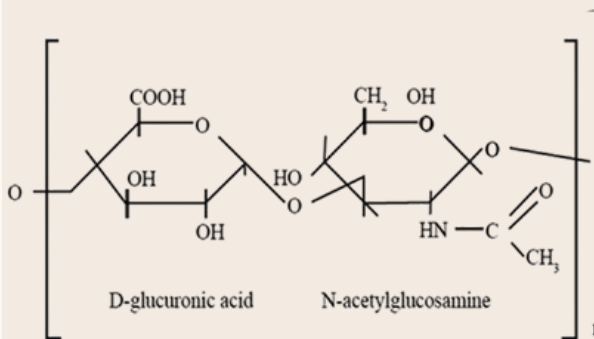




## NO NEEDLE NEEDLING FOR SENSITIVE SKIN

### Does LMW Hyaluronic truly have negative effects?



You probably heard that Hyaluronic acid (HA) comes in different molecular sizes or 'weights'. And you might have heard that low molecular weight HA is 'bad' but not necessarily how or why.

In just a few moments though, you will know if the rumors are true along with how's and why's.

### Let's talk sizes

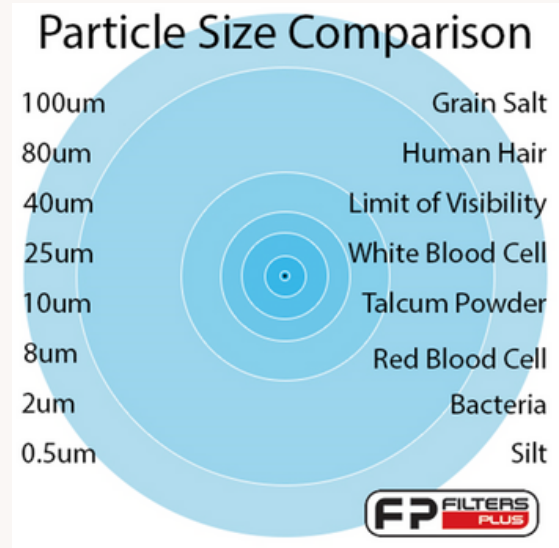
The graphic above shows one fragment of Hyaluronic acid. This simple unit repeated thousands of times forms a structure of a very long linear polymer. High molecular weight HA has a weight of 1,000 - 4,000 kDa (kilo Dalton) which is 964,000 of those fragments (!) whereas low molecular weight HA has a weight of 8 - 50 kDa (20 - 120 fragments).



To get an idea of the sizes, let's compare it to the particle size chart. The highest molecular weight HA is around 0.4  $\mu\text{m}$  (micrometer) and low molecular weight HA is 0.0008 – 0.005  $\mu\text{m}$ !

## Skin penetration

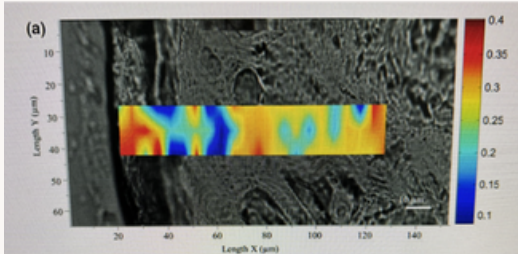
For a long time, we were told that only particles or molecules smaller than 500 Da can penetrate the skin. If that's the case, then low molecular weight HA wouldn't even penetrate the skin since 8kDa is 8,000 Da!



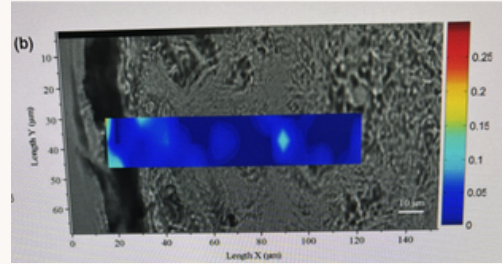
**We. need. proof. And fortunately, there is.**

The penetration of different weights of Hyaluronic acid was tested on skin and compared to Glycerin and Water. Glycerin penetrates well into the skin (positive control) while water doesn't (negative control).

