Peptan®

ALL ABOUT COLLAGEN

Collagen peptides for a healthy lifestyle

EFFECT ON JOINT FUNCTION

EFFECT ON HAIR AND NAILS

POST WORK OUT RECOVERY

SATIETY EFFECT

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WHAT IS **COLLAGEN**

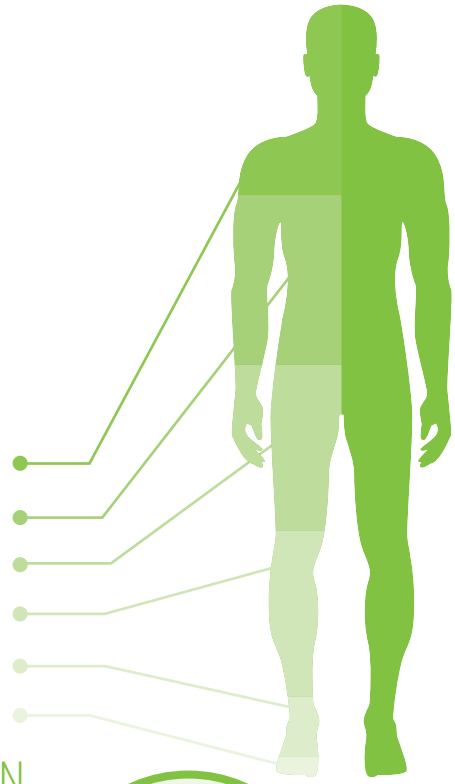
Collagen is a protein found in animals and made up of amino acids. Since ancient times, collagen has been known to benefit human health. For centuries, people have been consuming collagen in the form of bone broth to support their joint and bone health and in more recent times, to promote healthier hair, skin and nails.

COLLAGEN AND ITS ROLE IN THE HUMAN BODY

Collagen is the major protein in the connective tissues of the body. It holds all living tissues together and ensures the integrity, elasticity and regeneration of skin, cartilage and bones. It is the most abundant protein, representing almost 30% of all human protein content.

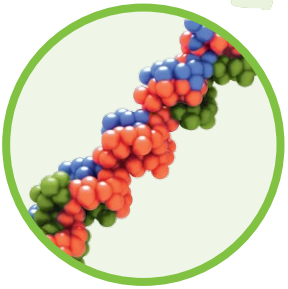
Bodily distribution of collagen

(By weight ratio)



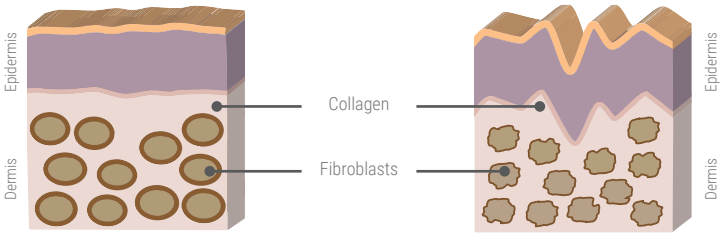
STRUCTURE OF COLLAGEN

Collagen is a triple helix of alpha-chains of amino acids which builds strong fibers used for the body's structure.



WHAT HAPPENS **WHEN WE AGE?**

Collagen production in our body peaks around the age of 20, and as we age, the body's production of collagen metabolism slows down causing a gradual deterioration of collagen fibers in all connective tissues. This degradation process will affect different parts of our body, for example in the skin as shown in below image.



State of full collagen

Aging causes collagen in dermis to damage and fragment

SKIN

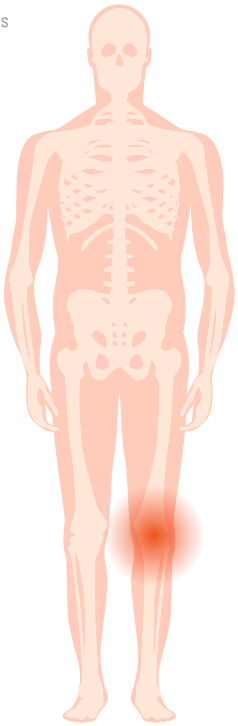
As skin cells become less active, the collagen network that provides skin firmness and structure breaks down. Skin becomes dehydrated and thinner, plus lines, wrinkles and deep furrows start to appear.

BONES

Bone turnover becomes imbalanced, that means there is more bone loss than bone formation. This causes bones to become more fragile and easier to break.

JOINT

Lower levels of collagen and other matrix components can cause loss of cartilage and joint function. This results in joint discomfort.

