

PATENT PROGRAM

Background

Bioenergy Life Science, Inc. ("BLS") currently holds or has exclusive rights to 24 issued and pending patents in the United States, Canada, Europe, Japan, China, and Australia directed to D-ribose compositions and their methods of use. BLS's patent portfolio is summarized in detail on the following pages

The biochemistry of ribose has been known for decades, having been elucidated through experiments with isolated cells or tissues. Dr. John E. Foker was one of the first to begin to study the physiology of Bioenergy Ribose in intact animals. His studies showed that hearts subjected to a global ischemic insult recovered ATP levels more quickly when ribose was administered intravenously.

In the mid-1990s, it was investigated whether ribose might have a role in raising the energy levels of healthy people. Before this research was carried out, there was no expectation that healthy people would show an increase in energy on ingesting ribose. It was possible, even likely, that healthy people would already have a high basal level of ATP and ATP synthetic capacity that would not be increased on ribose ingestion. BLS sponsored scientific, controlled studies at leading academic institutions in order to establish a firm scientific basis for the use of ribose in healthy people. The results of one study led to the first patent filing in 1998. BLS has expanded its research into other areas and through its patent portfolio BLS has the exclusive rights to produce and sell ribose compositions and their methods of use. Bioenergy Ribose passes on those rights to its customers and licensees.

BIOENERGY LIFE SCIENCE, INC. PATENTS AND PATENT APPLICATIONS

BLS's exclusive rights to uses of ribose can be divided into three groups:

1. Uses by healthy people, including sport uses
2. Uses for healthy people under specific stress conditions

1. Uses By Healthy People, Including Sport Uses

Patent Description	Representative U.S. Claims	Summary / Comments
<p style="text-align: center;">COMPOSITIONS FOR INCREASING ENERGY IN VIVO</p> <p>United States: US6159942 US6534480</p> <p>Europe: EP108779 EP1745789</p> <p>China: CN101264093</p> <p>Japan: JP2002518321 JP2010168394</p> <p>Canada: CA2334415</p>	<ul style="list-style-type: none"> • A method for increasing the energy levels of a healthy human, canine or feline which has not been subjected to ischemic insult, which comprises the oral administration of an effective amount of a pentose to said human, canine or feline. • ...wherein the human, canine or feline has increased energy demand. • A composition to be administered to increase energy levels in healthy humans, canines or felines which have not been subjected to ischemic insult, which comprises an effective amount of a pentose in combination with a vehicle. • ...unit dosage form of about 0.1 to 50 gm. • ...plus magnesium and creatine. • A method for raising the skeletal muscle ATP levels of a healthy mammal which comprises the oral administration of an effective amount of a pentose to said mammal. • A composition to be administered for raising the skeletal muscle ATP levels in mammals which comprises an effective amount of a pentose. 	<ul style="list-style-type: none"> • Oral ribose for healthy people, dogs, cats. Not limited to the delivery vehicle of oral dosage (drinks, bars, etc.). • Sports or heavy labor. • Ribose alone or in combination with magnesium and creatine.

1. Uses By Healthy People, Including Sport Uses

Patent Description	Representative U.S. Claims	Summary / Comments
<p style="text-align: center;">METHOD FOR REDUCING CRAMPING AND SORENESS</p> <p>United States: US6159943</p> <p>Europe: EP11235581</p> <p>Great Britain: GB2352175</p> <p>Australia: AU783796</p> <p>China: CN1247201</p> <p>Japan: JP2003516315 JP2011093910</p> <p>Canada: CA2383284</p>	<ul style="list-style-type: none"> • A method to prevent exercise-induced muscle cramping and soreness in the skeletal muscles of a mammal comprising administering an effective amount of ribose to the mammal a sufficient time prior to exercise so that ribose is present in the skeletal muscle of the mammal during exercise. • ...wherein the amount of ribose is 2 to 10 grams. • ...wherein the ribose is administered at least 10 minutes but no longer than 4 hours before exercise. • A method to prevent exercised induced muscle soreness in a mammal comprising administering an effective amount of ribose to the mammal after exercising 	<ul style="list-style-type: none"> • Sports or heavy labor. • Ribose alone or in any composition. • This is in addition to the use to increase energy because of the timing of dosage.
<p style="text-align: center;">COMPOSITIONS FOR IMPROVING ATHLETIC PERFORMANCE</p> <p>United States: US6429198</p>	<ul style="list-style-type: none"> • A method for increasing the athletic performance which comprises the oral administration of an amount of a pentose to a mammal, said amount being effective to increase the athletic performance of said mammal. 	<ul style="list-style-type: none"> • Serious, competitive athlete – human, horse, dog. This is differentiated from the '942 patent by the new finding that proper usage of ribose not only increases power, but prevents fatigue to a significant degree.
<p style="text-align: center;">METHOD FOR INCREASING MUSCLE MASS AND DECREASING BODY FAT IN HUMANS</p> <p>United States: US6525027</p>	<ul style="list-style-type: none"> • A method comprising administering ribose to a human performing weight-training exercise in order to decrease the body fat of said human. • A method for increasing the strength, percent fat-free muscle mass and stamina of a human comprising administering ribose and at least one supplement consisting of creatine, carnitine, pyruvate, magnesium or chromium picolinate 	<ul style="list-style-type: none"> • Weight training exercise is defined as exercise using all the large muscles of the body. • Weight lifters and those wishing to sculpt the body with diet and exercise. [Early results indicate that subcutaneous fat is selectively reduced]

