

# KAIMRC Innovation Patents



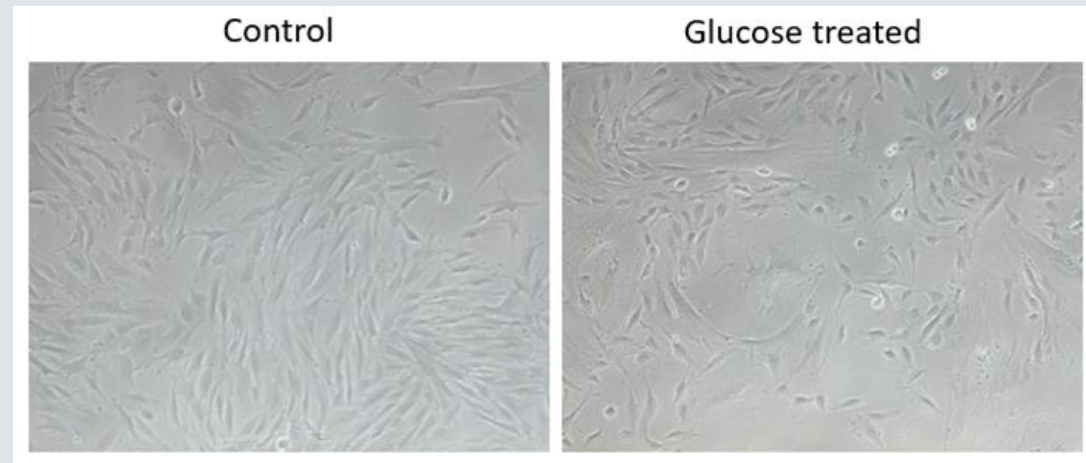
# Innovation Overview

Saudi Patent Office

## A Novel Method Preconditioning Of Placenta Derived Mesenchymal Stem Cells In High Glucose Induced Insulin Production

### Summary

Isolated and functionally differentiated stem cells from different parts of the human placenta including placental stem cells, in this invention, we found that these placental stem cells acquire antidiabetic function when adapted into insulin-producing cells. This invention will lead to the creation of cellular therapy to replace drugs or insulin injections.



Inventor Name

Dr. Yasser Basmakil and Dr. Tanvir Khatlani

Date of Issue

12, April 2023

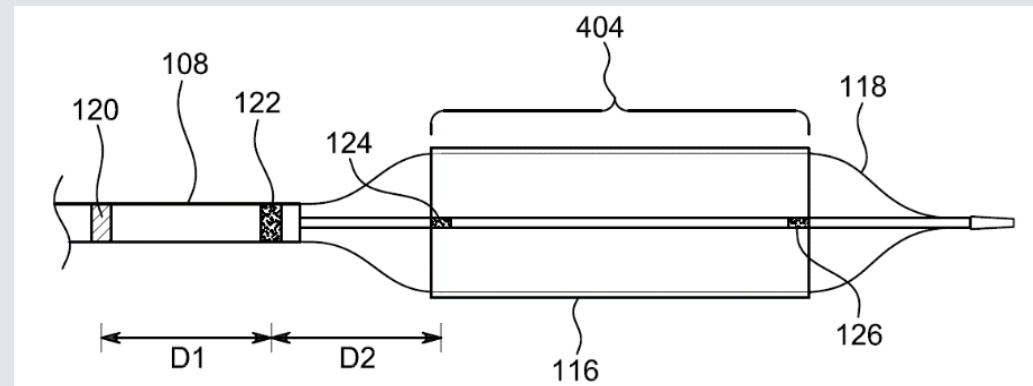
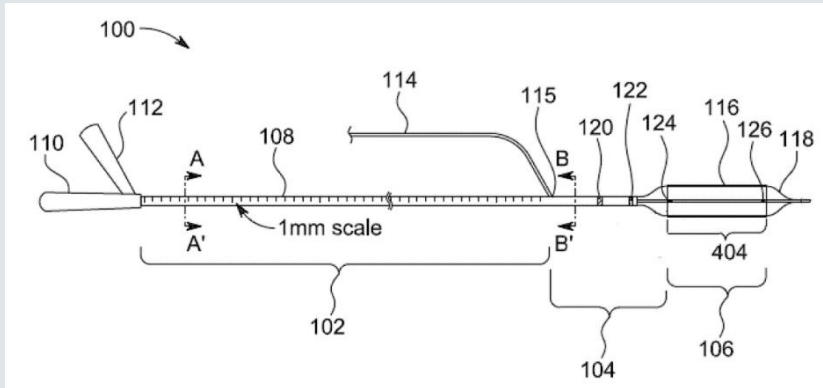
# Innovation Overview

US Patent Office

## Bifunctional Balloon-expandable And Self-expandable Stent

### Summary

The bifunctional expandable stent has a balloon-expandable body portion and a self-expandable trumpet portion. The breakable cover fits over only the self-expandable trumpet portion and prevents self-expansion. The balloon is used to expand the balloon-expandable portion, which breaks the breakable cover and allows the self-expandable trumpet portion to self-expand. A method of stenting a patient using the bifunctional expandable stent delivery assembly is also provided.



Inventor Name

Dr. Muhammad Fayaz Khan

Date of Issue

13, June 2023

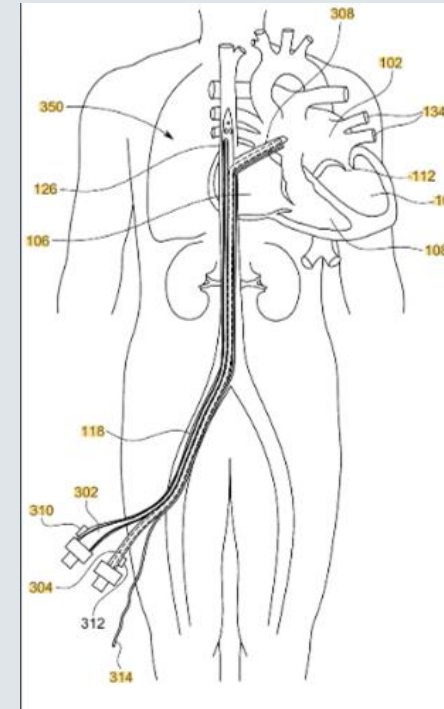
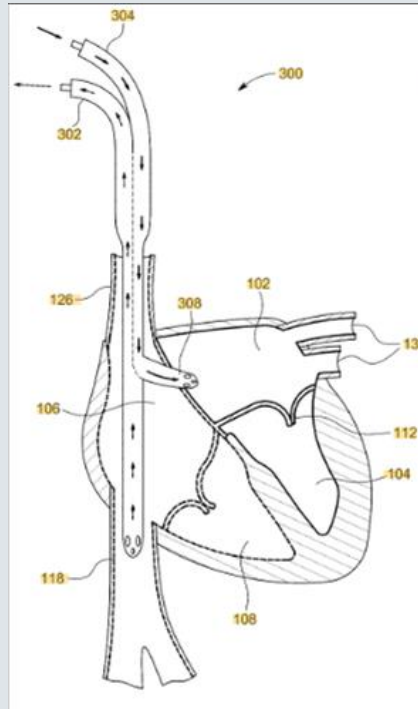
# Innovation Overview

US and Saudi Patent Office

## Dual Lumen Extracorporeal Membrane Oxygenation Catheter With Single Entry Port Bypassing The Right Heart and Lungs

### Summary

The invention pertains to a medical device: an ECMO (extracorporeal membrane oxygenation) catheter which can be used during right heart and lung failure. It pertains to a dual lumen catheter with a single port of entry which when in place bypasses the right heart and lungs while completing the veno-arterial circuit.



Inventor Name

Dr. Ali Ahmed  
Dr. Abdelhamid Saoudi

Date of Issue

July 18, 2023  
January 21, 2024

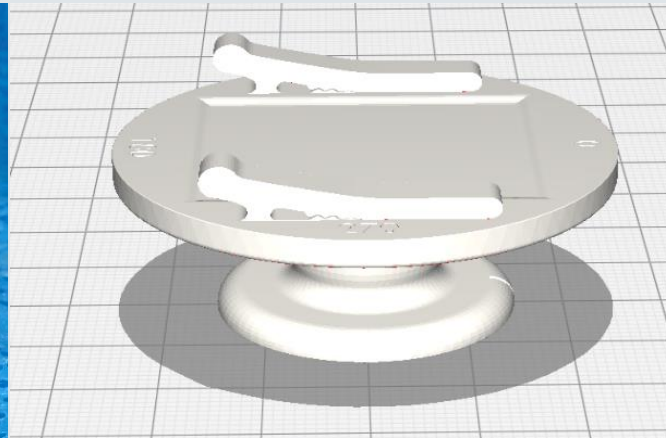
# Innovation Overview

US Patent Office

## Low-cost 3d-printed Tool With Multiaxial/Angular Vessel Orientation For Microvascular Anastomosis Training

### Summary

An ethically sound, safe, feasible, and cost-effective microsurgery practice technique that can easily be practiced by trainees having different skill levels and an adjustable device for holding and manipulating vascular tissue during microsurgery practice, especially for practicing anastomoses.



Inventor Name

Dr. Feras M Alshomer and Dr. Salah Aldekhayel

Date of Issue

4, April 2023

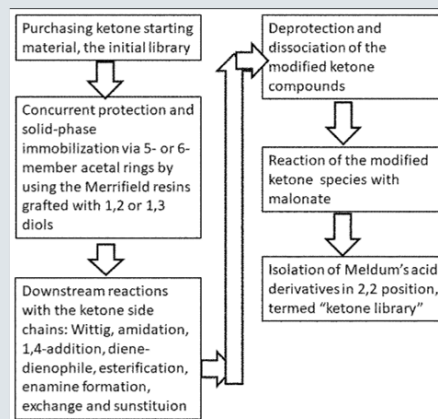
# Innovation Overview

US and Saudi Patent Office

## Anticancer 1,3-dioxane-4,6-dione Derivatives And Method Of Combinatorial Synthesis Thereof

### Summary

Compounds, methods of synthesis, and methods of cancer treatment by arylidene-1,3-dioxane-4,6-diones. A Meldrum's acid-based chemistry and hybrid solid-liquid method. The method includes protection of ketone and aldehyde components and simultaneous immobilization on the solid phase, introduction of substituents, grafts and derivatives compatible with the protection, detachment and restoration of active carbonyl reactivity, reaction of ketone library with malonate, reacting of the products with the aldehyde library in liquid phase and separation of the products by preparative HPLC



### Inventor Name

Dr. Imadul Islam, Dr. Rabi Alkaysi, Dr. Mohammed Boudjelal, Dr. Rizwan Ali, Dr. Atef Nehdi And Dr. Bander Alghanem

### Date of Issue

USPTO: 2, November 2021. SPO: 24, January 2023

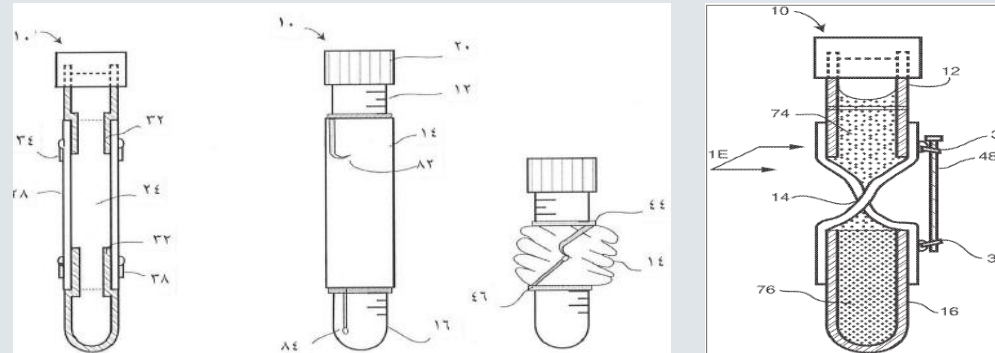
# Innovation Overview

US and Saudi Patent Office

## Blood Collection Tube

### Summary

A blood collection tube for physically separating the plasma and red blood cell fractions of a centrifuged sample is described. The blood collection tube has an elastomeric sleeve with rigid tube segments at both ends. Following blood collection and centrifugation, the elastomeric sleeve may be twisted to constrict its inner diameter and physically separate the two fractions. The blood collection tube may be secured in this position with a pin and a clamp, and further with an adhesive tape with pH paper. This enables blood samples to be transferred over long distances to a central lab facility without spoiling.



