

## Why choose Synolis VA ?

- ✓ Synolis VA rheological properties are similar to healthy synovial fluid
- ✓ The cartilage physico-chemical properties are enhanced after treatment with Synolis VA ex vivo
- ✓ Synolis VA counterbalances the chondrolysis in vitro

*A unique smart gel containing hyaluronic acid and sorbitol that provides long-lasting restoration of synovial joint function and rapid pain relief*

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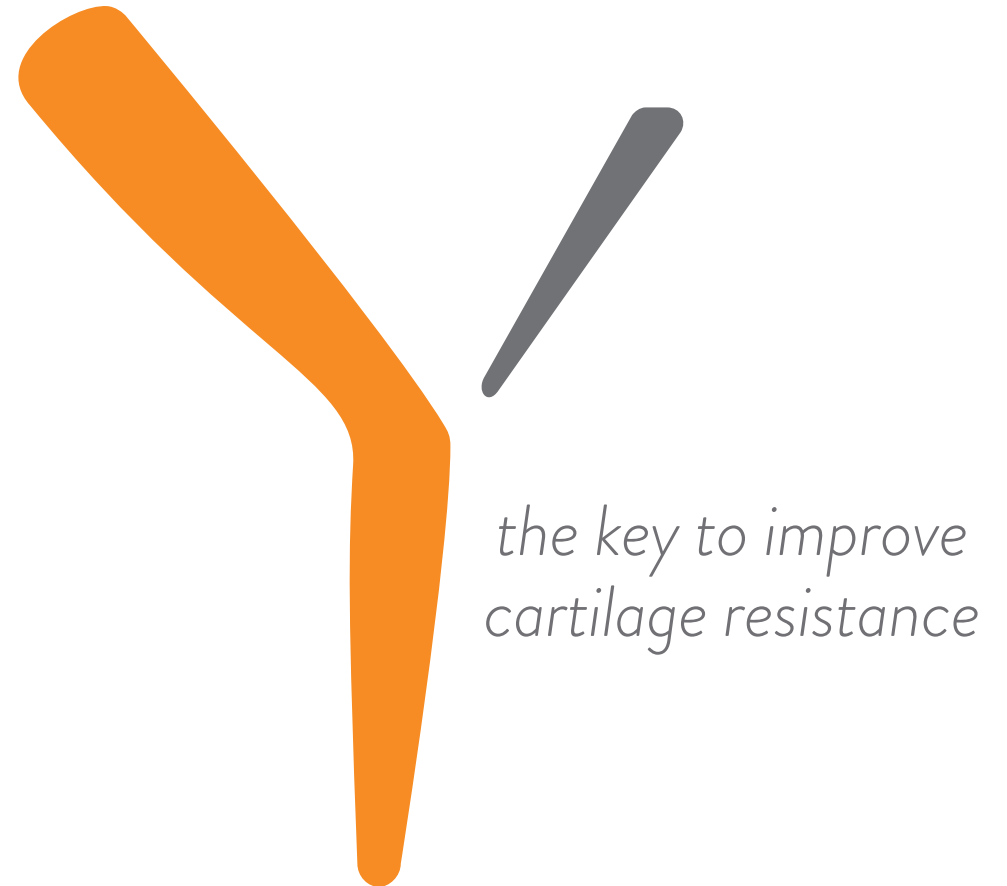


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## SYNOLIS VA & CARTILAGE : A GREAT AFFINITY



**SYNOLIS VA**  
HYALURONIC ACID 40mg / SORBITOL 80mg

# How can the long-term clinical effect of Synolis VA be explained since HA has a short half-life in the joint?

## Synergetic formulation for an acute effect on pain

Synolis VA has a fast and intense effect on pain thanks to its unique rheological properties. Relying on the combination of high dose hyaluronic acid (HA) and sorbitol, this patented gel enhances the visco-elasticity of osteoarthritic (OA) synovial fluid.