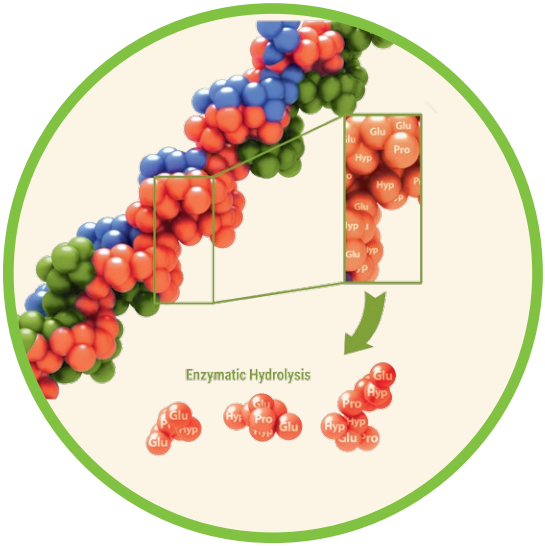


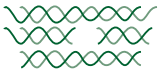
DIFFERENT **FORMS OF COLLAGEN**

Collagen is a safe and natural ingredient which can be obtained in different grades. It can be found in foods such as bone broth or gelatine based desserts.

The controlled breakdown of native collagen with the help of enzymes produces collagen peptides. The solubility, absorption and digestibility vary among different grades of collagen.

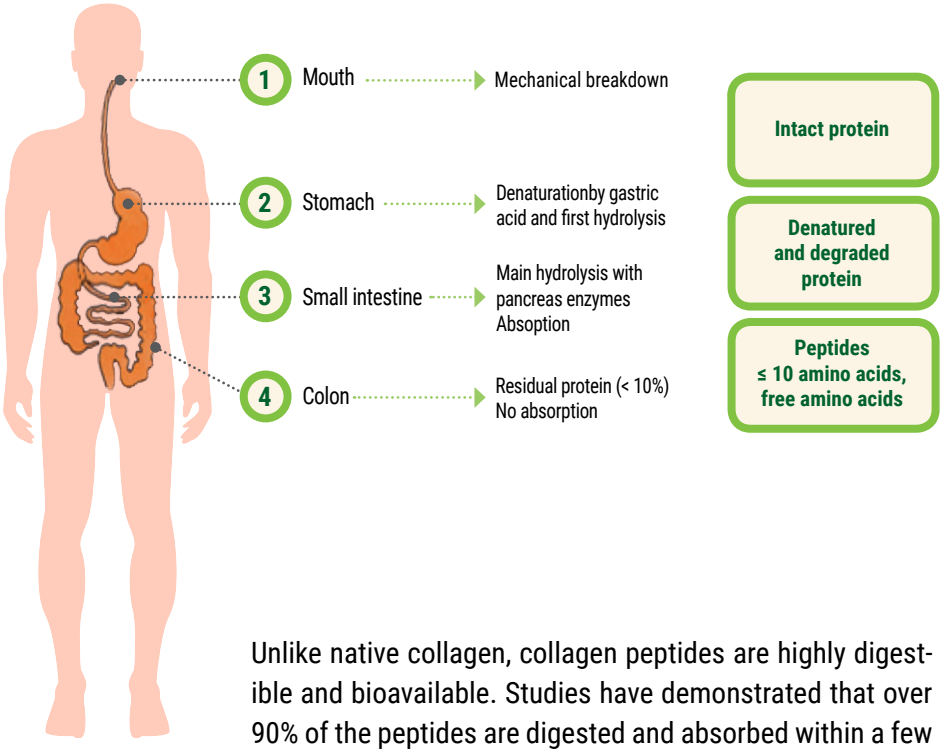
THE MUCH SMALLER AND EASILY DIGESTIBLE COLLAGEN PEPTIDES ARE PRODUCED BY CONTROLLED ENZYMATIC HYDROLYSIS.



Grade	Form	Solubility	Absorption & digestibility	Application examples
Native Collagen		Insoluble	None	Medical materials, collagen casing
Gelatin		Medium	Low	Gelatin desserts, confectionery
Collagen peptides		High	High	Dietary supplemetns, functional foods

DIGESTIBILITY AND BIOAVAILABILITY

Gelatin is a healthy food, but the unique benefits that collagen offers are not easily obtained by eating gelatine alone. Breaking gelatin into smaller chains of amino acids produces collagen peptides, which are easier digested and absorbed by the body. Consuming collagen peptides allows your body to maximizes the benefits that collagen has to offer.



