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HIGH-STRAIN STRESS RELAXATION: PROBING THE MAIN STRUCTURAL COMPONENTS IN THE CORTEX OF HUMAN HAIR

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Description

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The relation between the main cortical structures in hair (IFs & matrix) and its mechanical properties has been studied for many years. Beyond fundamentals aspects, this was also done with the objective to gain insight into structure specific effects of environmental damage and cosmetic treatments.
In practice, mechanical analyses to determine internal structural changes have largely been limited to studying fibre modulus, breakage, and a limited number of other parameters in the dry and the wet state.
High-strain stress relaxation experiments of hair in water provide the opportunity to study the strain-dependent, elastic properties of IFs and matrix via the creation of isochronal stress-strain curves. This approach is combined with the analysis of the non-linear viscoelastic relaxation performance of the matrix.
This paper discusses the experimental and theoretical methods used and the implications of its findings with respect to widely held theories about the relationship between the stress-strain properties of hair and its morphological and molecular structures.

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