

# **SUPPORTING INFORMATION**

## **Cu(II) Bis(thiosemicarbazone) Radiopharmaceutical Binding to Serum Albumin: Further Definition of Species-Dependence and Associated Substituent Effects**

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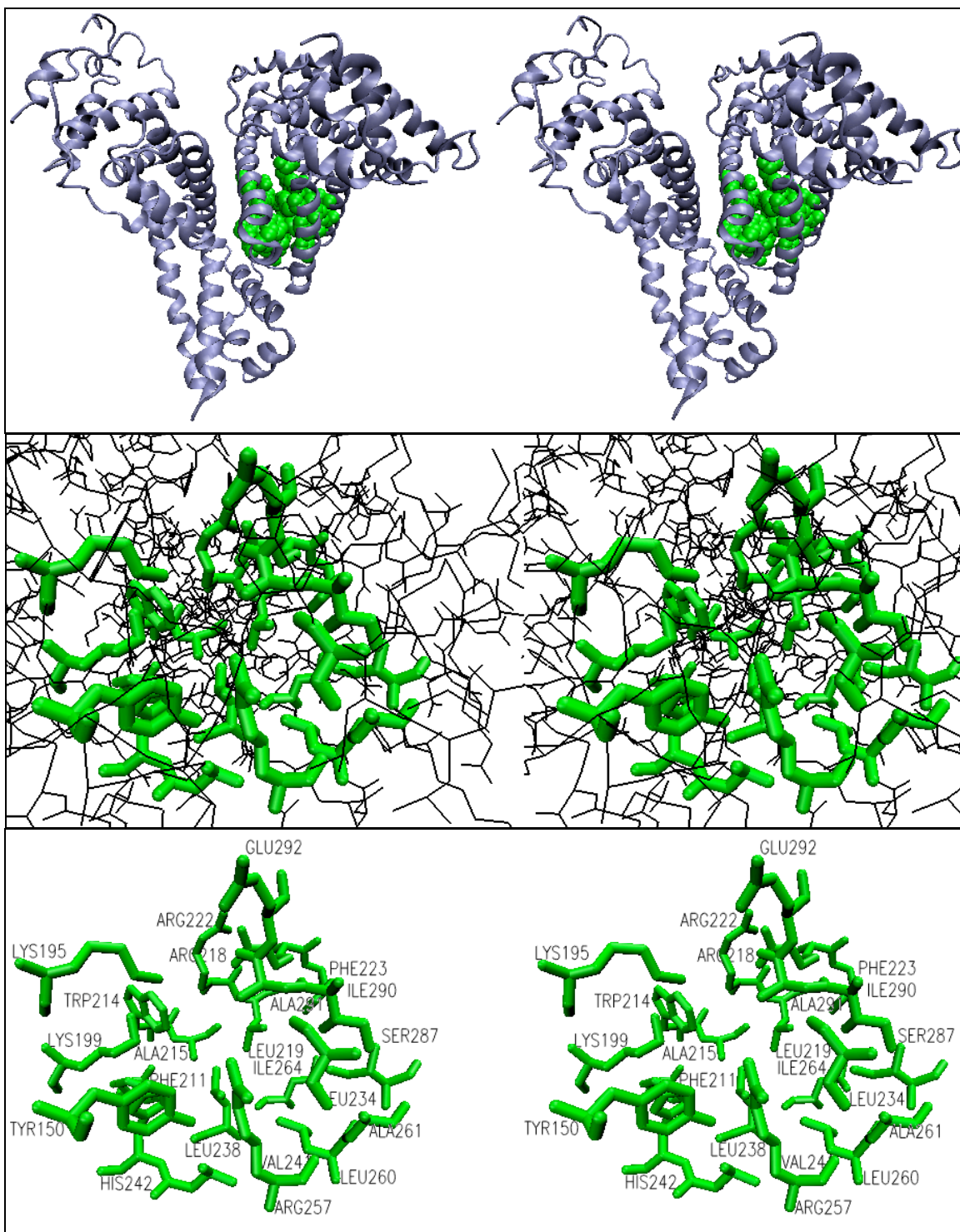
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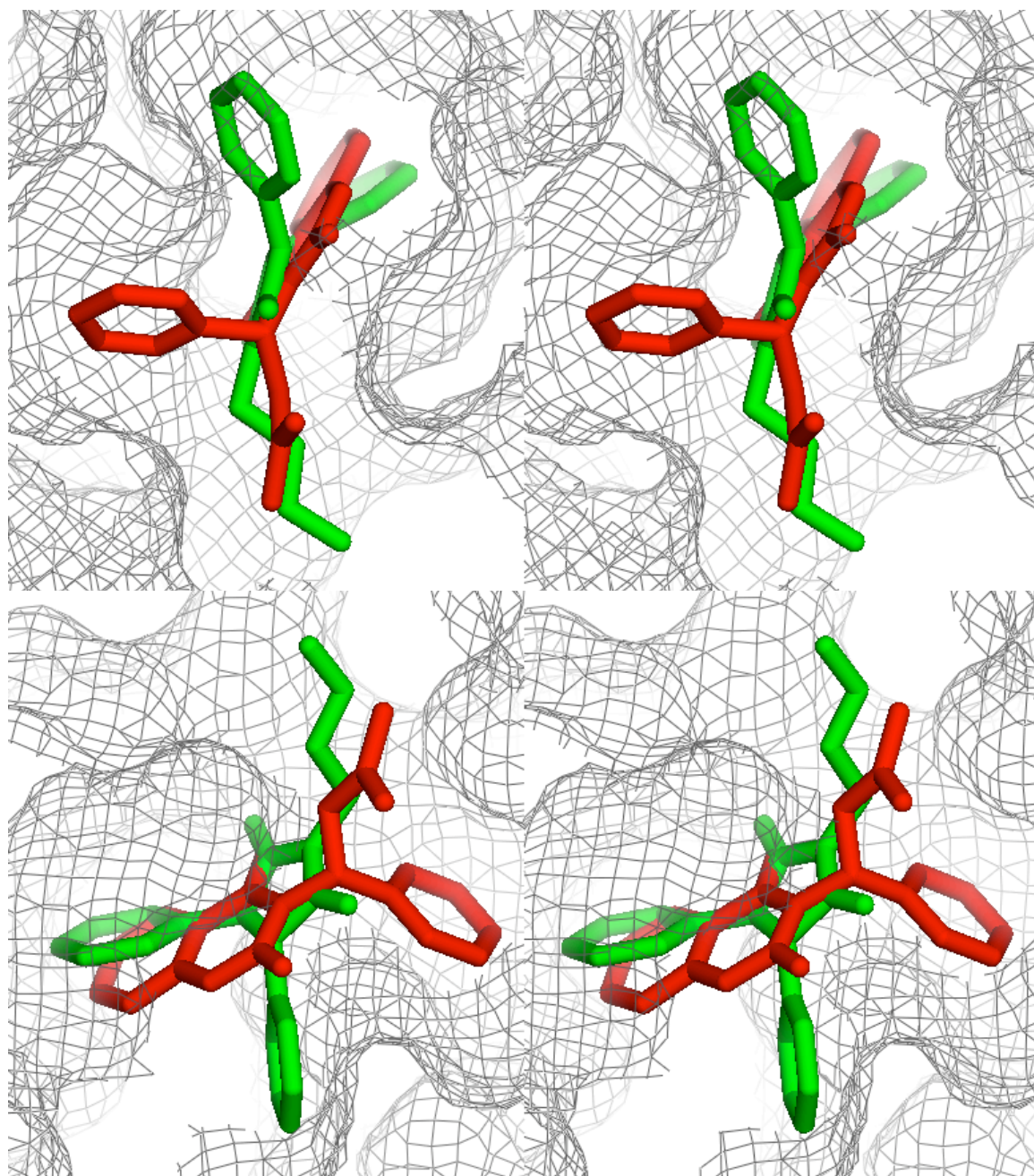
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**Figure 1.** Mammal Serum Albumin Sequence Homology Matrix. This figure shows the Smith-Waterman scores, and % identity values (shaded) for 17 mammal species. The values for the comparisons to HSA are indicated in bold.

