

Calcium Hydroxylapatite: Regenerative vs Biostimulatory Filler

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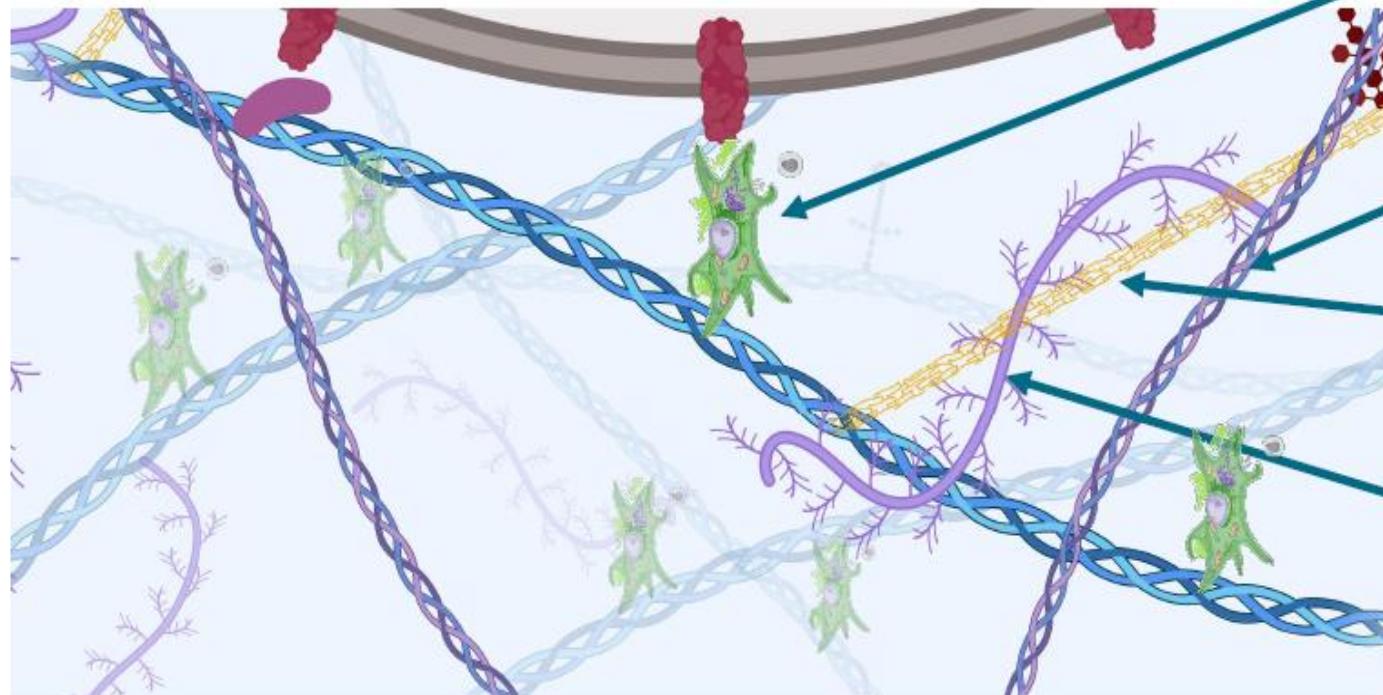
Calcium Hydroxylapatite (CaHA, Radiesse)

- Recognized in previous studies as not just a “filler”
- Known collagen stimulatory effects
 - PMMA (Bellafill)
 - PLLA (Sculptra)
- Can CaHA target the ECM to regenerate connective tissue?
 - Reverse collagen loss in aging?



