

# AGENDA

## Active Aging Market & Consumer Demand

- Consumer Insights & Benefits
- Category Opportunity

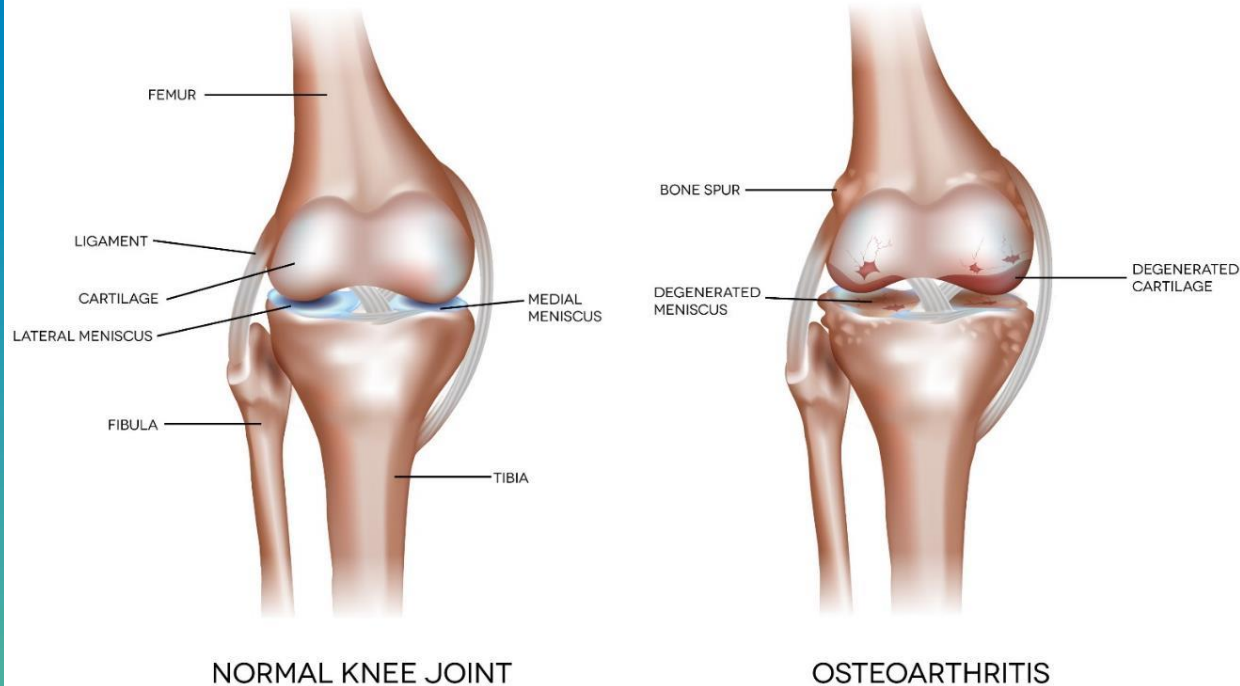
## UC-II<sup>®</sup> Product Overview

- What is UC-II<sup>®</sup>?
- Science - Clinical & Animal Research
- Mechanism of Action
- Formulation Strategies

## Q&A



# OSTEOARTHRITIS (OA)



**[ahr-thrahy-tis]**

*noun*

acute or chronic inflammation of a joint, often accompanied by pain and structural changes and having diverse causes, as infection, crystal deposition, or injury. When joints are inflamed, they can develop stiffness, warmth, swelling, redness and pain. There are over 100 types of arthritis.

# CONSUMERS SEGMENTATION

A wide range of consumers with different needs to address



PROFILE

Athletes practicing activities where the joints are strongly solicited such as endurance sports (trail, running), outdoor and impact sport (tennis)

Young active seniors (50-65) wanting to preserve their bone capital, their flexibility and their joint well-being.

