

AMWC 2022

AESTHETIC & ANTI-AGING
MEDICINE WORLD CONGRESS

**An innovative soft tissue filler
technology based on photocurable
rhCollagen for correction of contour
deficiencies and promotion of tissue
regeneration**

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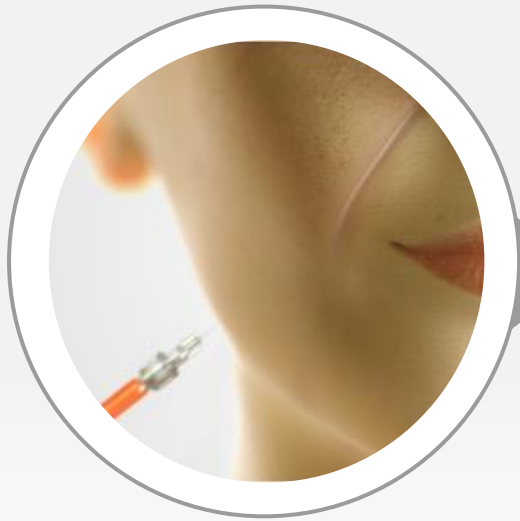
CollPlant
Biotechnologies

Pioneering
Regenerative
Medicine



An innovative soft tissue filler for contour deficiencies corrections using light

Easy injection



Injection

Sculpting before curing



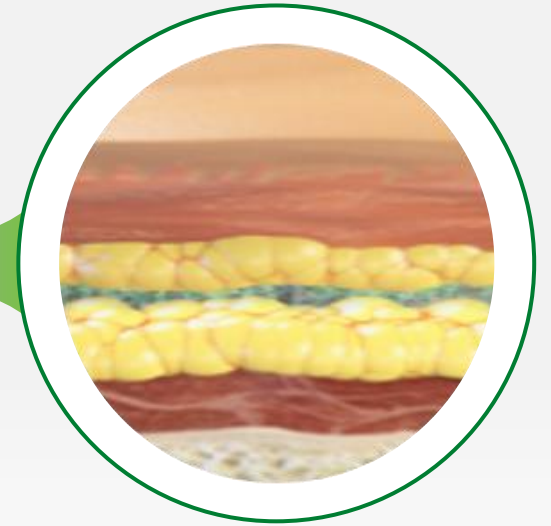
Sculpting

Optimized post curing stiffness



Photocuring in-situ

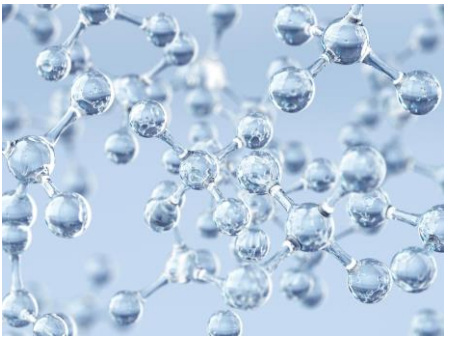
Good tissue retention



Tissue regeneration

The soft tissue filler is comprised of chemically modified recombinant human type I collagen (rhCollagen-MA), hyaluronic acid and a photoinitiator

