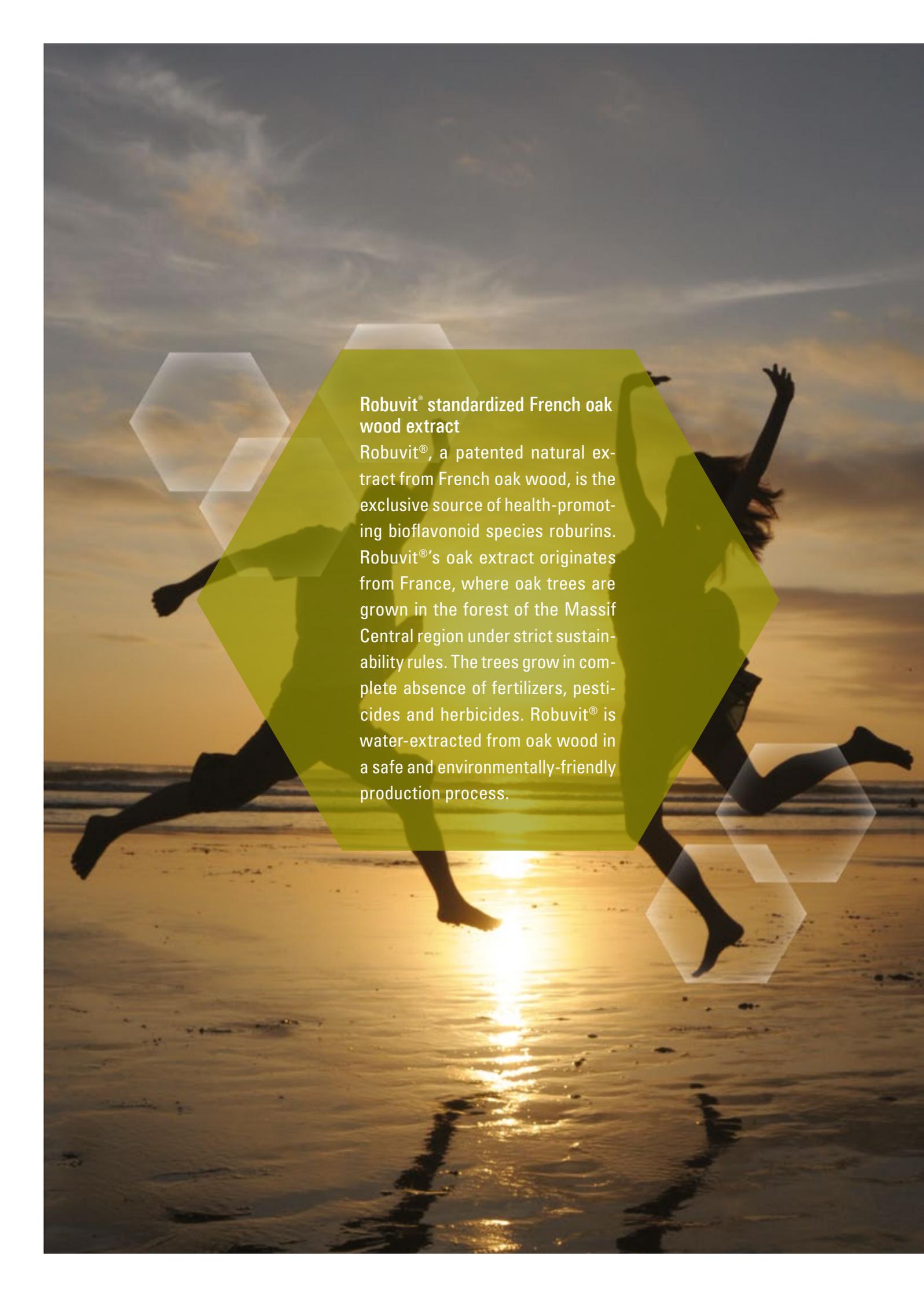


The Vitality Ingredient for  
Energy and Detoxification



A person is captured in mid-air, jumping joyfully on a sandy beach at sunset. The sun is low on the horizon, creating a bright, golden glow that reflects on the wet sand. The sky is filled with soft, wispy clouds. A large, semi-transparent green hexagon is overlaid on the center of the image, containing white text. Several smaller, semi-transparent white hexagons are scattered around the main green one, creating a geometric pattern.

