

Patent Annotations:

The patents annotated in this section have been selected by the authors of this issue as the most important patents of relevance to their field.

BIOFILMS: RECENT DEVELOPMENTS ON AN OLD BATTLE

1. **Ionene polymers and their use as antimicrobial agents**, Fitzpatrick, R.J., Shackett, K.K., Klinger, J.D.: *US20056955806 (2005)*.

Commentary:

Antimicrobial compositions containing ionene polymers are used for treating microbial infections in mammals. Methods for preventing and inhibiting growth of microorganisms on a susceptible surface are also described.

2. **Decontamination process**, Wiersma, J.G.: *US5882916 (1999)*.

Commentary:

A method for reducing the surface tension of the biofilm through decontamination process is discussed. The solution used in this process consists of saponin and sodium lactate. This method allows the removal of the biofilm for control of underlying bacteria.

3. **Intraocular lens with antimicrobial activity**, Christ, F.R.: *US19985843186 (1998)*.

Commentary:

Antimicrobial properties of improved intraocular lens (IOL) in combination with one or more antimicrobial polymers are discussed.

4. **Combination of antimicrobial agents and bacterial interference to coat medical devices**, Darouiche, R.O., Hull, R.: *US20046719991 (2004)*.

Commentary:

The present invention discusses the method for coating medical device by applying a portion of the surface of said medical device with an antimicrobial coating layer and a non-pathogenic bacterial coating layer. These antimicrobial and non-pathogenic bacterial coating layers inhibit the growth of pathogenic bacterial and fungal organisms.

5. **Method and system for controlling biofilm**, Korin, A.: *US20046773610 (2004)*.

Commentary:

The invention describes a method for removing biofilm in order to prevent biofilm formation on the interior surface of conduit by disabling supply of water to the conduit. This invention is suited for use in dental equipment.

6. **Composition and process for the avoidance of slime formation and/or for the removal of biofilm in water-bearing systems**, Eyers, M.E., van Pee, K.L.I., van Poele, J., Schuetz, J.F., Schenker, A.P.: *US5789239 (1998)*.

Commentary:

The present invention highlights the use of an enzyme component from the group consisting of carbohydrates, proteases, lipases and glycol proteases, and short-chained glycol component for the removal of biofilm on the surfaces of water-bearing systems.

ENGINEERING ENZYMES FOR BIOCATALYSIS

1. **Protein design for receptor-ligand recognition and binding**, Hellinga, H.W., Looger, L.L., Dwyer, M.A.: *US2004229290 (2004)*.

Commentary:

The protein structure-based design or redesign of receptor-ligand interfaces is done by synthesizing them artificially or naturally. These interfaces are used to engineer cells, tissues, or organisms.

2. **In vitro evolution in microfluidic systems**, Griffiths, A.D., Weitz, D., Link, D., Ahn, K., Bibette, J.: *US2006078888 (2006)*.

Commentary:

The invention provides method for isolating one or more genetic elements encoding a gene product having a desired activity. The steps include compartmentalizing genetic elements into microcapsules and sorting the genetic elements.

3. **In vivo incorporation of unnatural amino acids**, Schultz, P.G., Wang, L., Andersen, J.C., Chin, J.W., Liu, D.R., Magliery, T.J., Meggers, E.L., Mehl, R.A., Pastrnak, M., Santoro, S.W., Zhang, Z.: *US2005250183 (2005)*.

Commentary:

Compositions and methods for *in vivo* incorporation of unnatural amino acids are discussed.

4. **Apparatus and method for automated protein design**, Mayo, S.L., Dahiyat, B.I., Gordon, D.B., Street, A., Su, Y.: *US2006019316 (2006)*.

Commentary:

The present invention refers to apparatus and methods for quantitative protein design and optimization.

NEW DEVELOPMENTS AND PROSPECTIVE APPLICATIONS FOR β (1,3) GLUCANS

1. **Health promoting dairy and food products containing mushroom glucan produced through fermentation of *Grifola frondosa***, Zhu, Y., Sonnenberg, A.S.: *WO06107208 (2006)*.