Hyaluronic Acid



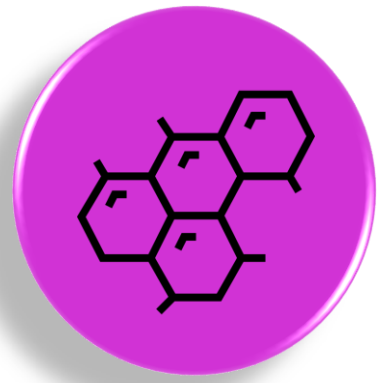
+

rhColl-MA



+

Photoinitiator



+

Light source

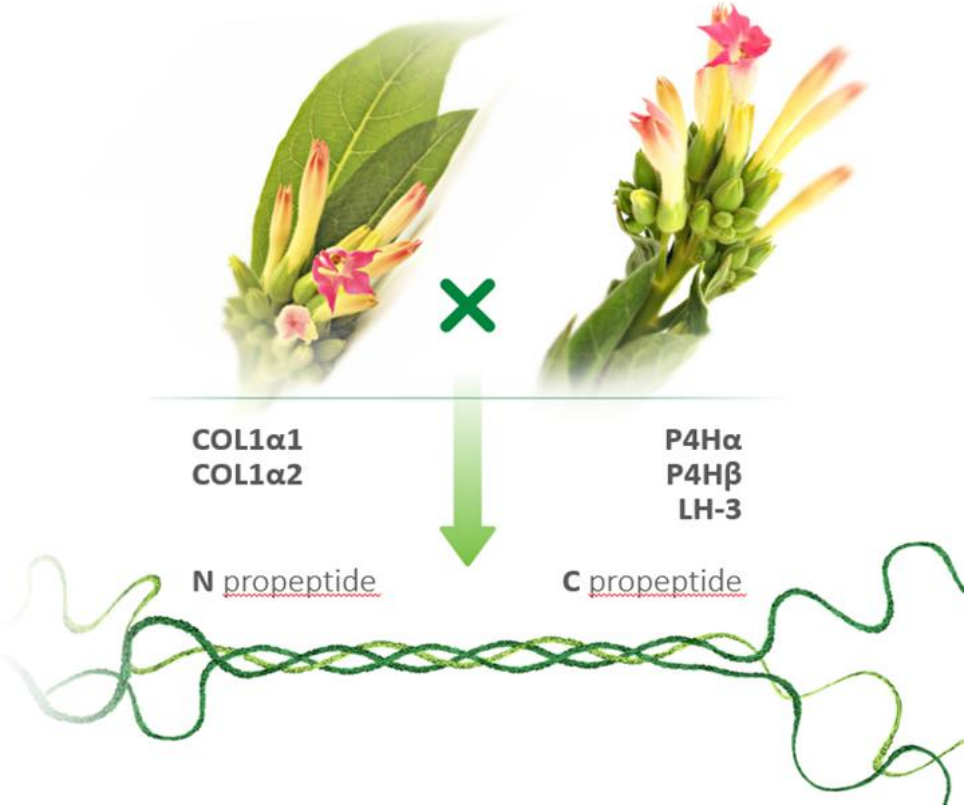
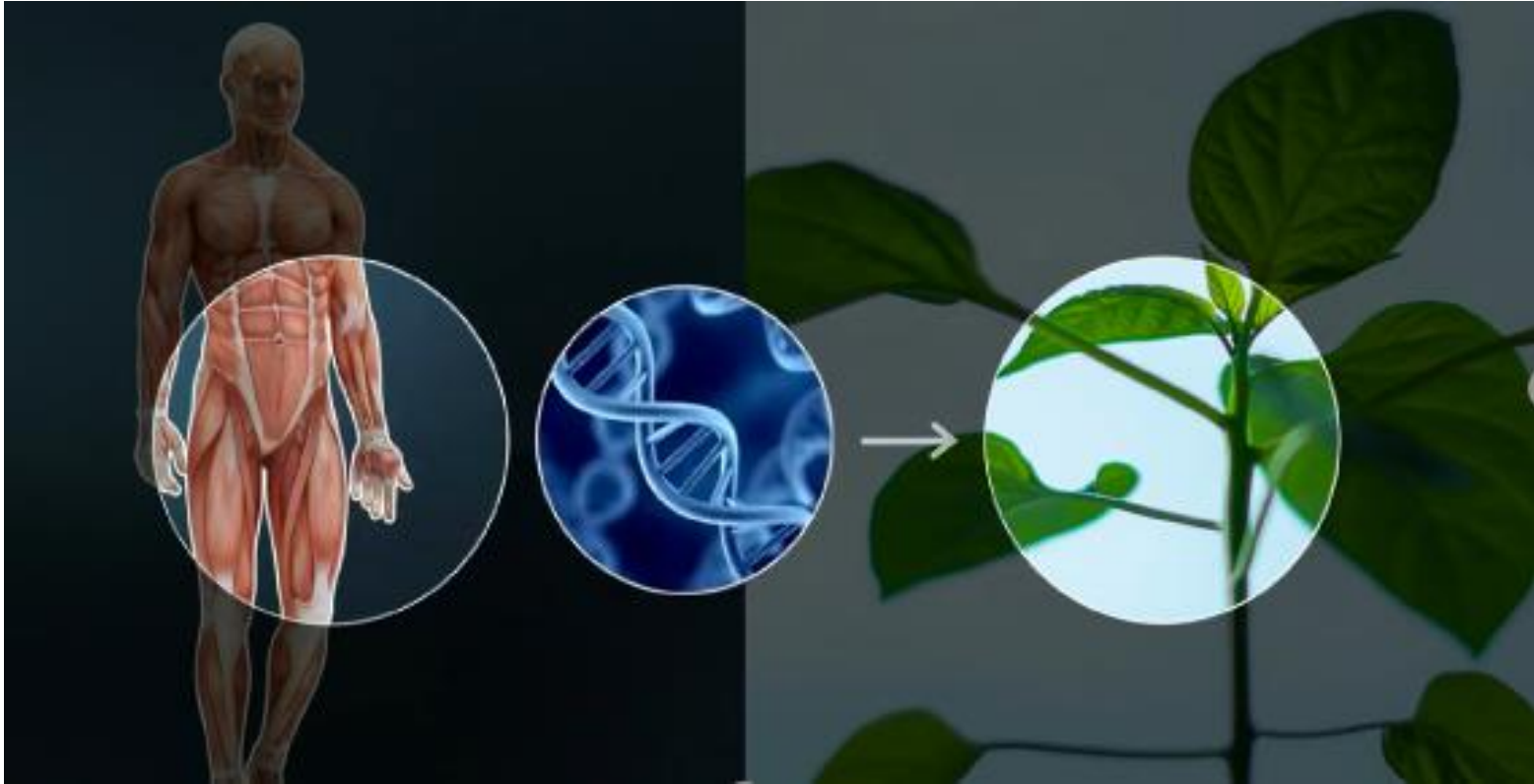