### Inventor Name

Dr. Ahmad Aljefri

### Date of Issue

USPTO: 27, December 2022 - SPO: 3, January 2023

# Innovation Overview

US and SPO Patent Office

## Hospital Healthcare Provider Monitoring and Verifying Device and System for Patient Care Condition

### Summary

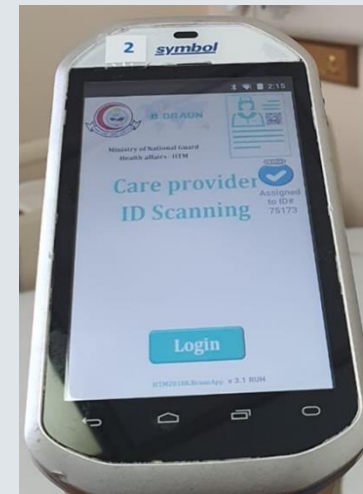
A hybrid ID system for a medical practitioner and patient care includes a hybrid electronic ID/key having a transmitter device having circuitry for storing ID data and transmitting a signal, and a key having a predetermined shape on a surface of the hybrid electronic ID/key. A radio frequency receptor device having circuitry, storing location information, that detects the signal containing ID data, a matching detection section configured to match the shape of the key, and a movement tracking portion that tracks movement of the predetermined shape as the key is rotated. A computer system including a patient database is configured to receive the ID data in conjunction with the location information from the radio frequency receptor device. when the predetermined shape is completely rotated to a final position, and store the ID data, location information, together with patient data associated with the location.

### Inventor Name

Dr. Azah Althumairi, Dr. Joud Abduljawad,  
Ms. Susanna Ferreira and HE Dr. Bandar Alknawy

### Date of Issue

USPTO: 3, May 2022 – USPTO (Continuation): 3, January 2023  
SPO: 28, September 2022





# Innovation Overview

US and Saudi Patent Office

## Tecoma Plant Based Compositions For Treating Skin Lesions

### Summary

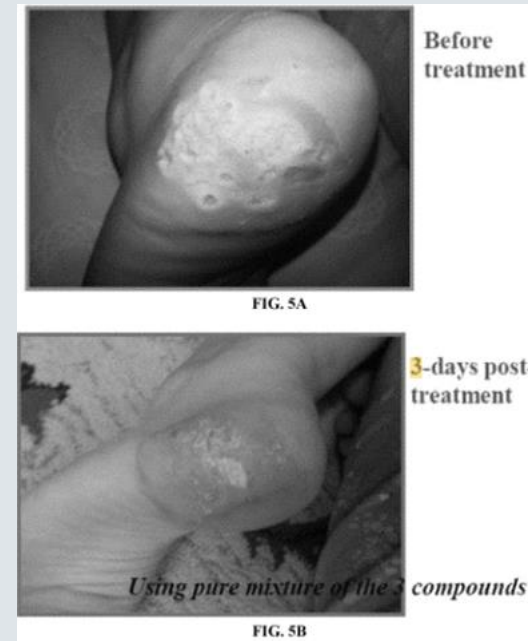
A plant-based composition containing an alcohol extract of Tecoma species (e.g. Tecoma stans) and an exogenous carrier and/or excipient. Also provided is a composition including a mixture of three acids, namely corosolic acid, oleanolic acid, and ursolic acid, which can be found in the Tecoma species. Methods of treating skin lesions (e.g. warts, corns, calluses, and umbilical granulomas) and reducing symptoms associated with the skin lesions using such compositions are specified.

### Inventor Name

Dr. Ayman Saleh

### Date of Issue

USPTO: 17, August 2021 - SPO: 11, December 2022



# Innovation Overview

US and Saudi Patent Office

## An In Vitro Dissolution Test Method For Fluticasone Propionate and Other Inhaled Drugs

### Summary

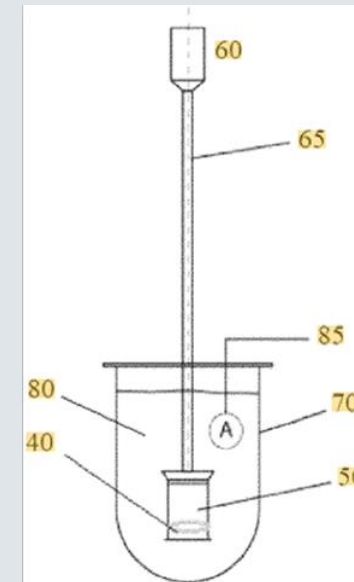
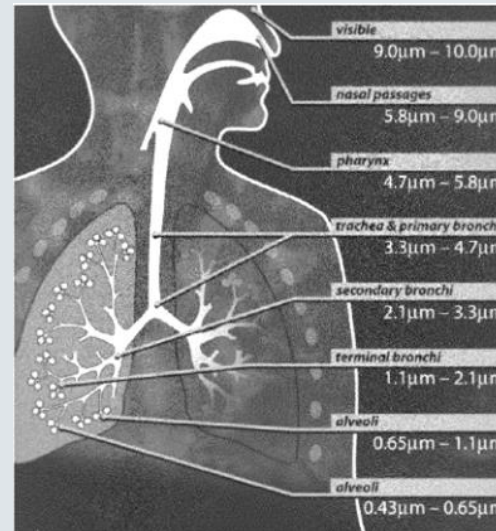
An apparatus and method for testing dissolution properties of a drug, especially anti-inflammatory drugs administered by aerosol into the respiratory system. The apparatus shortens the time it takes for a drug to dissolve and thus provides for rapid testing of new drugs for quality control as well as for regulatory purposes. It is suitable for evaluating bioequivalence or to study the pharmacokinetics of drugs administered into the respiratory system. This method shortens dissolution times for testing a drug to about 10 and 20 minutes and thus provides for rapid testing.

### Inventor Name

Dr. Salman Alfadhel

### Date of Issue

USPTO: 15, November 2022  
SPO: 9, July 2023



# Innovation Overview

Saudi Patent Office

## Elastic Splint for Knee and Elbow and Method of Using It

### Summary

A spongy splint that is wearable around the elbow as well as around the knee. It is made of high-density sponge, and it has a double opening to reduce ulcers or skin cracks, and two sponge belts supported by a high-resistance adhesive tape to close the splint. The sponge is covered with a flexible tubular fabric, and the size is determined according to the dimensions of the sponge. This splint is characterized by the ability to stretch and absorb any force released due to muscle contraction. And being covered with a flexible cover, it emits a force, thus preventing muscle contraction and pushing the joint to stretch (straight position), and its uses also prevent muscle contraction that loses control. It is flexible, soft and lightweight, easy to install, use and remove, and allows air to pass through.

### Inventor Name

Muhammad Yazid Bin Ayub

### Date of Issue

24, July 2022



# Innovation Overview

US and Saudi Patent Office

## Antiviral Peptides For Treatment of the Middle East Respiratory Syndrome

### Summary

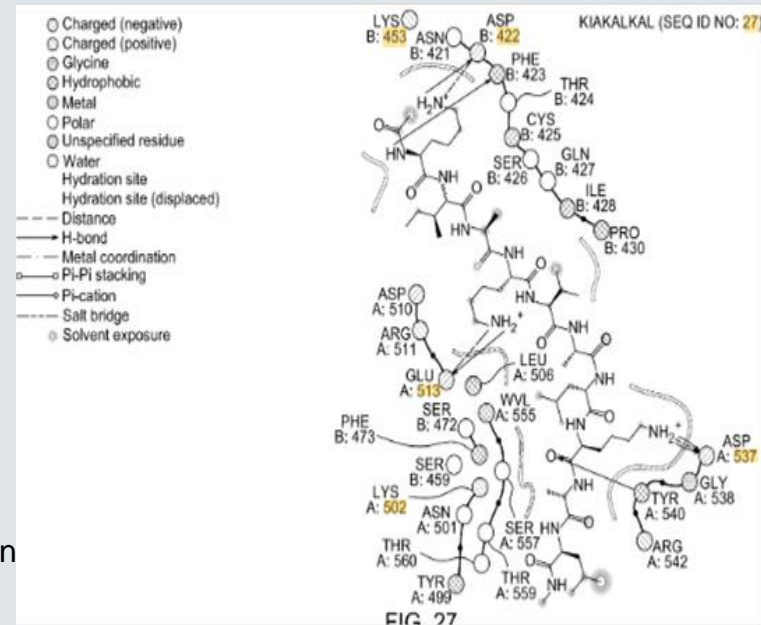
A peptide that binds to the Si spike protein of Middle East Respiratory syndrome coronavirus or MERS-CoV and a method for inhibiting infection of a subject exposed to or having MERS-CoV by administering the peptide.

Inventor Name

Dr. Musa Gabere, Dr. Ibrahim Bushnak, Dr. Hanan Balkhy, Dr. Mohamed Hussein and Dr. Sabeena Mustafa

Date of Issue

USPTO: 21, June 2022  
SPO: 14, November 2023



# Innovation Overview

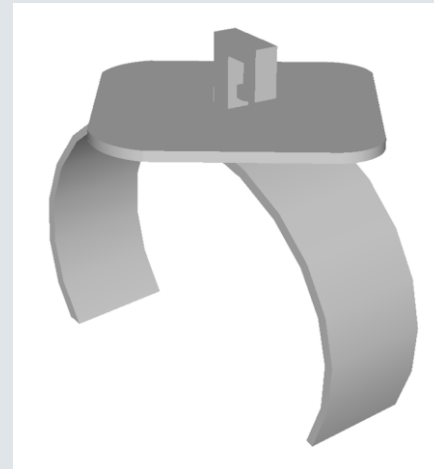
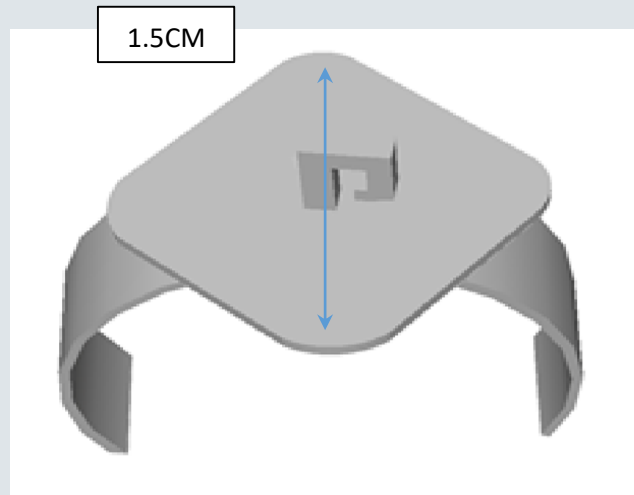
US Patent Office

## Suture Guide and Tensioning Device

### Summary



A finger protector to prevent lacerations to the fingers of a surgeon during suturing. A kit comprising the finger protector and a method of using it during surgery.



Inventor Name



Dr. Abeer Al Shammari

Date of Issue



3, May 2022

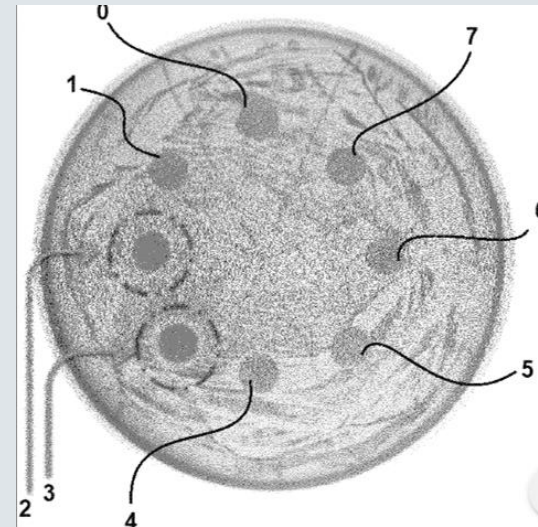
# Innovation Overview

US and Saudi Patent Office

## Maillard Reaction Products As Inhibitors Of Aggregatibacter Actinomycetemcomitans

### Summary

Maillard reaction products produced by heating carbohydrates with one or more amino acids (e.g., lysine), at basic pH and for a selected reaction time at a particular concentration in solution, can exhibit inhibitory activity against Aggregatibacter actinomycetemcomitans.



### Inventor Name

Raniah Jaha

### Date of Issue

USPTO: 10, May 2022 - SPO: 31, May 2023

# Innovation Overview

US Patent Office

## Iron Oxide Mesoporous Microparticle Drug Carrier

### Summary

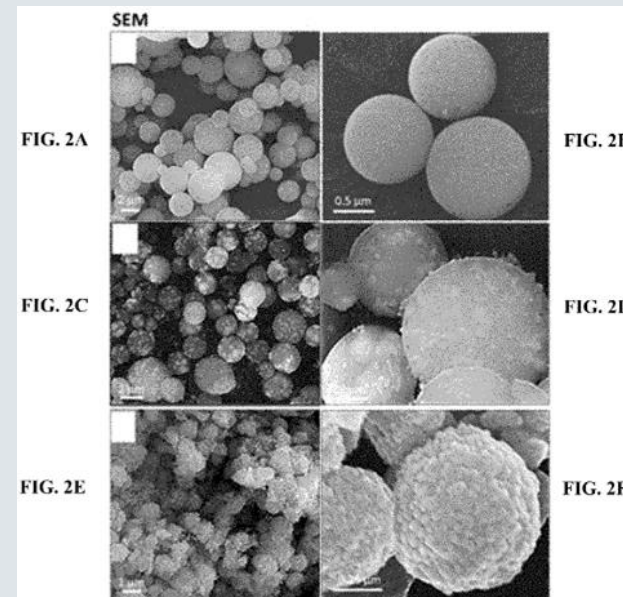
A magnetic micro particle drug carrier comprising mesoporous iron oxide is described. The drug carrier is made using a hard mesoporous silica template which is completely removed from the deposited iron oxide. It may be loaded with high amounts of hydrophilic anticancer chemotherapeutic drugs and/or hydrophobic hormonal anticancer drugs, and released in a pH-controlled manner inside cancerous cells. The drug micro particle carrier displays enhanced drug accumulation inside tumor tissues, deeply penetrates into a tumor region and kills the tumor cells inside. The designed carriers entrap and release different kinds of anticancer drugs in a controlled manner for synergistic combinatorial chemo/hormonal cancer therapy.