Unlike native collagen, collagen peptides are highly digestible and bioavailable. Studies have demonstrated that over 90% of the peptides are digested and absorbed within a few hours after meal.

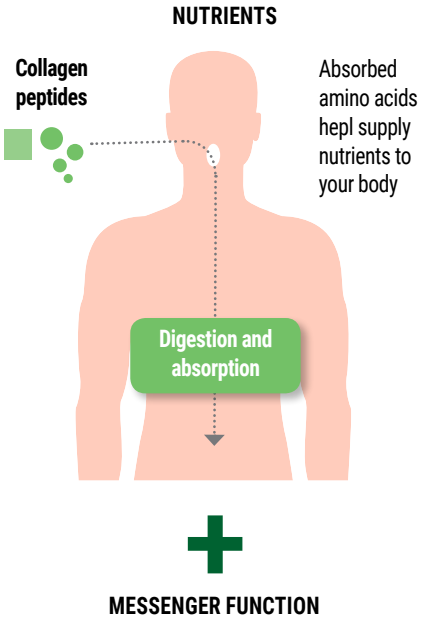
This rapid absorption and effective delivery of the essential peptides and amino acids to their site action within the body.

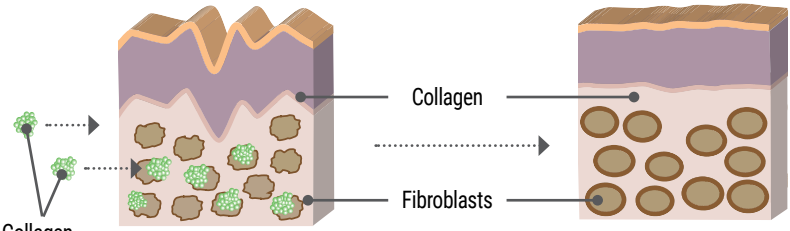
DUAL ACTION EFFECT

Proteins are essential nutrients for our body. Proteins are long chains made of amino acids linked together. Collagen peptides are bioactive proteins.

Consumption of collagen peptides will help to supply your body with amino acids needed as building blocks to renew tissues such as skin, bones and joints.

It has been proposed that collagen peptides may act as a messenger and trigger the synthesis and reorganization of new collagen fibers therefore supporting skin tissue structure.





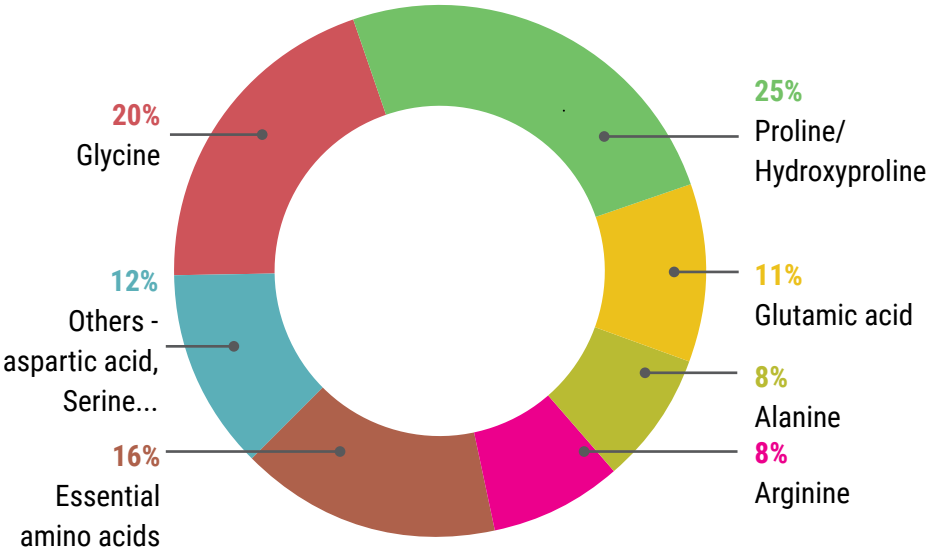
Specific amino acids proline-hydroproline (PO) and hydroxyproline-glycine from collagen peptides absorbed may act as mesenger to active fibroblast cells

ROLE OF **VITAMIN C**

Vitamin C is a co-factor which supports the production of collagen in the body. Therefore, it is important to ensure that you have sufficient Vitamin C in your diet to boost the collagen synthesis.