	Human	Cow	Elephant	Gerbil	Mouse	Rat	Orangutan	Vole	Dog	Cat	Pig	Sheep	Donkey	Horse	Rabbit	Rhesus Monkey	Guinea Pig
Human	<b>3168</b>	<b>3064</b>	<b>3071</b>	<b>3139</b>	<b>3139</b>	<b>3961</b>	<b>3170</b>	<b>3304</b>	<b>3366</b>	<b>3098</b>	<b>3146</b>	<b>3209</b>	<b>3184</b>	<b>3169</b>	<b>3766</b>	<b>3081</b>	
Cow		<b>75.8</b>	2960	2951	2978	3018	3168	2966	3215	3296	3755	3150	3142	3071	3211	2978	
Elephant			<b>73.7</b>	2931	2876	2963	3064	3009	3070	2943	2954	2949	2924	3006	3094	2904	
Gerbil				<b>73.9</b>	3388	3424	3088	3397	3091	2936	2949	3076	3067	3010	3122	3051	
Mouse					<b>72.4</b>	3684	3071	3369	3092	2981	2962	3060	3040	3056	3113	3104	
Rat						<b>73.4</b>	3139	3420	3158	3197	3059	3124	3105	3110	3184	3141	
Orangutan							<b>100.0</b>	3170	3304	3366	3098	3146	3209	3184	3169	3766	3081
Vole								<b>75.8</b>	3134	3140	2974	2990	3105	3084	3109	3219	3143
Dog									<b>80.1</b>	3568	3242	3267	3233	3208	3186	3331	3136
Cat										<b>81.9</b>	3249	3238	3262	3237	3198	3342	3177
Pig											<b>75.7</b>	3246	3177	3151	3082	3139	3024
Sheep												<b>75.0</b>	3183	3170	3088	3172	3007
Donkey													<b>76.7</b>	3938	3029	3247	3080
Horse														<b>76.3</b>	3011	3222	3055
Rabbit															<b>74.3</b>	3185	3048
Rhesus Monkey																<b>93.5</b>	3126
Guinea Pig																	<b>72.2</b>



**Figure 2.** The HSA IIA Drug Binding Site. Top: Stereo view of HSA with the VDW radii of 22 amino acids lining the IIA binding site shown in green. Middle/ Bottom: Stereo views of the IIA site with individual residues indicated.



