

Glycomacropeptide (GMP)-Based Food for the Treatment of PKU and Other Metabolic Disorders



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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing improved medical food for the nutritional management of phenylketonuria (PKU).

OVERVIEW

Phenylketonuria (PKU) is a genetic disorder in which an individual lacks the enzyme phenylalanine hydroxylase (PAH) that converts the amino acid phenylalanine into tyrosine. If left untreated, the buildup of phenylalanine in the blood can lead to mental retardation and central nervous system disorders.

The treatment for PKU is a lifelong reduced protein diet. Because most proteins contain significant amounts of phenylalanine, the specialized diet usually is protein poor and supplemented with other amino acids. This diet is difficult to follow, restrictive and unpalatable. Non-compliance is a common problem and can cause severe neuropsychological impairment.

THE INVENTION

UW-Madison researchers have developed an improved medical food for treating PKU. This food is made with highly purified glycomacropeptide (GMP) as its primary protein source and supplemented with other amino acids, including arginine, histidine, leucine, tyrosine and tryptophan. It provides a complete, low-phenylalanine source of protein and is more palatable than the standard specialized diet.

GMP is a naturally occurring protein that is formed during cheese making and contains no phenylalanine. The purity of GMP is one key to producing this medical food. The other is the amount and type of amino acid supplementation. For example, if too many sulfur-containing amino acids are used, the food tastes bad and patients will not eat it.

THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.



APPLICATIONS

- Nutritional management of PKU

KEY BENEFITS

- Provides the highest quality, most effective medicinal foodstuff available for treating patients with PKU
- Provides a complete source of protein while reducing the levels of phenylalanine in the blood of patients with PKU
- Tastes good enough for patients to remain compliant with the diet
- Economically feasible to manufacture
- Can be produced as a variety of food types, including beverages, bars, wafers, puddings, gelatins, crackers, fruit leathers, nut butters, sauces, flakes, crisp cereal pieces, puffs, pellets and extruded solids
- May be used to treat other metabolic disorders in addition to PKU

STAGE OF DEVELOPMENT

This food was successfully tested in human trials. It also was shown to support normal growth and reduce levels of phenylalanine in the blood and brain of PKU mice.

ADDITIONAL INFORMATION

Publications

Ney D.M., Gleason S.T., van Calcar S.C., MacLeod E.L., Nelson K.L., Etzel M.R., Rice G.M. and Wolff J.A. 2009. Nutritional Management of PKU with Glycomacropeptide from Cheese Whey. *J. Inherit. Metab. Dis.* 32, 32-39.

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Solverson et al. 2012. Glycomacropeptide, a Low-Phenylalanine Protein Isolated from Cheese Whey, Supports Growth and Attenuates Metabolic Stress in the Murine Model of Phenylketonuria. *Am. J. Physiol. (Endoc. & Metab.)* 302, E885-E895.

Solverson P., Murali S.G., Litscher S.J., Blank R.D. and Ney D.M. 2012. Low Bone Strength Is a Manifestation of Phenylketonuria and Is Attenuated by a Glycomacropeptide Diet. *PLoS ONE.* 7, e45165.

[Click here for a news release describing this technology.](#)

Van Calcar S.C. and Ney D.M. 2012. Food Products Made with Glycomacropeptide, a Low-Phenylalanine Whey Protein, Provide a New Alternative to Amino Acid-Based Medical Foods for Nutrition Management of Phenylketonuria. *J. Acad. Nutr. Diet.* 112, 1201-1210.

Tech Fields

Food & Supplements - Functional foods

Pharmaceuticals & Vitamin D - Metabolic disorders

CONTACT INFORMATION

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