

**FORTIBONE®**  
Collagen Matrix Stimulation



**FORTIBONE® –**  
the missing piece in bone  
health management

- Increase in bone mass density
- Clinically shown bone building effects
- Support bone stability and flexibility

**GELITA**  
Improving Quality of Life

# Collagen – The Body's Protein!

Collagen is a major component of the human body. About 30% of our total body protein is collagen. Collagen is crucial for mobile joints, stable bones, healthy muscles, strong ligaments and tendons, smooth skin, glossy hair and healthy finger nails. It is one of the primary structural proteins of connective tissues and also abundant in blood vessels, intervertebral discs, the blood-brain barrier, the cornea, dentin and the intestinal wall – a vital component of our whole body.

## ! Bioactive Collagen Peptides® stimulate collagen metabolism

GELITA Bioactive Collagen Peptides® (BCP) are a composition of different specific peptides optimized for specific physiological benefits. The peptides are derived from a highly controlled production process of collagen which is determined by hydrolyzation conditions. As a result, GELITA Bioactive Collagen Peptides® differ in physiological functionality. They are optimized to maximize stimulation of the human cell types involved in collagen biosynthesis.



Osteoporosis



Normal bone matrix



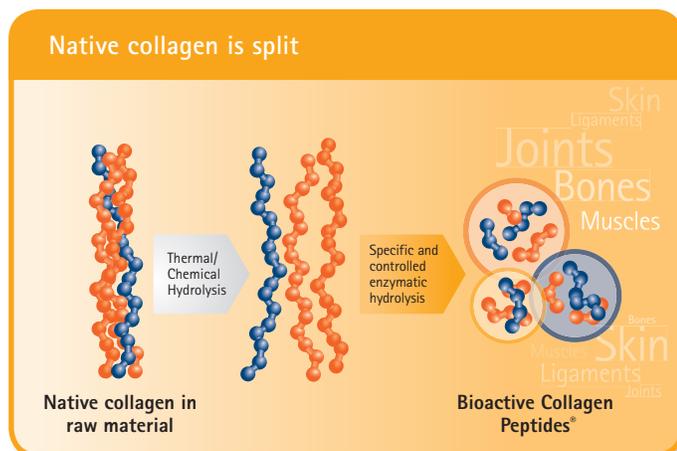
The effect of collagen peptides on increased extracellular matrix synthesis is based on two mechanisms:

- 1) Supply of typical collagen amino acids as valuable building blocks
- 2) Stimulate cell synthesis

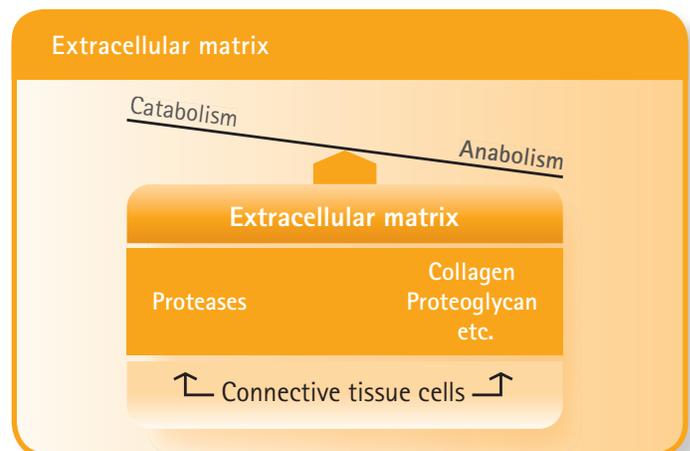
### Bioactive Collagen Peptides®

Skin Health	Fibroblasts	VERISOL®
Joint Health	Chondrocytes	FORTIGEL®
Bone Health	Osteoblasts/Osteoclasts	FORTIBONE®
Body Toning	Muscle cells	BODYBALANCE®
Ligaments/Tendons	Ligamentocytes/Tendocytes	TENDOFORTE®