Key Components in the ECM: Potential Targets for Regeneration

Extracellular Matrix¹



Fibroblasts^{1,2}

*Regenerate
Organization*

Collagen III & I^{2,3}

*Structure
Scaffolding*

Elastin^{2,3}

*Elasticity
Stretch*

Proteoglycans^{2,3}

*Hydrating
Water Retention*

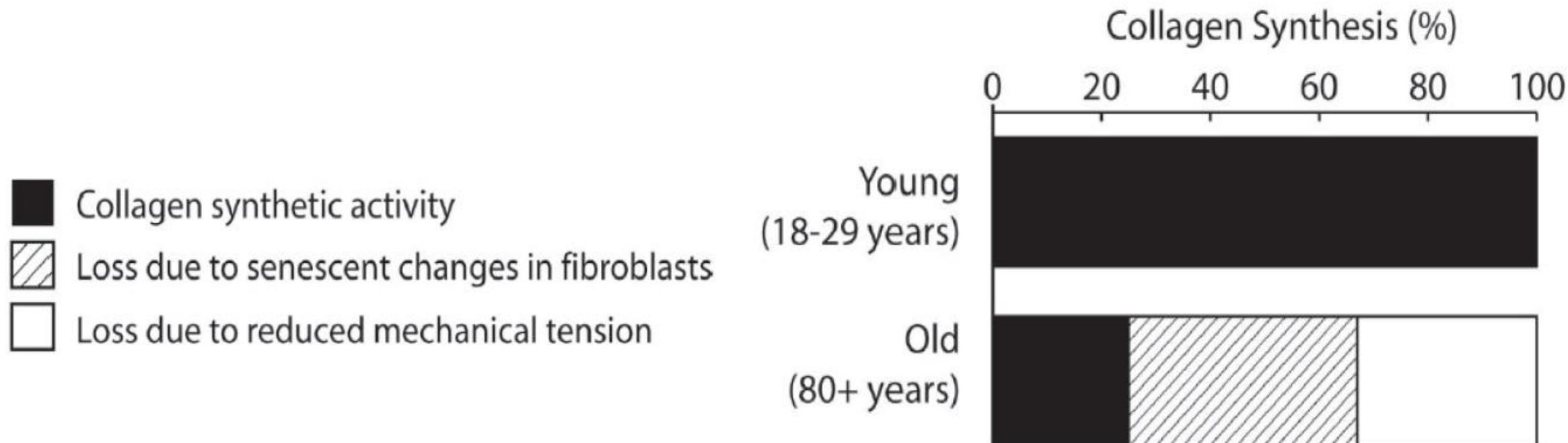
Angiogenesis³

*Vascularization
Healing*

¹Humphrey et al. *Nature Rev Mol Cell Bio*, 2014 ;15: 802–812; ²Birch HL. 2018 *Biochem Cell Bio Ageing* Chpt 7: 169-190.;

³Karamanos et al., *FEBS J*. 2021. Dec;288(24):6850-6912.

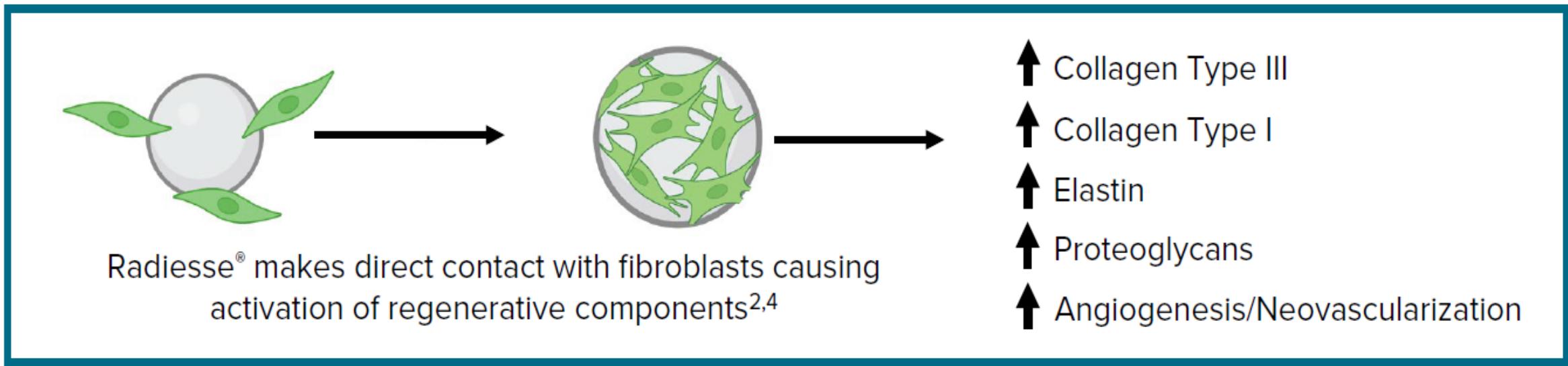
Loss of Collagen is Due to a Reduction in Fibroblastic Activity and Mechanical Tension¹



¹Varani et al. *AJP*, 2006;168(6):1861-8.

Image Sources: Varani et al, 2006.

