

## CONTENTS

1	INTRODUCTION .....	1
1.1	DNA assays in the clinical field.....	3
1.2	Biosensors for DNA detection .....	16
1.3	SNP genotyping methods.....	28
1.4	Integrated systems for DNA assays .....	49
1.5	Final remarks .....	73
1.6	References.....	74
2	OBJECTIVES .....	83
3	EXPERIMENTAL RESULTS.....	87
	Chapter 1. Allele-specific recombinase polymerase amplification and colorimetric microarray detection.....	89
3.1	Abstract.....	91
3.2	Introduction.....	92
3.3	Material and methods.....	95
3.4	Results.....	99
3.5	Conclusions.....	112
3.6	References.....	114
	Chapter 2. Allele-specific ligation and recombinase polymerase amplification for the detection of single nucleotide polymorphisms.....	115
3.7	Abstract.....	117
3.8	Introduction.....	118
3.9	Materials and methods .....	120
3.10	Results and discussion .....	124
3.11	Conclusions.....	134
3.12	References.....	135

Chapter 3. Polymorphism genotyping based on loop-mediated isothermal amplification and smartphone detection .....	137
3.13 Abstract .....	139
3.14 Introduction.....	140
3.15 Material and methods.....	143
3.16 Results and discussion .....	147
3.17 Conclusion .....	160
3.18 References.....	161
Chapter 4. Detection of genotyping assays based on loop-mediated isothermal amplification and consumer electronic devices .....	163
3.19 Abstract .....	165
3.20 Introduction.....	166
3.21 Material and methods.....	169
3.22 Results and discussion .....	173
3.23 Conclusions.....	188
3.24 References.....	189
4 RESULTS DISCUSSION.....	191
5 GENERAL CONCLUSIONS .....	201
6 ANNEXES .....	207
6.1 Annex 1 .....	211
6.2 Annex 2.....	217
6.3 Annex 3.....	227
6.4 Annex 4.....	249