PriMera Scientific Surgical
Research and Practice
Volume 8 Issue 1 July 2026
DOI: 10.56831/PSSRP-08-275
ISSN: 2836-0028

PriMera Scientific Publications

A Multi-formulation Patent Strategy for the Treatment of Insulin Resistance

Type: Review Article
Received: June 22, 2026
Published: July 02, 2026

Citation:
Christina Rahm. "A Multi-formulation Patent Strategy for the Treatment of Insulin Resistance". PriMera Scientific Surgical Research and Practice 8.1 (2026): 15-18.

Christina Rahm*

DRC VENTURES LLC, USA

***Corresponding Author:** Christina Rahm, DRC VENTURES LLC, USA.

Abstract

Insulin resistance is a primary pathologic process that causes type 2 diabetes mellitus, metabolic syndrome, cardiovascular disease, and associated endocrine disorders. Although pharmacologic therapy like metformin and insulin sensitizers are available, incomplete metabolic control, a significant number of the patient's experiences adverse effects, or progressive disease. The reviewed patent invention in this white paper presents an innovative, combined approach to treatment of insulin resistance with eight proprietary formulations used following a time-based dose pattern. The method aims to solve the problem of insulin resistance as a multifactorial metabolic malfunction of disrupted glucose use, chronic inflammation, oxidative stress, micronutrient imbalance, and cellular signaling changes. The goal of the patented approach based on the combination of targeted nutraceutical compounds, botanical extracts, amino acids, minerals, and antioxidants is to restore insulin sensitivity, enhance metabolic biomarkers, and decrease the need to resort to traditional pharmacotherapy. This white paper is a scientific assessment of the rationale, design of formulation, treatment protocol, and possible clinical implications of the insulin resistance treatment methodology as patented.

Introduction

Insulin resistance is considered a diminished biological reaction of peripheral tissues to circulated insulin, leading to the dysfunction of glucose consumption and compensatory hyperinsulinemia. With time, this compensatory condition leads to dysfunction of the beta cell, hyperglycemia, and type 2 diabetes mellitus. In addition to glycemic dysregulation, insulin resistance has systemic lipid metabolism, vascular and inflammatory mechanisms and hormone regulation (Rao et al., 2019). Sedentary lifestyles, dietary habits, high in refined carbohydrates, aging and genetic predisposition have increased the prevalence of insulin resistance in the world. Traditional pharmacologic treatment is mainly directed at glucose reduction but not on the upstream causes of insulin resistance. Consequently, it is becoming a topic of interest to focus on adjunctive and integrative methods that deal with oxidative stress, inflammation, nutrient deficiency, and mitochondrial dysfunction. The patented invention discussed in this paper suggests a multi-component treatment regimen involving several proprietary formulations that are used simultaneously in a specified duration of treatment, which is a contrast to the single-agent treatment model. This white paper looks at a patented multiformulation insulin resistance treatment protocol, and discusses how a mechanism-based, integrated dosing regime, developed with integrated mechanisms, represents a scientifically sound, and potentially rev-

olutionary addition to traditional metabolic treatments.

Overview of the Patented Invention

The patent entitled Formulations and Treatment Method for Insulin Resistance explains a treatment procedure that involved use of eight proprietary formulations that were administered during at least ninety days of treatment (Patent Application No. Crahm2025). The essential claim of the patent is the innovative, sequential combination of its eight formulations as the proprietary multi-target treatment protocol for insulin resistance. Such claims create a proprietary treatment regimen that differentiates it from the use of each component alone. The invention is designed to address both the symptoms and underlying mechanisms of insulin resistance, rather than focusing solely on managing elevated blood glucose levels. All these formulations focus on particular metabolic pathways that are involved in insulin resistance, such as oxidative stress, inflammation, glucose uptake, mitochondrial activity, hormonal imbalance, and nutrient deficiency. One of the traits of the invention is an increased organized dosing and a staggered administration program. This protocol takes into consideration the patient adaptation, tolerance and metabolic adjustments that led to the fact that therapy could be gradually increased in intensity with a consistent metabolic support.

Formation and Operative Rationality of the Proprietary Formulations
Initial Formulation: Mineral and Antioxidant Support

The first one is made of mainly water, zeolite extract, ascorbic acid (vitamin C), sea mineral extract, and potassium sorbate. It is suggested that zeolite compounds facilitate a detoxification process and a mineral exchange process, and that vitamin C is a potent antioxidant capable of reducing oxidative stress that deactivates insulin-signaling pathways (Derakhshankhah et al., 2020). Sufficient supply of minerals is vital to insulin receptor activity and glucose transport.

