ALL THE DINOSAURS ARE GONE!

While all of the frightening and deadly creatures known as dinosaurs that threatened our very existence are no longer present on the earth, the ongoing battle for security, safety, and well-being remains. At one time, the largest stress to our autonomic nervous system (ANS) was the fear of death. And that fear of death took the form of a direct and apparent threat to our life. Usually following these threats to our existence, the threat would subside and the body would have an opportunity to rest, recover, and return to a baseline and balanced level. Nowadays however, these threats take on much more subtle and less obvious mechanisms. They no longer come at us with teeth, fangs, and claws, but instead through, e-mails, text messages, traffic jams, job deadlines, and other equally as damaging means.

To make the matter even worse, these attacks no longer come in short durations and spurts, but instead come at a constant and continual level of over-stimulation and over-threats. So instead of having one large spike and then a chance for the body to rest and recuperate, the stress comes continuously, never allowing the body to return back to a balanced perspective. The stress of the 21st century is therefore not one major action, but instead a continual barrage of micro-situations that not only creates stress, but more importantly, never allows the body the opportunity to return to a normal baseline level and heal. It is this "new" type of continual stress that has altered the numerous biochemical and physiological mechanisms that we have within our body to combat stress and has placed us into a "new" dimension of risk.

In order to fully understand this "new" risk, we must examine the biochemical and physiological reactions that occur as a result of stress. Hans Selye defined stress as how the body reacts to a Stressor (something or reason that causes stress). There are acute stressors, which are a short-term stress that can affect you greatly or regularly, and there are chronic stressors, which are a long-term stress that can also affect you greatly or regularly.

In response to a stressor, corticotropin-releasing hormone (CRH) and arginine-vasopressin (AVP) are secreted into the hypophyseal portal system and activate neurons of the paraventricular nuclei (PVN) of the hypothalamus. The locus ceruleus and other noradrenergic cell groups of the adrenal medulla and pons, collectively known as the LC/NE system, also become active and use brain epinephrine to execute autonomic and neuroendocrine responses, serving as a global alarm system.

The autonomic nervous system provides the rapid response to stress commonly known as the fight-or-flight response, engaging the sympathetic nervous system and withdrawing the parasympathetic nervous system, thereby enacting cardiovascular, respiratory, gastrointestinal, renal, and endocrine changes. The hypothalamic-pituitary-adrenal axis (HPA), a major part of the neuroendocrine system involving the interactions of the hypothalamus, the pituitary gland, and the adrenal glands, is also activated by release of CRH and AVP. This results in release of adrenocorticotropic hormone (ACTH) from the pituitary into the general bloodstream, which results in secretion of cortisol and other glucocorticoids from the adrenal cortex. These corticoids involve the whole body in the organism's response to stress.

A small increase of cortisol has some positive effects, such as:

- Quick burst of energy for survival reasons
- Heightened memory functions

- A burst of increased immunity
- Lower sensitivity to pain
- Helps maintain homeostasis in the body
- Rapidly prepares the body for action in emergency situations
- Boosts the supply of oxygen and glucose to the brain and muscles, while suppressing other non-emergency bodily processes (digestion in particular)
- Increases heart rate and stroke volume
- Dilates the pupils
- Constricts arterioles in the skin and gastrointestinal tract while dilating arterioles in skeletal muscles
- Elevates the blood sugar level by increasing catabolism of glycogen to glucose in the liver, and at the same time begins the breakdown of lipids in fat cells

However, higher and more prolonged levels of cortisol, like those associated with chronic stress, have been shown to have negative effects, such as:

- Impaired cognitive performance
- Suppressed thyroid function
- Blood sugar imbalances such as hyperglycemia
- Decreased bone density
- Decreased digestion
- Decrease in muscle tissue
- Higher blood pressure
- Lowered immunity and inflammatory responses in the body as well as other health consequences
- Increased abdominal fat, which may be associated with heart attacks, strokes, and the development of higher levels of LDL's and lower levels of HDL
- Depression
- Diabetes
- Hair loss
- Heart disease
- Impaired developmental growth in children
- Hyperthyroidism
- Obesity
- Obsessive compulsive or anxiety disorder
- Sexual dysfunction
- Tooth and gum disease
- Ulcers, which have a suppressive effect on the immune system
- Perhaps even some types of cancer

In fact, it has been estimated that as many as **90%** of doctor's visits are for symptoms that are at least partially stress related!