Radiesse® Provides a 1-Step Mechanical Activation on Fibroblasts¹⁻⁴

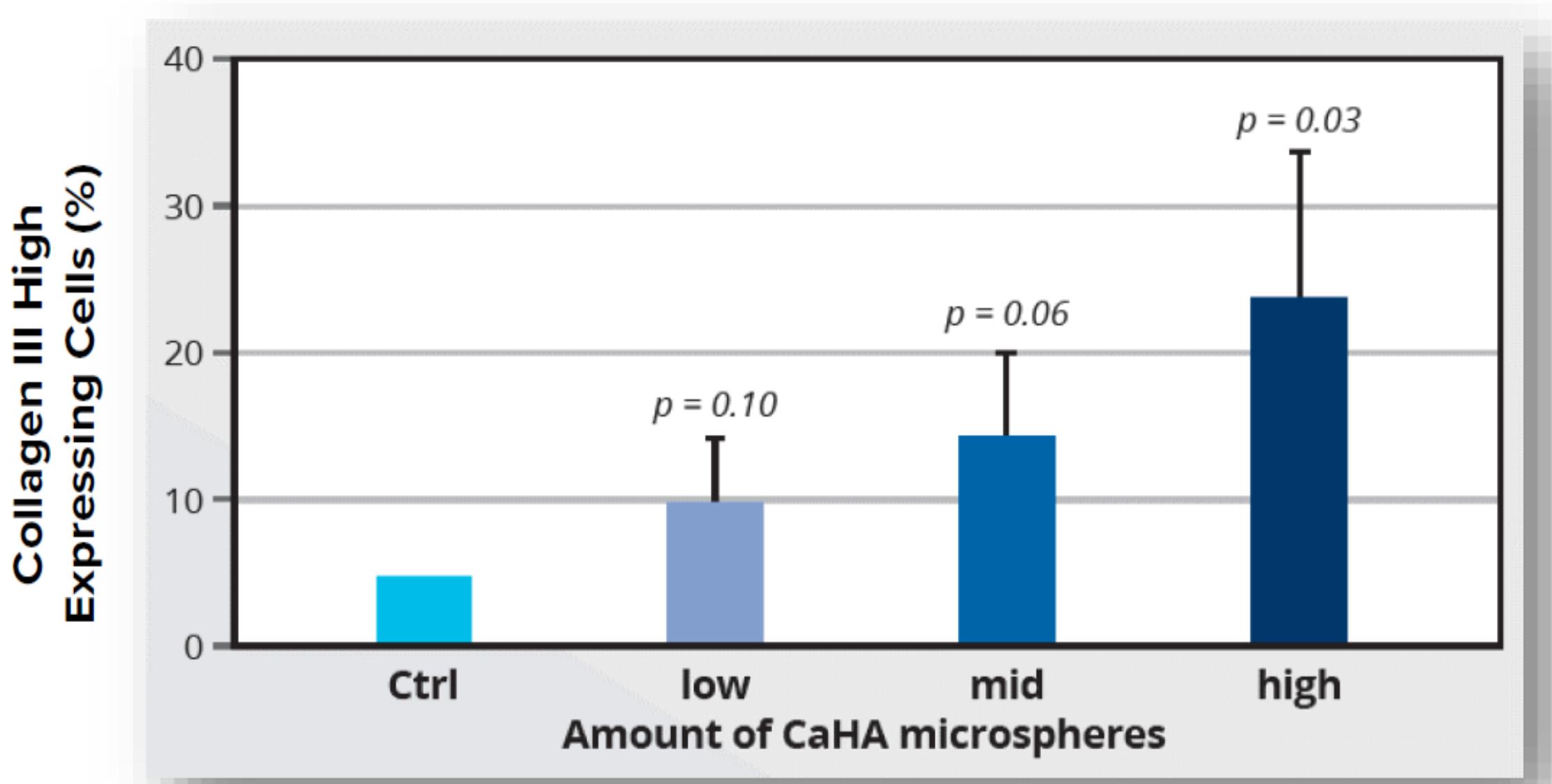


- The introduction of Radiesse® may restore the contact and tension of dermal fibroblasts^{1,3}
- Radiesse® microspheres act as scaffolding in the ECM²

¹Kim J et al., *Clin. Cosmet. Investig. Dermatol.* 2019; 12: 771–784.; ²Nowag, B et al. Poster presented at AMWC 2019.;