The cross-over frequency represents the switch from viscosity ( $G''$ ) to elasticity ( $G'$ ) depending on joints' needs <sup>1</sup>. **Synolis VA cross-over frequency (0,4 Hz) is similar to young synovial fluid** with a higher pressure tolerance, thereby enhancing shock absorption (Figures 1).

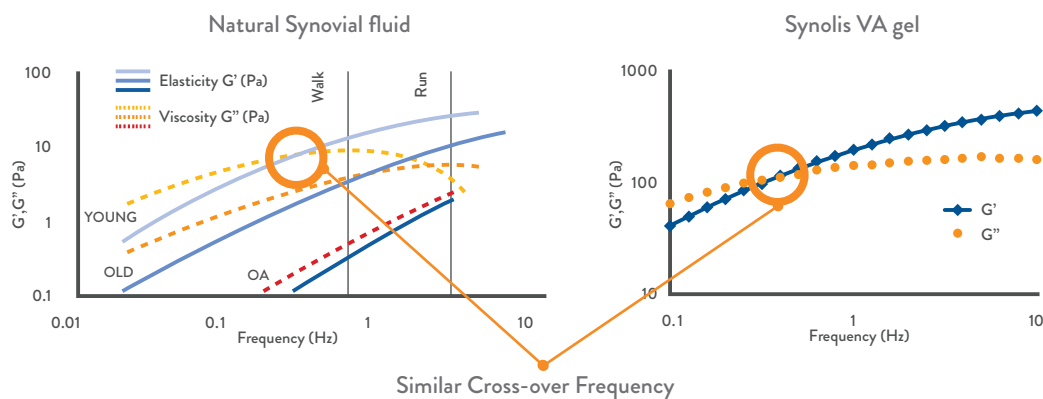


Figure 1: Viscoelasticity of synovial fluid of young, old and OA patients compared to Synolis VA

1. E.A Balazs, Univ Michigan Med. Center J., Special issue 34 (1968), 255-259  
 2. C Lavet, I Badoud, P Ammann. Hyaluronic acid/ sorbitol complex (Synolis VA) improves cartilage material properties (Poster ESCEO 2017)  
 3. Mongkhon JM, Thach M, Shi Q, Fernandes JC, Fahmi H, Benderdour M. Sorbitol-modified hyaluronic acid reduces oxidative stress, apoptosis and mediators of inflammation and catabolism in human osteoarthritic chondrocytes. Inflamm Res. 2014;63:691-701

## Synolis VA improves the quality of cartilage extracellular matrix

Bio-indentation analyses demonstrate that Synolis VA improves cartilage material properties, and that this effect persists over time.

After overnight incubation in Synolis VA, the cartilage resistance is improved as compared to the control (PBS). These modifications are maintained even 48h after exposure. (Figure 2)<sup>2</sup>.

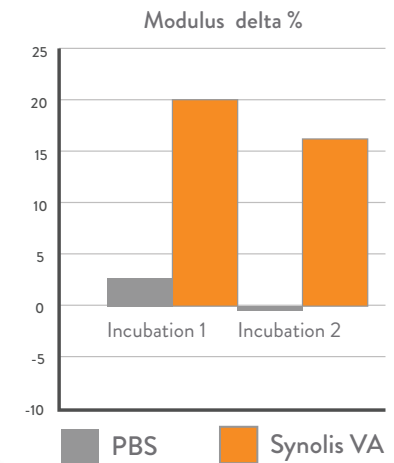


Figure 2: Improvement and persistence of cartilage modulus after incubation in Synolis VA

For more information see Poster presented ESCEO 2017: **Hyaluronic acid/sorbitol complex (Synolis VA) improves cartilage material properties.**  
 C Lavet, I Badoud, P Ammann

## Synolis VA enhances chondrocytes viability

In addition to beneficial physico-chemical effects on cartilage, Synolis VA possibly induces additional molecular mechanisms underlying long-term effect in OA patients (e.g. pain relief, mobility restoration etc.).

HA/Sorbitol has a dose-dependent beneficial effect in OA chondrocytes. This effect relies on the reduction of catabolic and inflammatory responses as well as oxidative stress and apoptosis mechanisms in vitro<sup>3</sup>.