### **Robuvit® standardized French oak wood extract**

Robuvit®, a patented natural extract from French oak wood, is the exclusive source of health-promoting bioflavonoid species roburins. Robuvit®'s oak extract originates from France, where oak trees are grown in the forest of the Massif Central region under strict sustainability rules. The trees grow in complete absence of fertilizers, pesticides and herbicides. Robuvit® is water-extracted from oak wood in a safe and environmentally-friendly production process.

# Robuvit® standardized French oak wood extract

Robuvit® is the exclusive dietary supplement source of flavonoid species roburins, which are found in nature – solely in oak wood and bears numerous additional oak flavonoid species, such as castalagin, grandinin, vescalin and other ellagitannins.

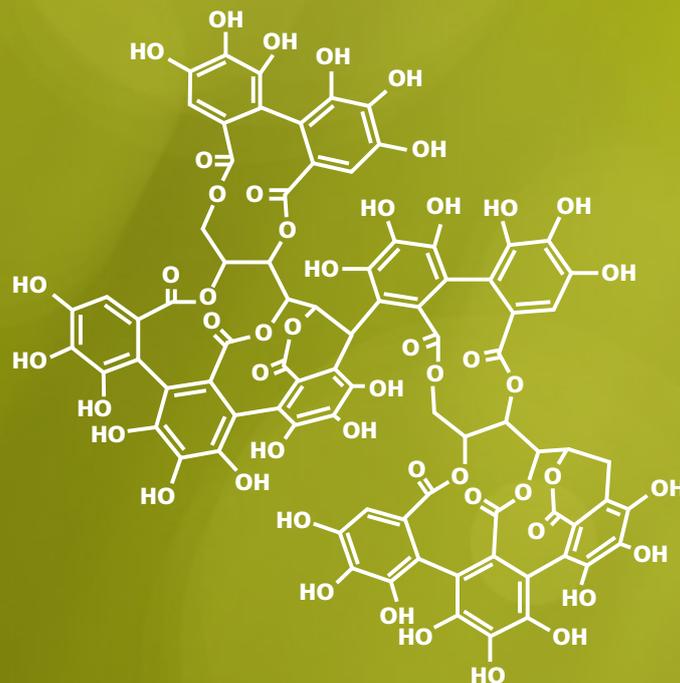
Robuvit®, a patented natural extract from French oak wood, is the exclusive source of health-promoting bioflavonoid species roburins. Robuvit® oak extract originates from France, where oak trees are grown in the forest of the Massif Central region under strict sustainability rules. The trees grow in complete absence of fertilizers, pesticides and herbicides. Robuvit® is water-extracted from oak wood in absence of chemical solvents, a safe and environmentally-friendly production process.

Robuvit® is standardized to bear > 40 % health-promoting polyphenols: roburins, vescalagin and castalagin, grandinin and vescalin with many further additional antioxidant ellagitannins present.

Humans have been exposed to roburins since ancient times primarily from red wine and whiskey maturing in oak wood barrels. Wine extracts minor quantities of roburins from oak barrel wood during maturation, which contributes to the astringent dry taste sensation [Glabasnia et al., 2006].

Robuvit® has successfully passed extensive safety testing. In clinical trials more than three hundred study participants have consumed Robuvit® daily, over time periods of one to six months, with no unwanted effects occurring.

Roburin A



## Health and performance promoting activities of Robuvit®

Following oral consumption of Robuvit®, gut microbiota process roburins to bioactive metabolites, known as urolithins in humans [Natella et al., 2014]. The closely related urolithin species, urolithin A, B and C, represent the predominant health-promoting principles from dietary oak wood flavonoids.

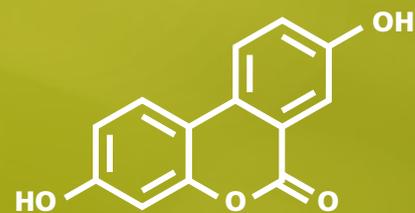
### Robuvit® yields better health with greater energy

Supplementation of Robuvit® provides antioxidant potency in human consumption and furthermore, improves liver health, and increases assembly of bioactive proteins in the body. Beyond functioning as potent antioxidants, urolithins are shown to improve liver health, increasing assembly of bioactive proteins for more energy as well as greater muscle function [Natella et al., 2014; Ryu et al., 2016].