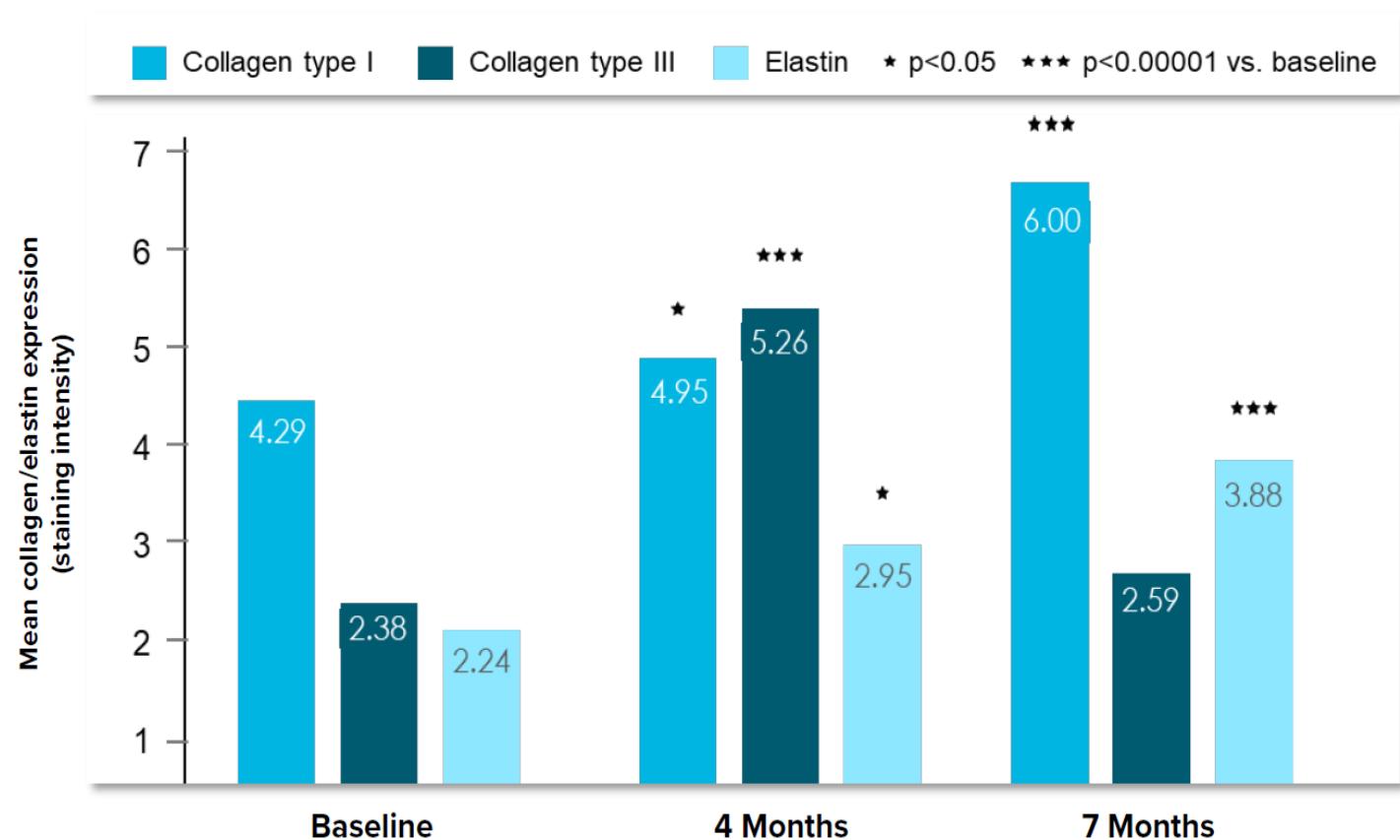
³Yutskovskaya Y et al., *J. Drugs Dermatol.* 2020 Apr 1;19(4):405-411. ⁴González, N. & Goldberg, DJ *Dermatol Surg* 2019 Apr;45(4):547-551.