### Inventor Name

Dr. Kheireddine El Boubbou , Dr. Rizwan Ali  
And Dr. Abdulmohsen Alkushi

### Date of Issue

3, May 2022



# Innovation Overview

Saudi Patent Office

## Detection and Targeting SARS-CoV-2/COVID19 with Multifunctional Nano-platforms-A Novel Diagnostic Approach

### Summary

The current invention relates to a diagnostic tool and method for detecting SARS-Cove 2 virus in its eye, including: a preliminary order or includes a primary monoclonic immune body and a secondary monoclonic immune body for the specialized association with or parts of the N or S virus sphage proteins whereas: The primary ampere or primary immune body is associated with an activated cellulose holder, and the secondary ampere or secondary immune body is associated with activated colored nano granules where the cellulose holder (the first platform) is activated by the order by modifying one end of the order by adding amino totals to it. While the cellulose carrier is activated by the immune body's association without amino modification, the cellulose carrier is modified by an organic bi-carboxyl compound, glutamic Acid, and then the modified primary orphan reactor or the unmodified primary immune body with the activated cellulose carrier. The activation of nanoparticles (platform II) begins with the addition of carboxy totals and then their reactor with a two-secretary organic compound, Lysine Lisine and then the modified secondary single reactor or the unmodified secondary immune body with activated nanoparticles.



Number of samples	SARS-CoV-2 (PCR)	SARS-CoV-2 New Diagnostic Test	Agreement %
20	-ve	-ve	100%
2	-ve	+	0
20	-ve	-ve	100%
2	SARS-CoV	-ve	100%
2	Common Cold Corona Virus (OC42)	-ve	100%
6	Common Cold Corona Virus (229E)	-ve	100%
2	Adeno Virus	-ve	100%
6	Influenza Virus (A/E)	-ve	100%
2	Rhinovirus	-ve	100%

Inventor Name

Dr. Khalid Abu Salah, Moayad Alhariri  
and Dr. Ibrahim Bushnak

Date of Issue

13, April 2022



# Innovation Overview

US Patent Office

## Method for Controlling Charge-Transfer Co-Crystals Growth

### Summary

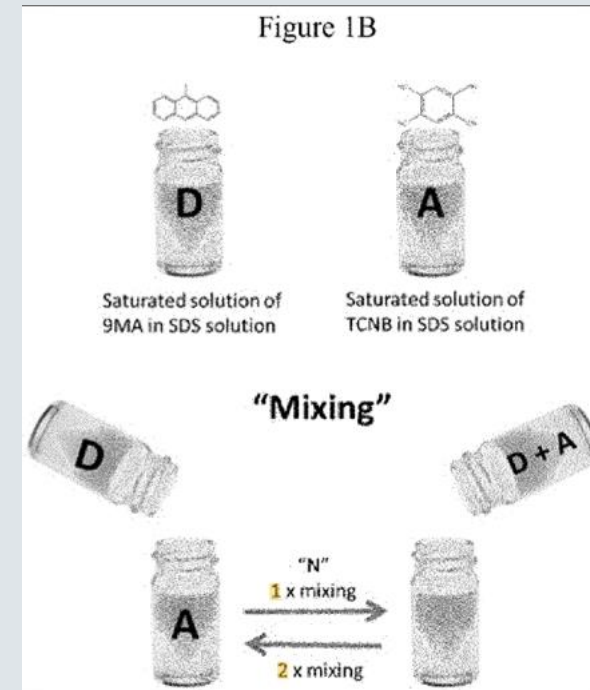
Methods of preparing hollow charge transfer co-crystals with reproducible habits and morphology are disclosed. The disclosed methods utilize surfactant to guide the crystal growth in aqueous solutions. The size and shape of the co-crystal can be controlled by the surfactant used, the concentration of the surfactant, and electron donor and electron acceptor, incubation temperature, and mixing condition.

Inventor Name

Dr. Rabih Al-kaysi

Date of Issue

7, December 2021



# Innovation Overview

US and Saudi Patent Office

## Pharmaceutical Composition Derived from Tecoma Plant and a Method for Treating Cancer

### Summary

A pharmaceutical composition containing an anti-proliferative compound, named Tecomaphorbide, which is identified and isolated from Tecoma plants (e.g. Tecoma stans). The pharmaceutical composition may contain a derivative and/or a salt of Tecomaphorbide. A process of obtaining Tecomaphorbide from Tecoma plants is specified. A method of treating cancer (e.g. leukemia, lymphoma, breast, colon, and prostate cancer) with the pharmaceutical composition is also provided.

Inventor Name

Dr. Ayman Saleh

Date of Issue

USPTO: 21, September 2021  
SPO: 19, June 2023

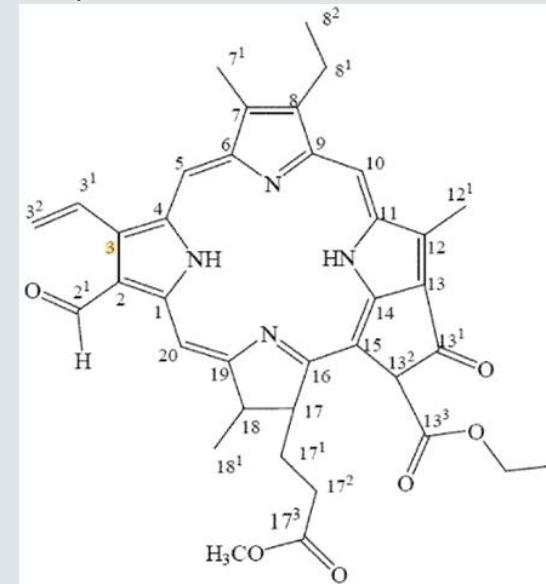


FIG. 1

# Innovation Overview

US Patent Office

## Dental Implantation System

### Summary

A damping dental post key configured to implant a dental root post for restoration of a tooth is described. The dental post key includes a body for handling and a post carrier having a key shape with respect to a head portion of the dental root post. During implantation of the dental post, rotation of the body compresses a set of springs in contact with the post carrier reducing a reaction force to a tooth root. In this way a limited force will be applied and a root fracture can be prevented. Further, the dental post key can be configured to have a fixed movement in a counterclockwise direction to remove the dental post and a free quarter-cycle movement with effort in a clockwise direction.

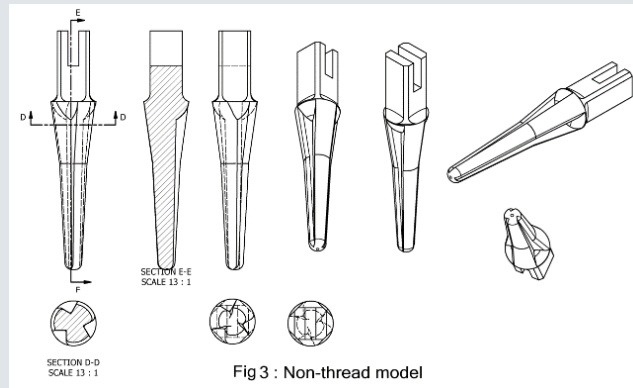


Fig 3 : Non-thread model

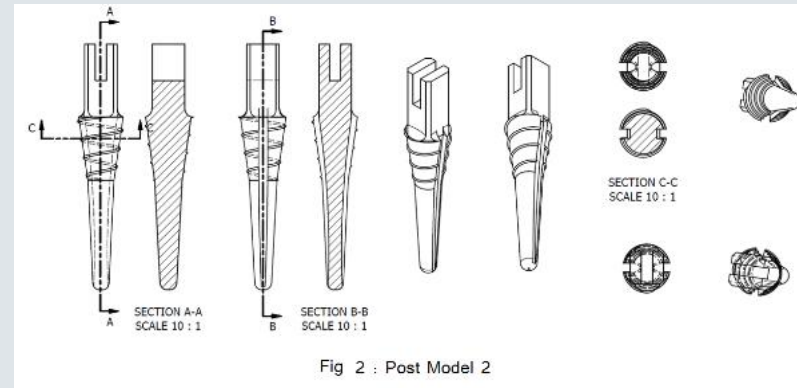


Fig 2 : Post Model 2

Inventor Name

Dr. Bassam Nawaf Srayeddin

Date of Issue

27, July 2021

# Innovation Overview

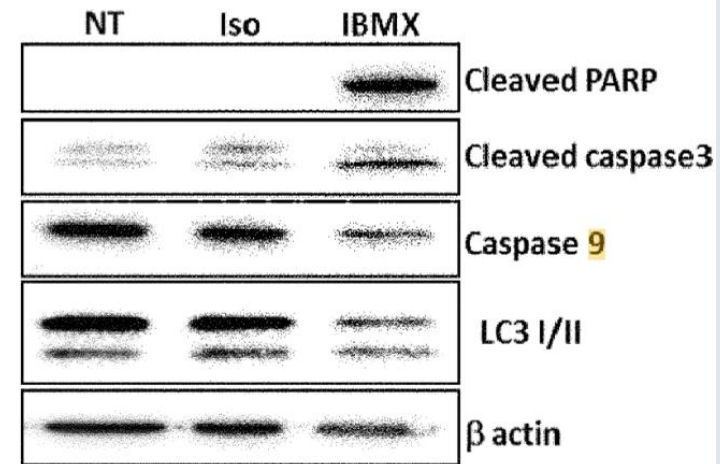
US Patent Office

## Methods For Treating Cancer Using Purine Analogs by Depleting Intracellular ATP

### Summary

The invention is directed to a method for treating a cancer patient by administering an agent that depletes intracellular ATP along with a purine analog, such as fludarabine. It is also directed to a method for selecting a patient having cancer cells susceptible to depletion of their intracellular ATP.

FIG. 1A



### Inventor Name

Dr. Atef Nehdi, Dr. Mohammed Boudjelal and Dr. Ahmed Alaskar

### Date of Issue

6, July 2021

# Innovation Overview

US Patent Office

## Skull Implanted Electrode Assembly for Brain Stimulation

### Summary

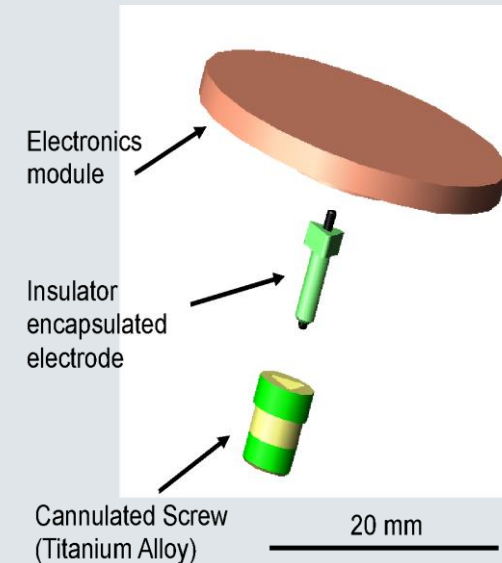
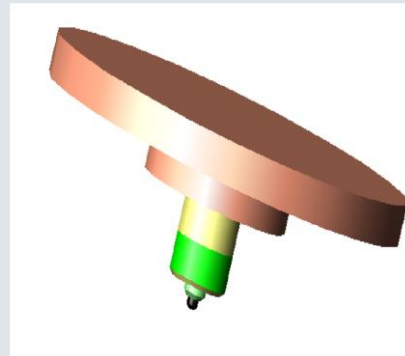
A skull-implantable electrode assembly for delivering pulses of electric current to a patient's brain, comprising a conductor housed in an insulated conduit and threaded through an electrically-conductive cannulated skull screw. Details of the exterior construction are discussed, as well as electrode arrangements and methods of treating a medical ailment of a patient.