Seniors (65-90) wishing to reduce joint pain and preserve their mobility

PROBLEM

joints problems due to **physical activity level**

joints problems due to age

OBJECTIVES

**PERFORM**

**ENJOY**

**PRESERVE**

**CARE**

Athletes

Weekend Warriors

Silver Agers

# NUTRITIONAL STRATEGIES IN JOINT HEALTH



## ANTI- INFLAMMATORY SUPPORT

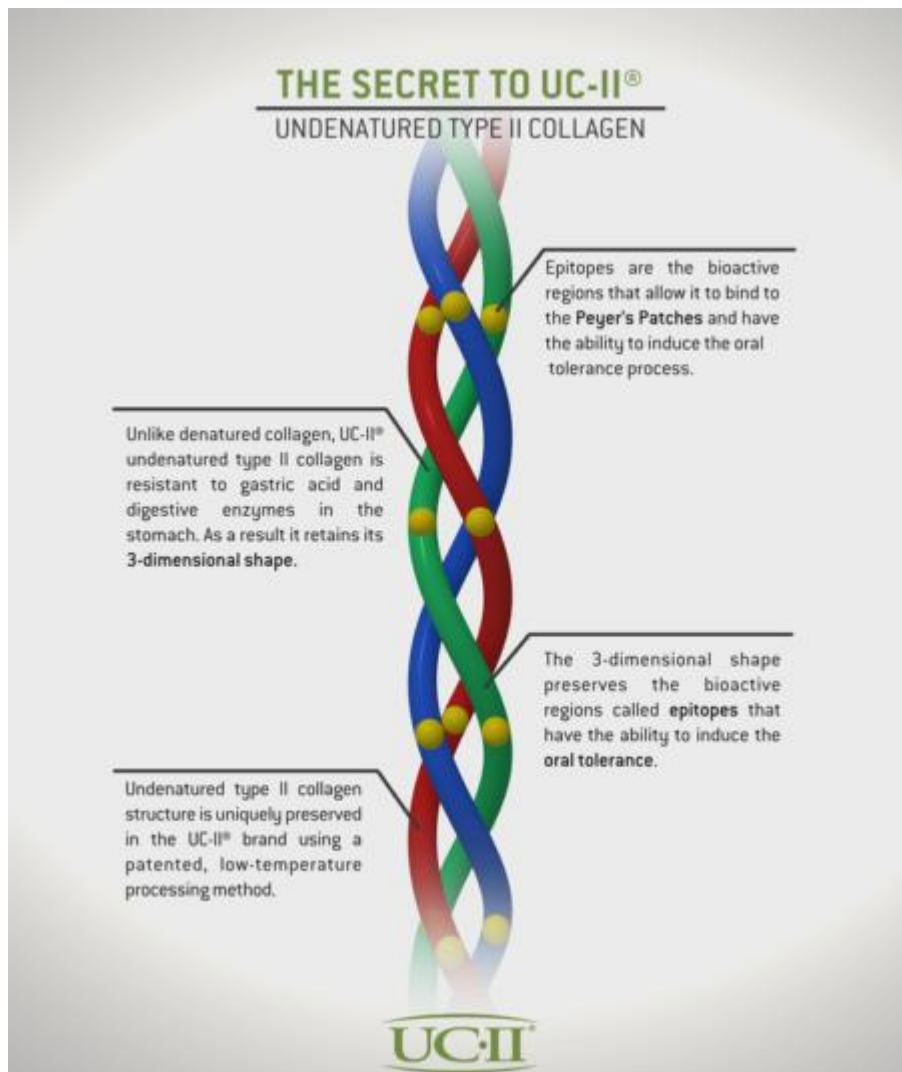
Curcumin, Boswellia,  
proteolytic enzymes,  
SAMe, MSM, omega 3  
fatty acids, Vit D,  
anthocyanin

## BUILDING BLOCKS

Glucosamine  
chondroitin, hyaluronic  
acid, (standard)  
collagen

## ANTIOXIDANTS & MICRO NUTRIENTS:

Vit C, Mn, Cu, Se,  
Vit D, Ca



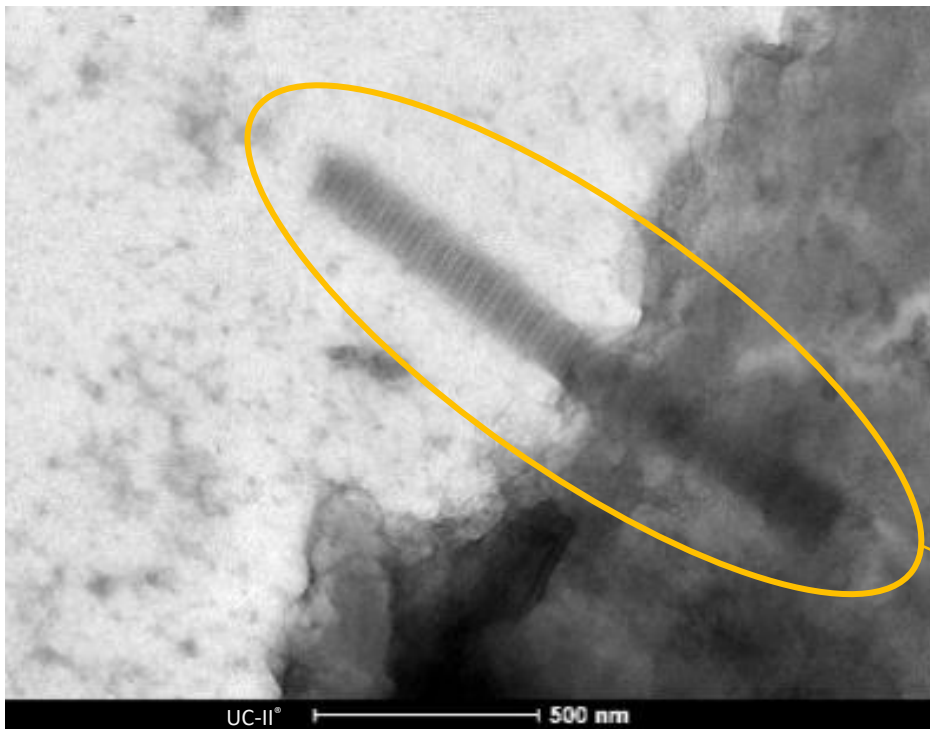
## WHAT IS UC-II® ?