Neocollagenesis is a CaHA Microsphere-Dependent Effect



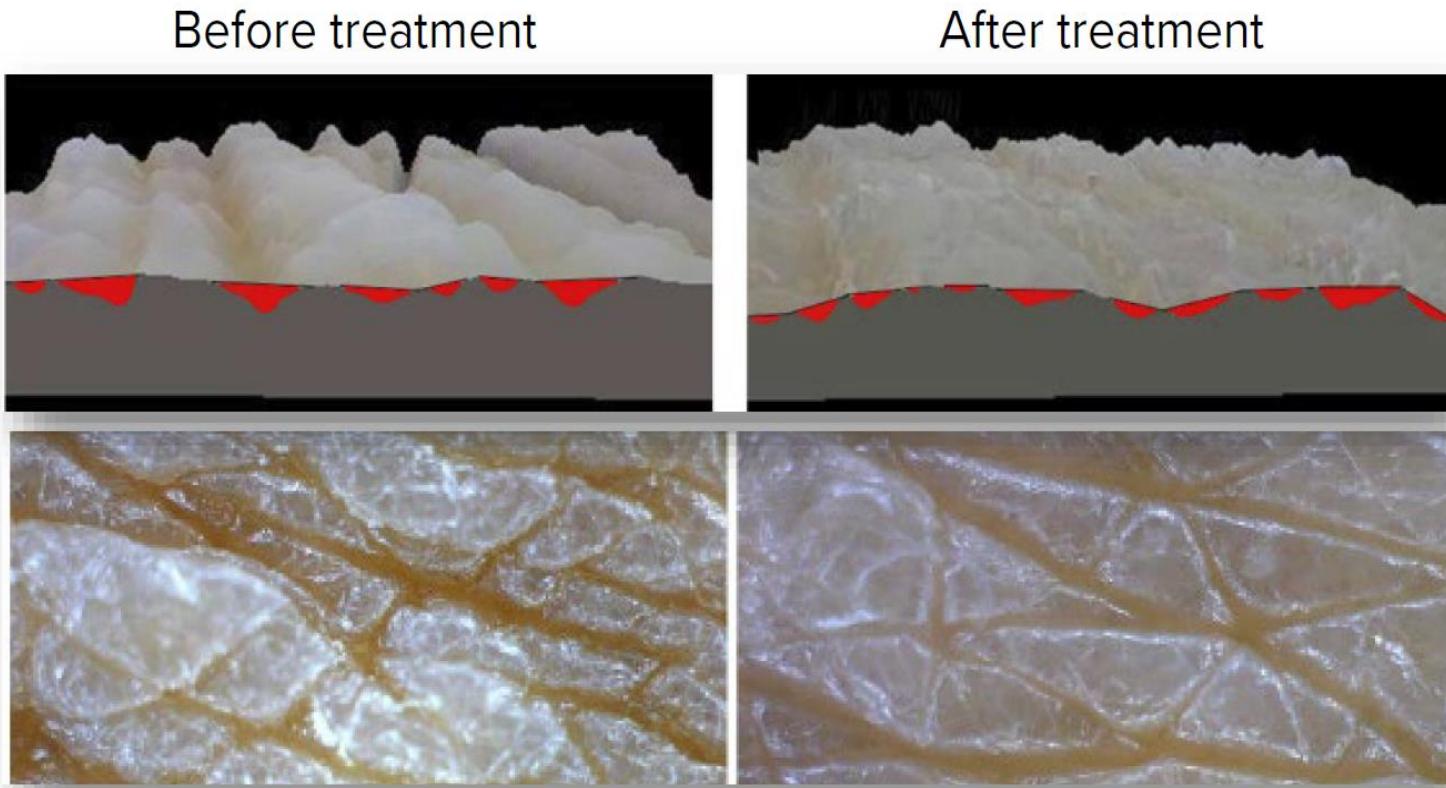
Radiesse® Regenerates Major Components of the ECM

- ▶ 20 patients
- ▶ Hyperdilute Radiesse®
 - ▶ 1:2 – 1:6 (based on skin quality) diluted with preserved saline
- ▶ Biopsies at baseline, 4 and 7 months
- ▶ IHC staining for collagen types I and III, and elastin



Radiesse® significantly increases collagen types I, III and elastin.^{1,2}

Radiesse® Improves Skin Quality

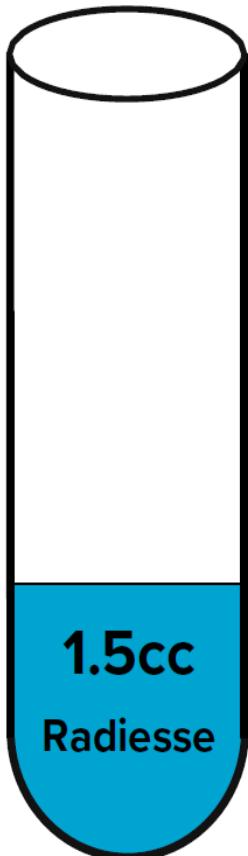


- Wrinkle depth and skin roughness significantly decreased 6 months after injection with Radiesse®