Commentary:

Methods to produce food products comprising of polysaccharides from edible or medicinal mushrooms with a

health promoting effect, are given in this invention. Immune modulation in general, and lowering and/or stabilizing blood sugar level are discussed.

2. **Low-carbohydrate digestible hydrocolloidal fiber composition, Singlett, G.E.: WO06069390 (2006).**

Commentary:

The digestible low-carbohydrate hydrocolloidal composition is separated from a cereal-based substrate by means of a specific sequence of steps for treating an aqueous slurry of the substrate. All these natural compositions are low in digestible carbohydrates and rich in soluble fiber, as well as proteins. These compositions are recovered in high yields and has a smooth texture, useful for texturizing food, especially bakery products as food ingredients for increasing the nutritional level of foods and supplements.

3. **Curdlan sulfate, Yamamoto, N., Nakashima, H., Uryu, T., Yoshida, T., Matsuzaki, K., Kaneko, Y., Mimura, T.: US5512672 (1996).**

Commentary:

Sulfate curdlan also known as beta-1,3-glucan of sulfated curdlan is presented which has a sulfur content of 12.4 to 17% and an average molecular weight of 27,000 to 330,000 daltons. It shows strong HIV inhibitory activity with little anticoagulant activity and minimum toxicity.

4. **Flour composition containing non-wheat cereal components, and noodles produced therefrom, Wang S.-J.: US2004175483 (2004).**

Commentary:

The flour composition containing wheat and non-wheat flour cereal components is provided in specific compositions.

5. **Meat products and processed meat products coated with curdlan gel film, Toyoda, S., Kimura, M.: US2004047949 (2004).**

Commentary:

The invention describes processing of meat products with a film of curdlan gel, a novel edible casing. This meat product is beneficial in many ways as it does not produce large amounts of waste and does not cause diseases or allergy unlike conventional meat products.

6. **Emulsified liquid shortening compositions comprising dietary fiber gel, water and lipid, Shukla, T.P., Halpern, G.J.: WO05039300 (2005).**

Commentary:

The invention discusses dietary fiber gel, water and lipid, as well as a method for making the emulsified shortening compositions. These dietary fiber gel are subjected to micro-particulation to form a mixture which is subjected to colloid milling or other equivalent methods of emulsification and the emulsified mixture can be pasteurized. For additional health benefits omega-3 and omega-6 oils and pure omega-3 and omega-6 fatty acids, medium chain triglyceride, beta carotene, calcium estearate, vitamin E, bioflavonoids, fagopyritrol, polyphenolic antioxidants of vegetable origin, lycopene,

luteine and soluble fiber, for example beta-glucan derived from yeast, soluble fibers derived from grain, flax seed, and other vegetable and fruit fiber sources can be added. The compositions are suitable for use in formulated foods to replace all or a portion of fats, oils and liquid shortenings.

7. **Food products with improved bile acid binding functionality and methods for their preparation, Marston, B., Perdon, A.A., Sung, S.-S., Hite, H.E., Heddleson, R.A.: CA2414326 (2003).**

Commentary:

Short chain beta-glucan or modified short chain beta-glucan are incorporated in food product intermediates. These chains having an average molecular weight of less than 50,000 daltons enhance bile acid binding capacity ensuing improved hypocholesterolemic effects.

8. **Beta-glucans encapsulated in liposomes, Kozbor, D., Kaneko, Y.: WO20010185141 (2001).**

Commentary:

The invention discusses beta-glucan encapsulated in liposomes. If transmucosally administered, this beta-glucan shows improved activity of enhancing a cellular immunity and is useful for the treatment or prevention of an infection or tumor.

