

Part II

**Connective Tissues
in Pulmonary Disease**

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Introduction

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There are no other systems in the body wherein the fibers of the connective tissues have more immediate and vital significance than in the respiratory system, especially the lung. In many ways the organization and distribution of the collagen and elastin of the lung have more impact on the physiologic behavior of the organ than does the absolute quantity of these scleroproteins. In the first paper of this part of the symposium, Dr. Gordon L. Snider presents some powerful arguments in support of the significance of the relationship between connective tissue organization and the mechanical behavior of the lung. Collagen and elastin work together, with collagen limiting pulmonary distensibility at high lung volumes and elastin providing the basic compliant character of the lung.

The unique contribution of elastin to the elastic functions of tissues, especially the lung and the large vessels, is reinforced by the presentation of Dr. Judith Foster. Dr. Foster's discussion of elastin biochemistry is highlighted by the interesting recent discovery of two distinct forms of tropoelastin or soluble elastin, called the "a" and "b" forms, whose proportions are unique to specific tissues and whose functional significance surely will be the object of intensive investigation in the future.

Dr. Gerald M. Turino defines the anatomy and biochemistry of the most common disease that interrupts these tissues, and thus interferes with normal function -- emphysema. Dr. Turino presents an excellent hypothesis for the etiology of emphysema, where the basic balance between α -1 antiprotease on the one hand and neutrophil or macrophage protease on the other hand is interrupted, e.g., with tobacco smoke, with resulting connective tissue disruption.

Dr. Holde Puchtler, whom we have honored, gives the final presentation of the symposium. As is usual with Dr. Puchtler, her presentation begins with a comprehensive historical digest; continues through the state of the art; and concludes with an enlightening prospective. Those readers who are willing to plunge into the massive literature written by Dr. Puchtler over the years may not always be able to keep pace with her intellect upon first reading, but a persistent reader will be amply rewarded by her brilliant applications of basic chemistry and physics to stain - substrate interactions, which hold the promise of placing histochemistry on a more scientific basis.

Her work in histochemistry in the past has often presaged advances in biochemistry; the paper presented here indicates that she may have done so once more, for her discussions of the histochemistry of elastin indicate a heterogeneity that may be related to the heterogeneous forms of elastin defined biochemically by Dr. Judith Foster.