- Undenatured (native) type II collagen derived from chicken sternum cartilage
- Trademarked, patented, clinically studied ingredient for joint health
- Manufactured in USA under food GMP conditions
- Small dose (40 mg/once per day)
- Unique mechanism of action (Oral tolerance)
- Backed up by preclinical and clinical science

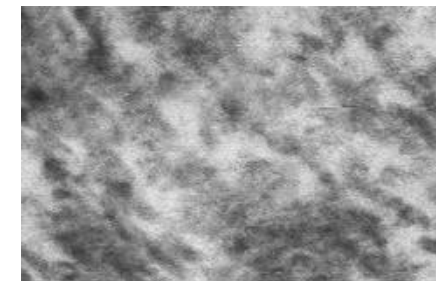


# A DIFFERENCE YOU CAN SEE

UC-II<sup>®</sup> ingredient has intact undenatured type II collagen when viewed under electron microscope



Example of collagen fiber intact without denaturation\*



Example of denatured protein\*\*

Patented processing method preserves the critical undenatured form of collagen.

Electron microscope findings show clear intact undenatured collagen fiber.

These intact undenatured collagen fibers are the reason UC-II<sup>®</sup> ingredient helps joints stay flexible.

\*Jeongmin Hwang, Boi Hoa San, Neill J Turner, Lisa J White, Denver M Faulk, Stephen F Badylak, Yang Li, S Michael Yu Molecular Assessment of Collagen Denaturation in Decellularized Tissues Using a Collagen Hybridizing Peptide. Acta Biomater, 53, 268-278 2017 Apr 15

\*\*Paolo Matteini, Riccardo Cicchi, Fulvio Ratto, Dimitrios Kapsokalyvas, Francesca Rossi, Marella de Angelis, Francesco S.Pavone, Roberto Pini, Thermal Transitions of Fibrillar Collagen Unveiled by Second-Harmonic Generation Microscopy of Corneal Stroma, Biophysical Journal, Volume 103, Issue 6, 2012, Pages 1179-1187, ISSN 0006-3495.

# COMMERCIALLY AVAILABLE COLLAGEN PRODUCTS

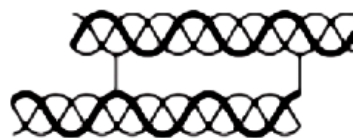
Making the difference with UC-II® undenatured type II collagen

