Immunotec®

Everything you need to know about

Glutathione


Immunotec®

TABLE OF CONTENTS

07

COMMON GLUTATHIONE MYTHS DEBUNKED

- Myth #1: Glutathione is a skin bleaching agent
- Myth #2: Glutathione is for women
- Myth #3: Glutathione can be harmful
- Myth #4: Glutathione IV is the best way to increase glutathione levels
- Myth #5: To increase glutathione, you need to supplement it

08

FREQUENTLY ASKED QUESTIONS ABOUT GLUTATHIONE

- How does glutathione interact with other medications?
- Can glutathione levels be tested? If so, how?
- Are there any age-specific recommendations for glutathione intake or supplementation?
- What is the relationship between glutathione and chronic diseases other than those covered?
- Does exercise increase glutathione levels?
- Can glutathione prompt hair growth or promote hair health?

09

HEALTH MATTERS. IMMUNOCAL®WORKS

- How do you actually raise your glutathione levels in a way your body can use?
- The Immunocal® Advantage: What Makes It Different?
- Immunocal® works with your biology, not against it.
- Why Other Glutathione Products Can't Compete
- Clinically Proven. Globally Recognized. Uniquely Patented
- The Most Trusted Name in Immune Health
- One Innovation three Powerful Powerful Formulas

01

INTRODUCTION TO GLUTATHIONE

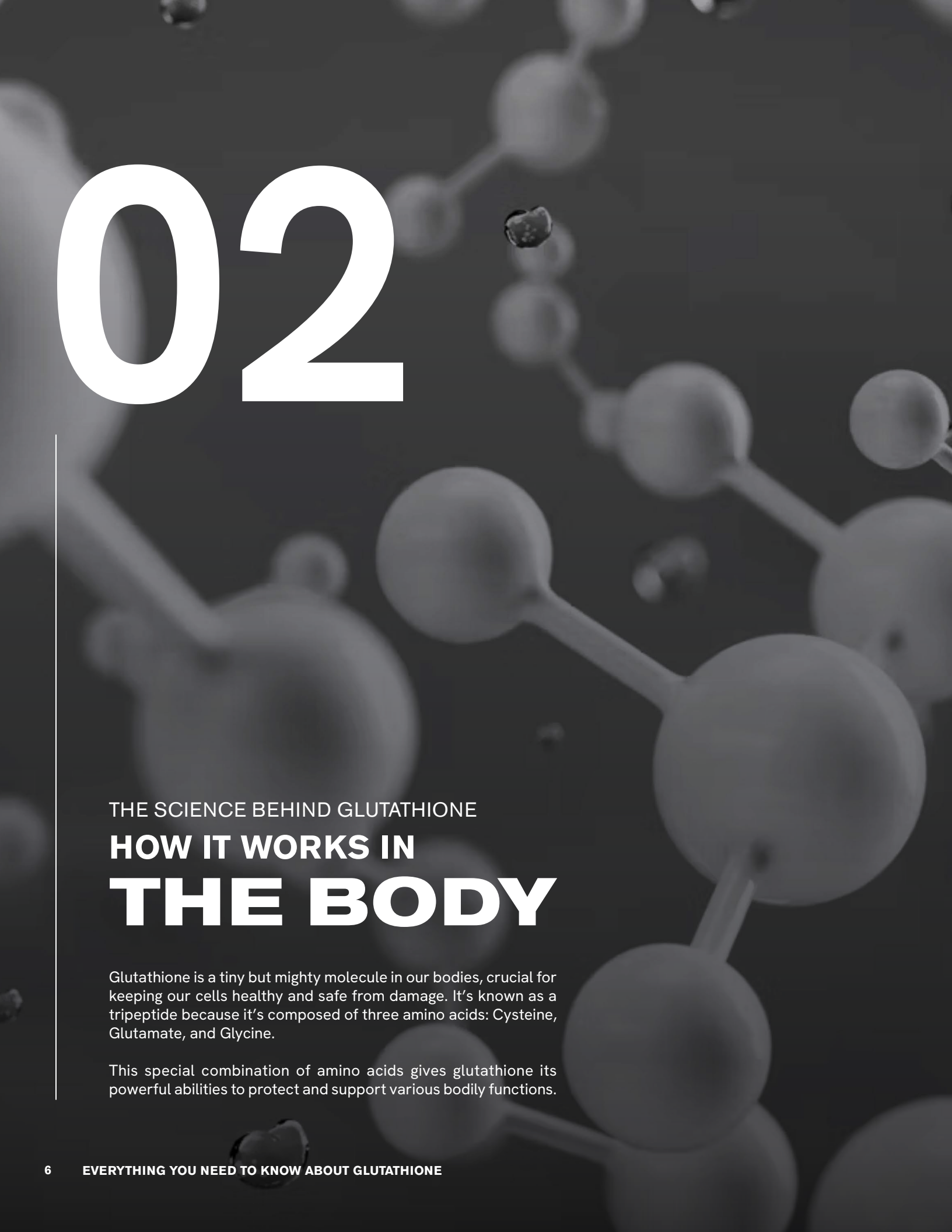
UNDERSTANDING THE BODY ANTIOXIDANT

YOUR BODY

A vibrant, busy, complex city, where every cell is like a tiny house.
Just as a city struggles with pollution on a day-to-day basis, your cells face threats from harmful molecules known as free radicals, created by stress and disease. If unchecked, they can cause damage, disease and inhibit our quality of life.

GLUTATHIONE TO THE RESCUE!

Your city's waste management.
This small, but powerful molecule patrols the streets, picking up your city's trash and upcycling them into less harmful substances.



02

THE SCIENCE BEHIND GLUTATHIONE

HOW IT WORKS IN THE BODY

Glutathione is a tiny but mighty molecule in our bodies, crucial for keeping our cells healthy and safe from damage. It's known as a tripeptide because it's composed of three amino acids: Cysteine, Glutamate, and Glycine.

This special combination of amino acids gives glutathione its powerful abilities to protect and support various bodily functions.

DNA

A RELIABLE GUARDIAN OF YOUR CELLS

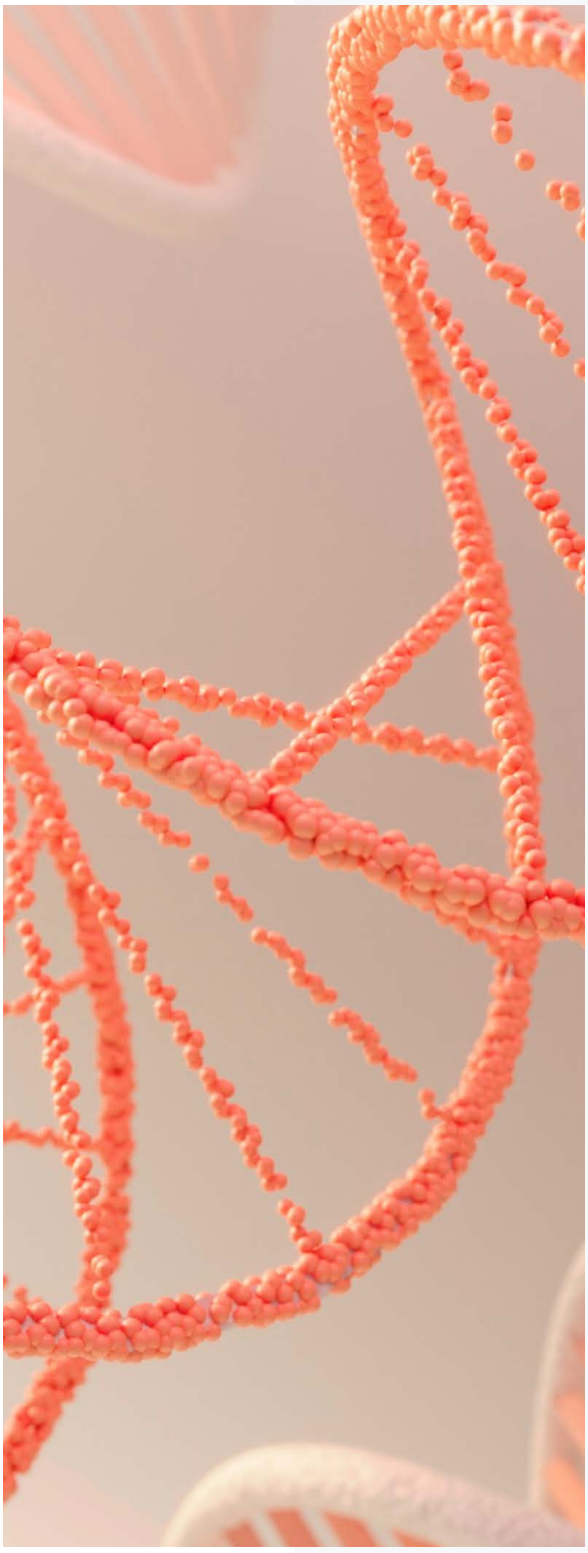
One of the primary functions of glutathione is to protect the integrity of cells by neutralizing harmful free radicals, which are produced both through normal metabolic processes and in response to environmental stressors. By converting free radicals into less harmful substances that the body can eliminate, glutathione helps prevent cellular damage and aging.

HELPS YOUR LIVER DETOXIFY

Glutathione also plays a significant role in the metabolism of toxins and carcinogens, directly participating in the neutralization and solubilization of these harmful compounds. This process is crucial for the liver, the body's main detoxification organ.

PROTECTS YOUR GENETIC BLUEPRINT

Glutathione participates in the synthesis and repair of DNA. This role is crucial for maintaining the genetic code's integrity and ensuring proper cell function and division. Moreover, glutathione influences the expression of genes, such as those involved in the body's detoxification and immune responses.



ADAPTS PROTEIN FUNCTION TO YOUR BODY'S NEEDS

Glutathione affects protein function through a process known as S-glutathionylation. This unique process is a bit like a switch for proteins in our cells, helping them react to changes in the cell's environment. Inside our cells, there's a delicate balance needed to keep everything running smoothly, known as redox homeostasis. This balance helps the cell manage its internal environment, especially how it handles oxidative stress, which can damage cells.

