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Parathyroid Hormone Variants and Assays Related to Disease

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Inventors

Randall Nelson
Research Professor
Molecular Biomarkers Lab
The Biodesign Institute
Arizona State University

Paul Oran
Graduate Research Associate
Molecular Biomarkers Lab
The Biodesign Institute
Arizona State University

Invention Description

Parathyroid hormone (PTH) is one of two hormones in the body primarily responsible for calcium regulation. PTH affects bone and kidney tissue. The inappropriate regulation of this hormone is associated with diseases such as primary and secondary hyperparathyroidism, hypoparathyroidism, hypo/hypercalcemia, and adynamic bone disease.

PTH exists in at least two biologically active (and several inactive) forms. Depending on the disease, multiple forms of PTH may have important diagnostic relevance. Most PTH assays presently in use target only a single form of PTH. Employing multiple different assays is expensive and time consuming. The results too are often subject to errors caused by cross reactivity of PTH variants. Thus it would be desirable to have a single, multiplexed assay that could measure all the PTH variants present in a clinical sample.

Researchers at the Biodesign Institute of Arizona State University have developed a multiplexed assay that can simultaneously measure 23 separate variants of PTH. This assay combines affinity isolation with mass spectrometry to give a technique for medical diagnoses, and additionally may be used for research to uncover other, as yet unknown, PTH variants. This method gives the absolute or relative concentration of the different isoforms of PTH.

This assay has the potential to replace many existing tests for different PTH variants. In addition, because a single, multiplexed assay gives the relative abundance of different PTH variants, it can be used to track the stage of the disease.

Potential Applications

- Diagnosis of diseases related to PTH misregulation, including primary and secondary hyperparathyroidism, hypoparathyroidism, hypo/hypercalcemia, and adynamic bone disease
- Tracking the course of the disease and the efficacy of its treatment
- Research into other, as yet undiscovered, PTH variants

Benefits and Advantages

- Provides a single multiplexed assay which takes the place of several different assays for different PTH variants
- Avoids the cross-reactivity problems of existing assays

Intellectual Property Status:

Provisional Application Filed

Contact

Jack Geltosky, PhD

Senior Vice President

Business Development, Life Sciences

Arizona Technology Enterprises, LLC (AzTE)

P: 480.884.1989

F: 480.884.1984

JGELTOSKY@AZTE.COM

HEALTHSCIENCES@AZTE.COM