## Undenatured

- No heat
- No enzyme
- Gentle processing

Retained Structure

- Intact polypeptides
- Active epitopes



## Gelatin

- Partial hydrolysis (heat)
- Harsh processing

Disrupted Structure

- Mixture of peptides and polypeptides
- No active epitopes



## Hydrolyzed collagen

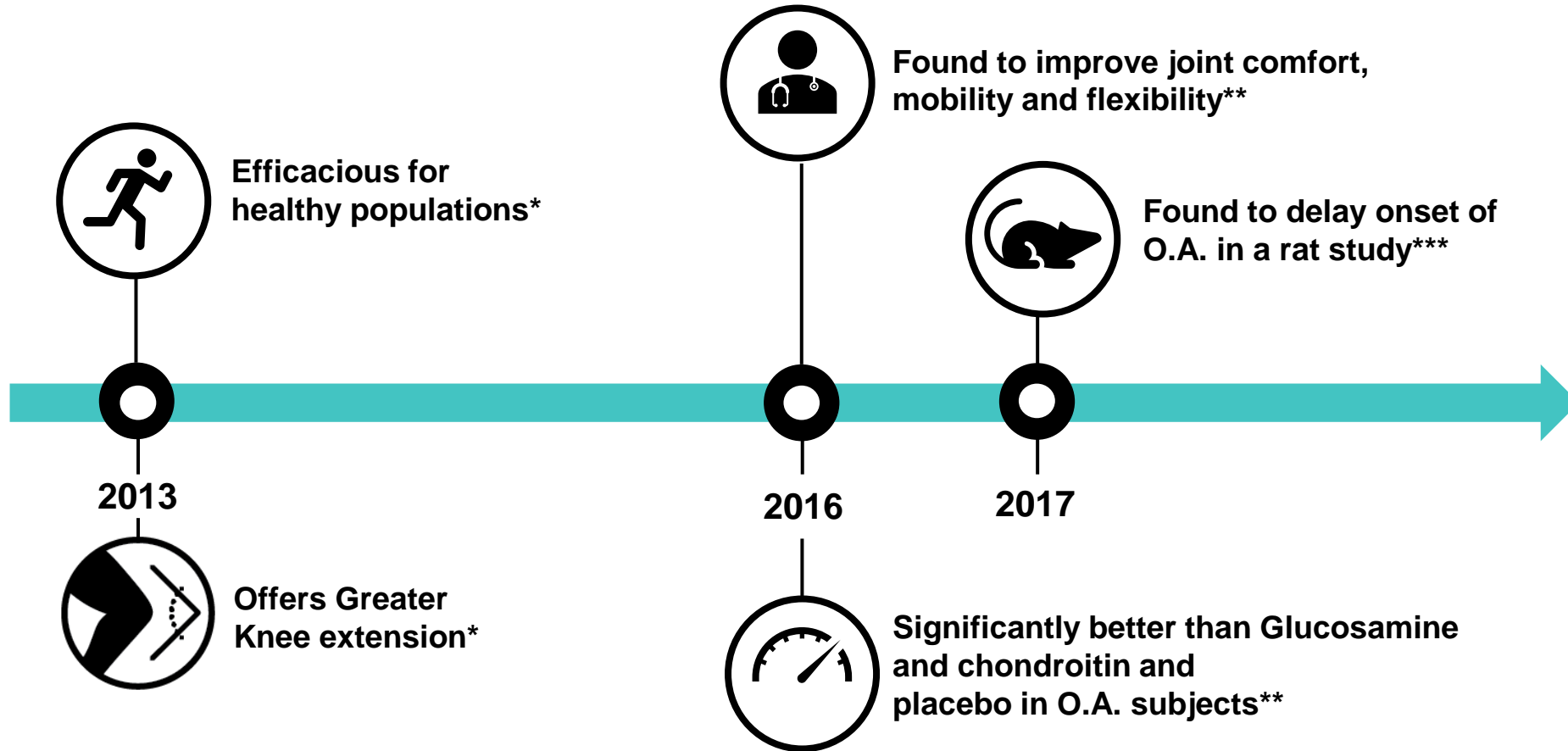
- Complete hydrolysis (heat + enzyme)
- Harsher processing

Disrupted Structure

- Amino acids & small peptides
- No active epitopes



# UC-II® CLINICAL STUDIES



\* Lugo et al., *J Int Soc Sports Nutr.* 2013;10:48

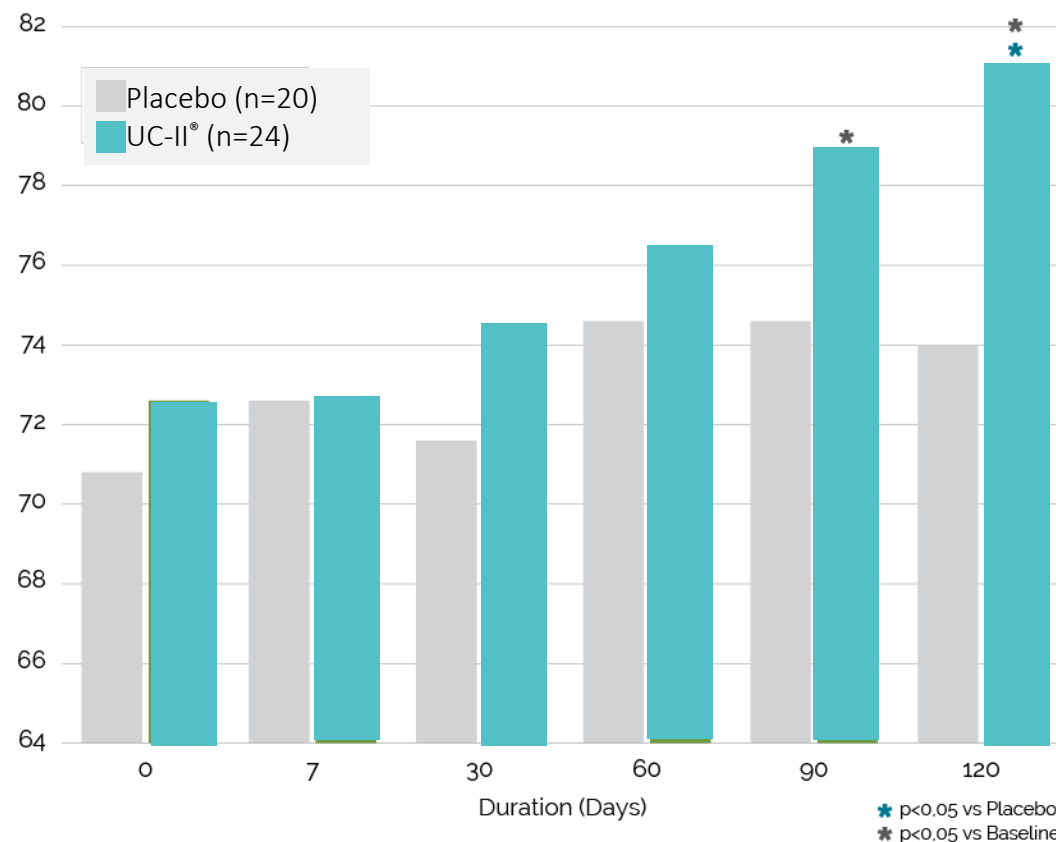
\*\* Lugo JP, et al. *Nutr J.* 2016;15:14.