### Inventor Name

Dr. Imran Alam

### Date of Issue

22, September 2020



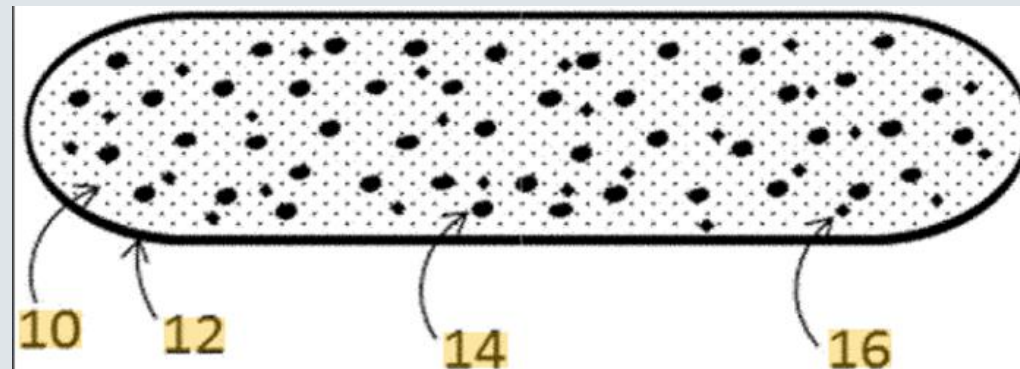
# Innovation Overview

US Patent Office

## Positron Emission Capsule for Image-Guided Proton Therapy

### Summary

Multi-modal imaging capsule for image-guided proton beam therapy, consisting of a biocompatible polymer layer,  $^{18}\text{O}$ -enriched water, and a contrast agent. The biocompatible capsule may be inserted near or inside a tumor under the guidance of X-ray, magnetic resonance, or ultrasonography imaging. Upon proton beam irradiation, the capsule emits positrons, allowing the tumor to be imaged and tracked by a PET detector.



### Inventor Name

Dr. Mamdooh Alqathami

### Date of Issue

25, August 2020

# Innovation Overview

US Patent Office

## Method for Delivering Pharmaceutical Nanoparticles to Cancer Cells

### Summary

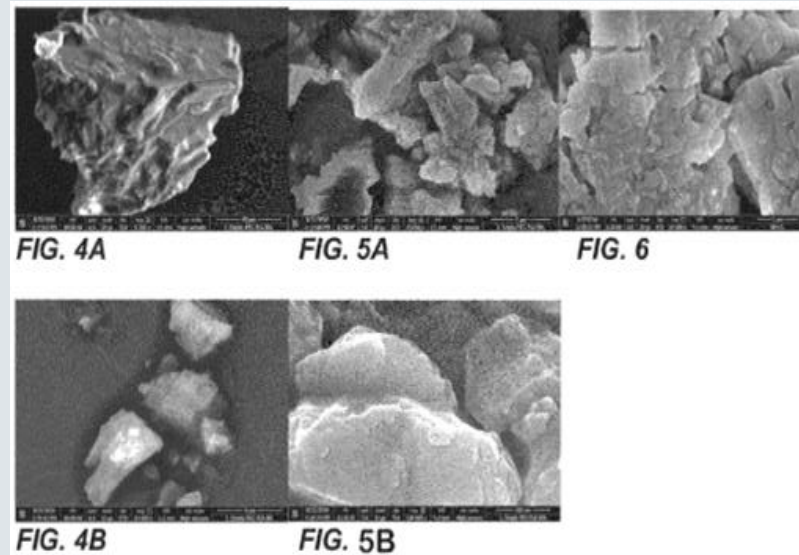
A nanoparticle that has a membrane including a polylactide-block-poly(ethylene glycol)-block-poly(lactide) (PLA-PEG-PLA) and a polyvinyl alcohol, a bovine serum albumin contacting the membrane on the outside of the nanoparticle, a targeting group attached to the outside of the nanoparticle, and a breast cancer therapeutic agent that is encapsulated by the membrane. A nanoparticle that consists of a membrane including a polylactide-block-poly(ethylene glycol)-block-poly(lactide) (PLA-PEG-PLA) and a polyvinyl alcohol, a bovine serum albumin contacting the membrane on the outside of the nanoparticle, breast cancer therapeutic agent that is encapsulated by the membrane, and an anti-Her2 antibody attached to the outer surface of the nanoparticle.

### Inventor Name

Dr. Salam Massadeh  
Dr. Manal Alaamery

### Date of Issue

14, July 2020



# Innovation Overview

US Patent Office

## A Method of Treating Leukemia

### Summary

The present disclosure relates to methods of reducing the number of abnormal PBMC cells in a leukemia patient. The methods may include administering an effective amount of a drug, which may not be indicated for leukemia, or an antibody-drug conjugate. The antibody-drug conjugate includes an antibody selected from the group consisting of an anti-2-adrenoreceptor antibody, an anti-adrenoceptor antibody, an anti-trace amine-associated receptor 1 antibody, an anti-dopamine receptor antibody, and an anti-serotonin receptor antibody; a drug selected from the group consisting of isoproterenol, methyldopa, olanzapine, and a derivative thereof; and a linker that conjugates the antibody and the drug.

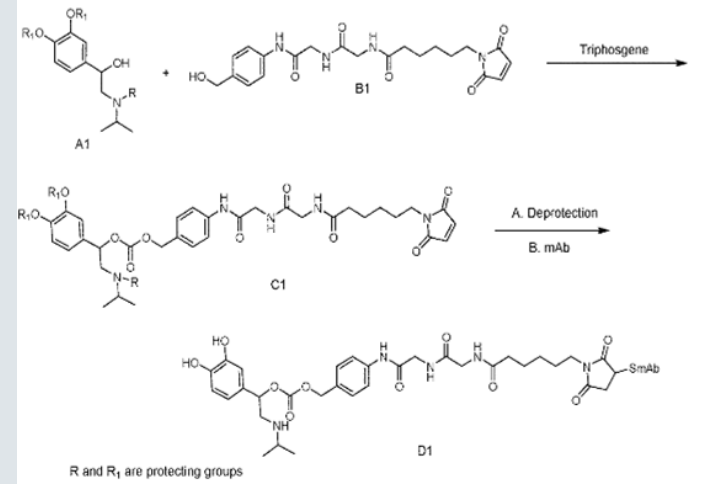
### Inventor Name

Dr. Mohammad Boudjelal,  
Dr. Atef Nedhi, Dr. Ahmed Alaskar,  
Dr. Imadul Islam, Hajar Al Zahrani

### Date of Issue

5, May 2020

**Scheme 2: Synthesis of pH Sensitive ADC of Isoproterenol**





# Innovation Overview

US Patent Office

## Acid-Stabilized Iron-based Metal Oxide Colloidal Nanoparticles, and Methods Thereof

### Summary

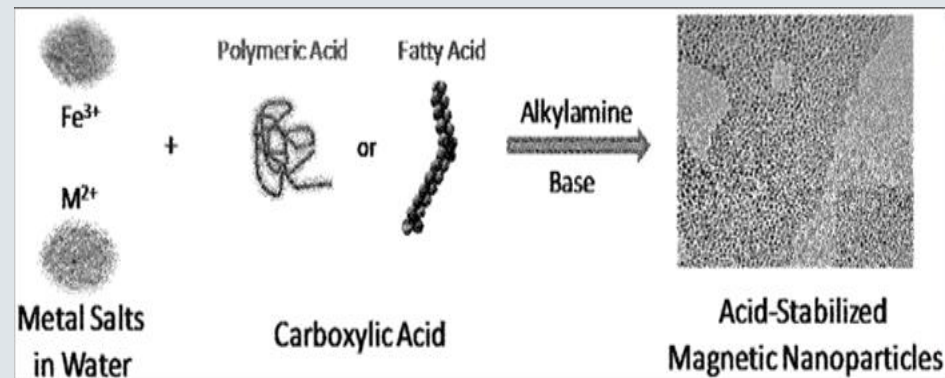
Size-controlled ultra-small iron-based metal oxide nanoparticles, nanocolloids comprising the nanoparticles, and methods of making the nanoparticles. The method for making the iron-based nanoparticles include sequential mixing of an iron(III) salt, a metal (II) salt, a carboxylic acid, an amine, and an inorganic base in water at temperatures ranging from 25-80° C. Nanoparticles in the size ranging from 2 nm to 10 nm with a narrow size distribution are obtained with the method. The nanoparticles have an iron-based core surrounded by molecules such as a panel of different carboxylates, polycarboxylates, and amines. Depending on the hydrophilicity of the carboxylates used, the functional nanoparticulate colloid can be dispersed in either organic or aqueous solvents. The nanocolloids comprise the nanoparticles in a concentration ranging from 1-10 mg/ml, and are stable for at least several months.

Inventor Name

Dr. Kheireddine El Boubbou

Date of Issue

21, April 2020



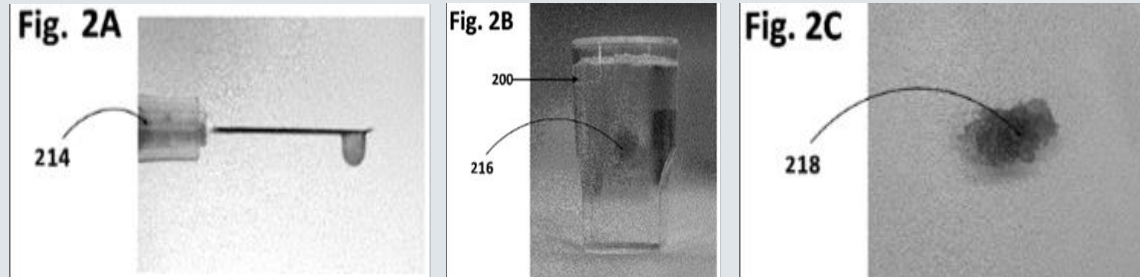
# Innovation Overview

US Patent Office

## Image-Guided Radiotherapy Method For Treating A Subject Having A Tumor

### Summary

A biocompatible curable composition and a method of detecting a border of a tumor, a tissue of interest, or both including injecting the biocompatible curable composition and contacting the border of a tumor or a tissue, the biocompatible curable composition crosslinks to form a three-dimensional cured nanocomposite, and imaging the three-dimensional (3D) cured nanocomposite, and imaging the 3D cured nanocomposite by at least one of MRI, CT, ultrasound, and X-ray, to detect the border of the tumor or the tissue of interest or track tumor motion during radiotherapy treatment. The biocompatible curable composition comprising an organic polymer having a hydrolysable functional group, a metallic nanoparticle, and a polar or a non-polar solvent. A brachytherapy strand consisting of a biocompatible curable composition and a radio-isotope seed. The biocompatible curable composition is shaped into an elongated cylinder and forms a 3D cured nanocomposite with a radio-isotope seed embedded



Inventor Name

Dr. Mamdooh Alqathami

Date of Issue

17, December 2019

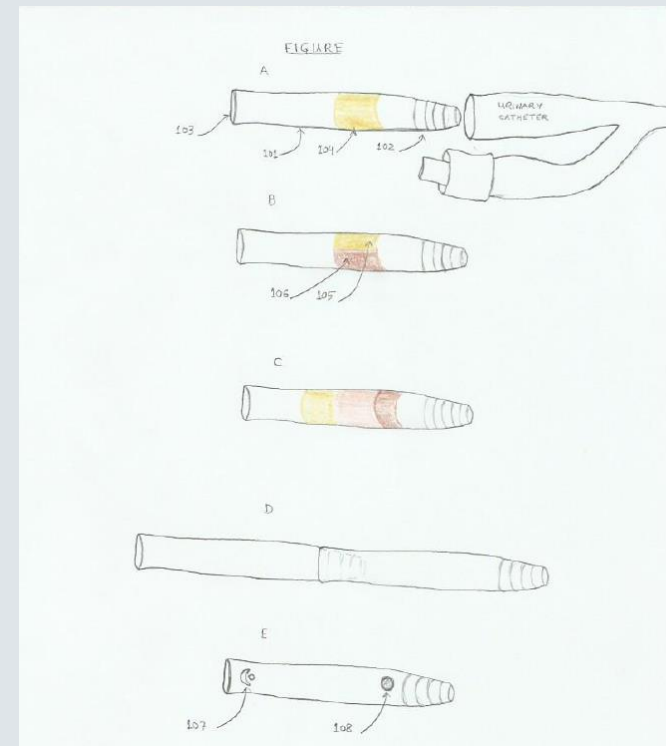
# Innovation Overview

US Patent Office

## Device Connectable to a Dialysis Catheter for in Situ Analysis

### Summary

The present invention relates to a device configured with an analyte sensor to measure analytes through an existing peritoneal dialysis catheter and to a method for using the device and to a method for changing of a dialysis protocol in a patient undergoing peritoneal dialysis using the device.



Inventor Name

Dr. Mahfooz Alam Farooqui and  
Dr. Ghassan Al Ghamdi

Date of Issue

26, November 2019

# Innovation Overview

US Patent Office

## Sustained Release of a Therapeutic Agent from PLA-PEG-PLA Nanoparticles for Cancer Therapy

### Summary

A nanoparticle that has a membrane including a polylactide-block-poly(ethylene glycol)-block-poly(lactide) (PLA-PEG-PLA) and a polyvinyl alcohol, a bovine serum albumin contacting the membrane on the outside of the nanoparticle, a targeting group attached to the outside of the nanoparticle, and a breast cancer therapeutic agent that is encapsulated by the membrane. A nanoparticle that consists of a membrane including a polylactide-block-poly(ethylene glycol)-block-poly(lactide) (PLA-PEG-PLA) and a polyvinyl alcohol, a bovine serum albumin contacting the membrane on the outside of the nanoparticle, breast cancer therapeutic agent that is encapsulated by the membrane, and an anti-Her2 antibody attached to the outer surface of the nanoparticle.

