
CONTENTS

ACKNOWLEDGEMENTS	i
ABSTRACT	vii
RESUMEN	xi
RESUM	xv
DISSEMINATION OF RESULTS	xix
ACRONYMS AND ABBREVIATIONS	xxiii
INTRODUCTION	1
1. The rise of sensors and biosensors	3
1.1. General overview	3
1.2. Biosensors	4
1.3. Sensing surface	5
1.4. Micro and nanostructuring of biolayers.....	7
1.5. Transduction principles.....	9
2. Optical biosensors	10
2.1. Plasmonic biosensing.....	12
2.2. Interferometric biosensing	13
2.3. Diffractive biosensing.....	14
2.3.1. Diffraction basics	14
2.3.2. Diffractive biosensing approaches	17
3. Waveguiding biosensing	19
3.1. Fundamentals of waveguiding.....	20
3.2. Principles of waveguide-based sensing	23
3.3. Biosensing approaches in waveguides	25
3.3.1. Nanoplasmonic biosensors	25
3.3.2. Interferometers.....	25
3.3.3. Ring resonators	27
3.3.4. Bragg gratings.....	27
4. References	33
OBJECTIVES	55
RESULTS	59
Chapter 1: Microcontact printing to pattern biogratings	61

Chapter 1.1: Indirect microcontact printing to create functional patterns of physisorbed antibodies	65
Chapter 1.2: Patterned bilayers of protein antigens for label free biosensing in cow milk allergy	89
Chapter 2: Fabrication of biogratings by local and periodic deactivation of bilayers	125
Denaturing for nanoarchitectonics: Local and periodic UV-laser photodeactivation of protein bilayers to create functional patterns for biosensing	129
Chapter 3: Biogratings on waveguides	163
Chapter 3.1: Bio Bragg gratings on microfibers for label-free biosensing	167
Chapter 3.2: Transducing Biorecognition Events Using Surface Bragg Gratings of Proteins Patterned on Integrated Waveguides	205
GENERAL DISCUSSION	235
GENERAL CONCLUSIONS	245