\*\*\* Bagi et al., *Osteoarthritis Cartilage* 2017; 25:2080-90



# UC-II® BRAND - HEALTHY SUBJECT STUDY, 2013

Randomized, Double-Blind, Placebo-Controlled Study



Lugo et al., *J Int Soc Sports Nutr.* 2013;10:48



UC-II® undenatured type II collagen significantly increase average knee extension compared to placebo



UC-II® undenatured type II collagen appears to be alleviating joint discomfort in healthy subject



Participants in UC-II group exercised longer before experiencing joint discomfort and recovered faster from joint discomfort.



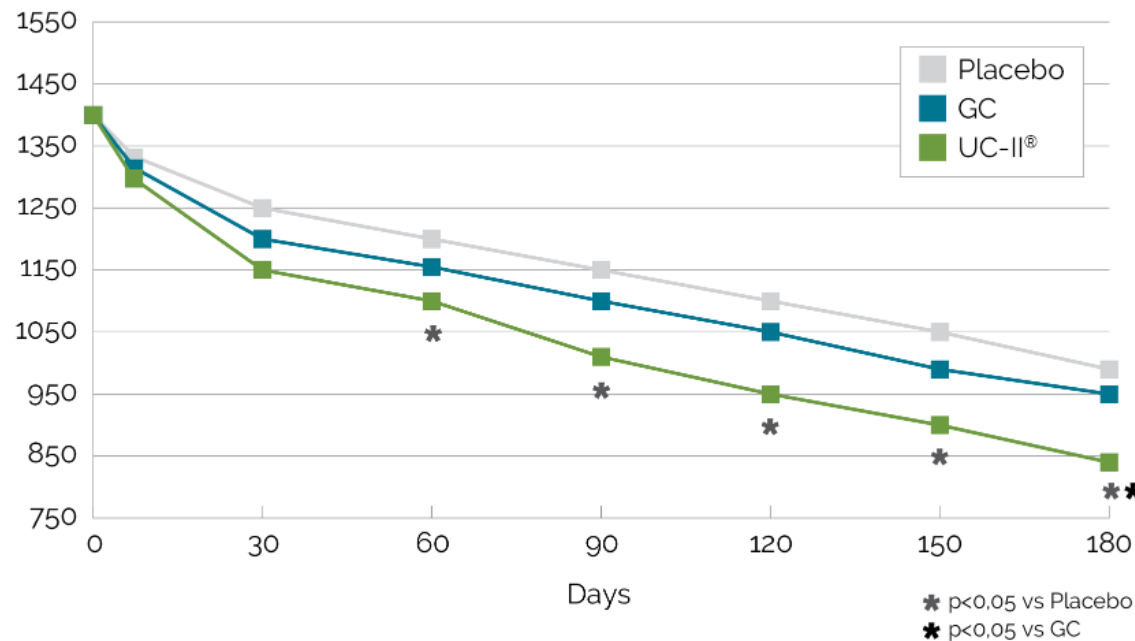
17-week supplementation with UC-II® undenatured type II collagen was well tolerated

# UC-II<sup>®</sup> BRAND - 2016 OA STUDY

Randomized, double-blind, placebo-controlled study

## Total WOMAC Score Reduction

- UC-II<sup>®</sup> brand achieved statistical significance versus placebo and GC
- GC failed to achieve significance versus placebo



