In Preparation:

Oriented Type I Collagen: A Review on Artificial Alignment Strategies

Spencer Cook[1], Karina Ambrock[1], Bernd Grohe[2] and Silvia Mittler[1]*

[1]Department of Physics and Astronomy, The University of Western Ontario, London, Ontario, N6A 3K7, Canada

[2] Department of Chemical and Biochemical Engineering, The University of Western Ontario, London, Ontario, N6A 5B9, Canada

*smittler@uwo.ca

Abstract:

Collagen is the most abundant protein in the human body and serves many functions, from mechanical stability and elasticity in tendons and bone to optical properties, such as transparency and a fine tuned refractive index in the cornea of the eye. Collagen has interested human kind since centuries; Leonardo Da Vinci has studied and drawn the tendons in the human body as precisely as possible in the 15th and 16th century. A quick look at the literature reveals easily > 200,000 hits.

This review gives a short overview on the hierarchical organization of type I collagen and oriented type I collagen structures found in nature, e.g. in the human body. It then focuses on the diverse methods implemented to mimic and fabricate artificial type I oriented collagen in 1D, 2D and 3D architectures. The applications of artificially fabricated type I oriented collagen structures are briefly discussed. The outline gives an overview on the content.

Outline: