Species-specific Polymerase Chain Reaction Primers for Detecting Prevotella nigrescens
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A previous study reported the cloning of a putative Prevotella nigrescens-specific DNA probe, Pn23, using random shotgun method. The present study evaluated the species-specificity of Pn23 for P. nigrescens using the clinical strains of Prevotella intermedia and P. nigrescens to develop Prevotella nigrescens-specific polymerase chain reaction (PCR) primers. The specificity was tested against 10 clinical isolates of P. nigrescens, 6 clinical isolates of P. intermedia and 20 type strains of oral bacteria. The sensitivity of PCR primers was determined by testing serial dilutions of the purified genomic DNA of P. nigrescens ATCC 335631 as a standard strand. Southern blot analysis showed that the DNA probe, Pn23, detected only the genomic DNA of P. nigrescens strains. PCR showed that the two sets of PCR primers, Pn23-F1/Pn23-R1 and Pn23-F2/Pn23-R2, had species-specificity for P. nigrescens. The detection limits of the four primer sets were 40 pg or 4 pg of the purified genomic DNA of P. nigrescens ATCC 335631. These results suggest that the DNA probe, Pn23, and the two sets of PCR primers, Pn23-F1/Pn23-R1 and Pn23-F2/Pn23-R2, can be useful for the detection of P. nigrescens in the molecular epidemiological studies of oral infectious diseases.

Keywords: Detection, Prevotella nigrescens, PCR

Detection of Fusobacterium periodonticum by Polymerase Chain Reaction
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The purpose of this study was to develop species-specific PCR primers for the detection of Fusobacterium periodonticum. These primers target the partial 5’tUTPase and partial Zinc Protease genes. The specificity of the primers was assessed against 11 Fusobacterium species, 8 representative oral bacteria and 19 clinical isolates (9 F. periodonticum and 10 Fusobacterium nucleatum strains). The primer sensitivity was determined by testing serial dilutions of the purified genomic DNA of F. periodonticum ATCC 336931. The specificity data showed that PCR primers produce amplicons from all the F. periodonticum tested, but not from the other species. The sensitivity of the Fp-F3/Fp-R2 and Fp-F1/Fp-R2 PCR primers sets was 4 pg and 40 pg of the chromosomal DNA from F. periodonticum ATCC 336931, respectively. To our knowledge, this is the first report on the development of F. periodonticum-specific PCR primers. These results suggest that the two sets of the PCR primers are quite sensitive to the detection of F. periodonticum in molecular epidemiological studies of periodontitis.

Keywords: Detection, Fusobacterium periodonticum, PCR

Induction of Cytokine Releases of Various Types of Poly-gamma-glutamic Acid Biopolymers
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Poly-gamma-glutamic acid (γ-PGA) is a safe and edible amino acid polymer in which the α-amino and γ-carboxy groups of D- or L-glutamic acid are linked by isopeptide bonds. Recently, many studies have proposed treatments involving γ-PGA induced secretion for tumor necrosis factor (TNF)-α and interferon (IFN)-β. To assess the immune stimulation effect of various types of γ-PGAs, we isolated the microorganisms that produce γ-PGA with different molecular weights and DL-glutamic acid ratios from the following fermented Korean foods: cheongkukjang, doenjang, toha-jeot (salt-fermented toha shrimp), and kimchi. We examined the induction of cytokines release by treatment RAW 264.7 (IBB-71) mouse macrophage cell line with various types of γ-PGAs. In the study, we found that the application of γ-PGA induced the secretion of TNF-α and IFN-β. We suggest that γ-PGA could be a good candidate for development as a functional food and medicine. [This work was supported by the Seoul R&D Program (10580) and Top Brand Project grant from Korea Research Council of Fundamental Science &Technology (KGM3110912).]