9. **Agent for stimulating the natural defenses of plants, useful as antiviral, antibacterial, antifungal and insecticide, comprises curdlan sulfate, Yvin, J.-C., Menard, R., Kauffmann, S., Fritig, B.: FR2865350 (2006).**

Commentary:

The invention identifies the natural curdlan sulfate as agent for stimulating the natural defense mechanisms of agricultural or ornamental plants. It stimulates production of protective antimicrobial PR proteins and of antibiotics, e.g. scopoletin.

RECENT PATENTS ON CELL SIGNALING SYSTEMS

1. **AKT nucleic acids, polypeptides and uses thereof, Guo, K., Pagnoni, M.F., Clark, K.L., Ivashchenko, Y.D.: US20056881555 (2005).**

Commentary:

The human AKT3 proteins and polypeptides are therapeutically useful in gene therapy, inhibiting cell death related with apoptosis, necrosis and hypoxia.

2. **Inhibitors of AKT activity, Owens, A.P., Barnett S.F.: US20067098208 (2006).**

Commentary:

Compounds consisting of triazolo[4,3-b]pyridazine moiety helps to inhibit the activity of AKT which is a serine/threonine protein kinase used as a chemotherapeutic agent.

3. **Method and compositions for treatment of BCR-ABL associated leukemias and other cell proliferative disorders, Schlessinger, J., Gishizky, M.L., Pendergast, A.M.: US20006066463 (2000).**

Commentary:

The invention provides compositions and methods involving a protein tyrosine kinase by complexing with a member of SH2- and/or SH3-containing family of adaptor proteins. This composition is used for the prevention and treatment of cell proliferative disorders. It is also used for identifying agents capable of decreasing or inhibiting the interaction between the members of such complexes.

4. **14273 receptor, a novel G-protein coupled receptor**, *Glucksmann, M.A., Tsai, F.-Y.: US20067057028 (2006).*

Commentary:

The present invention identifies a novel G-protein coupled receptor, and polynucleotides encoding the receptor and presents drug screening methods for diagnosing and treatment of receptor-mediated disorders, specifically, cardiovascular diseases, including congestive heart failure.

5. **Endogenous and non-endogenous versions of human G protein-coupled receptors**, *Liaw, C.W., Chalmers, D.T., Behan, D.P., Maciejewski-Lenior, D., Leonard, J.N., Lin, I.-L., Ortuno, D.: US20067119190 (2006).*

Commentary:

The transmembrane receptors discussed here are related more particularly to a human G protein-coupled receptor and to mutated versions of the human GPCRs for evidence of constitutive activity.

6. **G protein coupled-receptor (GPCR) agonists and antagonists and methods of activating and inhibiting GPCR using the same**, *Kuliopulos, A., Covic, L.: US20056864229 (2005).*

Commentary:

The invention discusses G protein-coupled receptors and methods to identify its agonists and antagonists.

7. **JAK kinases and regulation of cytokine signal transduction**, *Ihle, J., Witthuhn, B.A., Quelle, F.W., Silvennoinen, O.: US20056969760 (2005).*

Commentary:

Methods for regulating the cellular responses to cytokines involve inhibiting or enhancing of at least one JAK kinase activity. Assays for identifying inhibitors of JAK kinase activity are also provided.

8. **JAK-3 inhibitors for treating allergic disorders**, *Uckun, F.M., Malavia, R., Sudbeck, E.A.: US20056933300 (2005).*

Commentary:

The invention presents JAK-3 kinases and its use as inhibitors for the treatment of allergy.

9. **Phosphatases which activate MAP kinase pathways**, *Belmont, J.W., Fletcher, F.A., Chen, A.J., Jurecic, R., Tan, T.-H., Zhou, G.: US20056900043 (2005).*

Commentary:

The invention refers to the novel JNK activating phosphatase polypeptides, nucleic acid molecules, vectors, host cells and antibodies, and methods for producing JNK activating phosphatase polypeptides. Methods for the diagnosis and treatment of diseases associated with JNK activating phosphatase polypeptides are also given.

