

Method of Quantifying Disease Biomarkers in the Lens of the Eye
(NJMS 06-04) CNS/Medical Device/Biomarkers

Background

Age related neurodegenerative disease is a growing problem due to the aging of the population. Alzheimer's and other related diseases, associated with the aging process, are difficult to diagnose in early stages; despite the fact that early detection is the key to prophylactic treatment. To further complicate assessment of disease state or progression, many of the currently available diagnostic methods are qualitative. However, recent studies have shown that changes in the eye can provide information about corresponding changes in the brain related to the presence of age-related degenerative disease. Further, there is also evidence that the presence and concentration of specific disease-related biomarkers in the eye can be measured and that a correlation exists with the levels of such biomarkers in the brain.

Description of the Technology

The invention consists of disease related biomarkers and a non-invasive, non-contact optical method and instrument for the measurement of those biomarkers that have been shown to be indicative of the disease state. The instrument uses standard light source and CCD detection optics. A compact prototype has been built and tested on animals and human cadaver lenses.

Advantages

- Non-invasive, non-contact
- Short measurement time
- Can be performed in physician's office
- Relatively low-cost instrumentation
- Quantitative
- Allows measurement of progression over time

Applications

The applications for this technology include early detection of senile cataracts, complications of diabetes, Alzheimer's disease, and Wilson's disease.

Patent Status

U.S. Provisional patent has been filed.



Localized Insulin Delivery for Bone Healing (NJMS 05-43) Device

Background

Fracture healing is a complex process that involves the sequential recruitment of cells and the specific temporal expression of factors essential for bone repair. Previous studies have shown that diabetes impairs bone healing clinically and experimentally due to low insulin levels. The effect of insulin on bone metabolism has been also been previously investigated using a non-diabetic model and been shown to increase histomorphologic indices of bone formation *in vivo*.

Description of the Technology

The present invention relates to the local administration of insulin as an anabolic agent to accelerate bone healing in non-diabetic patients and a drug delivery system comprising insulin and a pharmaceutically active carrier, wherein said system is adapted for localized administration of insulin to a patient in need thereof. The insulin delivery system comprises at least one biocompatible carrier and may also include additional growth factors. The insulin can be delivered via implant or coating.

Advantages

The advantages of this technology are an increase in bone formation, compared with the control group, as well as an indication of improved mechanical properties such as torsional rigidity, torque to failure, shear stress, and maximum shear stress.

Applications

This invention is applicable to the treatment of bone conditions including bone fracture, bone trauma, arthrodesis, and bone deficit conditions associated with post-traumatic bone surgery, post-prosthetic joint surgery, post-plastic bone surgery, post-dental surgery, bone chemotherapy treatment, congenital bone loss, posttraumatic bone loss, post surgical bone loss, post infectious bone loss, allograft incorporation or bone radiotherapy treatment.

Patent Status

A worldwide PCT (P32,656-A PCT) and US Provisional Application (Serial No. 60/775,076) have been filed.

