

Supplementary Table 1: Deuterium Incorporation for IIa with the peptides GpIb $\alpha$ ,  $\gamma'$  and Hirudin and the protein fragment GpIb $\alpha$  (1-290) 3Y<sub>S</sub> and 2Y<sub>S</sub> at pH 6.5.

Residues	Theo. D <sub>max</sub> <sup>a</sup>	1 Minute					
		20:1		40:1	1.6:1		
		IIa	Hirudin	GpIb $\alpha$	$\gamma'$	2Y <sub>S</sub>	3Y <sub>S</sub>
-13 to -4	8.5	3.7 ± 0.1	3.4 ± 0.1	2.6 ± 0.1	2.4 ± 0.1	3.0 ± 0.2	2.4 ± 0.0
46-52	6.6	0.4 ± 0.0	0.4 ± 0.0	0.4 ± 0.0	0.4 ± 0.0	0.3 ± 0.1	0.4 ± 0.1
65-84	21.8	9.6 ± 0.1	4.2 ± 0.2	6.2 ± 0.1	5.3 ± 0.1	7.9 ± 0.3	6.7 ± 0.0
85-99	15.2	4.8 ± 0.1	4.3 ± 0.2	2.8 ± 0.1	2.9 ± 0.2	3.6 ± 0.2	2.9 ± 0.1
106-113	6.7	1.6 ± 0.0	1.2 ± 0.1	1.0 ± 0.1	1.1 ± 0.1	n/a	n/a
106-116	9.8	2.0 ± 0.1	1.6 ± 0.1	1.4 ± 0.1	1.4 ± 0.1	1.8 ± 0.1	1.5 ± 0.1
135-149D	19.4	8.4 ± 0.1	7.4 ± 0.1	7.3 ± 0.2	n/a	7.4 ± 0.1	7.4 ± 0.1
173-180	7.8	1.8 ± 0.1	1.4 ± 0.1	1.4 ± 0.1	1.2 ± 0.1	n/a	n/a
173-181	8.8	1.8 ± 0.0	1.7 ± 0.2	1.3 ± 0.1	1.1 ± 0.0	1.2 ± 0.1	1.2 ± 0.1
202-207	6.8	2.3 ± 0.0	2.3 ± 0.1	2.0 ± 0.1	1.8 ± 0.0	n/a	n/a
Residues	Theo. D <sub>max</sub>	10 Minutes					
		20:1		40:1	1.6:1		
		IIa	Hirudin	GpIb $\alpha$	$\gamma'$	2Y <sub>S</sub>	3Y <sub>S</sub>
-13 to -4	8.5	3.8 ± 0.0	3.9 ± 0.1	3.6 ± 0.0	3.2 ± 0.0	3.7 ± 0.0	3.4 ± 0.1
46-52	6.6	0.5 ± 0.0	0.5 ± 0.0	0.4 ± 0.0	0.4 ± 0.0	0.4 ± 0.0	0.4 ± 0.0
65-84	21.8	10.2 ± 0.1	6.1 ± 0.1	9.2 ± 0.1	8.2 ± 0.1	9.6 ± 0.1	9.3 ± 0.1
85-99	15.2	6.6 ± 0.2	6.9 ± 0.1	4.7 ± 0.1	5.0 ± 0.1	5.5 ± 0.1	5.0 ± 0.1
106-113	6.7	2.2 ± 0.1	2.2 ± 0.0	1.7 ± 0.1	1.8 ± 0.1	n/a	n/a
106-116	9.8	2.8 ± 0.1	2.7 ± 0.0	2.1 ± 0.0	2.2 ± 0.1	2.5 ± 0.1	2.4 ± 0.1
135-149D	19.4	8.9 ± 0.1	7.5 ± 0.1	8.2 ± 0.1	n/a	7.9 ± 0.0	8.0 ± 0.1
173-180	7.8	2.6 ± 0.1	2.5 ± 0.0	1.7 ± 0.0	1.7 ± 0.1	n/a	n/a
173-181	8.8	2.8 ± 0.1	2.7 ± 0.1	1.6 ± 0.0	1.7 ± 0.0	1.9 ± 0.1	1.8 ± 0.1
202-207	6.8	2.6 ± 0.1	2.5 ± 0.1	2.4 ± 0.0	2.4 ± 0.1	n/a	n/a

<sup>a</sup>The maximum number of exchangeable protons within the indicated peptide, assuming 100% deuteration. A fully deuterated peptide would theoretically have acquired this amount of deuterons.