**Figure 3.** Warfarin and Phenylbutazone HSA Binding. These stereo-view overlays show warfarin (red) and phenylbutazone (green) bound in the IIA site. In the top panel, the solvent-accessible entrance is oriented down. The deepest part of the IIA site is oriented up, containing the coumarin moiety of warfarin, and one phenyl group of phenylbutazone. In the bottom panels, the entrance to the pocket is oriented up, and the orientation of the second phenylbutazone phenyl ring is clearly distinct from the warfarin phenyl group. The PDB ID#s for the HSA-warfarin and HSA-phenylbutazone adducts are *2bxd*, and *2bxc*, respectively [24].

Table 1. Species-Dependence of Amino Acid Sequence Homology in Serum Albumins

Comparison Criteria	Sequence Conservation vs. HSA (% Identity)		
	Entire Protein <sup>a</sup>	Within ~20Å of Site IIA <sup>b</sup>	Directly Adjacent to Drug Site IIA <sup>c</sup>
Rat <sup>d</sup>	73.4	73.8	68.2
Sheep <sup>d</sup>	75.0	82.2	72.7
Donkey <sup>d</sup>	76.7	85.0	81.8
Rabbit <sup>d</sup>	74.3	77.7	63.6
Cow <sup>d</sup>	75.8	88.8	77.3
Pig <sup>d</sup>	75.7	86.0	90.9
Dog <sup>d</sup>	80.1	86.9	81.8
Mouse <sup>d</sup>	72.4	77.6	68.2
Cat <sup>d</sup>	81.9	89.7	81.8
Elephant <sup>d</sup>	73.7	80.3	86.4
Gerbil	73.9	74.8	72.7
Vole	75.8	75.7	72.7
Guinea Pig	72.2	81.3	63.6
Orangutan	100.0	100.0	100.0
Rhesus Monkey	93.5	95.3	86.4
Horse	76.3	84.1	81.8

<sup>a</sup>Approx. 585 total residues

<sup>b</sup>107 residues

<sup>c</sup>22 residues

<sup>d</sup> Evaluated to assess radiopharmaceutical binding in the present study using commercially available protein.

**Table 2.** Amino Acid Sequences in Selected Mammal Serum Albumins<sup>§†^</sup>

<sup>§</sup>Residues are aligned and numbered consecutively according to the HSA sequence. Unique non-human insertions are indicated in the leftmost column by (\*). Notes on gaps and insertions are included to the right of the sequences.

<sup>^</sup>For all species, the 22 amino acids corresponding to the residues that line the IIA drug binding site of HSA are shaded.

<sup>†</sup>The UniProt serum albumin identifiers are as follows: human (P02768), rat (P02770), mouse (P07724), cow (P02769), rabbit (P49065), sheep (P14639), dog (P49822), pig (A2THZ2), donkey (Q5XLE4), elephant (Q6B3Z0), cat, (P49064), gerbil (O35090), vole (Q5EG49), guinea pig (Q6WDN9), orangutan (Q5NVH5), monkey (Q28522), and horse (P35747).

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
-23	M	M	M	M	M	M	M	M	M		M	M	M	M	M		M
-22	K	K	K	K	K	K	K	K	K		K	K	K	K	K		K
-21	W	W	W	W	W	W	W	W	W		W	W	W	W	W		W
-20	V	V	V	V	V	V	V	V	V		V	V	V	V	V		V
-19	T	T	T	T	T	T	T	T	T		T	T	T	T	T		T
-18	F	F	F	F	F	F	F	F	F		F	F	F	F	F		F
-17	I	L	L	I	I	I	I	I	V		I	L	L	I	I		V
-16	S	L	L	S	S	S	S	S	S		S	L	L	S	S		S
-15	L	L	L	L	L	L	L	L	L		L	L	L	L	L	L	L
-14	L	L	L	L	L	L	F	L	L		L	L	L	L	L	L	L
-13	F	F	F	L	F	L	F	F	F		L	F	F	F	F	F	F
-12	L	I	V	L	L	L	L	L	L		L	V	V	L	L	L	L
-11	F	S	S	F	F	F	F	F	F		F	S	S	F	F	F	F
-10	S	G	G	S	S	S	S	S	S		S	G	G	S	S	S	S
-9	S	S	S	S	S	S	S	S	S		S	S	S	S	S	S	S
-8	A	A	A	A	A	A	A	A	A		A	A	A	V	A	A	A
-7	Y	F	F	Y	Y	Y	Y	Y	Y		Y	F	F	Y	Y	Y	Y
-6	S	S	S	S	S	S	S	S	F		S	S	S	S	S	S	S
-5	R	R	R	R	R	R	R	R	R		R	R	R	R	R	R	R
-4	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G
-3	V	V	V	V	V	V	L	V	V		V	V	L	V	V	V	V
-2	F	F	F	F	F	F	V	F	L		T	F	F	F	F	F	L
-1	R	R	R	R	R	R	R	R	R		R	R	R	R	R	R	R
0	R	R	R	R	R	R	R	R	R		R	R	R	R	R	R	R
1	D	E	E	D	E	D	E	D	D		E	D	D	E	D	D	D
2	A	A	A	T	A	T	A	T	T		A	A	A	A	A	T	T
*	--	--	--	--	--	--	--	--	--	--	A	--	--	--	--	--	--
3	H	H	H	H	H	H	Y	Y	H	Y	H	H	H	H	H	H	H
4	K	K	K	K	K	K	K	K	K	K	Q	K	K	K	K	K	K
5	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
6	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
7	V	I	I	I	I	I	I	I	I	I	I	I	I	I	V	V	I
8	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
9	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
10	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
11	F	F	Y	F	F	F	Y	F	F	Y	F	Y	Y	F	F	F	F
12	K	K	N	K	N	N	N	K	N	K	N	K	N	N	K	K	N
13	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
14	L	L	L	L	V	L	L	L	L	L	L	L	L	L	L	L	L
15	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E