UC-II<sup>®</sup> achieved statistical significance versus placebo



UC-II<sup>®</sup> achieved statistical significance versus GC



GC did not achieve statistical significance versus placebo



UC-II<sup>®</sup> is safe and effective

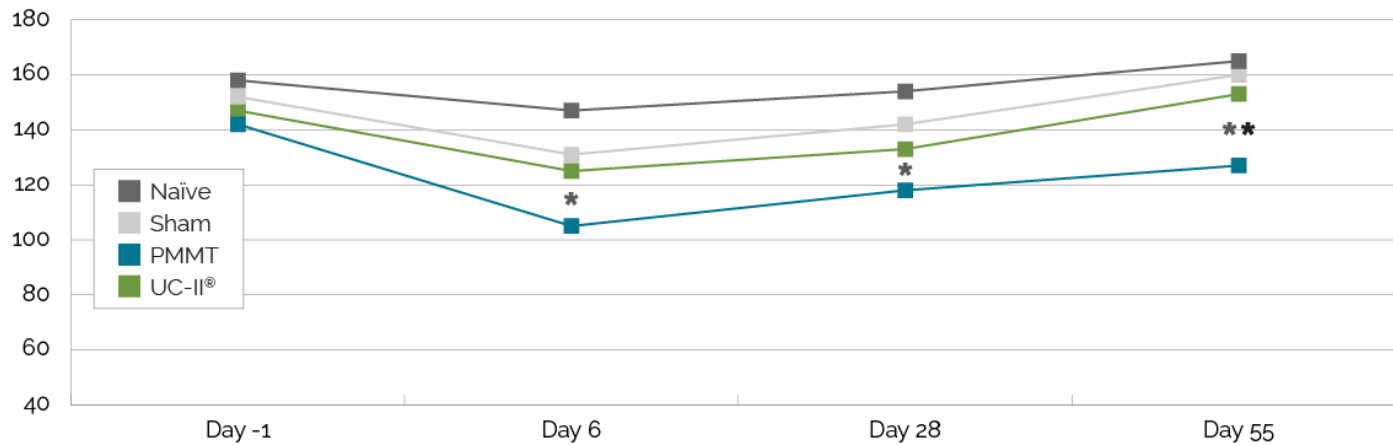
# UC-II<sup>®</sup> BRAND - 2017 STUDY BAGI ET AL

Rat Model of OA (Partial Medial Meniscectomy Tear)

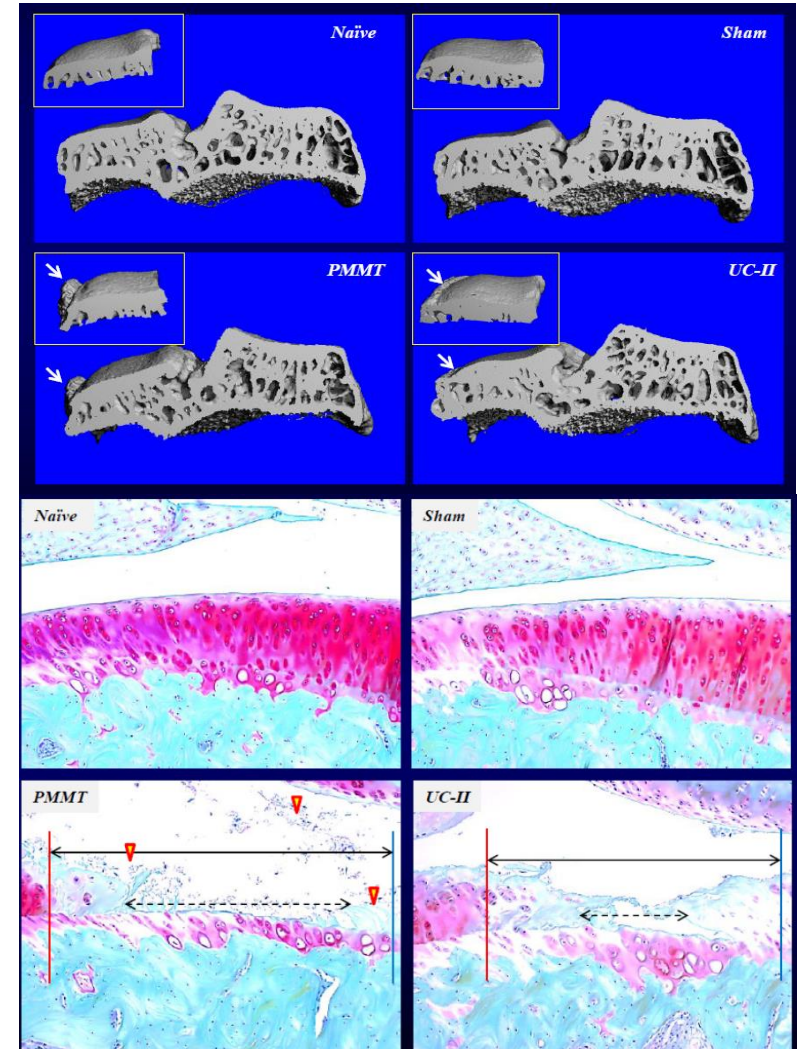
## Research results show that UC-II<sup>®</sup>:

- Improve the mechanical function of the injured knee
- Maintain bone integrity of the knee joint
- Prevent joint cartilage deterioration over the course of the study

Dry Weight Basis - Rear Right Leg (g)



\* p < 0.05 vs Naïve  
\*\* p < 0.05 vs Sham & UC-II<sup>®</sup>



# UC-II<sup>®</sup> BRAND - PROPOSED MECHANISM OF ACTION

*The principle of “oral tolerance”*

UC-II<sup>®</sup> Undenatured Type-II Collagen may trigger the rebuild of cartilage in your joints

