypes.

Key words: genetic similarity, Phil 80-13, G. 84-47, RAPD, genotypes, markers

Comparative Ultrastructural Cytology of Potato Infected Tissues With Potato Virus Y and Tobacco Ringspot Virus

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The effect of potato virus Y (PVY) and tobacco ring spot virus (TRSV) in the cytopathological changes in potato Solanum tuberosum cv. Spunta as well as pathogenicity and effect on cells of affected host were studied. The aggrisivness of virus isolates seemed to be corolated to their cytopathological effects on cell organelles. The two viruses varied in their aggressiveness and effect on host cells, giving rise to various deformations and degradations of host cell organelles. PVY formed cytoplasmic inclusion bodies "pinwheels, virus bundles, virus particles, and scrolls in the cytoplasm, and increased the number of mitochondria and peroxisomes. TRSV infected leaf proved the inducing of severe malformation of the nucleus, malformation of the mitochondria, and the chloroplast elliptical in shape, grana and its thylakoid membranes not appear, contains accumulation of osmiophilic bodies, and the vesicles appears in large number.

Key Words: PVY, TRSV, Ultra structural changes, and TEM.

Isolation and characterization of the dominant lactic acid bacteria in the traditional Egyptian Rayeb milk

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Starter cultures are required for the industrial production of fermented milks. These starter cultures are mainly composed of lactic acid bacteria (LAB). Starter LAB have many functions in the production of lactic acid during the fermentation process and provide formation of the curd. Furthermore, they play a role in the production of aroma compounds and antimicrobial substances. In order to prevent loss of LAB biodiversity and loss of traditional cheese diversity, it is important to identify novel LAB from traditional fermented milk.

The aim of this work was to isolate and identify natural LAB flora involved in traditional Egyeptian Rayeb milk. In order to achieve this goal, LAB were isolated and characterized by using phenotypic (cell morphology, Gram staining, physiological and biochemical tests) and genotypic methods (PCR- ……). Moreover, technological characterization was performed by monitoring the production of exopolysaccharide and the profile of acid production of the isolates.

Fourty Rayeb milk samples were collected from Giza, Monofeya, Sharkeya, Mansoura and Fayoum gavernorates (eight samples from each gavernorat). A total of 170 strains of LAB were isolated from those samples. The distribution of the isolates by genus was as follows: 75 streptococci, 50 lactococci and 45 leuconostoc. Further identification at the species level indicated that the lactococci isolates were L. bulgaricus (36%), L. acidophilus (27%), L. delbuerkii (18%) and L. helviticus (9%). The streptococci isolates were Str. acidomonas (50%), Str. thermophilus (38%) and Str. durans (12%). All of the leuconostoc isolates were Leu. cremoris. Among the isolates, E. faecium (30%) and Aero viridans (18%) were identified. PCR-….. method ……was found to be useful for further identification. Finally, Str. acidomonas, Str. thermophilus, Lb. bulgaricus, Lb. delbuerkii, and Lb. helveticus showed a positive result during exopolsaccharide production test.

Foliar application of some micronutrients ameliorate nitrate accumulation in radish and parsley plants

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Nitrate accumulation in Egyptian vegetables showed considerable high values compared to those found in vegetables grown in several foreign countries. This could be mainly due to the intensive application of nitrogen fertilizers to plants. Therefore a pot experiment was carried out during the season of 2006 under the green house of Soil, Water and Environment Institute at El-Mansoura to study the effect of foliar application of Mo, Fe & Mn on the accumulation of nitrate and nitrite in radish and parsley plants, aiming to reach the permissible limits, since these micronutrients have essential roles on the formation and activity of nitrate reductases. Foliar application of Fe, Mo and Mn either solely or as a mixture sharply and highly significantly decreased the concentrations of nitrate and nitrite in the two plants compared to the control. Foliar application of the mixture of micronutrients studied was superior for increasing the activity of nitrate reductases for radish and parsley plants followed by solely applied Mo, Fe, Mn and finally the untreated control. It can be concluded that application of such micronutrients in the leafy vegetable crops decreased significantly the accumulation of nitrate in plants which caused by the intensive doses of nitrogen fertilizers applied to plants. This is mainly due to the role of such micronutrients for activating the nitrate reductase effect in decreasing the nitrate and nitrite accumulation.

Keywords: nitrate reduction, nitrogen fertilizers, vegetables, human health.

Rapid propagation of *Periploca angustifolia* Labill. by tissue culture

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Periploca angustifolia **Labill. (Asclepiadaceae) is an extremely rare fodder shrub native to Egypt, which is being severely affected by habitat loss and overgrazing due to its high palatability to animals. Tissue culture of this species has not been previously reported and may be a method for its conservation and propagation as it is heavily overexploited. An efficient and rapid method for micropropagation of *Periploca angustifolia* was developed by nodal stem segments collected from mature shrubs in the wild. Nodal explants were established on Murashige and Skoog's (MS) basal medium containing 3% sucrose supplemented with different concentrations of 6-benzylaminopurine (BAP) (0.2, 0.5, and 1.0 mg l^{-1}) in combination with δ-Naphthalene acetic acid (NAA) (0.1 and 0.2 mg l^{-1}). Multiplication of shoots was obtained on MS medium containing 3% sucrose supplemented with BAP (0.5-2.0 mg 1^{-1}) and N6-(2-isopentenyl) adenine (2iP) (0.5 mg 1^{-1}). The maximum number of proliferated shoots was obtained on MS medium containing 3% sucrose supplemented with 2 mg l^{-1} BAP + 0.5 mg l^{-1} 2iP. Indole-3-butyric acid (IBA) gave better response for rooting than NAA. Seventy per cent of the shoots were rooted on half-strength MS medium containing 3% sucrose and 2.0 mg 1^{-1} IBA to obtain complete plantlets. *In vitro* rooted plantlets were successfully hardened in the soil under greenhouse conditions. The use of plants produced following this method appears to be a promising approach for population reinforcement and for *in vitro* preservation programs of threatened and rare populations.**

Keywords: Asclepiadaceae, conservation, micropropagation, *in vitro* culture, nodal explants.

Physiological and Genetic Studies on the Antimicrobial Activity of Ajwain (*Carum copticum* [L.] Benth. et Hook.) Seed Extract

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The main objective of this study was to explore the effect of the ethanolic extract of *Carum copticum* (Ajwain) seeds on some physiological and genetical parameters of seven selected pathogenic bacteria. Agar diffusion method was used to determine the antibacterial activity of the extract against seven bacterial species (*Agrobacterium tumefasciens, Erwinia sp, Klebsiella sp, E. coli, Proteus sp, Bacillus cereus* and *Bacillus thuringiensis*) selected from different pathogenic groups. The studied plant species showed a significant ($p<0.05$) antimicrobial activity against all the tested bacterial species. The attendance of Ajwain seed extract in liquid culture medium resulted in a sharp growth inhibition within the eight initial hours of bacterial growth. Furthermore, the extract also induces the appearance of additional protein bands characterize the intracellular bacterial proteins which could be expressed as stress proteins only in response to adverse conditions.