10. **p38 MAP kinase inhibitors**, *Cheng, S., Goldstein, D.M., Martin, T.A.T., Sjogren, E.B.: US20036630485 (2003).*

Commentary:

This invention presents the compounds of formula (I), p-38 MAP kinase inhibitors, their pharmaceutical compositions, their usage and preparation.

11. **Nuclear factors associated with transcriptional regulation**, *Baltimore, D., Sen, R., Sharp, P.A., Singh, H., Staudt, L., Lebowitz, J.H., Baldwin, Jr., A.S., Clerc, R.G., Corcoran, L.M., Baeuerle, P.A., Lenardo, M.J., Fan, C.-M., Maniatis, T.P.: US20026410516 (2002).*

Commentary:

The invention refers to the constitutive and tissue-specific protein factors which are identified and isolated by an improved assay for protein-DNA binding.

12. **Proteasome regulation of NF-KB activity**, *Palombella, V.J., Goldberg, A.L., Maniatis, T.P., Rando, O.: US20036660268 (2003).*

Commentary:

Methods for regulating NF-kappaB activity in animals include contacting cells of the animal with certain proteasome inhibitors.

13. **32544, A novel human phospholipase C and uses thereof**, *Meyers, R., Silos-Santiago, I.: US20056897056 (2005).*

Commentary:

The invention describes designated 32544 nucleic acid molecules, antisense nucleic acid molecules, recombinant expression vectors containing 32544 nucleic acid molecules, host cells and non-human transgenic animals. Diagnostic methods using these compositions are also provided.

14. **Novel human phospholipase C delta 5**, *Ducker, K., Brandt, S., Gleitz, J.: US20056958152 (2005).*

Commentary:

The invention refers to methods for producing phospholipase C delta 5 (PLCD5) polypeptides by recombinant techniques and its use in diagnostic assays.

L-LYSINE FERMENTATION

1. **Method for producing lysine derivative**, *Nakazawa, M., Takahashi, D., Onishi, N., Naito, M., Izawa, K., Yokozeki, K.: US20067012152 (2006).*

Commentary:

The present invention discusses methods for producing an amino group or carboxyl group of optically active 2-amino-6-methyl-6-nitroheptanoic acid. In another method industrial production of an optically active lysine derivative useful as a pharmaceutical intermediate is discussed.

- Bacterial strains, methods of preparing the same and use thereof in fermentation processes for L-lysine production, Liaw, H.J., Eddington, J., Yang, Y., Dancy, R., Swisher, S., Mao, W.: US20066984512 (2006) and US20067122369 (2006).**

Commentary:

The invention refers to new methods for the production of amino acids.

- L-lysine producing coryneform bacteria and methods for the production of L-lysine, Kreutzer, C., Mockel, B., Pfefferle W., Eggeling, L., Sahm, H., Patek, M.: ES2247987T (2006), EP1067193 (2006) and EP1619252 (2006).**

Commentary:

Production of L-lysine by coryneform bacterium is discussed with an amplified *pyc* (pyruvate carboxylase) gene in which at least one of the additional genes such as *dapA* (dihydropicolinate synthase), *lysC* (aspartate kinase), *lysE* (lysine exporter-carrier) and/or *dapB* (dihydropicolinate reductase), is amplified.

- Microorganism producing L-lysine and processes for producing L-lysine using the same, Kim, S.-J., Lee, K.-H., Sung, J.-S., Lim, S.-J., Jang, J.-W.: US20067008786 (2006).**

Commentary:

Coryneform bacterium is resistant to an antibiotic, monensin. L-lysine is produced by the direct fermentation through culturing said micro-organism in a fermentation medium.

- L-lysine-producing corynebacteria and process for the preparation of L-lysine, Kreutzer, C., Hans, S., Rieping, M., Möckel, B., Pfefferle, W., Eggeling, L., Sahm, H., Patek, M.: US20067094584 (2006).**

Commentary:

The invention describes production of L-lysine strains of corynebacteria with enhanced *lysE* gene in which strains of additional genes chosen from the group comprise of the dihydrodipicolinate synthase gene, the aspartate kinase gene and, the dihydrodipicolinate reductase gene.

