

Novel standardized test kit for measuring B12- uptake

– prevention of anaemia and neurologic dysfunction

Technical Field

Biotech – Health, medic-technical

Business opportunity

- Licensing
- Research collaboration.

Current state of technology

An absorption test for free vitamin B12 has been developed. The method builds on measurement of holoTC before and after two days intake of a test dose of vitamin B12. The current invention ensures the measurement also of vitamin B12 bound in food, that is in the form in which vitamin B12 is normally supplied.

Applications

- A method for extraction of a vitamin B12 binding protein suitable for use as a proxy for food bound vitamin B12.

Commercial Value

The invention offers a technology for extracting B12 binding protein from fish spawn and a method to allow the B12 binding protein to be adapted into current blood test used by the clinicians. This holds interesting market prospective as vitamin B12 deficiency is a common condition with a frequency of up to 10-20% in the elderly population.

Due to the nature of the B12 uptake and metabolism, vitamin B12 deficiency often has a 2-5 year lack before detection at a time where the patient may have severe problems. B12 deficiency covers pernicious anaemia and also conditions with memory loss almost indistinguishable from senile dementia and Alzheimer's diseases. Patients exhibiting symptoms for Alzheimer's may actually suffer from a vitamin B12 deficiency. Neurological symptoms are totally reversible if treated in time.

A low level of vitamin B12 has also been associated with asthma, depression, AIDS, multiple sclerosis, tinnitus, diabetic neuropathy and low sperm counts.

The importance of early detection and clear picture of disease severity will allow clinicians to provide the patient with optimal and focused treatment.

Today no standardized assay able to define whether a given patient is unable to liberate B12 from food exists. A test based on radio labeled vitamin B12 was previously used to assess the uptake of free vitamin B12 and the uptake of the vitamin bound to the endogenously produced intrinsic factor was available, but this test is no longer acceptable or available.

The Technology

Current clinical test for detection of B12 deficiency lacks reliable standardized results as either radioactive B12 or less reliable food bound B12 from chicken or eggs are being used. None of the tests are able to present standardized test results where the precise amount of B12 given the patient during the test is known. Another issue is the importance of testing with food bound B12 due to the nature of gastric digestion and special setup for B12 uptake over the ileum.

A B12 binding protein has been detected and extracted from fish spawn. The finding of a natural B12 binding protein allows the protein to be incorporated into current test standards. This provides the clinicians with a standardized vitamin B12 uptake test. By measuring vitamin B12 uptake and using current test this will provide the clinicians with a clear better picture of the cause for disease, thereby severity allowing optimal treatment of the patient.

Intellectual Property Rights

The Intellectual Property Rights are owned by Aarhus University and The Central Jutland Region, Denmark. Priority date is obtained in July, PA: 2009 00905.

Inventors



Ebba Nexø, Professor MD, Dr.Med.Sci.

Department of Clinical Biochemistry, Aarhus University Hospital, Denmark

Research area: *Cobalamin and its binding proteins:* Since 1972 worked with purification, characterization and measurement of cobalamin binding proteins. Participated in EUREKA-project (2000-2003) and has been coordinator for an EU-demonstration project (2002- 2006) on holo TC.

Epidermal growth factor (EGF) and its receptor: Since 1977 worked with various aspects of the EGF system, in particular in relation to cancer

Trefoil factor (TFF)s: Since 1997 worked with measurement and characterization of TFF.

Industrial relations: Co-founder of Cobento Holding Aps (2002) and Cobento Biotech A/S (2003). Production of human cobalamin binding proteins in plants.

Patents: Four patents with relation to vitamin B12 at various stages, and one with relation to the EGF system.



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Research area: *Cobalamin binding proteins in fish and fish spawn:* Since 2008 worked with identification, characterization and purification of cobalamin binding proteins in zebrafish (*Danio rerio*) and in the spawn of rainbow trout (*Oncorhynchus mykiss*).

STAT3-activation by folic acid in cancer cells: From 2005-2007 worked with activation of the STAT3 oncogene by folic acid in cancer cells expressing the Folate Receptor a.

Patents: One with relation to cobalamin binding proteins in rainbow trout spawn, and one with relation to the use of a STAT3 signaling pathway in cancer treatment.

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