0 1

Tohoku University's Invention

Method for the Diagnosis of Genitourinary Cancers

Haptoglobin β detection enables more highly accurate diagnosis than common PSA test

Abstract

To date, prostate-specific antigen (PSA) has been known as an early diagnostic marker for prostate cancer (PCa). However, PSA levels are elevated not only in case of PCa but also in case of benign prostatic disease (BPD), and the specificity is insufficient. This invention provides anti-RM2 antibody, which specifically binds to haptoglobin β chain in tissue or body fluid from a subject, and its diagnostic use for genitourinary cancers by checking expression level of haptoglobin β chain.

Effect & Application

<Effect>

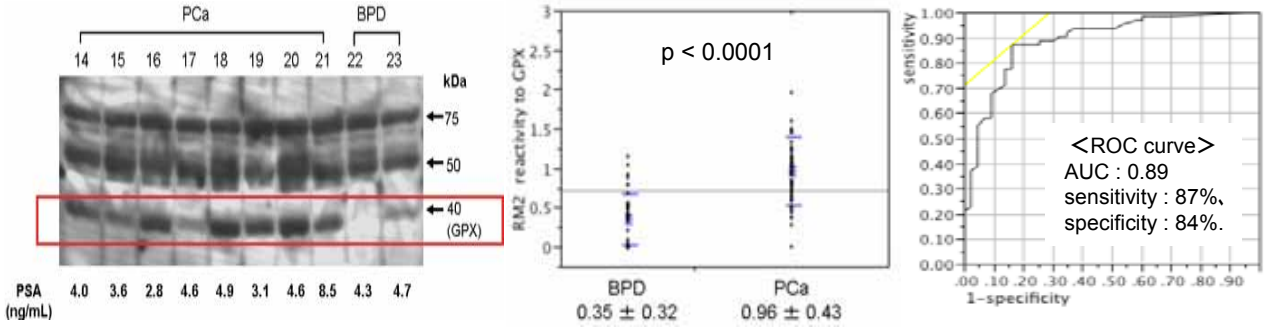
- Early diagnosis or prediction of prognosis of genitourinary cancers (PCa, renal cancer, urothelial cancer, testicular etc.) can be accomplished in a simple and non-invasive manner with the use of sera of patients or the like.
- The combination of this method and PSA exam enables evaluation of PCa with higher specificity
- This method is available for distinguishing PCa from BPD and evaluating grade of malignancy of PCa.

<Application>

- A kit for evaluating genitourinary cancer

Date Sheet
Patent publ No. (TTA No): WO2009/011466 (T07-005)
Inventor: Dr Seiichi Saito, Dr Yoichi Arai

Distinguishing PCa from BPD -Reaction of antibody RM2 to serum of PCa and of BPD



Compared with 43 patients with benign prostatic disease, antibody RM2 (=GPX) reaction was enhanced on serum haptoglobin β in the majority of 62 patients with early prostate cancer. These patients were subjected to histological diagnosis via biopsy and exhibited PSA level of less than 10 ng/g.

Evaluation of grade of malignancy of early PCa

When RM2 reaction level is high, PSA recurrence is high
→RM2 reaction level reflects the grade of malignancy of early PCa

Evaluation of other genitourinary cancers

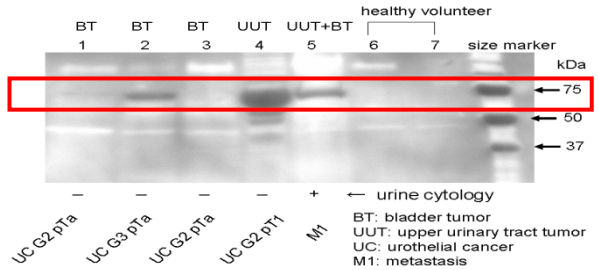


Fig. Reactivity of mAb RM2 to 75kDa protein tends to be observed in high grade urothelial cancer.