Plasmid curing led to a 4- fold increase in sensitivity of *Agrobacterium tumefasciens* to *Carum copticum* seed extract compared to the control.

Keywords: Pathogenic bacteria, ethanolic extract, bacterial growth, intra-cellular bacterial proteins, plasmid curing.

Isolation and identification of *Streptomyces* strains from Egyptian soil and investigating their antimicrobial activity

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The present study aims at isolating and identifying biologically-diverse *streptomyces* strains. The strains were originally isolated from soil at different locations in Great Cairo, Egypt and were tested for the production of antagonistic compounds against different microbial pathogens. The antimicrobial screening involved different pathogens including fungi (*Aspergillus niger* and *Aspergillus flavus*) as well as bacteria (*Staphylococcus aerus* and *Escherichia coli*). The results showed that all strains belonged to *Streptomyces* spp. Two of these stains showed broad-spectrum antimicrobial bioactivity against all pathogens. The one with highest bioactivity was identified using molecular and phylogenetic analyses.

Key words: antimicrobial, *Aspergillus, Egypt , Escherichia coli, Streptomyces, Staphylococcus aureus.*

Identification of Polymorphism and Genetic Diversity in Sugarcane Based on Biotechnological

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The present work was conducted at the El-Mattana Agricultural Research Station, Quena Governorate during the 2006/2007 and 2007/2008 seasons to assess genetic variability of 6 sugarcane genotypes (G.T54-9, G.84-47, G.98-28, G.95-21, G.95-19 and Phil8013) and to detect polymorphism among these genotypes.

The RAPD-derived genetic similarity indices ranged from 10 % between G.T.54-9 and Phi1 8013 to 87 % between G.T. 95-21 and G 95-19. G 84-47 and Phi1 8013 share 23 % of their genomes, while G.T. 54-9 and G. 84-47 share about 35 % of their genomes. These results suggested a (G.T.54-9 and Phi1 8013). Results showed that three primers gave polymorphism. The genetic diversity studies of the 6 sugarcane genotypes divided them in four clusters. Results showed that genetic diversity was lower within G.T. 95-21 and G 95-19, and it was relatively wide between the two genotypes currently grown commercially (G.T.54-9 and Phi1 80-13).

This paper revealed that biotechnological tools like RAPD analysis were useful tool to estimate genetic diversity among sugarcane genotypes.

Key words: genetic similarity, Phil 80-13, G. 84-47, RAPD, genotypes

Isolation and culture of banana (*Grand Naine cv*.) protoplast

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***In vitro* full expended, healthy leaves and sterilized In *vivo* leaves of banana (Musa sp. cv. Grand Naine) plants were taken and prepared under asceptic conditions as different sources explants .Also, different enzymes mixtures, incubation periods, osmotic pressure factors, shaking periods and speeds were conducted during protoplast isolation stage. In addition, sieve size and centerfugation speed were evaluated in during purification stage. Moreover, medium type, protoplast density, auxin /cytokinin concentration ratio, and antibiotic type were tested during protoplast culturing. It is found that *In vitro* explant source maximized protoplast yield. Also enzyme mixture consists of 1% cellulase + 1% Macerozyme + 1% pectinase was superior in increasing protoplast yield, Moreover, adding 10g /100ml manitol as osmotic pressure factor and incubation for 24 hours then, shaking for 30 min. with speed rate 50 rpm succeeded in enhancing the highest protoplast isolation of banana. Meanwhile, using of 25 μM pore size mesh sieve and centrifugation at the rate of 1000rpm maximized protoplast purification. Moreover, culturing of protoplast on Murashige and Skooge medium supplemented with 3.0 mg/L NAA and 0.3 mg/L BAP as well as the combination of antibiotics (0.4 mg/L Ampicilin + 0.1 g/L gentamycin + 0.1 g/L tetracycline) and using protoplast density at the rate of 2.5 x 10^4 induced the best protoplast viability and development of banana .**

Keywords: Shaking periods , Centerfugation speed, Medium & Antibiotics types and Protoplast density.

Industrial & Environmental Session

Presentations

Environmental Biotechnology: Applications and Considerations

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Environmental biotechnology- Also known as "White biotechnology" is the interaction of biological sciences and other sciences technologies for the provision of environmentally friendly products and services. Environmentally friendly biotechnology aims at reducing the impact of human activities on the environment. This presentation aims at reviewing the various areas and applications of environmental biotechnology, and describes the possibilities together with the best practice analysis implications. The beginning and growth of environmental biotechnology goes back to 4000 B.C till now and the hierarchy of knowledge based sustainable development is emphasized. Considerations and concepts of sustainable development of biotechnological resources and environmental protection have to be environmentally sound, economically viable, socially just, humane and adaptable. The progress of current environmental-biotechnological developments is attributed to economic, environmental and social benefits. The economic benefits include reduced cost and better control of product properties, new product and market opportunities, and improved balance of trade and energy independence. The environmental benefits cover prevention of pollution, 'green fuel'- chemicals and materials, and material recycles. The social benefits include economic diversity and growth, access of all countries to the bio-based economy, and improvement of human environment, health and quality of life. The major considerations of environmental biotechnology applications including efficiency, sustainable development, best practices and investment in research are reviewed. The inter-linkages between environmental biotechnology and some economic, environmental, and social factors are covered. The best practice approach hierarchy for sustainability of environmental biotechnology is discussed as an important operational issue in the application of environmental biotechnology. Where are we from all these Environmental biotechnology innovations and applications?-An important question needs to be answered.

The Killer Bacteria…!!!

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Ladybirds have gained an economic importance due to their high efficiency as a bio-control agent against aphids, which is considered a highly dangerous pest. Ladybirds are a known hot-spot for invasion of male-killing bacteria. These bacteria, which are maternally inherited, cause the death of male host embryos, to the benefit of female siblings and the bacteria they contain. Previous work, in which male-killers have been identified from 12 ladybird species, has noted that high temperatures can eradicate the bacteria, leaving the host free from infection. Here, we report the finding of not only a novel male-killing infection, in a population of a coccinellid, *Coccinella undecimpunctata*, from a hot region of lowland Egypt, but also the discovery of a further instance of two different male-killers co-existing sympatrically in the same host, the coccinellid *Coccinella undecimpunctata*. We discuss the implications of these findings to theories of male-killing and suggest avenues for future field-work on this system.