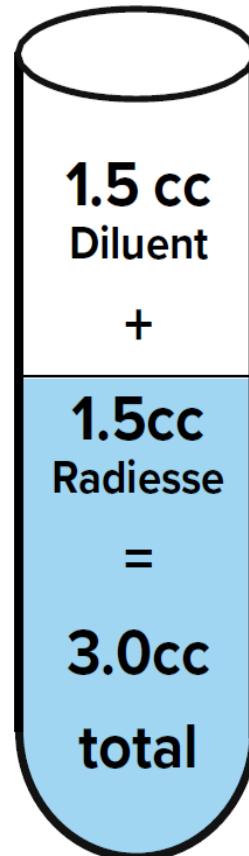
Function Dictates Dilution Scheme

Volumization and Dermal Remodeling¹

undiluted



1:1 dilution

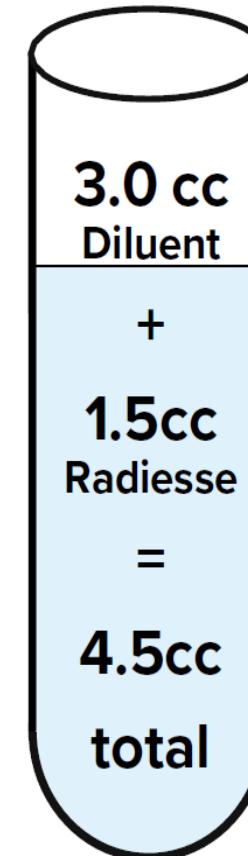


Product

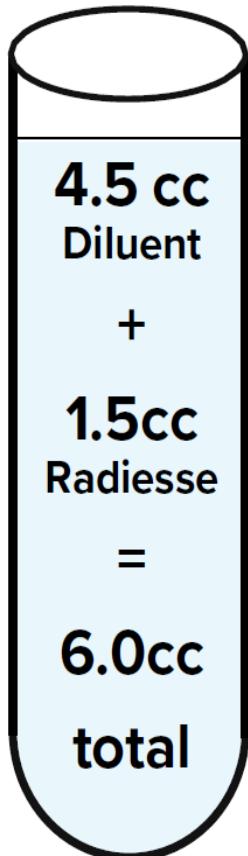
Dilute

Regeneration²

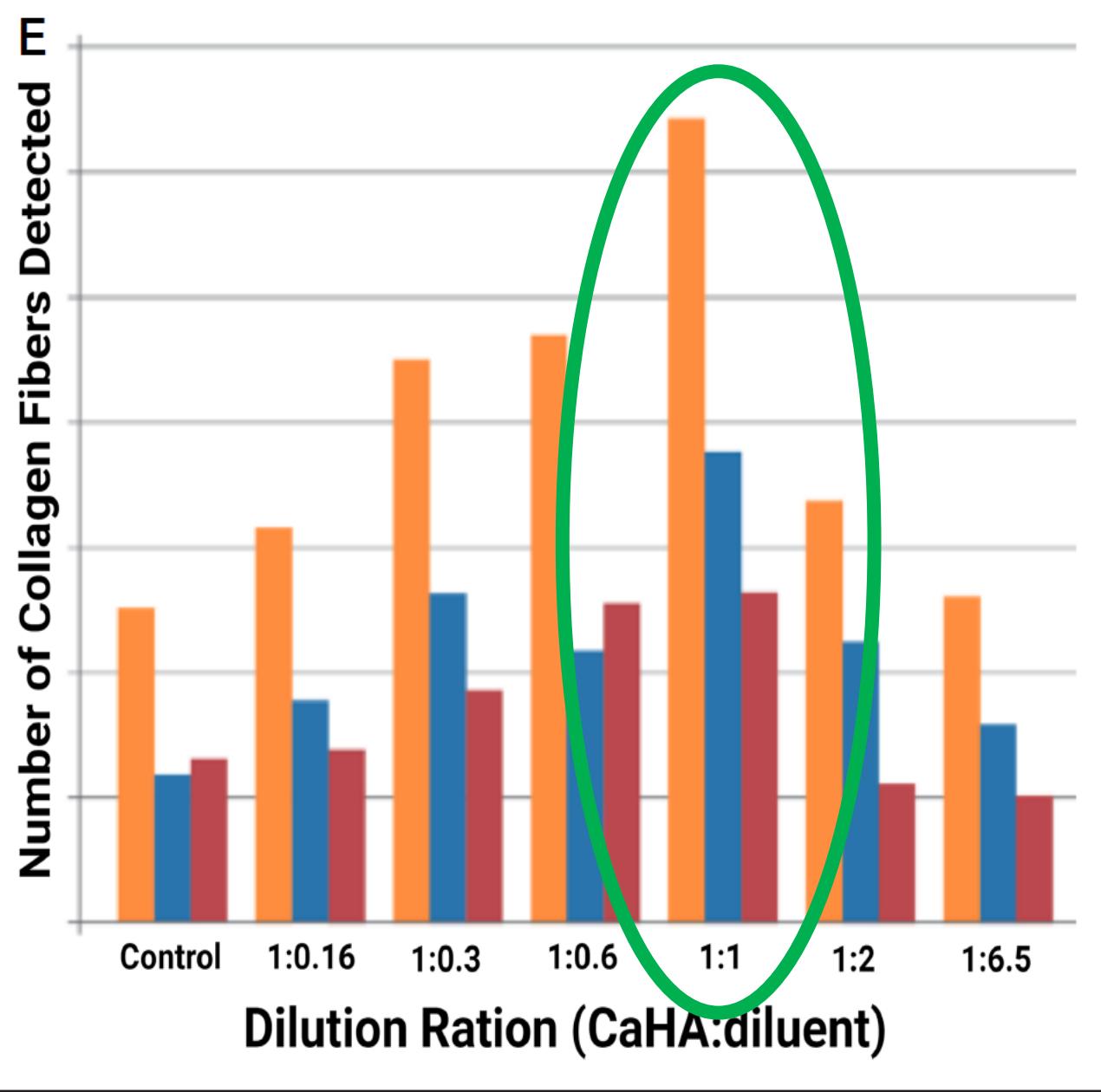
1:2 dilution



1:3 dilution



Hyperdilute



Supplement

Cosmetic Medicine

The Role of Calcium Hydroxylapatite (Radiesse) as a Regenerative Aesthetic Treatment: A Narrative Review

Shino Bay Aguilera, DO, FAOCD; Alec McCarthy, PhD;
Saami Khalifian, MD; Z. Paul Lorenc, MD, FACS; Kate Goldie, MD, MBChB;
and W. Gregory Chernoff, MD