Keywords: PGA, Poly-gamma-glutamic acid, cytokine

The Suppression Effect of Phaseolus radiatus (mung bean) Ferment Extract on NC/Nga Mice, a Mouse Model for Mite Antigen-Induced Sever Atopic Dermatitis
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The study was conducted to investigate the suppression effect of Phaseolus radiatus (mung bean) ferment extract on NC/Nga mouse model for mite antigen-induced sever atopic dermatitis (AD). This model was used to determine the expression levels of chemokines in atopic lesions using IgE and IL-13 in serum by ELISA and histological microscopy. The ferment products from Phaseolus radiatus extract (FPh) were fermented by Lactobacillus sakei (FPFL), Pediococcus pentosaceus (FPFP), Lactobacillus fermentum (FPPh), Bacillus subtilis treated with protease (FPPh-P). When NC/Nga mice were repeatedly treated with DF for 2 to 3 weeks on the back skin, the IgE and IL-13 levels of serum were markedly increased within the inflammatory lesion. FPPh-P significantly reduced 45% serum IgE levels in mice compared with control group. FPPh and FPPh-P showed the strongest inhibitory effects of serum IL-13 levels by 99.1%, 96.2% than IL-13 of control. Histopathological examination and toluidine blue staining of atopic lesions revealed that FPhs reduced the skin thickness and mast cell infiltration in the skin lesions. These results indicate that sever atopic dermatitis induced by DF accompanies elevated serum chemokine levels, and it was reduced by Phaseolus radiatus ferment extract.

Keywords: atopic dermatitis, Phaseolus radiatus ferment extract, inflammatory
M-3

Human Immunodeficiency Virus and the Safety of Plasma Products

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Human plasma products have previously been associated with frequent transmission of human immunodeficiency virus type 1 (HIV-1). Development of technologies for virus inactivation/removal has greatly reduced the frequency of such transmission. To evaluate the safety of plasma products against HIV-1, the efficacies and mechanisms of the virus clearance processes used during the manufacture of albumin, immunoglobulin, factor VIII, factor IX, anti-thrombin III, and fibrin sealants, such as pasteurization, ethanol fractionation, chromatography, virus filtration, lyophilization, dry-heat, and low pH treatment, were investigated. Pasteurization and dry-heat treatment were found to be robust and effective steps in inactivating HIV-1, where all the viruses spiked were inactivated to undetectable levels during the processes. HIV-1 was effectively partitioned from albumin during cold ethanol fractionation. Virus filtration step was a robust and effective step in removing HIV-1. Chromatography steps were moderately effective for partitioning HIV-1. HIV-1 was highly susceptible to low pH treatment and lyophilization. The overall safety of each plasma product will be presented.

Keywords: Human immunodeficiency virus, plasma products, safety

M-4

Effect of Recombinant Interleukin-2 on Liver Regeneration in Rats after Partial Hepatectomy

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Interleukin-2 (IL-2) is a cytokine, produced by T lymphocytes. In this experiment, effects of IL-2 administration were evaluated in the regenerating liver after 67% partial hepatectomy (PH) of rats. Rats were randomly divided into 4 groups: A (control), and B (12×10^6 IU/kg bw), C (6×10^6 IU/kg bw), and D (3×10^6 IU/kg bw) treated with IL-2 on dosage concentrations. Rats subcutaneously injected IL-2 at 3 times a day and operated 67% PH. We observed clinical signs of body weight, hematology, and immunohistochemical (IHC) alteration in target organs, and clinical chemistry analysis in all rats. The liver regeneration rates in the four groups were 73% in A, 78% in B, 74% in C, and 74% in D. Hematological parameters in the group treated with 67% PH significantly showed decline of total lymphocyte levels, increase neutrophil levels, and decrease of BUN levels, LDH, total glucose and triglycerides. On histological observations, liver cell of the group treated with IL-2 increased cell proliferation, and liver lobules and cell plates rearranged compare with control group during liver regeneration. IHC experiments revealed that the proliferating cell nuclear antigen (PCNA) levels is up-regulated by IL-2. These results suggest that IL-2 might play a adjuvant role during liver regeneration in rats.

