# **Vital** Cellular

Code: FE1428 – 60 vegetable capsules

**Vital Cellular** is a unique formulation based on astragalus, N-acetylcysteine, R(+)-lipoic acid, Vitamin C and E to help protect against **cellular oxidation** and **premature ageing**. Our formulation provides 450 mg of astragalus standardised to 3% of astragalosides, equivalent to 13.5 mg of astragalosides per capsule. It also includes the most natural active form of lipoic acid, its R(+) configuration.

**HEALTH CLAIMS (EU Regulation 432/2012):** *Vitamin E contributes to the protection of cells against oxidative damage and helps protect the cell against premature ageing. Astragalus is a plant that helps maintain a healthy immune system.*

**Ingredients**: Astragalus root extract (*Astragalus membranaceus*), *N*-acetyl-L-cysteine, R(+)-*alpha*-lipoic acid, natural peppermint flavour, L-ascorbic acid (vitamin C), D-*alpha*-tocopheryl acid succinate (vitamin E), anticaking agent (magnesium salts of fatty acids and silicon dioxide), vegetable capsule (glacing agent: hydroxypropylmethylcellulose; humectant: purified water).

| **Nutritional information:** | **1 capsule (842 mg)** |
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| Astragalus (3% astragalosides) | 450 mg |
| *N*-acetyl-L-cysteine | 195 mg |
| *R*(+)-*alpha*-lipoic acid | 25 mg |
| Vitamin C ( L-ascorbic acid) | 10 mg |
| Vitamin E (D-*alpha*-tocopheryl acid succinate) (10 IU) | 6,7 mg α-TE (56%*) |

*NRV: Nutrient Reference Value in %

**Contains no:** Preservatives, artificial flavour or colour, sugar, milk or milk products, starch, wheat, eggs, soy, or yeast, gluten or citrus.

**Size and format:**
60 vegetable capsules

**Recommended daily dose:**
1 capsule daily with a meal.

Do not exceed the stated recommended daily dose.

**Indications and uses:**

- Cellular protection for healthy ageing by preserving telomere function and exerting an antioxidant action (anti-ageing programmes, prevention of chronic diseases associated with ageing (cardiovascular disease, glucose metabolism, infectious diseases).
- Immune support and reinforcement against external aggressions (winter periods, convalescence, situations of increased need for physical and mental resistance), immuno-ageing.

**Cautions:**

Do not use if you are pregnant or breastfeeding. Consult a health-care practitioner if you are being treated with medication

**Vital** Cellular is a unique formulation based on 5 active ingredients that act on the two processes that mainly affect cellular ageing; the formation of free radicals and the shortening of telomeres. A standardised extract of astragalus root in combination with some of the most recognised antioxidants in the biology of ageing make this product a perfect ally that can help delay cellular ageing. Astragalus acts on telomeres, which are structures located at the ends of chromosomes whose elongation is associated with healthy ageing and longevity.

Astragalus, one of the most popular plants in traditional Chinese medicine, is also used for its recognised activity on the immune system, the cardiovascular system and its adaptogenic properties. These properties are related not only to astragalosides, but also to other active components found in the root of the plant. That is why Vital Cellular, in addition to astragalosides, provides other compounds associated with the overall benefits of the plant.

ASTRAGALUS: Astragalus root has traditionally been used in traditional Chinese medicine to regulate the spleen and stomach and is used for diarrhoea, fatigue and lack of appetite and in colds and the flu to improve physical and humoral resistance. Its immunomodulatory effect is commonly known. This effect is due to the polysaccharides contained in the plant, which have been shown to increase macrophage production, as well as to activate T-cells and NK cells. These actions and others associated

with the stimulation of the immune system are what have linked this plant to antiviral activity *(Herpes simplex* type-2, cytomegalovirus, among others). It exerts an action on immune function without suppressing its function with prolonged use and can therefore be recommended for long-term use. In other studies, astragalus polysaccharides have been shown to enhance anti-tumour immunity via IL-2 by enhancing the lymphocyte response in both healthy subjects and cancer patients. Astragalus has also been investigated in adjuvant cancer therapy for its ability to increase resistance to immunosuppression associated with chemotherapy. It has increased the activity of chemotherapeutic agents, inhibits malignant recurrences, prolongs survival and reduces the toxic effects of radiation therapy and chemotherapeutic agents (mitomycin, cisplatin, cyclophosphamide, 5-fluorouracil).[1-5]