Supplementary Table 2: Deuterium Incorporation for IIa (pH 7.5 and 5.6) with the peptides GpIb $\alpha$ ,  $\gamma'$ , and Hirudin at pH 5.6

Residues	Theo. D <sub>max</sub> <sup>a</sup>	1 Minute				
		IIa		20:1		
		5.6	7.5	GpIb $\alpha$	$\gamma'$	Hirudin
-13 to -4	8.5	3.4 ± 0.1	3.2 ± 0.1	2.2 ± 0.0	2.7 ± 0.0	2.8 ± 0.1
46-52	6.6	0.4 ± 0.0	0.4 ± 0.0	0.4 ± 0.0	0.4 ± 0.0	0.4 ± 0.0
65-84	21.8	9.4 ± 0.2	8.2 ± 0.2	5.7 ± 0.0	6.7 ± 0.0	3.5 ± 0.2
85-99	15.2	6.0 ± 0.1	3.7 ± 0.1	2.0 ± 0.1	2.2 ± 0.1	3.3 ± 0.3
106-113	6.7	2.2 ± 0.0	1.1 ± 0.0	0.9 ± 0.0	0.9 ± 0.1	1.0 ± 0.1
106-116	9.8	2.7 ± 0.1	1.6 ± 0.0	1.4 ± 0.0	1.3 ± 0.0	1.4 ± 0.2
135-149D	19.4	7.8 ± 0.2	8.7 ± 0.2	7.3 ± 0.0	7.9 ± 0.1	6.4 ± 0.1
173-180	7.8	2.4 ± 0.0	1.5 ± 0.1	1.2 ± 0.0	1.3 ± 0.1	1.2 ± 0.1
173-181	8.8	2.5 ± 0.1	1.7 ± 0.1	1.3 ± 0.1	1.4 ± 0.1	1.3 ± 0.1
202-207	6.8	2.3 ± 0.1	2.2 ± 0.1	1.3 ± 0.1	1.6 ± 0.1	2.0 ± 0.1
Residues	Theo. D <sub>max</sub>	10 Minutes				
		IIa		20:1		
		5.6	7.5	GpIb $\alpha$	$\gamma'$	Hirudin
-13 to -4	8.5	3.9 ± 0.2	3.9 ± 0.1	3.2 ± 0.3	3.2 ± 0.2	3.4 ± 0.2
46-52	6.6	0.6 ± 0.0	0.5 ± 0.0	0.4 ± 0.0	0.4 ± 0.1	0.4 ± 0.0
65-84	21.8	11.0 ± 0.3	10.6 ± 0.1	8.6 ± 0.2	8.7 ± 0.5	4.4 ± 0.2
85-99	15.2	7.7 ± 0.1	5.9 ± 0.0	2.8 ± 0.1	3.4 ± 0.4	5.4 ± 0.3
106-113	6.7	2.3 ± 0.0	1.8 ± 0.0	1.4 ± 0.1	1.4 ± 0.2	1.8 ± 0.1
106-116	9.8	3.1 ± 0.0	2.3 ± 0.0	1.8 ± 0.1	1.8 ± 0.2	2.2 ± 0.1
135-149D	19.4	9.7 ± 0.2	9.4 ± 0.1	8.4 ± 0.2	8.0 ± 0.3	6.8 ± 0.1
173-180	7.8	2.9 ± 0.1	2.3 ± 0.0	1.3 ± 0.1	1.4 ± 0.1	1.9 ± 0.2
173-181	8.8	3.8 ± 0.0	2.3 ± 0.1	1.3 ± 0.1	1.4 ± 0.1	2.0 ± 0.1
202-207	6.8	2.9 ± 0.1	2.8 ± 0.0	1.6 ± 0.1	2.1 ± 0.2	2.3 ± 0.1

<sup>a</sup>The maximum number of exchangeable protons within the indicated peptide, assuming 100% deuteration. A fully deuterated peptide would theoretically have acquired this amount of deuterons.