Keywords: Interleukin-2, Liver regeneration, Partial hepatectomy

M-5

Development of Capillary Columns Carrying Probe DNA Oligomers for Analysis of Target DNA Oligomers

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An HPLC-type capillary column system was developed for quantitative analysis of DNA oligomer, which can be separated based on the base sequence- and Tm-dependence. The DNA oligomers with an amino group at the 5'-end (used as probes) were immobilized on the inner silica surface of the capillary column which had been sequentially treated with APTS (3-aminopropyltriethoxysilane), BMS (butoxytrimethoxysilane), and DSG (disuccinimidyl glutarate). We succeeded in separating complementary and non-complementary DNA oligomers in specific and quantitative modes. We also developed a temperature gradient strategy for efficient separation of target DNA oligomers. The DNA-immobilized capillary column system developed here could be further improved and used for the quantitative analysis of DNA or mRNA samples.

Keywords: open tubular capillary, quantitative analysis, target DNA

M-6

Studies on the Antifungal Activity of Bee Venom

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This study was carried out to investigate the antifungal activity of bee venom collected by bee venom collector devices that used electrical impulses to stimulate the bees to sting. The antifungal activity of the bee venom against Trichophyton mentagrophytes and Trichophyton rubrum was determined by using the broth dilution assay in this investigation. The most common dermatophytes, named Trichophyton mentagrophytes and Trichophyton rubrum, were known to cause a variety of cutaneous infections in humans and animals. The bee venom exhibited significant antifungal activities against dermatophytes tested in this investigation. Moreover, the antifungal activity of the bee venom was much stronger than that of fluconazole, one of the commercial antifungal drugs used in the treatment and prevention of superficial and systemic fungal infections. The result suggests that the bee venom could be developed as an antifungal drug such as athlete's foot ointment. *Following are results of a study on the "Student Enterprise" Project, supported by the Ministry of Education, Science & Technology(MEST) and the National Research Foundation of Korea (NRF).

Keywords: Bee venom, antifungal activity, T. rubrum, T. mentagrophytes

The Korean Society for Microbiology and Biotechnology
High Molecular Weight Poly-γ-glutamic Acid Regulates Lipid Metabolism in Rats and Humans
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We investigated the effect of high molecular weight poly-γ-glutamic acid (hm γ-PGA) on adiposity and lipid metabolism of rats in the presence of an obesity-inducing diet. Thirty-two Sprague-Dawley rats were fed either a normal-fat (11.4% kcal fat, NFC) or high-fat (51% kcal fat, HFC) diet. HFC group had significantly higher body weight, visceral fat mass, fasting serum levels of total cholesterol, LDL cholesterol and leptin and lower serum HDL cholesterol level compared to those of NFC group. Also, hm γ-PGA increased serum HDL cholesterol in HFC group. In vitro, HMG-CoA reductase activity was suppressed by the addition of hm γ-PGA. In agreement with observation in animal study, the supplementation of hm γ-PGA (600mg/day) to 20 female subjects in an 8-week double-blind, placebo-controlled study resulted in a tendency to decrease total cholesterol and LDL cholesterol concentrations. We thus conclude that dietary supplementation of hm γ-PGA may act as hypcholesterolemic agent, secondary to their inhibitor effect on HMG-CoA reductase and decrease abdominal adiposity by decreasing hepatic lipogenesis. The present study is an important first step in establishing the effect of hm γ-PGA on cholesterol levels in rats and humans. [This work was supported by ‘Seoul R&D program (10580)’].

Keywords: high molecular weight poly-gamma-glutamic acid, lipid metabolism, in vivo and human trial study
The Synthesis of Cholesterol-based Cationic Lipids with Trimethylamine Head and the Effect of Spacer Structures on Transfection Efficiency

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The molecular structure of cationic lipids is important factor influencing gene delivery. However, it was very hard to understand structure-transfection activity relationship (SAR) for transfection due to involving numerous steps related to cellular delivery of DNA. This study describes the synthesis and SAR of six cholesterol-based cationic lipids including cholest-5-en-3β-[oxyethane-N,N-trimethylammonium bromide (Chol-ETA) structure where the cholesterol backbone is linked to cationic head via various lengths of ether-linked carbon spacer. These compounds were synthesized to observe the effect of change of a spacer structure connecting cationic head and hydrophobic domain on transfection efficiency. These compounds showed sufficient transfection efficiency when compared with commercial cationic liposomes in COS-7 cell. The transfection efficiency of these compounds was increased in order of three (Chol-PRO) <four (Chol-BTA) <two (Chol-ETA) methylene unit in their spacer, and was decreased by an addition of isomethyl group to Chol-PRO spacer. In case of the presence of multiple bonds in the spacer, it required the more cationic lipids in liposome formulation than single bond in the spacer to present similar transfection efficiency.