One of the properties associated with this plant is its action on cardiovascular health. Astragalosides are responsible for the positive effect on cardiac function by inhibiting lipid peroxidation in the myocardium and decreasing blood clotting. It protects against cardiac ischaemia by increasing coronary flow via NO synthase. Multiple studies have been conducted in patients with heart failure, with very encouraging results in relieving many of the parameters describing the disease and improving the quality of life of patients with chronic heart failure. It also exerts a vasodilatory action on the vascular endothelium and has been shown to be effective in hypertension alone or in combination with other plants. Literature references also focus on its ability to improve lipid profile by binding to bile acids and improving cholesterol efflux from the liver to the bowel and its subsequent clearance in the faeces and its hypoglycaemic [6-11]

Many references point to astragalus root as a first-rate choice in anti-ageing treatment protocols. Its relationship with telomere elongation, the protection of the mitochondria and its proven antioxidant activity are mechanisms that are likely to converge and have been proposed to elucidate its role in cellular ageing. Telomeres are structures that protect the ends of the chromosomes found in the nuclei that make up the genetic information. These telomeres shorten as cell divisions occur. Human cells are divided a maximum of 50-60 times before reaching the Hayflick limit, after which division ceases and cellular senescence occurs, a phenomenon in which the cell remains in a state of inactivation and metabolic alteration. Telomere lengthening has been linked to delayed cellular ageing and increased longevity. Some studies consider that telomere length measurement may be a predictive biomarker of healthy ageing. In particular, a study performed in over 3,000 people aged 70-79 found that those with a longer telomere length in leukocytes (white blood cells) had a longer YHL (Years of Healthy Life).[12] Other studies also suggest that telomere lengthening may increase life expectancy by activating the gene encoding or expressing telomerase, an enzyme that adds base pairs to the ends of telomeres for their elongation. The cells that need to renew themselves most rapidly show telomerase activity and are haematopoietic cells, white blood cells, epithelial cells and germ cells. These cells maintain stable telomere length whereas, in most somatic cells of the body, telomerase activity is repressed and consequently these cells lose telomere length as they divide. Therefore, therapies aimed at reactivating telomerase and lengthening age-shortened telomeres could mean a breakthrough in anti-ageing protocols. In some experimental models, boosting telomerase activity has led to a delay in ageing and an increase in life expectancy of around 40%. [13-14]

It has been shown that centenarians in good health have longer telomeres compared to centenarians in poor health condition. Telomere shortening has been associated with chronic age-related diseases such as cardiovascular diseases, certain neurodegenerative diseases (Alzheimer's), osteoarticular diseases (osteoarthritis, osteoporosis) as well as certain infectious diseases. [15]

In a study assessing the relationship between telomere length and mortality in 143 people with an average age of 60 years, it was found that those with shorter telomere length were 3 times more likely to die from heart diseases and 8 times more likely to die from infectious disease. Finnish investigators are considering telomere length as a predictive marker of chronological ageing and a marker of cardiovascular ageing, since atherosclerosis, heart failure and hypertension are diseases in which leukocytes with short telomere length are observed.[16-17]

Some authors suggest that telomere length is an indicator of coronary heart disease based on the results from 484 individuals at risk of heart disease. Those with telomere shortening had twice the risk compared to those with greater telomere lengthening.[18]