KEEPS IRON IN CHECK

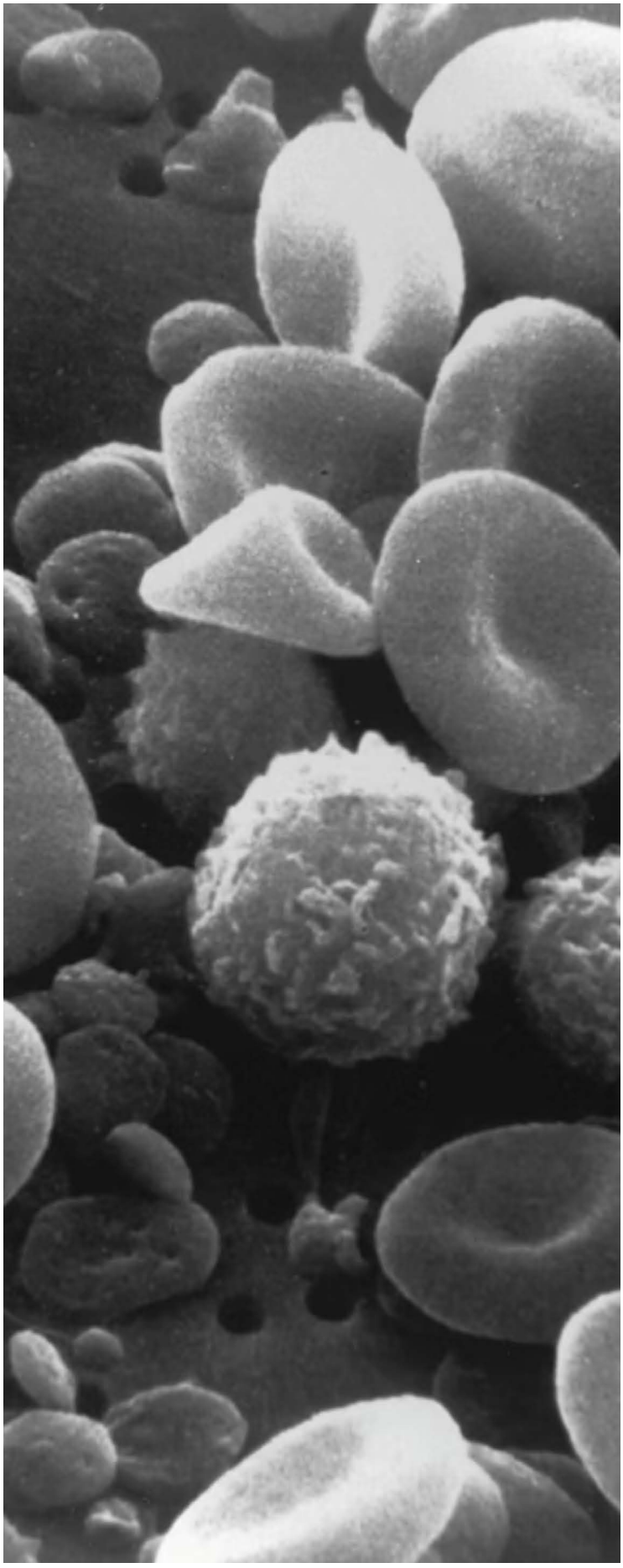
Regulating iron levels is crucial for our health because both elevated and low levels can lead to serious health issues. Too much iron can cause oxidative damage, leading to organ damage, while too little can result in anemia, weakening the immune system and reducing energy levels.

Glutathione helps manage these risks by maintaining iron in its reduced, soluble form, which is essential for the body to use it properly. This role of glutathione is important not only for preventing iron-induced oxidative damage but also for supporting the healthy function of red blood cells and facilitating other iron-dependent processes in the body.

PROTECTS YOUR LUNGS

The lungs utilize more glutathione than any other organ. It contributes to the antioxidant defense against the air's oxygen-rich environment and other airborne pollutants. It helps maintain lung integrity and function by protecting epithelial lung cells against oxidative stress and inflammation.

It's a dynamic regulatory mechanism that helps adapt cellular activities to changing conditions, particularly in stress responses.



MAINTAINS A HEALTHY DOSE OF PROGRAMMED CELL DEATH

Glutathione levels in cells can influence cellular aging and apoptosis (programmed cell death), processes vital for preventing cancer and maintaining tissue health. Adequate glutathione levels help to prevent unnecessary cellular apoptosis by reducing oxidative stress, whereas a deficiency might accelerate the aging process and contribute to the development of various diseases.

ALSO REGENERATES OTHER ANTIOXIDANTS

Glutathione also plays a crucial role in keeping other antioxidants, like vitamins C, E, and A, effective. After these antioxidants do their job and neutralize harmful free radicals, they lose their active form. Glutathione steps in to recharge them, restoring their ability to fight off damage again.

CAN GLUTATHIONE BE DEPLETED?

Yes. There are several nutrients and lifestyle habits that have been shown to affect glutathione levels, such as:

- Smoking
- Alcohol
- Excess fat in the body
- Certain medications
- B vitamins and vitamin C
- Carnitine
- Alpha-lipoic acid
- Selenium
- Cysteine
- Glutamine
- Glycine

Disclaimer: Of course, this doesn't mean you should skip out on getting your recommended daily allowance of essential nutrients, but it highlights one potential downside of excess nutrient intake.

03

BOOSTING IMMUNE FUNCTION WITH GLUTATHIONE

STRENGTHENING YOUR BODY'S DEFENSES

As mentioned earlier, plays a critical role in maintaining and enhancing the immune system's functionality.

REGULATING IMMUNE BALANCE

Glutathione is like the conductor of an orchestra, ensuring the body's immune system responds harmoniously to threats. It balances the first quick-action defenses (innate immunity) and the more calculated, targeted responses (adaptive immunity) against invaders.

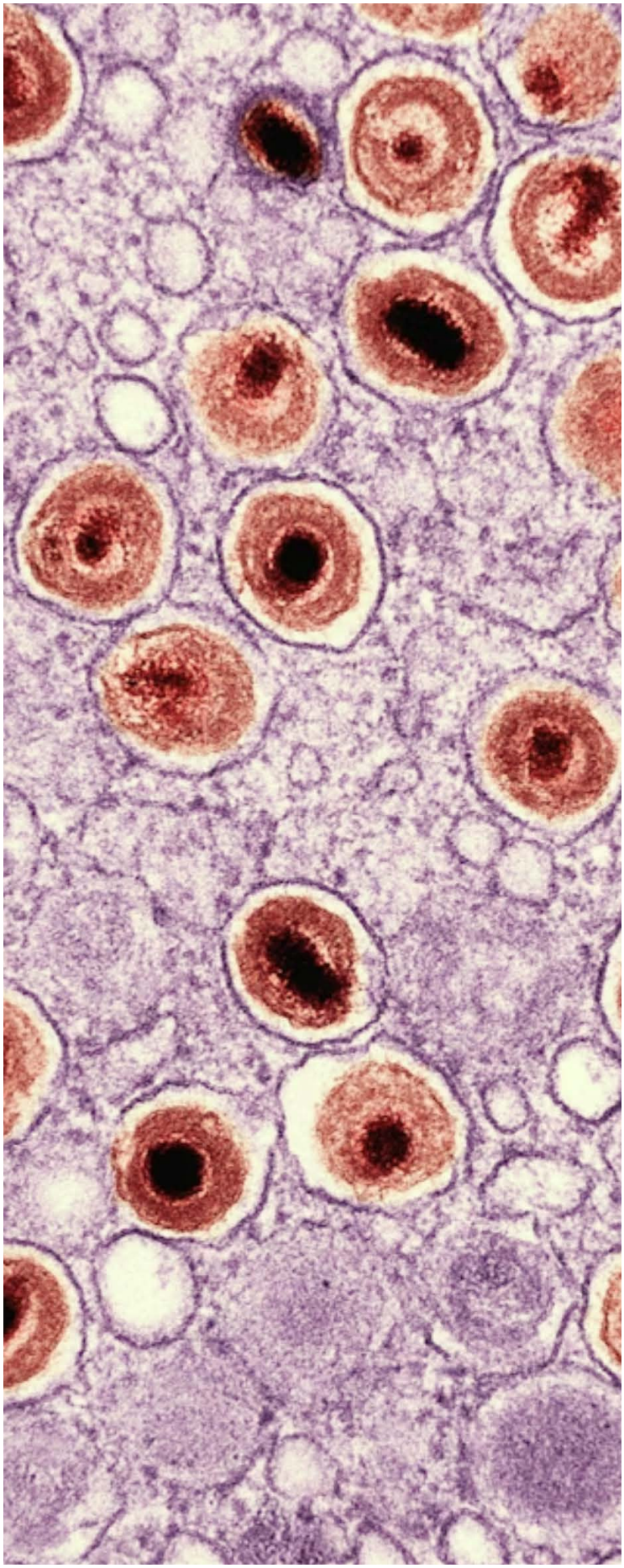
By keeping glutathione levels optimal, our bodies can coordinate these defenses smoothly, preventing the kind of inflammation that might otherwise spiral into serious health issues like organ failure.

ENHANCING T-CELL FUNCTION

One of the key roles of glutathione is its involvement in the lifecycle and efficacy of T-cells, a type of lymphocyte that forms the backbone of the adaptive immune system. Glutathione enhances the function of three types of T-cells:

- Helper T-cells: Identify and mark pathogens for destruction.
- Killer T-cells: Destroy the pathogens marked by helper T-cells.
- Suppressor T-cells: Wind down the immune response after the threat is neutralized to prevent excessive inflammation.

Glutathione helps these cells metabolically reprogram and differentiate, enabling them to innitiate adapted immune responses.