Keywords: Wolbachia, sex ratio distorter, inherited bacteria, selfish genetic element, Coccinellidae, male-killing

Biodegradation of Reactive Red azo dye in anoxic/aerobic bioremediation system

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The biodegradation of Reactive Red (RR) textile azo dye was investigated. Three bacterial isolates: Enterobacter cloacae, Pseudomonas sp. and Bacillus sp. were used to decolourize and\or degrade the dye. A small bench scale suspended bed bioreactor was used to study the capacity of three bacterial strains and isolates to decolourize the dye solutions supplemented in five successive additions trial. The degradation of azo dyes is usually judged by the formation of aromatic amines. All bacterial isolates used under anoxic conditions were found to produce aromatic amines. The evidence of biodegradation of RR textile azo dye was tested using three bioassay methods. Six strains contributing to soil fertility were grown in spent media obtained from RR biodegradation. The growth of each strain and isolate on biodegradation products was as high as the same growth on specific media for each strain. This is an evidence for removal of toxicity in biodegradation products. The effect of RR dye biodegradation products on wheat and berseem clover seed germination was investigated. The biodegradation of RR dye removed the dye phytotoxic effects. The COD decreased from 2048 to 599 ppm under aerobic conditions. The bacterial growth increased indicating the breakdown of organics. The continued decrease in COD value indicates steady biodegradation of the anoxic biodegradation products under aerobic conditions. The study shows the potential for using this approach for biodegradation of toxic textile azo dyes by using potent bacterial strains in the sequential anoxic/aerobic bioremediation system.

Key words: biodegradation, COD, phytotoxic, suspended bed bioreactor, RR dye, bioremediation.

Optimization of fermentation conditions for the biosynthesis of inulinase by the new source; *Aspergillus tamarii* and hydrolysis of some inulin containing agro-wastes

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From the rotted Jerusalem artichoke tubers, 11 fungi were isolated on synthetic medium containing inulin as a sole carbon source. On the base of inulinase activity on inulin (I), one of them was selected and identified as *Aspergillus tamarii* AR-IN9. Incubation of *A. tamarii* AR-IN9 for 72 h, pretreatment of inulin-containing agro-wastes in autoclave at 20 Ib/in^2 (as a carbon source), 3% corn steep liquor in the growth medium, pH 5.5 and 35°C were the best conditions for inulinase. The overall production reached up to 71.97 U ml^{-1}. *A. tamarii* AR-IN9 showed invertase activity on sucrose (S), with values of I/S ratio indicating that the fungus is active in inulinase production.

Inulinase activity of the reaction mixture reached its maximum at pH 5.2 and 45 °C. Inulinase was still stable by 80% or more at the pH range from 4.4 to 7.2 for 24 h, and by 75% at 50°C for 90 min. The metal ions; $MgCl_2$, $CoCl_2$ and $MnCl_2$ positively modulated inulinase activity. The resultant Inulinase showed high hydrolysis activity on Jerusalem artichoke (71.64%), dahlia tubers (67.55%) and chicory roots (55.11%). Therefore, various agro-wastes and inulin-containing materials could be economically hydrolyzed with *A. tamarii* AR-IN9 inulinase into fructose which has many therapeutic and industrial aspects. Besides the beneficial return on the environment from the getting rid of agro-wastes.

Key words: *Aspergillus tamarii*, Inulinase, Invertase, agro-wastes, Pretreatment

Keratinases from new thermophilic Bacteria

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Feathers are composed of about 91% protein, 8% water, and 1% lipids. The type of protein in feathers is called keratin. The structure of the keratin gives the feather its strength and suppleness. Feathers are produced in large amounts as a waste byproduct at poultry-processing plants, and reach millions of tons per year worldwide. Scince feathers are almost pure keratin, they represent a potential alternative to more expensive dietary ingredients for animal feed (Sangali and Brandelli 2000). However, feather waste is utilized on a limited basis as a dietary protein supplement for animal feed, because conventional methods of processing them require large amounts of energy and yield a product with poor digestibility and variable nutrient quality (Riffel et al. 2003). Therefore, the commonly known proteases such as pepsin, trypsin, and papain are not able to attack keratin to a great degree. Nevertheless, feathers do not accumulate in nature since structural keratin can be degraded by microorganisms possessing keratinases. Keratinases (E.C. 3.4.99.11) belong to the group of proteinase enzymes that are capable of degrading keratin, a fibrous and insoluble structural protein extensively cross- linked with disulfide, hydrogen and hydrophobic bonds. There is still a need to find more robust and specific thermostable keratinolytic enzymes that can be applied in the textile (modification of wool fibers), food (hydrolysis of proteins derived from animals and plants), and pharmaceutical (production of bioactive peptides) industries.

The protease and keratinase enzymes from the new thermophilic bacteria are characterized in this study.

Riffel A, Lucas F, Heeb P, Brandelli A 2003 Characterization of a new keratinolytic bacterium that completely degrades native feather keratin. Arch Microbiol 179:258–265

Sangali, S., & Brandelli, A. (2000). Isolation and characterization of novel feather-degrading bacterial strain. Applied Biochemistry and Biotechnology, 87, 17–24.

Keywords: Thermophilic bacteria, keratinase, feather , enzymes

Industrial & Environmental Posters

Cadmium-Ginger two way antagonistic relationship

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Forty two wistar rats were equally divided into seven groups and investigated for induced cadmium toxicity, and the antagonistic effect of ginger on liver and kidney- accumulated cadmium. Group 1 served as control was fed with commercial pelleted food and water for the whole test interval (six weeks), Group 2 was fed with commercial food and cadmium water (50ppm Cd in water). Group 3 were fed with commercial food and cadmium water (100ppm Cd in water). Group 4 was fed with commercial food and cadmium water (200 ppm Cd in water). Group 5 was fed with commercial food- ginger (95:5, w/w) and cadmium water (50ppm Cd in water). Group 6 was fed with commercial food- ginger (95:5, w/w) and cadmium water (100ppm Cd in water). While Group 7 was fed with commercial food- ginger (95:5, w/w) and cadmium water (200ppm Cd in water). Cadmium induced significant elevation for liver and kidney functions, while ginger lowered these parameters. It was concluded that Cadmium and Ginger act against each other producing two way antagonistic effect. It was finally concluded that ginger expressed an antagonistic action on cadmium toxicity.