### Inventor Name

Dr. Salam Massadeh  
and Dr. Manal Alaamery

### Date of Issue

6, August 2019

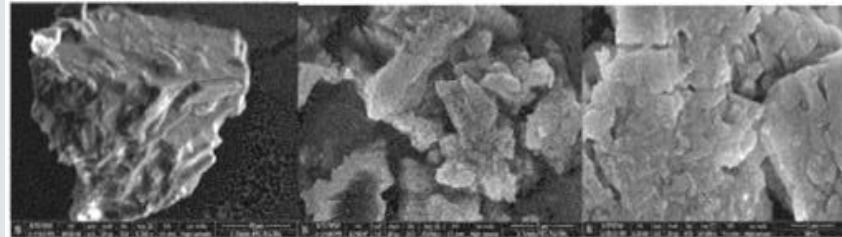


FIG. 4A

FIG. 5A

FIG. 6

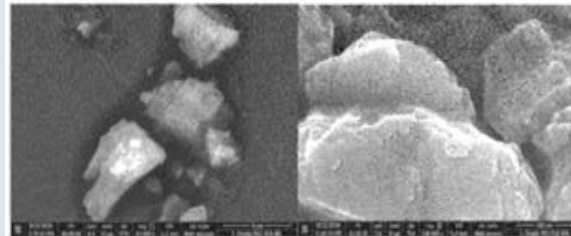


FIG. 4B

FIG. 5B

# Innovation Overview

US Patent Office

## Method of Regulating Body Temperature

### Summary

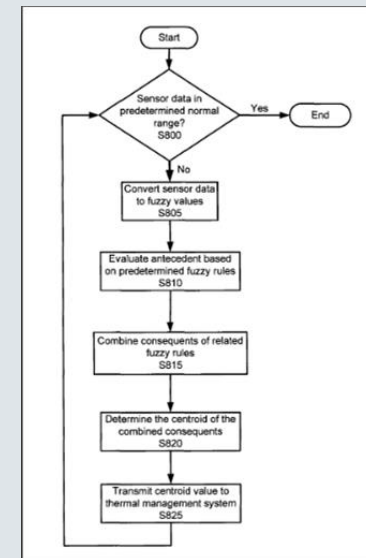
A method of regulating body temperature that involves (i) determining, via processing circuitry, if sensor data from a plurality of sensors is in a predetermined normal range, (ii) converting the sensor data to fuzzy values when the sensor data is not in the predetermined normal range, (iii) combining one or more related consequents of the predetermined fuzzy rules, (iv) evaluating the combined consequents to determine a centroid value using a centroid method; and (v) transmitting the centroid value to a thermal management system to activate the thermal management system to a predetermined activation level based on the centroid value, wherein the plurality of sensors include a core temperature sensor, a skin temperature sensor, a skin blood flow sensor, a cardiac output sensor, a neuromuscular activity output sensor, an electromyography sensor, a vibration sensor, and an imaging device

Inventor Name

Dr. Abderrezak Bouchama and Dr. Ali Almontashri

Date of Issue

4, June 2019



# Innovation Overview

US Patent Office

## A Curable Composition and Method for Implantation

### Summary

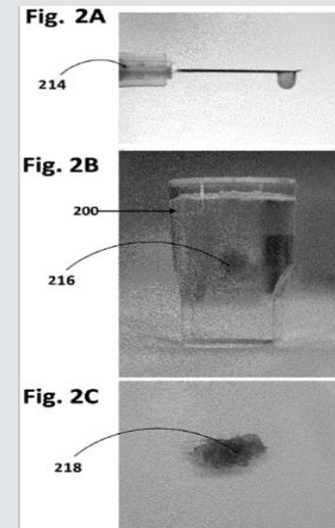
A biocompatible curable composition and a method of detecting a border of a tumor, a tissue of interest, or both including injecting the biocompatible curable composition and contacting the border of a tumor or a tissue, the biocompatible curable composition crosslinks to form a three-dimensional cured nanocomposite, and imaging the three-dimensional (3D) cured nanocomposite, and imaging the 3D cured nanocomposite by at least one of MRI, CT, ultrasound, and X-ray, to detect the border of the tumor or the tissue of interest or track tumor motion during radiotherapy treatment. The biocompatible curable composition comprising an organic polymer having a hydrolysable functional group, a metallic nanoparticle, and a polar or a non-polar solvent. A brachytherapy strand consisting of a biocompatible curable composition and a radio-isotope seed embedded.

Inventor Name

Dr. Mamdooh Alqathami

Date of Issue

4, June 2019



# Innovation Overview

US Patent Office

## Microcrystal exfoliation by UV light irradiation

### Summary

A method is described for exfoliating a microcrystal of an anthracene derivative by irradiation with short pulses of light having a wavelength of 220-420 nm. The irradiation induces a cis-trans isomerization of the anthracene derivative in a part of the microcrystal, which leads to the separation of an outer layer having a thickness of 200-600 nm. The exfoliated microcrystal may be irradiated again with pulses of light of a same or different wavelength.

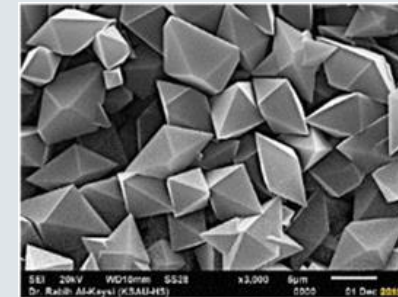
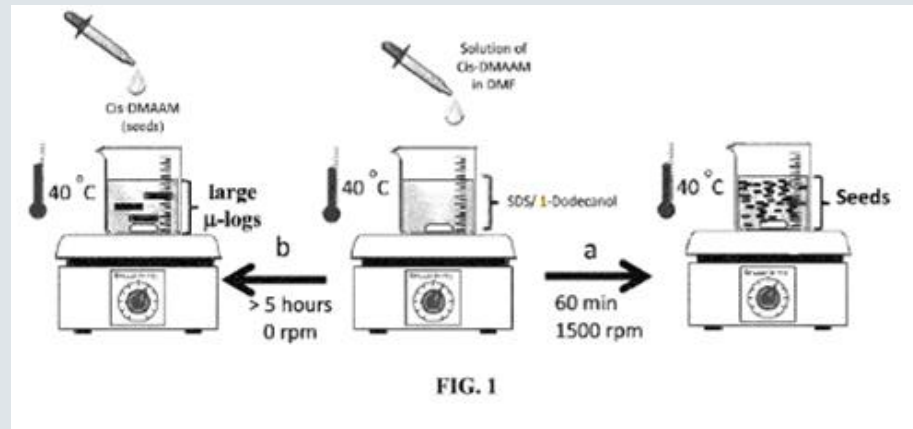


FIG. 2A

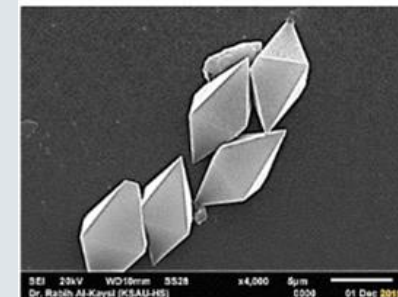


FIG. 2B

Inventor Name

Dr. Rabih Al-kaysi

Date of Issue

16, April 2019

# Innovation Overview

US Patent Office

## A Method of Treating Leukemia Based on Gene Expression of Clock Genes

### Summary

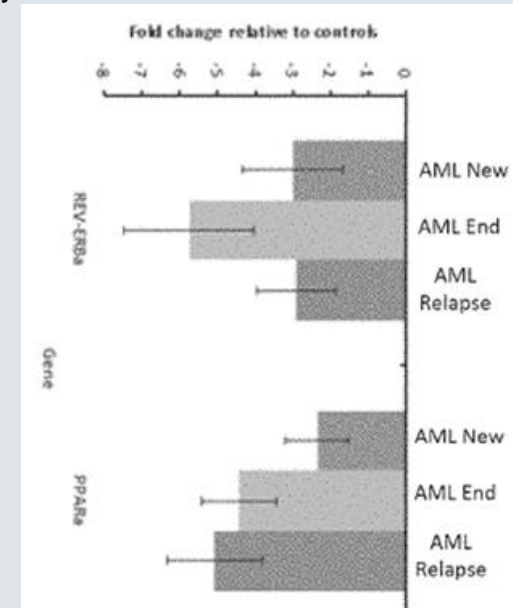
A method of treating leukemia in a patient, the method including obtaining a plasma sample from a patient at a first time point and at a second time point, measuring a gene expression level of a set of core clock genes, and at least one of a first set of peripheral clock genes and a second set of peripheral clock genes, each in the plasma sample at the first time point and in the plasma sample at the second time point. Then determining that a first treatment is effective or ineffective for the patient when a correlation of the gene expression level of the set of core clock genes, the first set of peripheral clock genes, and the second set of peripheral clock genes, and treating the patient accordingly.

### Inventor Name

Dr. Mohammad Boudjelal, Dr. Ahmed Alaskar, Alshaimaa Alhallaj, Dr. Atef Nehdi, Hina Rehan, Dr. Sabhi rahman, Dr. Gamal Edin Gmati and Dr. Khadega Abuelgasim

### Date of Issue

9, April 2019





# Innovation Overview

US Patent Office

## Damping Dental Root Post Key

### Summary

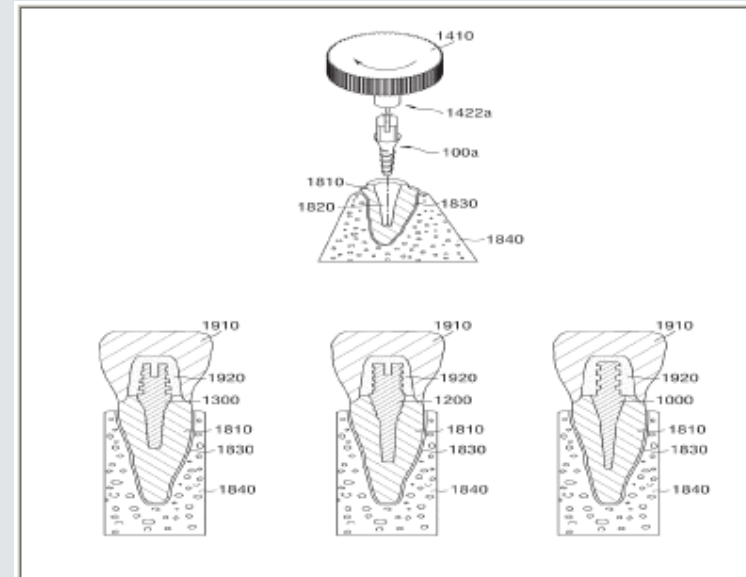
A damping dental post key configured to implant a dental root post for restoration of a tooth. The dental post key includes a body for handling and a post carrier having a key shape with respect to a head portion of the dental root post. During implantation of the dental post, rotation of the body compresses a set of springs in contact with the post carrier reducing a reaction force to a tooth root. In this way a limited force will be applied and a root fracture can be prevented. Further, the dental post key can be configured to have a fixed movement in a counterclockwise direction to remove the dental post and a free quarter-cycle movement with effort in a clockwise direction.

Inventor Name

Dr. Bassam Nawaf Srayeddin

Date of Issue

2, April 2019



# Innovation Overview

German Patent Office

## A System And Method For Establishing An Insertion Path For A Surgical Implant

### Summary

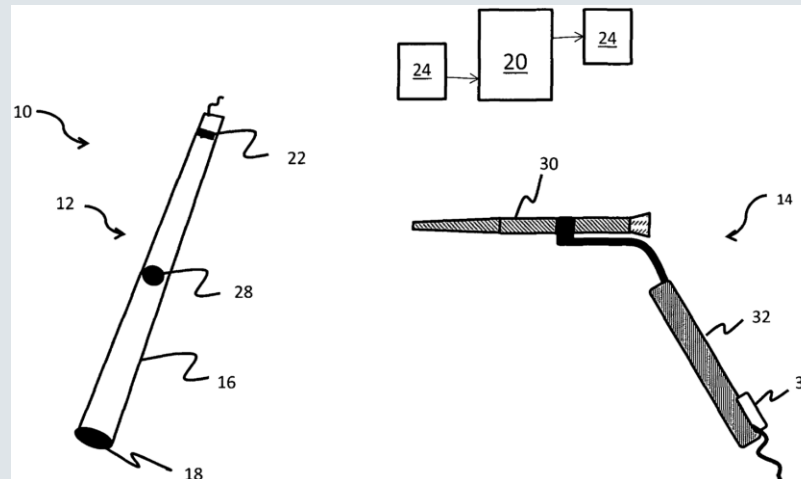
A system for determining an insertion path for a surgical implant, comprising: a portable probe unit, ultrasonic transducer and ultrasonic receiver arranged to probe a tissue region. a first tracking unit adapted to detect a spatial position and orientation of the probe unit relative to the tissue area and output corresponding first tracking signals to the spatial location and orientation of the probe unit; an insertion unit adapted to establish an insertion path in the tissue area ; a second tracking unit configured to detect a spatial position and an orientation of the insertion unit relative to the tissue area and second tracking signals corresponding to the spatial position and orientation of the insertion unit outputs; and a processing unit adapted to receive a scheduled insertion path based on the first tracking signals, wherein the processing unit is further adapted to compare the second tracking signals to the planned insertion path.

