

Surface Chemistries for Magnetic Core Nanoparticles (MNP) and used for Corona Experimentation

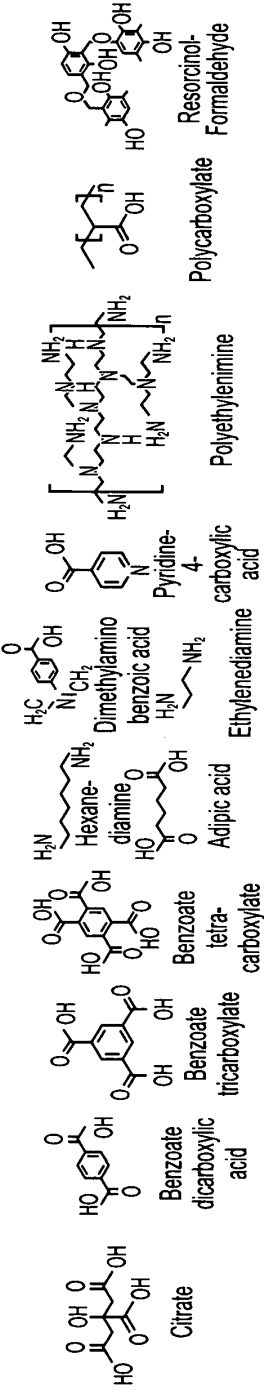
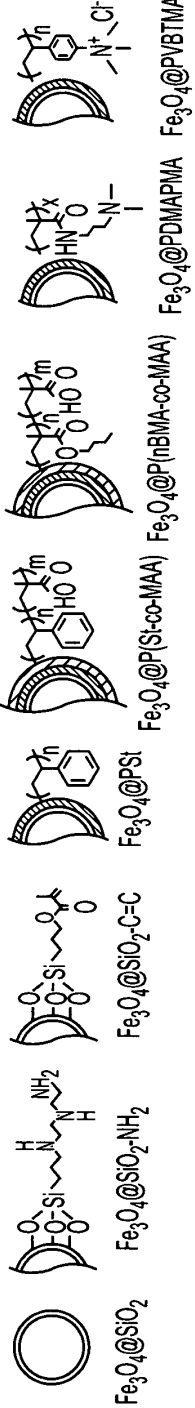
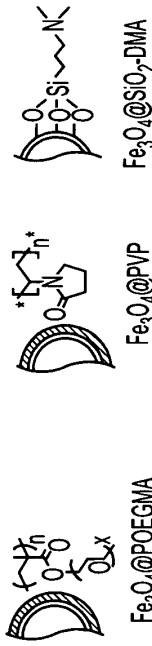
Particle type	Surface functionalization	
Iron oxide	Paramagnetic, Polyacrylic acid (PAA)	
Iron oxide (Superpara-magnetic)		
Iron oxide Core-shell (Superpara-magnetic)		
		

FIG. 1

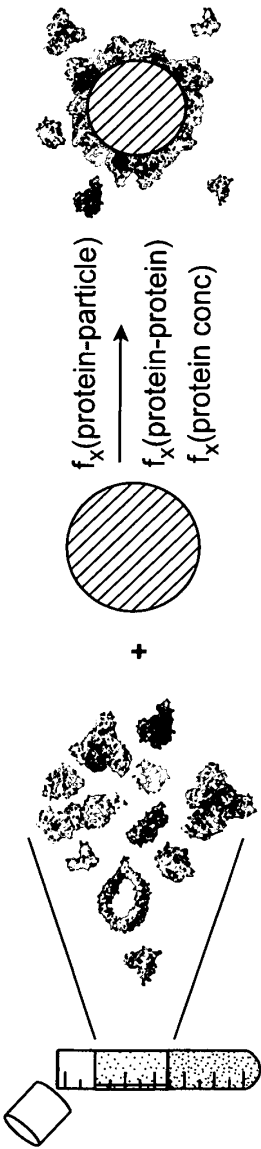


FIG. 2A

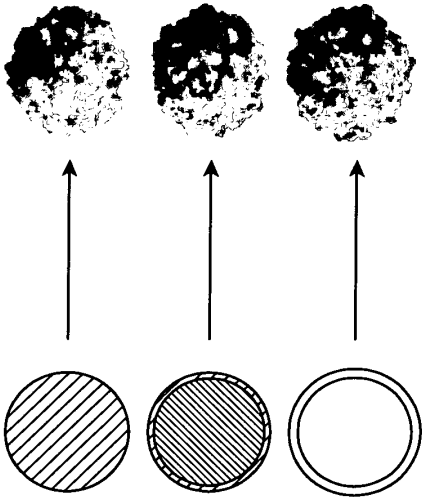


FIG. 2B

Particle type	Surface functionalization
Iron oxide <i>(Superparamagnetic)</i>	<i>anionic, cationic, neutral polymeric, lipidic, glass organic, inorganic high or low ligand density ...</i>
Silica	
Polymeric	
Gold	
Liposomes	

FIG. 3

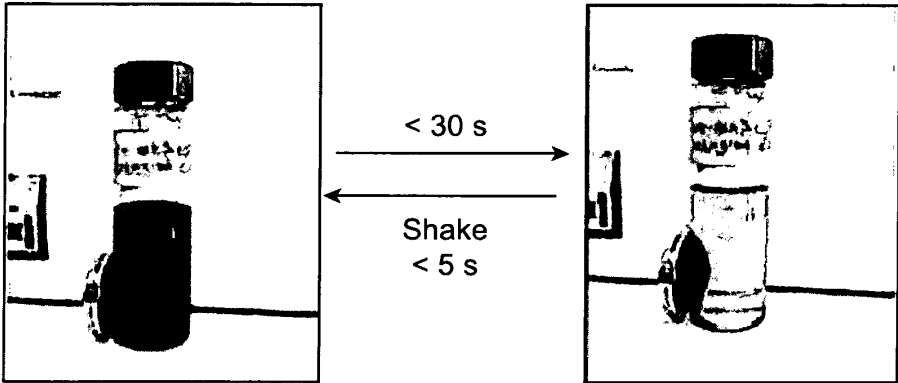


FIG. 4

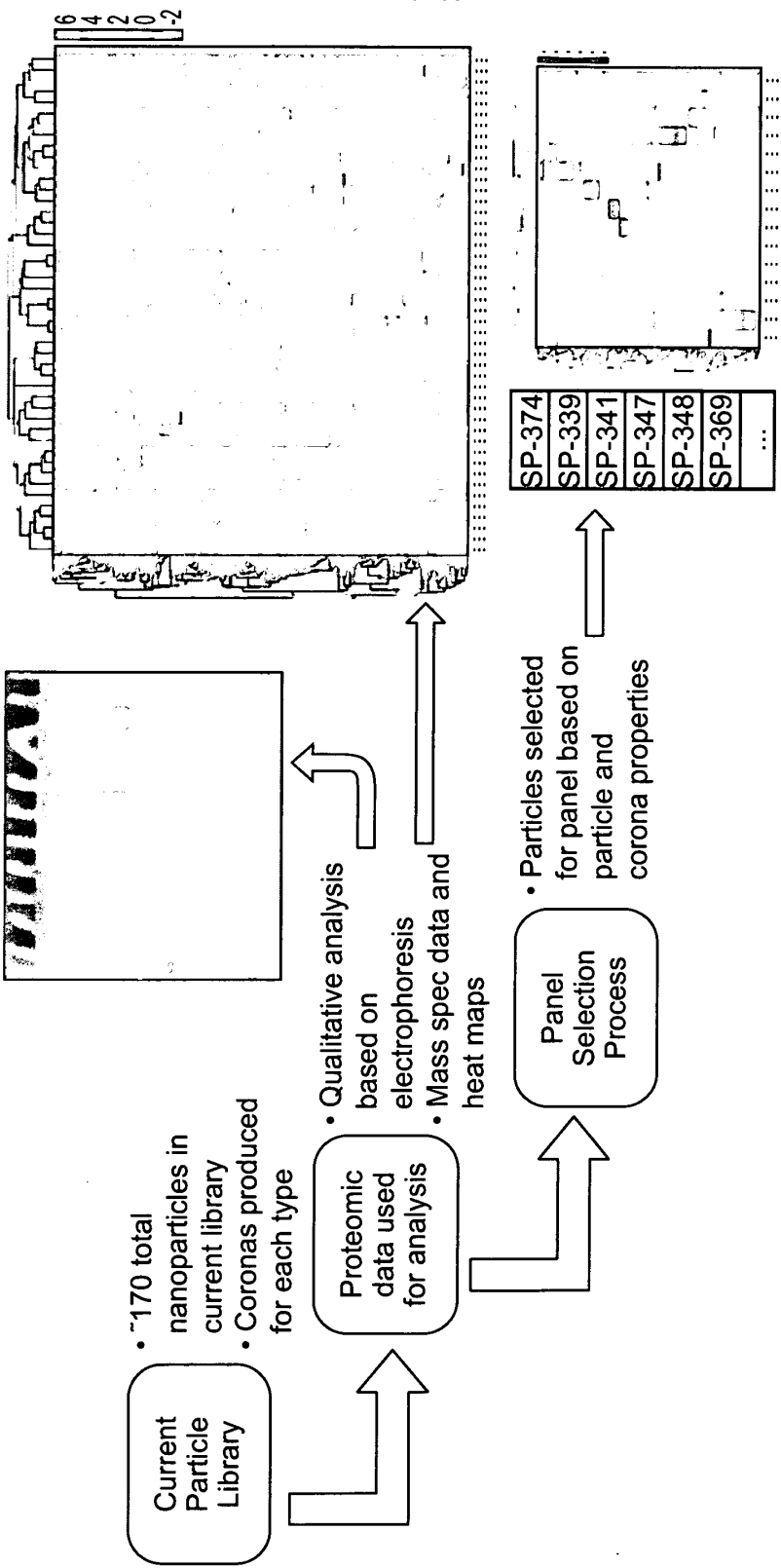


FIG. 5

Attribute	Methods	Description
Size/Geometry	DLS	Size distributions
	TEM	Size confirmation and indication of shape
	Other (A4F, LD, NTA, etc.)	Orthogonal methods for size distribution
Charge	Zeta potential	Surface charge in environments of interest
Surface Functionality	XPS	Surface chemistry (outer 10 nm)
	SIMS	Surface expression (outer 1 nm)
	Other (FTIR, Raman, etc.)	Orthogonal methods for composition
Magnetism	SQUID	Response to magnetic fields
Other	A variety of composition tests, microbial tests, and other properties	Full specification sheet to be developed prior to reagent kit distribution