Keywords: Cholesterol, Cationic liposome, Gene transfer technique

Effects of Highly Purified Hyaluronidase from Ovine Testis on Biochemical and Hematological Parameters of Rats

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Hyaluronidases have been isolated from such diverse sources as mammalian testis, the venom of bees and the salivary gland of leeches. These enzymes hydrolyze hyaluronan, a polysaccharide of high molecular mass that is found in the extracellular matrix. This study was performed to evaluate repeated-dose biochemical and hematological parameters of highly purified hyaluronidase (p-HAase) from ovine testis in 60 SD rats. Crude hyaluronidase and p-HAase were subcutaneously injected once a week or three times per week for 21 days, individually. Levels of glucose (p<0.05) was significantly increased in crude hyaluronidase and p-HAase group. Crude hyaluronidase group were a decrease at total cholesterol and total protein values (p<0.05). They were a increase at BUN, ALT, AST and LDH values. p-HAase group were no significant changes at total cholesterol, total protein, BUN, ALT and LDH values. granulocytes values (p=0.05) increased more than 5 times in crude hyaluronidase. Platelet values (p=0.05) decreased more than 0.5 times in crude hyaluronidase. Platelet values (p=0.05) decreased more than 0.5 times. HAase group were no significant changes in granulocytes, uratecratic and platelet values. Biochemical and hematological parameters findings revealed no evidence of specificity related to p-HAase.

Keywords: Hyaluronidase, Hematological Parameters, Biochemical Parameters

The Combination of G-rich Oligonucleotide AS1411 and Doxorubicin showed a Selective Antitumor Effect

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In this study, we focused on evaluating the potential of combining AS4111 (guanine-rich oligonucleotide aptamer) with Doxorubicin (Dox) in MCF-7 (hormone-dependent breast cancer cell line) and MCF-10A (immortalized human breast epithelial cells line). For combination studies, after pretreatment of 2 μM of AS4111 (a concentration that did not cause growth inhibition when used alone) for 1 day in MCF-7 and MCF-10A cells, 250 nM of Dox was added for 1 hour (a concentration that did not cause growth inhibition when used alone for 1 hour) and then cells were incubated for 3 days in fresh culture medium. Interestingly, AS4111 showed more than 30% of synergistic growth inhibition when used with Dox in MCF-7 cell but did not show growth inhibition in MCF-10A cell. Also, we confirmed found that the pretreatment of AS4111 increased uptake of Dox into MCF-7 cell: 59% for at 30 minutes treatment of Dox and 93% for 60 minutes treatment of Dox compared to no pretreatment control of AS4111. In light of these,These results indicate that the synergic effect might be caused by increased uptake of Dox in MCF-7 cell suggesting the potency of the combination of AS4111 and Dox as the cancer selective treatment agent.