Lifting

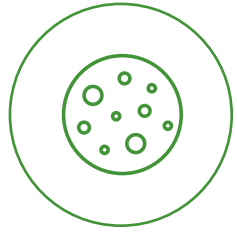
Rejuvenation

Sculpting

rhCollagen is extracted from transgenic tobacco plants expressing 5 human genes and is identical to human collagen



rhCollagen has superior biological properties compared with tissue extracted collagen



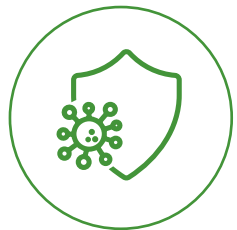
Better bio-functionality

- Accelerates human cell proliferation
- Faster tissue healing



Superior homogeneity

- Controlled physical/rheological properties
- Reproducibility
- Transparency (not visible)



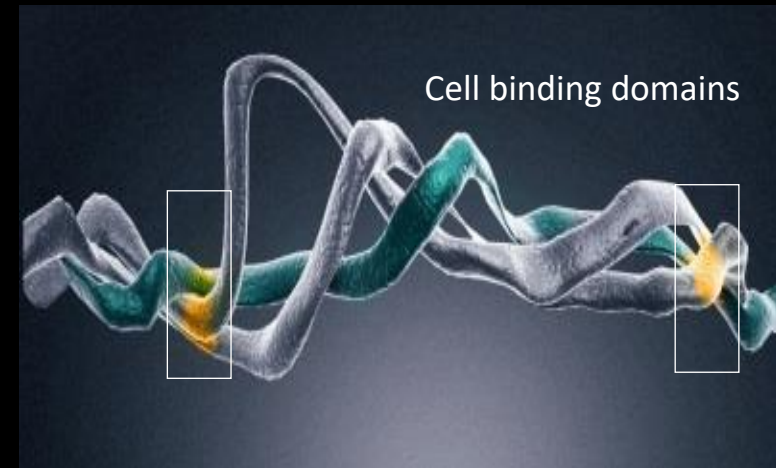
Improved safety and greater purity

- Non-immunogenic
- Non-allergenic
- No pathogens
- No foreign body response

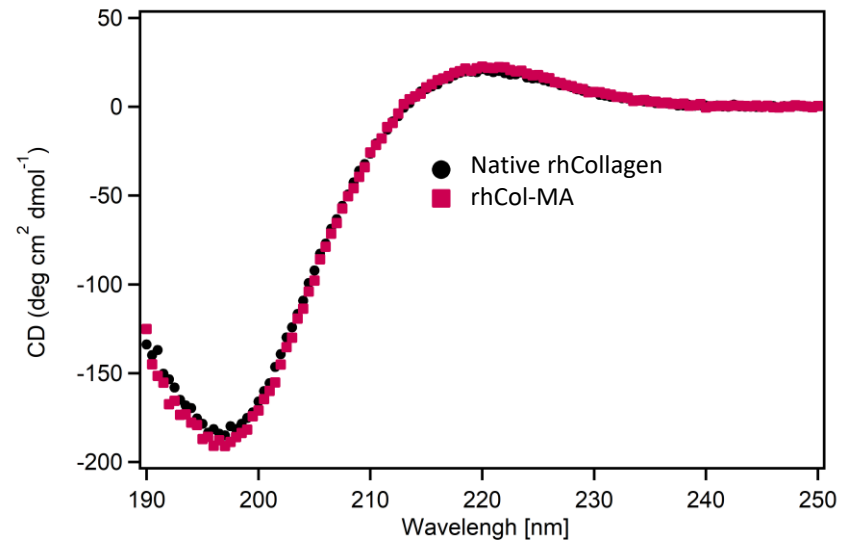
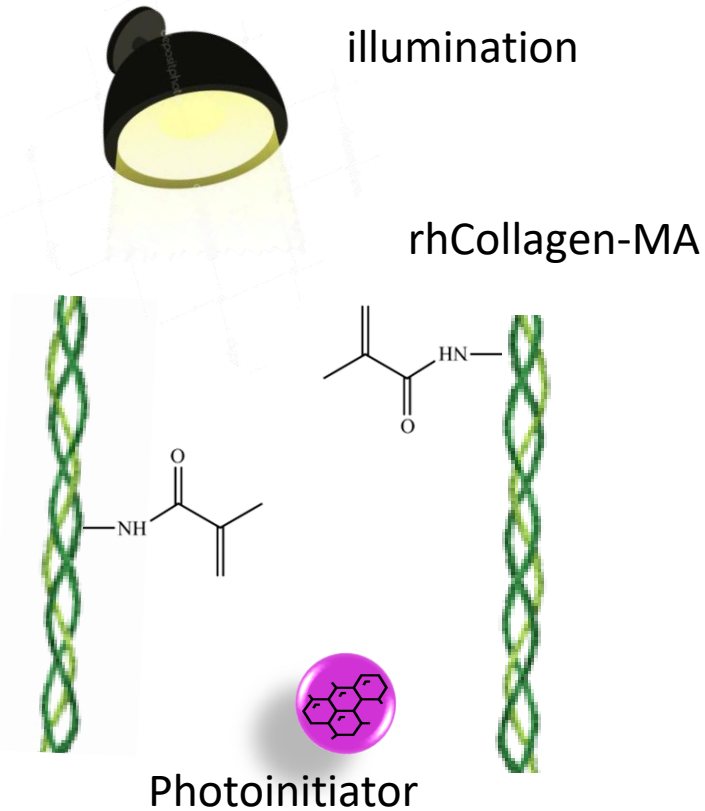
Plant-derived