FIG. 6

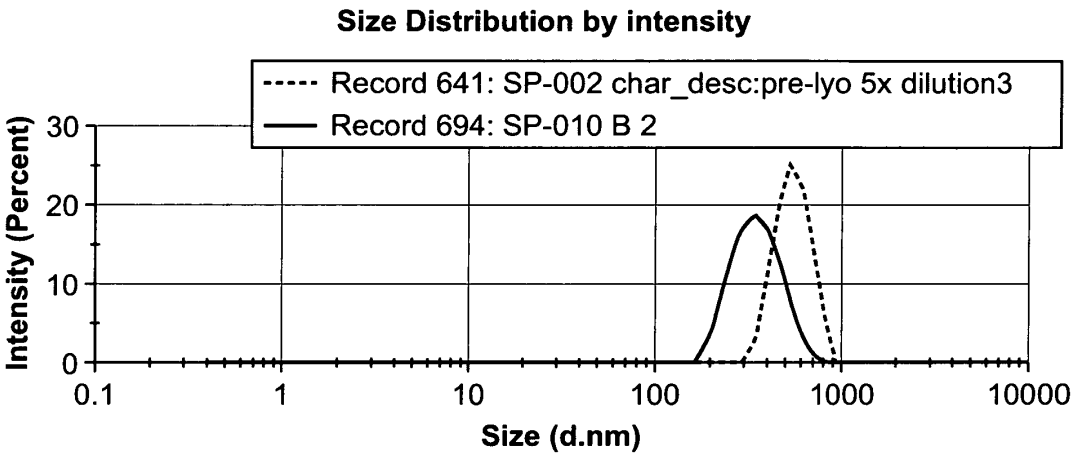


FIG. 7

7 / 47

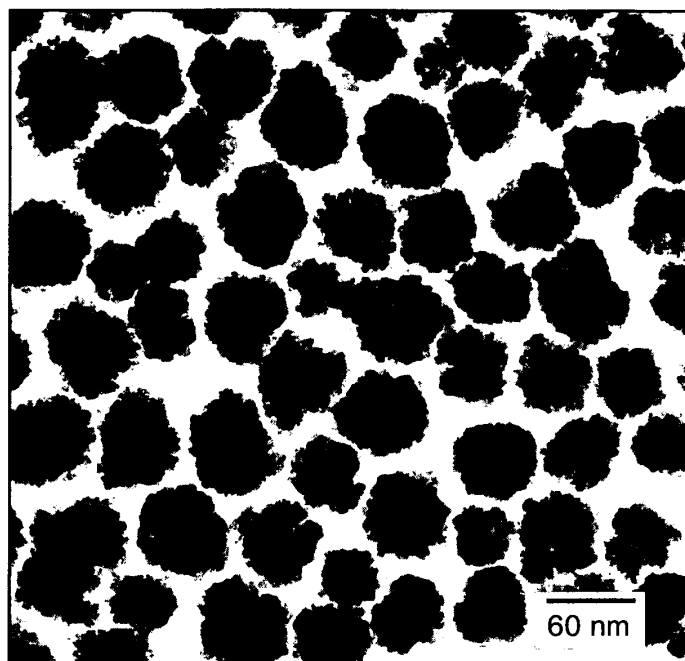


FIG. 8A

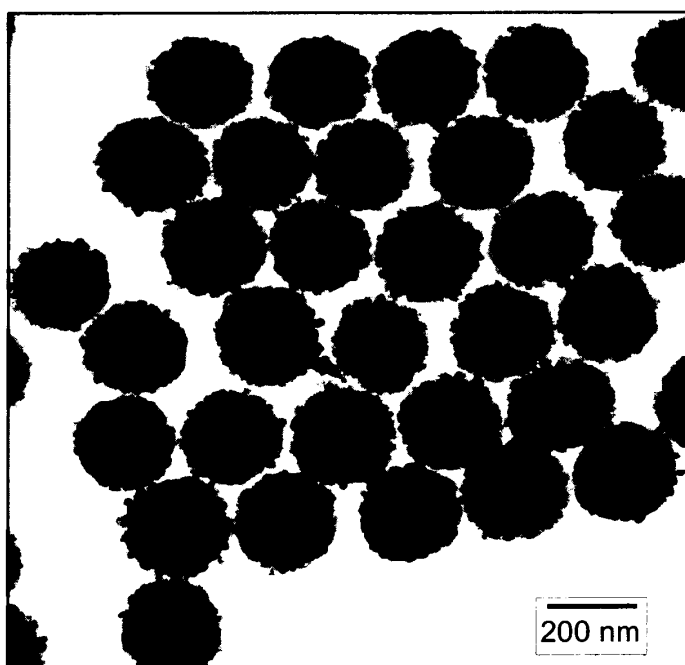


FIG. 8B

8 / 47

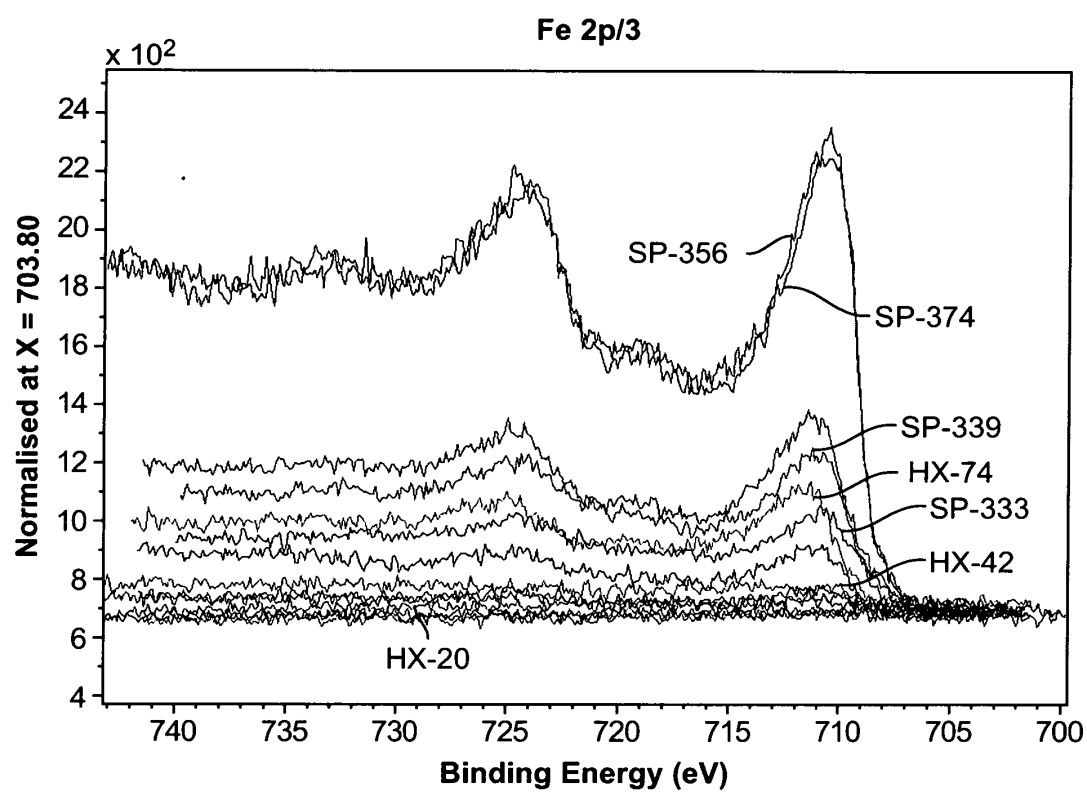


FIG. 9

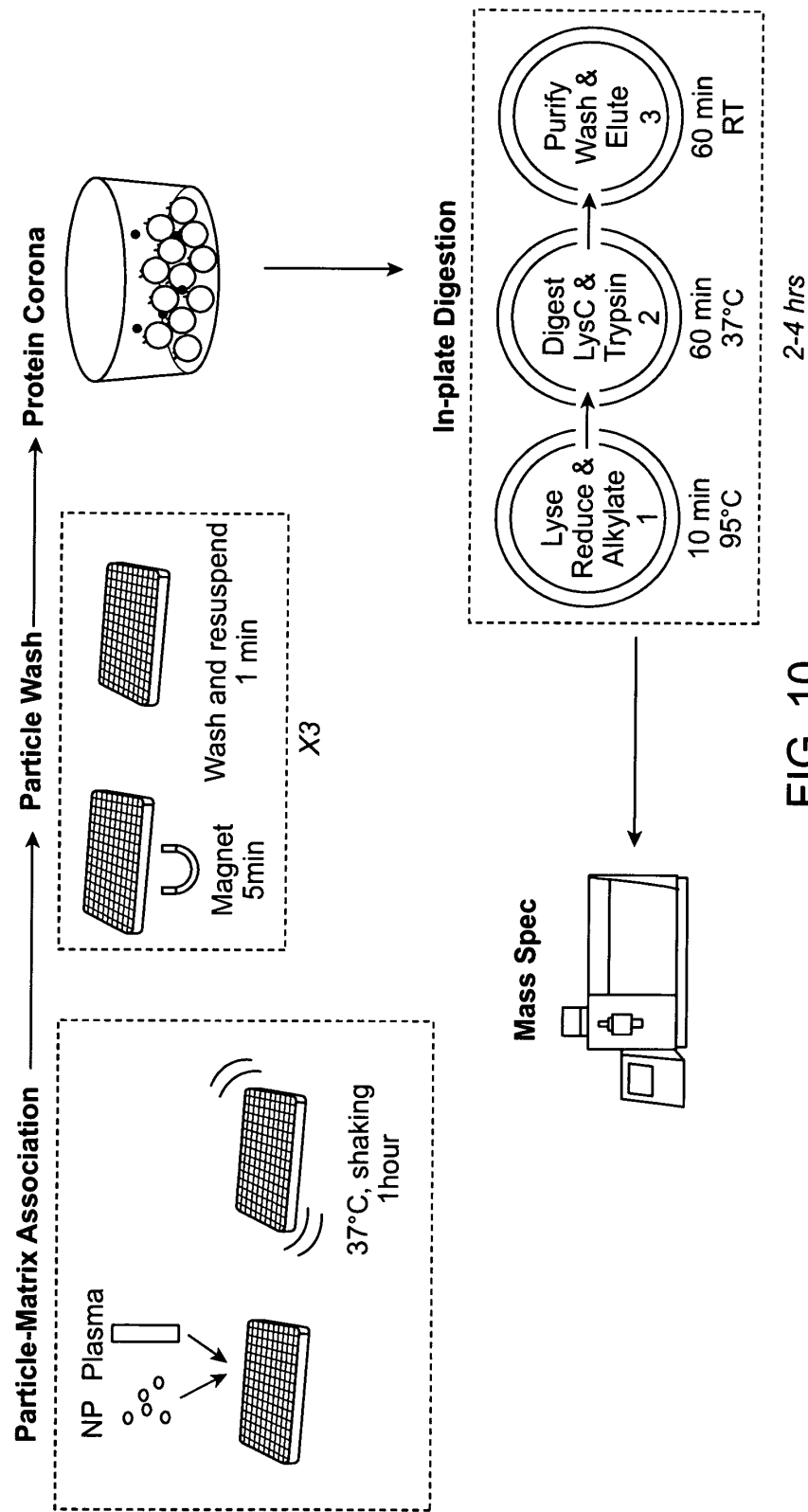


FIG. 10

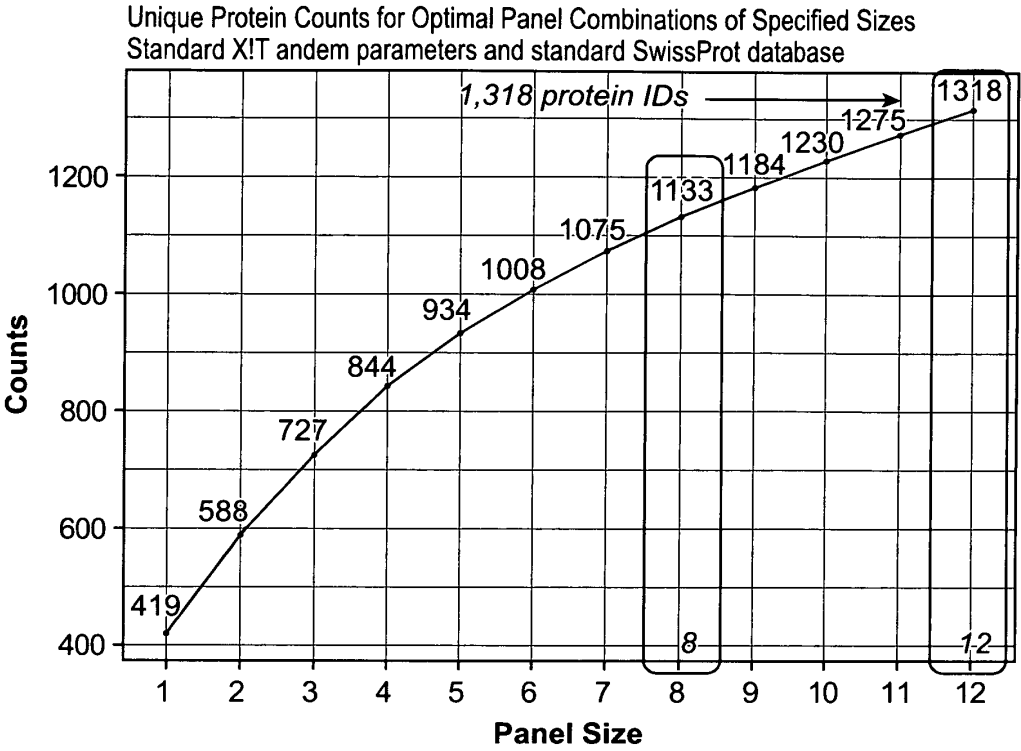


FIG. 11

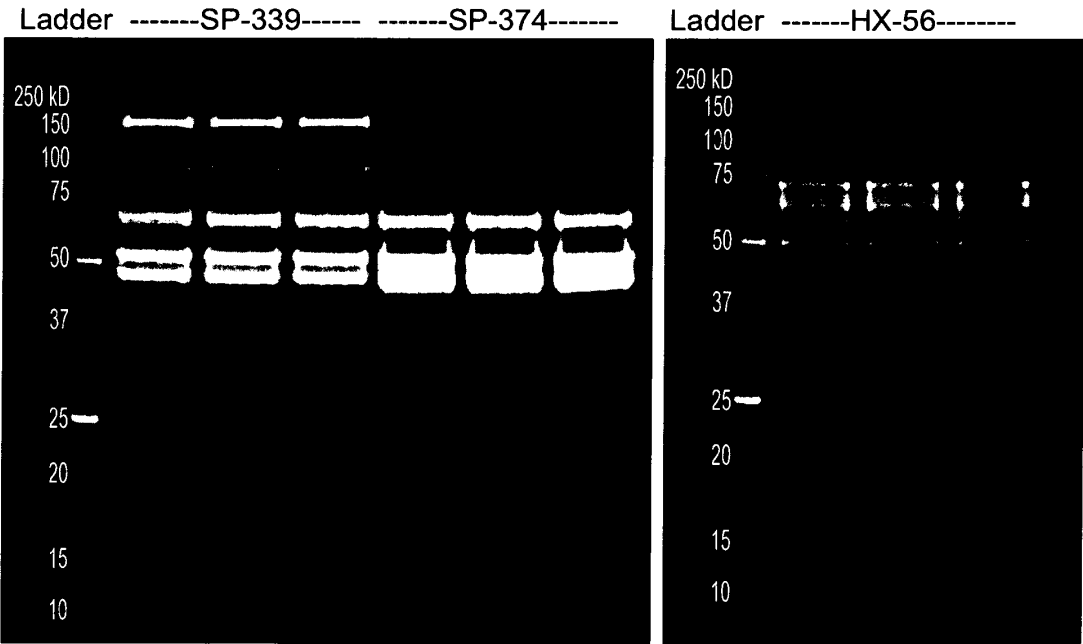


FIG. 12

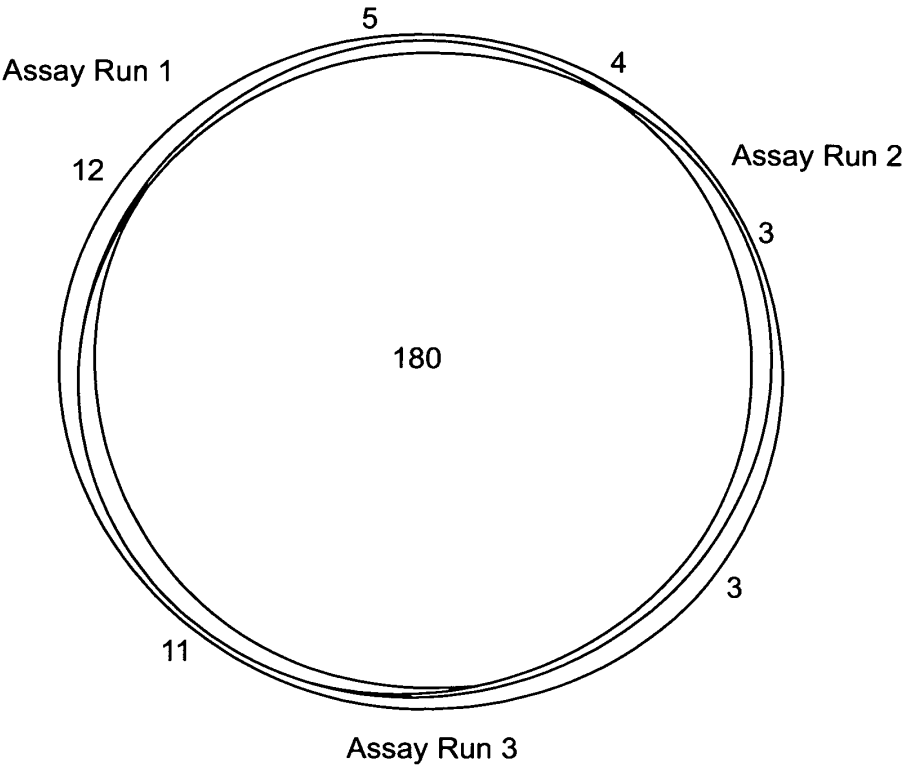


FIG. 13

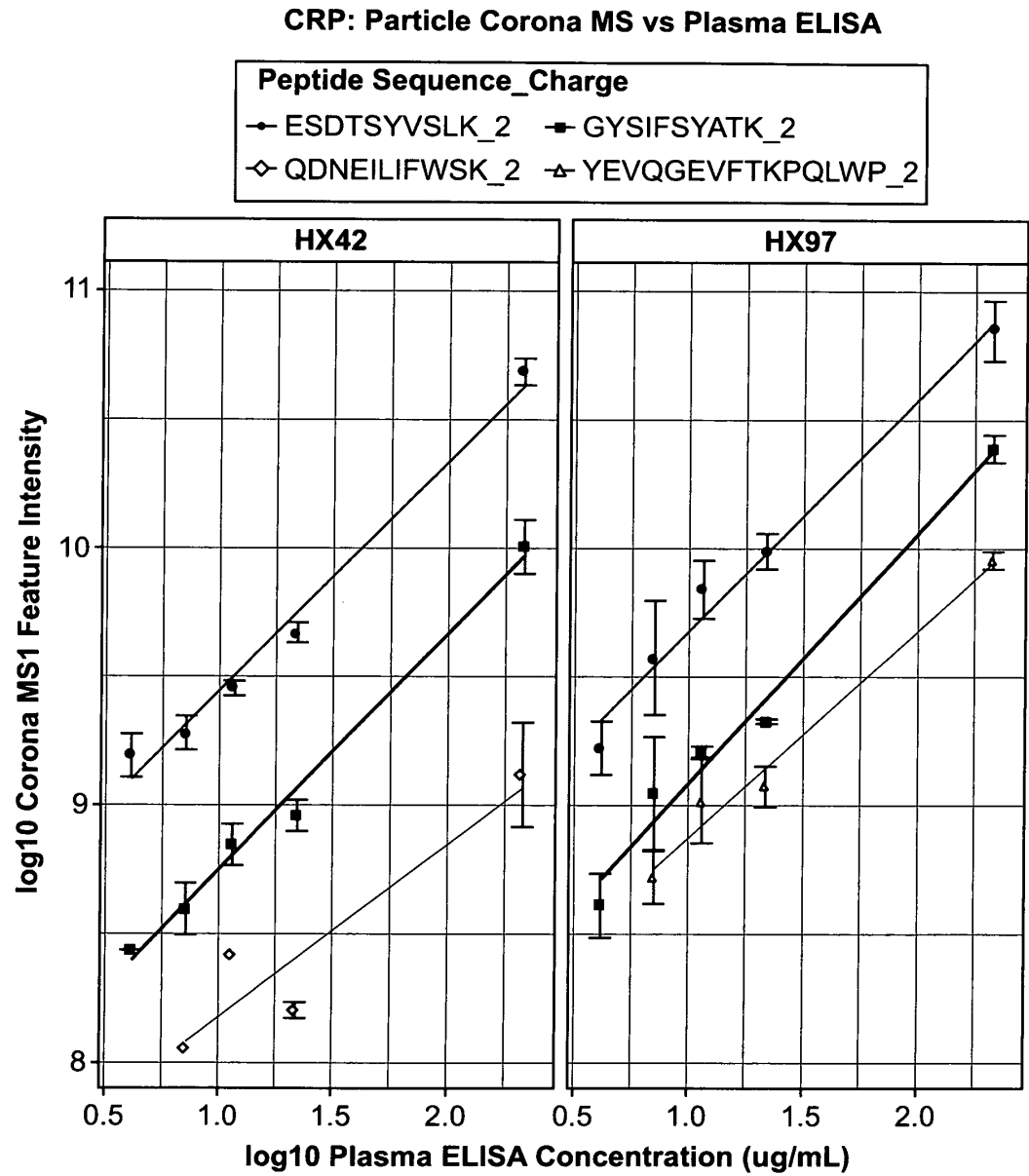


FIG. 14A

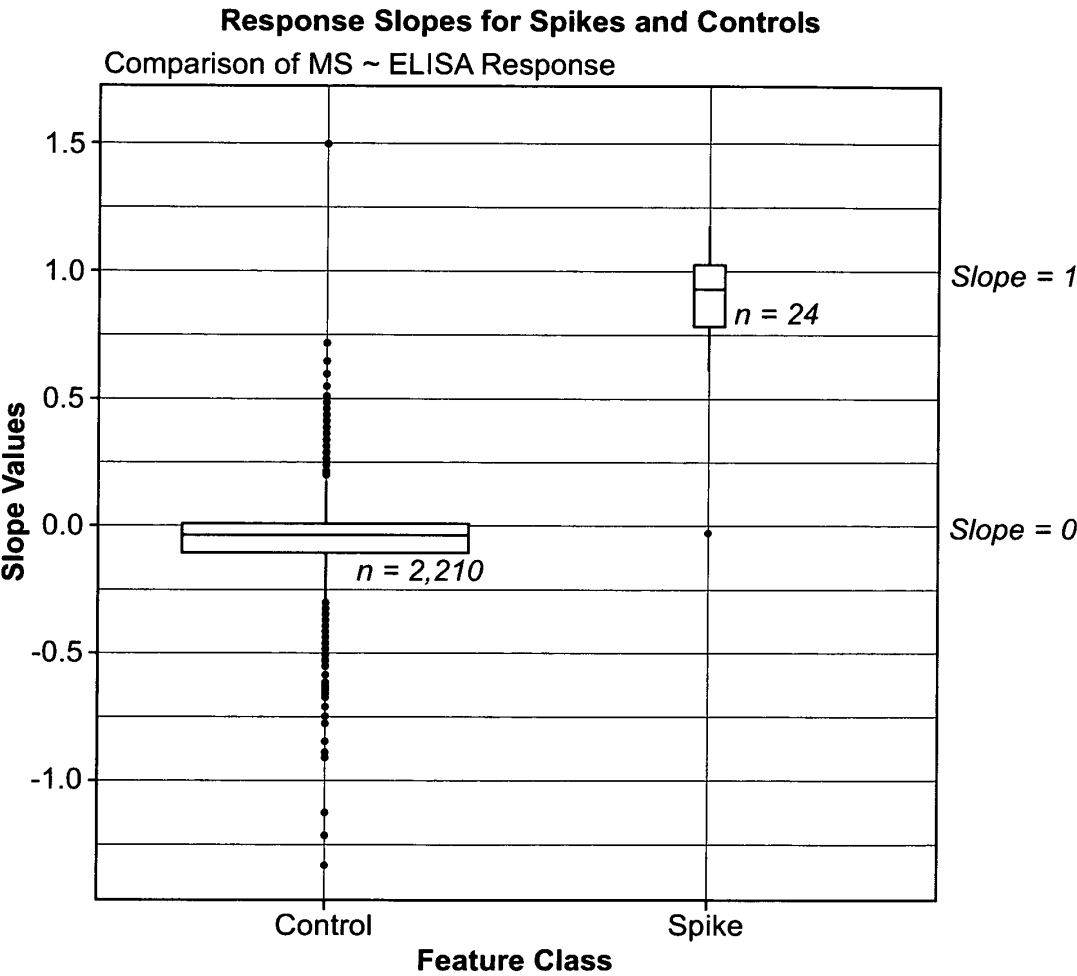


FIG. 14B

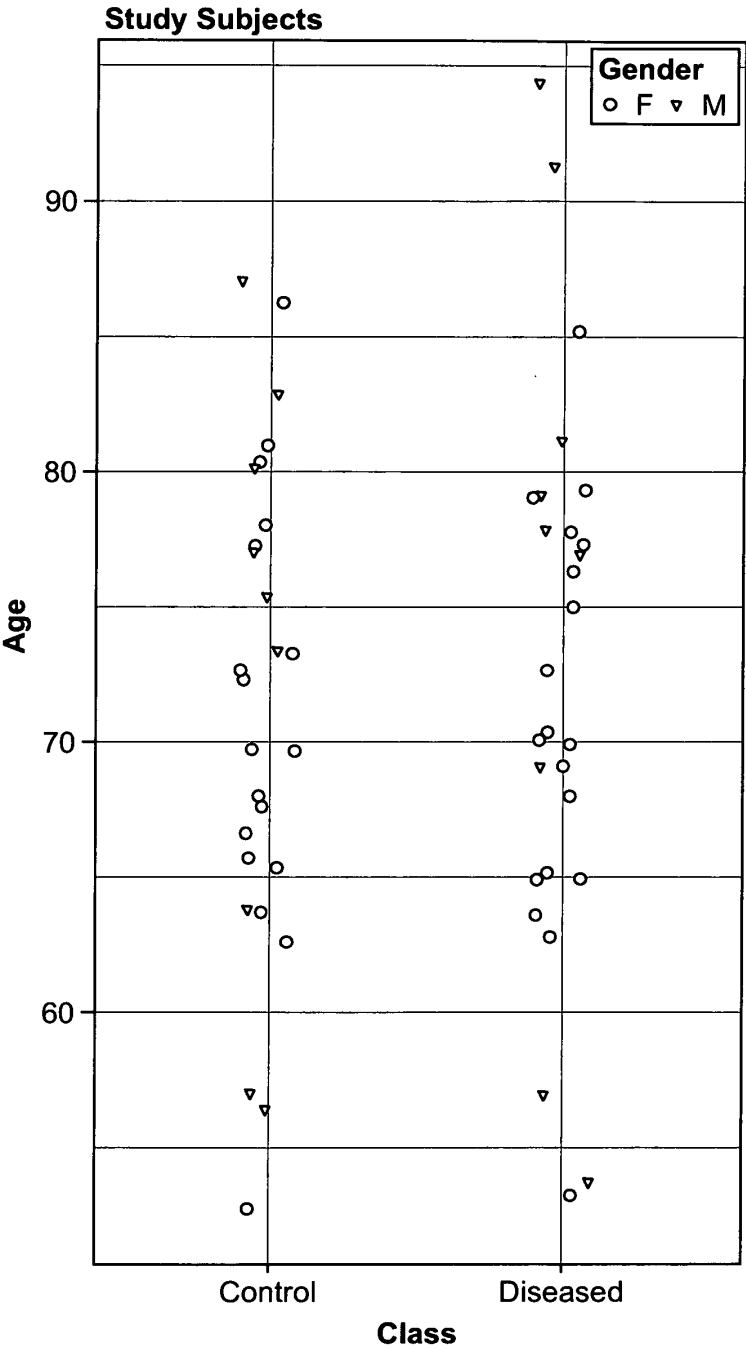


FIG. 15

15 / 47

Nanoparticle Panel Results- 1 hr Run

Particle	Total MS1 Features	Filtered Features¹	Significant Hits
SP-339	19042	2162	69
HX-74	19255	2222	26
SP-356	19754	1634	10
SP-333	24703	2184	7
HX-20	17789	1871	4
SP-374	21504	2044	4
HX-42	23278	2364	0
Panel Total	145325	14481	120