The maladies that are currently affecting men and women all seem to have direct relations to stress and the body's complex adaptative mechanisms to deal with that stress. Most if not all of these issues could be easily dealt with if one had the opportunity to stop working, rest on a beautiful beach without the modern electronic distractions, eat healthy food, and enjoy a perfect amount of activity each and every day. However, for the majority of us, this ideal scenario is but a distant dream.

Therefore, the next step in treating this new stress reaction would be to alter our behavior, practice meditation / yoga, and stop reacting to stress. While this sounds ideal, it is hard to fit yoga and mediation into our daily lives, where we are forced to stick it somewhere between traffic, getting the kids off to school and their programs, work, home duties, and our other too-many-to-count daily activities. So what is left to offer us hope that this vicious cycle may be broken?

Perhaps gently and through natural means, manipulating the stress reaction in our brain may just stop our body's overt and dangerous reactions. This exact premise is what has driven the creation of the new product **ReZEN** for this new type of stress reaction.

ReZEN is a gentle blend of nutrients and herbs that may offer calming relaxing emotions without a resulting sedative feeling. Early trials have elicited comments from the participants that include:

- "I find it easier to cope with my daily life"
- "I feel more energized and less fatigued to make it through my day"
- "My sleep is deeper and more restful then it has been in years"
- "My focus, concentration and short-term memory has improved substantially"
- "I just feel great!"

The ingredients in **REZEN**:

L-Theanine (gamma-glutamylethylamide or 5-N-ethyl-glutamine) is a glutamic acid analog or amino acid derivative commonly found in tea (infusions of *Camellia sinensis*) and also in the basidiomycete mushroom *Boletus badius*. In 1950 the Tea laboratory of Kyoto successfully separated theanine from Gyokuro leaf, which has the highest theanine content among all teas. Theanine is an analog to glutamine and glutamate and can cross the blood-brain barrier. It is sold in the US as a dietary supplement and is FDA confirmed as GRAS (GRAS exemptions are granted for substances that are generally recognized, among experts qualified by scientific training and experience to evaluate their safety, as having been adequately shown through scientific procedures to be safe under the conditions of their intended use).

L-Theanine can effectively cross the blood-brain barrier and has been cited in numerous research articles to create an alert yet totally relaxed state of mind without drowsiness.

In addition to relaxation, research suggests that L-theanine may have application in:

- Diminishing symptoms of PMS
- Improving learning performance
- Heightening mental acuity / neurotransmitters
- Promoting concentration
- Acting antagonistically against the paralysis induced by caffeine
- Supporting the immune system
- Lowering blood pressure
- Increasing formation of the inhibitory neurotransmitter GABA
- Increasing brain dopamine levels among other positive benefits with no known downside

GABA (gamma-aminobutyric acid) is a non-essential amino acid which acts as an inhibitory calming neurotransmitter to regulate brain and nerve cell activity by inhibiting the number of neurons firing in the brain. GABA is referred to as the "brain's natural calming agent," and by inhibiting over-stimulation of the brain, GABA may help promote relaxation and ease nervous tension.

GABA stimulates the production of Human Growth Hormone (HGH). It is HGH that has been found in studies to facilitate the metabolism of fats in the body. HGH is also known for its powerful muscle-building effects. HGH tends to decrease naturally with age, so the older you get, the harder it is to lose fat.

GABA may be an essential element in the nutritional treatment of alcoholism, attention deficit disorder, dementia, schizophrenia, stress, Parkinson's disease, and premenstrual syndrome; may be important for anorexia nervosa, bulimia, chronic fatigue syndrome, fibromyalgia, substance abuse, and Wilson's disease; and is helpful for depression and obesity.

GABA is usually deficient in both clinical and experimentally induced seizures. Low levels of GABA promote excitatory neurotransmitters and have been found in the brains of patients with multiple sclerosis, action tremors, tardive dyskinesia, and other disorders of movement.

Low GABA levels have been found in panic, anxiety, depression, alcoholism, and bipolar disorders. Vitamin B6, manganese, taurine, and lysine can increase the synthesis and effects of GABA.

Ashwagandha (*Withania somnifera*) is the Indian herb that scientists have discovered counters some of the oxidative damage generated by nervous tension. Ashwagandha has been shown to confer improvements in well-being and a healthy outlook. In a large clinical trial, Ashwagandha reduced levels of the hormone

cortisol by up to 26% while maintaining already normal blood sugar levels and already normal lipid profiles. Subjects who took the standardized Ashwagandha extract reported improvements in energy, sleep, and well-being as well as diminished fatigue. Additional research suggests that Ashwagandha confers neuro-protection by supporting the regeneration of axons and dendrites, nerve cell components that support brain and nervous system function.