CONTACT

Tohoku Techno Arch Co., Ltd.
TEL: +81-22-222-3049 FAX: +81-22-222-3419
Contact Us

Tohoku University's Invention

A Novel Bisphosphonate with Potent Anabolic Action

A stimulator of bone formation with low risk of osteonecrosis of jaws

Abstract

This invention provides novel bisphosphonate (Bis-A) which strongly stimulates bone formation both in vitro and in vivo. This Bis-A also has anti-bone-resorbing and anti-inflammatory actions. This Bis-A is not a nitrogen-containing bisphosphonates (NBPs) and therefore has low risk of osteonecrosis of jaws, which is quite serious problem in dentistry field.

Possible Applications

(1) Treatment of bone diseases with excessive bone loss, including periodontitis and osteoporosis

(2) Tissue engineering of bone tissue

(3) Maintenance of implants

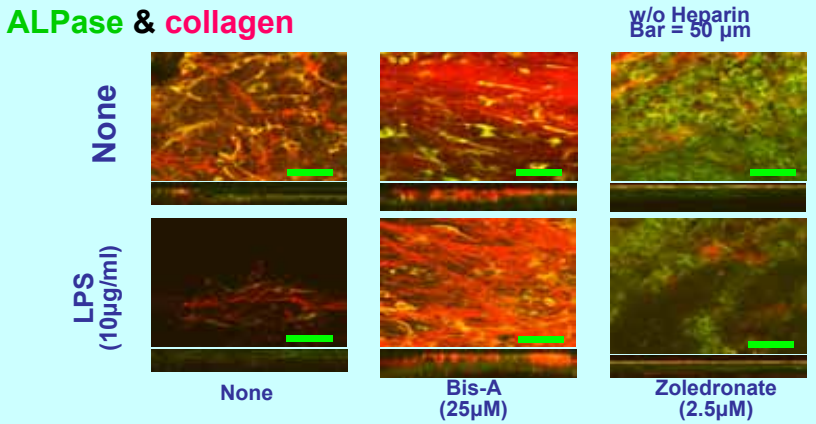
(4) Promotion of fracture healing

(5) Treatment of cleft palate,

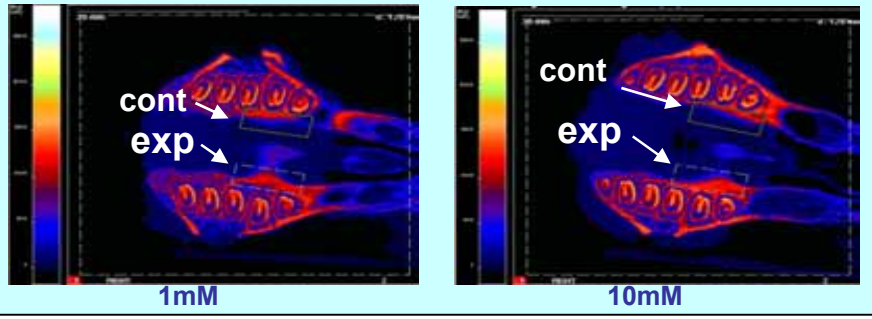
and so forth

Data Sheet
Patent Appl No (TTA NO): PCT/JP2009/003758 (T08-041)
Inventor: Dr Hisashi Shinoda et al

Effects of Bis-A and zoledronate on collagen synthesis in mouse calvarial culture



Effect of topical administration of Bis-A on rabbit alveolar bone



CONTACT

Tohoku Techno Arch Co., Ltd.
TEL: +81-22-222-3049 FAX: +81-22-222-3419
Contact Us

Tohoku University's Invention

Isolation and Differentiation Methods for Human Lung Endogenous Stem Cells

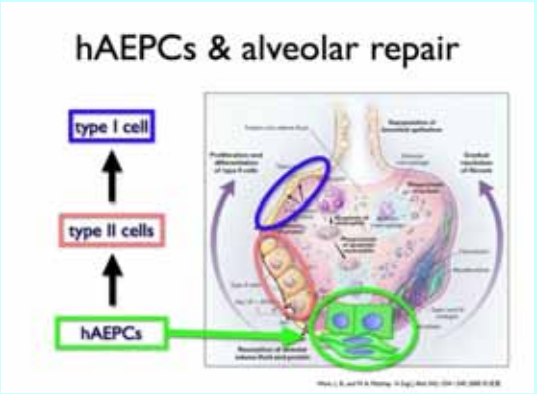
Novel population of the human alveolar epithelial type II progenitors (hAEPCs)