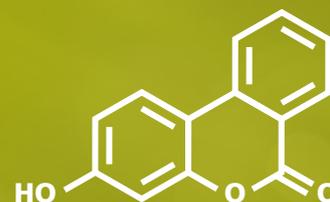
### Robuvit® elevates protein and enzyme synthesis capacity

In a recent study, Robuvit® was discovered to increase ribosome generation, the process of the ultra-microscopic complex molecular machinery assembling all new proteins in cells of the body [Natella et al., 2014]. Ribosomes consist of two subunits- the small subunit and a large ribosomal subunit. Ribosome biogenesis has a high cellular energy demand and is affected by oxidative and nutritional stress, resulting in lowered protein synthesis capacity.

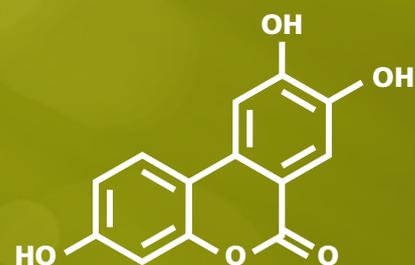
Ribosomes synthesize all of the >10'000 protein species present in humans: muscle fibres, enzymes, antibodies, collagen etc. Ribosomes assemble essential proteins required by connecting individual amino acids based on a DNA-transcript (m-RNA) as a blueprint. Expansion of ribosome numbers facilitates greater protein assembly capacity, allowing to more rapidly meet a heightened demand for specific required proteins anywhere in the body. For example, ribosome expansion allows for elevated muscle fibre creation in exercising athletes, or increased enzyme assembly in a challenged liver, or greater abundance of antibodies to eliminate an infection.