¹Filtered features are detected in at 50% of the samples from at least one of the study groups (diseased and/or control)

FIG. 16A

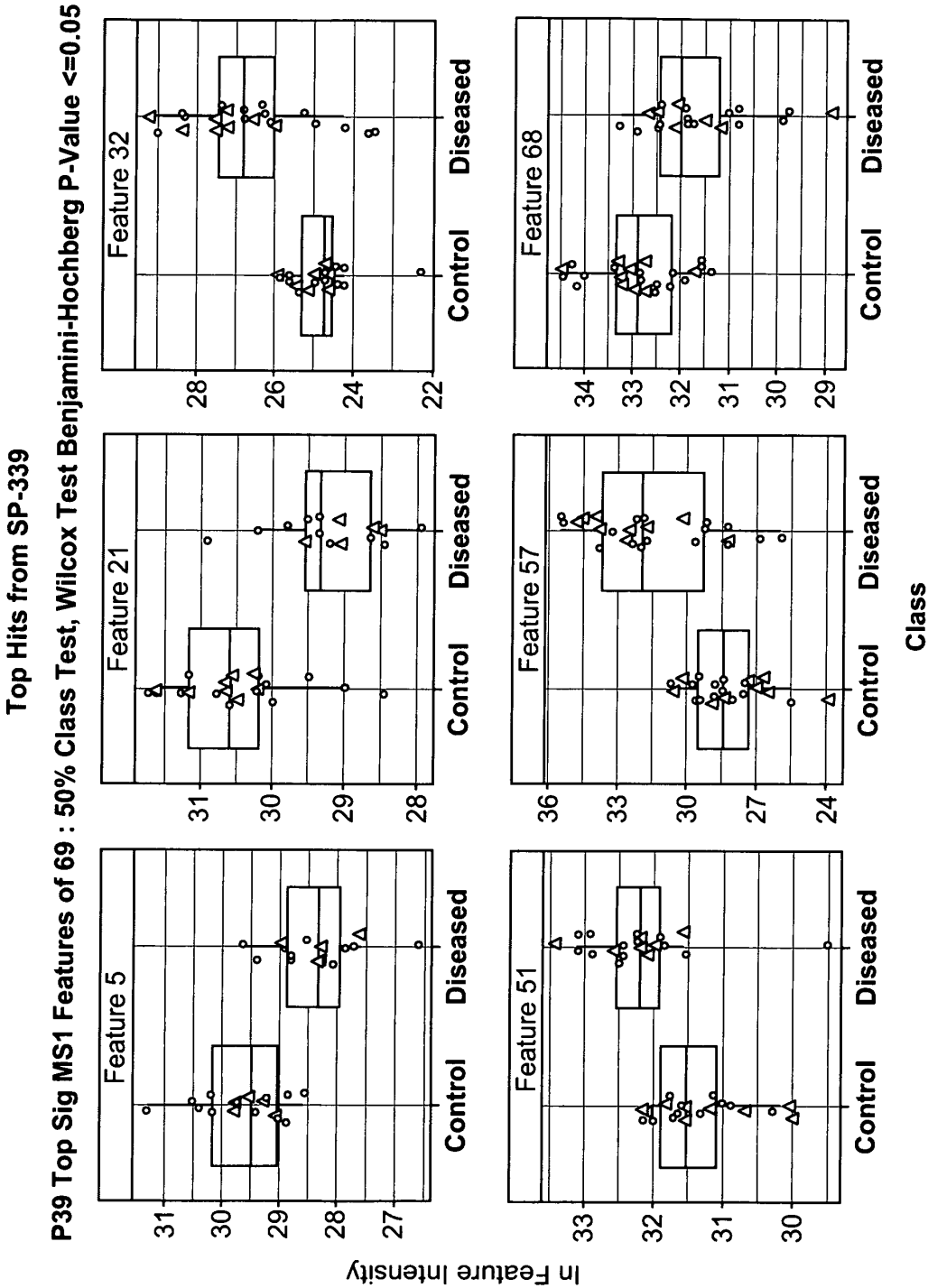


FIG. 16B

17 / 47

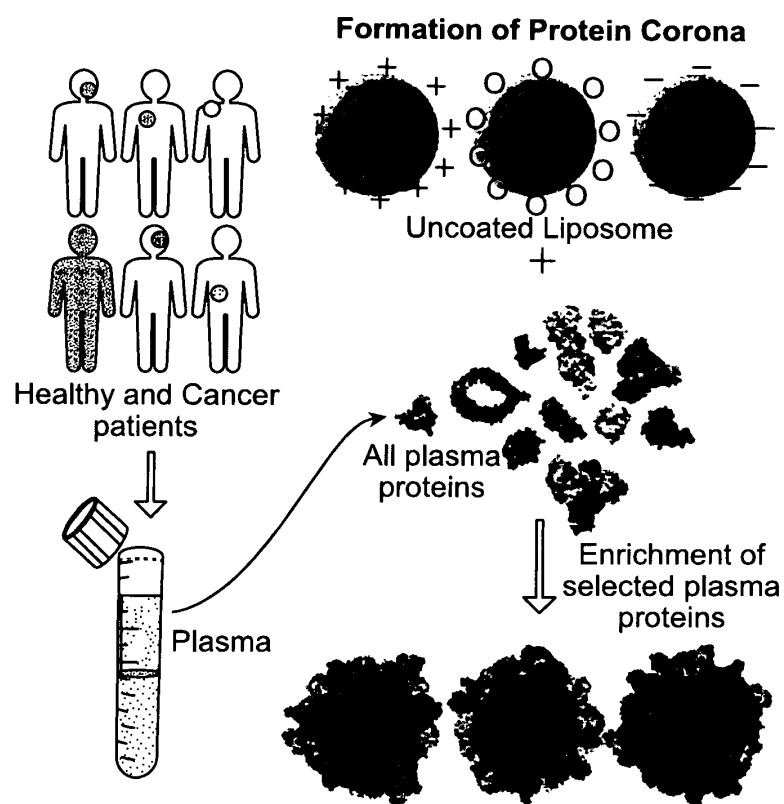


FIG. 17A

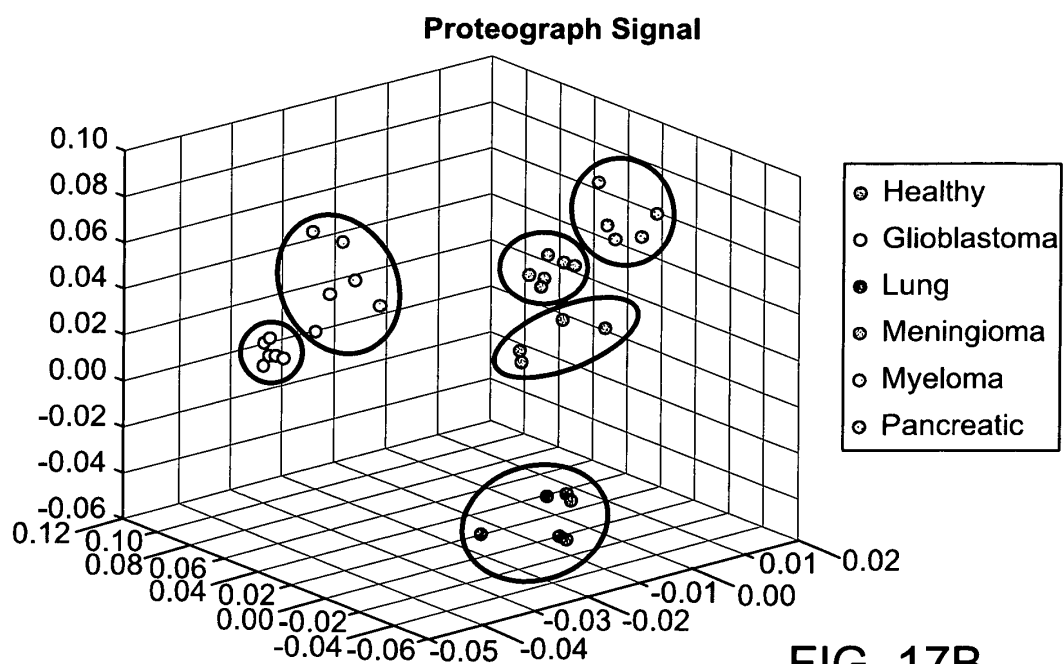


FIG. 17B

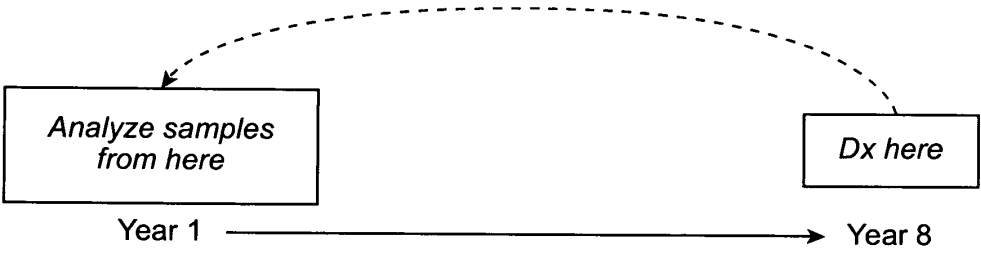


FIG. 18A

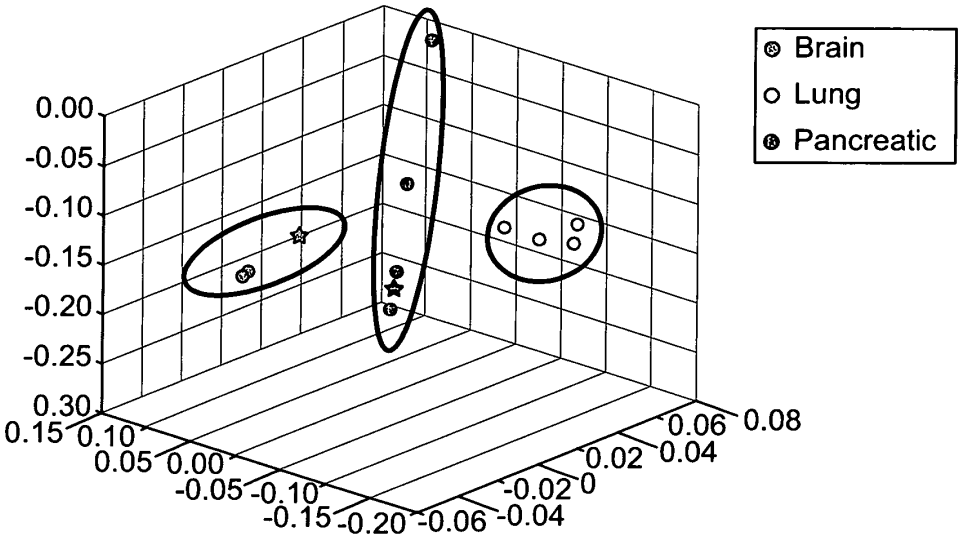


FIG. 18B

P#	Description
HX-13 or SP-001	Carboxylate (Citrate)
HX-19 or SP-002	Phenol-formaldehyde resin coated
HX-31 or SP-004	Polystyrene coated
HX-38 or SP-005	Carboxylated Poly(styrene-co-methacrylic acid), P(St-co-MAA)
HX-42 or SP-006	N-(3-Trimethoxysilylpropyl)diethylenetriamine coated
HX-57 or SP-008	1,2,4,5-Benzenetetracarboxylic acid coated
HX-58 or SP-009	Vinylbenzyltrimethylammonium chloride (PVBTMAC) coated
HX-59 or SP-010	Carboxylated, Poly(acrylic acid), PAA
SP-333	Carboxylate microparticle, surfactant free
SP-339	Polystyrene carboxyl functionalized
SP-341	Carboxylic acid, 150 nm
SP-347	Silica coated, 200 nm
SP-348	Carboxylic acid
SP-353	Amino surface microparticle, 0.4-0.6 μm
SP-356	Silica amino functionalized microparticle, 0.1- 0.39 μm
SP-363	Jeffamine surface, 0.1-0.39 μm
SP-364	Polystyrene microparticle, 2.0-2.9 μm
SP-365	Silica
SP-369	Carboxylated Original coating, 50 nm
SP-373	Dextran based coating, 0.13 μm
SP-374	Silica Silanol coated with lower acidity
HX-20 or SP-003	Silica-coated superparamagnetic iron oxide NPs (SPION)
HX-56 or SP-007	poly(N-(3-(dimethylamino)propyl) methacrylamide) (PDMAEMA)-coated SPION
HX-86 or SP-011	poly(oligo(ethylene glycol) methyl ether methacrylate) (POEGMA)-coated SPION