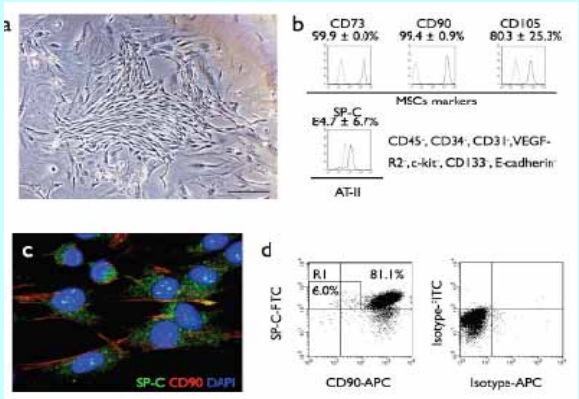
Abstract

New methodology to isolate, culture, and differentiate endogenous stem cells from the adult human lung tissues were developed. This novel population of alveolar epithelial progenitors is located in the diseased lungs, including some type of lung cancer. Using the new methodology, the phenotypic differences among the basal lung diseases or the patients' age were discovered. This new methodology and the novel stem cell population are good tools for the future lung research.

Possible Applications

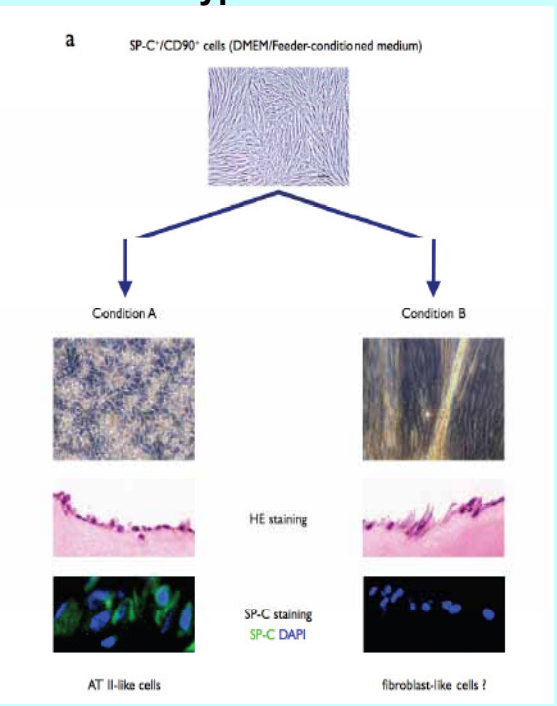
- Cancer Stem Cell Research
- Drug Discovery
- Cell Therapy for the Lung Diseases





hAEPCs isolation from the human lung tissues

Differentiation into alveolar type II cells



Data sheet
Patent appl No (TTA No.): PCT/JP2010/056447 (T08-235)
Inventor: Dr Hiroshi Kubo et al

CONTACT

Tohoku Techno Arch Co., Ltd.
TEL: +81-22-222-3049 FAX: +81-22-222-3419
Contact Us