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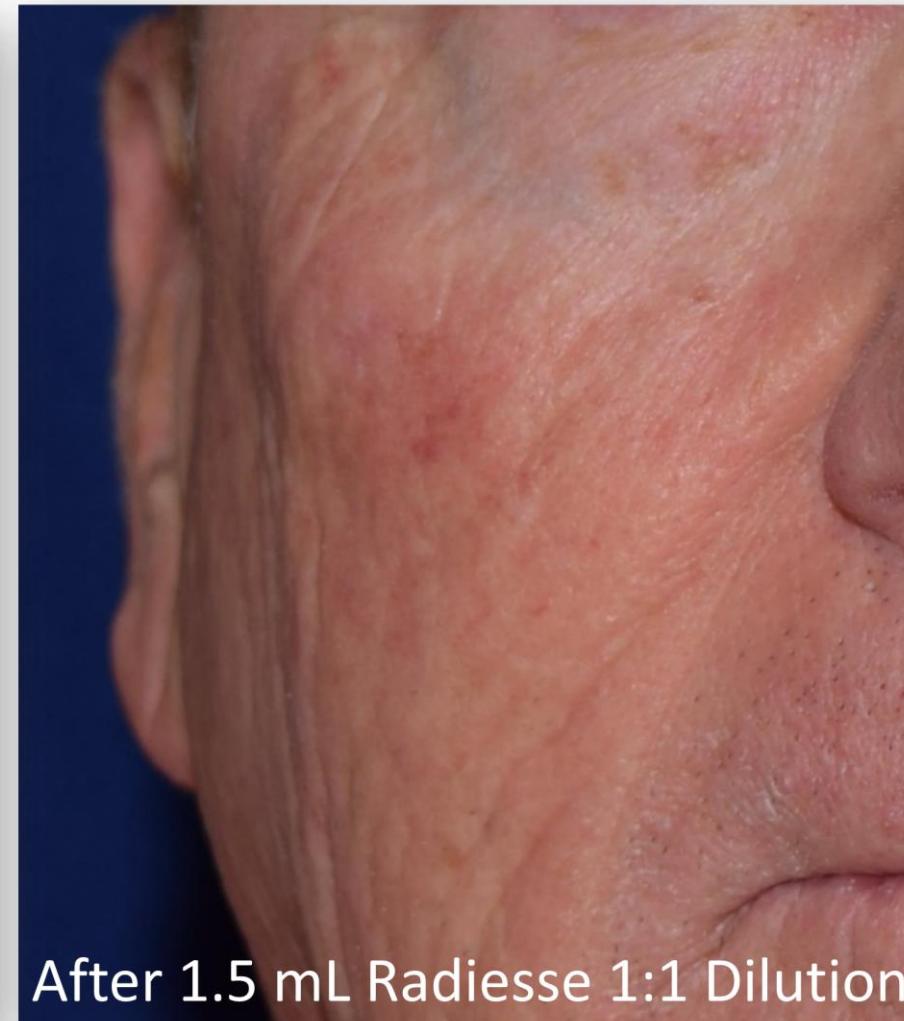
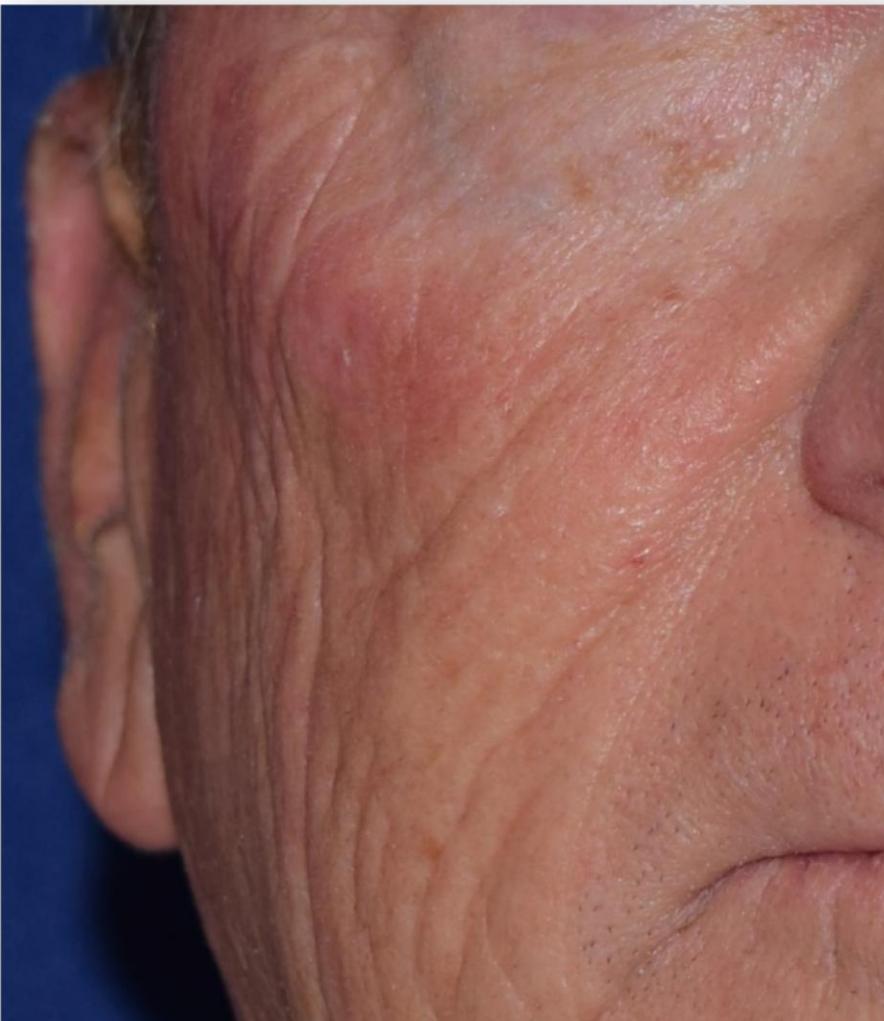
Collagen
Type I
Type III
Type I + III

Clinical Examples



After 1.5 mL Radiesse 1:2 Dilution

Clinical Examples



After 1.5 mL Radiesse 1:1 Dilution

Clinical Examples



After 3 mL Radiesse 1:1 Dilution

Summary

- Diluted Radiesse offers biostimulation & regeneration of ECM collagen
- May be useful for treating aging skin



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