Keywords: Doxorubicin, AS4111, Antitumor effect
**M-15**

**Biological Properties on Titanium Surface of Combined Micro and Nano Scale Structure**

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Titanium (Ti) and its alloy's surface has important role when implant to human body. Especially, micro- and nano-topography of it's surface acts on major factor for osteoblast cell adhesion, proliferation and differentiation. The aim of this study is to fabricate the Ti surface to micro- and nano-structure and evaluate their biological properties. In this study, six groups of Ti surface are prepared. At first, commercially pure Ti (CP-Ti) was mechanically polished to even the surface, and it is fixed as a control group. Other modified groups (blasted Ti, dual-acid treated Ti, Blasted and dual-acid treated Ti, Blasted and NaOH treated Ti, NaOH treated Ti) were prepared for experimental groups. To compare their surface properties, scanning electron micrographs (SEM), and X-ray diffraction (XRD) were used. Dual-acid treated Ti, blasted Ti, blasted and dual-acid treated Ti shows micro structured surface. Otherwise, NaOH treated Ti shows nano structured surface and blasted after NaOH treated Ti shows surface of combined micro and nano scale structure. When MTT and ALP assay were proceeded to evaluate their biocompatibility, Micro surface shows the top-notched results of all. But some more research is need to clarify this result. (NRF, No. 2010-0011370)

Keywords: Titanium, surface, modification, SEM, biocompatibility

**M-16**

**Antigenicity Study of Highly Purified Hyaluronidase from Ovine Testes**

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The hyaluronidases are a family of enzymes that degrade hyaluronic acid. In humans, there are six associated genes, including HYAL1, HYAL2, HYAL3, and PH-20/SPAM1. Ovine testicular hyaluronidase (OTH) has been used in several medical fields for many years. This study was performed to evaluate the antigenicity of highly purified Hyaluronidase (p-HAase) from ovine testis using an active systemic anaphylaxis (ASA) and passive cutaneous anaphylaxis (PCA) test in rats. In ASA test using rats, there were no statistical significant symptoms in addition to licking nose in all individuals of low (150 IU/kg) and high (1,500 IU/kg) dose of both group treated with only p-HAase and cotreated with p-HAase and Freund's complete adjuvant (FCA) group. In PCA test, intradermal sensitization with antisem serum obtained from low and high dose of p-HAase only treatment group and treated-with-adjuvant group, followed by intravenous injection of respective antigen and Evan's blue mixture (1:1) showed no blue spot observed. In conclusion, p-HAase, as showed in ASA and PCA test, did not cause anaphylactic shock when treated 6 and 60 times higher than clinically intended dose, nor induce IgE, so that might not have antigenic properties in rats.

Keywords: hyaluronidases, Antigenicity

**M-17**

**The Effects of Streptococcus mutans Mutan on Alveolar Bone Resorption of Rat**

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Dental plaque microorganisms and their metabolic products such as toxins, enzymes and polysaccharides have been shown to induce periodontitis. This study tried to find out the effect of mutan (α-1,3-glucans) obtained from the extracellular polysaccharides of Streptococcus mutans on the resorption of alveolar bones of rats. Sprague-Dawley rats were divided into four groups: Group A (saline), B (LPS), C (mutan) and D (LPS+mutan). The group C and D were administrated 100 μg/kg by injection into the interproximal regions of palatal gingiva between the first and second molars of maxillary. The administration was repeated 3 times a week over 2 weeks. The group B was administrated 10 μg/kg in the same way. Three dimensional image of maxillary alveolar bone was constructed using Micro-CT (Sky Scan 1172 high resolution micro-CT). The results of Micro-CT data showed that alveolar bone resorption was induced around the molar by injection of group B. However, group C and D injection sites showed weak bone loss. These results suggest that mutan from S. mutan promotes the bone loss of alveolar bone.

Keywords: Streptococcus mutans, mutan, alveolar bone resorption

**M-18**

**Preparation and Comparison of Hydrogel Systems with Two Enzymes Prepared by Direct and Indirect Immobilizing Methods for Diabetic Ulcer Treatment Using Gamma-Irradiation**

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Previously, we reported that the preparation of hydrogel system with two enzymes: glucose oxidase (GOx) and Horseradish peroxidase (PO) for diabetic ulcer treatment using gamma-irradiation method. However, the immobilized enzyme activity actually was very low due to the enzyme inactivation caused by gamma-irradiation. Thus, in this study, we prepared and compared two hydrogel systems between directed and indrected approaches for enzyme immobilization method. When the prepared hydrogels is examined, both of the prepared hydrogels showed suitable physiological properties with PVA based hydrogel at 25 kGy irradiation. The hydrogels prepared directed method showed only about 16% of physiological properties with PVA based hydrogel at 25 kGy irradiation. The hydrogels prepared indirect method showed only about 16% of enzyme activity even though higher immobilization rate of above 95% in hydrogel was achieved. Thus we prepared hydrogel system by using indirect method that prepared by freeze-drying and following soaking process at PVA hydrogel. Compared to direct method, however, the 4-fold for GOx or 2.7-fold for PO activity yield (%) was achieved although immobilization rate (%) was about 1/10 lower than direct method.