urolithin A

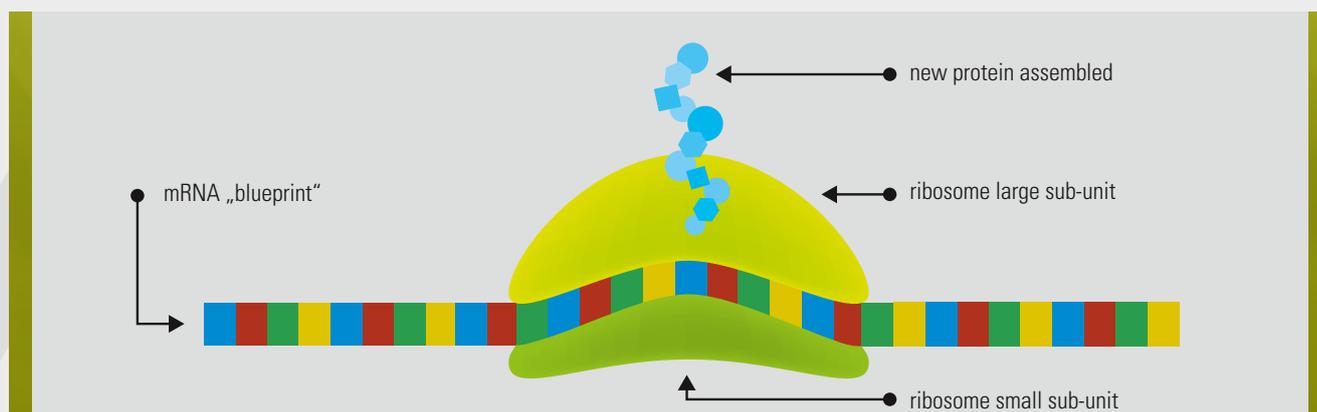


urolithin B



urolithin C

### Increased number of ribosomes allows for expanded protein generation capacity



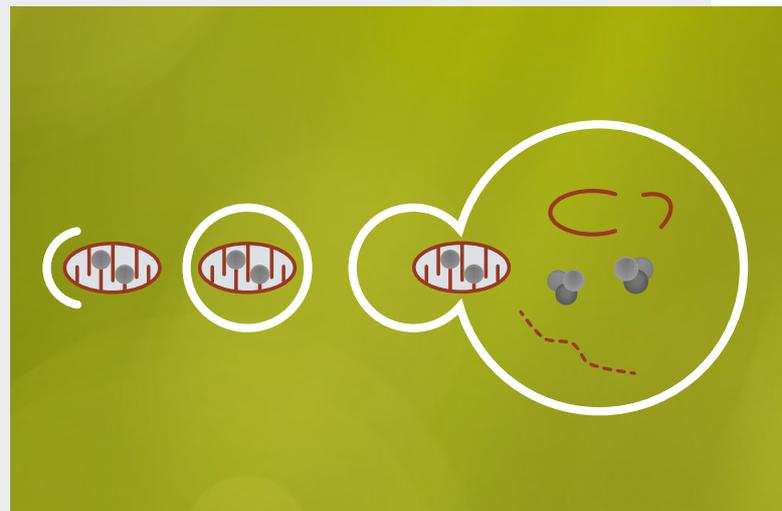
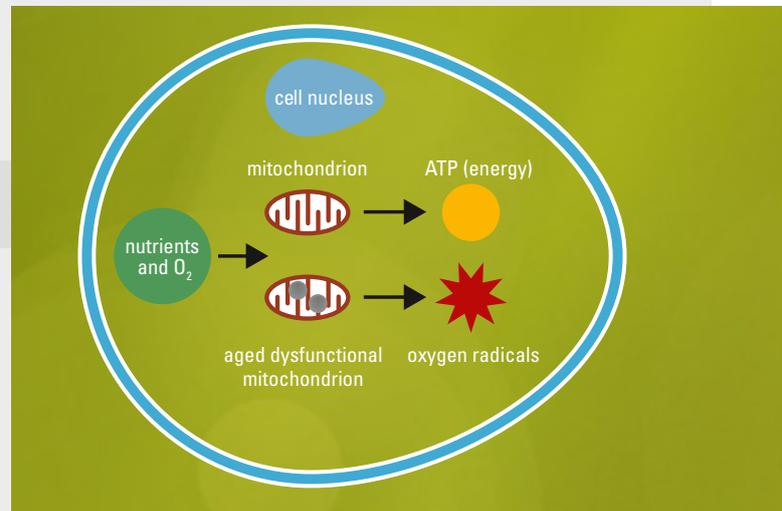
# Robuvit<sup>®</sup> elevates energy

## Robuvit<sup>®</sup> rejuvenates mitochondria for greater energy

Energy in the body is generated by mitochondria, largely autonomous small cell organelles, present in all body cells. These cellular power stations generate energy in form of ATP from burning nutrients, carbohydrates, lipids, and further materials, with considerable oxidative stress as by-products, which may harm the host cell, but especially burdens the performing mitochondrion itself. Aged malfunctioning mitochondria continue to process fats and carbohydrates, yet with rapidly decreasing efficiency for ATP-generation and increasing oxidative stress and accumulating debris, which gradually destructs the mitochondrion itself. Especially organs with high energy turnover, such as muscle, neuros and liver, are prone to harm.

## Robuvit stimulates mitophagy

Robuvit<sup>®</sup> metabolites urolithins are shown to induce mitophagy, a process submitting aged, seared, dysfunctional mitochondria to lysosomes, cell compartments specialised for complete disintegration of debris, by enzymes and acid. In replacement, new mitochondria are assembled, which are fully functional, providing energy at maximum yield. Robuvit<sup>®</sup> metabolites urolithins increase muscle function by rejuvenating mitochondria through accelerated replacement of aged mitochondria by newly synthesised fully operative mitochondria.



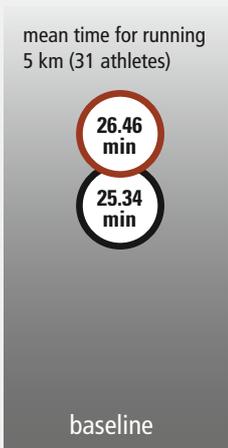
## Clinical trials show Robuvit<sup>®</sup> energizes individuals at all ages

The ability of Robuvit<sup>®</sup> to support both protein synthesis and mitochondrial energy output, which involves substantial liver function support, is shown in eleven clinical trials to benefit individuals at all life stages.

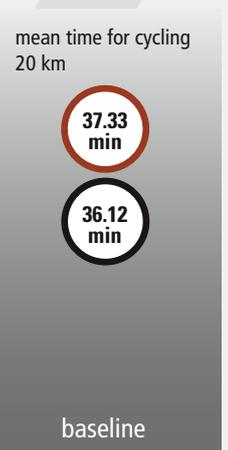
Robuvit<sup>®</sup> significantly increases performance of athletes in a triathlon. Three studies identified energizing effects for individuals suffering from chronic fatigue, and four studies point to significant liver health support.

## Robuvit® improves endurance in triathlon

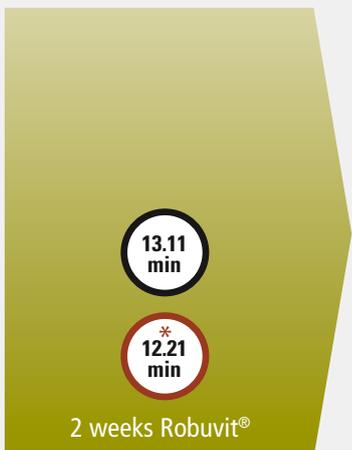
A study with sixty-one recreational athletes, men and women in their early thirties, showed that daily supplementation of Robuvit® can improve training effects compared to an untreated control group [Vinciguerra et al., 2015].