PROTECTION

SUPPORTING CYTOKINE PRODUCTION

Glutathione maintains normal levels of cytokines, the signaling proteins that orchestrate the immune response. By ensuring effective communication between cells, glutathione supports the activation of B-cells, which are responsible for producing antibodies, thereby enhancing the body's ability to fight off complex infections.

PROTECTING MAST CELLS

Mast cells are like guards stationed at the gates (the respiratory system), the primary entry points for airborne invaders, such as viruses, bacteria and fungi. Exposed to constant threats from pollutants and pathogens, these cells rely heavily on glutathione to maintain their defenses.

In summary, glutathione not only enhances the function and coordination of various immune cells but also protects them from the oxidative stress that can occur during intense immune responses. By supporting glutathione levels through diet, lifestyle choices, and possibly supplementation, individuals can help strengthen their immune defenses, thereby enhancing their ability to prevent and fight infections.

04

GLUTATHIONE AND DETOXIFICATION

SUPPORTING YOUR BODY'S NATURAL CLEANSING PROCESSES

Glutathione is crucial for detoxification, helping to cleanse the body of harmful substances that accumulate from both external pollutants and internal metabolic processes. Thus, it comes as no surprise, that glutathione is particularly present in the lungs and the liver.

PHASE II DETOXIFICATION IN THE LIVER

Glutathione is pivotal in the liver's phase II detoxification pathway. Here it conjugates toxins to make them water-soluble, so your body can excrete them. This process is vital for clearing out drugs, environmental toxins, and carcinogens.

Researchers have used an innovative tool called the "thiol-activatable fluorescent gold nanoprobe." This probe travels to the liver and can visualize the detoxification processes. These observations revealed, that:

- As glutathione is released from liver cells, it elevates the concentrations of both glutathione and cysteine in the liver's specialized, capillary-like blood vessels (the so-called "sinusoids".

- This increase alters the surface chemistry of the nanoparticles.

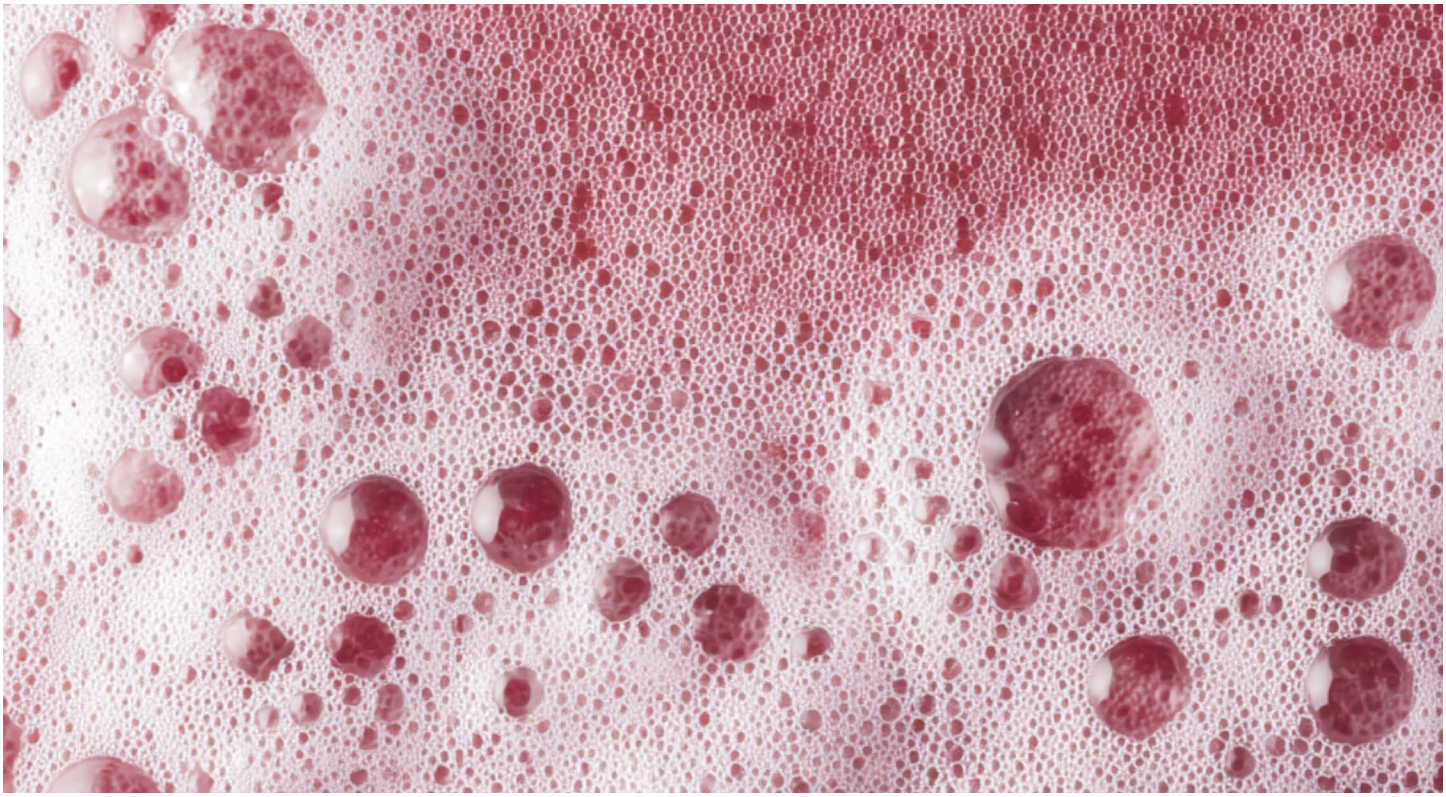
- The new surface chemistry enables nanoparticles to be removed quicker from the bloodstream. Including damage to organs and the nervous system. Researchers have suggested, that glutathione acts like a magnet for heavy metals. This process is known as chelation. Glutathione grabs onto heavy metal ions, binding with them to form a complex. This binding is important because it transforms the heavy metals into a form that the body can handle more easily. Instead of floating freely and causing damage, these metals are now "escorted" safely out of the body, primarily through the liver and kidneys.

TRANSFORMING AND REMOVING NANOPARTICLES

In addition to its traditional detox role, glutathione is crucial for managing newer challenges such as nanoparticles. These tiny particles, often used in medicine and other technologies, can accumulate in the body if not properly processed, leading to potential toxicity. To understand glutathione's interaction with nanoparticles.

REMOVING HEAVY METALS

Heavy metals like lead, mercury, and arsenic are harmful pollutants that can sneak into our bodies through things like contaminated water, ood, and even some industrial work environments. Once inside, they can cause serious health issues,



05

GLUTATHIONE FOR HEALTHY AGING & SKIN

REVERSING
THE EFFECTS OF OXIDATIVE STRESS

UNDERSTANDING OXIDATIVE STRESS AND AGING

Oxidative stress, caused by an imbalance between free radicals and antioxidants in the body, is a major contributor to aging. Over time, exposure to environmental pollutants, UV radiation, and other stressors accelerates this process, leading to visible signs of aging such as wrinkles, fine lines, and loss of skins elasticity.

THE ROLE OF GLUTATHIONE IN HEALTHY AGING AND SKIN

In the quest for maintaining skin health and combating various dermatological conditions, glutathione supplementation emerges as a promising area of interest.

As our bodies contend with daily assaults from environmental pollutants, UV rays, and other stressors, glutathione Known as the body's "master antioxidant," stands as a first line of defense. It helps neutralize harmful free radicals that not only accelerate skin aging but also contribute to various skin conditions and inflammation. By bolstering our antioxidant defenses, glutathione supplementation holds the promise of mitigating these detrimental effects, thus preserving both the health and aesthetic quality of our skin.

HOW OXIDATIVE STRESS AFFECTS SKIN

Oxidative stress is a critical factor affecting skin health, characterized by an imbalance between harmful free radicals and the body's ability to counteract their damaging effects. This imbalance can lead to inflammation, premature aging, and a variety of skin conditions.

The skin, which is the body's largest organ, acts as a protective barrier against environmental challenges such as UV radiation, pollution, and chemical exposure. These elements can produce free radicals, unstable molecules that cause damage to DNA, proteins, and lipids, contributing to skin aging and the development of skin diseases.

GLUTATHIONE AGAINST OXIDATIVE DAMAGE

Present in every cell, glutathione plays a critical role in neutralizing free radicals, thereby mitigating oxidative stress. It also helps regenerate other antioxidants, like vitamin C and E, enhancing the body's overall defense against oxidative damage.

PSORIASIS

When you have Psoriasis, your skin is in overdrive, shedding and renewing at hyper speed. That's psoriasis for you. It's not just a harmless skin condition; it feels like your skin's throwing a tantrum, with red, scaly patches that can itch or sting. Aside from physical discomfort, psoriasis can also have a significant emotional impact, affecting self-esteem and social interactions.

Psoriasis is a persistent condition that not only affects the skin but may also increase the risk for other health issues, such as heart disease and diabetes. The underlying causes are complex, involving an immune response that mistakenly attacks healthy skin cells, influenced by both genetic predispositions and environmental factors.

COULD GLUTATHIONE REVOLUTIONIZE PSORIASIS MANAGEMENT?

Could glutathione revolutionize Psoriasis management? This powerful antioxidant combats oxidative stress, which in turn may alleviate the symptoms of psoriasis.

The study conducted by the Washington Dermatology Center provided promising preliminary evidence that a diet supplemented with a special whey protein, aimed at boosting glutathione levels, could lead to improvements in psoriasis symptoms for all participants.

These findings ignite interest in the broader implications of diet on psoriasis, suggesting that nutritional strategies might play a significant role in managing this challenging condition. However, several critical questions remain unanswered. For instance:

- How do other glutathione precursors affect psoriasis symptoms?
- Which dietary sources or supplements best increase glutathione levels for psoriasis patients?
- What are the long-term effects of glutathione-related interventions on psoriasis and health?

