



Neocollagenesis in Non-Invasive Aesthetic Treatments

PDF (Size: 74KB) PP. 1-5 DOI: 10.4236/jcdda.2013.31A001

Author(s)

Ilja L. Kruglikov

ABSTRACT

Dermal neocollagenesis is often assumed to be the main reason of visible skin improvement after different non-invasive and minimal invasive aesthetic treatments. However, the very slow dynamics of the mature collagen remodelling in the extra cellular matrix (ECM) of dermis, with a half-life time of 15 years, renders every observable upregulation of collagen production insufficient to replace a significant part of the matrix during the short time in which it is claimed skin improvement takes place.

KEYWORDS

Neocollagenesis; Aesthetic Treatments; Procollagen; Mature Collagen; Turnover

Cite this paper

I. Kruglikov, "Neocollagenesis in Non-Invasive Aesthetic Treatments," *Journal of Cosmetics, Dermatological Sciences and Applications*, Vol. 3 No. 1A, 2013, pp. 1-5. doi: 10.4236/jcdda.2013.31A001.

References

- [1] J. Varani, R. L. Warner, M. Gharaee-Kermani, S. H. Phan, S. Kang, J. H. Chung, Z. Q. Wang, S. C. Datta, G. J. Fisher and J. J. Voorhees, " Vitamin A Antagonizes Decreased Cell Growth and Elevated Collagen-Degrading Matrix Metalloproteinases and Stimulates Collagen Accumulation in Naturally Aged Human Skin," *Journal of Investigative Dermatology*, Vol. 114, No. 3, 2000, pp. 480-486. doi:10.1046/j.1523-1747.2000.00902.x
- [2] S. E. G. Fligiel, J. Varani, S. C. Datta, S. Kang, G. J. Fisher and J. J. Voorhees, " Collagen Degradation in Aged/ Photodamaged Skin in Vivo and after Exposure to Matrix Metalloproteinase-1 in Vitro," *Journal of Investigative Dermatology*, Vol. 120, No. 5, 2003, pp. 842-848. doi:10.1046/j.1523-1747.2003.12148.x
- [3] G. J. Fisher, J. Varani and J. J. Voorhees, " Looking Older. Fibroblast Collapse and Therapeutic Applications," *Archive of Dermatology*, Vol. 144, No. 5, 2008, pp. 666-672.
- [4] W. A. El-Harake, M. A. Furman, B. Cook, K. S. Nair, J. Kukowski and I. G. Brodsky, " Measurement of Dermal Collagen Synthesis Rate in Vivo in Humans," *American Journal of Physiology*, Vol. 274, No. 4, 1998, pp. E586-E591.
- [5] N. Verzijl, J. DeGroot, S. R. Thorpe, R. A. Bank, J. N. Shaw, T. J. Lyons, Bijlsma, F. P. Lafeber, J. W. Baynes and J. M. TeKoppele, " Effect of Collagen Turnover on the Accumulation of Advanced Glycation end Products," *Journal of Biological Chemistry*, Vol. 275, No. 15, 2000, pp. 39027-39031. doi:10.1074/jbc.M006700200
- [6] P. R. Mays, R. J. McNulty, J. S. Campa and G. J. Laurent, " Age-Related Changes in Collagen Synthesis and Degradation in Rat Tissues: Importance of Degradation of Newly Synthesized Collagen in Regulating Collagen Production," *Biochemistry Journal*, Vol. 276, 1991, pp. 307-313.
- [7] Z. O. Wirtschaftler and A. S. Bentley, " The Influence of Age and Growth Rate on the Extractable Collagen of Skin of Normal Rats," *Laboratory Investigations*, Vol. 11, 1962, pp. 316-320.
- [8] J. C. Waterlow and J. M. L. Stephen, " Adaptation of the Rat to a Low-Protein Diet: The Effect of a Reduced Protein Intake on the Pattern of Incorporation of L-[¹⁴C] Lysine," *British Journal of*

- [Open Special Issues](#)
- [Published Special Issues](#)
- [Special Issues Guideline](#)

[JCDSA Subscription](#)
[Most popular papers in JCDSA](#)
[About JCDSA News](#)
[Frequently Asked Questions](#)
[Recommend to Peers](#)
[Recommend to Library](#)
[Contact Us](#)

Downloads:	43,520
Visits:	111,714

Sponsors, Associates, and Links >>

- [9] J. H. Chung, J. Y. Seo, H. R. Choi, M. K. Lee, C. S. Youn, G. Rhie, K. H. Cho, K. H. Kim, K. C. Park and H. C. Eun, " Modulation of Skin Collagen Metabolism in Aged and Photoaged Human Skin in Vivo," *Journal of Investigative Dermatology*, Vol. 117, No. 5, 2001, pp. 1218-1224. doi:10.1046/j.0022-202x.2001.01544.x
- [10] Y. Dang, X. Ye, Y. Weng, Z. Tong and Q. Ren, " Effects of the 532-nm and 1064-nm Q-Switched Nd:YAG Lasers on Collagen Turnover of Cultured Human Skin Fibroblasts: A Comparative Study," *Lasers in Medical Sciences*, Vol. 25, No. 5, 2010, pp. 719-726. doi:10.1007/s10103-009-0657-4
- [11] J. S. Orringer, S. Kang, T. M. Johnson, D. J. Karimipour, T. Hamilton, C. Hammerberg, J. J. Voorhees and G. J. Fischer, " Connective Tissue Remodeling Induced by Carbon Dioxide Laser Resurfacing of Photodamaged Human skin," *Archives of Dermatology*, Vol. 140, No. 11, 2004, pp. 1326-1332. doi:10.1001/archderm.140.11.1326
- [12] C. Spock, A. I. Metelitsa, J. Kaufman and J. B. Green, " Lasers and Light Sources to Activate Fibroblasts," *Cosmetical Dermatology*, Vol. 25, No. 1, 2012, pp. 27-33.
- [13] J. S. Orringer, C. Hammerberg, T. Hamilton, T. M. Johnson, S. Kang, D. L. Sachs, G. J. Fisher and J. J. Voorhees, " Molecular Effects of Photodynamic Therapy for Photoaging," *Archives of Dermatology*, Vol. 144, No. 10, 2008, pp. 1296-1302. doi:10.1001/archderm.144.10.1296
- [14] B. D. Zelickson, D. Kist, E. Bernstein, D. B. Brown, S. Ksenzenko, J. Burns, S. Kilmer, D. Mehregan and K. Pope, " Histological and Ultrastructural Evaluation of the Effects of a Radiofrequency-Based Nonablative Dermal Remodeling Device. A Pilot Study," *Archives of Dermatology*, Vol. 140, No. 2, 2004, pp. 204-209. doi:10.1001/archderm.140.2.204
- [15] C. E. M. Griffiths, A. N. Russman, G. Majmudar, R. S. Singer, T. A. Hamilton and J. J. Voorhees, " Restoration of Collagen Formation in Photodamaged Human Skin by Tretinoin (Retinoic Acid)," *New England Journal of Medicine*, Vol. 329, No. 8, 1993, pp. 530-535. doi:10.1056/NEJM199308193290803