Athelete's running performance was marginally better in the control group at baseline. However, after two weeks during which one group was supplemented daily with Robuvit®, this group completed the five km running distance significantly faster than the untreated control group.

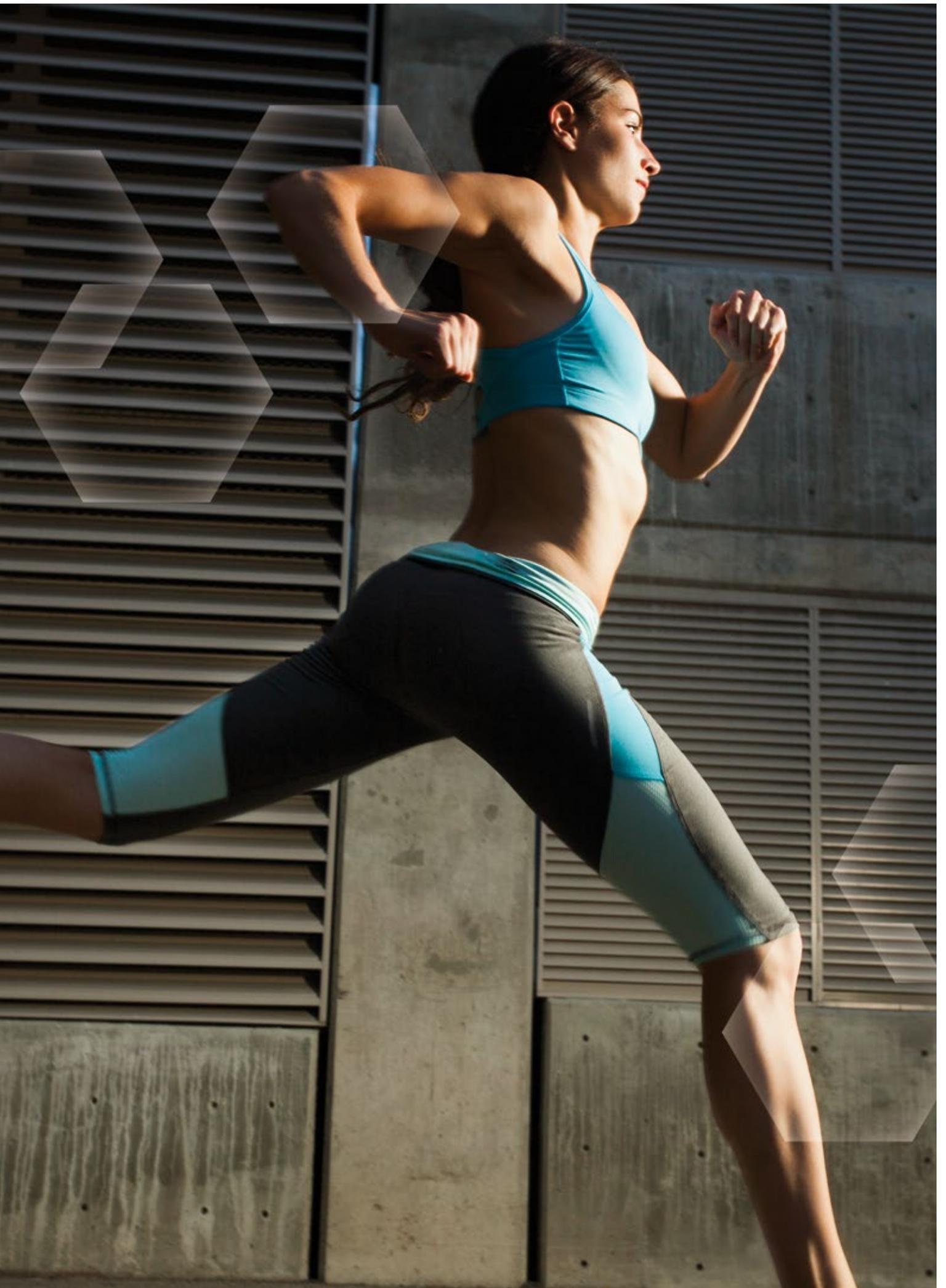


The time required for cycling a 20 km distance was likewise faster at baseline in the untreated control group. Following consumption of Robuvit® for two weeks, this group of cyclists completed the 20 km significantly faster at 34:03 minutes, while the control group required almost two minutes longer.