Tohoku University's Invention

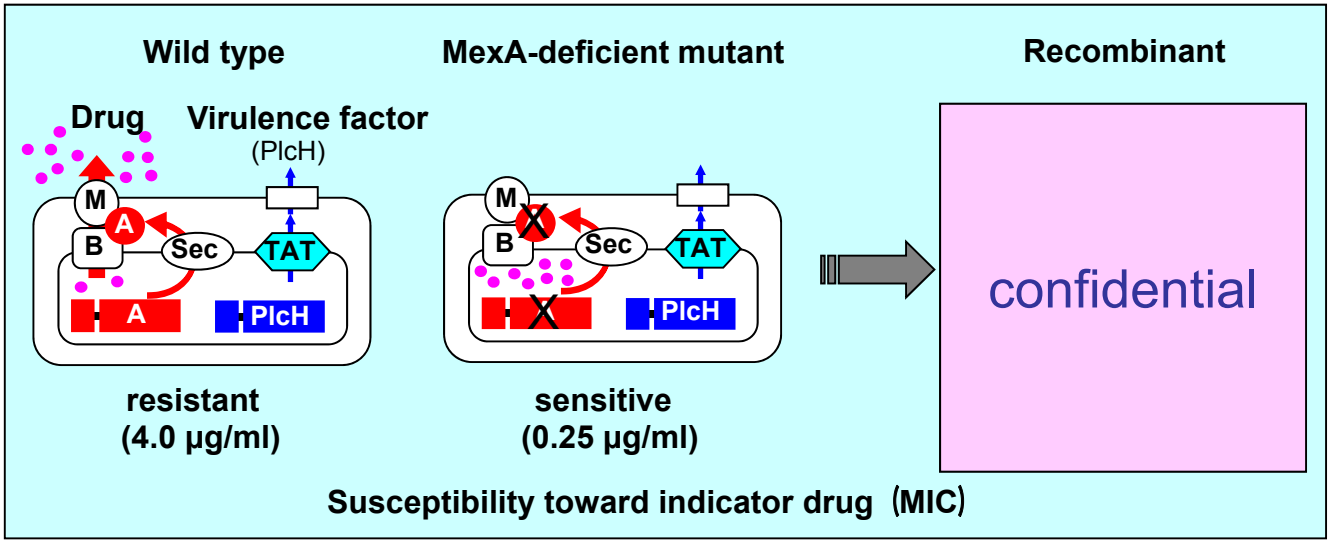
Novel Screening System for New Antibiotics

Two novel targets can be evaluated at the same time

Abstract

This technology is a novel high-throughput screening system for compounds targeting the new protein secretion pathway, Tat, which is not present in human, by utilizing multidrug efflux pump, MexAB-OprM, of *Pseudomonas aeruginosa*.

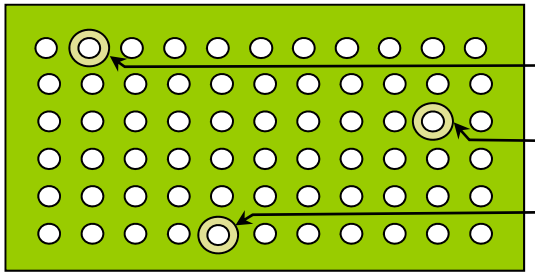
This technology also provides the method to create recombinant strain for the screening system.



Application

- Screening of new antibiotics for multiantibiotic resistant *P. aeruginosa*
- Screening of novel drugs for combination chemotherapy

Construction of the high-throughput screening system using the recombinant as an indicator strain



The inhibitory zones indicate the growth inhibition due to prevention of the efflux of an indicator antibiotic generated by lead compounds.

This system can simultaneousoy screen novel targets, Tat secretion pathway and Mex AB-OprM multiantibiotic efflux pump .

Reference: (1) Yoneyama et al (2010)
Antimicrobial Agents and Cehmotherapy
54: 1492-1497

Date Sheet
Patent appl No (TTA NO): JP2009-210760 (T08-245)
(Preparation for PCT filing)
Inventor: Dr Hiroshi Yoneyama et al

CONTACT

Tohoku Techno Arch Co., Ltd.
TEL: +81-22-222-3049 FAX: +81-22-222-3419
Contact Us

Tohoku University's Invention

Method for Reconstruction of X-ray CT Images

Drastic removing of artifact image in multi-slice type X-ray CT

Abstract

X-ray CT is a diagnostic device which can obtain inner structure images of subject by collecting and constructing transfer images after exposure of diagnostic x-rays to the subject. This invention, in particular, provides methods to modify quality of helical scanning images from multi-slice type CT and to reconstruct images by removing windmill artifact which is unavoidable during image collection.