### Inventor Name

Dr. Ahmad Al Ferayan  
Dr. Souheil Mohammed Al-Hakim

### Date of Issue

21, March 2019



# Innovation Overview

US Patent Office

## Skull Implanted Magnet Assembly For Brain Stimulation

### Summary

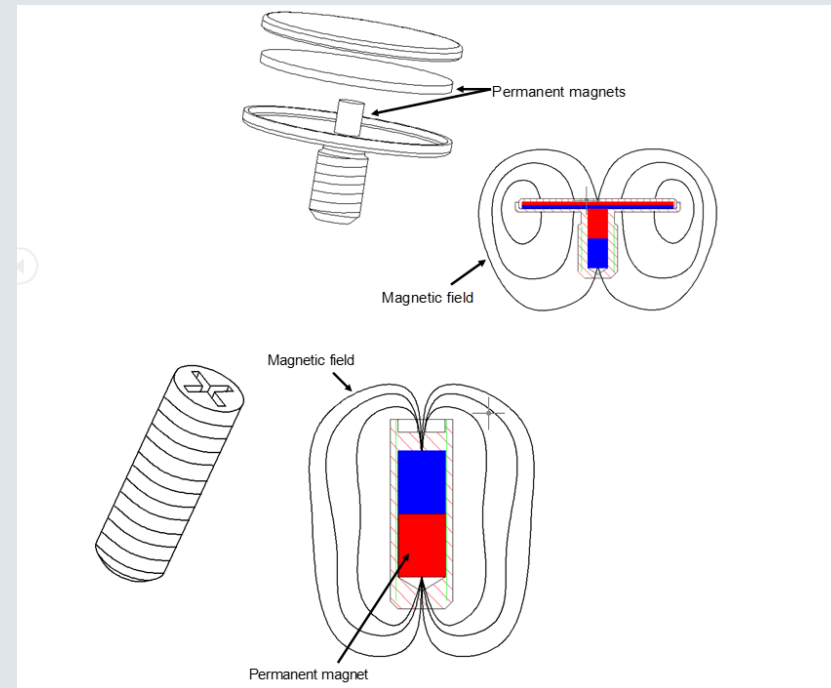
A skull-implantable magnet assembly for delivering a static magnetic field to a patient's brain, comprising a rod-shaped magnet housed within a skull screw, removable attached to a casing housing at least one flat magnet, is described.

Inventor Name

Dr. Imran Alam

Date of Issue

19, February 2019



# Innovation Overview

US Patent Office

## Artificial Hypothalamus for Body Temperature Regulation

### Summary

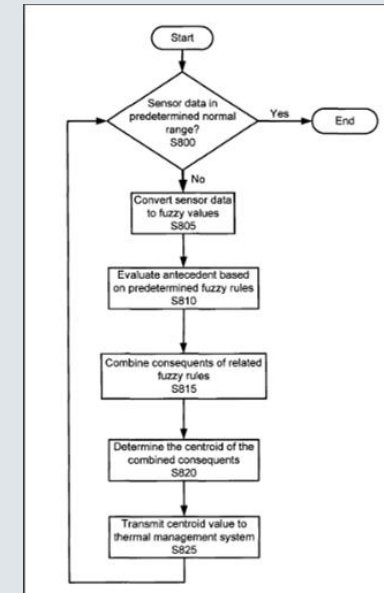
An artificial hypothalamus system for regulating body temperature for a human can include monitoring data from a plurality of sensors. The sensor data can be used in a control system to optimize temperature regulation in real time through a feedback loop. The feedback loop can include monitoring the sensor data, evaluating a predetermined set of fuzzy rules using the data, and combining the output of the fuzzy rules to produce a precise value. The precise value can correspond to an output level for various temperature regulation devices, and a signal can be transmitted based on the precise value to activate the temperature regulation devices to a corresponding level of output.

Inventor Name

Dr. Abderrezak Bouchama and Dr. Ali Almontashri

Date of Issue

29, January 2019



# Innovation Overview

US Patent Office

## Cartilage Prosthetic Implant

### Summary

This disclosure relates to a cartilage prosthetic implant that can be used in orthopedics for a replacement of a damaged cartilage in a joint between opposing bones, for example in the case of osteoarthritis or trauma. The cartilage prosthetic implant described herein can replace the damaged cartilage at the joint without cutting bones of the joint. The cartilage prosthetic implant can maintain or restore a native joint anatomy, allowing for a natural movement at the joint. The cartilage prosthetic implant can be used as a permanent treatment or an intermediate treatment before requiring a total joint replacement. An example of the cartilage prosthetic implant is described for a knee joint replacement and is divided into a proximal implant configured to replace a cartilage at a distal end of a femur bone and a distal implant configured to replace a cartilage on a proximal end of a tibia bone.

Inventor Name

Dr. Abdullah Al Otaibi

Date of Issue

22, January 2019



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# Innovation Overview

US Patent Office

## Spontaneous Peeling of Tetragonal Microcrystals with Short Pulses of UV-Light

### Summary

A method is described for exfoliating a microcrystal of an anthracene derivative by irradiation with short pulses of light having a wavelength of 220-420 nm. The irradiation induces a cis-trans isomerization of the anthracene derivative in a part of the microcrystal, which leads to the separation of an outer layer having a thickness of 200-600 nm. The exfoliated microcrystal may be irradiated again with pulses of light of a same or different wavelength.

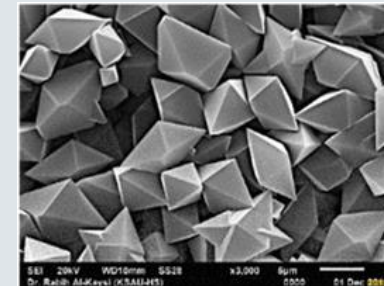
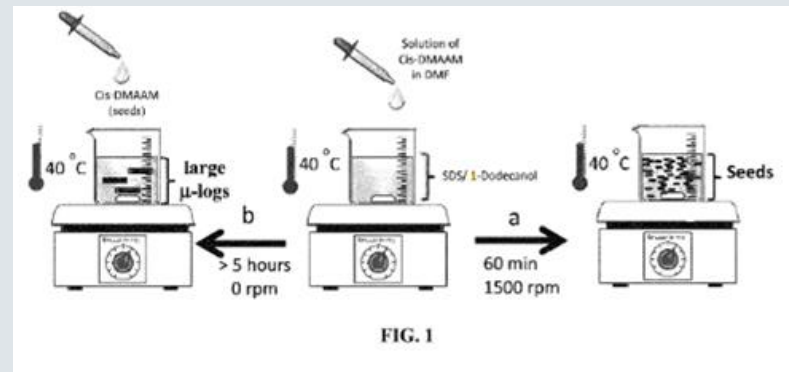


FIG. 2A

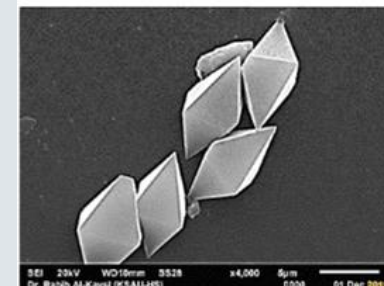


FIG. 2B

Inventor Name

Dr. Rabih Al-kaysi

Date of Issue

15, January 2019

# Innovation Overview

US Patent Office

## Quantification of Lamin C and Lamin A for Tumor Classification

### Summary

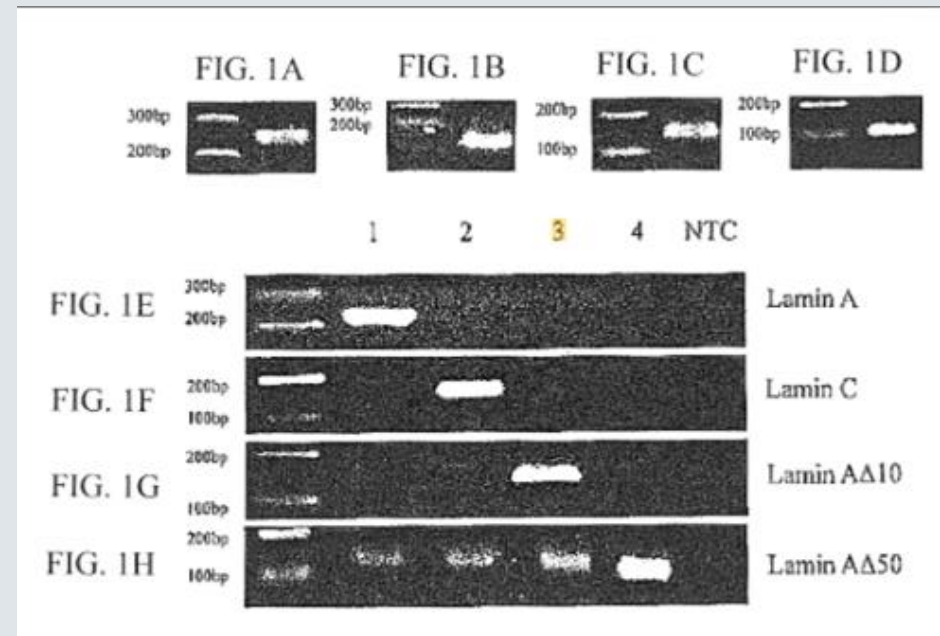
A method for detecting cancer by determining ratios of alternatively spliced Lamin A/C gene mRNAs in tissue samples, especially an increased ratio of Lamin C to Lamin A mRNAs. Therapeutic for subjects having a tumor or cancer characterized by an elevated ratio of Lamin C to Lamin A mRNA or protein.

Inventor Name

Dr. Ahmed Samir Aljada

Date of Issue

11, December 2018



# Innovation Overview

US Patent Office

## Apparatus for in Vivo Detection and Quantification of Analytes in a Peritoneal Fluid

### Summary

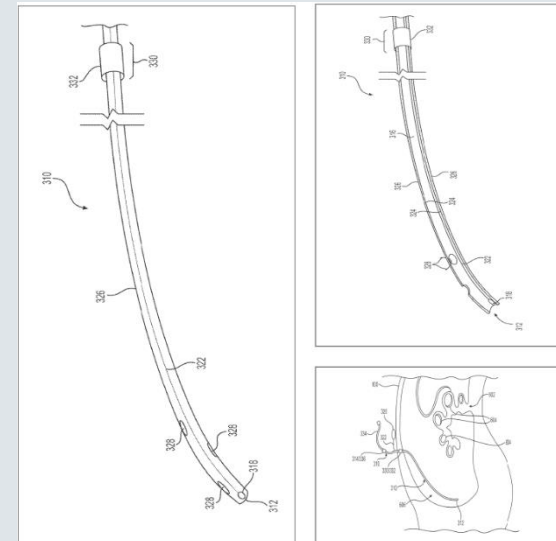
A device for in vivo detecting and quantifying a concentration of an analyte in a peritoneal fluid of a subject. The device includes (a) a catheter having an open proximal end configured to be disposed external to the subject, an open distal end configured to be disposed within the peritoneal cavity comprising the peritoneal fluid, an anchor portion, an outer wall, and an inner wall, (b) a sensor disposed adjacent to the open distal end and configured to detect and quantify the concentration of the analyte in the peritoneal fluid, and (c) a main control unit disposed external to the subject, connected to the sensor via a wire, and configured to control the sensor, receive and store detection and quantification data from the sensor, and transmit the data to a second device. A portion of the wire is disposed between the inner wall and the outer wall of the catheter.

Inventor Name

Dr. Mahfooz Farooqui

Date of Issue

11, September 2018





# Innovation Overview

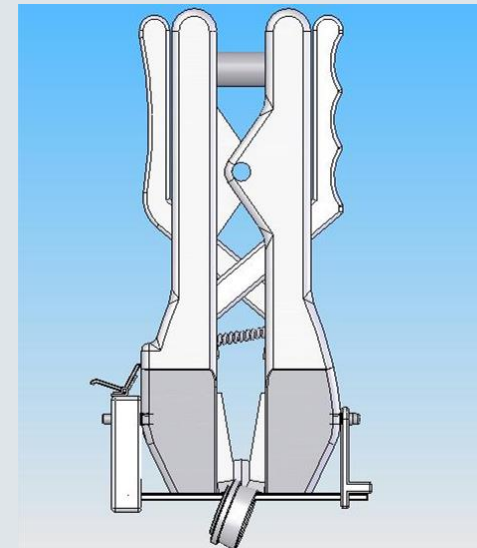
US Patent Office

## Protective Surgical Cutter

### Summary



An apparatus and method are provided for surgical removal of a ring. The apparatus includes guards rotatably connected, handles rotatably connected to the guards that each include a portion partially disposed within the respective guard, a guide connected to the guards, and blades disposed on the portion of the handles. The blades contact with at least one of the guide and an inner surface of the respective guard. A rotational axis of a joint between the guards, a rotational axis of a first handle and a first guard, and a rotational axis of a second handle and a second guard are substantially parallel. Movement of a first end of the first handle toward a first end of the second handle results in movement of a second end of the first handle toward a second end of the second handle, and movement of a first blade toward a second blade.



