

Contents

ORIGINAL PAPERS	3
ABBREVIATIONS	4
1 INTRODUCTION	5
2 MICROARRAY ANALYSIS	8
2.1 DNA microarray	8
2.2 Classical proteomics	9
2.3 Protein microarray	10
2.4 Antibody microarray	12
3 PROTEIN MICROARRAY TECHNOLOGY	15
3.1 Spotting in pL-scale	15
3.2 Array processing	16
3.3 Analytical principles	18
3.3.1 Label-based detection	18
3.3.2 Label-free detection	19
3.4 Data analysis	21
4 THE PROBE: SINGLE FRAMEWORK RECOMBINANT ANTIBODY FRAGMENTS (SINFABS)	23
4.1 Antibodies in nature	23
4.1.1 Antibody structure	24
4.2 Recombinant single chain antibody variable region fragments (scFvs)	25
4.3 Choice of probe format	26
4.3.1 Stability	27
4.3.2 Sensitivity	30
5 THE SOLID SUPPORT	32
5.1 Substrates based on adsorption	33
5.1.1 1- and 2-dimensional substrates	33
5.1.2 3-dimensional substrates	34
5.2 Substrates based on covalent coupling	35

5.3	Substrates based on affinity coupling	36
5.3.1	Ni ²⁺ -coated substrates and polyhistidine-tags	37
6	CONCLUDING REMARKS AND FUTURE OUTLOOK	38
	POPULAR SCIENTIFIC SUMMARY	41
	POPULÄRVETENSKAPLIG SAMMANFATTNING	43
	POPULÄRWISSENSCHAFTLICHE ZUSAMMENFASSUNG	45
	ACKNOWLEDGEMENTS	47
	REFERENCES	49
	PAPERS I-V	58