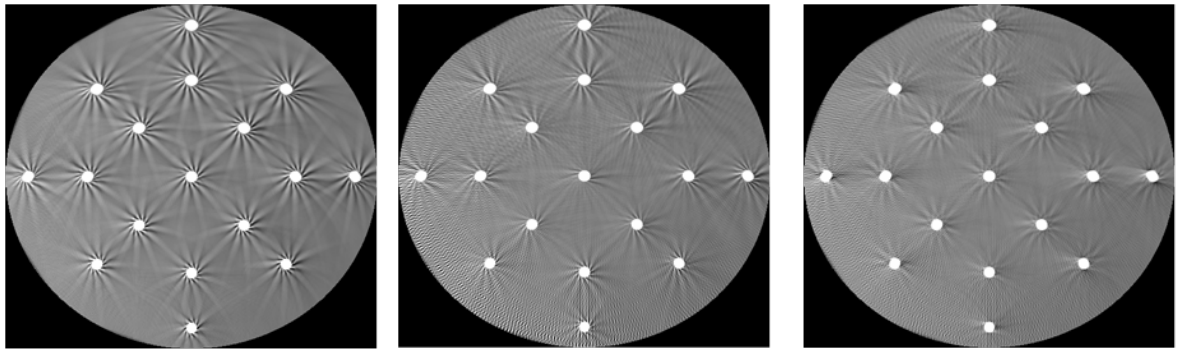
Effects

This invention is effective to remove artifacts drastically from multi-slice CT images, and enables to perform highly accurate diagnostic imaging with low slice thickness of images. In addition, high resolution images obtained by this invention make it possible to reduce x-ray exposure of subject in wide field, for example abdominal region, diagnosis.

Data sheet
Patent publ No (TTA No) WO2007/148725 (T05-292)
US 2009/068952A1
EP 2036498A1
Inventor: Dr Issei Mori

Results

Comparison of helical artifacts (windmill artifacts)



Standard reconstruction without z-FFS

Common z-FFS

This invention

Sixteen MDCT (Multi-Detector Row CT) image, Collimation range: 1.0 mm, detector pitch: 13

Note: FFS:Flying Focal Spot

CONTACT

Tohoku Techno Arch Co., Ltd.
TEL: +81-22-222-3049 FAX: +81-22-222-3419
Contact Us

Tohoku University's Invention

The Method and Agent for Restoration from Male Sterility in Gramineous Plants

Abstract

It is reported that the abnormal pollen formation often occurs in several plant species under acceleration of global warming and extreme weather. This problem of male sterility may lead to global decreasing of crop production.

This invention provide the method and agent for restoration of male sterility in gramineous plants under high-temperature condition.

Effects & Applications

The barley, one of gramineous species, is weak against high-temperature causing male sterility in the season of pollen formation.

This invention can protect plants such as wheat and barley from heating stress inducing male sterility. (see right figures)

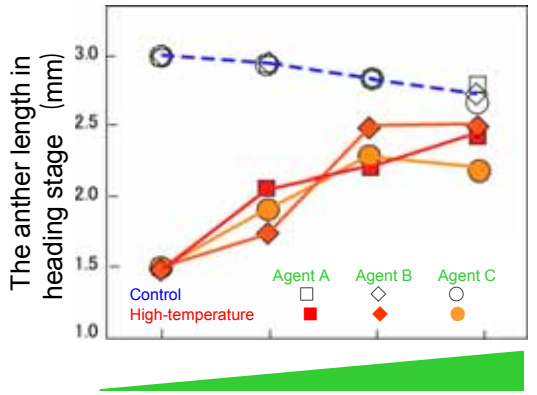
＜Application＞

・Plant growth regulator for gramineous plants

Reference: (1) Sakata et al (2010) PNAS (in press)

Restoration of anther length in heading stage

In high-temperature treated sample, the agent of this invention (A, B and C) significantly recovered the growth of anther length and pollen formation as similar as that of control one in dose- dependent manner in heading stage.



Example photos of fertility restoration

Under high-temperature condition, the barley group without spray treatment could not perform successful self-fertilization and following seed production, although spikes grew well.