ACNE

Acne vulgaris, a widespread skin condition characterized by pimples, blackheads, whiteheads, and occasionally cysts and nodules, commonly affects individuals at various stages of their life.

This condition arises from the blockage of hair follicles with oil and dead skin cells, leading to inflammation. Although it doesn't involve systemic symptoms like eczema, its impact on self-esteem and emotional well-being on folks from all walks of life is not to be underestimated.

CAN GLUTATHIONE HELP COMBAT ACNE?

Results from a Turkish study suggest, that oxidative damage might play a role in the manifestation of acne. As mentioned, glutathione combats oxidative stress and helps to detoxify harmful substances, which can influence the health and appearance of the skin.

A study by the Ikeno Clinic of Dermatology and Dermatologic Surgery, sheds light on the potential link between glutathione levels and acne vulgaris. Their study explored the hypothesis that acne vulgaris might be associated with variations in antioxidative activity, particularly the levels of glutathione in the skin.

The study found that the quantity of glutathione in the outermost layer of the skin of acne patients was significantly lower than that in healthy subjects, indicating a diminished antioxidative defense mechanism in those with acne.

Some important questions, researchers need to answer regarding acne and glutathione:

- Is the supplementation of Glutathione precursors effective against acne?
- How effective is a glutathione-enriched lotion against acne?
- If a glutathione-based treatment proves to be effective, does it need to be continued to prevent future flare-ups?

In a nutshell, the researchers concluded that a decrease in glutathione may contribute to the pathogenic development of acne by lowering your skin's antioxidative.

TWO FORMS OF GLUTATHIONE PUT TO THE TEST!

Glutathione exists in two forms:

1. the reduced form (GSH) and
2. the oxidized form (GSSG)

...both of which play crucial roles in the body's antioxidant defense system.

A placebo controlled study by Thai researchers aimed to evaluate the effects of both forms of glutathione at doses of 250 mg/day—on various skin properties. Conducted as a randomized, double-blind, placebo-controlled trial, the research involved healthy female participants divided into three groups:

1) those receiving GSH,
2) those receiving GSSG,
3) and those given a placebo, over a period of 12 weeks.

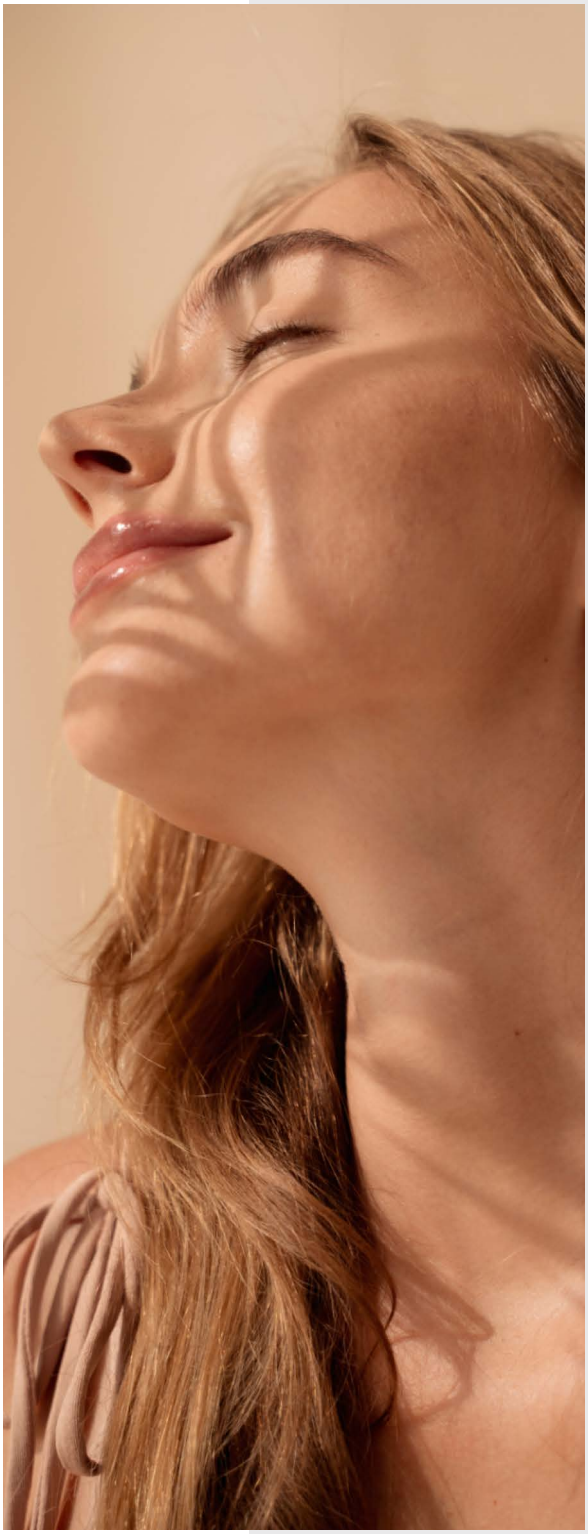
KEY FINDINGS FROM THE STUDY

- Skin Lightening and UV Protection: Both GSH and GSSG groups showed a tendency toward a lower melanin index and fewer UV spots on all evaluated sites, including the face and arms, compared to the placebo group. This suggests that glutathione can contribute to skin lightening and may offer protective effects against UV-induced skin damage.

- Reduction in Wrinkles: Those lucky enough to get GSH noticed their wrinkles smoothing out more than the no-supplement crowd. It seems like glutathione doesn't just sit back; it dives into action, working on making skin look smoother and younger.

- Increased Skin Elasticity: There was a trend toward increased skin elasticity in both GSH and GSSG groups when compared with placebo, suggesting that glutathione supplementation might help in enhancing skin firmness and elasticity.

- No serious side effects were reported throughout the study duration.



DO YOU HAVE TO INGEST GLUTATHIONE OR CAN IT BE APPLIED DIRECTLY ON THE SKIN?

The aforementioned study focused on systemic glutathione supplementation. Ultimately, researchers asked themselves, if similar effects could be achieved by simply applying glutathione lotion to your skin.

Consequently, a placebo-controlled study was conducted to examine the effects of topical GSSG.

Healthy women between the ages of 30 to 50 were instructed to apply a 2% GSSG lotion to one side of the face and a placebo lotion on the other (a so-called "split-face" study) twice a day.

For dermatologists, these split-face studies are fantastic because they offer a clear, direct comparison of a treatment's effects against a placebo on the same individual.

For 10 weeks, the researchers looked at various skin parameters, such as:

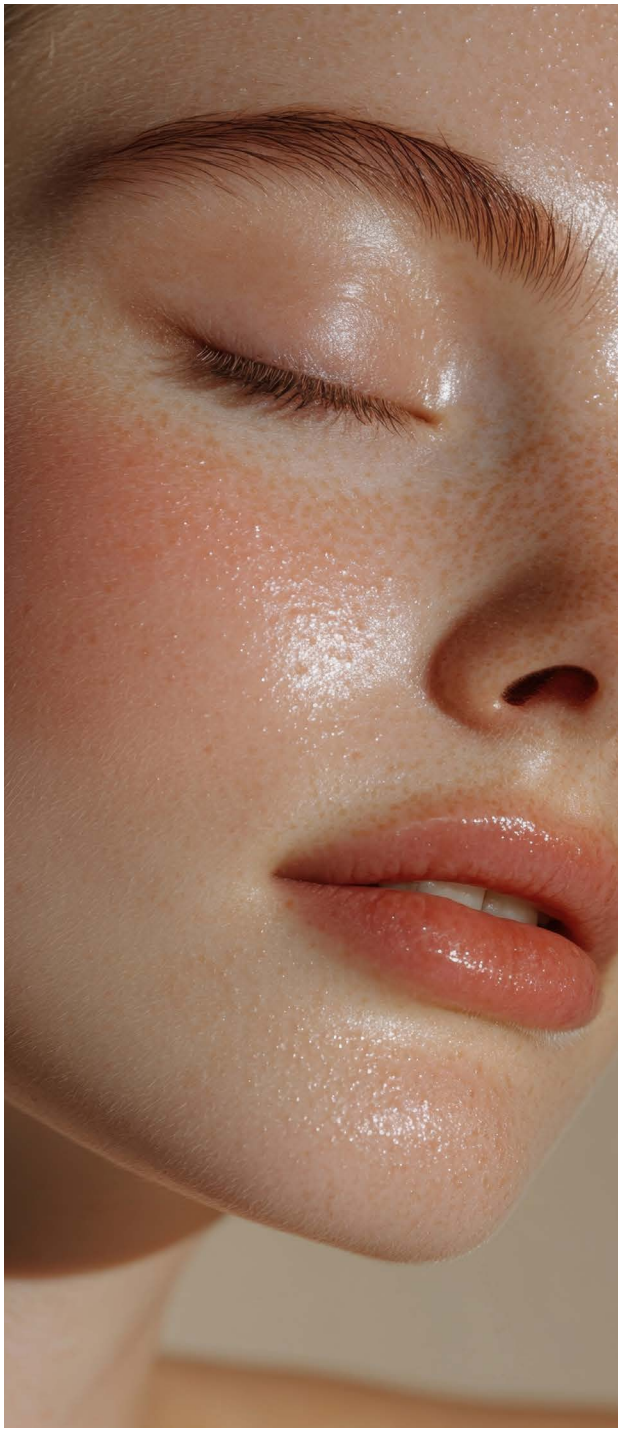
- Elasticity
- Melanin index
- Moisture content
- Skin smoothness
- Subjective assessments of skin whitening
- Wrinkle formation
- Wrinkle reduction

THE FASCINATING RESULTS

- GSSG treatment significantly reduced the skin melanin index early in the trial, maintaining this effect throughout the 10 weeks, supporting its skin-whitening capability.

- The latter half of the study saw significant improvements in moisture content, wrinkle suppression, and skin smoothness at GSSG-treated sites.