Precursor Residues

N-Terminus

Gerbil insertion

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
17	E	Q	Q	E	E	E	E	Q	K	D	E	K	K	G	E	E	K
18	N	H	H	H	H	N	H	Y	H	L	H	Y	Y	H	N	H	H
19	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
20	K	K	K	K	I	Q	R	E	K	K	R	K	K	K	K	K	K
21	A	G	G	G	G	G	G	G	G	G	G	G	G	G	A	G	G
22	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
23	V	V	V	V	V	V	V	V	V	L	V	V	V	V	V	V	V
24	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
25	I	I	I	I	I	I	V	I	V	I	V	Y	I	I	I	V	V
26	A	A	A	A	T	A	A	A	A	S	A	T	T	T	A	A	A
27	F	F	F	F	F	F	F	F	F	F	F	F	F	L	F	F	F
28	A	S	S	S	S	S	S	S	S	A	S	S	A	S	A	S	S
29	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
30	Y	Y	Y	Y	Y	Y	Y	H	Y	Y	Y	Y	H	H	Y	Y	Y
31	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
32	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
33	Q	K	K	Q	K	Q	Q	Q	Q	K	Q	K	K	K	Q	Q	Q
34	C	C	C	C	C	C	C	C	C	S	C	C	C	S	C	C	C
35	P	P	S	P	P	P	P	P	P	P	P	S	P	P	P	P	P
36	F	Y	Y	F	Y	F	F	Y	F	Y	F	Y	Y	F	F	F	F
37	E	E	D	D	E	D	E	E	E	D	E	E	E	E	E	E	E
38	D	E	E	E	E	E	D	E	D	E	D	E	E	E	D	E	D
39	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
40	V	I	A	V	A	V	V	V	V	V	V	V	I	V	V	V	V
41	K	K	K	K	K	K	K	K	K	Q	K	K	K	K	K	K	K
42	L	L	L	L	L	L	L	L	L	S	L	L	L	L	L	L	L
43	V	V	V	V	V	V	A	V	V	V	V	V	V	V	V	V	V
44	N	Q	Q	N	K	K	K	R	N	T	N	R	N	N	N	N	N
45	E	E	E	E	E	E	E	E	E	A	E	E	E	E	E	E	E
46	V	V	V	L	V	L	V	V	V	V	V	V	V	V	V	V	V
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48	E	D	D	E	D	E	E	E	E	D	E	D	D	D	E	E	E
49	F	F	F	F	L	F	F	F	F	L	F	F	F	F	F	F	F
50	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
51	K	K	K	K	K	K	K	K	K	K	S	K	K	K	K	K	K
52	T	T	T	T	A	T	A	T	K	T	G	N	A	A	T	T	K
53	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
54	V	V	V	V	V	V	A	V	A	A	V	A	A	V	V	V	A
55	A	A	A	A	A	A	A	A	A	A	A	K	A	A	A	A	A
56	D	D	D	D	D	D	E	D	D	D	D	D	D	D	D	D	D
57	E	E	E	E	E	E	E	E	E	E	Q	E	E	E	E	E	E