By spraying agent of this invention, pollen fertility, fertilization and seed production were similar level to those in control groups even under high-temperature stress.

Data sheet
Patent appl No (TTA No)：PCT/JP2010/50101 (T08-089)
Inventor: Atsushi Higashitani, et al.

CONTACT

Tohoku Technoarch Co., Ltd.
TEL +81-22-222-3049 FAX +81-22-222-3419
Contact Us

Tohoku University's Invention

Biochemical Recycle of Biodegradable Plastic

Abstract

This invention provides method for low-cost and high efficient hydrophobic plastic degradation. This method is comprised by the technique using hydrophobic surface binding proteins (hydrophobins), HsbA or RolA protein, and their nature to recruit esterolytic enzyme to hydrophobic surface.

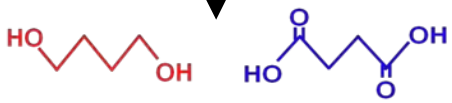
Effect & Application

The use of *Aspergillus oryzae,* which co-expresses hydrophobin and esterolytic enzyme, enables to achieve higher efficiency of plastic degradation. For example, said *A. oryzae* is cultured on the hydrophobic plastic surface, and then degradation buffer is added. This methods provides 73% of degradation rate of hydrophobic plastic.

The model of PBSA Degradation by an esterase

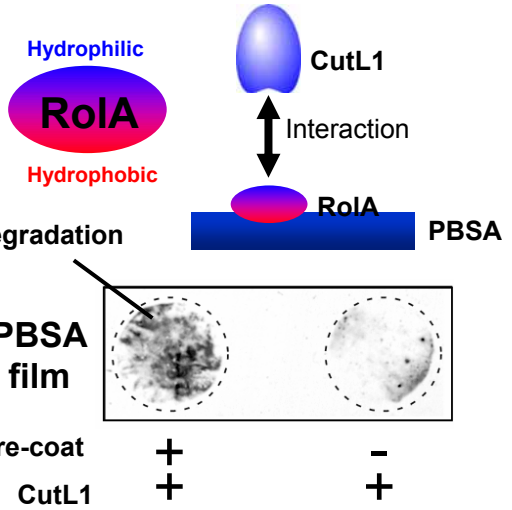
Polybutylene succinte-*co*-adipate (PBSA)

Esterase activity

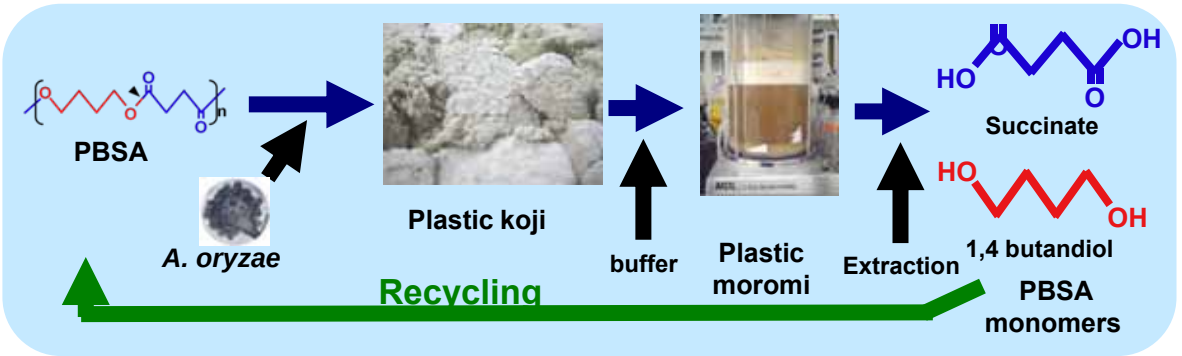


1,4-butandiol **Succinate**

RolA recruits CutL1



The PBSA recycling system by *A. oryzae*



Data sheet

Patent publ No (TTA No): JP 4273504 B2 (20022092)
EP 1595949 A1

Inventor: Dr Keietsu Abe, et al.