Key words: Cadmium, antagonistic, ginger, wistar rats, GOT, GPT, Creatinine, Urea, Uric

Evaluation Of The Antimutagenic Effect Of Vitamin C Against DNA Damage And Cytotoxicity Induced By Trimethyltin In Mice

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TMT is one of the organotin compounds which are widely used as polyvinyl chloride heat stabilizers and marine biocides. The objective of this study is to investigate the utility of comet assay and chromosome aberrations analysis for detecting the possible antimutagenic activity of vitamin C to reduce the genotoxic effect of Trimethyltin (TMT). In this study, male Swiss mice were treated interapretoneally (i.p.) with three tested doses 0.25, 0.50 and 1.0mg TMT/kg b.wt. for 1, 2 and 3 days. Alkaline comet assay in nucleated bone-marrow cells and chromosome analysis in spermatocytes were performed 24h after the last treatment. The amount of DNA damage in cells was estimated from comet tail length as the extent of migration of the genetic material. A significant increase in comet tail length indicating DNA damage was observed at all concentrations compared with control ($p<0.05$). The mean comet tail length showed a concentration- related and time-dependent increase. Also, the percentage of chromosome aberrations in spermatocytes was statistically significant ($p<0.05$) and showed dose and time dependent manner. Concurrent administration of vitamin C (VC) orally at 20mg/kg b.wt. with the highest dose of TMT for 1, 2 and 3 days reduced DNA damage in somatic and germ cells to a significant extent. In conclusion, our results indicated that vitamin C ameliorated DNA damage and genotoxicity induced by trimethyltin in mice somatic and germ cells in vivo.

Keywords: Trimethyltin, Vitamin C, Bone marrow, Spermatocytes, Comet assay, Chromosome aberrations.

The influence of culture conditions on cellulase production by *Streptomyces thermoalcalitolerans*

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The cellulase production by this *Thermophilic actinomycete*, during submerged cultivations in shake fask, was examined. The influence of different carbohydrates, nitrogen source, surfactants and the effect of culture agitation on the cellulase production were studied: The result show that carboxy methyl cellulose (CMC) 1.0 % (w/v) gave the highest cellulase yield. The organic nitrogen compounds stimulated higher cellulase yield than inorganic sources. Yeast extract at concentration between 0.3 and 0.7 % (w/v) induced the best yield. Surfactants enhanced the release of cellulase. Highest yield was obtained in the presence of 0.5 % Tween80. Culture agitation improved the cellulase excretion; maximum release of cellulase was noticed at 200 rpm.

Development of new phenotypes of Japanese quail in Egypt

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Japanese quail is an important poultry bird in Egypt and all over the world. Since its immigration to Egypt new breed with new phenotypes were appeard. For improving the production and its attributes, varieties are often produced and evaluated under different conditions. Utilization of molecular marker analysis provided new insights to breeders for molecular assisted selection (MAS). Depending on the marker system used, the genetic similarity analyses varied dramatically. Knowledge about genetic diversity and phylogenetic relationships among breeding materials could be an invaluable aid in animal improvement strategies.
In this report, genomic variation within four isolated phenotypes of Japanese quail in Egypt, were investigated using two different molecular marker systems; RAPD (random amplified polymorphic DNA) and ISSR (inter-simple sequence repeat). Different dendrograms constructed based on RAPD and ISSR results individually and collectively revealed that similarity and clustering is much dependant on the marker system used.

Rock phosphate solubilization by isolates of *Aspergillus niger* and *Penicillium* sp. and their further application in soil-mung bean system

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Isolation and identification of rock phosphate (RP) solubilizing fungi were studied under laboratory conditions. Fungal isolates that displayed the highest ratio of clear zone / colony diameter were selected and identified as *Aspergillus niger* and *Penicillium* sp. The optimum condition for RP solubilization were found to be at the 6th (*A. niger*) and 7th (*Penicillium* sp.) day of incubation with shaking (150 rpm) at 30 ˚C and pH ranging from 5.6 to 6.0. Glucose followed by fructose and xylose supported the RP solubilization process in the presence of 2.5 g L^{-1} RP as the optimum concentration. The overall soluble P after optimization studies on RP were 99.7 (*A. niger*) and 77.5 mg L^{-1} (*Penicillium* sp.). During the fermentation process, there was remarkable reduction in the final culture pH. The titratable acidity was positively correlated with RP solubilization. Under NaCl salt stress both fungi were able to solubilize RP, in which, *A. niger* was more tolerant than *Penicillium* sp. The dual and individual cultures of fungi solubilized sources of phosphate commonly exist in soil and also, possess phytase activity.

Under *in vivo* conditions, the inoculation of mung bean seeds with *A. niger* and/or *Penicillium* sp. in the presence of RP or calcium superphosphate (CSP), increased significantly the growth (except for branches No. plant^{-1}), seed yield and P-uptake, as well as, improved the nodulation status and population of total and phosphate dissolving fungi in the rhizospheric soil of mung bean. These inoculation saving about ⅓ phosphate fertilizer dose. Hereby, these combined effects encourage the potential use of the isolated fungi in the biosolubilzation of RP in soil plant system.

Key words: *Aspergillus niger*, *Penicillium* sp., rock phosphate, solubilization, mung bean, biofertilization

The characterization and identification of novel cyanobacterial bioactive compounds

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In the light of discovery of new pathogens, the increased resistance of the recongnised ones, and the limited efficacy of the available bioactive compounds as well as their expensive nature, new cost-effective drug resources for bioactive compounds need to be explored and exploited. In that regard, cyanobacteria represent a prolific but largely unexploited source of bioactive compounds. In the present research, we report the antimicrobial activity of several extracts from mostly local cyanobacterial strains. Several fractions showed high individual antimicrobial bioactivity against either multidrug resistant *Salmonella* , *Citrobacter sp. Aspergillus niger* or *Aspergillus flavus.* Fraction 3 from *Chroococcum* , showed a highest activity against two multidrug-resistant bacterial pathogens. The inhibition zone diameter was 1.4 cm for *Salmonell* and 1.4 cm for *Citrobacter.* Meanwhile fraction 4 from the same cyanobacterium showed broad-spectrum bioactivity (inhibition zone diameter was 0.9 cm for *Aspergills niger*, 1 cm for *Citrobacter* and 0.9 cm for *Salmonella*). One Fraction from *Aphanizomenon* showed antifungal bioactivity against *Aspergillus niger* and *Aspergillus flavus* where the inhibition zone diameter was 1.1 cm and 1.0 cm, respectively. Characterisation of the bioactive compounds in these fractions was performed using chemical analyses such as GC-mass and UV.

Key words: antimicrobial, *Aphanizomenon, Aspergillus, Chroococcum, Citrobacter*, multidrug-resistant, *Salmonella.*

Comparative study of the antibacterial activity of free and encapsulated extracts of algae collected off the coast of Alexandria (Egypt)

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The antibacterialy active methanolic-L extracts of the marine algae *Ulva lactuca* and *Pterocladia capillacea*, collected from Abu Qir Bay, Alexandria, Egypt during May 2008, were encapsulated into calcium alginate beads by homogenizing the extract with sodium alginate solution, followed by crosslinking with $CaCl_2$. The beads, encapsulated with the methanolic-L extract of *P. capillacea*, showed significant ($P < 0.05$) *in vitro* antibacterial activity against three fish pathogens; *A. hydrophila*, *V. anguillarum* and *P. floresence* compared with the free extract. The free methanolic-L extract of *U. lactuca* exhibited significant ($P < 0.05$) reduction of *A. hydrophila* and *P. floresence* activities more than the encapsulated extract. Conversely, the encapsulated extract of this alga showed a wide spectrum of good antibacterial activity against *V. anguillarum* ($P < 0.05$). The surface morphology of the formed beads was studied using scanning electron microscope (SEM). Changes of the characteristics of the beads were investigated by FTIR spectroscopy.

