CONTENTS

		Page
Pre	face	ix
	BIOLOGY, GENETICS, AND SYNTHESIS	
1.	Silk: Biology, Structure, Properties, and Genetics	2
2.	General Properties of Some Spider Silks	17
3. 4.	Silk Glands of Araneid Spiders: Selected Morphological and Physiological Aspects Molecular Map for the Silkworm: Constructing New Links between Basic	29
	and Applied Research	45
5.	Importance of Unique Silk Proteins to the Ecological and Evolutionary Diversity of Araneid Spiders	59
6.	Initial Characterization of Nephila clavipes Dragline Protein	67
7.	Silk and Silk Proteins from Two Aquatic Insects	80
8.	Synthetic and Recombinant Domains from a Midge's Giant Silk Protein: Role for	
0	Disulfide Bonds In Vivo Synthesis and Structural Analysis of Alanylakusina Rich Artificial Proteins	91 98
9.	In Vivo Synthesis and Structural Analysis of Alanylglycine-Rich Artificial Proteins	104
10.	Design, Synthesis, and Fabrication of Novel Self-Assembling Fibrillar Protein	104
	CHARACTERIZATION, PROPERTIES, AND MODELING	
	Optical Characterization of Silk Secretions and Fibres	120
12.	Structural Evolution of Genetically Engineered Silklike Protein Polymers	137
13.	NMR Characterization of Silk Proteins	148
14.	Raman Spectroscopic Analysis of the Secondary Structure of Spider Silk Fiber	155
15.	Crystal Structure of Silk of Bombyx mori	168
16.	Toward Single-Fiber Diffraction of Spider Dragline Silk from Nephila Cavipes	176
17.	X-ray Moduli of Silk Fibers from Nephila clavipes and Bombyx mori	185
18.	Aspects of the Morphology of Dragline Silk of Nephila calvipes	196
19.	Thermal Properties of Silk Proteins in Silkworms	211
20.	Mechanical and Chemical Properties of Certain Spider Silks	222
21.	Mechanical Properties of Major Ampulate Gland Silk Fibers Extracted from Nephila	
	cavipes Spiders	234
22.	Initial Degradative Changes Found in Bombyx mori Silk Fibroin	252
23.	Molecular Modeling Studies on Silk Peptides	270
24.	Approaches to Modeling and Property Prediction of Model Peptides	283
	Mechanism of Fiber Formation of Silkworm	292
	Spinning of Protein polymer Fibres	311
	Elastomeric Network Models for the Frame and Viscid Silks from the Orb	
	Wed of the Spider Araneus diadematus	328
28.	Formation and Properties of Silk Thin Films	342
	Applications of Silk	353