No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
58	S	N	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
59	A	A	A	H	A	H	G	A	A	A	A	A	A	A	A	A	A
60	E	E	A	A	A	A	A	E	E	E	A	E	E	Q	E	E	E
61	N	N	N	G	N	G	N	N	N	H	N	N	N	N	N	N	N
62	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
63	D	D	D	E	D	D	D	D	D	G	E	D	D	G	D	D	D
64	K	K	K	K	K	K	K	K	K	D	K	K	K	K	K	K	K
65	S	S	S	S	S	S	S	S	S	S	S	S	S	A	S	S	S
66	L	I	L	L	L	L	L	I	L	L	L	L	L	I	L	L	L
67	H	H	H	H	H	H	H	H	H	H	H	H	H	A	H	H	H
68	T	T	T	T	D	T	T	T	T	T	E	T	T	T	T	T	T
69	L	L	L	L	I	L	L	L	L	I	L	L	L	L	L	L	L
70	F	F	F	F	F	F	F	F	F	F	L	F	F	F	F	F	F
71	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
72	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
73	K	K	K	E	K	E	K	K	K	K	K	K	K	K	K	K	K
74	L	L	L	L	I	L	L	L	L	L	L	L	L	V	L	L	L
75	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
76	T	A	A	K	A	K	T	A	T	A	T	S	A	A	T	T	T
*	--	--	--	--	--	--	--	--	--	R	--	--	--	--	--	--	--
77	V	I	I	V	L	V	V	I	V	V	V	L	I	I	V	V	V
78	A	P	P	A	P	A	A	P	A	T	A	P	P	P	A	A	A
79	T	K	N	S	S	T	S	S	T	A	S	N	N	S	T	T	T
80	L	L	L	L	L	L	L	L	L	H	L	F	L	L	L	L	L
81	R	R	R	R	R	R	R	R	R	Q	R	G	G	R	R	R	R
82	E	D	E	E	D	E	D	G	A	D	D	E	D	E	E	E	A
83	T	N	N	T	T	T	K	H	T	T	K	K	N	T	T	T	T
84	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
85	G	G	G	G	G	G	G	G	G	G	G	A	A	G	G	G	G
86	E	E	E	D	D	D	D	D	E	E	E	E	E	E	E	E	E
87	M	L	L	M	V	M	M	L	L	F	M	M	M	L	M	M	L
88	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
89	D	D	D	D	D	D	D	D	D	E	D	D	E	D	D	D	D
90	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
91	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
92	A	A	T	E	E	E	E	E	E	G	E	A	A	A	A	A	E
93	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
94	Q	Q	Q	Q	K	Q	Q	E	Q	Q	K	Q	Q	E	Q	Q	Q
95	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	E	E
96	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
97	E	E	E	E	E	E	D	E	E	E	E	E	E	D	E	E	E

Elephant  
insertion

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
98	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
99	N	N	N	N	N	N	N	N	N	N	N	N	N	V	N	N	N
100	E	E	E	E	E	E	E	E	E	E	E	E	Q	E	E	E	E
101	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
102	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
103	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
104	Q	Q	Q	S	H	N	A	Q	T	K	Q	Q	K	Q	Q	Q	T
105	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
106	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
107	D	D	D	D	D	D	D	N	D	D	D	D	D	D	D	D	D
108	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
109	N	N	N	S	K	S	N	N	H	N	N	N	K	N	N	N	H
110	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
111	N	N	S	D	D	D	G	D	N	A	G	Q	S	N	N	N	N
112	L	L	L	L	L	L	F	I	L	L	F	L	L	L	L	L	L
113	P	P	P	P	P	P	P	P	P	P	G	P	P	P	P	P	P
114	R	P	P	K	P	K	P	K	K	P	Q	P	P	P	R	P	K
115	L	F	F	L	F	L	L	L	L	L	L	F	F	F	L	L	L
116	V	Q	E	K	A	K	V	K	K	V	V	K	V	E	V	V	K
117	R	R	R	--	R	--	A	--	--	R	T	R	R	R	R	R	--
118	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P
119	E	E	E	D	E	E	E	D	E	P	E	E	E	E	E	E	E
120	V	A	A	P	A	P	P	P	P	A	A	P	A	P	V	V	P
121	D	E	E	N	D	D	D	V	D	D	D	D	E	E	D	D	D
122	V	A	A	T	V	T	A	A	A	A	A	A	V	A	V	V	A
123	M	M	M	L	L	L	L	L	Q	L	M	M	M	L	M	M	Q
124	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
125	T	T	T	D	K	A	A	A	A	A	T	T	T	T	T	T	A
126	A	S	S	E	A	E	A	D	A	S	A	A	S	A	A	A	A
127	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
128	H	Q	K	K	H	K	Q	Q	Q	E	H	Q	Q	K	H	H	Q
129	D	E	E	A	D	A	D	E	E	E	E	E	E	E	D	D	E
130	N	N	N	D	D	D	N	D	D	N	N	N	N	N	N	N	D
131	E	P	P	E	E	E	E	E	P	E	E	A	P	N	E	E	P
132	E	T	T	K	K	K	Q	Q	D	R	Q	E	A	D	E	A	D
133	T	S	T	K	A	K	L	K	K	K	R	A	S	R	T	T	K
134	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
135	L	L	M	W	F	W	L	W	L	F	L	M	M	I	L	L	L
136	K	G	G	G	G	G	G	G	G	G	G	G	G	G	K	K	G
137	K	H	H	K	H	K	K	K	K	V	K	H	H	H	K	K	K
138	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Hooved  
animal  
gaps