Keywords: Hydrogel systems, Immobilizing methods, Gamma-irradiation
Effects of Osteoclast Differentiation by Lipoteichoic acid and Mutan from Streptococcus mutans

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The study was designed to evaluate osteoclast differentiation of lipoteichoic acid (LTA) and mutan in vitro. LTA and mutan on osteoclastogenesis induced by the bone differentiation factor RANKL. In examination of macrophage activation, murine macrophage RAW 264.7 cells activated by LTA and mutan elevated formation of nitric oxide. No cytotoxicity was observed. LTA and mutan remarkably increased nitric oxide activity at 10 μg/ml. LTA inhibited RANKL induced osteoclast differentiation as activity of multinucleated tartrate-resistant alkaline phosphatase (TRAP)-positive osteoclasts. However, mutan activated the RANKL induced osteoclast differentiation. This results suggest that LTA has a potential to inhibit osteoclast differentiation but mutan promotes osteoclast formation by a RANKL-independent mechanism.

Keywords: Lipoteichoic acid, mutan, Osteoclast Differentiation

M-21 Direct Tuberculosis Monitoring by Magnetophoretic Immunoassay in a Close System for Preventing Laboratory-acquired Infections

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Magnetic nanoparticles (MNPs) and gold nanoparticles (Au NPs) often serve as diagnostic agents owing to unique optical and electromagnetic properties in biomedical fields. In this study, we present a simple diagnostic method for tuberculosis (TB) by magnetophoresis using an immunological combination of MNPs and Au NPs through the immunoreactions of TB antibodies (Ab) and antigens (Ag) in a capped glass vial. Two individual biocapped NP solutions were prepared using monoclonal and polyclonal antibodies, respectively. When the TB-AgS were added into a closed system, two different NPs were linked through immunoreaction, resulting in a combination of Au NPs and MNPs, which is correlated with the quantity of TB-Ags. The combined sandwich-constructions of NPs can be selectively removed to the base of the vials by external magnetic force without unlocking the caps, which is potentially beneficial in the treatment of contagious or respiratory bio-molecules. The absorbance of Au NPs, which was measured by UV/Vis spectroscopy through the glass of the bottle, was inversely correlated with the concentration of Ags.

Keywords: Tuberculosis, Laboratory-acquired infection, Surface plasmon resonance

Development of Type II Diabetic Mellitus Animal Model with Mini-Pig

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Diabetes has been explosively increased in terms of its incidence and considered one of the serious diseases to overcome for human life. Among the animal models used for the drug efficacy test, mini-pig model is going to rapidly upload because of many similarities with human, particularly concerning the pharmacokinetic of compounds after subcutaneous administration, the structure and function of the gastrointestinal tract, the morphology of the pancreas, and overall metabolic status. Based on these various advantages, we try to develop Type II diabetic mellitus animal model with mini-pig. We set 4 male mini-pigs for the study, 3 animals for the induction of moderate insulin deficient model with Nicotinamide/Streptozotocin treatment and 1 animal for control. For the evaluation of Type II diabetic incidence, we checked blood glucose level, OGTT as well as immunohistochemistry of pancreatic tissue. All of the animals treated showed high glucose and low insulin levels compared to control mini-pig. And also, we got the partially destroyed beta cell population from the tissue of pancreas in the animals treated. Based on these results, we want to report that the animal model developed can be used for efficacy test of candidate diabetic drugs.