Second Formulation: Metabolic Modulation and Neuroendocrine

The second formula contains vitamin D3, L-tyrosine, caffeine anhydrous, L-theanine, Mucuna pruriens, pine bark extract and turmeric root extract. Vitamin D deficiency has been closely linked to insulin resistance and the anti-inflammatory and insulin-sensitizing effects of polyphenols including curcumin and pine bark extract are demonstrated. The presence of neuroactive compounds implies the idea of controlling the metabolic dysregulation of stress.

Third Formulation: Glycemic and Mitochondrial Support

The third formulation is in liquid sachets and is a combination of raspberry ketones, turmeric curcuminoids, resveratrol, D-ribose, apple cider vinegar, and black cumin seed oil. Resveratrol and curcuminoids are studied for their role of enhancing mitochondrial efficiency, and insulin signaling. D-ribose is used in cellular energy metabolism that may increase glucose use at the cellular level.

Fourth and Sixth Formulations: Micronutrient Repletion

Fourth and sixth formulations include vitamin C, zinc, magnesium, quercetin, and fat-soluble vitamins. Magnesium deficiency is a proven factor in insulin resistance, and zinc is very important to the synthesis and storage of insulin. Quercetin offers extra protection of antioxidants and anti-inflammatory properties.

Fifth Formulation: Gut -Metabolic Axis Support

The fifth formulation contains agave inulin, green banana powder, spirulina, dietary fiber, probiotics, and phytonutrient-dense plant powders. This composition is designed to support and modulate the gut microbiota, which plays an increasingly recognized role in insulin sensitivity, inflammatory regulation, and glucose metabolism (Patent Application No. Crahm2025).

Seven and Eight Formulations: Amino Acid Optimization Botanical

The seventh formulation includes botanical agents, including Panax notoginseng, Gymnema sylvestre, and Astragalus membrana-

ceus, all of which have both traditional and emerging evidence of glucose regulation (Gaytan Martinez et al., 2021). The eighth formula includes essential amino acids, branched-chain amino acids, antioxidants, and hepatoprotective substances and targets to improve muscle glucose uptake, liver metabolism, and the general anabolic balance (De Bandt et al., 2023).

Clinical Implementation and Treatment Protocol

The patented protocol focuses on simultaneous administration of all the eight formulations in the initial day and dose escalations with time. This method considers a realization that insulin resistance cannot be caused by one pathological process but by interplaying metabolic dysfunctions (Patent Application No. Crahm2025). Treatment period of ninety days is a sufficient time during which cells can adapt, reduce the inflammatory load and bring about objective changes in metabolic biomarkers. An example of a case provided in the patent shows that there were significant and clinically meaningful changes in fasting glucose, hemoglobin A1C, weight loss, fatigue, and decreased need to rely on metformin therapy, which shows that the invention has the potential to be translated to humans.

Scientific and Clinical Implications

The patented insulin resistance approach is strategically designed in alignment with current scientific understanding that multi-factorial metabolic disorders require comprehensive, multimodal interventions (Patent Application No. Crahm2025). Rather than targeting a single pathway, the formulation integrates antioxidant support, micronutrient repletion, gut microbiome modulation, and botanical compounds known to support insulin sensitivity. By addressing multiple upstream contributors simultaneously, it reflects a systems-based approach to metabolic health. This strategy may be particularly beneficial for individuals with early or subclinical insulin resistance, polycystic ovary syndrome (PCOS), or metabolic syndrome who are seeking proactive measures to help delay or reduce disease progression. While not intended to replace conventional pharmacotherapy, the invention offers a compelling adjunctive option that, when implemented under professional supervision, may support improved metabolic outcomes and potentially reduce overall therapeutic burden over time.

Limitations and Future Research

The patented multiformulation treatment strategy for insulin resistance is a biologically plausible and comprehensive approach. However, it is necessary to acknowledge several limitations to give a fair scientific evaluation. The first limitation is that the clinical evidence presented in the patent mostly consists of the observational effects on one single patient. The improvements in blood sugar control, weight loss, fatigue, and medication needs that were reported are significant from a clinical point of view but such results cannot be taken as representative of the whole population without further larger studies with control groups. The lack of randomized controlled trials restricts the possibility to link the benefits observed directly and solely to the patented formulations, i.e., confounding factors such as dietary change, better compliance with lifestyle interventions or placebo effects cannot be ruled out.