Inventor Name



Dr. Fayez Almodhen

Date of Issue



13, February 2018

# Innovation Overview

US Patent Office

## Therapeutic Liposome and Method of Treating a Subject having Cancer

### Summary

A therapeutic liposome including a bilayer comprising at least one poly-unsaturated fatty acid (omega-3 fatty acid, omega-6 fatty acid, and omega-9 fatty acid), a beta-glucan, a cholesterol, and a doxorubicin. The liposome has a diameter of 100 nm to 1.5 μm. The beta-glucan and the doxorubicin are encapsulated in the liposome and the cholesterol is integral to the bilayer of the liposome.



### Inventor Name

Dr. Majed Abdulaziz Halwani and Moayad Alhariri

### Date of Issue

23, May 2017

# Innovation Overview

US Patent Office

## Releasable Torque Device

### Summary

The releasable torque device obviates the need for removal of the wire introducer in order to torque or manipulate a vascular or other guide wire and/or catheter in a medical procedure, and further obviates the need to remove the torque device for wire and/or catheter introduction. The device may include a base cylinder and an inflation cylinder defining a variable fluid volume there between. As the inflation cylinder is pushed toward the base cylinder, the fluid is forced through a port in the inner wall of the inflation cylinder and between a tubular inner cylinder and an inflatable guide wire grip within the inner cylinder to squeeze the grip onto the guide wire passing axially there through. Alternatively, the device only has a central tube and an inflatable guide wire grip therein, using a remotely disposed fluid pump and reservoir supplying fluid to the tube and guide wire grip.

### Inventor Name

Dr. Riyadh Nasser Alokaili and Asma Matar Alenezi

### Date of Issue

2, August 2016



# Innovation Overview

US Patent Office

## Medical Material Delivery Device

### Summary

Includes a shaft having a lumen that receives a therapeutic agent, and can include a guide having a channel for receiving a medical instrument adapted for positioning in conjunction with a bodily part. An expandable member positioned in conjunction with the guide is adapted for communication with the bodily part and is arranged to burst open when the expandable member is disrupted by a disrupting mechanism to deliver the therapeutic agent to the bodily part. Further embodiments include a medical instrument and an expandable member in conjunction with the medical instrument to burst or leak to deliver a therapeutic agent. The medical material delivery device can include a bodily fluid locator attached with the device, as well as can include a second expandable member to inflate and deflate to localize a bodily part, with a first expandable member bursting to deliver a therapeutic agent.

Inventor Name

Dr. Riyadh Alokaili

Date of Issue

14, June 2016



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# Innovation Overview

US Patent Office

## Thermometer Using Differential Temperature Measurements

### Summary

It utilizes a pair of adjacent temperature sensors in order to measure the temperature of a common surface over a pre-selected period of time. The thermometer includes a housing and first and second thermistors mounted adjacent one another on the housing. The first and second thermistors are positioned against the surface, which can be a body part (for oral, rectal or axial body temperature measurements) or can be any other desired surface for which a spot check temperature reading is desired. A programmable current source pre-heats the second thermistor to a pre-selected temperature, while the first thermistor is initially at room temperature. A controller inside the housing causes both the first and second thermistors to take instantaneous temperature measurements of the surface at two successive times. The controller linearizes the measurements to predict the temperature of the surface, which is then displayed to the user.

Inventor Name

Engr. Abdulrahman Musa Al-faifi

Date of Issue

23, February 2016



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# Innovation Overview

US Patent Office

## Pneumatic Device for Treating Intussusception

### Summary

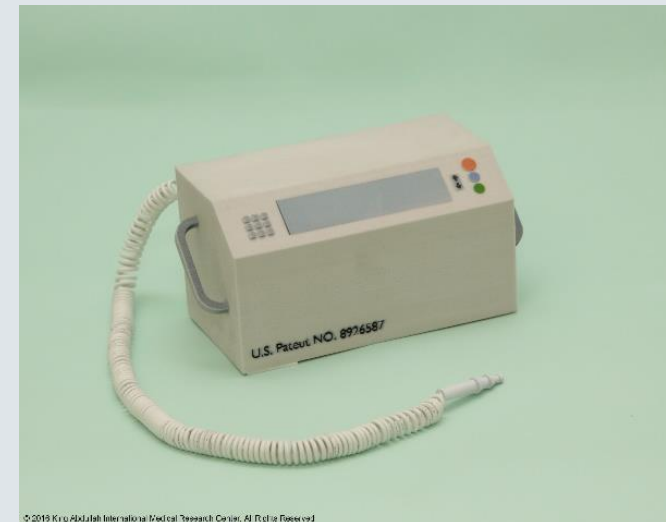
The pneumatic system for intussusception treatment, i.e., invagination of a segment of the intestine into an adjacent segment, includes a pressurized gas supply connected to a series of filters, valves, regulators, and sensors connected to a rectal insertion tube to introduce gas at moderate pressure into the intestine of the patient. A computerized control and monitoring subsystem is included. The system includes a heating system to warm the gas as desired. The system also includes an exhaust portion to relieve internal intestinal pressure as required or desired. The exhaust portion of the system preferably includes a filter to absorb undesirable fecal odors that accompany the exhausted gas. At least the rectal insertion tube and the odor filter may be separable from the remainder of the system for convenient disposal. An alarm may be provided to alert the doctor or medical professional of conditions other than normal.

### Inventor Name

Engr. Abdulrahman Al Faifi and  
Dr. Hesham Al Shaalan

### Date of Issue

6, June 2015



# Innovation Overview

US and Saudi Patent Office

## Pediatric Lithotomy Positioning Splint

### Summary

A positioning splint for safely and securely positioning a pediatric patient into a lithotomy position. The splint comprises a toroid, wedge-shaped splint having an anterior and posterior jaw which is attached to shoulder straps or a jacket/vest that holds the splint in place during use. The wedge splint and shoulder attachments are padded. The wedge splint may have a disposable covering. Methods of using the splint to position a patient for urinary catheterization as well as for other procedures, exams and surgeries requiring unobstructed access to the perineal and anorectal areas. Additional wrist/hand and ankle/leg straps are used for conscious patients who are uncooperative or incompetent patients or in the case of a patient with involuntary movement disorders.

### Inventor Name

Dr. Eman Nooreddeen and Layla Adam AISomaily

### Date of Issue

USPTO: 27, June 2023 - SPO: 1, October 2023



# Innovation Overview

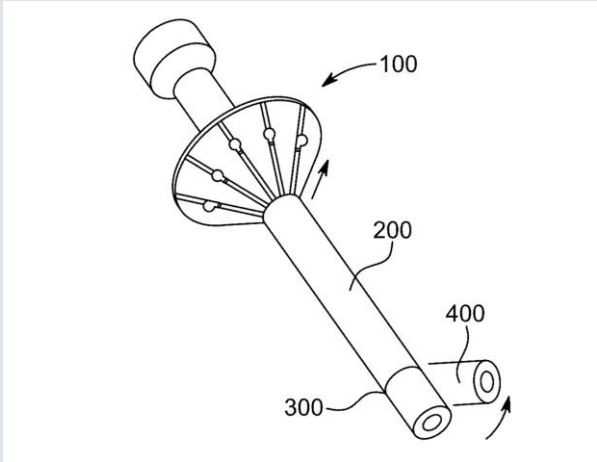
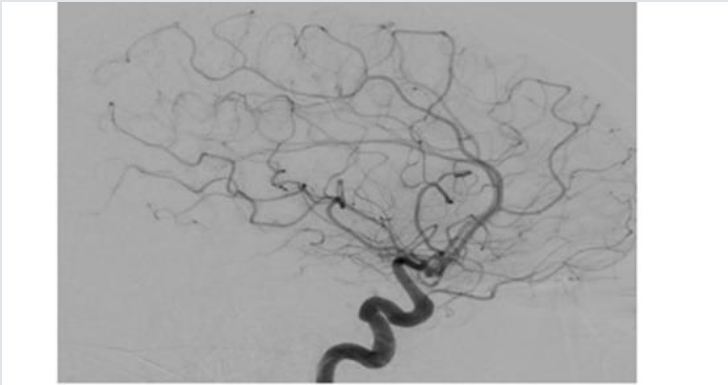
US and Saudi Patent Office

## Endovascular Catheter With Controllable Tip

### Summary



A steerable endovascular catheter which can be used and for diagnosis and endovascular treatment of vascular diseases. Methods of diagnosis and endovascular treatment comprising steering the catheter through vasculature of a patient.



### Inventor Name



Mohammed Adnan Alabdulkareem

### Date of Issue



USPTO: 21, November 2023 - SPO: 1, October 2023



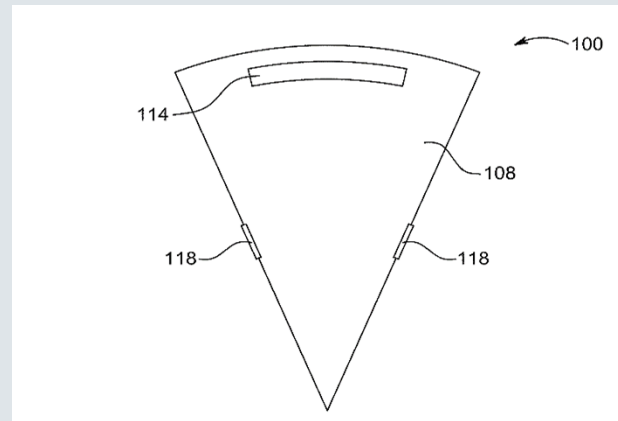
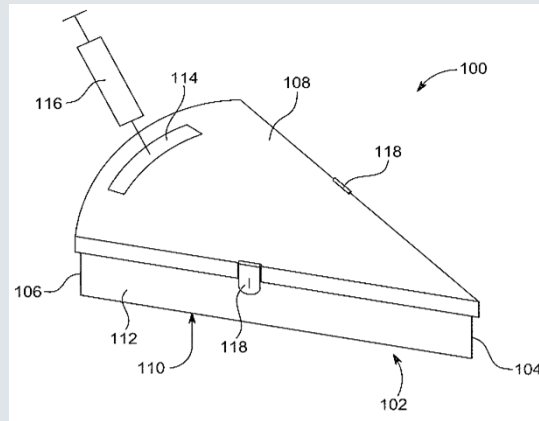
# Innovation Overview

US Patent Office

## Method, System, And Apparatus Using Centrifugation To Accumulate And Collect Biological Samples

### Summary

A system for quickly determining antibiotic sensitivity of a microorganism comprising a triangular-shaped plate and cover for culturing, recovering, and re-suspending recovered microbial colonies and a second triangular-shaped plate comprising a non-liquid medium cut with concentric trenches over which the re-suspended microbial colonies are distributed by centrifugation and contacted with antimicrobial strips or disks.



Inventor Name

Ahmad Mohammed Shikan Aljefri

Date of Issue

10, October 2023

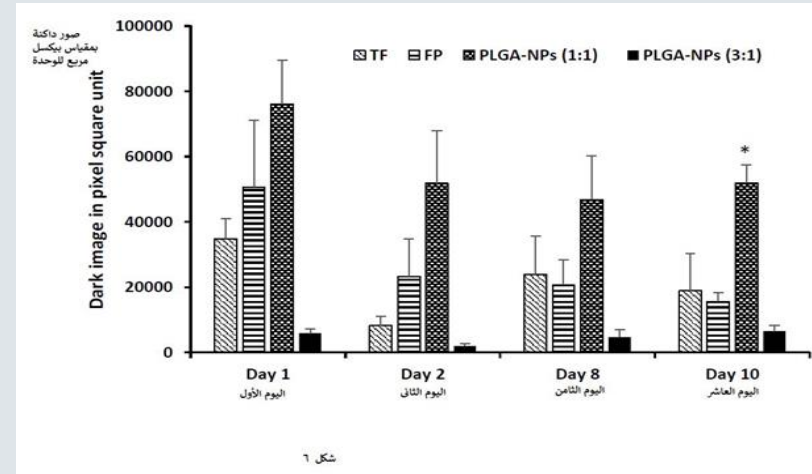
# Innovation Overview

Saudi Patent Office

## Nanotechnology Used For Hair Strength, And Color

### Summary

Nanotechnology using nanomaterials stimulates the delay of hair graying and improves the overall appearance of hair in terms of color and strength. Through research, it has been shown that nanomaterials, when designed in a specific way and applied to hair care; They can enhance the benefits of the active ingredients and thus improve hair growth, strength, and long-lasting color. These nanoparticles can be used to target the hair follicles and shaft and thus aid in hair growth, strength, and beauty.