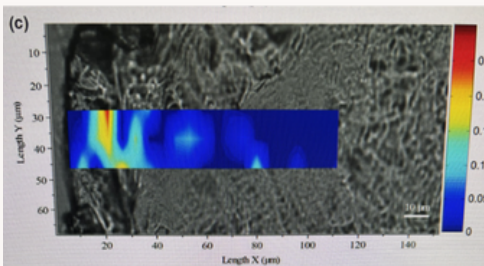
glycerin (positive)



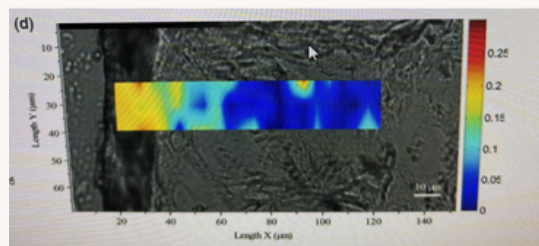
water (negative)



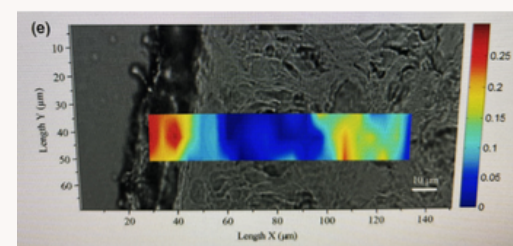
1000-1400 kDa HA



100-300 kDa HA



20 – 50 kDa HA



As you can see, there is no penetration of the high molecular weight HA (graphic c). The area where you can see yellow, red and light blue is still the stratum corneum. The medium weight HA is penetrating slightly (d) but the low weight HA is detectable in the lower epidermis going into the dermis (e). This shows that molecules larger than 500 Da DO penetrate the skin!

However, the question of whether low molecular weight HA is good or bad, especially knowing now that it gets into our system relatively easily, is still unanswered.

So, let's get that answer!



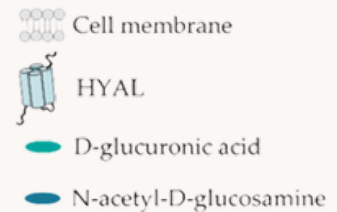
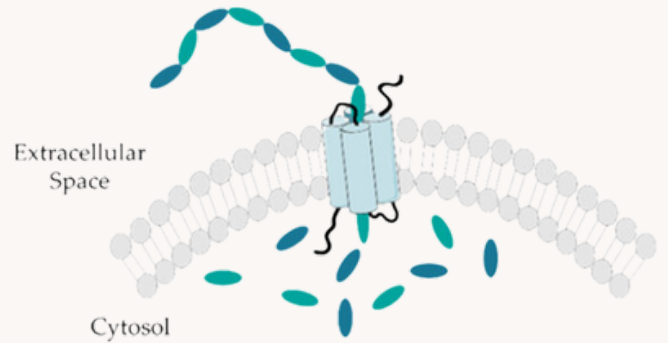
## Basics

To understand why it got some negative reviews, we must look at the basics. What does Hyaluronic acid really do? All we mostly hear about it is that it is hydrating, water-binding, acts as cushion of joints and is lubricating collagen fibers. What part of this could possibly have a negative effect?

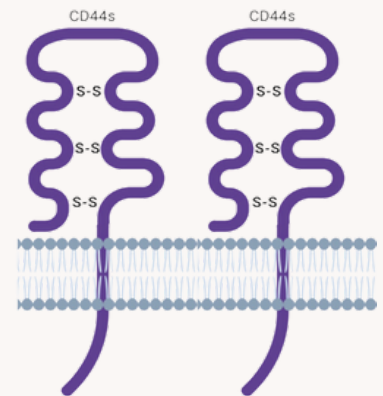
The answer is: nothing if you only look at those functions.

**Hyaluronic acid has other functions, too. It displays anti-inflammatory and immunosuppressive properties!**

The components of Hyaluronic acid, D-Glucuronic acid and N-Acetyl-D-Glucosamine, are produced in the inner surface of cells and connected to Hyaluronic acid by the help of 3 proteins (HAS) that also release it into the Extra Cellular Matrix.



There it binds to CD44; a transmembrane glycoprotein that is the main receptor for Hyaluronic acid and present on almost all cells in the body. CD44 interacts with other ligands like the Matrixmetalloproteinase (MMP). MMP's cut pathways into the tissue to allow cells like fibroblasts to migrate. CD44 induces fibroblast migration to wounded areas but ONLY when high molecular weight HA is interacting with it! Therefore, HA plays a crucial role in the anti-inflammatory process. Furthermore, it creates a protective cover over the cell membrane which masks cell death receptors preventing the cell from reaching apoptosis. This increases the longevity of the cell.