Secondly, the fact that eight different formulations are administered at the same time makes it difficult to maintain the patients' adherence and to repeat the experiment or to be certain which one of the formulations was responsible for the therapeutic effect. As the formulations are administered simultaneously, the metabolic outcomes cannot be directly attributed to any one or more individual components or formulations. From a pharmacological point of view, potential interactions between bioactive compounds, although not necessarily problematic, should be thoroughly investigated to guarantee safety, correct dosing, and long-term tolerability, especially in patients with other diseases or those taking multiple medications.

The third limitation relates to the ingredients of the formulations. While many of the substances used in the patented formulations have been shown to have the desired metabolic and insulin-sensitizing effects, the particular mixtures have not yet been independently verified. Issues such as regulation, quality control, and standardization of botanical and nutraceutical ingredients pose further challenges that should be taken seriously and need thorough monitoring in future translational applications.

As is outlined in the present paper, a comprehensive and well-structured research program should be designed to compare the patented method with standard drug therapies and lifestyle changes. The researchers should not limit the assessment to traditional

markers of glycemia that are fasting glucose and hemoglobin A1C only but also include insulin sensitivity measures, inflammation markers, lipid parameters, gut microbiota composition, and questionnaires to patients about their well-being. Dose response studies and factorial experimental designs are two methodologies that could be employed to identify which elements of the protocol are critical and possibly help to simplify the formulation pattern.

Extended follow-up research is required to confirm the lasting effects of metabolic improvements, safety of prolonged use, and the possibilities of delaying or preventing the onset of type 2 diabetes mellitus (Rao et al., 2019). Moreover, subsequent studies should determine the extent to which this therapeutic model can be used in different populations such as those with metabolic syndrome, polycystic ovarian syndrome, and genetic or lifestyle risk profiles of varied types. It will be necessary to carry out thorough clinical research in order to overcome these limitations and thus fully prove the therapeutic effectiveness and potential for clinical application of the patented insulin resistance treatment method.

Conclusion

Insulin resistance remains one of the most significant and rapidly escalating healthcare challenges worldwide. It is a foundational driver of type 2 diabetes, metabolic syndrome, cardiovascular disease, nonalcoholic fatty liver disease, and polycystic ovary syndrome, placing a substantial burden not only on individual health outcomes but also on healthcare systems globally. As prevalence continues to rise across diverse age groups, there is an increasing need for strategies that move beyond symptom management and instead address the underlying biochemical and physiological dysfunctions that contribute to impaired insulin signaling. The patented multi-formulation treatment approach discussed in this white paper introduces a novel and comprehensive strategy for supporting insulin sensitivity. Rather than focusing solely on glycemic control, the invention targets upstream contributors to metabolic dysregulation, including oxidative stress, micronutrient insufficiency, inflammatory pathways, mitochondrial function, and gut microbiome imbalance. Through a carefully structured dosing protocol and strategically designed compositions, the method reflects a systems-biology framework that aligns with current scientific understanding of insulin resistance as a multifactorial condition requiring multimodal intervention.

By integrating antioxidant therapy, targeted nutrient repletion, microbiome modulation, and botanical compounds that support metabolic signaling pathways, the invention offers an organized and practical framework that complements existing therapeutic paradigms. Its design acknowledges the complex interplay between endocrine signaling, immune modulation, cellular energy production, and gastrointestinal health in the development and progression of insulin resistance. While the conceptual and mechanistic rationale for this approach is strong, continued clinical trials and structured evaluations are essential to further validate efficacy, optimize dosing strategies, and define ideal patient populations. Future research will be critical in refining implementation protocols and positioning this multi-formulation method within evidence-based metabolic care models. With appropriate scientific validation and professional oversight, this approach has the potential to become a valuable adjunct within comprehensive metabolic health strategies.

References

1. De Bandt JP, Coumoul X and Barouki R. “Branched-chain amino acids and insulin resistance, from protein supply to diet-induced obesity”. Nutrients 15.1 (2022): 68.
2. Derakhshankhah H., et al. “Biomedical applications of zeolitic nanoparticles, with an emphasis on medical interventions”. International journal of nanomedicine (2020): 363-386.
3. Gaytan Martinez LA., et al. “Effect of Gymnema sylvestre administration on glycemic control, insulin secretion, and insulin sensitivity in patients with impaired glucose tolerance”. Journal of Medicinal Food 24.1 (2021): 28-32.
4. Patent Application No. Crahm2025-20. Formulations and treatment methods for insulin resistance.
5. Rao M., et al. “Effect of inulin-type carbohydrates on insulin resistance in patients with type 2 diabetes and obesity: a systematic review and meta-analysis”. Journal of diabetes research 2019.1 (2019): 5101423.