

# Preface to the Fifth Edition

Nearly 9 years have passed since the writing of the fourth edition and much progress has been made in that time span. Identification and classification of the chromosomes and genes involved in the important IF (intermediate filament) and KAP (keratin associated proteins) proteins of human hair and some of the genes involved in different forms of alopecia and hair abnormalities has occurred. Many of the SNPs of different genes in natural hair color and hair fiber size and shape and the geographic influence on these genes and properties have also been made. Our understanding of the distribution of different proteins in the fiber and its control of hair fiber curvature has increased dramatically. Methods development has also increased at a rapid pace. For example, a new hair curvature (most important single fiber property of hair) method has been described and applied to the scalp hair of more than 2,400 different persons in more than 20 different countries. Our understanding of hair growth, hair breakage, the torsional behavior of hair and the mechanisms of important oxidative reactions (chemical bleaching and sunlight degradation) in human hair has also improved greatly.

This edition contains expanded data and more comprehensive data bases with statistical analyses for hair fiber diameters, hair densities (hairs/cm<sup>2</sup>), ellipticity, incidence of hair graying, male pattern alopecia, female pattern alopecia versus age, and comparisons of most of these properties among different geo-ethnic groups and males versus females. Sections on the effects of pregnancy and the menopause on hair fiber and assembly properties have also been expanded as well as a new Chapter providing definition for most of the important cosmetic hair assembly properties and how these properties are influenced by changes in single fiber properties in general and as a function of age.

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