Keywords: *Ulva lactuca*; *Pterocladia capillacea*; Ca-alginate beads; *A. hydrophila*; SEM; FTIR spectroscopy

Iron deprivation stress and immune reactivity induced by Mycoplasma in cattle

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The economic impact of Mycoplasma especially Mycoplasma bovis warrants continued investigation to the mechanisms by which M. bovis survives and induce immunodeficiency effect in host cell. This study intended on feedlot cattle suffered from severe respiratory manifestations in a private farm at Kalubia governorate and diagnosed in a previous publication as M. bovis infection. The result pursued that iron is a key regulator of host pathogen interactions. Hypoferrmia had been recorded during Mycoplasma infection while iron binding capacity, transferrin, and nitric oxide were obviously elevated. The immune response was measured by estimation of total immunoglobulins, specific IgG by indirect ELISA or detection of the reactive immunoglobulin to the immunogenic membrane proteins by immunoblotting.

Screening of the antibacterial activity of some marine algae from the coast of Alexandria (Egypt) against fish and human pathogens

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The ethyl acetate and methanolic extracts of the marine algae *Ulva lactuca, Enteromorpha comporessa, Ulva fasciata, Pterocladia capillacea, Corallina mediterranea, Hypnea musciformis* and *Padina pavonia*, collected from the coast of Alexandria (Egypt), were tested as antibacterial agents against fish and human pathogenic bacteria; *Aeromonas hydrophila, Vibrio anguillarum, Pseudomonas florescence, Staphylococcus aureus, Pseudomonas aeruginosa* and *Salmonella typhimurium*. The best activities were shown by the methanolic-L extract of *P. capillacea* against *P. florescence, V. anguillarum* and *P. aeruginosa*. The methanolic-L extract of *U. lactuca* showed high activity towards *A. hydrophila, V. anguillarum, P. florescence* and *S. aureus*. Cluster analysis was used to study the action of the crude algal extracts.

Keywords: *Enteromorpha comporessa*; *Ulva fasciata*; *Vibrio anguillarum*; cluster analysis

PRODUCTION OF BIOLOGICALLY SAFE FOOD ADDITIVES AND INTRODUCTION IN POULTRY FARM

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The existence of potential demand for the results of the Project witnesses the fact that the population frequently addresses to veterinary apothecary network with the hope to get the high quality Protein-Vitaminous-Mineral Concentrate (PVMC) food additives which is not frequently justified because law quality and unsuitable composition.

Goal of the Project is to reveal the waste sources of food-production, working out the optimal and technological means of processing on cattle and continuation of experimental works on poultry, informing the farmers and entrepreneurs about the gotten results and technological equipment and implementation in agricultural animal and poultry practice.

Using the nontraditional, quickly-spoiling food means on production scale as a main demand should be considered avoiding of extra water, working out the ways of stabilization for keeping and establishing their optimal doze in the total mass of food, use of vacuum together with relatively high temperature during drying of bone-flesh and earthworm, which effectively accelerates the production process without worsening the food value of the components. For stabilization of impermanent matters (vitamins, unsaturated adipose acids) there will be used one of the natural products – propolis the properties of which (medical and preserving) are well known. As for other works (achievement of desirable consistence of food, establishment of their efficiency of poultry) they will be performed by the generally established methods – through drawing up of experimental groups and keeping the known demands of duration of the experiments.

In vitro effect of salinity stress on solasodine production in *Solanum nigrum* L. callus

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The effect of Salinity stress on solasodine production by *Solanum nigrum* under tissue culture conditions has been investigated. Solasodine is steroidal alkaloid, alternative to diosgenin, which is used as a precursor for the commercial production of steroidal drugs. Salinity stress has been applied by adding NaCl to the culture medium MS, five concentrations were applied: 0.0 (control), 50, 100, 150, and 200 mM for 8 weeks. The obtained results show the possibility to increase solsasodine level production under salainity stress. However, the highest salinity stress concentration (200 mM of NaCl) has not significant effect on solasodine levels when it is compared to (150 mM of NaCl) concentration. Positive correlations were observed between the NaCl levels and solasodine content accumulation, proline content and solasodine accumulation in *Solanum nigrum* calli. As physiological effect of salainty on calli cells, the total protein estimated was increased along the duration of study. The solasodine production increased significantly as a result of increasing of NaCl concentrations. However, non-significantly differences were observed between 150 mM and 200 mM of NaCl on solasodine accumulation.

Student Session

Stem cell therapy/research in equine species.

George Newman
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In recent years, stem-cells have been the subject of many major research developments in the medical industry. These new ideas have extended into the veterinary industry and are now used to treat many animal health issues. The most successful and well established treatment is the repair of damaged ligaments and tendons in equine species. With over 300 successful cases, this treatment is becoming very popular within the equine industry and is now the basis for research which can lead to future applications in both animal and human medicine. In the following essay the biology of the stem cells will be described along with the major research topics that have led to their success within the medical and veterinary industry. A selection of the many successful cases will also be described. Finally the future prospects of this treatment will be uncovered along with the research that is being carried out to make these a success.

Multifunctional implantable chitosan for skin tissue engineering and wound healing

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Chitosan, the deacetylated derivative of chitin, is considered as a new technology for skin wounds treatment. In this study, chitosan was dried by evaporation and seeded into primary cell culture of baby mice (1-2 days) skin tissue, supplemented with 10% fetal calf serum to develop epithelial tissues that can be used for implantation for skin regeneration and wound healing in mice model. After using anesthesia wounds of same size were induced in each mouse of the tested and their free chitosan control groups, the tested mice include two chitosan treated groups one with suture wound and the second was left with open wound. The efficacy of treatment was assessed after the application. On day 9 the wound closure of the suture chitosan group is better than the suture control group, but the closure rate of the suture control group increase to become nearly equal at day 11 and show significantly increase at day 13 and 16 in comparing to the tested group. For the groups of open wound, on days 3 and 9 the wound closure of both the chitosan and control group are similar, but at days 11 and 13 the chitosan group significantly accelerate the wound closure to heal completely at days 16 compared to the control and sewing groups. Results clarify the ability of transplanting culture substrates and biodegradable implement for skin regeneration in open wound.