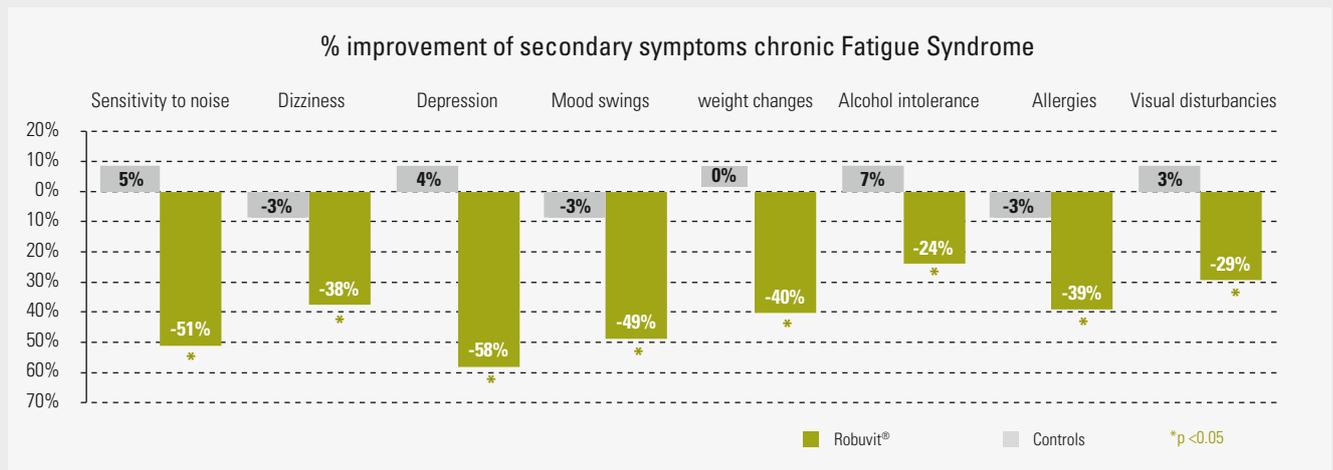
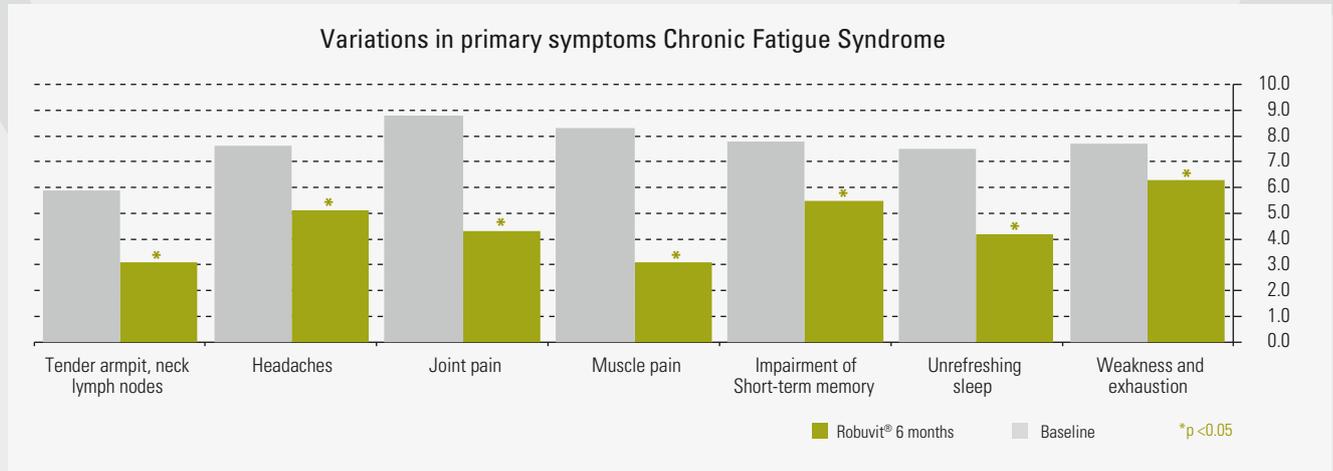
Supplementation with Robuvit® correspondingly also significantly boosted performance for swimming a 750 m distance.