- Again, no significant adverse effects were observed.



ECZEMA

Eczema, or atopic dermatitis, turns your skin into a real drama queen – think red, itchy, and totally overreacting.

Eczema is chronic and tends to flare periodically. It may be accompanied by asthma or hay fever. The skin affected by eczema can become cracked, rough, and sensitive.

While we don't know exactly why eczema crashes the party, it seems to be a mix of genetics and environment that makes the immune system go on a skin-attacking spree.

HOW DOES GLUTATHIONE AFFECT ECZEMA?

A publication from the Sapienza University of Rome emphasizes glutathione as a pivotal element in autoimmune diseases, including eczema.

Glutathione's capacity to modulate the immune response and reduce oxidative stress is central to its beneficial effects in managing autoimmune conditions. The study underscores the antioxidant's therapeutic potential, suggesting that enhancing glutathione levels could mitigate the autoimmune reactions contributing to eczema.

While these results are promising, there are two major questions left unanswered:

- Could pumping up our glutathione levels be a game-changer for those with eczema?

- And the big one: If glutathione is so great at managing autoimmune issues, how can we use it best to help with eczema flare-ups? Which type of glutathione is best and should it be injected, swallowed or applied as a lotion?

06

GLUTATHIONE AND AUTO-IMMUNE CONDITIONS

EXPLORING ITS ROLE IN DISEASE

PREVENTION
AND MANAGEMENT

Autoimmune diseases are like a home security system gone haywire, attacking the very residents it's supposed to protect.

They are characterized by the body's immune system mistakenly attacking its own tissues. These conditions are often accompanied by chronic inflammation, which can lead to increased oxidative stress—a scenario where the production of potentially harmful molecules called free radicals overwhelms the body's ability to neutralize them.

Some of the more common autoimmune disorders are:

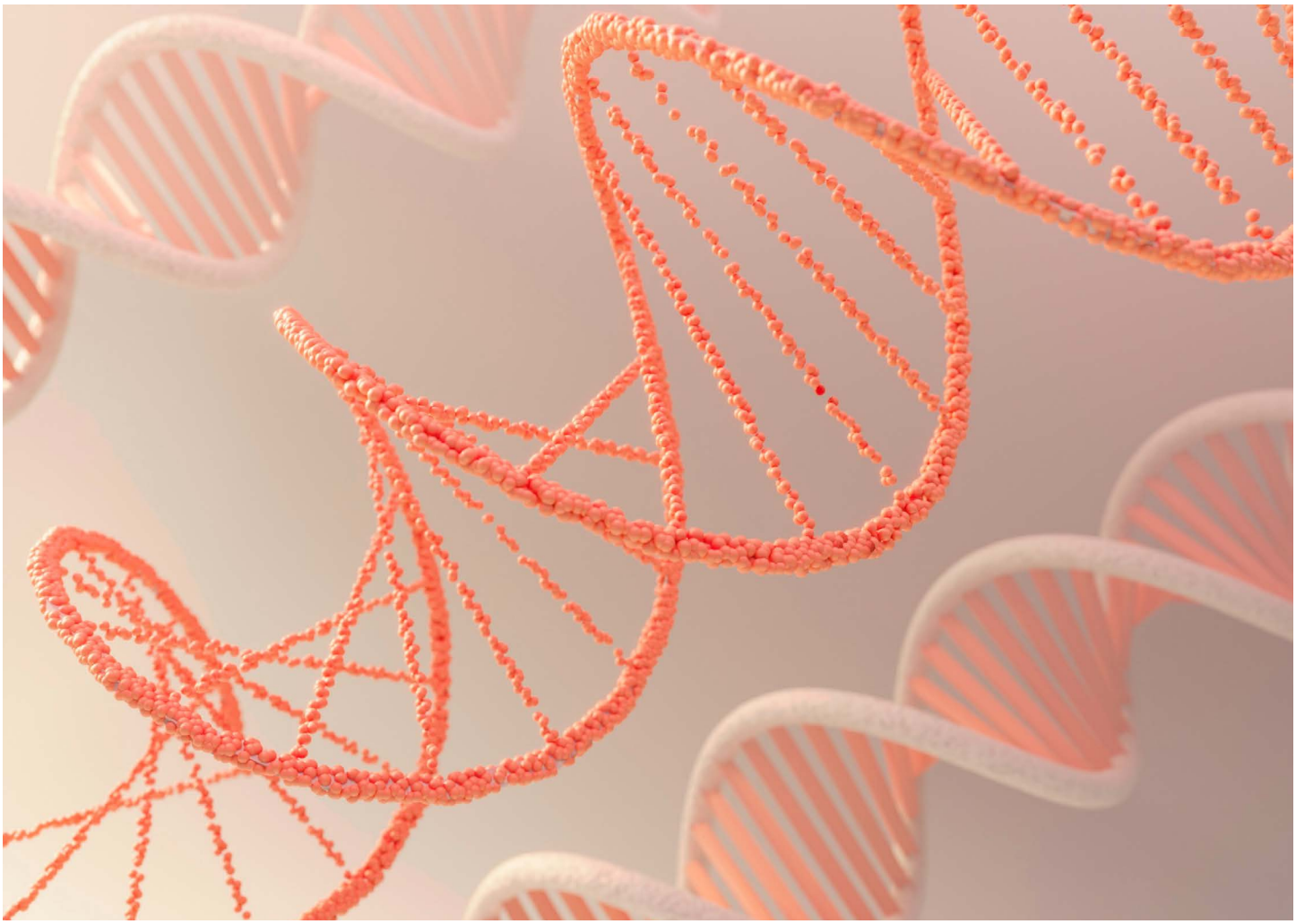
- Rheumatoid arthritis
- Celiac disease
- Multiple Sclerosis
- Grave's disease
- Hashimoto's thyroiditis
- Lupus

HOW GLUTATHIONE MAY HELP

Think of glutathione as a thermostat for your body's immune system. Just like a thermostat regulates the temperature—keeping it from getting too hot or too cold—glutathione helps balance your immune response. It turns up the heat when needed to fight off threats but also cools things down to prevent excessive inflammation that can lead to tissue damage.

Additionally, it acts like a shield for the mitochondria, the power plants of our cells, protecting them from the onslaught of harmful molecules called free radicals.

This is especially crucial in autoimmune diseases, where inflammation often launches a direct attack on these vital structures.



RHEUMATOID ARTHRITIS (RA)

Rheumatoid arthritis is an autoimmune disease where the immune system primarily attacks the joints, causing swelling, pain, and over time, joint damage and disability. Chronic inflammation plays a central role in RA, contributing to ongoing oxidative stress and joint degradation.

GLUTATHIONE'S IMPACT ON RHEUMATOID ARTHRITIS

One promising approach in the treatment of RA involves using a special form of glutathione called liposomal glutathione. This form is encapsulated within nanoscale liposomes, which are tiny, spherical structures that can deliver the antioxidant directly to the inflamed tissues where it's most needed. This targeted delivery is particularly beneficial in RA, where inflammation tends to be localized but intense.

A study has shown that liposomal glutathione can significantly decrease several key markers of inflammation and oxidative stress in the context of rheumatoid arthritis. These include:

- Malondialdehyde (MDA): A marker for oxidative stress, indicating cell damage due to inflammation.
- C-reactive protein (CRP): A substance produced by the liver in response to inflammation.
- Rheumatoid Factor (RF): An antibody found in the blood that is indicative of inflammatory activity typical in RA.

By lowering these markers, liposomal glutathione not only helps reduce inflammation but also minimizes the oxidative stress associated with RA. This dual effect can potentially ease symptoms, decrease the progression of joint damage, and improve overall quality of life for patients.

Traditional treatments for RA include non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroids, which, while effective, can have serious side effects like gastrointestinal bleeding, increased risk of infections, and liver toxicity. In contrast, liposomal glutathione offers a potentially safer alternative that works by enhancing the body's natural antioxidant defenses rather than suppressing the immune system.

HOWEVER, THERE ARE STILL SOME QUESTIONS THAT RESEARCHERS ARE STRIVING TO ANSWER, SUCH AS:

- How does glutathione treatment compare in efficacy to more traditional therapies over extended periods?

- What is the optimal dosage and method of administration for achieving the best outcomes in RA treatment?

- Does glutathione slow the progression of RA over time, and if so, to what extent?

PREVENTION

CELIAC DISEASE

Celiac disease is another autoimmune disorder where the ingestion of gluten (from wheat, rye, or barley) triggers an immune response that damages the small intestine. This results in symptoms like diarrhea, bloating, and malnutrition due to impaired nutrient absorption. The only current treatment for celiac disease is a strict lifelong gluten-free diet.

GLUTATHIONE'S IMPACT ON CELIAC DISEASE

In celiac disease, the small intestine constantly battles against inflammation triggered by gluten. Here, glutathione (GSH) plays a significant role. It's primarily tasked with protecting cells by neutralizing reactive oxygen species (ROS) – harmful molecules that result from oxidative stress, which is prevalent in inflammatory conditions like celiac disease.

Research indicates that in celiac patients, the glutathione redox cycle is impaired, leading to a reduced ability to detoxify ROS and lipid hydroperoxides (LOOH) – other markers of oxidative damage in the body. This dysfunction contributes to the ongoing damage seen in the intestinal mucosa of individuals with celiac disease.

IN A NUTSHELL:

▪ Gluten consumption triggers an immune response in the small intestine of celiac disease patients.

▪ This leads to increased oxidative stress with higher levels of reactive oxygen species (ROS).

▪ Normally neutralizes ROS to protect cells, but its function is impaired in celiac patients.

▪ Due to reduced glutathione activity, oxidative stress damages intestinal mucosa.