## WEAR & TEAR



Daily activities, exercise, or normal stress could lead to joint and inflammation

## CLEAN



Enzymes are upregulated to remove cartilage

## REPAIR

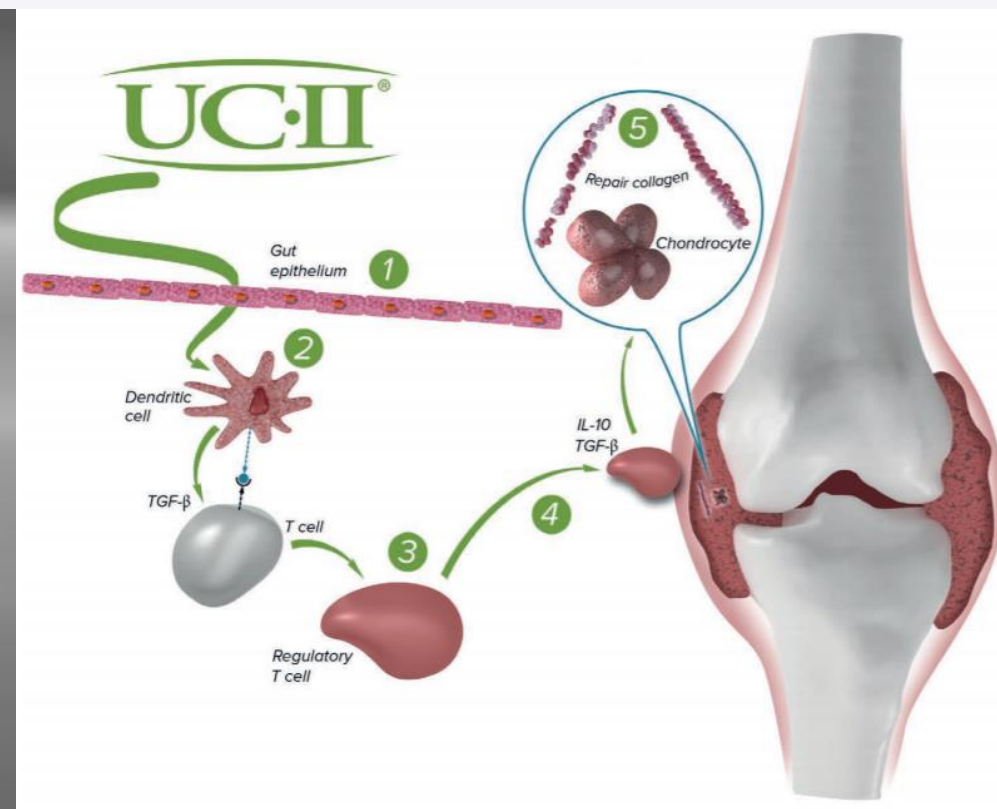


UC-II<sup>®</sup> product triggers anti-inflammatory cascade

# UC-II® UNDENATURATED TYPE II COLLAGEN UNIQUE MODE OF ACTION



UC-II®



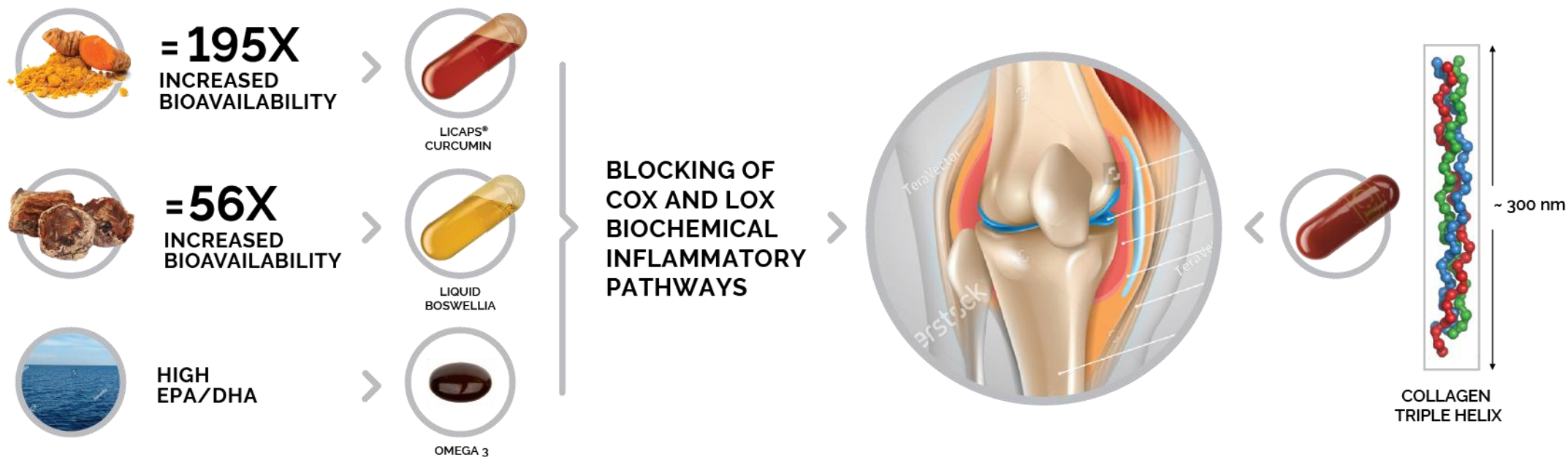
UC-II® undenatured type II collagen appears to exert joint-health benefits by a process called oral tolerance, based on pre-clinical research.