Keyword: cell culture; skin substitutes; skin regeneration; wound healing; biodegradable implement, anesthesia.

Copying Nature: The Use of Recombinant Proteins in Nanoscale Gene Therapeutics

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There are a good number of molecular medicines that can be used to treat a wide variety of medical disorders. These form the basis of biotechnological nanomedicine development. However, there is a problem; insufficient drug delivery systems have yet to be established to allow the drug to reach the target – often in the cytosol or nucleus of the cell. I hereby discuss the ability of Recombinant Cytosolic Trafficking Proteins (rCTP), to deliver genes, siRNA or antisense oligonucleotides to the cytosol, to slow the progression of viral inflicted disease or the potential to induce apoptosis via the delivery of apoptotic mediators. CTPs exploit the cells quality control system, the Endoplasmic Reticulum Associated Degradation (ERAD) pathway to gain access to the cytosol via the sec61p translocon. Once within the cytosol they commonly depurinate ribosomes leading to cell death. We have attenuated (detoxified) two CTPs and analysed the cytosolic translocation by a variety of biotechnological processes which shall be further discussed. We found that CTP1 is capable of cytosolic translocation as analysed by subcellular fractionation and western immunoblotting. The future of this project hopes to use biotechnology to analyse other classes of CTP and establish the least toxic and most efficient drug delivery vector for improved treatment of disease and neurological disorders.

In-vitro Mesenchymal Stem Cells Differentiation into Hepatocytes in the presence and absence of the microenvironment

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This study included 16 patients in which mesenchymal stem cells (MSCs) were isolated from bone marrow after aspiration from the posterior iliac crest. After the samples were obtained the mononuclear cells were isolated and culturing with alpha-MEM media. After 48 hrs non adherent cells were removed and adherent cells were cultured in presence of mesenchymal media for 3 weeks. After reaching 80% confluence the MSCs were harvested by incubation with trypsin / EDTA and counted on hemocytometer. The MSCs were detected by flow cytometric analysis of CD271 and CD29 which revealed positive expression of both markers (75.5±13 & 89.04±5.2 respectively). After this step, the MSCs were differentiated in-vitro into hepatocytes by adding four growth factors cocktails using 96 well micro-plates without microenvironment and Corning plates with microenvironment (96 well micro-plates with ultra web synthetic surface). The presence of microenvironment showed increased number of differentiated hepatocytes than in absence of microenvironment. Finally, the differentiated MSCs were detected using the alpha fetoprotein monoclonal antibody as an early marker expressed in differentiated hepatocytes. My results showed that growth factor cocktails one (HGF, EGF, and FGF) and two (HGF, EGF, FGF and dexamethazone) gave the best result for differentiation of MSCs into hepatocytes.

Keywords: Differentiation, growth factors, AFP monoclonal antibody

Antibiotic targeting of *Wolbachia* endosymbiotic bacteria as a new approach to the treatment of filarial infection and disease

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Elephantitis is a disease that is caused by lymphatic filariasis and characterized by the thickening of the skin and underlying tissues, especially in the legs, male genitals and female breasts. Elephantiasis occurs in the presence of microscopic, thread-like parasitic worms such as *Wuchereria bancrofti*, *Brugia malayi*, and *B. timori*, all of which are transmitted by mosquitoes. However, the disease itself is a result of a complex interplay between several factors: the worm, the symbiotic *Wolbachia* bacteria within the worm, the host's immune response, and the numerous opportunistic infections and disorders that arise. Consequently, it is common in tropical regions and Africa. Egypt was one of the first countries to implement a national programme to eliminate lymphatic filariasis based on WHO's strategy of repeated rounds of mass drug administration (MDA). In 2003 it was suggested that the common antibiotic doxycycline might be effective in treating elephantiasis. *Wolbachia* has evolved a mutualistic symbiosis with the nematode that is essential for parasite development, fertility and survival. Whilst the bacteria are beneficial for the nematode, their release into the host results in inflammatory immune activation that leads to adverse events following anti-filarial treatment and contributes to the pathogenesis of river blindness and elephantiasis. When the symbiotic bacteria are killed by the antibiotic, the worms themselves also die. A recent breakthrough occurred in medical research after investigation on the role of *Wolbachia* in driving filarial disease pathogenesis through activation and regulation of host immunity and immunopathology was performed. Future research is aiming to perform laboratory and field-based studies to exploit *Wolbachia* as a target for antibiotic therapy, providing a novel and effective treatment for filarial disease.

Keywords: Elephantitis, lymphatic, doxycycline, antibiotics

Using the Molecular tools to diagnose Homochromatosis disease

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Hereditary hemochromatosis is one of the most common disorders, characterized by an increase in the iron amount in the body, which in turn lead to its accumulation in the various organs of the body, causing several serious problems including, liver failure, pancreatic damage, thyroid deficiency and heart abnormalities.

This iron storage disorder is considered to be an autosomal recessive disease caused by a defect (mutation) in the HFE gene which is present on the human chromosome 6.

A mutation, which is known as C282Y mutation, simply causes a substitution in the 282nd amino acid, changing the cysteine into tyrosine.

The objective of this study is to screen for the C282Y mutation by using the appropriate molecular tools in order to create new molecular diagnostic way for the Hemochromatosis disease as it affects both men and women in their adulthood, and it is, in many cases, wrongly diagnosed.

Posters

Pharmaceutical biotechnology

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Pharmaceutical product are the back bone of the modern medicinal therapy where they are almost low molecular weight organic compound either it is extracted from naturally source of even been synthesized. Categorizing pharmaceutical as product of biotechnology or chemical synthesis become some way arterial where there are certain semi-synthesized antibiotics are produced by modification of natural antibiotic produced by fermentation technology.

The term biologic refers to any pharmaceutical product produced by biotechnology as certain biological system has been modified in the way we need to produce what we need exactly. The question is why we need red biotechnology in these days? The answer is simply that biotechnology disciplines for serve us in the best way and the lowest coast and the highest accuracy targeting and the minims side effects.

We always force, by the genetic modification, a biological systems to produce certain biologic to be ultra specific for its target from here we could treat any disease whatever its cause and whatever its tolerance with no side effects and the minimal coast to be available for all.

Integrated Omic Technologies: The Future of Nutritional Intervention?

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The Human Genome Project has given rise to a new field of nutritional research, nutrigenomics; the study of nutrient-gene interactions. It has been hypothesized that when nutrigenomics is integrated with other omic technologies such as metabolics, proteomics and transcriptomics, it is possible to construct a nutritional blue-print, which is unique to the individual. This means that future dietary intervention has the potential to be more customized and less generic. The prospect of "Bespoke" nutrition is revolutionary and will no doubt lead to advancements in other technologies, such as bioinformatics and biomarkers. This study will discuss the current omic technologies and the analytical tools available to them, and how their integration can be applied to advance human nutrition research.