Keywords: Diabetic Mellitus, Mini-pig, Animal model
Inhibitory Effects of Antimicrobial Peptide on growth and Biofilm Formation of Pseudomonas aeruginosa

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Biofilms are microbial communities attached to solid surfaces and enclosed in a self-produced polymeric matrix. Resistance to conventional antibacterial agents is a key feature of biofilm infections, which highlights the necessity for the development of novel compounds able to effectively control them. Accordingly, antimicrobial peptides represent a promising class of molecules with which to combat these pathogens, and among those is the analogue peptide P5, which was designed and synthesized from a hybrid peptide, CA-MA [derived from cecropin A (1-8) and magainin 2 (1-12)]. In the present study, P5 and several conventional antibiotics were applied to biofilm-forming clinical isolates of Pseudomonas aeruginosa for susceptibility testing. All of the strains were found to be resistant to the tested compounds. Nonetheless, P5 inhibited the formation of biofilms at very low concentrations and also showed positive synergy when applied at its MBCo concentration in combination with vancomycin. P5 also inhibited production of such extracellular matrix formation by drug-resistant strains.

Preparation of Reactive-end DNA Oligomer Using Terminal deoxynucleotidyl Transferase(TdT)

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The chronic inflammation in tissue induces a long term secretion of nitric oxide that cause DNA damage in tissue via nitrosative oxidation. In such nitrosative oxidation stress, guanine in genome can be converted to oxanine (Oxa), which is one of the damaged bases. Oxa has reactivity to nucleophile due to their unique α-acylsioear ring structure. Oxa’s reactivity to nucleophile has been researched in terms of its biological roles and their applications, in particular Oxa as a cross-linker. In this study, using terminal deoxynucleotidyl transferase (TdT), reactive Oxa was incorporated at the 3’-end of DNA strands. This is a new method for preparation of reactive-end DNA oligomer, which can be used for DNA-conjugated particle, surface or protein complex.

Keywords: Oxanine, Terminal deoxynucleotidyl Transferase, Cross-linker

Antibacterial Activity and Mechanism of the Scrambled Peptides

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The antibacterial peptides need to develop that are non resistant to the rapid emergency of bacterial infections. Here we report that repeat of alternating polar and nonpolar residues peptides act on Gram negative and Gram positive, including multiresistant bacterial membranes, a rapid collapse of transmembrane potential, ability to induce membrane permeability, and cause rapid cell death. Antibacterial activity of these scrambled peptides increases until a certain balance of cationic and hydrophobicity level. Further increasing cationic and hydrophobicity in the scrambled peptide was demonstrated to correlate with peptide beta sheet and self associating ability in aqueous environment. Peptide self association or increasing hydrophobicity was correlated with increasing hemolytic activity. The scrambled peptides kill the bacteria by membrane disruption was evaluated through membrane potential depolarization assay, membrane permeability. Interaction of these peptides with model liposomes vesicles was examined using tryptophan fluorescence. The CD spectra revealed that these scrambled peptides had an unordered structure in PBS (except for (KW)5-NH2), and also adopted beta sheet conformation in egg yolk L-2-phosphatidyl ethanolamine (EYPE) egg yolk L-2-phosphatidyl glycerol (EYPG) (7:3 w/w) and egg yolk L-2-phosphatidylcholine (EYPC):cholesterol (CH) (10:1 w/w). In additionally, we studied the interaction of the antibacterial peptide (KW5-NH2) with E. coli using scanning electron microscopy and confocal laser scanning microscopy. The present data revealed that the balance of cationic and hydrophobicity containing (KW5-NH2) scrambled peptide is essential for bacterial membrane disruption, while having only small lyte effects on eukaryotic membranes.

Signal Amplification of Inflammted Cell Detection by Antibody Conjugated Bead.

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Inflammation is biological protective response to various harmful stimuli and also initial healing process. But continuous inflammation related to various diseases. So, it is important to detect inflammation on living cell in the initial stage. A kind of inflammated cell detection is using antibody. 1st antibody(TLR1) recognize particular receptor on cell surface and fluorescence functional 2nd antibody bind to 1st antibody. But it is hard to detect weak signal. The signal amplification attempted by antibody conjugated bead. Nano silica beads that covered with fluorescence functional 2nd antibody amplify the signal. Through the bead size optimization, 200nm bead showed apparent signal and less non-specific binding noise. It is useful to distinguish weak inflammation signal by amplification. This antibody-bead conjugation method is expected to serve as a effective strategy of live cell inflammation detection.