Rhodiola (*Rhodiola rosea*), sometimes called Arctic root or golden root, is an adaptogenic herb, meaning that it acts in non-specific ways to increase resistance without disturbing normal biological functions. The herb grows at high altitudes in the arctic areas of Europe and Asia, and its root has been used in traditional medicine in Russia and the Scandinavian countries for centuries.

Rhodiola rosea may be effective for improving mood and alleviating depression. Pilot studies on human subjects showed that it improves physical and mental performance and may reduce fatigue.

Rhodiola rosea's effects potentially are related to optimizing serotonin and dopamine levels due to monoamine oxidase inhibition and its influence on opioid peptides such as beta-endorphins, although these specific neurochemical mechanisms have not been clearly documented with scientific studies.

Rhodiola is included among a class of plant derivatives called adaptogens which differ from chemical stimulants.

A 2002 review in *Herbalgram*, the *Journal of the American Botanical Council*, reported that over the years, numerous studies of Rhodiola in humans and animals have shown that it helps prevent fatigue, stress, and the damaging effects of oxygen deprivation. Evidence also suggests that it has an antioxidant effect, enhances immune system function, and can increase sexual energy.

A study published in 2007 in the *Nordic Journal of Psychiatry* showed that patients with mild-to-moderate depression who took a Rhodiola extract reported fewer symptoms than those who took a placebo. And a study by researchers at the University of California at Irvine found that fruit flies that ate a diet supplemented with Rhodiola lived an average of 10 percent longer than flies that didn't eat this herb.

In a double blind, randomized, placebo-controlled research study in Australia at the University of Wollongong, Rhodiola was found to be effective in tests for retention of new information.

In another similar study mentioned in *Neuropsychopharmacology*, Bacopa effects were documented for several weeks and various memory functions were tested with levels of anxiety. The study revealed the same – Bacopa decreases the rate of forgetting of newly acquired information, verbal learning rate, and memory consolidation.

In yet another study, the chronic (3 weeks to 12 weeks) administration of Bacopa showed significant improvement in speed of visual information processing by IT task, learning rate, and memory consolidation as compared to placebo. There was improvement in higher order cognitive functions that depend on memory, learning, and environmental factors.

Bacopa (*B. Monnieri*) has been extensively researched. A few of the more pertinent findings of the herb include:

- Mild To Moderate Mental Deficiency – Bacopa was tested on men with mild to moderate mental deficiency. 172 persons received Bacopa 500 mg of extract three times a day while 114 persons received placebo for one year. At the end of study, there was improvement in concentration ability, memory span, and overall mental performance in individuals taking the extract as compared with the placebo group.
- Alzheimer's Disease– Loss of cholinergic activity in hippocampus was the primary cause of Alzheimer's disease. Bacopa showed important antioxidant activity in many brain parts like the hippocampus, striatum, and frontal cortex. Further studies showed its protective effect against DNA damage in astrocytes and fibroblast cells. All this suggests its important role in Alzheimer's disease

and at the very least it could be useful in checking the progression of this disease to some extent.

- Improving Learning Skills – In this research trial, the animals were trained in a T maze. One group was not given any medicine, the second group was given Diazepam, and the third, fourth, and fifth groups were given Bacopa. After 10 days there was comparable memory and learning enhancement in the group treated with Bacopa. Biochemical studies found the Serotonin content of Bacopa groups to be more compared to the control group and the other group.

- Stress – In this study on rats, Bacopa showed the potential to be effective in stress. The response had been better in the group that was pretreated for one week with 20 to 40 mg/kg/daily of it even before exposing to stress. The level of Hsp70 increases in brain as a response to stress. After giving Bacopa for seven days, and then giving stress to animals, the Hsp70 was found in lower concentration in animals pretreated with Bacopa. The two P450 enzymes respond differently to Bacopa. These two enzymes EROD and PROD levels in pretreated rats were found more even before exposure to stress. Thus Bacopa primed the brain for stress by stockpiling these useful enzymes even before the stressful conditions were introduced. Our susceptibility to stress could therefore likewise potentially be lowered by using this medicinal herb.

- Anxiety – Another one-month study on diagnosed anxiety neurosis patients using syrup Bacopa equivalent to 12 gm of crude powder found significant reduction in anxiety symptoms, level of disability, and fatigue. There was additional increase in immediate memory, decreased respiratory rate, and decreased SBP or systolic blood pressure.