FIG. 21

21 / 47

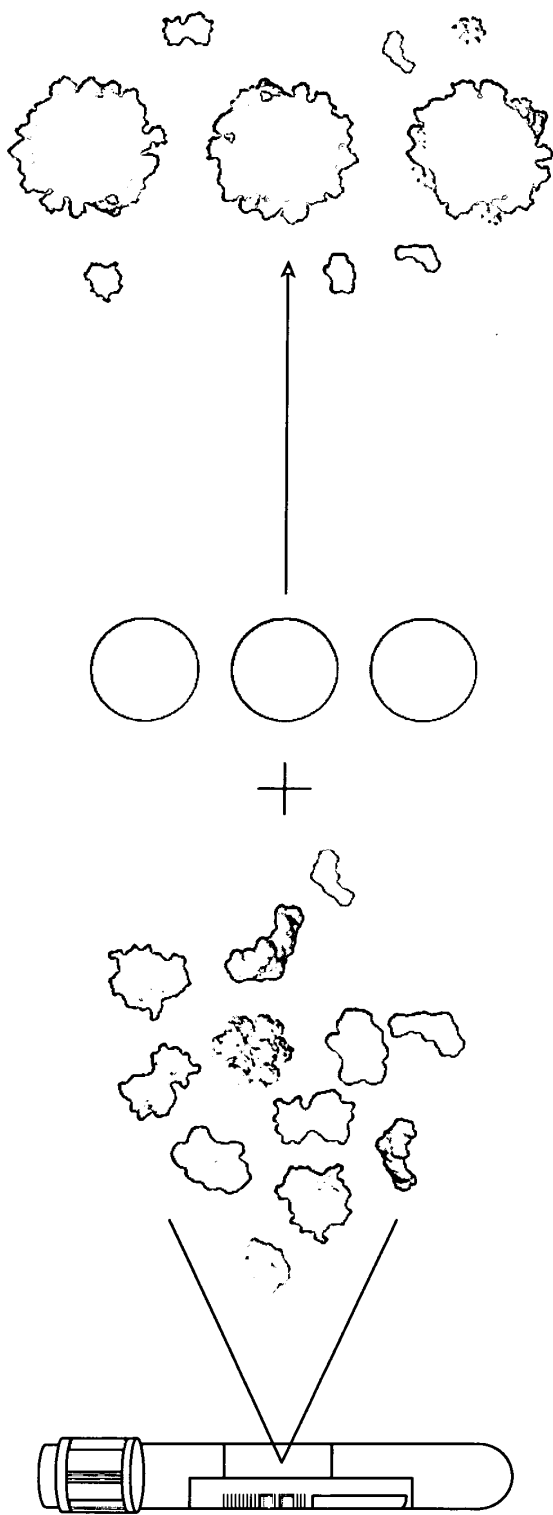


FIG. 22A

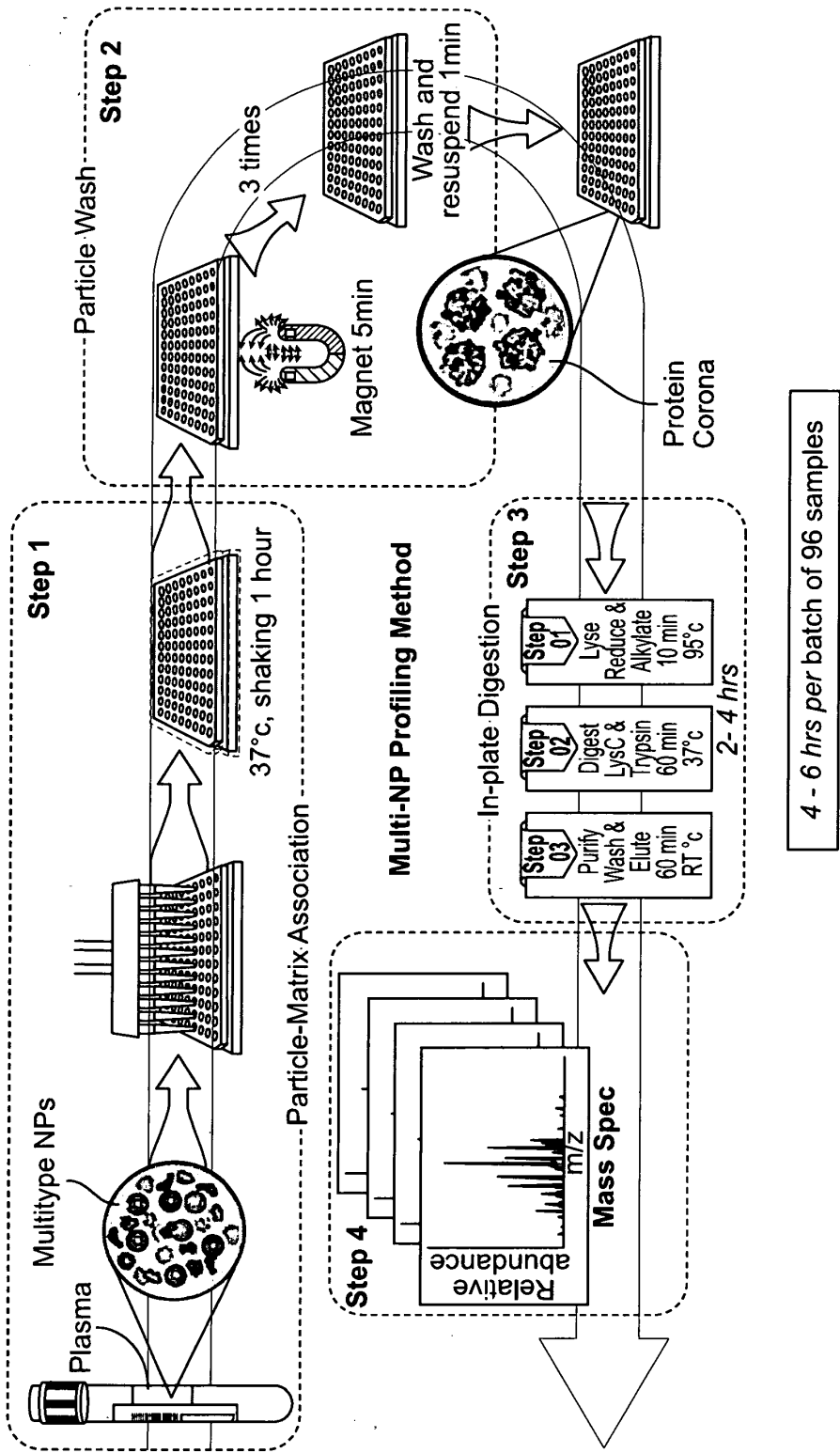


FIG. 22B

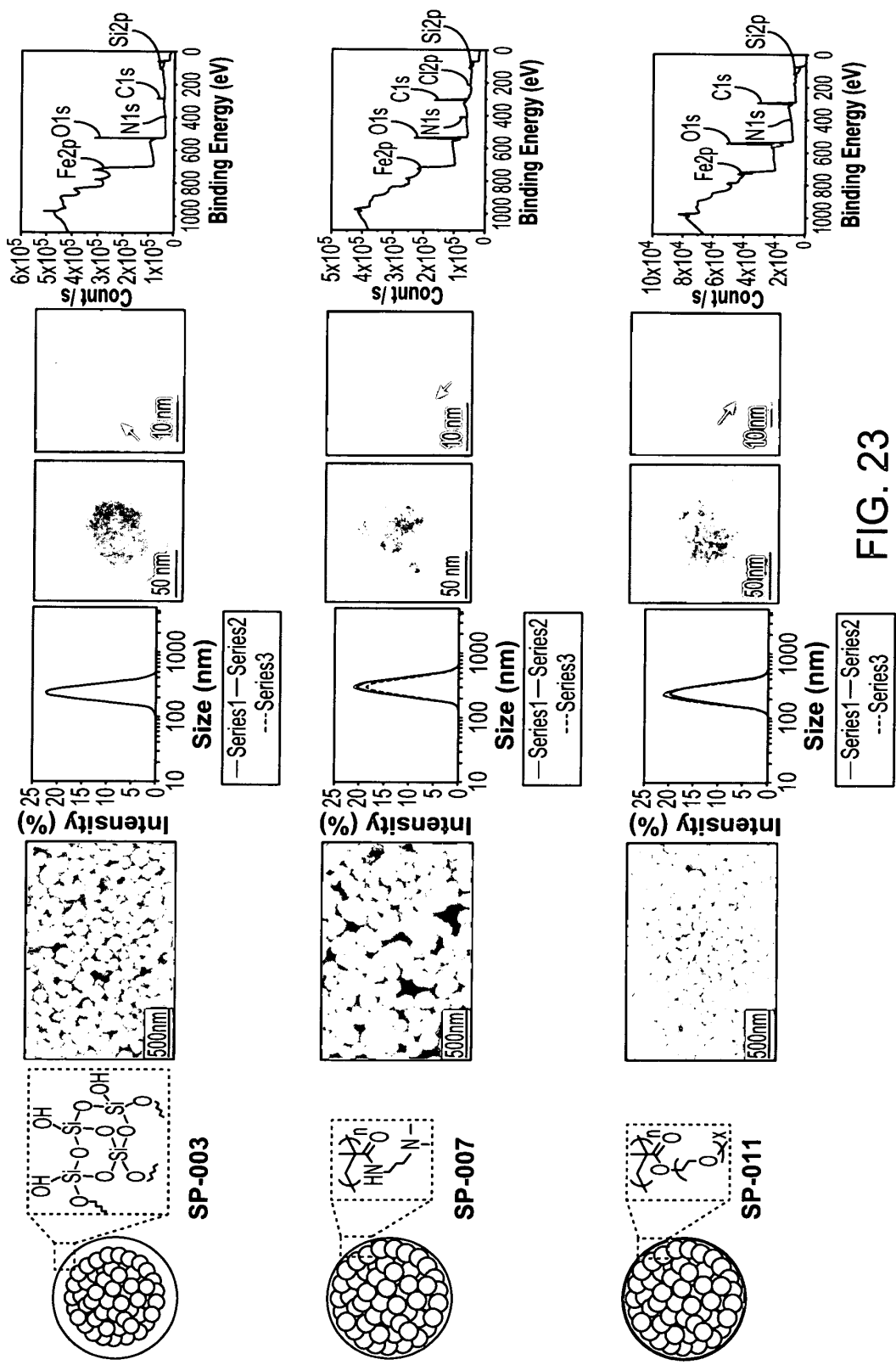


FIG. 23

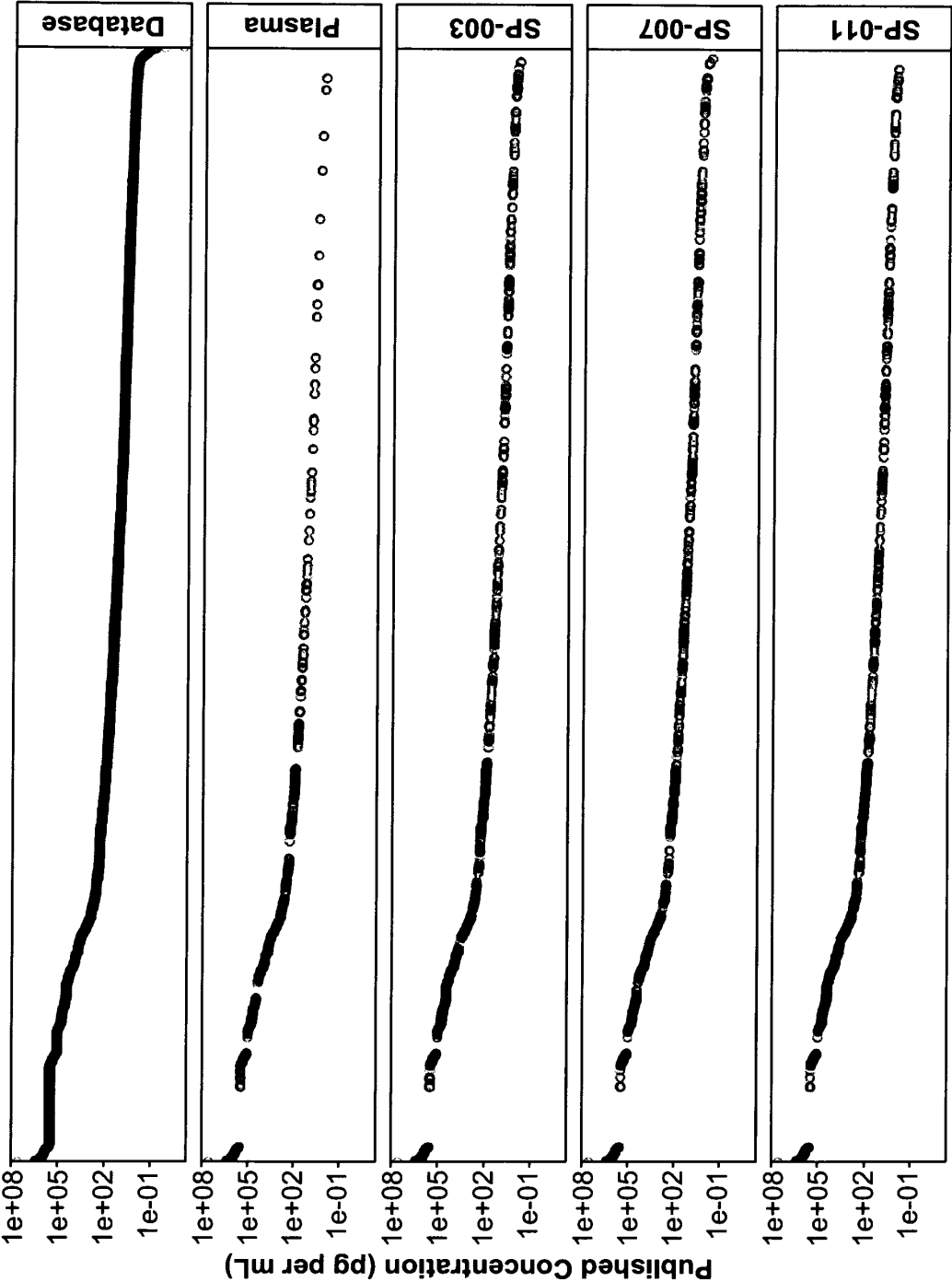


FIG. 24

Proteins Ordered Based on Published Concentration

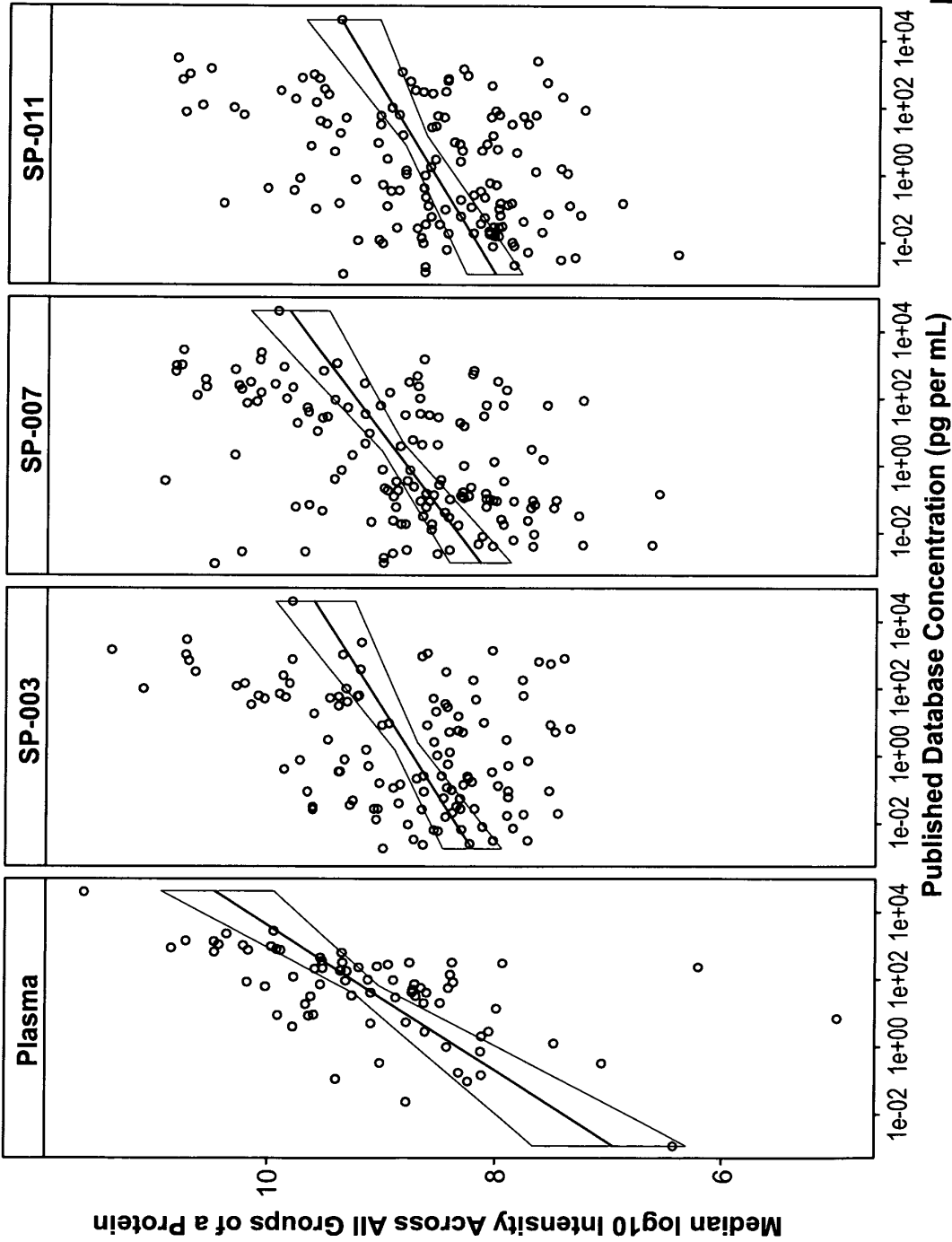
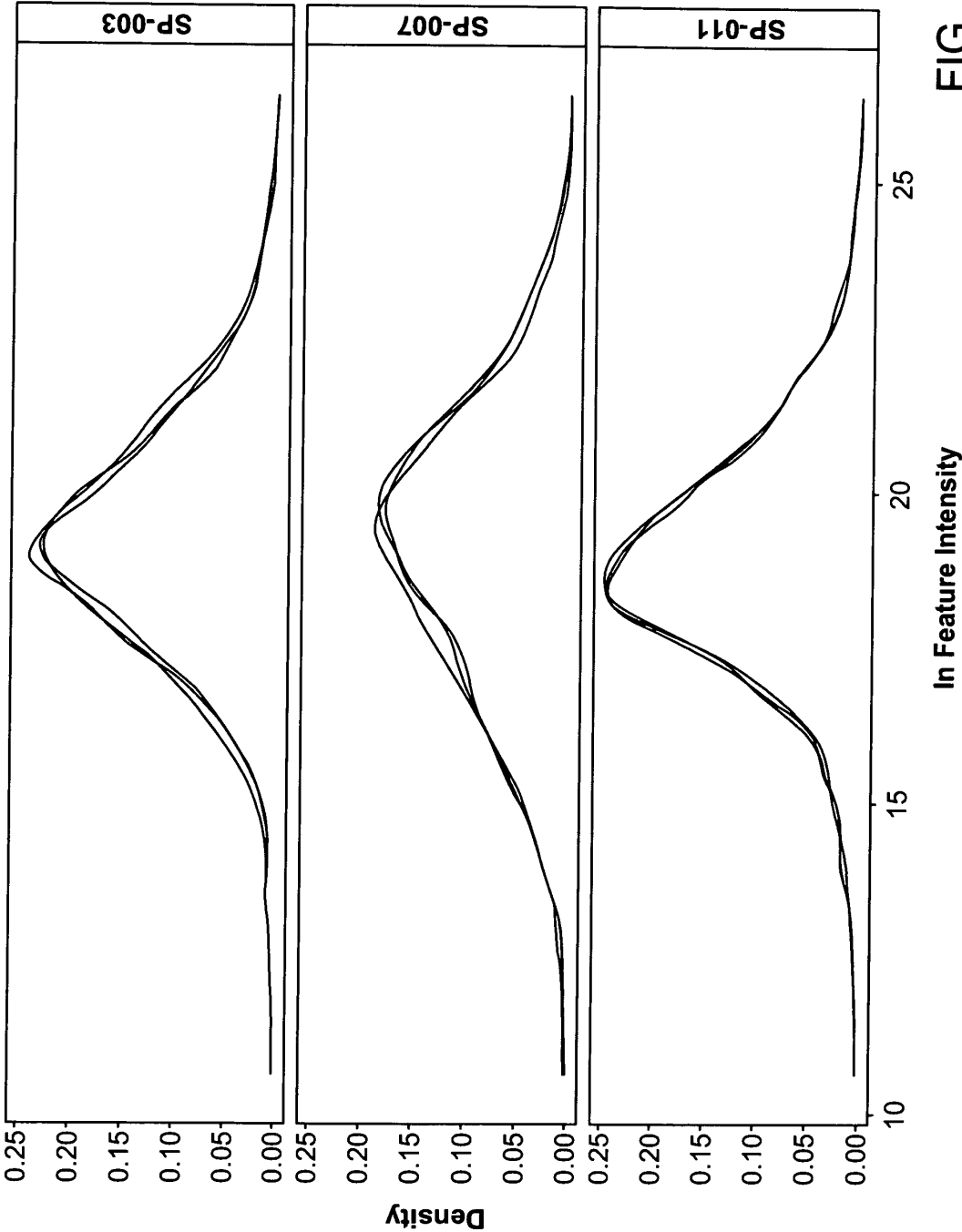
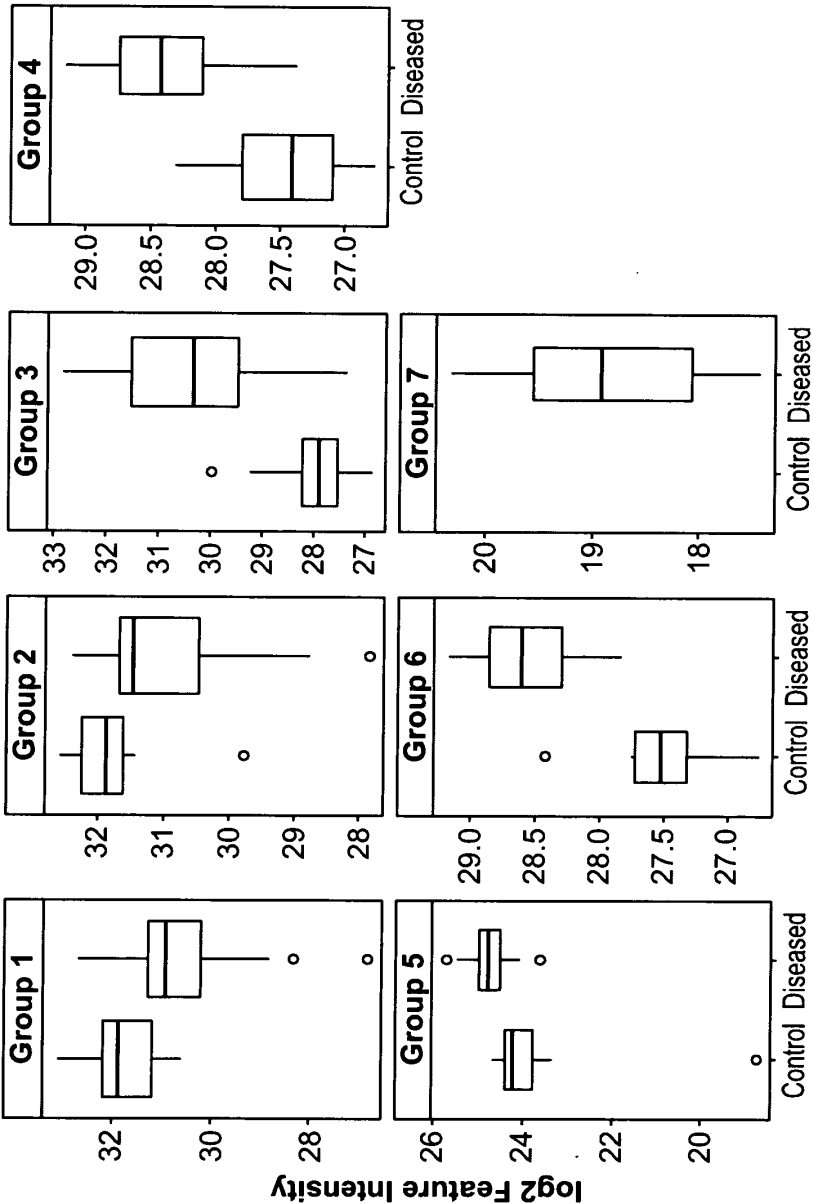