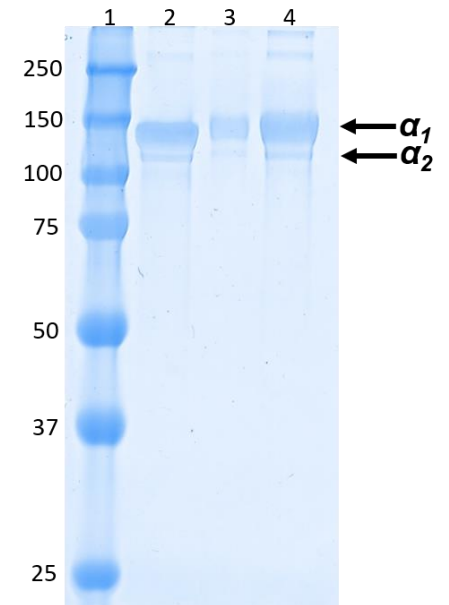
Tissue Extracted



The rhCollagen-MA crosslinks in the presence of light while maintaining its structural and biological functions

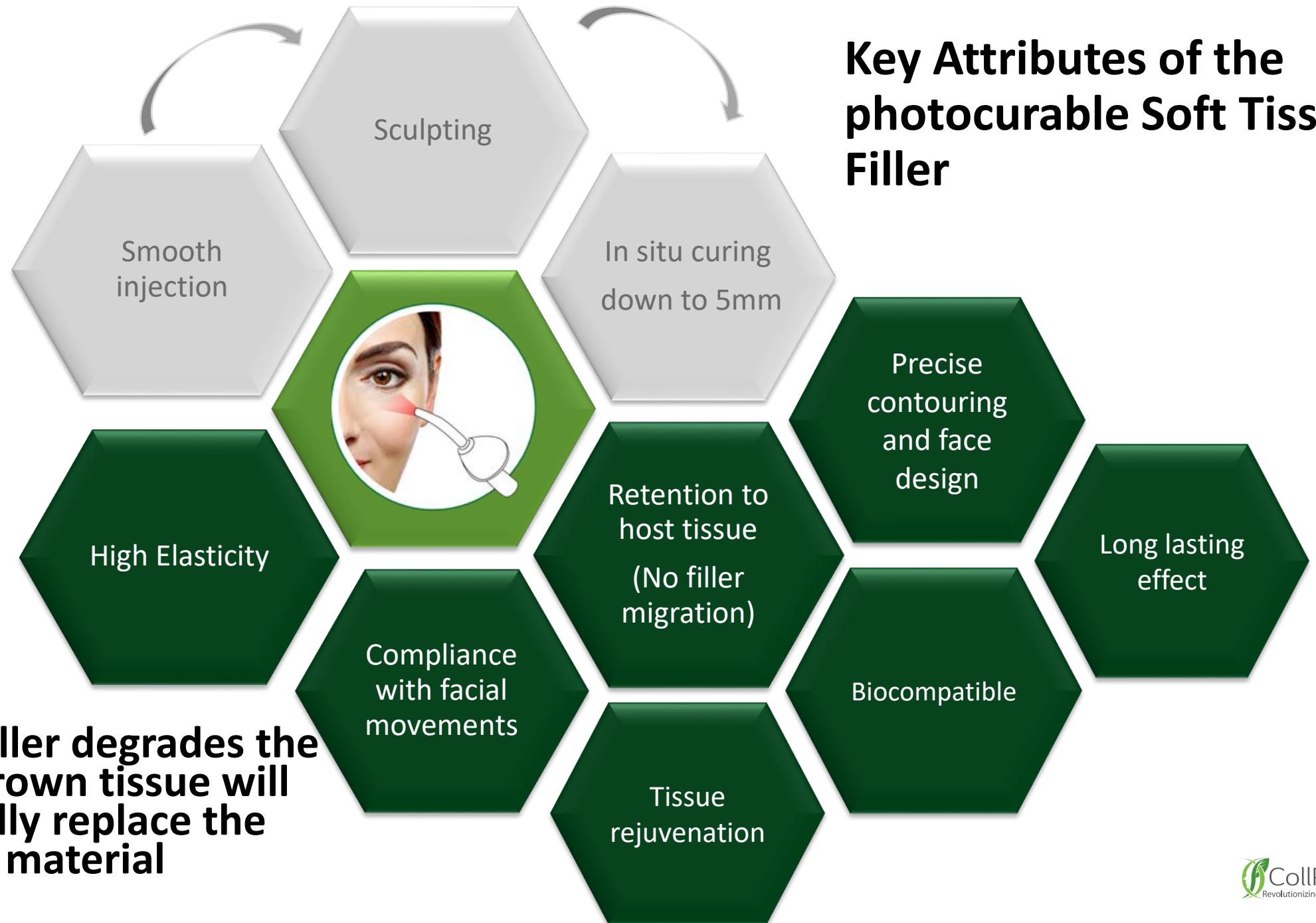


Typical CD spectra of native rhCollagen (black) and modified rhCol-MA (pink) at 0.3 mg/mL in a 10 mM HCl solution.