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
139	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
140	Y	H	H	Y	Y	Y	Y	Y	Y	Y	Y	H	H	Y	Y	Y	Y
141	E	E	E	E	E	E	E	E	E	E	E	E	A	E	E	E	E
142	I	V	V	I	V	V	I	I	V	V	I	V	V	V	I	V	V
143	A	A	A	A	A	A	A	A	A	A	A	A	A	S	A	A	A
144	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
145	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
146	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
147	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
148	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
149	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
150	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
151	A	A	A	A	A	A	A	A	G	A	A	G	A	A	A	A	G
152	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
153	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
154	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
155	L	L	L	L	L	L	L	L	L	I	L	L	L	L	L	L	L
156	F	Y	Y	Y	Y	Y	Y	Y	F	Y	Y	Y	Y	Y	F	F	F
157	F	Y	Y	Y	Y	Y	Y	Y	H	Y	Y	L	Y	Y	F	F	H
158	A	A	A	A	A	A	A	A	A	S	A	A	A	A	A	A	A
159	K	E	E	N	Q	N	Q	I	E	E	E	D	E	E	K	A	E
160	R	K	Q	K	K	K	Q	I	E	K	E	K	K	K	R	R	E
161	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Q	Y	Y	Y	Y
162	K	N	N	N	K	N	K	K	K	K	K	T	S	K	K	K	K
163	A	E	E	G	A	G	G	D	A	D	G	A	A	N	A	A	A
164	A	V	I	V	I	V	V	V	D	I	V	V	I	A	A	A	D
165	F	L	L	F	L	F	F	F	F	L	F	L	M	L	F	F	F
166	T	T	T	Q	T	Q	A	S	T	T	T	T	T	T	T	A	T
167	E	Q	Q	E	E	E	E	E	E	E	E	E	E	E	E	E	E
168	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
169	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
170	Q	T	A	Q	E	Q	Q	Q	P	H	E	A	A	E	Q	Q	P
171	A	E	E	A	A	A	A	A	A	A	A	A	E	A	A	A	A
172	A	S	A	E	A	E	A	A	D	D	A	D	A	A	A	A	D
173	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
174	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
175	A	A	E	G	G	G	A	A	A	A	A	G	A	A	A	A	L
176	A	A	S	A	A	A	A	A	G	A	A	A	A	A	A	A	A
177	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
178	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
179	L	T	T	L	T	L	G	L	I	K	T	T	G	T	L	L	I

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
180	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
181	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
182	L	L	L	I	L	I	I	I	L	I	V	L	L	L	L	L	L
183	D	D	D	E	D	D	E	E	D	D	D	D	D	D	D	D	D
184	E	A	G	T	A	A	A	H	A	A	A	A	A	A	E	E	A
185	L	V	V	M	L	M	L	L	L	L	L	L	L	I	L	L	L
186	R	K	K	R	E	R	R	R	K	K	R	K	K	K	R	R	K
187	D	E	E	E	G	E	E	E	E	D	E	E	E	E	D	D	E
188	E	K	K	K	K	K	K	K	R	T	K	K	K	K	E	E	R
189	G	A	A	V	S	V	V	V	I	V	V	A	A	A	G	G	I
190	K	L	L	L	L	L	L	L	L	L	L	L	L	L	K	K	L
191	A	V	V	A	I	A	L	T	L	A	A	V	L	V	A	A	L
192	S	A	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
193	S	A	S	S	A	S	S	A	S	A	S	A	S	S	S	S	S
194	A	V	V	A	A	A	A	A	A	A	A	V	V	A	A	A	A
195	K	R	R	R	Q	R	K	K	K	R	K	R	K	Q	K	K	K
196	Q	Q	Q	Q	E	Q	E	Q	E	Q	E	Q	Q	Q	Q	Q	E
197	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
198	L	M	M	L	L	L	F	L	L	L	L	L	L	L	L	L	L
199	K	K	K	R	R	R	K	K	K	K	K	K	K	K	K	K	K
200	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
201	A	S	S	A	A	A	A	A	S	A	A	S	S	A	A	A	S
202	S	S	S	S	S	S	S	S	S	N	S	S	S	S	S	S	S
203	L	M	M	I	I	I	L	I	F	I	L	M	L	L	L	L	F
204	Q	Q	Q	Q	Q	Q	Q	Q	Q	H	Q	K	E	Q	Q	Q	Q
205	K	R	K	K	K	K	K	K	K	K	K	K	K	K	K	K	N
206	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
207	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
208	E	E	E	E	D	E	D	E	E	E	E	E	E	E	E	D	E
209	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
210	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
211	F	F	F	L	Y	L	F	F	F	F	F	F	F	F	F	F	V
212	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
213	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
214	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
215	A	A	A	S	A	S	S	S	S	A	S	A	A	S	A	A	S
216	V	V	V	V	L	V	V	L	V	V	V	V	V	V	V	V	V
217	A	A	A	A	V	A	A	A	A	T	A	A	A	A	A	A	A
218	R	R	R	R	R	R	R	R	R	H	R	R	R	R	R	R	R
219	L	M	L	L	L	L	L	L	L	L	L	M	M	L	L	L	L
220	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
221	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
222	R	R	T	K	R	K	R	R	K	R	K	T	K	K	R	K	K
223	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
224	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
225	K	N	N	K	K	K	K	K	K	K	K	N	K	K	K	K	K
226	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
227	E	E	D	E	D	D	D	D	D	D	E	D	D	E	E	E	D
228	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
229	A	A	A	V	T	T	A	T	A	A	A	A	A	A	A	A	A
230	E	E	E	E	D	D	E	E	E	E	E	E	E	E	E	E	E
231	V	I	I	V	I	V	I	I	V	V	I	I	I	I	V	V	V
232	S	T	T	T	S	T	S	S	S	S	S	T	T	S	S	S	S
233	K	K	K	K	K	K	K	K	K	K	K	K	K	T	K	K	K
234	L	L	L	L	I	I	V	I	I	L	L	L	L	I	L	L	I
235	V	A	A	V	V	V	V	V	V	A	V	A	A	V	V	V	V
236	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
237	D	D	D	D	D	D	D	D	D	D	D	D	D	S	D	D	D
238	L	V	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
239	T	T	T	T	T	T	T	A	T	G	A	T	T	T	T	T	T
240	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
241	V	I	V	V	V	V	V	V	V	V	I	V	V	V	V	V	V
242	H	N	N	H	H	H	H	H	H	Y	H	T	T	T	H	H	H
243	T	K	K	K	K	K	K	K	K	Q	K	Q	Q	K	T	T	K
244	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
245	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
246	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
247	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
248	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
249	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
250	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
251	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
252	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
253	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
254	A	A	A	A	A	A	A	A	A	A	A	A	V	A	A	A	A
255	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
256	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
257	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
258	A	A	A	A	A	A	A	A	A	A	A	A	L	Q	A	A	A
259	D	E	E	D	D	D	D	D	D	D	D	E	E	E	D	D	D
260	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
261	A	A	A	A	A	A	A	A	T	A	A	A	A	A	A	A	A