Bioenergy Life Science, Inc. has the exclusive right to advertise and sell ribose for increasing energy levels in healthy humans. The patents already issued and in prosecution cover substantially all the market in sports and nutritional supplements.

2. Used for Healthy People Under Specific Stress Conditions

Patent Description	Representative U.S. Claims	Summary / Comments
<p style="text-align: center;">COMPOSITIONS FOR INCREASING ENERGY IN VIVO</p> <p>United States: US6159942 US6534480</p> <p>Europe: EP108779 EP1745789</p> <p>China: CN101264093</p> <p>Japan: JP2002518321 JP2010168394</p> <p>Canada: CA2334415</p>	<ul style="list-style-type: none"> • A method for increasing the energy levels of a healthy human, canine or feline which has not been subjected to ischemic insult, which comprises the oral administration of an effective amount of a pentose to said human, canine or feline. • ...wherein the human, canine or feline has increased energy demand. • ...wherein the increased energy demand is caused by recovery of the human,, canine or feline from infection, trauma or burn. • A composition to be administered to increase energy levels in healthy humans, canines or felines which have not been subjected to ischemic insult, which comprises an effective amount of a pentose in combination with a vehicle. • A method for raising the skeletal muscle ATP levels of a healthy mammal which comprises the oral administration of an effective amount of a pentose to said mammal. • ...wherein the mammal has increased energy demand. • ...wherein the mammal is exercising strenuously • A composition to be administered for raising the skeletal muscle ATP levels in mammals which comprises an effective amount of a pentose. 	<ul style="list-style-type: none"> • In addition to the conditions explicitly listed in claim, the patent teaches that increased energy demand exists during heavy labor, advanced age.
<p style="text-align: center;">METHOD FOR RAISING THE HYPOXIC THRESHOLD</p> <p>United States: US6218366</p>	<ul style="list-style-type: none"> • A therapeutic method comprising administering ribose to a mammal in an effective amount to increase the tolerance of the mammal to hypoxia so that ribose is present in the tissue of the mammal during the hypoxic event. • ...wherein ribose is administered orally, intravenously or intraperitoneally. • ...wherein the hypoxia is due to cardiovascular disease, myocardial stunning anesthesia surgical procedures, peripheral vascular disease, intermittent claudication, pulmonary dysfunction physical exertion, pharmaceutical treatment, tachycardia, or poisoning. 	<ul style="list-style-type: none"> • Bioenergy’s first research centered essentially on muscle – both cardiac and skeletal. This is an extension into the general body effects of hypoxia. • Hypoxic events affecting healthy persons are described as including the conditions listed.

2. Used for Healthy People Under Specific Stress Conditions

Patent Description	Representative U.S. Claims	Summary / Comments
<p style="text-align: center;">METHOD FOR TREATING ACUTE MOUNTAIN SICKNESS</p> <p style="text-align: center;">United States: US6511964</p>	<ul style="list-style-type: none"> • A method to prevent or alleviate the symptoms of acute mountain sickness comprising administering an amount of ribose to a mammal effective to prevent or alleviate symptoms. 	<ul style="list-style-type: none"> • Relieves headache, nausea of altitude sickness. • May ameliorate the serious symptoms of pulmonary and cerebral edema.
<p style="text-align: center;">COMPOSITIONS AND METHODS FOR IMPROVING CARDIOVASCULAR FUNCTION</p> <p style="text-align: center;">United States: US7553817</p> <p style="text-align: center;">Europe: EP11313488</p> <p style="text-align: center;">China: CN1299690</p> <p style="text-align: center;">Japan: JP2004505056</p>	<ul style="list-style-type: none"> • A method for improving the cardiovascular function of a subject having reduced cardiovascular function consisting of the administration of two to eight grams of D-ribose one to four times daily to the subject for a period of three weeks. • A method for improving the cardiovascular function of a subject having reduced cardiovascular function comprising the administration of two to eight grams of D-ribose plus an effective amount of a vasodilator one to four times daily to the subject for a period of three weeks. 	

Bioenergy Life Science, Inc. has the exclusive right to advertise and sell ribose for the use of healthy persons who are experiencing stresses such as heavy exercise, burns, hypoxia, acute mountain sickness, and the like.