COLLAGEN IS A UNIQUE PROTEIN
WITH KEY AMINO ACIDS

Collagen peptides are characterized by a high level of the key amino acids: glycine and proline/hydroxyproline, which represents around 50% of the total amino acid content. Hydroxyproline is unique to collagen. The amino acids in collagen are the same as found in skin, joints and bones.

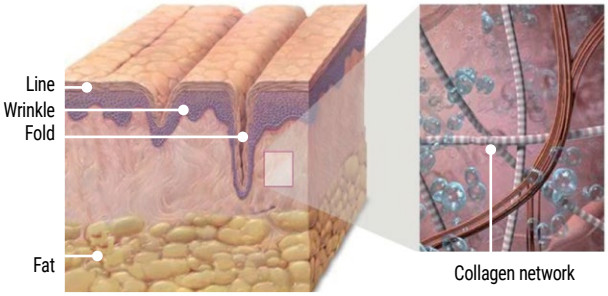


This very specific composition of amino acids provides collagen peptides with unique biofunctional properties that cannot be found in other protein sources.

COLLAGEN PEPTIDES' **SKIN HEALTH EFFECTS**

Collagen makes up 70% of skin's dry mass skin content. As a key component of the skin's structure, collagen fibers provide the infrastructure for elastin, which maintains skin's elasticity, and for hyaluronic acid to trap moisture.

As we age, the number and activity of skin cells that produce collagen decreases, the skin then becomes dry and thinner as the collagen network that provides skin firmness and structure starts to break down.



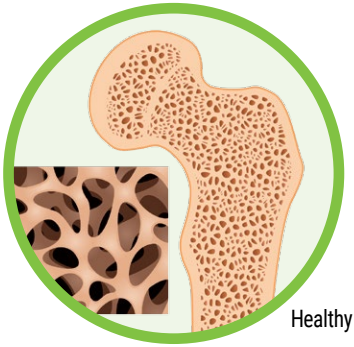
COLLAGEN'S EFFECTS ON **SKIN STRUCTURE AND MOISTURE**

Clinical trials showed that collagen peptides (Peptan®) consumption effectively improved skin structure: the fragmentation of collagen in the deep layers of the skin was reduced already after 4 weeks and decreased by 31% after 12 weeks. At the same time the density of collagen layer increased providing more strength to the skin.

Peptan® further increased skin moisture by 28% after 8 weeks. This restructuring of the skin is the key to bringing anti-aging benefits and more youthful appeareance.

BONES

Collagen represents around 90% of organic bone mass and provides a flexible framework to which calcium hydroxypathite is added to provide strength.



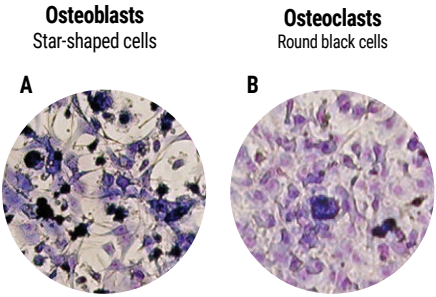
Healthy bone

A cycle of continuous bone formation and breakdown replaces approximately 15% of bone mass in healthy adults each year.

When this balance tips towards faster bone loss and slower bone formation, the bone density decreases leaving the bone more fragile.

COLLAGEN'S EFFECT ON **BONE FORMATION**

Collagen peptides (Peptan®) are demonstrated in scientific studies to promote bone health by stimulating bone renewal, maintaining bonemineral density and improving bone solidity and strength.



The image on the left shows bone cells that are cultured in the presence of a control protein (B) or Peptan® (A). Peptan® stimulates the developing of bone forming cells- osteoblasts visible as star-shaped cells much more than the control protein. Bone resorbing cells-osteoclasts are not affected by Peptan® or the control protein. (Guillerminet *et al*., 2010).

COLLAGEN PEPTIDES' **HEALTH EFFECTS**

JOINT

Collagen fibers make up 70% of dry cartilage mass and are responsible for its structure and strength.

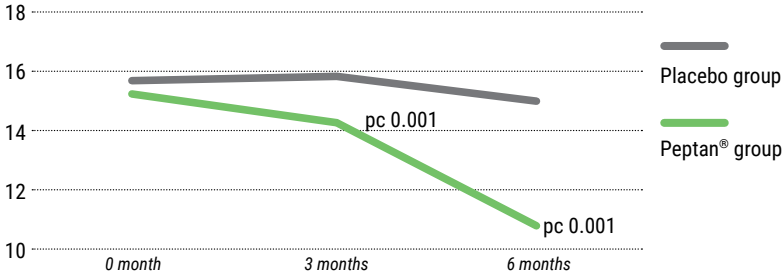
Aging and high impact sports can cause wear and tear to cartilage. This can lead to joint discomfort, tenderness, stiffness and locking.