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
262	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
263	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
264	I	M	M	I	M	I	M	I	I	I	I	M	M	M	I	M	I
265	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
266	E	E	E	D	E	D	E	E	E	D	E	E	D	E	E	E	E
267	N	N	N	N	H	H	N	N	H	N	N	N	N	H	N	N	H
268	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
269	D	A	A	D	E	D	D	D	D	E	D	A	A	D	D	D	D
270	S	T	T	T	T	A	S	T	S	T	S	S	T	S	S	S	S
271	I	I	I	I	I	L	I	I	I	L	I	I	I	I	I	I	I
272	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
273	S	S	S	S	S	S	T	T	G	S	T	S	S	S	S	S	G
274	K	K	K	K	H	K	K	K	K	K	K	K	K	K	K	K	K
275	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
276	K	Q	Q	K	K	K	K	K	K	K	K	Q	H	K	K	K	K
277	E	A	T	E	E	E	E	E	A	E	E	A	T	E	E	E	A
278	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
279	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
280	E	D	D	D	D	D	D	D	D	D	G	D	D	V	E	D	D
281	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
282	P	P	P	P	P	P	P	P	P	P	P	E	P	P	P	P	P
283	L	V	L	L	I	V	V	L	L	V	V	M	V	T	L	L	L
284	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
285	E	Q	K	E	E	E	E	E	Q	A	E	Q	Q	Q	E	E	Q
286	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
287	S	S	A	S	A	S	S	S	S	S	S	S	A	A	S	S	S
288	H	Q	H	H	H	H	Q	H	H	H	H	Q	H	H	H	H	H
289	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
290	I	L	L	I	I	I	L	I	I	I	I	L	L	I	I	L	I
291	A	A	S	A	Y	A	A	A	A	A	S	A	A	L	A	A	A
292	E	E	E	E	G	E	E	E	E	E	E	E	E	E	E	E	E
293	V	I	V	V	L	V	V	A	V	L	V	V	V	I	V	V	V
294	E	E	E	E	H	D	E	K	K	D	E	E	D	Q	E	E	K
295	N	H	H	K	N	K	R	R	E	K	R	H	H	R	N	N	E
296	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
297	E	N	T	A	E	A	E	E	D	D	E	D	E	E	E	E	D
298	M	I	M	I	T	V	L	L	L	P	L	M	M	L	M	M	L
299	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
300	A	A	A	E	A	E	G	A	S	A	A	A	A	T	A	A	S
301	D	D	D	N	G	N	D	D	D	D	D	D	D	E	D	D	D
302	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
303	P	P	P	P	P	P	P	N	P	P	P	P	T	P	P	P	P
304	S	S	A	P	A	P	S	P	A	S	P	A	P	D	S	S	A
305	L	I	I	L	V	L	L	L	L	I	L	L	L	L	L	L	L
306	A	A	A	T	A	T	A	E	A	V	A	T	A	A	A	A	A
307	A	A	A	A	E	A	A	H	A	P	V	A	D	V	A	A	A
308	D	D	D	D	E	D	D	D	D	D	D	D	D	D	D	D	D
309	F	F	F	F	F	F	F	F	F	Y	F	F	F	F	F	Y	F
310	V	V	V	A	V	A	V	V	A	V	V	V	V	V	V	V	A
311	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
312	S	D	D	D	D	D	D	D	D	D	D	D	D	D	S	S	D
313	K	K	Q	K	K	K	K	K	K	K	K	K	K	K	K	K	K
314	D	E	E	D	D	E	E	E	E	D	E	D	D	E	D	D	E
315	V	V	V	V	V	V	V	V	I	V	V	V	V	V	V	V	I
316	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
317	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
318	N	N	N	N	N	N	N	N	H	N	N	N	N	N	N	N	H
319	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F	Y	Y	Y
320	A	A	A	Q	E	Q	Q	K	K	Q	Q	A	A	A	A	A	K
321	E	E	E	E	E	E	E	E	D	E	E	E	E	E	E	E	D
322	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
323	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
324	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
325	V	V	V	A	L	V	V	V	V	I	V	V	V	V	V	V	V
326	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
327	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
328	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
329	M	T	T	S	K	S	T	T	T	T	T	T	T	T	M	M	T
330	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
331	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
332	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
333	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
334	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
335	A	S	S	S	S	S	A	S	S	S	S	S	A	S	A	A	S
336	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
337	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
338	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
339	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
340	D	D	D	E	D	E	E	D	D	E	E	E	D	E	D	D	D
341	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
342	S	S	S	A	S	A	S	S	S	S	S	S	S	S	S	S	S
343	V	V	V	V	V	V	V	V	V	A	V	V	V	I	V	V	V