CONTACT

Tohoku Techno Arch Co., Ltd.
Tel: +81-22-222-3049 Fax: +81-22-222-3419
Contact Us

Tohoku University's Invention

Method for Immobilizing Proteins and Cells

Highly Reproducible Immobilization of Target Proteins without Inactivation on the Biochips

Abstract

In these days methods using antigen-antibody reactions and electrochemical techniques have been used for protein research. However, such methods often lead to denature of proteins, need large and expensive devices, and have unstable immobilization of proteins. This invention provides a method for immobilizing proteins and cells, and tip, which are able to solve the stated problems.

Effect & Application

This invention immobilizes proteins as follows: 1) making layer of negatively charged substances with non-protein-absorbablity on the surface of positively charged basal plate, 2) modifying said layered surface locally to protein-absorbable one, 3) immobilizing target proteins by absorption of said proteins on said locally protein-absorbable. This methods can avoid target proteins from denaturation, achieve small scale and low cost protein analysis, and provide high reproducibility of protein immobilization in the small flow channel.

＜Application＞

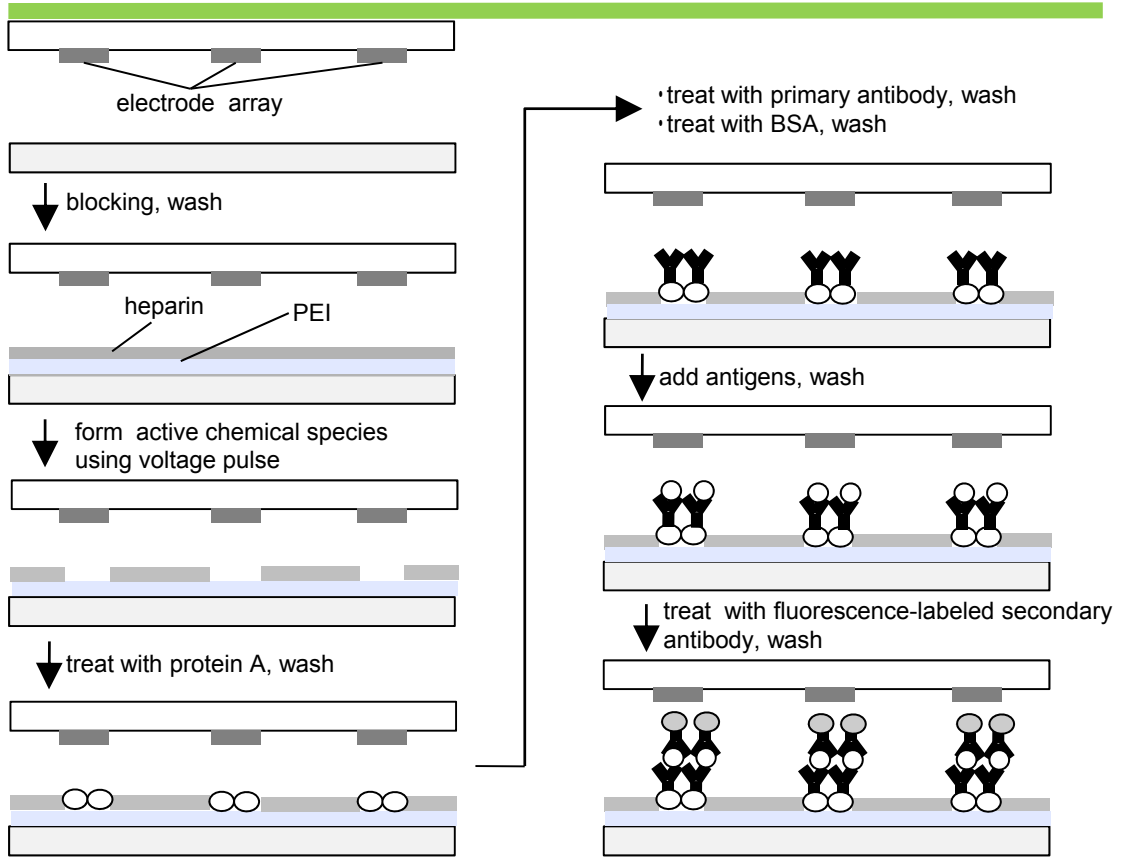
・Chip for biochemical assay using enzyme reaction

Datasheet

Patent publ No (TTA No): WO 2005/111630 A1 (20043431)
EP 1746424 A1
US 2008/248972 A1

Inventor: Dr Matsuhiko Nishizawa et al

Example process of sandwich-immunoassay using microfludic chips



CONTACT

Tohoku Techno Arch Co., Ltd.