COLLAGEN'S EFFECTS ON JOINT FUNCTION

Collagen peptides (Peptan®) have been proven to stimulate cartilage cells synthesis, producing increased aggrecan and collagen. A recent study (Jiang *et al.*, 2013.) showed that an intake of Peptan® can reduce joint discomfort and improve joint flexibility and function.

DEVELOPMENT OF WOMAC SCORES

(decreased score value = improvement - significantly lower pain scores)



NEW *IN VIVO* STUDY

PEPTAN® HELP IN THE REGENERATION OF CARTILAGE AND REDUCE JOINT INFLAMMATION

Recently an *in vivo* study (Dar *et al*., 2016) has been carried out which has shown that collagen peptides help in the regeneration of cartilage and reduce joint inflammation.

This study was performed with animals who were induced a post-traumatic arthritis, degenerative joint disease that culminates with the irreversible loss of articular cartilage.

Given the difficulty in effectively treating this disease or reducing its symptoms, it is necessary to find therapeutic strategies that offer a regenerative and chondroprotective capacity. Up to now cartilage-containing food supplements have been marketed to maintain joint health, but no great results have been obtained. However, a positive action on chondrocyte function has been observed with the use of Peptan® (type 1 hydrolyzed collagen peptides).

This study has shown that Peptan® is chondro-regenerative and anti-inflammatory in the context of small mammals with post-traumatic arthritis in the knees. While the mechanism of action is still under investigation, these results provide the basis for explaining the results obtained in the already published studies on the symptomatic relief observed in people suffering from arthritis.

The upcoming clinical trials will be highly significant given that arthritis is one of the most common diseases in the world and effective treatment has not yet been established.

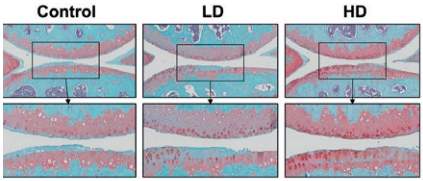


Fig. 1: Safranin O / rapid green staining in knee joint 12 weeks after meniscal ligament rupture reveals an improvement in pericellular proteoglycan content and a greater thickness in the articular cartilage of the tibial plateau in treated mice With Peptan® with low dose (LD) and high dose (HD). Histomorphometry revealed significant positive effects of Peptan® on the area of the calcified tibial cartilage.

OTHER BENEFITS OF **COLLAGEN PEPTIDES**

Collagen peptides such as Peptan® is a bioactive and pure protein, and as a protein it can help contribute to different health benefits. Protein is a vital part of the diet and the WHO recommends a mean daily intake of 0.8 g / kg body weight of good quality protein.

HAIR AND NAIL

Collagen provides the structural foundation for hair and nails. When ingested with collagen peptides, the amino acids are absorbed and used by hair follicle cells to produce keratin protein for healthy hair. Fingernails and toenails are also made of keratin, and rest on a nail bed made of skin dermis.

POST WORK OUT RECOVERY

To ensure optimum muscle regeneration, physically active people need a sufficient availability of amino acids to enable muscle synthesis during recover. A high protein diet just after exercise may enhance muscles anabolism, replace lost proteins, help maintain and restore the protein content of the muscles while also reduce the recovery time.

SATIETY EFFECT

Providing a high satiety effect, collagen peptides are excellent protein source to control appetite and moderate cravings.

HOW TO **REPLENISH COLLAGEN**

DAILY INTAKE

In order to continuously boost the production of collagen in the body, it is recommended to consume collagen peptides on a daily basis.

If you have a medical condition or are pregnant, please consult your medical doctors or health care professionals.

SUPPLEMENTS

Collagen peptides are available in different forms for daily intake.

They can be in forms of drinks, powders, tablets and more, depending on which may fit your preference and lifestyle.

FOOD

There are various types of functional foods that are enriched with collagen peptides such as dairy products, soup, bars, etc.

There are also good sources of collagen peptides and can be alternatives to dietary supplements.

FAQ

Peptan®

ARE COLLAGEN PEPTIDES SAFE?

Collagen peptides as Peptan® are pure and bioactive protein, derived from 100% natural source and free from any side-effects.

WHAT IS THE SOURCE OF COLLAGEN PEPTIDES?