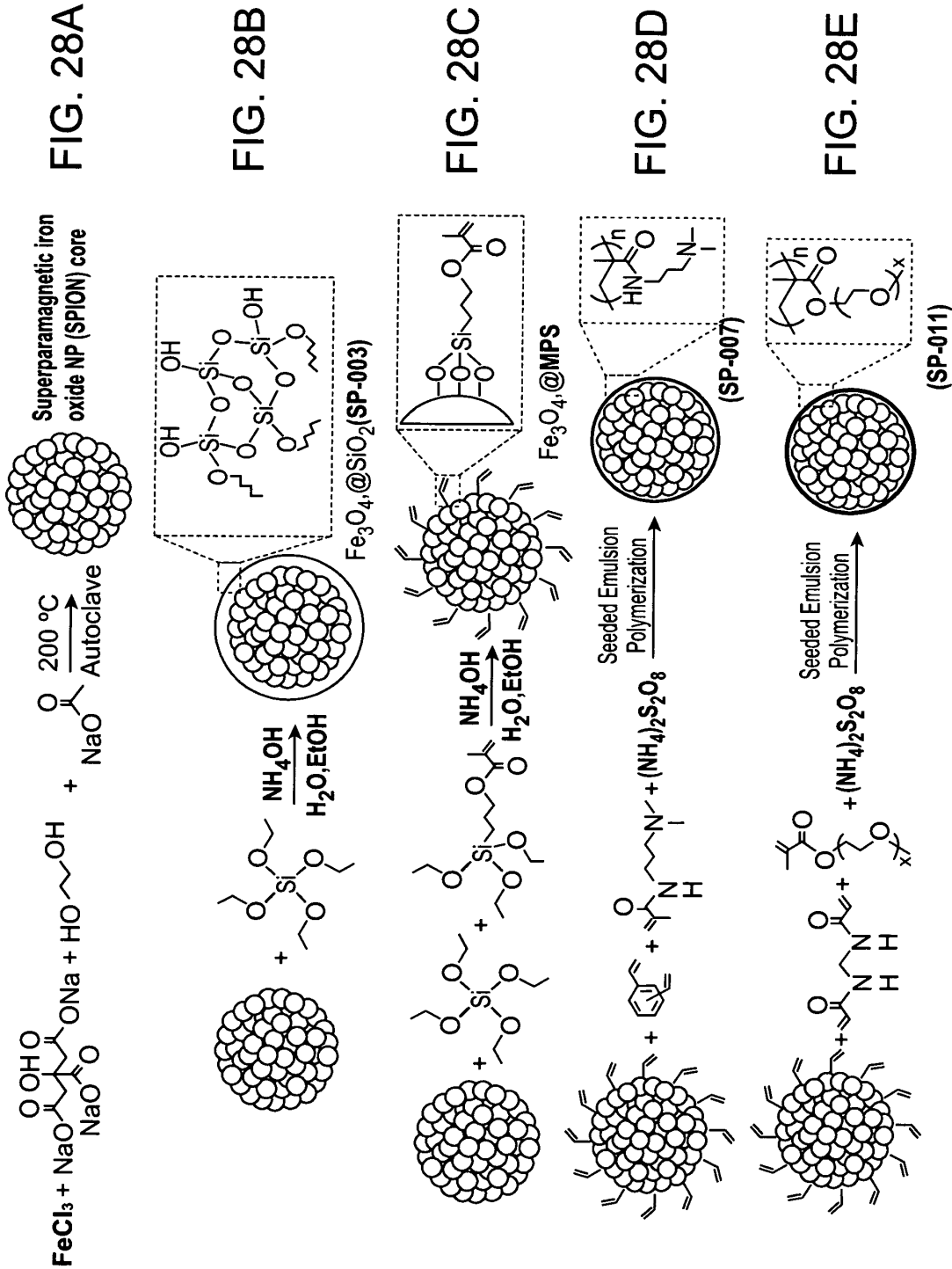
FIG. 25





Feature Group	Protein	Peptide_Charge	NumControl	NumDiseased	log2 Difference	Adj. P-value
Group 1	PON1	YVYIAELLAHK_3	28	28	0.95	0.0398
Group 2	Unknown	Unknown	26	28	0.41	0.398
Group 3	SAA1	FFGHGAEDSLADQAANEWGR_3	22	24	-2.44	0.0019
Group 4	TENA	AATHYTITIR_3	20	17	-1.03	0.0097
Group 5	NCAM1	AGEQDATIHLK_3	17	18	-0.54	0.0398
Group 6	FIBA	GSESGIFTNTK_2	12	19	-1.08	0.0107
Group 7	Unknown	Unknown	0	14	NA	NA

FIG. 27



29 / 47

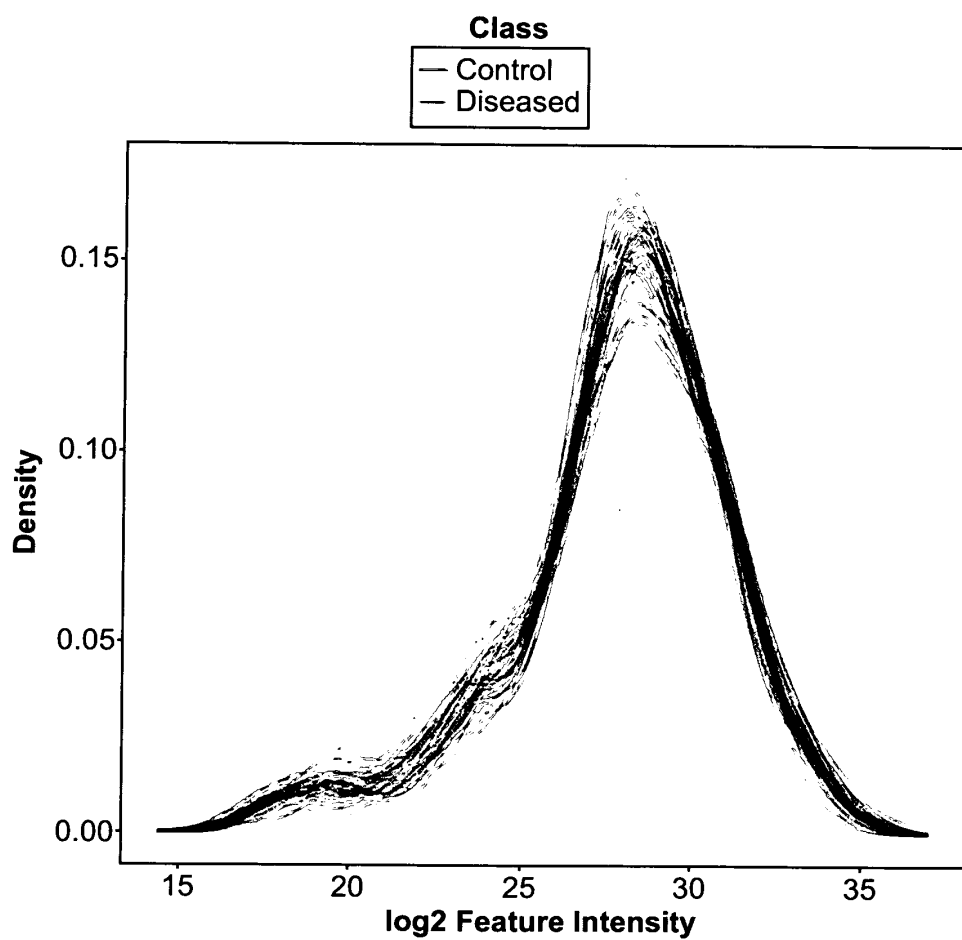


FIG. 29

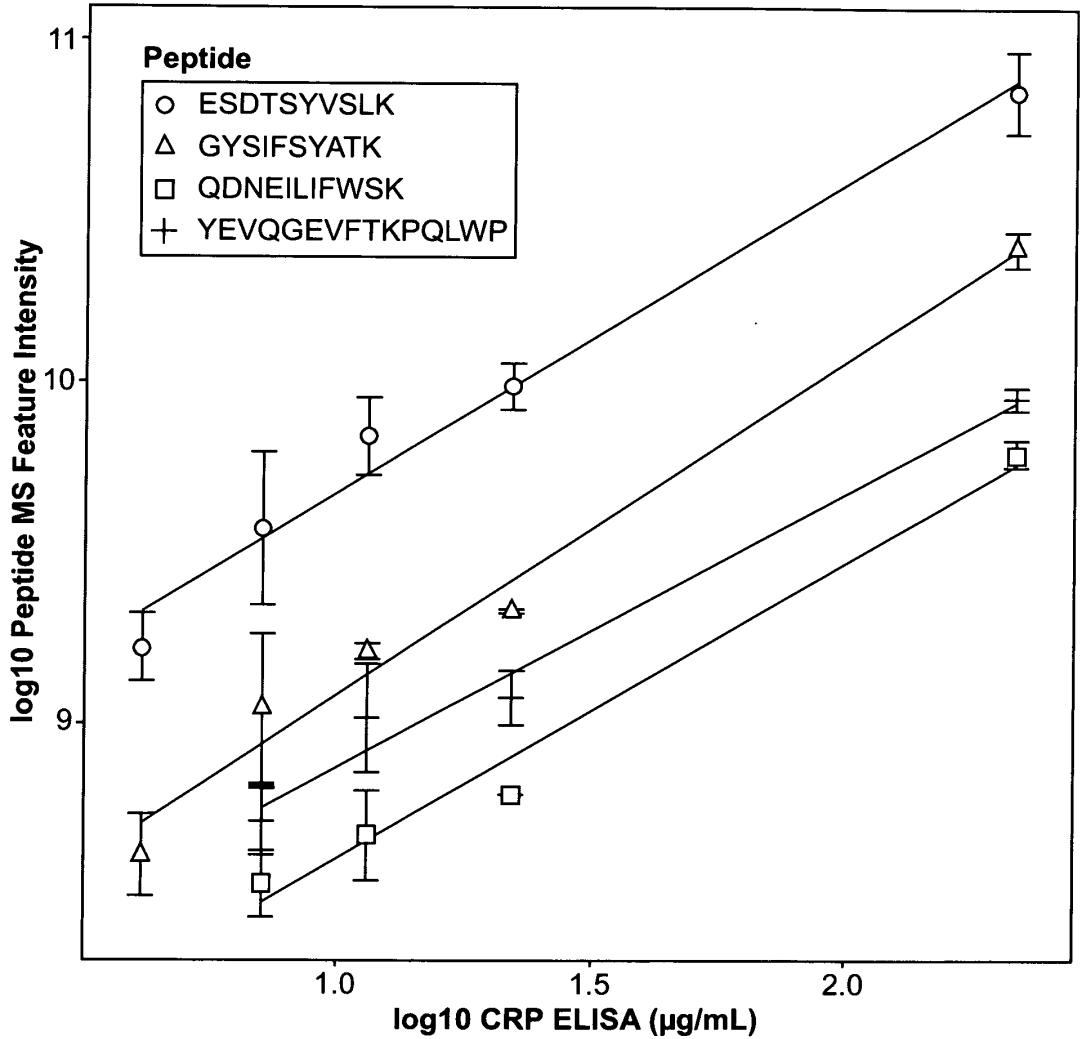


FIG. 30

Angiogenin Precursor Feature Intensities vs. Expected Concentration

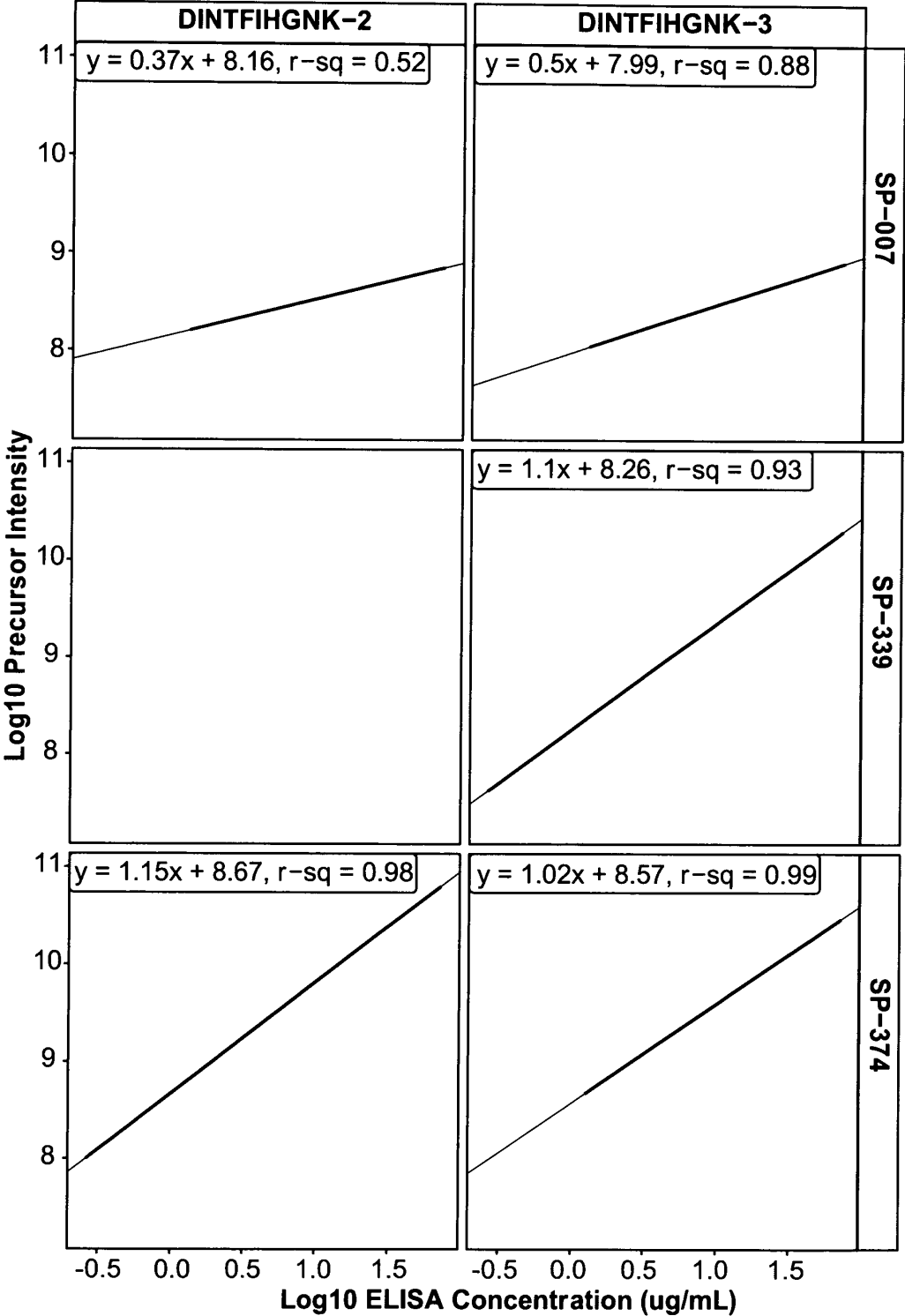
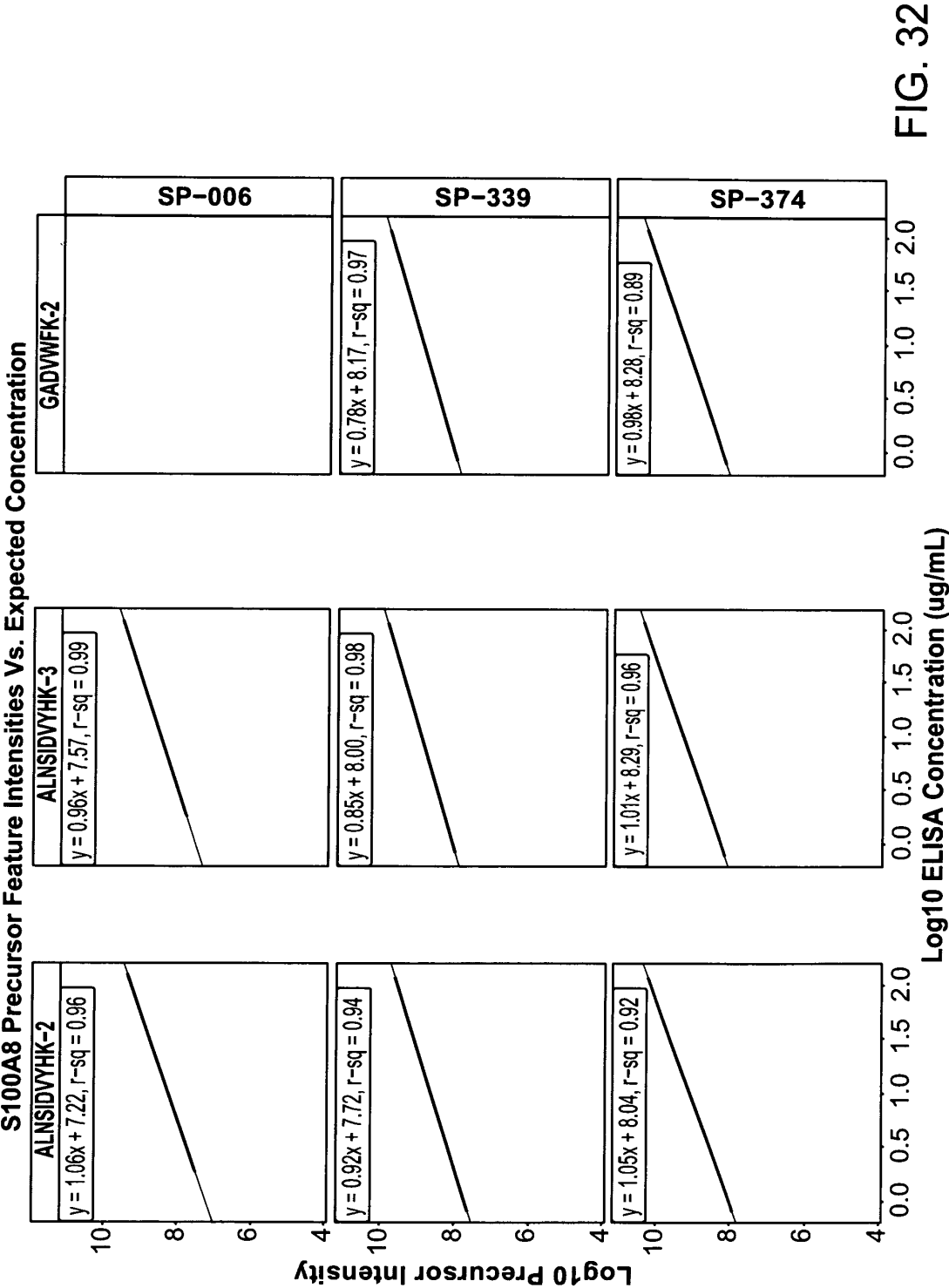