NUTRACEUTICALS, NUTRITIONAL THERAPY, PHYTONUTRIENTS, AND PHYTOTHERAPY FOR IMPROVEMENT OF HUMAN HEALTH: A PERSPECTIVE ON PLANT BIOTECHNOLOGY APPLICATION

- Novel nutraceutical compositions, Wolfram, S., Loon van, L.J.C.: WO06077202A1 (2006) and EP1633208A1 (2006).**

Commentary:

The present invention refers to a new nutraceutical composition containing an amino acid and a protein hydrolysate.

- Nutraceuticals for the treatment, protection and restoration of connective tissues, Shen, B.J., Ghosh, P.: AU20020112A4 (2002), WO03062279A1 (2003), JP2005519914T2 (2005), EP1476471A1 (2004), CA2474269AA (2003); ZA0406621A (2004) and NZ0534760A (2005).**

Commentary:

The invention describes a method for isolating connective tissue from a variety of glycosaminoglycan (GAG)-peptide complexes and polypeptides. These peptides are free of contaminating DNA and other molecules such as viruses. Uses of GAG-peptide complexes, for the treatment, protection and restoration of connective tissues in inflammatory and degenerative disorders, such as rheumatoid arthritis, and osteoarthritis, in any of their multiple forms or other degenerative conditions in mammals are also discussed.

- Oral compositions for the treatment of scalp disorders, Franchesco, D.P.: RU2274470C2 (2005), WO03013561A1 (2003), US20050008711A1 (2005), JP2005511494T2 (2005) and EP1414473B1 (2006).**

Commentary:

The invention relates to pharmaceutical and/or cosmetic compositions containing extracts of *Serenoa repens* and of *Vitis vinifera* for the treatment and prevention of scalp disorders.

- Method for preparing hepatoprotective and hypocholesterolemic agent, Tonikovich, O.E., Jur'evich, P.A., Andreevna, A.O., Grigor'evna, D.E., Sergeevna, Z., Olegovna, P.E.: RU2270686C2 (2006).**

Commentary:

The hepatoprotective and hypocholesterolemic agent are prepared by using common wormwood-leaved ragweed (Ambrosia).

- Cancer cell growth inhibition by black bean (*Phaseolus vulgaris* L) extracts, Gutierrez-Urbe, J.A., Serna-Saldivar, S.R.O., Moreno-Cuevas, J.E., Hernandez-Brenes, C., Uajardo-Touche, E.M.: WO05107780C1 (2005), US20060024394A1 (2006), WO05107780A2 (2005) and WO05107780A3 (2005).**

Commentary:

The invention relates to a group of phytochemical compounds extracted from *Phaseolus vulgaris* L. These phytochemicals are classified as phenolics and other antioxidant compounds that are effective for decreasing cancer proliferation of hormone dependent mammary (MCF-7), hormone independent hepatic (HepG2) and colon cancer cells (Caco2). They are also used in lowering cholesterol level or oxidation of LDL and/or inhibiting cholesterol synthesis and reducing symptoms of menopause.

6. **Method for altering the nutritional content of plant seed**, *Kirihara, J.A., Hibberd, K.A., Anthony, J.:* *US20056960709 (2005) and US20060112443A1 (2006).*

Commentary:

The invention describes the preselected DNA sequences and their usage in the alteration of the nutritional content of plant seed.

7. **Transgenic plants expressing assembled secretory antibodies**, *Hein, M.B., Hiatt, A.:* *US20067037722 (2006), US20067005560 (2006), US20066995014 (2006) and US20026417429 (2002).*

Commentary:

Expression and assembly of foreign multimeric proteins, such as antibodies in plants that express such proteins, are provided in this invention.