Keywords: Inflammation, Signal Amplification, Antibody-Bead Conjugation
A Rationally Designed Peptide with Antibacterial and Synergistic Effect Against MRDS Isolated from Patients with Cholelithiasis

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Keywords: FAMEs, glycerol carbonate, lipase

Production of FAMEs and glycerol carbonate from corn oil with dimethyl carbonate as acyl acceptor in the presence of Novozyme 435

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Fatty acid methyl esters (FAMEs) and glycerol carbonate (GC) were produced from corn oil and dimethyl carbonate (DMC) as acyl acceptor by using lipase. Herein, DMC was employed as the substrate and the reaction medium. Novozyme 435 was used as the biocatalyst. The effects of oil/DMC ratio, water content, reaction temperature and detergent addition were analyzed and optimized. The yields of FAMEs and GC were more than 90% and 70%, respectively, and residual glycerol and methanol contents were negligible at the optimized reaction condition.

Keywords: FAMEs, glycerol carbonate, lipase

Ethanol Production from Oil Palm Trunks Pretreated by Soaking in Aqueous Ammonia

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Oil palm trunks are lignocellulosic wastes, of which the enormous amount is currently generated from oil palm tree farms in Malaysia and Indonesia. The feasibility of using trunks for ethanol production was evaluated by pretreating the biomass using the method of soaking in aqueous ammonia. The degree of lignin removal was closely related to the enzymatic digestibility of the trunks. Untreated trunks showed an enzymatic digestibility of only 11.9% of the theoretical maximum yield of glucose from its cellulose fraction. The optimum pretreatment conditions such as pretreatment, time, aqueous ammonia concentration and solid-to-liquid ratio found to be 80°C, 1:12 solid-to-liquid ratio, 8 h and 7% (w/w) ammonia solution. The trunks pretreated at the optimum conditions resulted in an enzymatic digestibility of 95.4% with an insoluble solids recovery of 49.8%. From the simultaneous saccharification and fermentation using 60 FPU per g of glucon andSaccharomyces cerevisiae D4A, the highest values of ethanol concentration (13.3 g/L) and yield (78.3%) after 96 h were obtained from the pretreated trunks. Acknowledgment This work was supported by the Advanced Biomass R&D Center of Korea Grant(2010-0029734) funded by the Ministry of Education, Science and Technology, Korea.

Keywords: oil palm trunks, ammonia pretreatment, ethanol

Statistical Optimization of Salts in the Medium for Production of Carboxymethylcellulase by a Marine Microorganism E. coli JM109/LBH-10 from Rice Bran using Response Surface Method

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The optimal concentrations of salts - K2HPO4, NaCl, MgSO4·7H2O, and (NH4)2SO4 - in the medium for cell growth and the production of carboxymethylcellulase (CMCase) of Psychrobacter aquimaris LBH-10 by a recombinant E. coli JM109/LBH-10 were investigated using the response surface method (RSM). The analysis of variance (ANOVA) of results from central composite design (CCD) indicated that highly significant factors ("probe-F" less than 0.0001) for cell growth were K2HPO4, MgSO4·7H2O, and (NH4)2SO4 whereas that for production of CMCase was K2HPO4. The optimal concentrations of K2HPO4, NaCl, MgSO4·7H2O, and (NH4)2SO4 for cell growth extracted by Design Expert Software were 7.50, 1.50, 0.30, and 0.90 g/L respectively, whereas those for production of CMCase were 3.98, 0.86, 0.26, and 0.33 g/L. Expected maximal cell growth and production of CMCase by E. coli JM109/LBH-10 were 3.49 g/L and 545.8 U/mL.

Keywords: carboxymethylcellulase (CMCase), E. coli JM109/LBH-10, response surface method (RSM)