### Native collagen is split



### Extracellular matrix

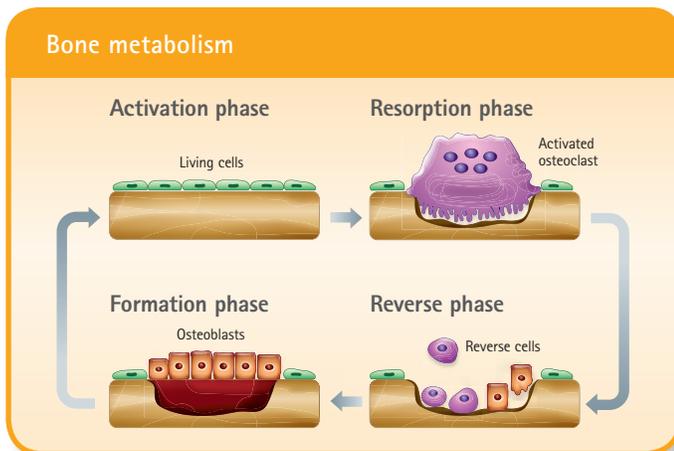


## ! Bones need more than calcium

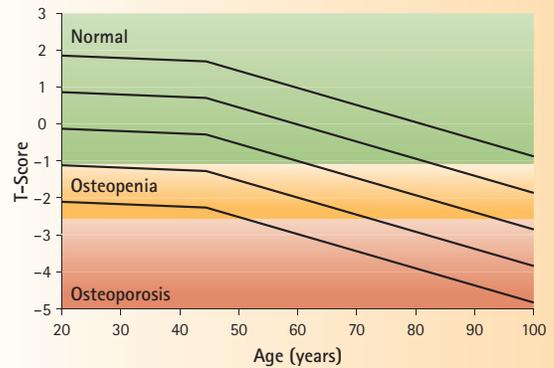
Calcium supplements are everywhere, yet more and more people are suffering from osteoporosis and osteopenia. Bone is a mixture of mineral crystals held in an organic collagen matrix. On their own, the crystals would be extremely brittle and prone to break. Like a bridge is built out of concrete and steel, collagen in the bones is essential for bone flexibility and elasticity. It is important to keep the skeletal system healthy. Osteoporosis (OP) is a condition characterized by low bone mass and micro-architectural deterioration of bone tissue, which leads to enhanced bone fragility and a consequent increase in fracture risk<sup>1</sup>. Osteopenia, the early stage of osteoporosis, can begin at the age of 35 years where bone mass progressively declines.<sup>2</sup> The likelihood to get a fracture increases with age. The risk of contracting a bone fracture is doubling every ten years in both genders.<sup>3</sup>

## ! FORTIBONE® stimulates synthesis of bone collagen matrix

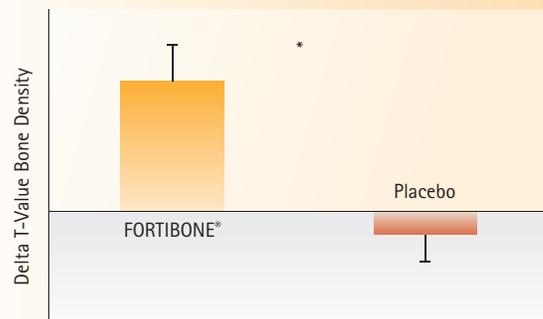
The specific peptides of FORTIBONE® stimulate bone cells to increase the synthesis of bone components such as collagen. They have a kind of 'signaling effect' on osteoblasts to counterbalance the collagen degradation in the extracellular bone matrix, which is the essential framework for bone mineralization. In addition FORTIBONE® influences degenerative processes in bones by reducing osteoclast activity. The result is a considerably higher synthesis of collagenous bone matrix.



### Bone mineral density measurement



### Bone mass increase in the spine



## ! Clinically proven to promote bone health

A single-center, prospective, randomized, placebo-controlled, double-blinded study showed the potential of FORTIBONE®. Over a period of 12 months, 180 women with reduced bone mass participated in a therapy with daily intake of 5 g FORTIBONE® or placebo. Changes in bone mass density were measured in the spine and femoral neck of the participants detected by DXA scans.

FORTIBONE® consumption showed a significant improvement of bone density. The results showed a pronounced increase in BMD (Bone Mineral Density) after FORTIBONE® supplementation in women suffering from osteopenia or osteoporosis. The results indicate an anabolic effect. FORTIBONE® is an interesting option to counteract bone degeneration.

<sup>1</sup> Alves RD, Demmers JA, Bezstarosti K, van der Eerden BC, Verhaar JA, Eijken M, van Leeuwen JP (2011) Unraveling the human bone microenvironment beyond the classical extracellular matrix proteins: a human bone protein library. *J Proteome Res* 10:4725-4733

<sup>2</sup> Raisz LG (2005) Pathogenesis of osteoporosis: concepts, conflicts, and prospects. *J Clin Invest* 115:3318-3325

<sup>3</sup> Cole ZA, Dennison EM, Cooper C (2009) The impact of methods for estimating bone health and the global burden of bone disease. *Salud Publica Mex* 51 Suppl 1:S38-S45

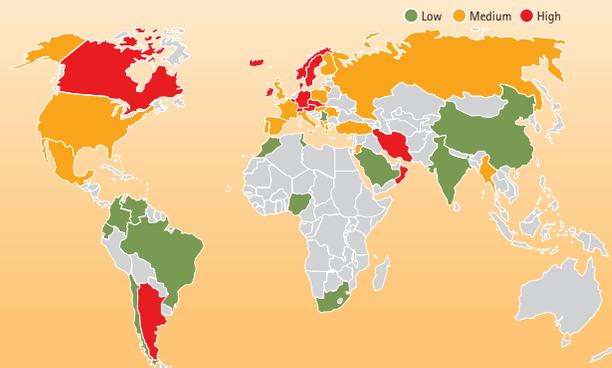
## Osteoporosis and Osteopenia are global issues

Bone atrophy, loss of bone density and bone stability is a problem particularly post-menopausal women have to deal with. But not only them. Osteoporosis is a major public health threat for an estimated 44 million U.S. citizens and for 55 % of all Americans 50 years of age and older. Due to the increased human lifespan, osteopenia and osteoporosis have progressively turned into a major worldwide public health problem causing economic costs of € 19 billion every year. By 2025, experts predict that osteoporosis will be responsible for approximately three million fractures and \$25.3 billion in costs annually.\*

FORTIBONE® is developed to promote bone health, increasing bone density and reducing degradation processes. Products including FORTIBONE® appeal to the elderly and also to physically active consumers interested in maintaining good health.

\*[www.nof.org/patients/what-is-osteoporosis/](http://www.nof.org/patients/what-is-osteoporosis/)

### Risk Category Osteoporosis



### Your FORTIBONE® supplement: recommended by medical doctors



**FORTIBONE®**  
promotes

- clean label (no E numbers)
- highly digestible food
- non-allergenic food
- scientific evidence



## Create innovative dietary supplements with FORTIBONE®!

FORTIBONE® can be used in a variety of supplement formats such as sachets, vials or gels, but is also applicable in functional food.

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