Contents

	Author biographies	vi
	Preface by Maneli Mozaffarieh	i
	Preface by Josef Flammer	х
	Acknowledgements	xii
	Abbreviations	X
1	Introduction	:
2	Basic sciences relevant to glaucoma	!
	What is a redox reaction?	!
	What is the role of light?	(
	The oxygen molecule	7
	The concept of cellular stress	1:
	Oxidative stress	13
	Assessment of ocular blood flow	1
3	What is glaucoma?	2
	Glaucomatous optic neuropathy	2
	Epidemiology of glaucoma	28
	Symptoms of chronic glaucoma	28
	Signs of glaucomatous optic neuropathy	30
4	Risk factors for glaucoma	3!
	Risk factors for an increase in intraocular pressure	3
	Risk factors for glaucomatous optic neuropathy	30
	The role of ocular blood flow	40
5	Regulation of ocular blood flow	4:
	Regulation of blood flow in the eye	4
	Endothelial-derived vasoactive factors	48
	Circulating hormones	50

vi • CONTENTS

6	Vascular dysregulation syndrome	55
	What is vascular dysregulation?	55
	Primary vascular dysregulation	55
	Primary vascular dysregulation and other risk factors for	
	glaucomatous optic neuropathy	61
	Primary vascular dysregulation and eye circulation	63
	Primary vascular dysregulation and other eye diseases	64
	Secondary vascular dysregulation	66
7	Reperfusion damage	69
	What is reperfusion injury?	69
	What leads to reperfusion injury?	69
	Why does reperfusion injury induce glaucomatous	
	optic neuropathy?	70
	Are there signs of oxidative stress in human glaucoma?	71
8	Pathogenesis of glaucomatous optic neuropathy	75
9	Treatment strategies	79
	Importance of reducing intraocular pressure	79
	Methods to reduce intraocular pressure	79
	Non-intraocular pressure lowering treatments	80
	Further reading	99
	Index	101