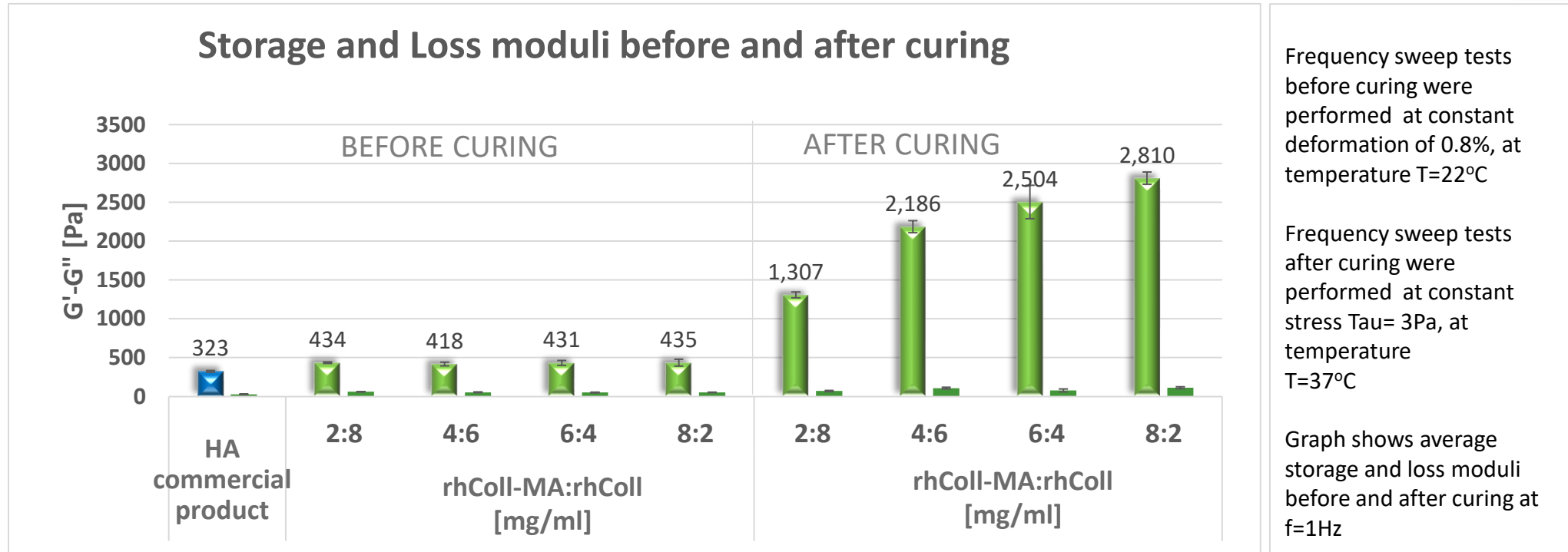
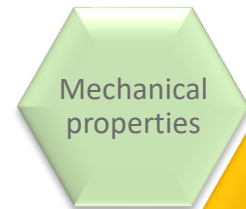
SDS PAGE. Lane 1: Standard protein marker; Lane 2: rhCollagen; Lane 3 and 4: 5 μ l and 25 μ l sample of rhCol-MA, respectively.

Key Attributes of the photocurable Soft Tissue Filler



As the filler degrades the newly grown tissue will eventually replace the injected material

Results: Elasticity (elastic- storage modulus)