FIG. 31



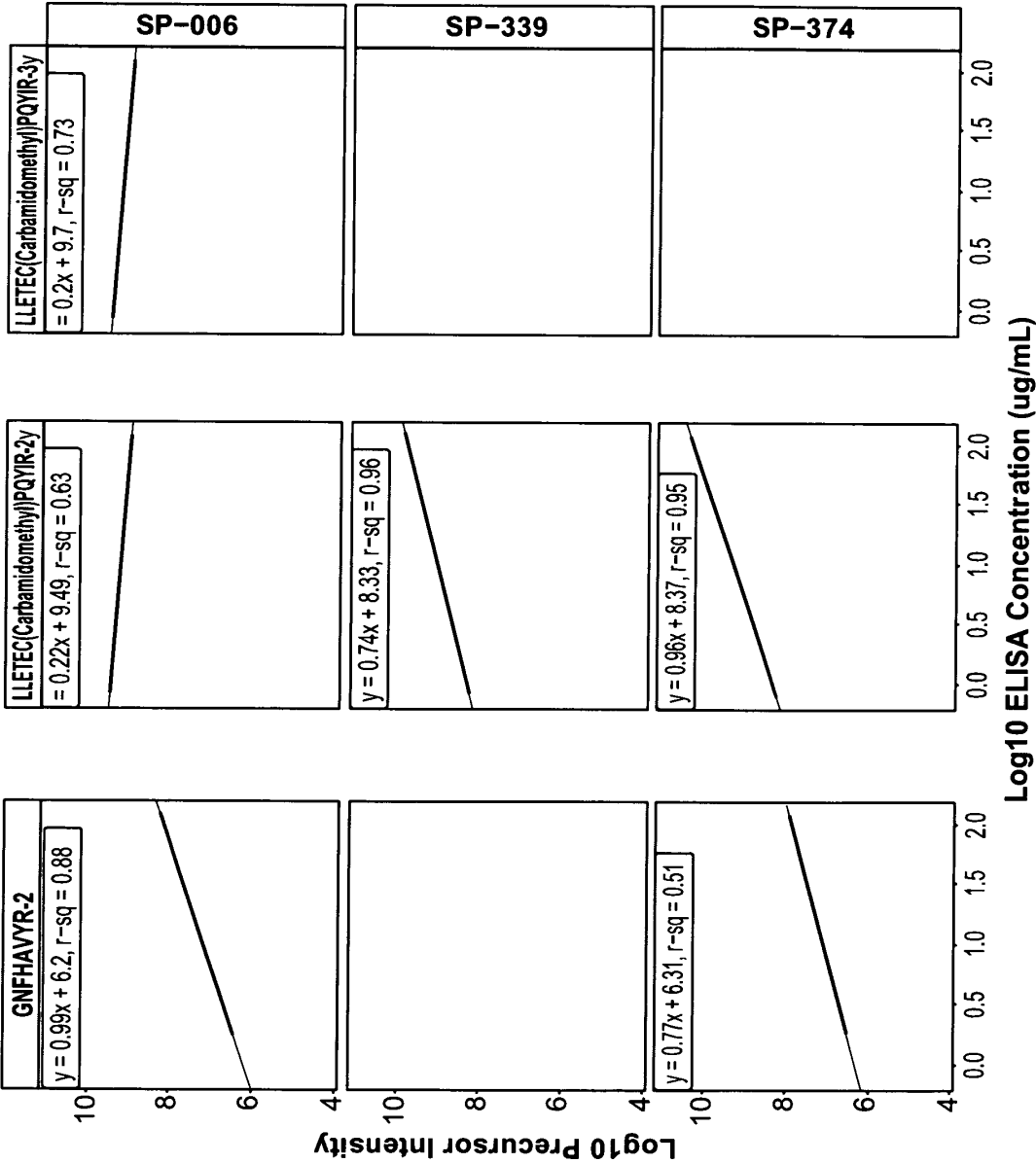


FIG. 32 (Cont.)

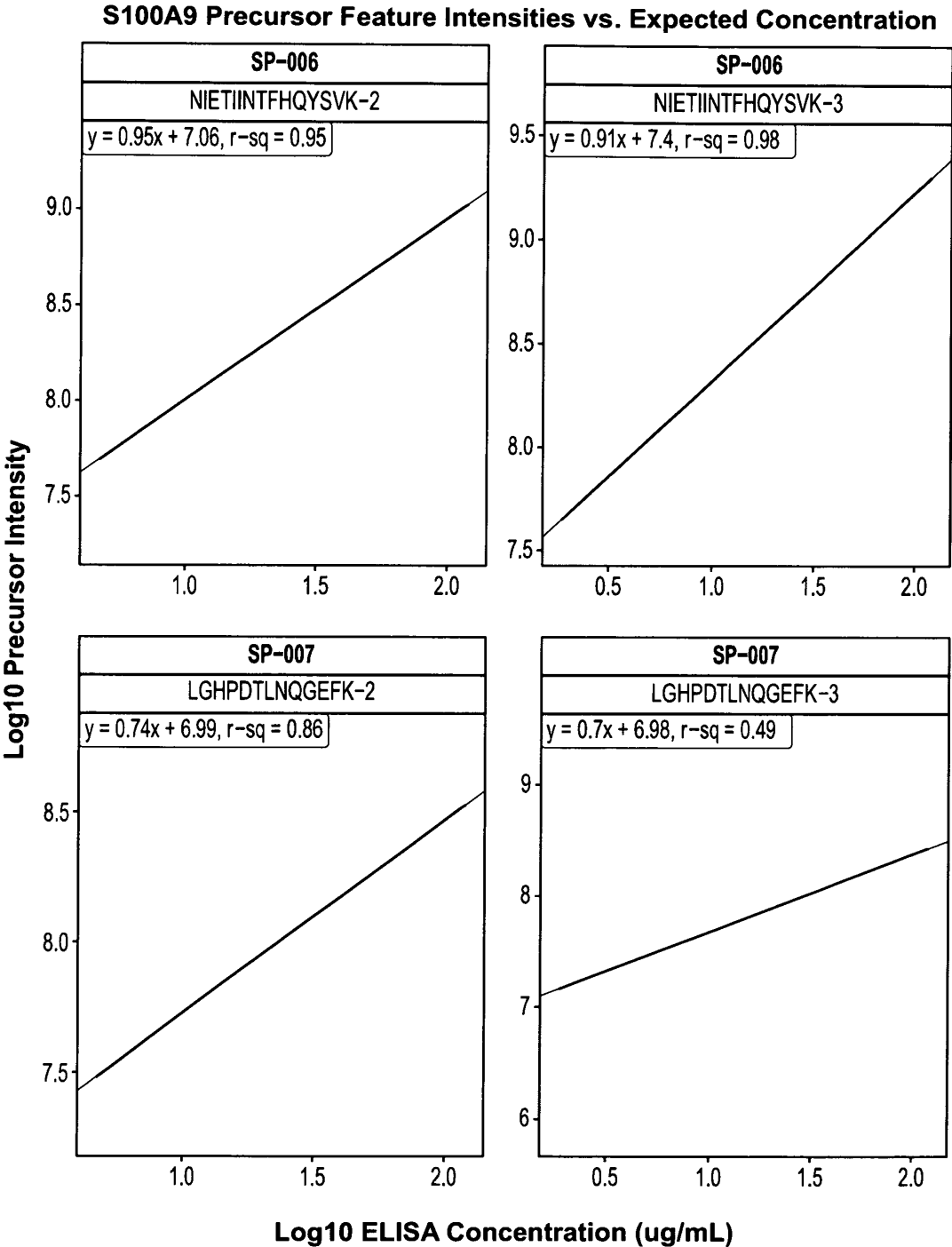


FIG. 33

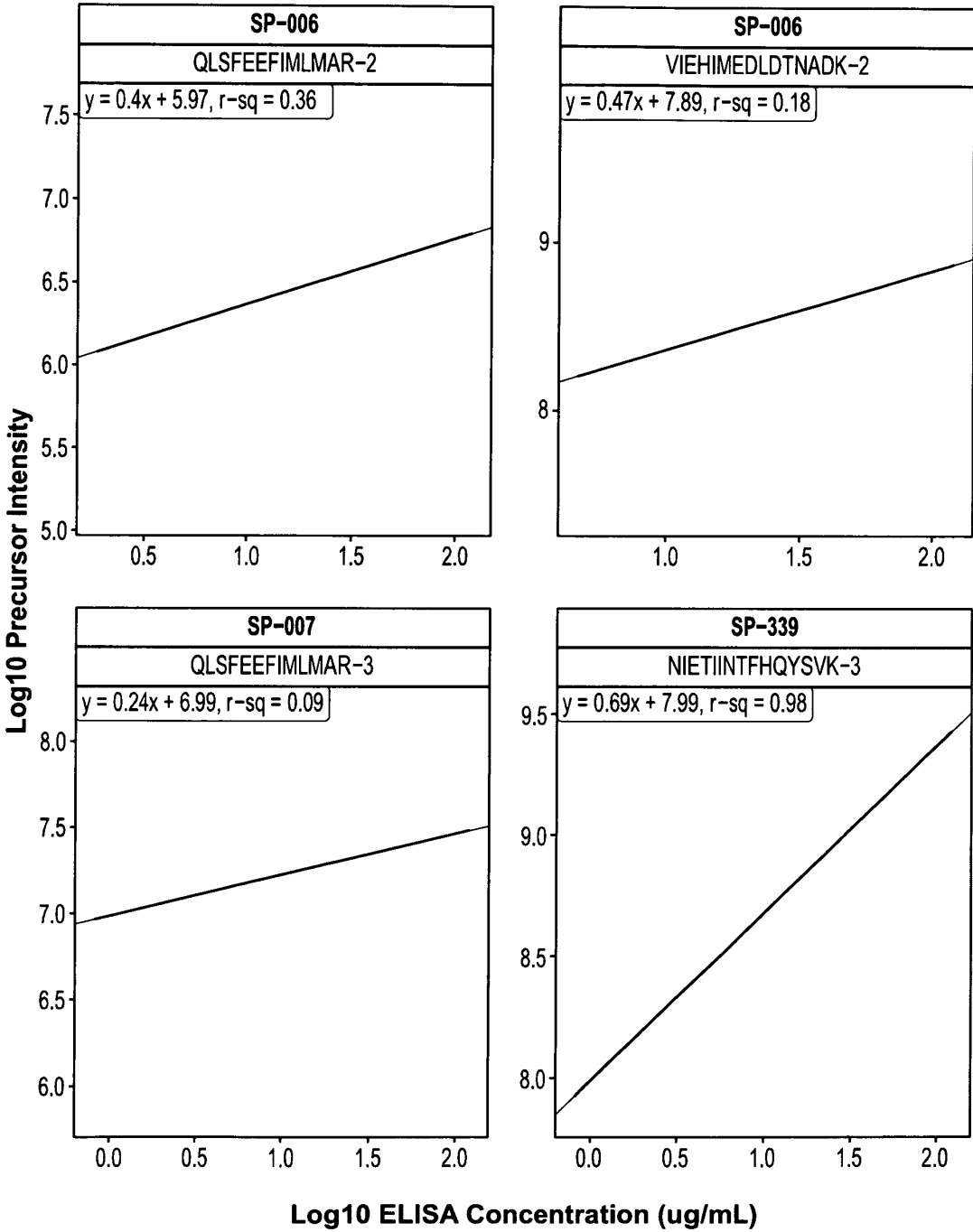


FIG. 33 (Cont. 1)

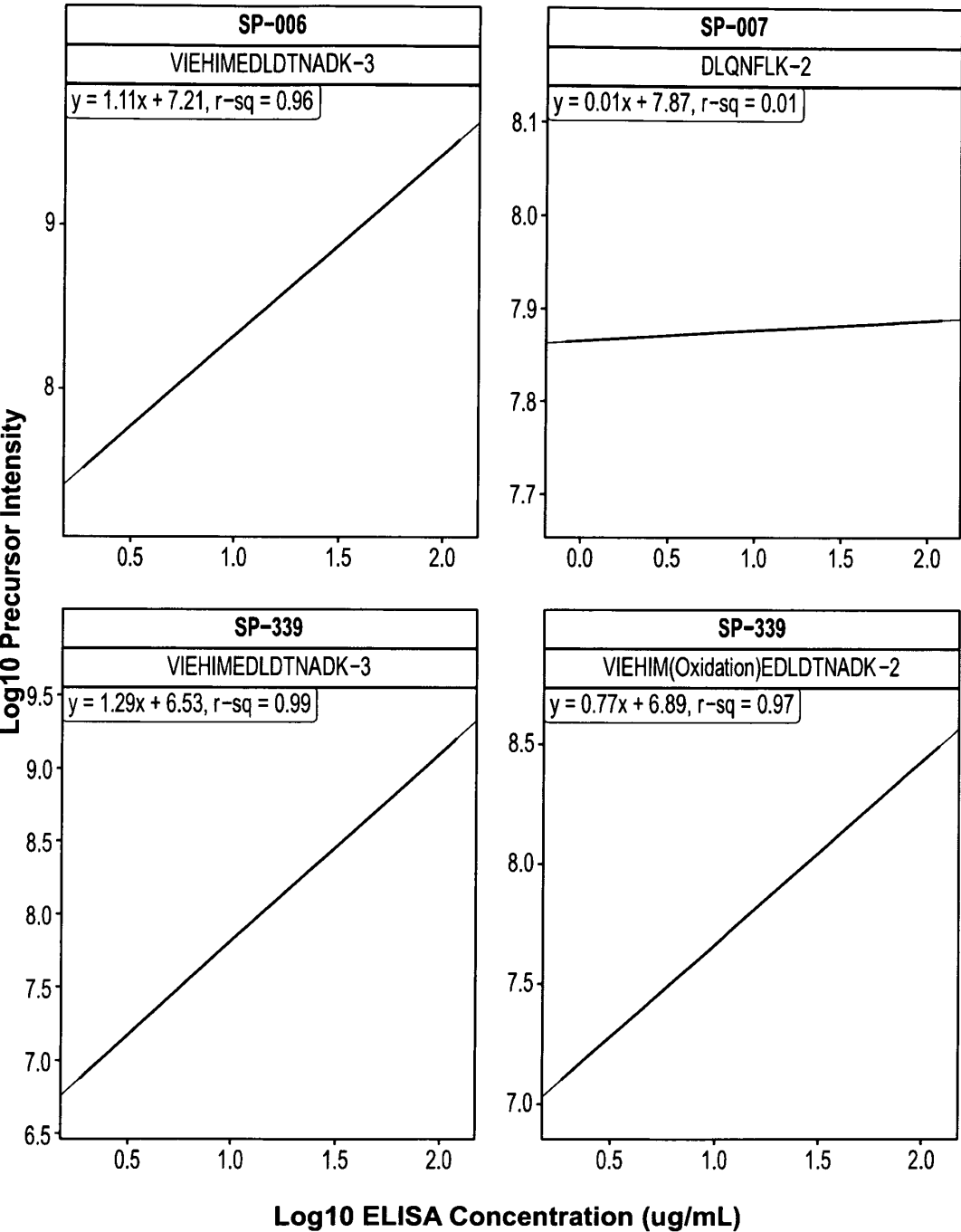


FIG. 33 (Cont. 2)