An approach to fight vitamin A deficiency using Golden rice

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"Golden Rice" is a popular case supported by the scientific community, the agbiotech industry, the media, the public, the Consultative Group on International Agricultural Research (CGIAR), the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO), official developmental aid institutions, etc., but equally strongly opposed by the opponents of genetically modified organisms (GMOs). The first group likes "Golden Rice" because it is an excellent example of how genetic engineering of plants can be of direct benefit to the consumer, especially the poor and the disadvantaged in developing countries. the second group, the GMO opposers, however, is concerned that "Golden Rice" will be a kind of "Trojan Horse", opening the developing countries to other applications of the GMO technology, and for improving acceptance of GMO food. The research that led to golden rice was conducted with the goal of helping children who suffer from Vitamin A Deficiency (VAD). At the beginning of the 21st century, 124 million people, in 118 countries in Africa and South East Asia, were estimated to be affected by VAD. VAD is responsible for 1–2 million deaths, 500,000 cases of irreversible blindness and millions of cases of xerophthalmia annually. Because many children in countries where there is a dietary deficiency in Vitamin A rely on rice as a staple food, the genetic modification to make rice produce provitamin A (beta-carotene) is seen as a simple and less expensive alternative to vitamin supplements or an increase in the consumption of green vegetables or animal products. It can be considered as the genetically engineered equivalent of fluoridated water or iodized salt.

Keywords: Golden Rice – Vitamin A –beta carotene

Biotechnology and Improvement of Banana production

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As an excellent source of carbohydrates, fibers, proteins, fats, vitamins and minerals, bananas are the fourth most valuable food in developing countries after rice, wheat and maize. But there is a decline in banana production and an increase in demand for good quality and healthy planting material. Pests and diseases have become major constraints to banana production in Africa (including Egypt). Biotic challenges to banana cultivation include fungi, bacteria, viruses and nematodes. Moreover, traditional plant breeding strategies are problematic due to low female fertility, ploidy and poor seed set. As a result, classical genetics is difficult, limited and time consuming. For this developing countries are advancing efforts to use biotechnology to improve food and fiber crops production for the benefit of their populations. They are combining new biotechnology techniques with indigenous genetic diversity and local varieties, mainly to develop Disease-Resistant crops and improved fruits for human health needs as in Edible Vaccines.

Keywords: Bananas, Biotechnology, Higher yield, Diseases–Resistance, Edible Vaccines.

Using genetically modified bacterial strains for oil spots biodegradation

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The presence of oil spots either on land or in seas threatens our environment, several traditional methods have been developed for oil spots removal but many of them are expensive besides they have several nasty consequences. It has been found that several bacterial strains are capable of oil biodegradation producing environmental friendly byproducts in a low cost price. *Acinetobacter calcoaceticus* RAG-1 is a marine bacteria that can use hydrocarbons as a source of carbon, this naturally occurring bacteria have low growth rate so using biotechnology we could overcome this by cloning the desired gene into other bacterial strains having high growth rate, also Pseudomonas or other oil degrading strains could be used instead of RAG-1. Bacteria could also undergo partial degradation process thus could be used for the removal of undesired components of oil as sulphur through biocatalytic desulphurization process instead of Hydrodesulphurization process.

Keyword: oil-degrading bacteria – Bacterial growth rate – Cloning

Spider silk……a huge step into the future of industry

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Spider silk is a protein fiber spun by spiders and is a remarkably strong material. Its tensile strength is superior to that of high-grade steel, and as strong as aramid filaments. Spider silk is composed of complex protein molecules. This, coupled with the isolation stemming from the spider's predatory nature, has made the study and replication of the substance quite challenging. Because of the repetitive nature of the DNA encoding the silk protein, it is difficult to determine its sequence and to date; silk-producing sequences have only been decoded for fourteen species of spider. The spider silk can be extracted as a protein and then identify the gene responsible for the translation of this protein and then this gene will be inserted into a vector to be amplified to many copies and then the protein spider silk can be used in many industrial applications. The possible uses for synthetic spider silk are endless. They include applications in the industrial, medical, and military fields as well as in everyday uses. Spider silks could be used to create strong and flexible artificial ligaments and tendons, bandages, and surgical thread. Spider silk could also be used to construct protective clothing or body armor. It would make an exceptional material for this use because it is one of the toughest materials on Earth that can be woven into a fiber and is estimated to be three times as strong as Kevlar (the material currently use to make bullet-proof vests). Also, spider silk is more environmentally sound because it does not use any of the toxic, acidic processes used to produce Kevlar and it is biodegradable. Spider silk could be used to make paper for important documents, because it would be flexible and could not be torn.

Key words: Spider silk, protein, β-sheets, gene cloning.

DNA vaccines…a new hope for the hopeless

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The today used vaccines which were discovered years ago are proved to be not that efficient in some cases, they are difficult to store, easily degraded, can evolve some kind of allergic responses with some people (rare but present). These problems are due to there dependence on what attenuated viruses or anti-bodies extracted from the sera of the animals like horses or others and since these injected vaccines and sera are non-self proteins they can be irritating for the immune system. Some scientists aimed to produce anti-bodies through the recombinant therapeutic proteins but this way is so time, coast and effort consuming. Finally the new trend was discovered, which is the ability of DNA to act as a vaccine. Actually, this way is a part of gene therapy protocols where the gene encoding the epitope (part of the protein sequence of that protein which is very specific) of the protein of that pathogen is integrated in the genetic makeup of the host cell before being infected with the pathogen and by this case the body can prepare its own anti-bodies for that pathogen also the pathogen will be packed and produced pre-mature and can't invade any other living cell in the host. This idea is still under investigation and not merely approved yet but it was applied on the laboratory animals for more than one pathogen (e.g. HCV and the Schistosoma) and proved to be very effective, which gives the light of hope for producing vaccines for many pathogens which we were unable to fight with before that era.

Keywords: Vaccines, DNA Vaccines, Avian Flu, Plasmid, Immunogenic response.

Treatment of Sour Water: Hydrogen Sulfide

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Sour water is a problem that many companies face because it is produced as a waste product. The ELAB Company faces this problem which is a primary concern because they want to maintain their reputation and image of being a safe and healthy environment. The sour water contains this really bad, rotten egg odor that cannot be tolerated; this odor is due to hydrogen sulfide. This proposal is to introduce easy and a cheap way to get rid of the hydrogen sulfide and therefore to the odor by a combination of chemical and biological techniques or processes. According to Chung et al (2003), the chemical process will be performed by a chemical oxidizing agent ferric sulfate, and the biological oxidation will be performed by the aerobic bacteria *Thiobacillus ferrooxidans*.