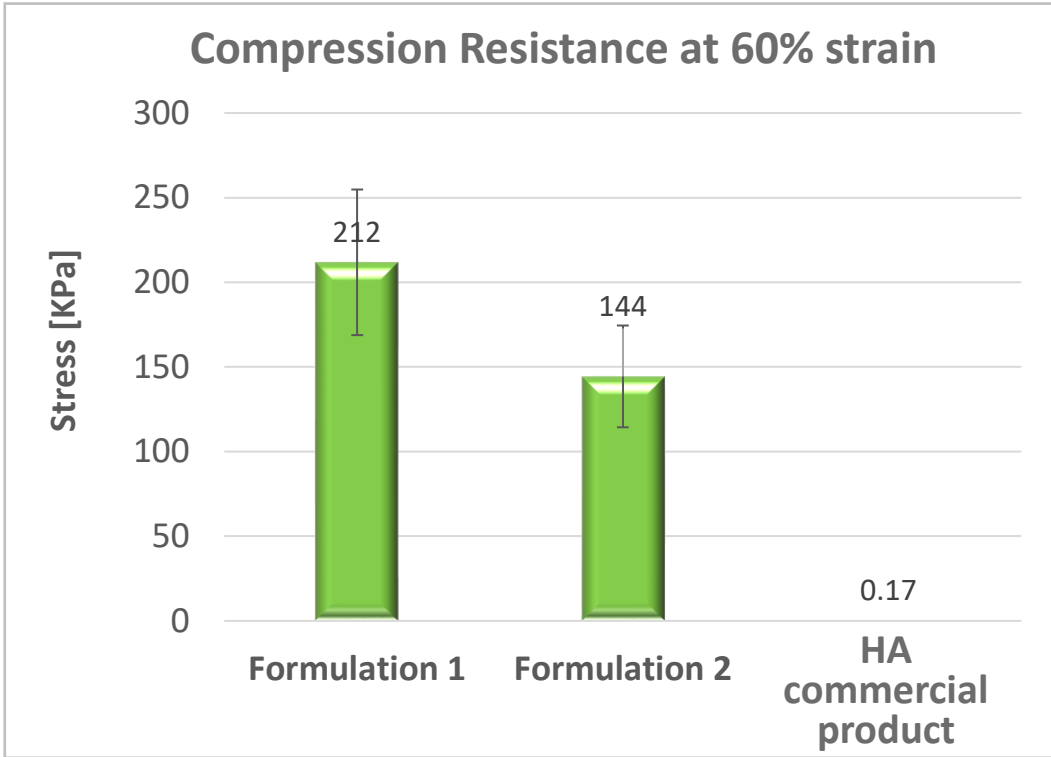


- Before curing (left side): no significant difference between the formulations
- After curing (right side): storage modulus (G') increases with modified rhCollagen concentration
- Higher $G' \rightarrow$ better resistance to outside forces \rightarrow better structure

Results: Compression Resistance

Mechanical properties

Clinical Attributes

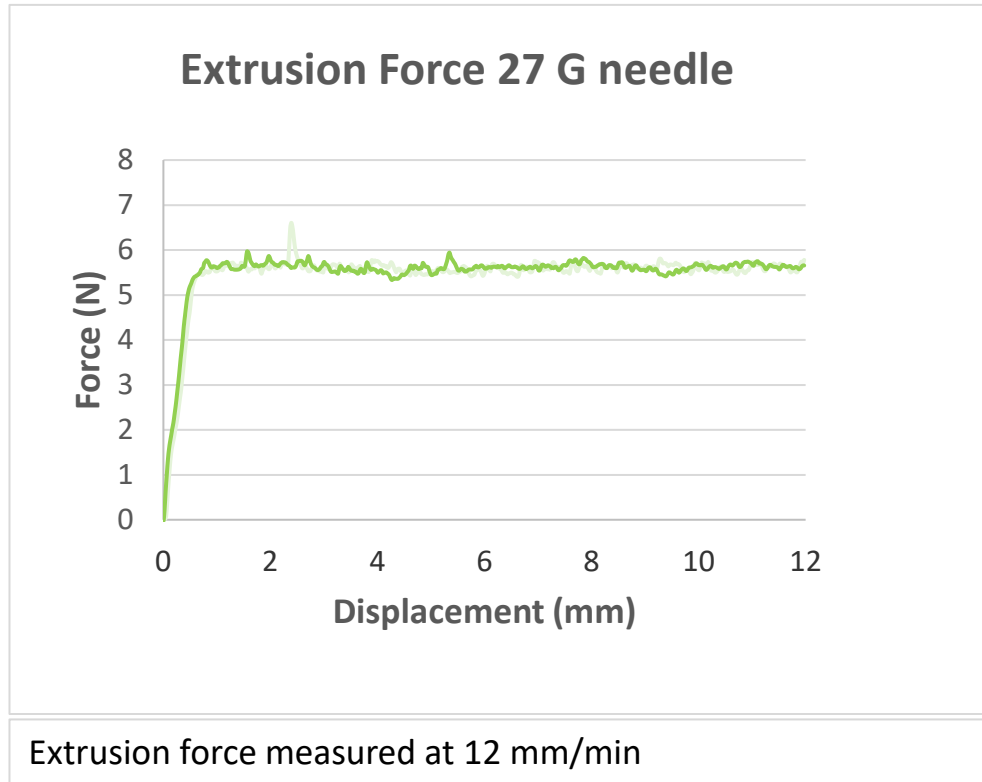


- Higher resistance to compression
- Higher resistance to external forces such as gravity

