

# Contents

<b>1</b>	<b>Current Optical Biosensors in Clinical Practice</b>	<b>1</b>
1.1	Principle of Biosensors	1
1.2	Enzyme-Linked Immunosorbent Assay (ELISA)	2
1.3	Sandwich ELISA	4
1.3.1	Capture Antibody Immobilization	4
1.3.2	Washing Procedure	4
1.3.3	Blocking Step	4
1.3.4	Antigen Attachment	5
1.3.5	Primary Antibody Attachment	5
1.3.6	Secondary Antibody Attachment and Reading the Signals	5
1.4	Evaluation of ELISA	5
1.5	Advantages and Disadvantages of ELISA	7
1.6	Functionalization Techniques	8
	References	10
<b>2</b>	<b>An Alternative Chemical Approach for Development of Polymeric Analytical Platforms</b>	<b>13</b>
2.1	Proposed Chemical Methodology	13
2.2	Application of Developed Polymer Compositions in ELISA	15
2.3	Characterization of the Biochips	15
2.3.1	Scanning Electron Microscopy (SEM), Morphology Analysis	15
2.3.2	Atomic Force Microscopy (AFM), Topography Analysis	16
2.3.3	Water-in-Air Contact Angle Measurement, Surface Wettability	16
2.3.4	X-ray Photoelectron Spectroscopy, Surface Chemistry	17

2.4	Infectious Diseases . . . . .	18
2.5	Neglected Tropical Diseases . . . . .	18
2.6	Dengue Fever . . . . .	18
	References . . . . .	19
<b>3</b>	<b>Biochips Fabrication and Surface Characterization . . . . .</b>	<b>23</b>
3.1	Synthesis of Poly(MMA-co-MAA) Compositions . . . . .	23
3.2	Fabrication of Spin-Coated Biochips . . . . .	24
3.3	Application of Biochips in ELISA and Surface Modification Techniques . . . . .	24
3.3.1	Physical Immobilization . . . . .	25
3.3.2	Covalent Immobilization . . . . .	26
3.3.3	Immobilization via Amine-Bearing Spacers. . . . .	27
3.4	Morphology Analysis of the Biochips . . . . .	28
3.5	Topography Analysis of the Biochips. . . . .	30
3.6	Wettability of the Biochips . . . . .	32
3.7	Surface Analysis of the Biochips by XPS . . . . .	34
	References . . . . .	36
<b>4</b>	<b>Application of Biochips in Dengue Virus Detection . . . . .</b>	<b>39</b>
4.1	Physical Immobilization . . . . .	39
4.1.1	Detection Range Study. . . . .	39
4.1.2	Detection Performance Comparison . . . . .	40
4.1.3	Calibration Curves. . . . .	41
4.1.4	Evaluation of the Assay . . . . .	42
4.1.5	Chemistry Aspect . . . . .	43
4.2	Covalent Immobilization. . . . .	44
4.3	Immobilization via Amine-Bearing Spacers. . . . .	45
	References . . . . .	47
	<b>Summary . . . . .</b>	<b>49</b>
	<b>Appendices . . . . .</b>	<b>51</b>



<http://www.springer.com/978-981-10-0106-2>

Novel Polymeric Biochips for Enhanced Detection of  
Infectious Diseases

Hosseini, S.; Ibrahim, F.

2016, XII, 55 p. 23 illus., 6 illus. in color., Softcover

ISBN: 978-981-10-0106-2