- Depression – Bacopa extract in the dose of 20 to 40 mg per kg was given once daily for five days and it was found comparable to the standard anti-depressant drug Imipramine in anti-depressant activity in rodent animals.

- ADD / Hyperactive Children – A double blind study at BRD Medical College at Gorakhpur, India, on children with ADHD (Attention Deficit Disorder) showed benefit after 12 weeks of Bacopa use in sentence repetition, logical memory, and paired associated learning tasks. The children were given the test four weeks after the Bacopa had been withdrawn and it affirms its lasting impact.

Acetylcarnitine (acetyl l carnitine, acetyl-l carnitine, or l-acetylcarnitine and carnitine) play several important roles in the human body. These nutrients shuttle acetyl groups and fatty acids into mitochondria for energy production. Without carnitine, fatty acids cannot easily enter into mitochondria. The acetyl group of acetyl l carnitine is used to form acetyl-CoA, the most important intermediary in the generation of energy from amino acids, fats, and carbohydrates. Therefore, acetyl l carnitine serves as an energy reservoir of acetyl groups and both acetylcarnitine and carnitine help improve energy production. The acetyl group of acetyl l carnitine is also used to make the important brain chemical acetylcholine. Some studies suggest that perhaps acetyl l carnitine can even act as a neurotransmitter itself. This name of this nutrient is sometimes abbreviated as ALC or ALCAR.

Those who take carnitine supplements notice an increase in physical energy but not as much mental energy. Acetyl l carnitine has a significantly more immediate and noticeable mental effect than carnitine because it crosses into the brain much better. The mind-boosting effect of ALC is often noticed within a few hours, or even within an hour. Most people report feeling mentally sharper, having more focus, and being more alert. Some find a mild mood enhancement.

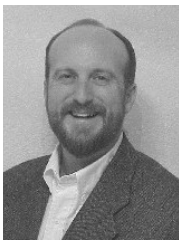
It also supports normal memory function and concentration through increasing levels of Acetylcholine. Acetylcholine is an important neurotransmitter and is often reduced in the in the aged with memory related problems.

N-Acetyl Carnitine is also believed to lessen oxidative stress and damage in the brain, helps in the regeneration and repair of neurons, and slows neuronal decline. It promotes healthy aging of the nervous system. Carnitine is often low in people with various types of neuropathy.

Pyridoxine (one of the compounds that can be called vitamin B6, along with pyridoxal and pyridoxamine) is converted in erythrocytes to pyridoxal phosphate and to a lesser extent pyridoxamine phosphate, which act as coenzymes for various metabolic functions affecting protein, carbohydrate, and lipid utilization. It functions as a coenzyme essential for the synthesis and breakdown of amino acids, the conversion of tryptophan to niacin, the breakdown of glycogen to glucose 1-phosphate, the production of antibodies, the formation of heme in hemoglobin, the formation of hormones important in brain function, the proper absorption of vitamin B12, the production of hydrochloric acid and magnesium, and the maintenance of the balance of sodium and potassium, which regulates body fluids and the functioning of the nervous and musculoskeletal systems. The need for increased amounts of pyridoxine is related to protein intake and occurs during pregnancy, lactation, exposure to radiation, cardiac failure, aging, and use of oral contraceptives.

SUMMARY

While the research and arguments for including these ingredients into a comprehensive "new" stress formula are strong, the manufactures of **REZEN** are not suggesting in any way that this product may treat any associated diseases or conditions. Instead each ingredient and its specific source and content has been carefully selected to aid the body in its ongoing battle against this "new" stress. We do not wish to suggest that practitioners should stop recommending or taking any of the products that you have been successfully implementing, but instead, add **REZEN** to your arsenal. See if in some small but meaningful way your patients do not feel less stressed and respond that much better to your normal course of therapy. We believe that you will enjoy and love **REZEN** as much as we do!



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Dr. Robert Greenberg received his Ph.D. in Biochemistry from the University of Virginia and a Doctorate of Chiropractic from the Logan College of Chiropractic. A health care professional for almost 30 years, Dr. Greenberg has been a chiropractor and the owner of two integrative health centers as well as a biological technology company. He is an inventor, a patent holder, a lecturer that has travelled the world, a nutritional product formulator, and a developer of numerous assessment and clinical devices.

FDA Disclaimer

*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

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