Results: Injectability

Mechanical properties

Clinical Attributes

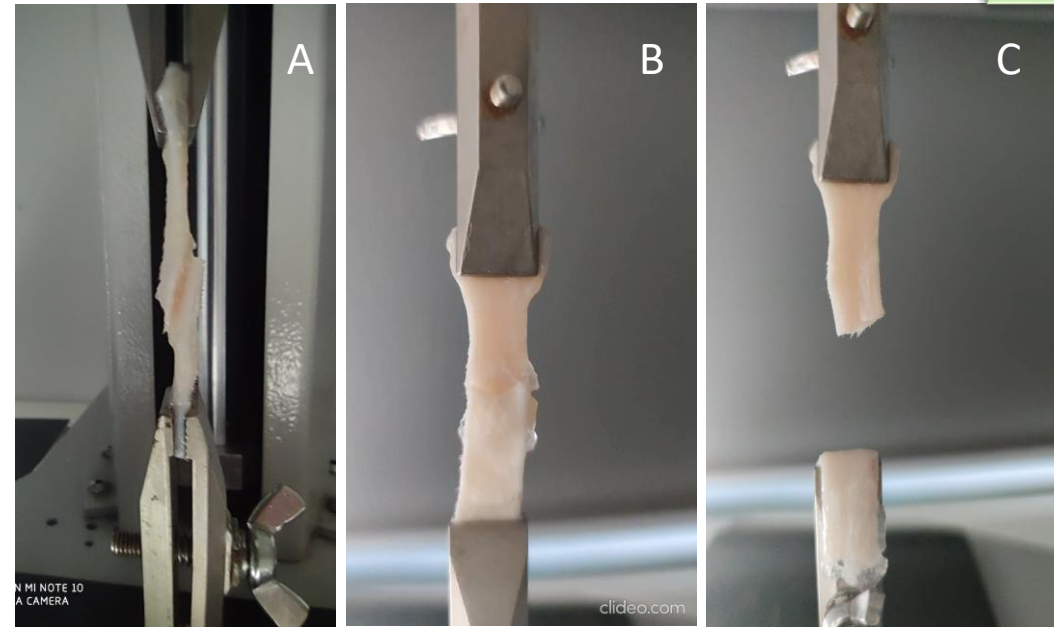
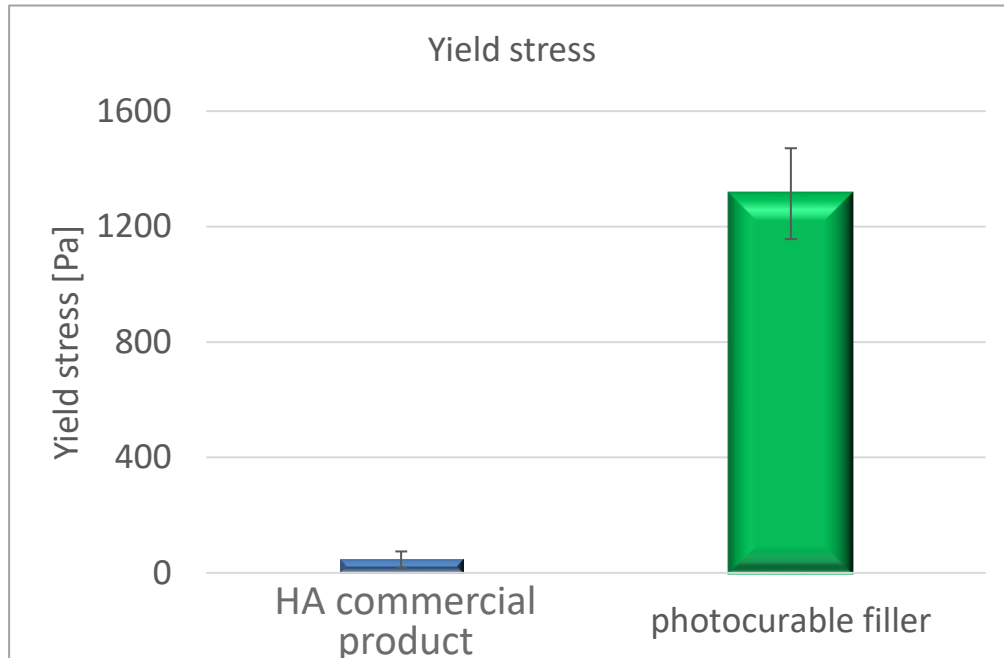