TEL: +81-22-222-3049 FAX : +81-22-222-3419

Contact Us

Tohoku University's Invention

Microsorting System and Biochip

Microsorting system separating and classifying the target molecules quickly and automatically, and Biochip with the microsorting system

Abstract

As biotechnology handling of molecule (ovums, cells, and fungi etc.) in biochip, there is a series of handlings such as separation, classification, processing, selection, and treatment of molecules. Previously, these handlings have been mostly performed on the basis of image information obtained from a microscope by humans. Recently, non-contact handling of bio molecules in microchanels in biochip has been required to remove effect s of disturbance caused by human error, and then studied and developed so far.

This invention provides biochips which enables to perform the processes of separation, processing, selection, and treatment of biotechnology-related molecule quickly and effectively. Specifically, in the present invention, molecules are effectively separated and classified by controlling electoromagnets using maicromini-magnetic maicrotool(MMT) produced by MEMS technologly.

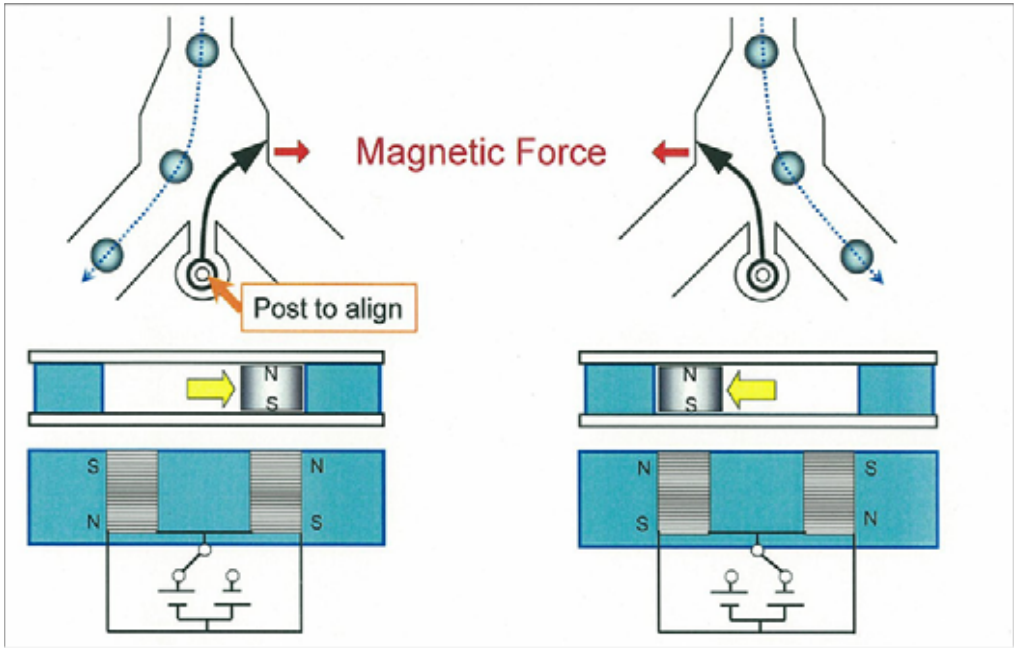


Fig. Pattern Diagram of the present invention

Effect & Application

●Application
・Biochip available to fast sorting of molecule

Data sheet
Patent appl No (TTA No): PCT/JP2009/57382 (T07-214)
Inventor: Dr Hirofumi Arai et al

CONTACT

Tohoku Techno Arch Co., Ltd.
TEL: +81-22-222-3049 FAX : +81-22-222-3419
Contact Us