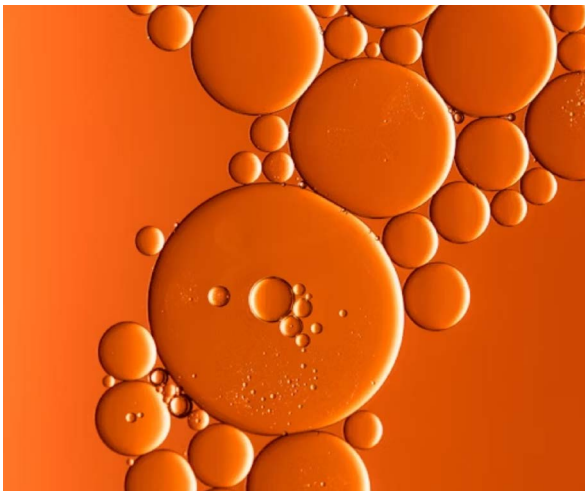
Boosting glutathione levels through diet or supplements could potentially benefit those with celiac disease. By restoring the balance of antioxidants, it's possible to mitigate some of the oxidative stress and thus, the associated intestinal damage and systemic symptoms of celiac disease. Studies suggest that even after years on a gluten-free diet, the glutathione levels in celiac patients remain compromised, underscoring the potential for supplementation.

Unfortunately, no studies to determine a causal relationship have been conducted thus far, leaving the following crucial questions unanswered for now:

▪ How effective is glutathione supplementation in restoring normal antioxidant function in the gut and overall health in celiac patients?

▪ Does increasing glutathione levels improve the efficacy of the gluten-free diet in healing intestinal damage more rapidly?

▪ Can we further elucidate the precise mechanisms by which glutathione supports intestinal healing and reduces oxidative stress in celiac disease?



HASHIMOTO'S THYROIDITIS

Hashimoto's Thyroiditis, often just called HT, is a relatively common condition (around 7.5 % prevalence) where your immune system mistakenly attacks your thyroid gland. This attack causes ongoing inflammation and can slow down your thyroid, leading to what's known as hypothyroidism. When your thyroid isn't working as it should, you might start feeling really tired, gain weight more easily, become more sensitive to cold, and even feel down or depressed.

GLUTATHIONE'S IMPACT ON HASHIMOTO'S THYROIDITIS

Research points to oxidative stress playing a major role in the development of Hashimoto's Thyroiditis (HT). Oxidative stress happens when there's too much production of harmful molecules called free radicals and not enough antioxidants in the body to neutralize them. In HT, this issue is highlighted by low levels of glutathione and the enzymes that work with it, which are crucial for getting rid of these damaging free radicals. This imbalance can contribute to the disease and affect thyroid health.

One pivotal study from 2013 showed that:

▪ Patients with newly diagnosed HT had significantly lower levels of serum glutathione and activities of glutathione peroxidase, a key enzyme that uses glutathione to reduce peroxides (damaging compounds).

▪ These patients also showed higher levels of specific antibodies. Both of these are indicators of autoimmune activity against the thyroid:

  ▪ Thyroid Peroxidase Antibodies (TPO-AB): Target enzymes important for thyroid hormone production.

  ▪ Thyroglobulin Antibodies (Tg-AB): Target a protein essential for thyroid hormone production.

IN A NUTSHELL:

We now know there is a connection between reduced glutathione and the increased oxidative stress and immune dysfunction observed in Hashimoto's Thyroiditis. In a nutshell:

THIS SUGGESTS THAT THE THYROID GLAND IN HT PATIENTS MAY BE MORE VULNERABLE TO DAMAGE DUE TO INSUFFICIENT ANTIOXIDANT PROTECTION.

07

COMMON GLUTATHIONE MYTHS
DEBUNKED

01

GLUTATHIONE IS A SKIN BLEACHING AGENT

While some studies suggest that glutathione may influence skin pigmentation and potentially lead to a lighter complexion, labeling it as a skin bleaching agent oversimplifies its role.

Glutathione's primary function in the skin is to neutralize oxidative stress and regenerate other antioxidants, which can indirectly affect melanin production.

However, its impact on skin tone is neither drastic nor intended for dramatic cosmetic changes like those achieved through conventional skin bleaching techniques.

02

GLUTATHIONE IS FOR WOMEN

The notion that glutathione is only beneficial for women is a misleading stereotype. Glutathione is a crucial antioxidant for all humans, regardless of gender.

Its key roles in detoxification, immune function, and cellular health are vital for both men and women.

The misconception may stem from the marketing of glutathione in beauty and skincare products, which often target female audiences, but its health benefits are universally essential, irrespective of gender.

03

GLUTATHIONE CAN BE HARMFUL

Contrary to this myth, glutathione is naturally produced by the body and plays a vital role in maintaining physiological balance and protecting against cellular damage.

Concerns about harm typically arise from misunderstandings about supplementation. While excessive intake of any supplement can have potential side effects, natural glutathione produced by the body or obtained through a balanced diet is not only safe but beneficial.

04

GLUTATHIONE IV IS THE BEST WAY TO INCREASE GLUTATHIONE LEVELS

Intravenous (IV) administration of glutathione is often touted as the most effective way to elevate its levels in the body. While IV administration can quickly increase glutathione levels in the bloodstream, it is not necessarily the most effective method for long-term cellular benefits.

Oral precursor supplements, especially those formulated for enhanced absorption, can also effectively raise and maintain glutathione levels in the body's tissues without the involvement of needles.

TO INCREASE GLUTATHIONE, YOU NEED TO SUPPLEMENT IT

One prevalent misconception is that direct supplementation is necessary to boost glutathione levels. However, it's important to note that there are many ways to enhance glutathione production without taking glutathione itself.

This can be achieved through the intake of precursors-

05

Precursors to glutathione are components that the body uses to synthesize glutathione naturally. These include amino acids and other nutrients that contribute directly to the biosynthesis of glutathione within cells.

SOME PRECURSORS OF GLUTATHIONE:

- Cysteine: This sulfur-containing amino acid is critical because it provides the essential sulfur molecule in glutathione, acting as a rate-limiting factor in its synthesis. A notable example of a dietary approach to boosting glutathione through precursors is the use of cysteine-enhanced products like Immunocal. Immunocal is a specially formulated non-denatured whey protein that is rich in cysteine.

- Glycine and Glutamate: Along with cysteine, these two other amino acids are directly used to form glutathione.

08

FREQUENTLY ASKED QUESTIONS ABOUT

GLUTATHIONE

HOW DOES GLUTATHIONE INTERACT WITH OTHER MEDICATIONS?

Glutathione may interact with certain medications, particularly those that are metabolized by the liver, as glutathione plays a significant role in detoxification processes. For instance, it can potentially affect the effectiveness of chemotherapy drugs by protecting cells from oxidative damage. Always consult a healthcare provider before starting glutathione supplementation, especially if taking other medications.

CAN GLUTATHIONE LEVELS BE TESTED? IF SO, HOW?

Yes, glutathione levels can be tested through blood tests that measure the amount of glutathione in your red blood cells. Other methods include breath tests that assess the breakdown products of glutathione.

ARE THERE ANY AGE - SPECIFIC RECOMMENDATIONS FOR GLUTATHIONE INTAKE OR SUPPLEMENTATION?

There are no official age-specific guidelines for glutathione intake; however, older adults may benefit from increased intake or supplementation due to naturally declining levels with age, which can impact various health aspects, including immune function and oxidative stress.

WHAT IS THE RELATIONSHIP BETWEEN GLUTATHIONE AND CHRONIC DISEASES OTHER THAN THOSE COVERED?

Glutathione has been linked to the management of various chronic diseases, including diabetes, by improving insulin resistance.

Its antioxidant properties may generally support better management of any condition characterized by increased oxidative stress or impaired detoxification. The research is ongoing, but every year, the evidence becomes increasingly compelling.

DOES EXERCISE INCREASE GLUTATHIONE LEVELS?

Here we have to distinguish between the short-term and long term effects of exercise.

SHORT TERM

When trained people do intense physical exercise that involves contracting their muscles, the amount of a substance called oxidized glutathione (GSSG) in their blood goes up by 72% right after the workout compared to when they are resting. However, one hour after finishing the exercise, the levels of GSSG go back to normal.

GSSG is a marker of how active GSH has been in combating oxidative stress, with more GSSG forming as GSH neutralizes more harmful substances. Under conditions of increased oxidative stress, such as intense physical exercise, more GSH is converted to GSSG, reflecting the body's efforts to protect itself from damage.

It doesn't seem surprising that putting stress on our bodies increases a marker indicative of combating stress. And as you may know, controlled repeated stress can be a good thing. Thus, the long-term effects of exercise are much more relevant.

LONG TERM

A study found that physically active older adults maintained higher levels of GSH and antioxidant enzymes in their muscles. This suggests that regular physical activity may enhance antioxidant defenses, helping to manage reactive oxygen species during exercise and potentially improving muscle function as people age.

So it seems, that just like training a muscle, we may be able to train our body to synthesize more glutathione to adapt to repeated exercise-induced oxidative stress.

CAN GLUTATHIONE PROMPT HAIR GROWTH OR PROMOTE HAIR HEALTH?

Circumstantial evidence suggests, that oxidative stress may be an important mechanism that contributes to hair loss or loss of hair pigmentation.

While in theory, Glutathione may help combat this, there have been no studies on it. So we definitely cannot assume causality.