Inventor Name

Dr. Majid Alfadhel, Dr. Abdulaziz Aldayel, Dr. Yousra Ahmed

Date of Issue

9, July 2023

# Innovation Overview

Saudi Patent Office

## Smart Device And System For Treatment Of Gastric Reflux

### Summary

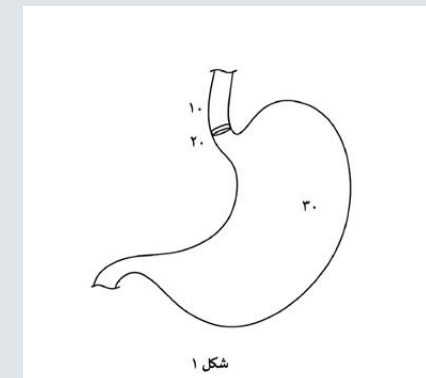
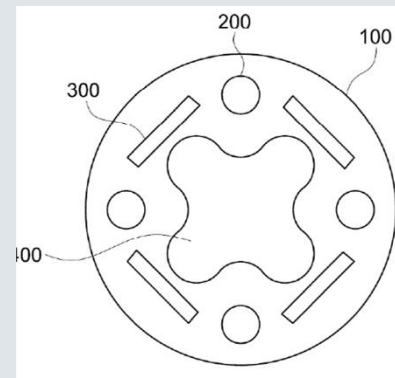
A smart device that monitors the condition of the lower esophagus by means of cameras, pH sensors, and other biometric sensors. The device may be equipped with movable arms that facilitate the collection of tissue biopsies from the esophagus as well as a reservoir that contains a medicament such as an antacid or other medicament useful for treating GERD. Data from the cameras and sensors may be transmitted and processed outside of the body and used to diagnose and treat esophageal disorders and can provide early detection of esophageal cancer or to treat GERD.

### Inventor Name

Dr. Abdullah Alotaibi

### Date of Issue

9, July 2023



شكل ١

# Innovation Overview

US Patent Office

## A Method For Tissue Regeneration Using Cancer Cell-derived Exosomes

### Summary

The invention pertains to a method for temporarily conferring advantageous cancer cell phenotypes, such as a higher proliferation rate, resistance to apoptosis and cell death, and resistance to endogenous factors that inhibit cell growth, on non-cancer cells that help repair and regenerate damaged tissues.

### Inventor Name

Batla S. Al-Sowayan

### Date of Issue

5, September 2023

# Innovation Overview

US Patent Office

## Artificial Compositions and Comprising Corosolic Acid, Oleanolic Acid; And Ursolic Acid In A Form Of An Emulsion, Salve, Ointment, Suspension, Or Gel

### Summary

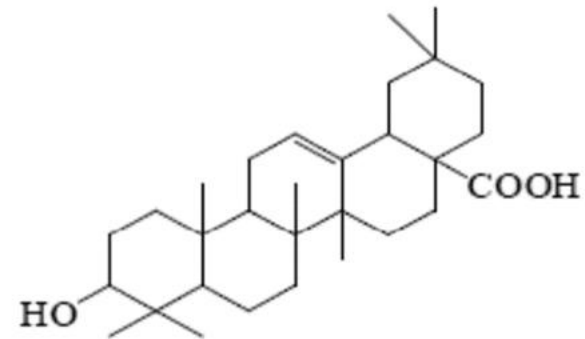
A plant-based composition containing an alcohol extract of Tecoma species (e.g. Tecoma stans) and an exogenous carrier and/or excipient. Also provided is a composition including a mixture of three acids, namely corosolic acid, oleanolic acid, and ursolic acid, which can be found in the Tecoma species. Methods of treating skin lesions (e.g. warts, corns, calluses, and umbilical granulomas) and reducing symptoms associated with the skin lesions using such compositions are specified.

Inventor Name

Ayman Saleh

Date of Issue

February 20, 2024



# Innovation Overview

US Patent Office

## Purification and Identification of a Protein Complex Containing B-Cell Lymphoma Protein (BCL10)

### Summary

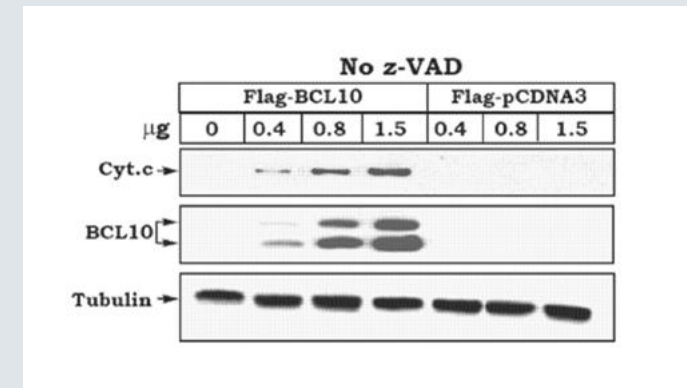
A method for isolated a protein complex comprising BCL10 and at least one, preferably all, of ROS1, LSD1, BTK, KU80, KU70, CUL4A, IMP3, thioredoxin, hTID1, DAP3, CDK1/CDC2, PRL1/PTP4A1 or NM23. Methods for using this complex to diagnose or prognose diseases including diabetes, obesity, cancer, neurodegenerative disease or inflammatory diseases associated with activation of NF-κB Methods for distinguishing lean, obese and diabetic subjects based on expression of BCL10 and its ligands are also disclosed. The invention also pertains to pharmaceutical compositions comprising ligands for BCL10 or other components of this complex or agents such as siRNA or miRNA that regulate the expression of the protein components of this complex.

### Inventor Name

Ayman Mahmoud SALEH, Mamoun Salim Ahram, Amre Osman Nasr

### Date of Issue

January 23, 2024



# Innovation Overview

US Patent Office

## Chromosomal Enhancement and Auto Chromosomal Abnormalities Detection Using Chromosomal Ideograms

### Summary

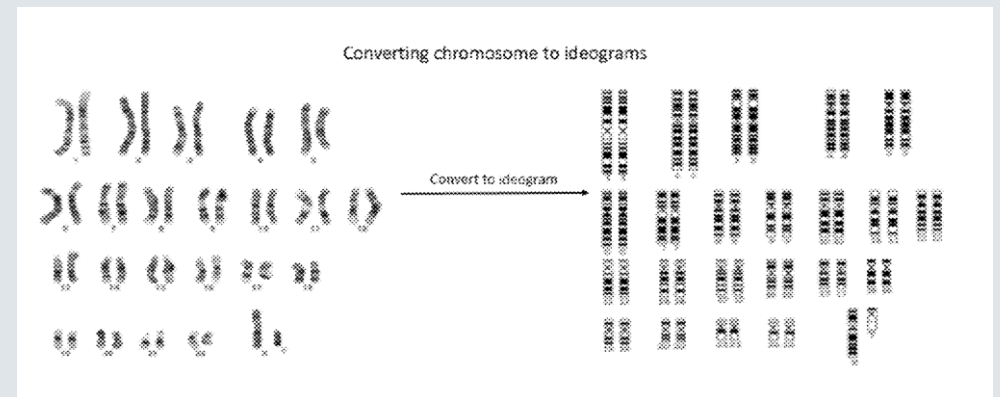
A method for detecting chromosomal abnormalities comprising conversion of a chromosomal image into an ideogram which is compared to a control or standard ideogram of a chromosome; or converting an ideogram of a chromosome into a chromosomal image.

### Inventor Name

Yahya Abdulfattah Bokhari, Areej Alhareeri, Azizah Alkhalidi, Abdulrahman Aljouie

### Date of Issue

June 11, 2024



# Innovation Overview

US Patent Office

## Neuropilot Manual Neural Navigation Device

### Summary

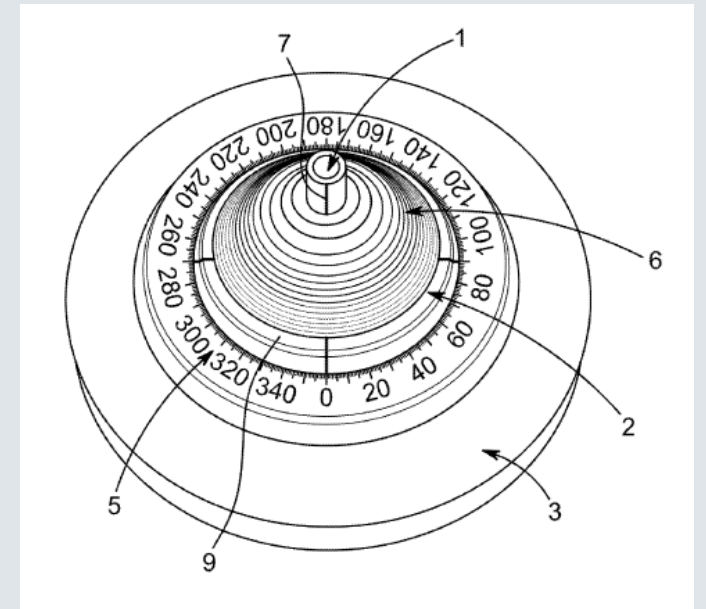
A device suitable for guiding a trajectory of a surgical shunt or needle comprising two protractors on a curved frame configured to fit over, or attach to, the skull of a patient, wherein the two protractors are respectively oriented in a circular dimension and anterior posterior/medio-lateral directions. A method for using the device to guide a surgical needle, probe, shunt or other instrument during surgery.

Inventor Name

Dr.Momen Ahmad Sharab

Date of Issue

May 7, 2024





# Innovation Overview

Saudi Patent Office

## Double Image Receptors X-Ray Table Bucky

### Summary

The present invention relates to a radiology examination table that is used to conduct radiological examinations for patients and works to reduce the radiation dose to patients by ensuring the use of a scattered radiation absorption device, as it is used automatically when choosing the type of examination to be performed. It includes the following: an image receiving device with a radiation absorption device. The volatile rays are installed in it, an image receiver without a volatile ray absorption device, a floating table surface, pedals to move the floating table surface, a safety lock button, a storage space on the edges of the table to store the image receiving devices in the event that they are not used or one of the two devices is used during the examination procedure, and it includes The table also has a motion field to move the image receivers inside the table.

### Inventor Name

Saleh Alqurbani

### Date of Issue

February 27, 2024

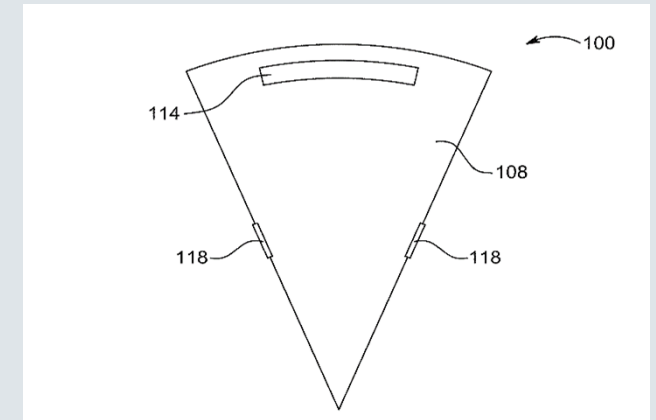
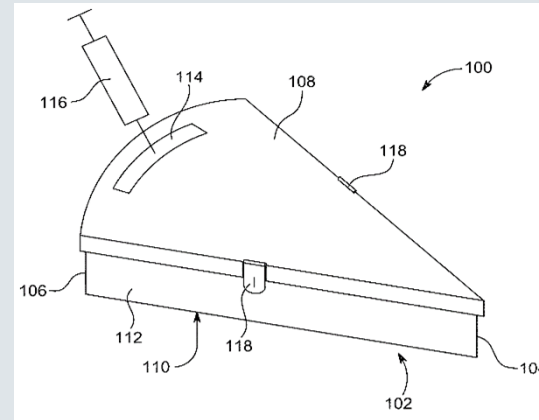
# Innovation Overview

Saudi Patent Office

## Triangular Plate For Use In Centrifugation

### Summary

A system for quickly determining antibiotic sensitivity of a microorganism comprising a triangular-shaped plate and cover for culturing, recovering, and re-suspending recovered microbial colonies and a second triangular-shaped plate comprising a non-liquid medium cut with concentric trenches over which the re-suspended microbial colonies are distributed by centrifugation and contacted with antimicrobial strips or disks.



Inventor Name

Ahmad Mohammed Shikan Aljefri

Date of Issue

May 5, 2024

# Innovation Overview

Saudi Patent Office

## Product to treat tooth hypersensitivity

### Summary

Compound for the treatment of excessive tooth sensitivity affecting Dentinal tubes root in a safe way which includes Ultrasonic effective compound mixing for agent Remineralization (bioactive glass nanoparticles) with ozo (olive oil with ozone)

### Inventor Name

Dr. NOURA SALEH AL-NAMI  
Dr. Randa Sabry Ibrahim

### Date of Issue

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