Genetic engineering to increase protein content in corn for poultry feed

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One of the essential proteins that are required for the poultry feed formula is glutelin because it's the major constituent in Corn Gluten Meal which is commonly used as a high level protein and energy source. It may be used in ruminant feeds, pet foods, poultry (replacement chicks, layer and breeder), turkey and swine

Since glutelin gene is present inside the cells of the corn in a constitutive manner, its enhancement to increase its protein is relatively easier, that's by isolating the gene from the plant, adding tissue specific promoters and transforming the plant cells to have an enhanced gene activity. Conformational tests are going to be done to assure the presence of the gene, its expression and the protein yield which is expected to be higher than protein expression in non transformants' cells by at least 2 times. Tissue culture methods are going to be used in order to maintain the transgenic line of plants to be then used for the production of the poultry feed by consumption of corn leaves instead of corn kernels which could be used in other processes.

Bioremediation of oil spills

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Bioremediation is a useful cleanup strategy that has become a major method employed in re-establishment of oil-polluted environments that makes use of natural microbial biodegradative activities, These microorganisms naturally biodegrade numerous contamination of petroleum hydrocarbons, thus purification of ocean from oil pollutants.

Sceening for hpp gene mutation site using molecular diagnosis

Shaza Ahmed[1], Amit Prabhakar, Azizur Rahman[2] , Martin Snowden[2] and Ayman Diab[1]

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Thalassemia is a genetic blood disorder. The normal body hemoglobin consists of two alpha and two beta chains that which any deficiency in them can cause abnormalities in the formation of the Red Blood Cells (RBC's).The aim of this project that has been successfully done at the Greenwich University, England as a part of the graduation research project. It was by partially isolating the mutational site of the hpp gene that caused beta thalassemia disease in homosapeins, and by analyzing the results it can be easily determined whether this placental DNA is mutant or wild type.

Increase the expression of Su2 gene in *Zea maize*

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The process for increase the level of expression su2 gene in maize plant that is important to increase the contents of fructose, glucose, sucrose for provision of energy and responsible for combining of fructose, glucose and sucrose as it plays a big role in producing starch. Carbohydrates is to provide a steady release of energy into the body while also providing more of what each of us need from our daily diets.
Increase the level of sugary2 gene will done by transform the gene into construct plant expression vector (PBI121), and infect plant callus with *Agrobacterium tumefaciens* LBA4404 co-culture of plant on media.
The plant will be generating with high level of sugary carbohydrate.

Biodegradation of phenolic compounds from coking wastewater by immobilized white rot fungus *Phanerochaete chrysosporium*

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The treatment of sour water produced from petroleum industries was done by using a traditional way, where they used stripping units that remove the toxic compounds from the surface of the water, but this way is cost and may not remove all the toxic components found in water and in order to perform the treatment with more efficient way, we will use one of biotechnology applications which is biodegradation of phenolic compound, ammonia and COD from the coking wastewater by using a white rot fungus *Phanerochaete chrysosporium* which will be immobilized on wood chips from felled dried trunk of the matured tree of Italian poplar, where the fungus will absorb the phenolic compounds and COD found in sour water. The immobilized fungus dried with vacuum freeze desiccator and get high activity after 9 months preservation and then it is easy to be activated and domesticated.
The maximum expected removal rate of phenolic compounds and COD by using immobilized fungus is 87.05% and 72.09% in 6 days.

Sour Water Treatment

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Egyptian Linear Alkyl Benzene Company had some problems regarding its products and its byproducts which may cause real harm to the pollution. One of the problems was the production of sour water as a waste product due to chain of chemical reactions. The goal of this research is to achieve the HSE (Healthy and Safety Environment) of this company using an economical and an efficient way, instead of paying a fortune for its sour water to be treated in other wastewater treatment plants.

The removal of hydrogen sulfide in biotrickling filters inoculated with *Thiobacillus thioparus*

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Hydrogen sulfide (H2S) was produced as result of industrial activities, which cause awful odors. Contaminated gaseous with H2S were treated by biotrickling filters inoculated with a single cultures of sulfur oxidizer bacteria, which exhibit several advantages over physicochemical methods, such as shorter adaptation times and higher removal ability. Therefore, it is concluded that using a biotrickling filter inoculated with *Thiobacillus thioparus* constitute the best strategy to exhibit a high removal Capacities of hydrogen sulfide

Conversion of Corn wastes into Ethanol and Electricity

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Hydrogen sulfide (H2S) was produced as result of industrial activities, which cause awful odors. Contaminated gaseous with H2S were treated by biotrickling filters inoculated with a single cultures of sulfur oxidizer bacteria, which exhibit several advantages over physicochemical methods, such as shorter adaptation times and higher removal ability. Therefore, it is concluded that using a biotrickling filter inoculated with thiobacillus. Thioparus constitute the best strategy to exhibit a high removal Capacities of hydrogen sulfide. The corn, with the scientific name being *zea*, is considered to be a member of the family Poaceae or Gramineae which is the grass family.

The corn is cultivated all around the world in rows in order to make the stalks, which are the stems that support the different plant parts, able to undergo a cross-pollination process together.

The leaves on the stalks are very long and skinny, and the cob is found inside these leaves and it contains thousands of kernels which are the seeds of the corn.

After harvesting the Kernels, the corn stovers are left in the field unused, or they may be burned or used as animal feed.

These corn stovers are made up of 70% cellulose and hemicellulose, and therefore, they have been discovered to be a very important source of energy.

They can be converted into electricity by using the microbial fuel cells, or they can be converted into cellulosic ethanol after being pretreated with the Ammonia Fiber Expansion process (AFEX), and then participate in a fermentation process that occurs in the presence of the yeast *Saccharomyces cerevisiae*.

Partial isolation of the mutation site causing Cystic fibrosis

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Cystic fibrosis is the most common fatal genetic disease in Homo sapiens, It causes the body to produce thick mucus that clogs the lungs, and blocks the pancreas, leading for stopping the digestive enzymes from reaching the intestines where they are required to digest food. The aim of our work is that to get a Placental DNA (from Homo sapiens) and investigate whether it is infected with the CFTR disease or not by partial isolation of the mutated site sequence in the Genome, and designing a suitable primers for it and then investigate whether it is a wild type or mutated by analyzing the results.

Biotechnology

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Pharmaceutical

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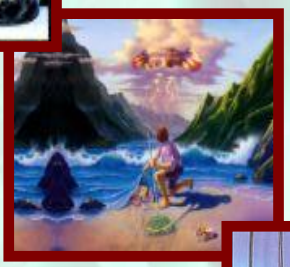
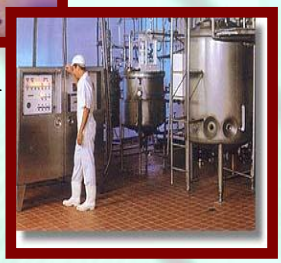


Environmental



Industrial

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