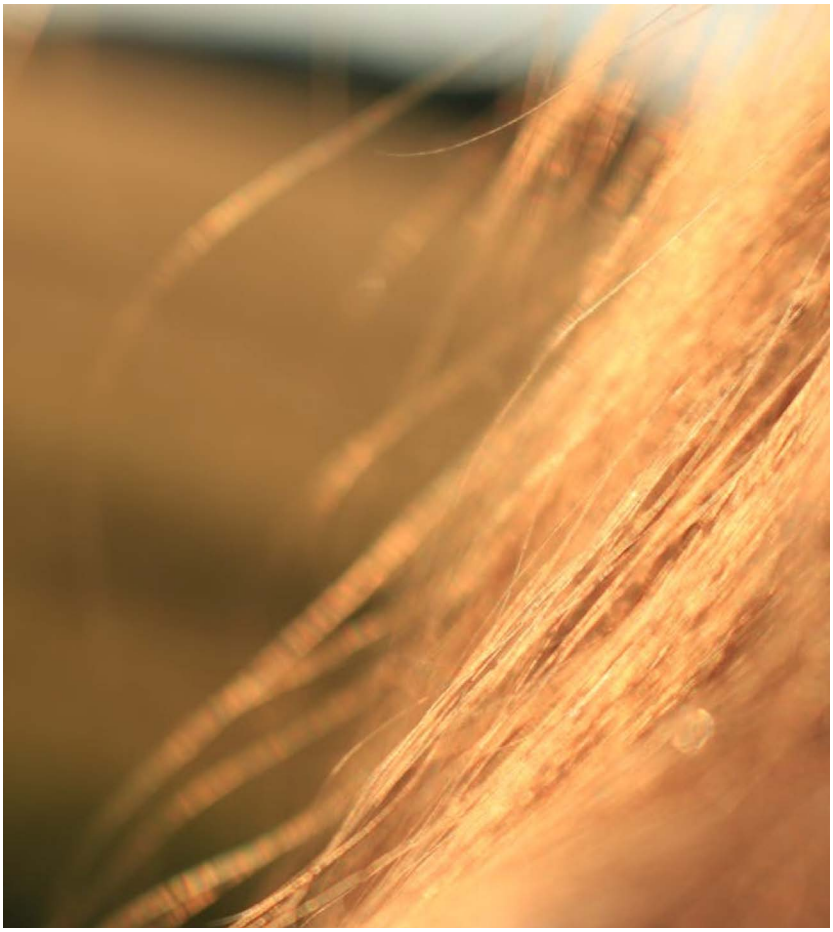
Many supplement brands, may make claims such as:

- Glutathione protects the hair shaft from breakage and reduces the likelihood of split ends.

- Glutathione improves the moisture balance of the hair and prevents brittle hair.

- Glutathione enhances blood circulation to the scalp, which stimulates hair growth and revitalizes dormant hair follicles.

Unfortunately, such claims are largely unsubstantiated. As of now, there is no direct scientific evidence either proving or debunking the causality of such claims.

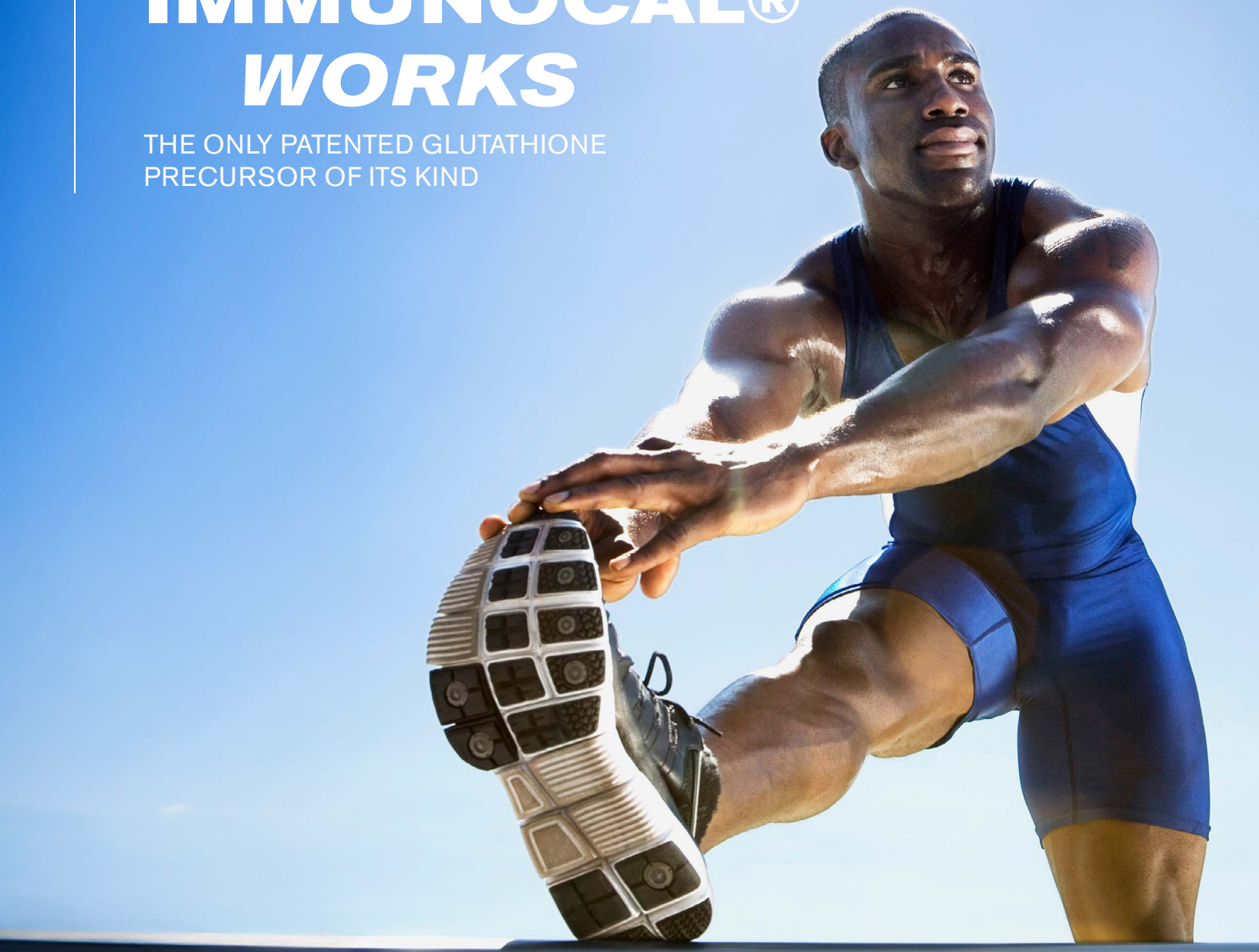


09

HEALTH MATTERS.

IMMUNOCAL® *WORKS*

THE ONLY PATENTED GLUTATHIONE
PRECURSOR OF ITS KIND



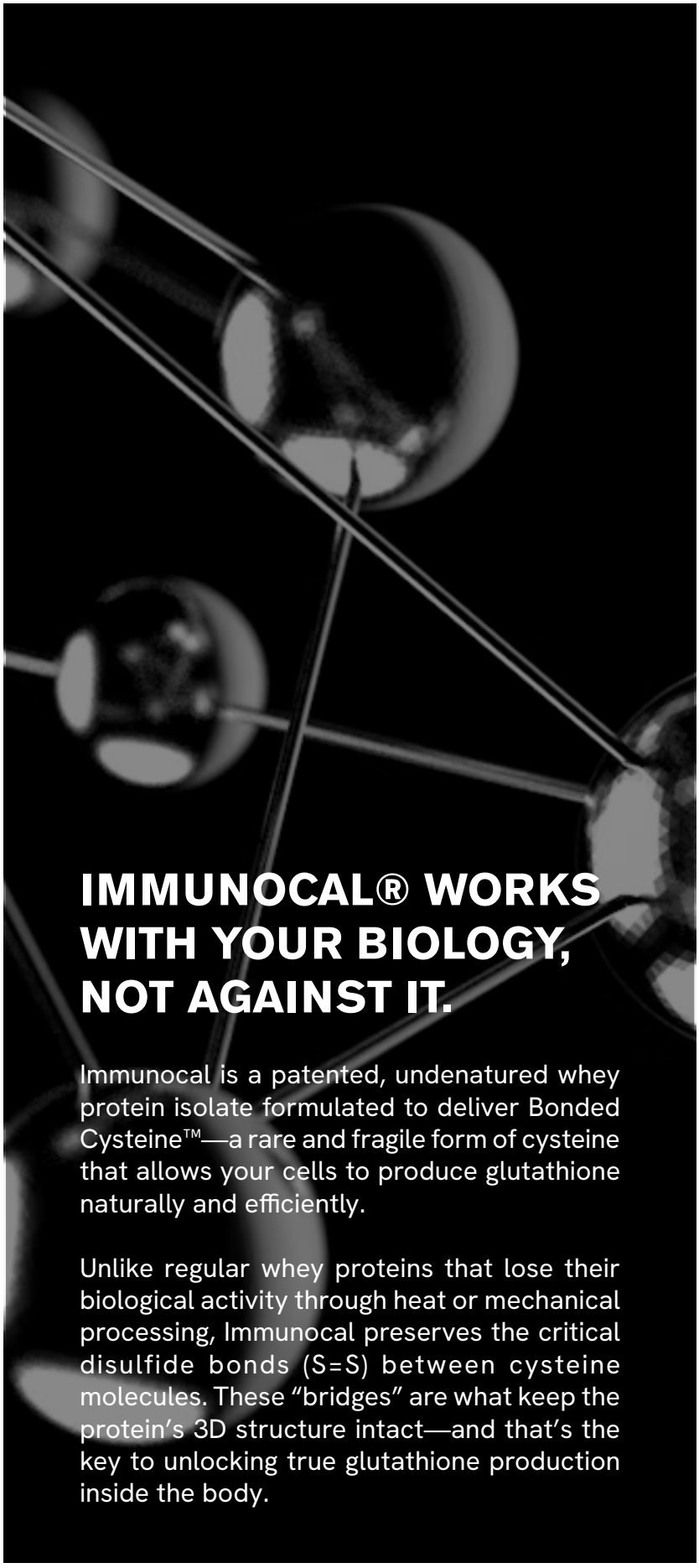
After exploring the science and benefits of glutathione throughout this eBook, the most important question remains:

HOW DO YOU ACTUALLY RAISE YOUR GLUTATHIONE LEVELS IN A WAY YOUR BODY CAN USE?

The answer isn't taking glutathione directly—not in a pill, a powder, or even an injection. The answer is Bonded Cysteine™—and only Immunocal® delivers it.