- Smooth and easy injectability through 27G needles

Results: Tissue Adhesion

Mechanical properties

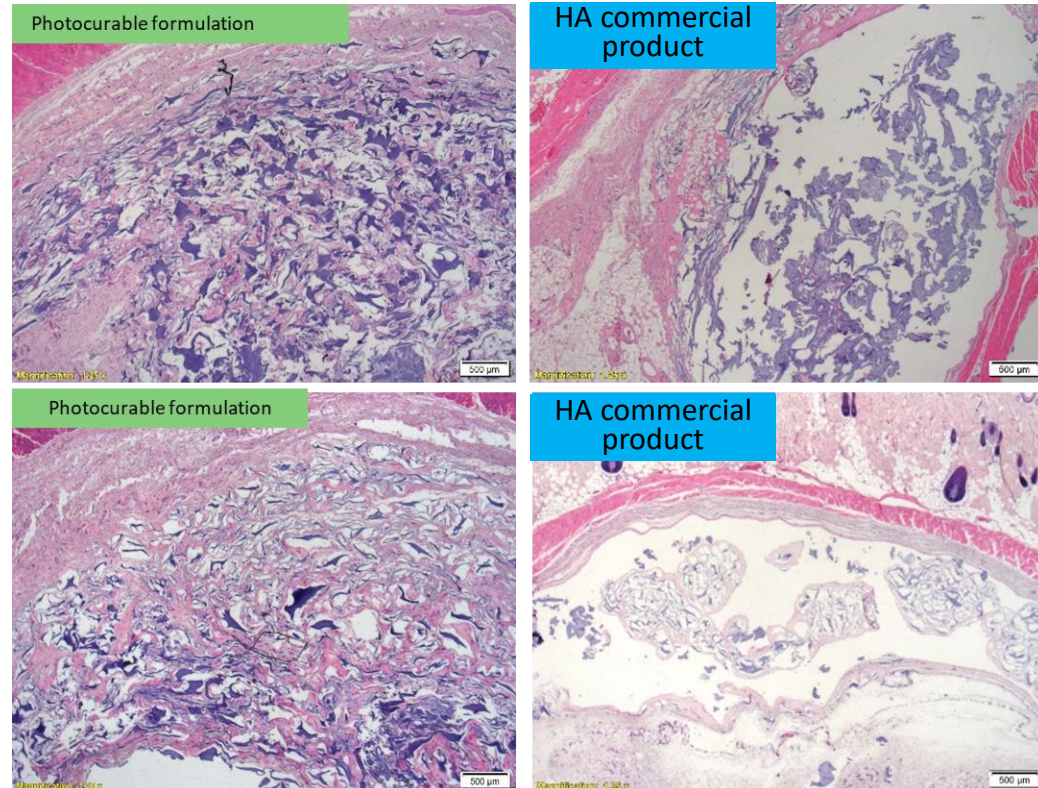
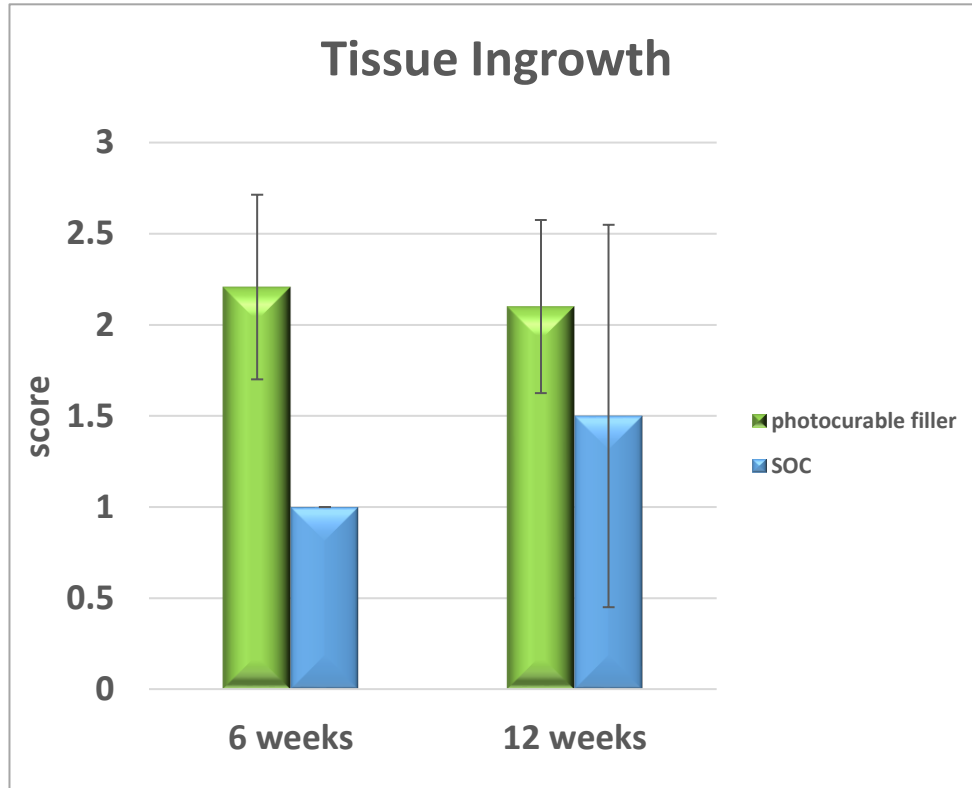
Clinical Attributes



Tissue adhesion test method: A- before shear (side view), B- before shear (front view), C- after shear: at detach (front view)

- Higher shear force is required to separate two skin patches attached using the photocurable filler rather than an HA commercial filler
- Retention to surrounding tissue and compliance with facial movements
- No filler migration

Results: in-vivo biological response –histology scoring



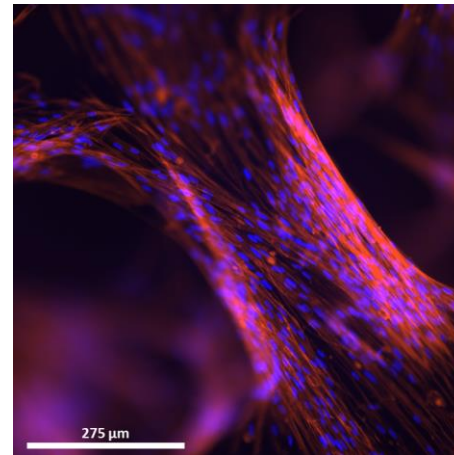
6 weeks

12 weeks

- Increased tissue ingrowth within the photocurable filler compared with HA commercial product
- Addition of rhCollagen enhances and promotes tissue regeneration

Conclusions

The proposed photocurable filler is designed to allow physicians to shape desired facial contours by using simple transdermal illumination of the injection location and to promote tissue regeneration



Normal human fibroblasts grown on rhCollagen-MA based gel



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