Collagen has a long history of use in foods, mainly in the form of gelatin found in gummies and jello style desserts. Collagen is also naturally present in high amount in some cooked foods, e.g. bone broth and in the skins of fish and chicken.

When manufactured as a supplement, collagen is extracted from high quality raw materials and is purified and dried to produce a pure protein powder.

HOW MUCH TIME IS NEEDED TO SEE THE FIRST RESULT?

Most studies show positive health effects on skin and joints within 1-3 months of daily intake.

However it is vital to keep up a regimen of daily collagen intake to ensure efficient metabolism and optimal effects.

HIGH PERFORMANCE COLLAGEN PEPTIDES
BACKED BY SCIENCE

Peptan® is a unique, high-purity bioactive collagen peptide. Peptan® is manufactured using a gentle enzymatic process, enabling a precise degree of hydrolysis and optimal molecular weight, to ensure superior performance and ease of use. Peptan® has been specifically developed to deliver multiple health benefits and functional properties. Numerous scientific studies, including *in-vitro*, *in-vivo* and clinical research, have demonstrated Peptan's ability to promote healthy living and its proven benefits in key areas of healthy aging, joint and bone health, skin beauty and sports nutrition.

QUALITY FIRST

As a premium collagen peptide, Peptan® is 100% natural, safe and free from any preservatives or additives. Peptan® is manufactured by Rousselot's state of the art certified plants in France and Brazil meeting the highest international food and quality standards with full traceability throughout the process. Peptan® can be provided under Halal or Kosher certification.

ABOUT ROUSSELOT

Rousselot

Reaching forward together, Rousselot is the global leader of gelatin and collagen peptides. Rousselot's wide range of collagen peptides are marketed under the Peptan® brand. They work in partnership with their customers all over the world, delivering innovative and advanced ingredient solutions manufactered through state or the art operations. They help their customers achieve their goals, enabling them to create world class pharmaceutical, food and nutritional products to ispire and excite today's demanding consumers. Rousselot supports its worldwide customers with its unique knowledge and expertise.

Peptan®

www.peptan.com
peptan@rousselot.com

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Scientific studies about Peptan® in this book

- Asserin J., et al. 2015, «The effect of oral collagen peptide supplementation on skin moisture and dermal collagen network: evidence from an ex vivo model and randomized, placebo-controlled clinical trials», Journal of Cosmetic Dermatology, (in press)

- Guillerminet, F. et al., 2010. Collagen peptides improve bone metabolism and biomechanical parameters in ovariectomized mice: an in vitro and in vivo study. Bone, 46: 827-834

- Guillerminet, F. et al., 2012. Hydrolyzed collagen improves bone status and prevents bone loss in ovariectomized C3H/HeN mice. Osteoporosis International, 23: 1909-1919

- Jiang, J.X . et al., 2014. Peptan Collagen Peptides for Treatment of Knee Osteoarthritis: A Double-Blind, Randomized,Placebo-Controlled Study. Agro Food Industry Hi Tech 25(2): 20-21

- Dar, Q. A. et al., 2016, Oral hydrolyzed type 1 collagen induces chondroregeneration and inhibits synovial inflammation in murine posttraumatic osteoarthritis, Osteoarthritis and Cartilage, 24:S532-S533

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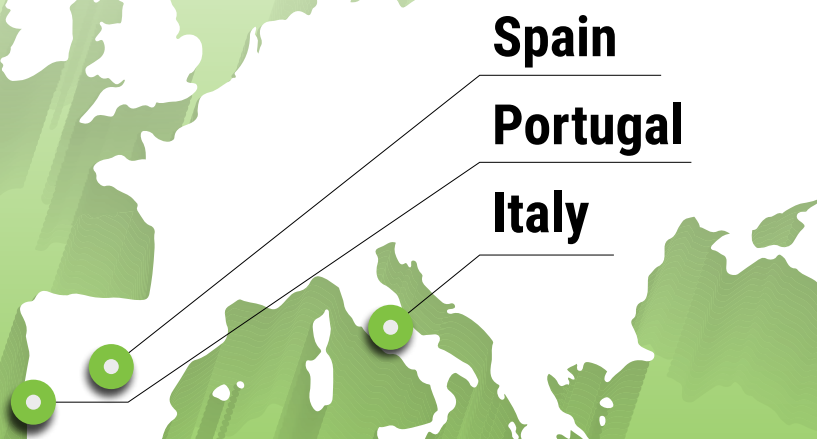

Solchem Nature SLU
Consell de Cent, 153
08015 Barcelona
SPAIN
+34 934 518 844

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