THE IMMUNOCAL® ADVANTAGE: WHAT MAKES IT DIFFERENT?

Most glutathione supplements on the market contain pre-formed glutathione or synthetic ingredients that your body struggles to absorb. But your body doesn't want to "receive" glutathione—it wants to make it using its own built-in system.



IMMUNOCAL® WORKS WITH YOUR BIOLOGY, NOT AGAINST IT.

Immunocal is a patented, undenatured whey protein isolate formulated to deliver Bonded Cysteine™—a rare and fragile form of cysteine that allows your cells to produce glutathione naturally and efficiently.

Unlike regular whey proteins that lose their biological activity through heat or mechanical processing, Immunocal preserves the critical disulfide bonds (S=S) between cysteine molecules. These "bridges" are what keep the protein's 3D structure intact—and that's the key to unlocking true glutathione production inside the body.

WHY OTHER GLUTATHIONE PRODUCTS CAN'T COMPETE

Let's set the record straight:

- Glutathione pills or capsules are mostly destroyed during digestion.

- Liposomal glutathione attempts to "wrap" the molecule in fat to aid absorption—but its effectiveness is inconsistent and short-lived.

- Injections or IV drips may temporarily raise levels but are invasive, expensive, and not sustainable for long-term use.

- NAC (N-acetylcysteine) is synthetic, short-acting, and not well tolerated for long-term supplementation.

None of these options match the efficiency, safety, or long-term effectiveness of Immunocal.

CLINICALLY PROVEN. GLOBALLY RECOGNIZED. UNIQUELY PATENTED

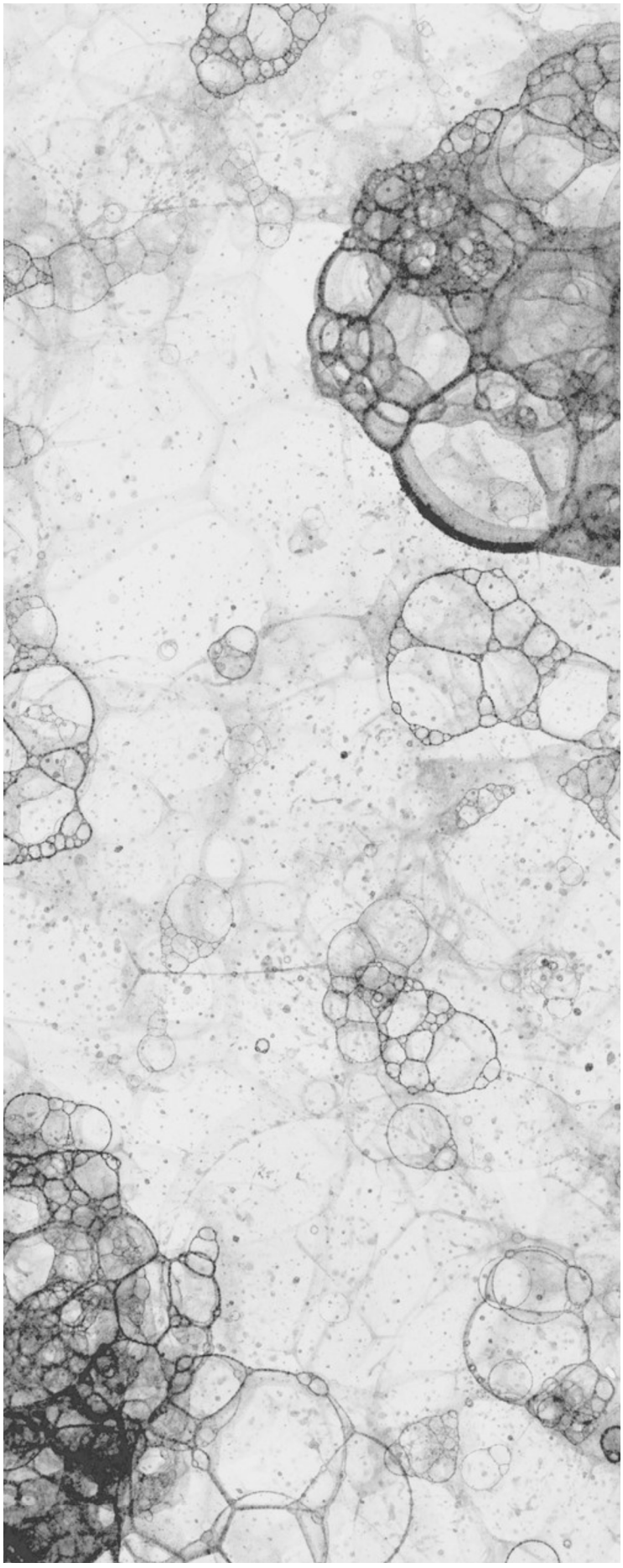
Immunocal® isn't just another supplement—it's a scientifically validated medical innovation:

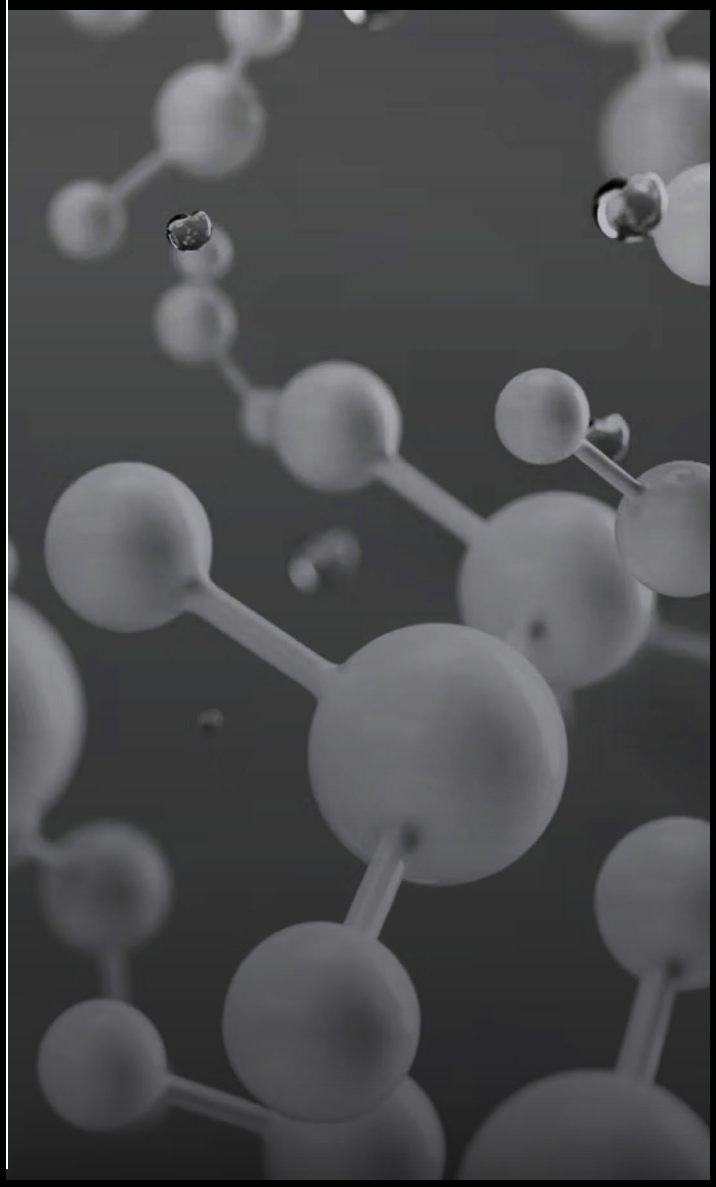
- Backed by over 90 peer-reviewed studies.

- Protected globally by 80 international patents

- Listed in both the Physicians' Desk Reference (PDR) and Compendium of Pharmaceutical Specialties (CPS)

- Informed Sport & Clean Label Certified for quality, safety, and elite performance.





THE MOST TRUSTED NAME IN IMMUNE HEALTH

"True wellness means giving your body what it needs—nothing more, nothinguartificial.

Immunocal is a completely natural, additive-free formula that helps your body raise its own glutathione levels—no sugar, no fat, no coloring.
Just clean, clinically proven formula for resilience from within."

Mauricio Domenzain,
Immunotec CEO

There is no other product on the market like Immunocal®. It is the only glutathione precursor of its kind powered by Bonded Cysteine™, proven to safely and effectively raise glutathione levels over time.

"A product works only if science proves it. Immunocal is the only natural product with robust human studies that validate its efficacy."

Dr. Jimmy Gutman, MD
World Leading Author + Expert on Glutathione

ONE INNOVATION

THREE POWERFUL FORMULAS

Category | Healthy Aging

IMMUNOCAL PLATINUM®

ALL THE BENEFITS OF IMMUNOCAL — AND MORE

- Adds Cytokine Modulating Peptides™ and Redox Modulating Formula™
- Helps regulate inflammation, reduce acidity, and support bone health
- Designed to slow the signs of aging at the cellular level

Ideal for: Adults 35+, healthy aging support, and proactive longevity.

Category | Advanced Immunity

IMMUNOCAL®

THE #1 MASTER ANTIOXIDANT

- Clinically proven to raise glutathione levels naturally
- Reinforces immune resilience, supports detox, and fuels energy
- Made with undenatured whey protein isolate and exclusive Bonded Cysteine™

Ideal for daily immune support, chronic fatigue, or long-term wellness defense.

Category | Sport Performance

IMMUNOCAL SPORT®

ALL THE BENEFITS OF IMMUNOCAL — ENHANCED FOR PEAK PERFORMANCE.

- Includes Immunocal's Bonded Cysteine™ for glutathione production
- Adds Nitro Boost™: L-Citrulline, Beetroot, and Tart Cherry Extract
- Delivers EAAs, BCAAs, and nitric oxide support for stamina and recovery

Ideal for Athletes, fitness enthusiasts, and active lifestyles seeking fast recovery.