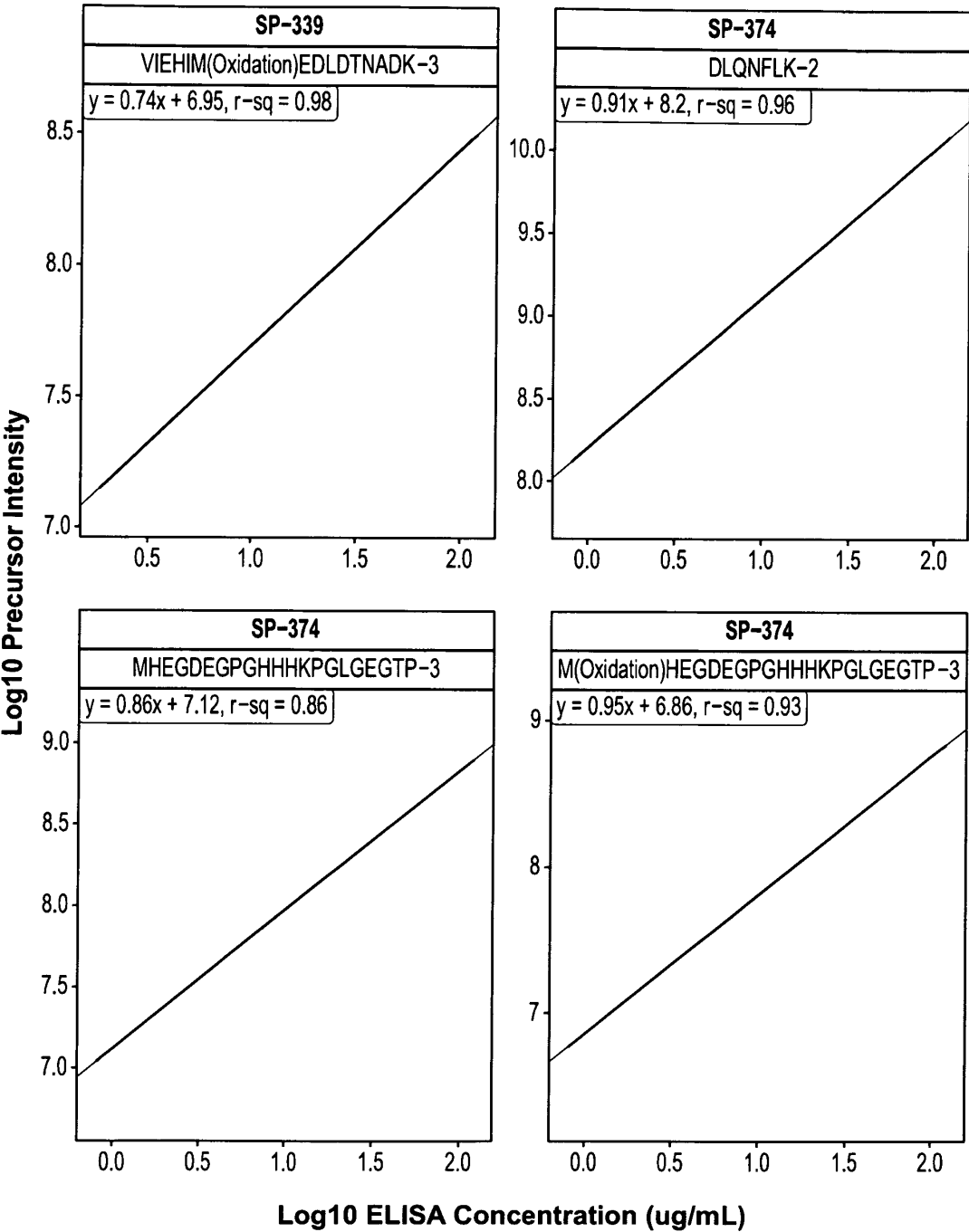


FIG. 33 (Cont. 3)

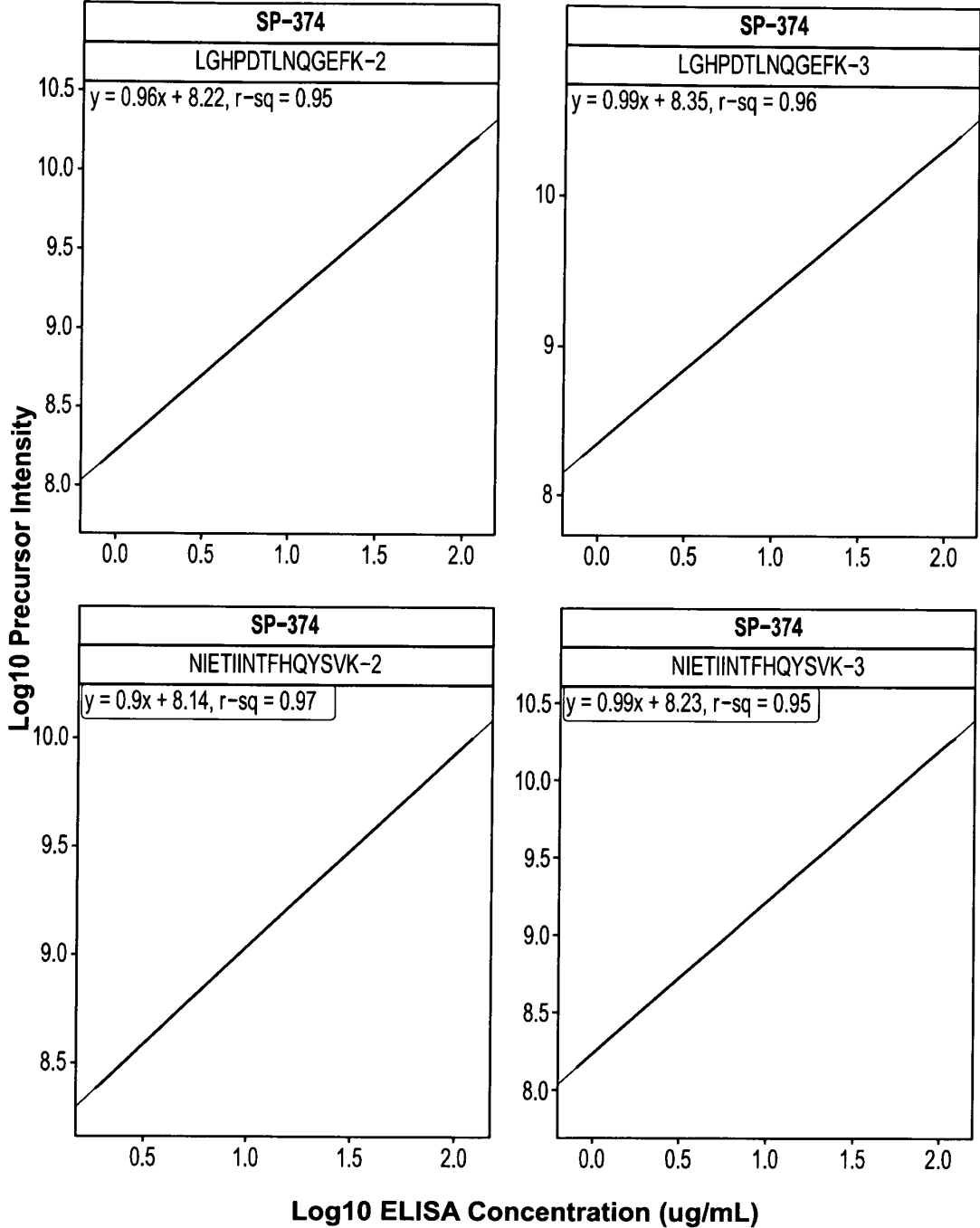


FIG. 33 (Cont. 4)

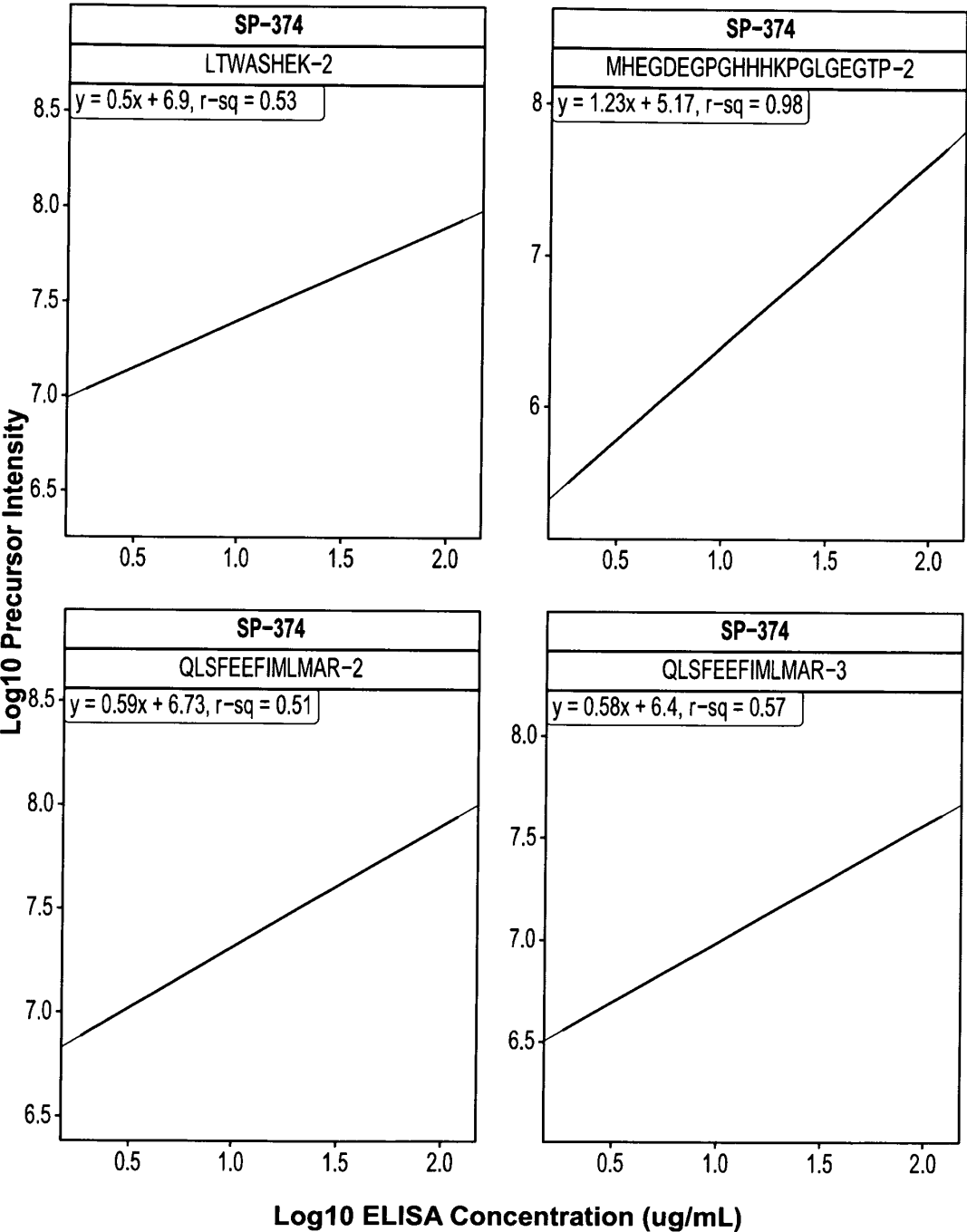


FIG. 33 (Cont. 5)

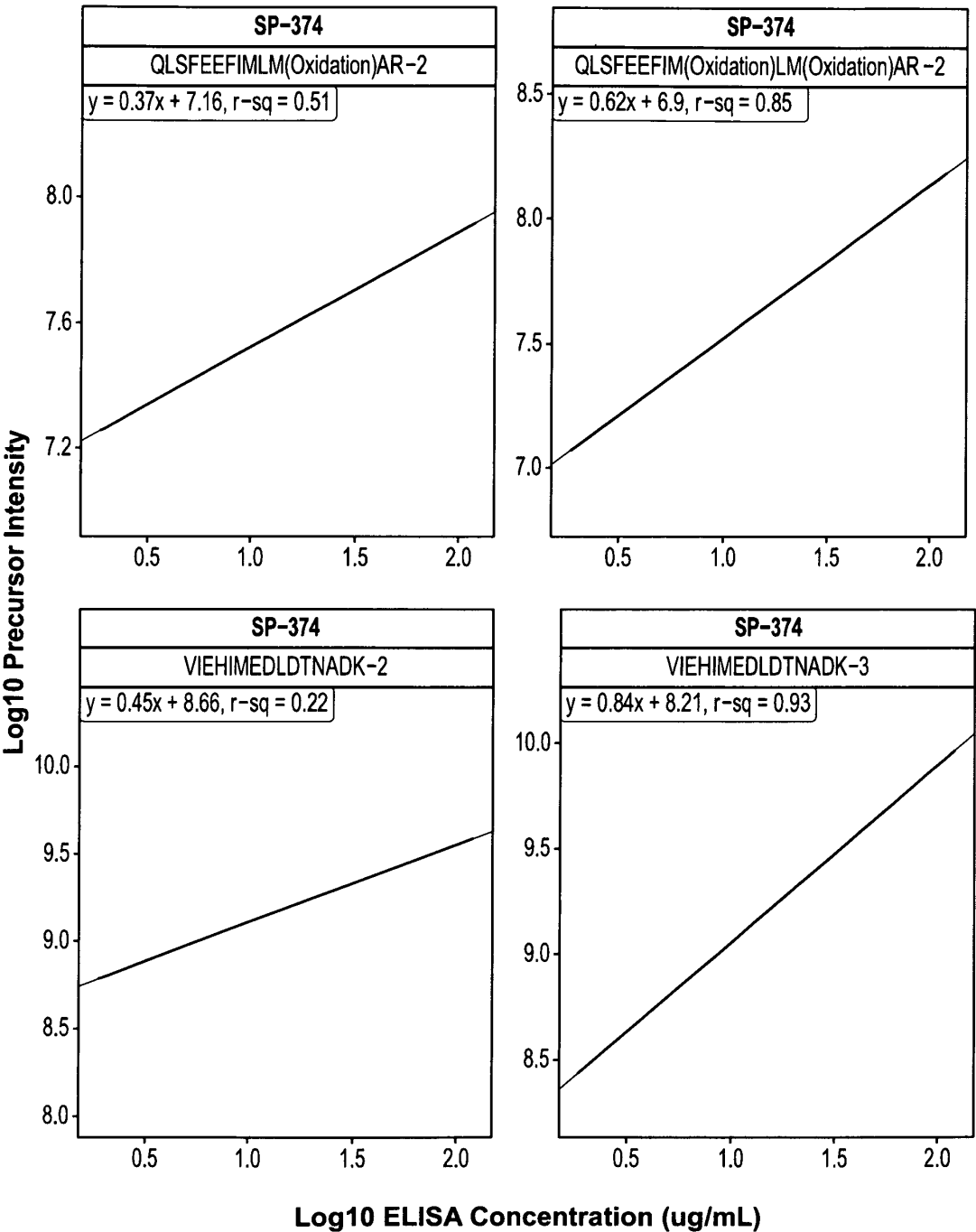


FIG. 33 (Cont. 6)

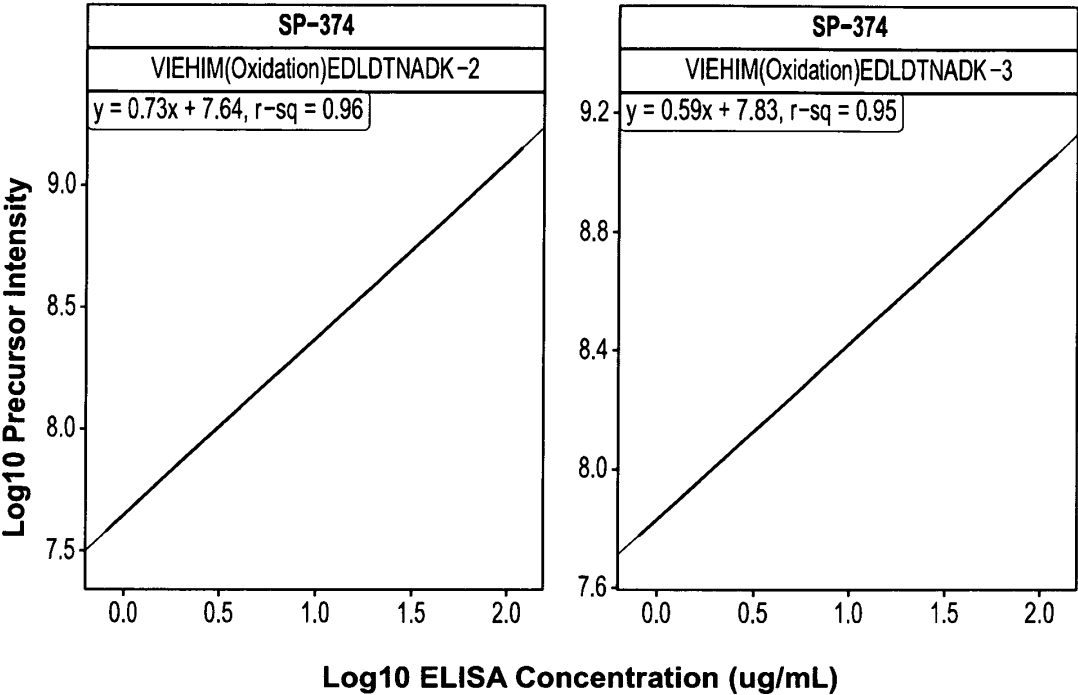


FIG. 33 (Cont. 7)