○ control      ○ Robuvit®



## Robuvit® a stimulant-free natural energizer

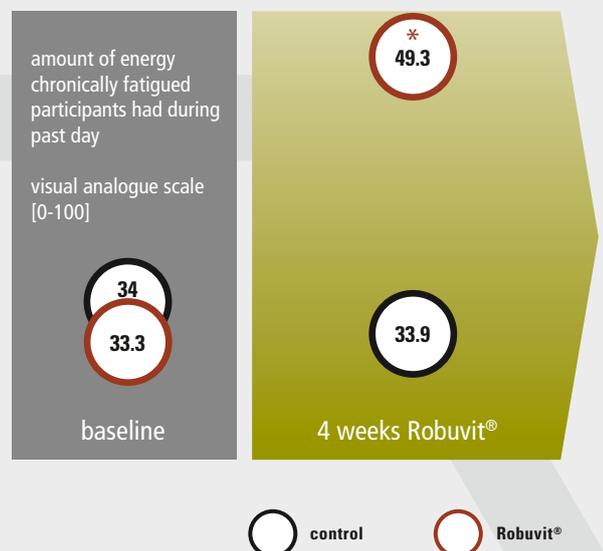
Three independent clinical trials demonstrate that daily supplementation with Robuvit® significantly helps fatigued individuals to regain energy and actively engage in daily life challenges [Belcaro et al., 2014; Országhová et al., 2014; Belcaro et al., 2015].



## Robuvit® naturally revives fatigued individuals

Chronic fatigue is perceived by affected people as exhaustion which cannot or barely be recovered by sleep. Diagnosis for chronic fatigue encompasses absence of other medically “diagnosable” disease, such as an infection or organ malfunction.

A clinical study showed that 80 participating individuals, suffering from chronic fatigue, for at least six consecutive months, in absence of organic disease, significantly benefitted from the energizing capacity of Robuvit® [Belcaro et al., 2015]. The study participants experienced significantly elevated energy and also reported improvements related to their sexual life.



# Robuvit<sup>®</sup> keeps the liver healthy

The liver is our bodies' greatest metabolic throughput, with the largest agglomeration of enzymes, to synthesise, modify and degrade substances, as required.

Clinical investigations demonstrate that daily supplementation with Robuvit<sup>®</sup> significantly reduces levels of harmful homocysteine [Deakova et al., 2015]. Elevated homocysteine levels indicate challenged liver health, resulting from unhealthy diet or intoxication. Increased homocysteine levels may cause blood vessel inflammation and can ultimately be a risk factor of cardiovascular disease. Because Robuvit<sup>®</sup> stimulates increased generation of ribosomes, the cellular machinery constructing new proteins and enzymes may adapt faster to meet a heightened demand.

Supplementation with Robuvit<sup>®</sup> significantly lowers homocysteine levels in individuals presenting with elevated levels of this harmful substance [Deakova et al., 2015].

Liver function may be challenged during exposure to toxins or medications, during infections, or in unhealthy life-style, such as with alcohol consumption.

Robuvit<sup>®</sup> improves liver function reducing homocystein levels



10.4  $\mu\text{M}$

baseline

8.4  $\mu\text{M}$   
p<0.001

4 weeks treatment

9.7  $\mu\text{M}$   
p<0.001

2 weeks wash-out

## Robuvit® improves liver health for individuals with temporary hepatic damage

Robuvit® supplementation significantly lowered liver markers related to enzymes alanine transferase (ALT) and gamma glutamyl transferase (GGT) than lifestyle improvements alone, as advised by physicians. While Robuvit® was taken over a period of twelve weeks, the major improvements were manifest after six weeks supplementation [Belcaro et al., 2014].



Blood ALT [IU/L] healthy levels: 7–56 IU/L



Blood GGT [IU/L] healthy levels 0–42 IU/L

## Robuvit® supports liver health maintenance in temporary alcohol exposure

In a clinical trial with 75 participants showing symptoms of moderate functional hepatic impairment, related to usage of acetaminophen, antibiotics or alcohol abuse, Robuvit® was taken daily for twelve weeks, and compared to a control-group [Belcaro et al., 2014].

Alcohol is toxic to liver cells, challenging liver functionality and may, especially in chronic abuse, cause serious harm to the organ. Robuvit® was found in 44 participants to reduce rising liver-markers in response to alcohol consumption [Pellegrini et al., 2016]. Daily supplementation with Robuvit® improved markers indicative of liver function better than cessation of alcohol consumption alone. Total bilirubin,  $\gamma$ -glutamyl transferase and aspartate aminotransferase (AST, aka SGOT) were significantly better in the group who supplemented with Robuvit® for six and twelve weeks.