# DEVELOPMENT OF UC-II® ANTI-INFLAMMATORY STRATEGIES

Selection of natural solutions to address joint inflammation

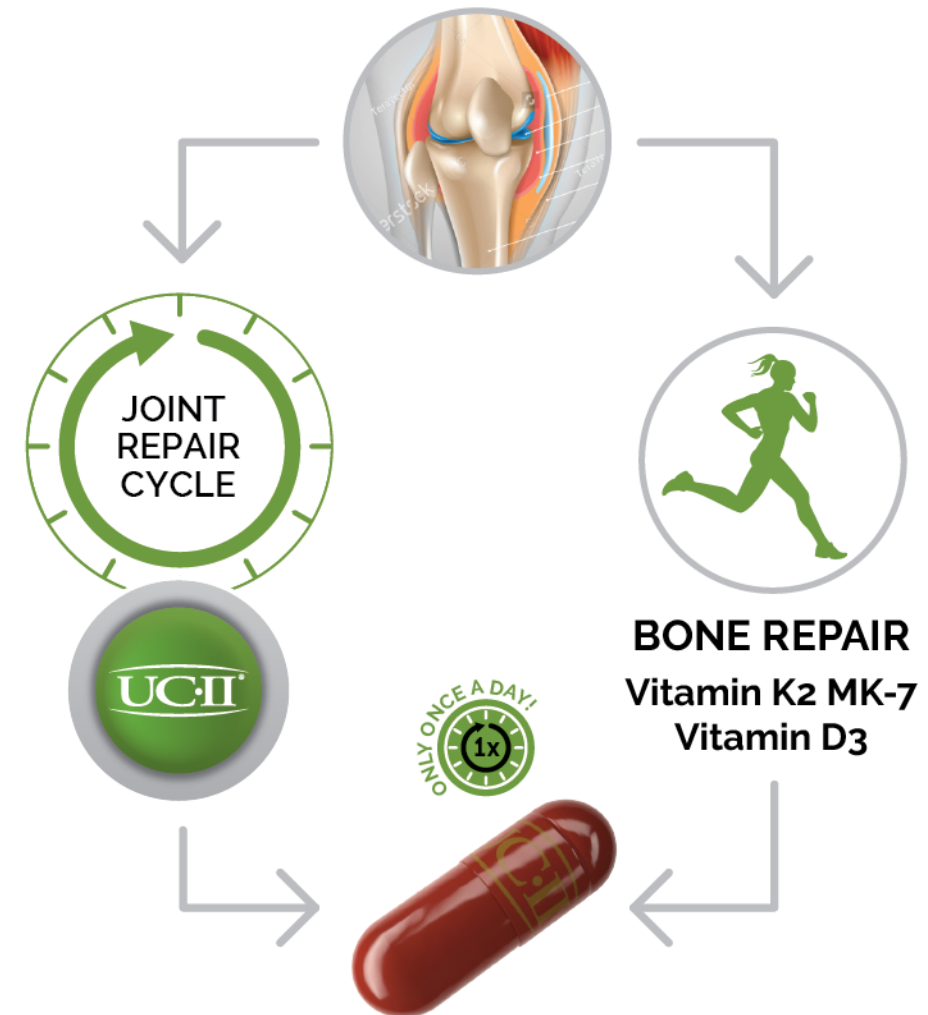
- High bioavailable formulations of plant-based Curcumin/Boswelia known for their multiple effects on inflammatory pathways
- High EPA / DHA containing Omega3 Oils
- UC-II® to trigger the rebuild of cartilage



# UC-II® VIT K2

## TURN-KEY SOLUTION FOR JOINT AND BONE HEALTH

- Synergetic Science Backed ingredients:
  - UC-II® triggers the chondrocytes to rebuild cartilage
  - Vit K2 ensures activation of bone building Osteocalcin
- Ready to market Formulation:
  - 1 single capsule dose a day contains 40 mg of UC-II®
  - VIT K2, Vit C and Vit D3 for joint/bone health claims
  - K2VITAL® 100% pure and stable Vitamin K2
- Convenience:
  - Small size 2 easy to swallow Licaps® liquid filled capsule.



# TAKE-AWAYS