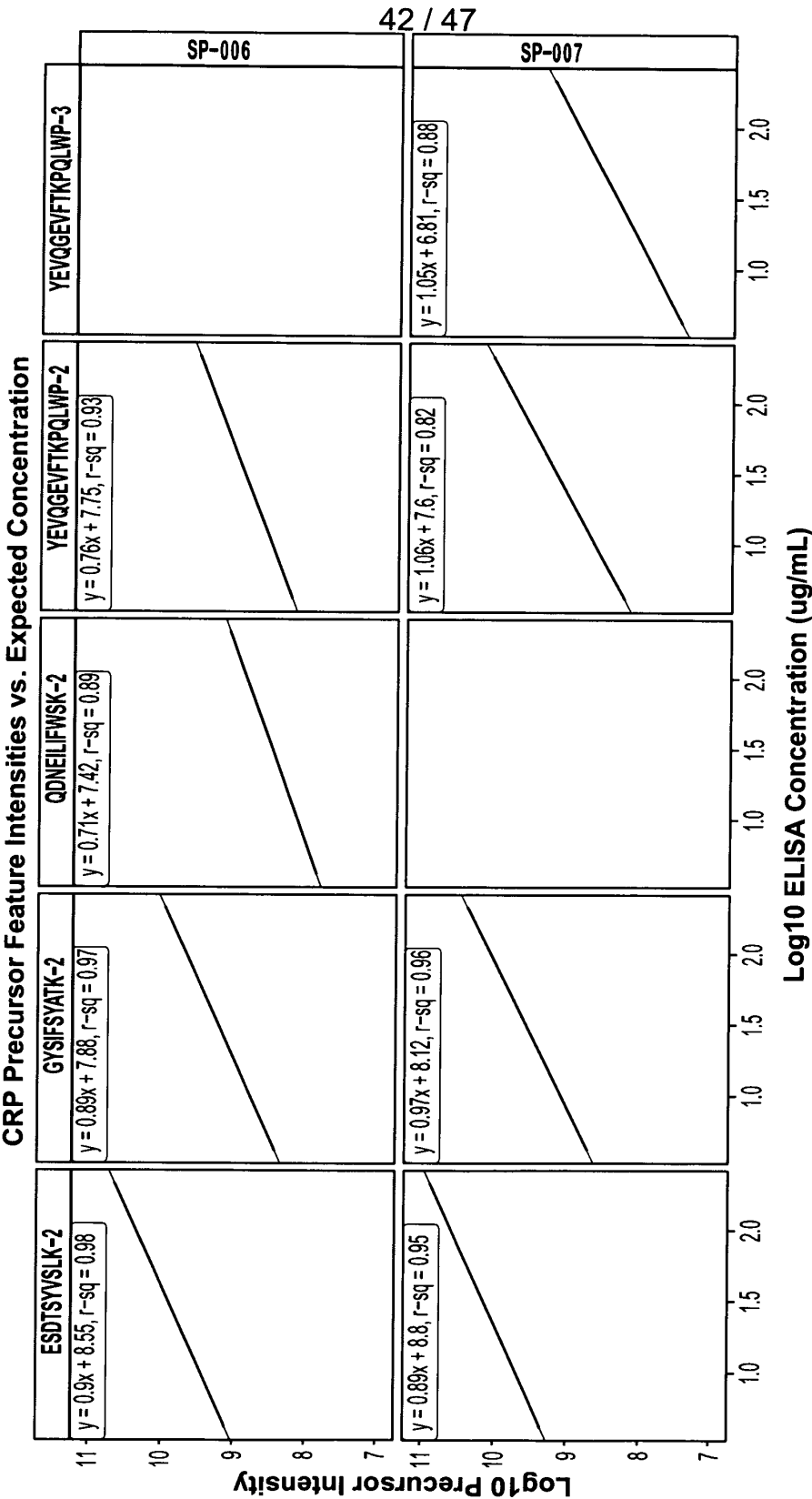


FIG. 34

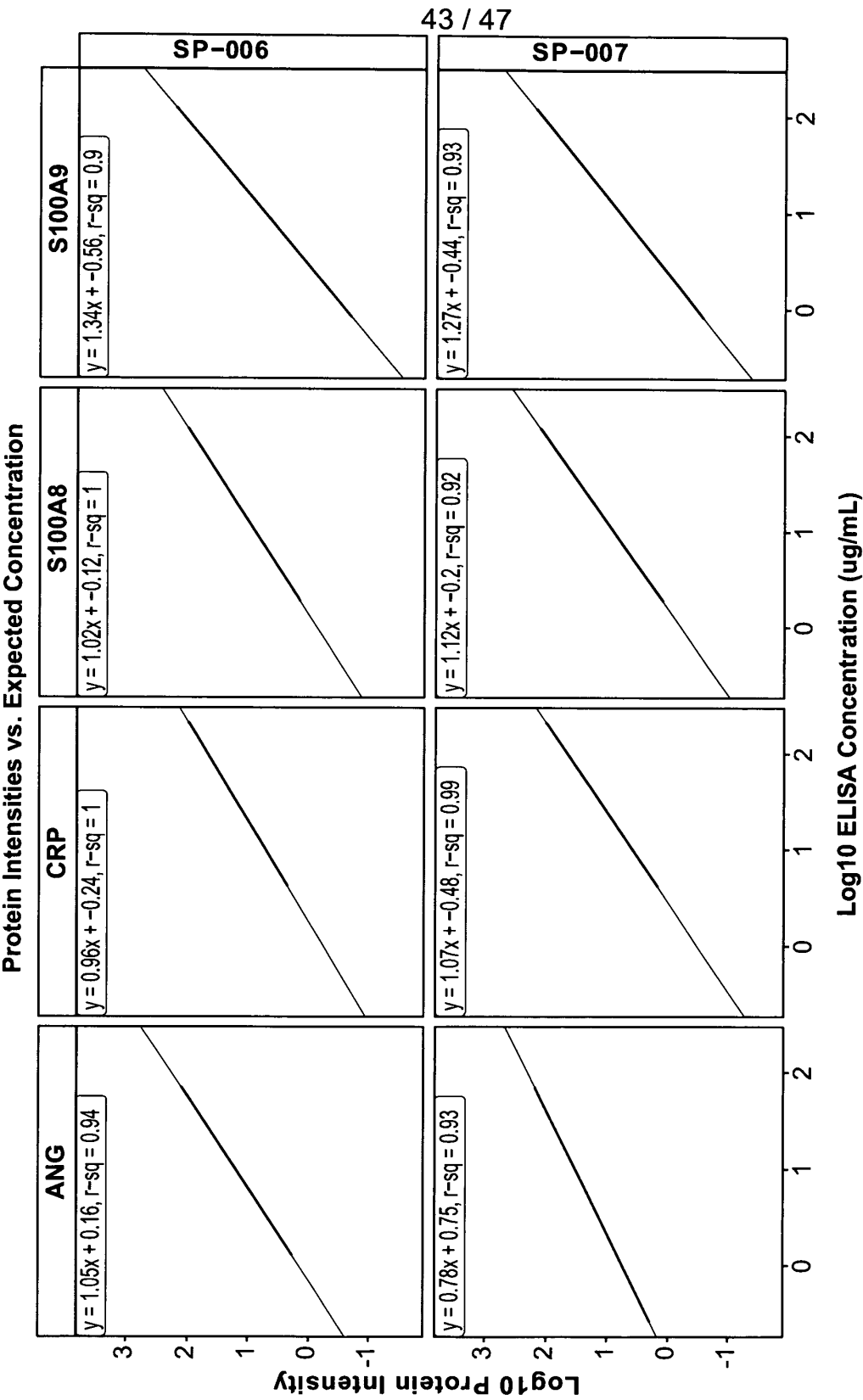


FIG. 35

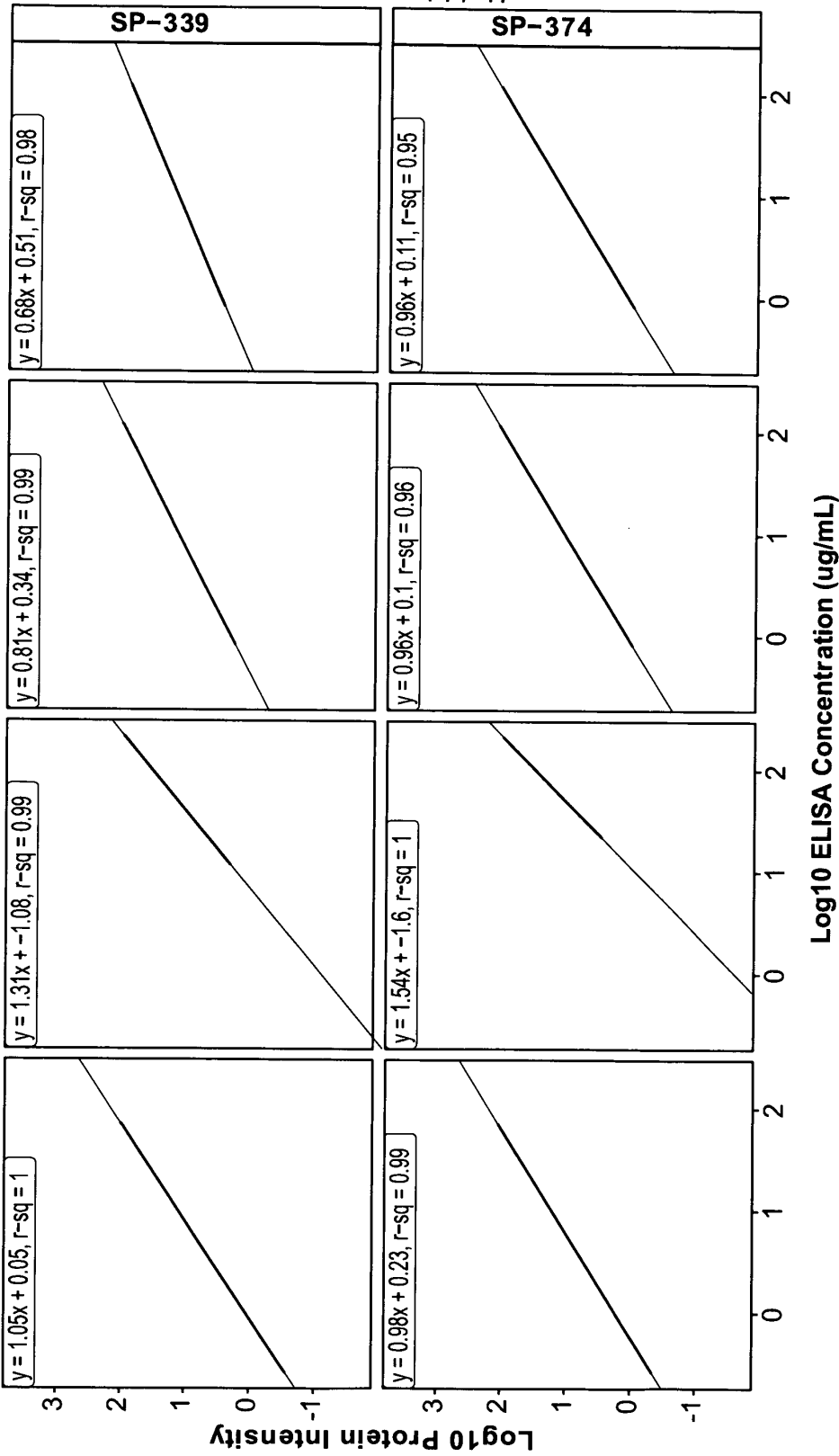
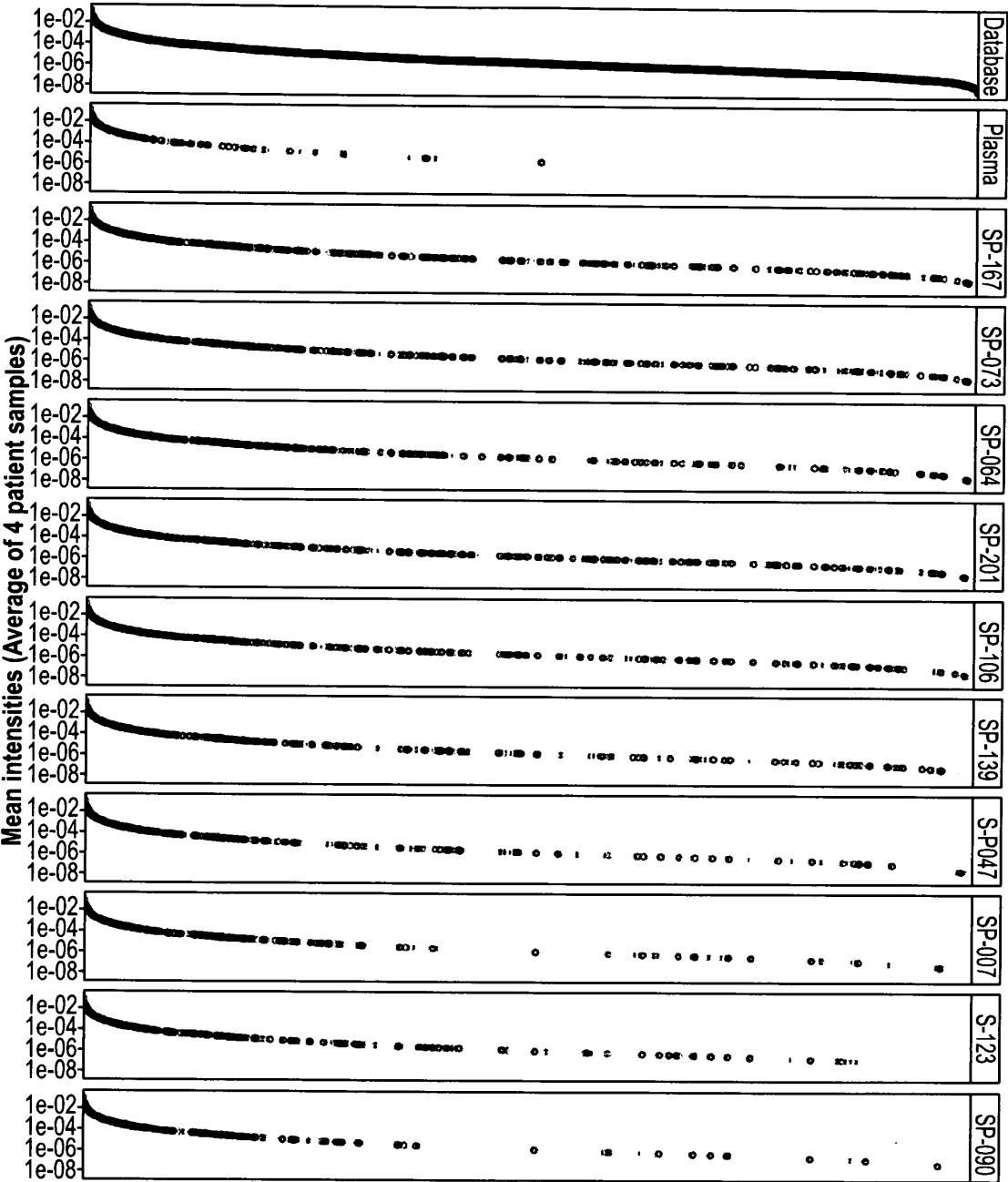


FIG. 35 (Cont.)



Proteins Ranked by Mean Intensities

FIG. 36

46 / 47

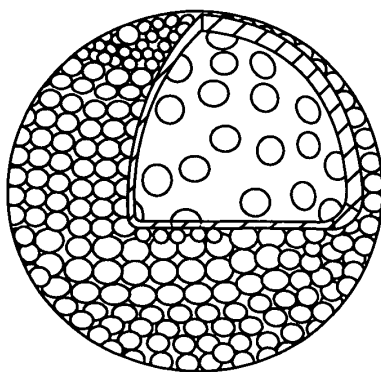


FIG. 37A

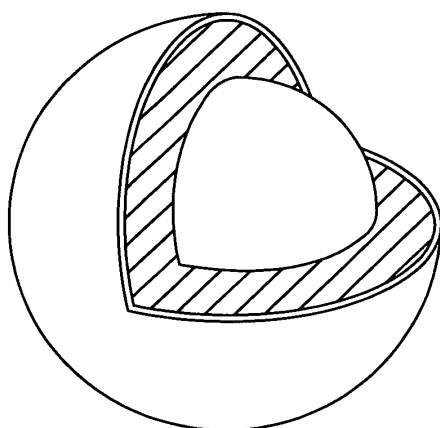


FIG. 37B

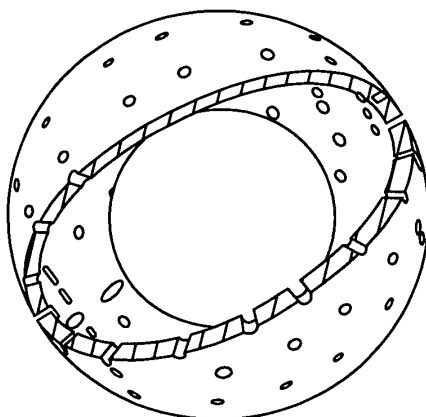


FIG. 37C

47 / 47

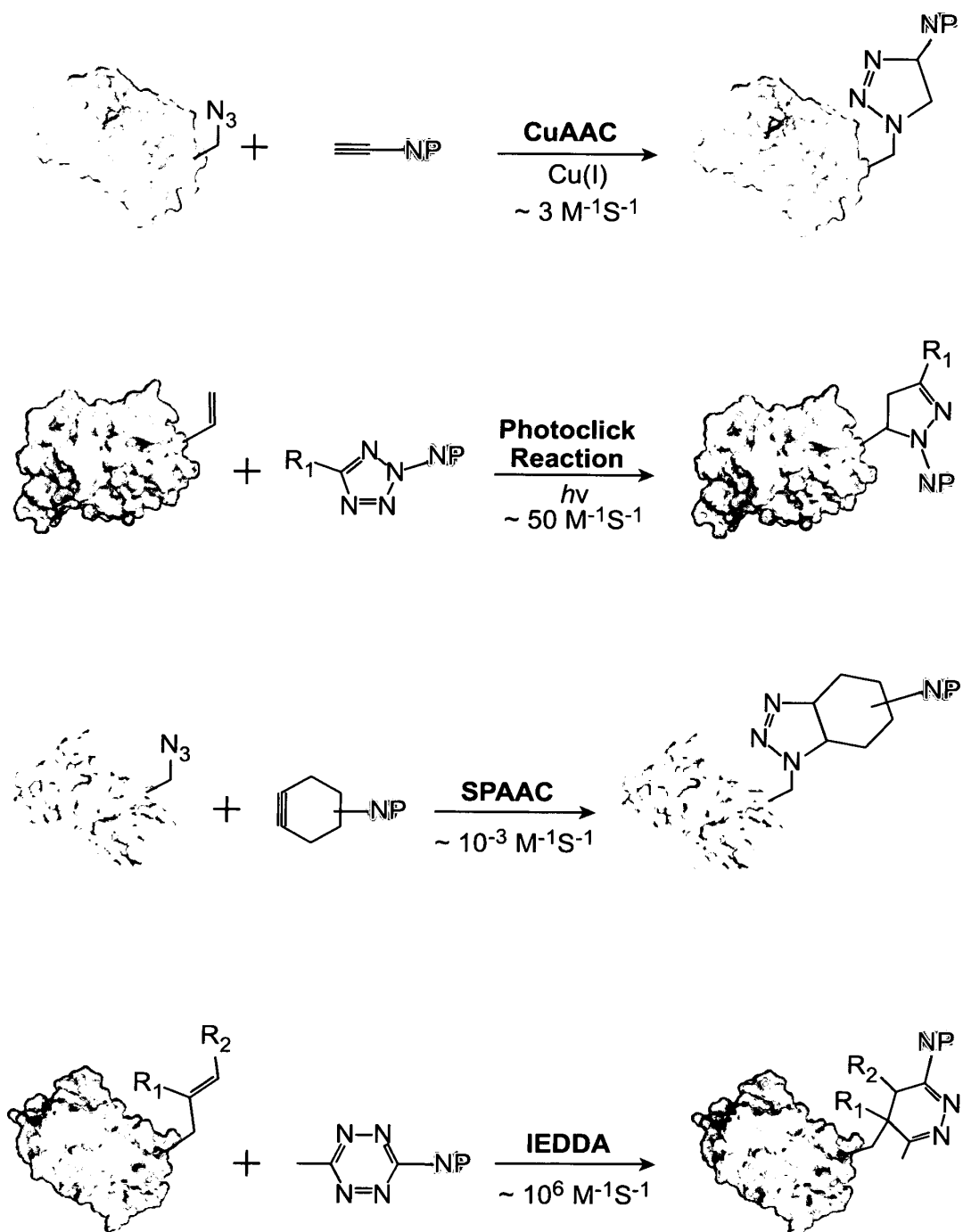


FIG. 38