Low molecular weight HA is also produced in the body as it is a potent pro-inflammatory molecule that informs cells about stressors. In case of stress, Hyaluronidase (HA enzymes) break the high molecular weight HA down into low weight HA.

The fact that our body indirectly produces low weight HA shows that there are circumstances when we need it. For instance, in wound repair! Inflammatory disorders like rosacea do benefit from this effect as well.

Applying low weight HA constantly though, even if we don't need to signal stress to aid the healing process, is constantly signaling stress and triggers inflammatory processes. This causes chaos in healthy skin, leads to imbalances and sensitivities.

This can be prevented by mixing different weights of HA with ingredients that increase our natural Hyaluronic acid production.



## Open up, skin!

CD44 favors high molecular weight Hyaluronic acid. As we know now, it is best to have a lot of it in the skin but topically applied, it 'only' creates a film on top of the skin which prevents transepidermal water loss. We take that!

However, with technologies and techniques like micro-needling we can create channels vertically into the skin to allow even large molecules like high molecular weight HA to enter! The downside of micro-needling is the invasiveness and risk of going too deep leading to broken capillaries, pain and inflammation.

Sensitive and compromised skin are a contraindication for a reason.

Luckily, we have the ability to create vertical channels in a safe and gentle way for even the most sensitive skin!



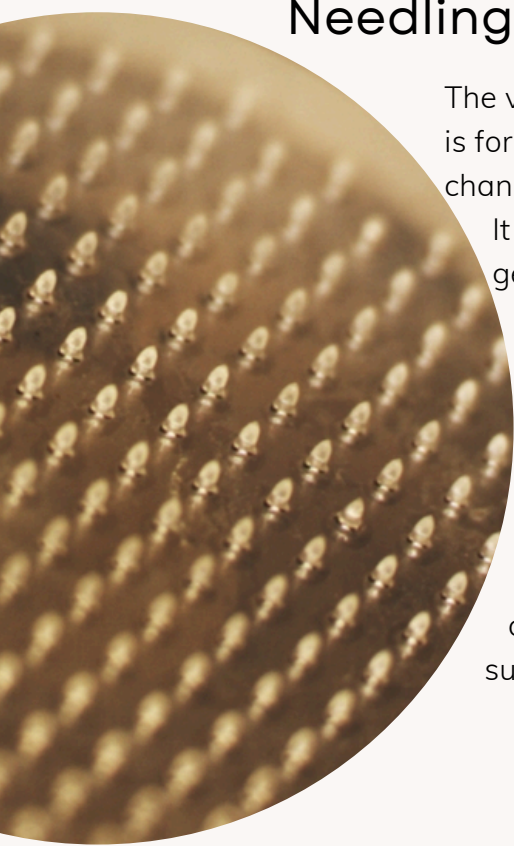
## Needling with micro-sized HA pyramids

The viscosity of HA is easily influenced by the amount of water used when a product is formulated. We solidify HA in pyramid shape, called 'epipins' to gently create channels into the epidermis without causing inflammation.

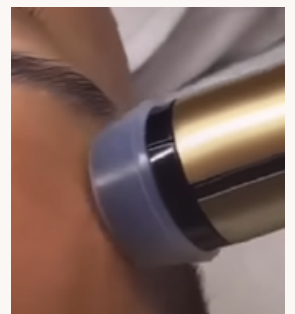
It allows a quick penetration of active ingredients which are necessary to get long-term regenerating or rejuvenating effects on cell level besides of the induced Collagen production that always occurs in case of vertical channels. Large molecules such as Hyaluronic acid can reach the basal layer this way. Furthermore, an instant wrinkle plumping step is performed in area of concern which follows the dry-channeling step.

Result: instant epidermal wrinkle filler plus long-term firming effect.

Without any downtime, pain or inflammation! Since our pyramids are made of high molecular weight HA that fuse into the epidermis through the firstly created channels, it has an anti-inflammatory effect as well which makes it suitable for sensitive, compromised skin even more.



If you would like to learn more, feel free to book a call with one of our National Educators through our website [www.epistep.com/QA](http://www.epistep.com/QA)



*Thank you*

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