Telomere length is determined by genetic inheritance, but age, gender (men have shorter telomeres), stress, smoking, alcohol, exposure to free radicals, as well as high levels of oxidative stress or inflammation further increase telomere shortening. There is evidence that chronic stress decreases the telomerase activity of immune cells, resulting in telomere shortening. These results provide a potential mechanism of stress associated with telomere length shortening, and suggest that strategies to enhance T-lymphocyte telomerase activity may provide beneficial effects on immune function in situations of chronic emotional stress.[18]

Some studies report that astragalosides are also able to act on dermal fibroblasts, preserving their quality and reversing the visible effects of ageing.[19-21]

Some authors also link mitochondrial protection and its anti-ageing effect. Lipid peroxidation of mitochondrial membranes damages these structures by modifying their permeability and cellular metabolism. The conclusions of the studies show that the polysaccharides in this plant inhibit mitochondrial injury by interfering with oxidative processes by reacting with free radicals and scavenging reactive oxygen species. It also increases the antioxidant activity of certain enzymes, resulting in a reduction in mitochondrial dysfunction and an improvement in energy metabolism.[22]

N-ACETYLCYSTEINE (NAC): a more stable and more bioavailable form of L-cysteine, the key amino acid for glutathione synthesis. Glutathione is one of the most important antioxidant systems for cellular protection and one of the best ways to optimise the effectiveness of this system is through NAC. Glutathione plays a central role in the body's defence against oxidative stress. The thiol group (SH) of the cysteine group is responsible for providing the reduced nature of glutathione. The reduced form neutralises most free radicals, while this strong reducing nature allows the reuse of other antioxidants that have been oxidised, such as vitamin C and vitamin E, amplifying the effect through this antioxidant cascade. NAC is commonly used in liver detoxification programmes and some studies suggest that taking NAC together with vitamin C improves the immune response in experimental models of oxidative stress. Antioxidant levels (vitamin E, vitamin C and glutathione) have been shown to decrease with age and photo-ageing processes, so their inclusion in anti-ageing formulas would be fully justified.[23-25]

R-ALPHA-LIPOIC ACID: considered the universal antioxidant due to its ambiphilic nature, it is distributed in all cellular compartments and acts in both aqueous and lipophilic media. Its synthesis decreases with age and its levels are reduced in people with certain chronic diseases such as diabetes, liver diseases, heart diseases, atherosclerosis and in people who do intense physical exercise. It is a free radical neutraliser, a regenerator of other antioxidants (vitamin C, co-enzyme Q10 and glutathione), a metal chelator and an inducer of glutathione synthesis. Administered exogenously, it is a potent cellular signal transducer involved in glucose metabolism, inflammatory response, oxidative stress and induction of phase II enzymes for detoxification and elimination of xenobiotics. The scientific evidence regarding its health benefits is extensive, with several studies on the relationship between this active ingredient and diabetes, cardiovascular diseases, cognitive and neurodegenerative disorders, its detoxifying effect and its role in ageing and age-related diseases. [23,26,27]

A recent animal study found that alpha-lipoic acid supplements for two weeks reversed the effect of age-associated low ascorbic acid concentrations. [28]

Some studies suggest that alpha lipoic acid enhances collagen synthesis in dermal fibroblasts, which may have beneficial effects on skin ageing. [29]

In our formulation, we have included the natural more active isoform of lipoic acid, compared to the R-S lipoic acid racemic mixture found in most products on the market. [30]

VITAMIN C AND VITAMIN E: included in our formula to boost and enhance the effect of NAC and lipoic acid. Remember that they also neutralise free radicals and are therefore an important anti-ageing factor.

Vitamin C is the main water-soluble antioxidant. Provides additional antioxidant protection by regenerating vitamin E and glutathione production cycles. It also has a stabilising effect on the whole formula. [31-33]

Vitamin E is a fat-soluble antioxidant that stabilises cell membranes to protect them from oxidative damage. Vitamin E supplements have been shown to be effective in neurological, cardiac and immune function.[34-36]

**References:**

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