# References

## **Robuvit® increases ribosomal activity and protein synthesis capacity**

*Glabasnia A & Hofmann T.*

Sensory-directed identification of taste-active ellagitannins in American (*Quercus alba* L.) and European oak wood (*Quercus robur* L.) and quantitative analysis in bourbon whiskey and oak-matured red wines. *J Agric Food Chem* 54: 3380-3390, 2006.

*Natella F, Leoni G, Maldini M, Natarelli L, Comitato R, Schonlau F, Virgili F, Canali R.*

Absorption, metabolism, and effects at transcriptome level of a standardized French oak wood extract, Robuvit®, in healthy volunteers: pilot study. *J Agric Food Chem* 15: 443-453, 2014.

*Horvathova M, Orszaghova Z, Laubertova L, Vavakova M, Sabaka P, Rohdewald P, Durackova Z, Muchova J.*

Effect of the French oak wood extract Robuvit® on markers of oxidative stress and activity of antioxidant enzymes in healthy volunteers: a pilot study. *Oxid Med Cell Longev* doi:639868, 2014.

## **Robuvit® elevates energy**

*Belcaro G, Cornelli U, Luzzi R, Cesarone MR, Dugall M, Feragalli B, Hu S, Pellegrini L, Ippolito E.*

Improved management of primary chronic fatigue syndrome with the supplement French oak wood extract (Robuvit®): a pilot, registry evaluation. *Panminerva Med* 56: 63-72, 2014.

*Belcaro G, Cornelli U, Luzzi R, Ledda A, Cacchio M, Saggino A, Cesarone MR, Dugall M, Feragalli B, Hu S, Pellegrini L, Ippolito E.*

Robuvit® (*Quercus robur* extract) supplementation in subjects with chronic fatigue syndrome and increased oxidative stress. A pilot registry study. *J Neurosurg Sci* 59: 105-117, 2015.

*Országhová Z, Waczulíková I, Burki C, Rohdewald P, Duracková Z.*

An Effect of Oak-Wood Extract (Robuvit®) on Energy State of Healthy Adults-A Pilot Study. *Phytother Res* 29: 1219-1224, 2015.

*Vinciguerra MG, Belcaro G, Cacchio M.*

Robuvit® and endurance in triathlon: improvements in training performance, recovery and oxidative stress. *Minerva Cardioangiol* 63: 403-409, 2015.

## **Robuvit® helps maintain a healthy liver function**

*Belcaro G, Dugall M, Hu S, Ledda A, Ippolito E.*

French Oak Wood (*Quercus robur*) Extract (Robuvit®) in Primary Lymphedema: A Supplement, Pilot, Registry Evaluation. *Int J Angiol*. 2015 Mar;24(1): 47-54. doi: 10.1055/s-0034-1395982.

*Belcaro G, Gizzi G, Hu S, Dugall M, Pellegrini L, Cornelli U, Cesarone MR, Trignani M, Maione C.*

Robuvit® (French oak wood extract) in the management of functional, temporary hepatic damage. A registry, pilot study. *Minerva Med* 105: 41-50, 2014.

*Deáková Z, Országhová Z, Andrežalová L, Slezák P, Lehotay J, Muchová J, Burki C, Duracková Z.*

Influence of oak wood polyphenols on cysteine, homocysteine and glutathione total levels and PON1 activities in human adult volunteers - a pilot study. *Gen Physiol Biophys* 34: 73-80, 2015.

*Pellegrini L, Belcaro G, Dugall M, Corsi M, Luzzi R, Hosoi M.*

Supplementary management of functional, temporary alcoholic hepatic damage with Robuvit® (French oak wood extract). *Minerva Gastroenterol Dietol* 62: 245-252, 2016.

[info@robuvit.com](mailto:info@robuvit.com)  
[www.robuvit.com](http://www.robuvit.com)

Robuvit® is a registered trademark of Horphag Research.  
Use of this product is protected by one or more U.S. patents and other international patents.

The information provided in this document is for professional use only. Statements and information provided herein have not been evaluated by the Food and Drug Administration or other health authorities. This product is not intended to diagnose, treat, cure or prevent any disease. Horphag Research supplies Robuvit® as a raw material to manufacturers of finished products. Therefore, Horphag Research makes no claims regarding the use of finished products and each manufacturer is responsible for ensuring that any claims it chooses to make in connection with the use of its finished products fully comply with the regulatory and legal requirements of the locations in which it markets its products.