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
344	V	S	S	S	V	S	S	S	S	F	S	S	A	G	V	M	S
345	L	L	L	V	L	V	L	L	L	L	L	L	L	M	L	L	L
346	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
347	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
348	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
349	L	L	L	L	L	L	L	I	I	I	L	L	L	I	L	L	I
350	A	A	A	A	G	A	A	A	A	A	A	A	A	A	A	A	A
351	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
352	T	K	K	E	A	E	E	I	T	E	E	K	K	G	T	A	T
353	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
354	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
355	T	A	A	A	A	A	A	A	A	A	A	A	A	A	T	A	A
356	T	T	T	T	T	T	T	T	T	T	T	T	T	K	T	T	T
357	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
358	E	E	E	E	K	E	E	E	E	E	E	E	E	E	E	E	E
359	K	K	K	E	K	D	K	D	K	R	K	K	K	K	K	K	K
360	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
361	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
362	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
363	A	E	E	K	T	K	T	K	E	A	T	E	E	E	A	A	E
364	A	G	A	D	D	E	D	E	A	A	D	A	A	A	A	A	A
365	D	D	N	D	D	D	D	D	D	D	D	D	D	D	D	D	D
366	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
367	H	P	P	H	H	H	P	P	P	H	P	H	H	H	H	H	P
368	E	A	A	A	A	A	T	A	A	A	A	A	A	A	E	E	A
369	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
370	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
371	A	G	G	S	A	A	A	A	A	A	A	G	G	A	A	A	R
372	K	T	T	T	K	T	K	T	T	K	H	H	K	K	K	K	T
373	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
374	F	L	L	F	L	F	L	F	F	L	F	F	F	F	F	F	F
375	D	A	A	D	D	D	D	D	D	D	D	D	D	D	D	D	D
376	E	E	E	K	E	K	E	K	Q	A	E	E	E	E	E	E	Q
377	F	F	F	L	F	L	F	F	F	F	F	F	F	L	F	F	F
378	K	Q	Q	K	Q	K	K	Q	T	T	K	K	Q	Q	K	Q	T
379	P	P	P	H	P	H	P	P	P	P	P	P	P	P	P	P	P
380	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
381	V	V	V	V	V	V	V	V	V	V	V	V	V	I	V	V	V
382	E	E	E	D	D	D	D	D	E	E	E	E	E	D	E	E	E
383	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
384	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P



No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
385	Q	K	K	Q	K	Q	Q	K	K	Q	H	Q	K	K	Q	Q	K
386	N	N	N	N	N	N	N	N	S	G	N	N	N	K	N	N	S
387	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
388	I	V	V	I	V	I	V	I	V	V	V	V	V	V	I	V	V
389	K	K	K	K	K	K	K	K	K	K	K	K	K	Q	K	K	K
390	Q	T	T	Q	Q	K	T	Q	K	Q	T	S	A	Q	Q	Q	K
391	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
392	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
393	E	E	D	D	E	E	E	E	D	E	E	E	E	E	E	E	D
394	L	L	L	Q	L	L	L	L	L	H	L	L	L	L	L	L	L
395	F	Y	Y	F	Y	F	F	F	F	F	F	Y	F	F	F	F	F
396	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	E	E
397	Q	K	K	K	Q	K	K	K	E	Q	K	K	K	K	Q	Q	E
398	L	L	L	L	L	H	L	L	V	L	L	L	L	L	L	L	V
399	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
400	E	E	E	E	D	E	E	E	E	E	E	E	E	E	E	E	E
401	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
402	K	G	G	G	N	G	G	G	D	G	G	G	G	G	K	K	D
403	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
404	Q	Q	Q	Q	Q	Q	Q	Q	Q	T	Q	Q	Q	Q	Q	Q	Q
405	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
406	A	A	A	A	A	A	A	A	A	E	A	A	A	A	A	A	A
407	L	V	I	L	L	L	L	L	L	L	L	V	L	L	L	L	L
408	L	L	L	I	L	I	L	I	I	A	L	L	L	A	L	L	I
409	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
410	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
411	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
412	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
413	K	Q	Q	R	K	R	K	K	K	R	K	K	Q	Q	K	K	K
414	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
415	V	A	A	V	V	A	A	V	A	V	V	A	A	A	V	V	A
416	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
417	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
418	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
419	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
420	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
421	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
422	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
423	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
424	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
425	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
426	V	A	A	V	I	I	V	V	I	V	V	A	V	Y	V	V	I
427	S	A	A	S	S	S	S	A	G	S	S	A	S	A	S	S	G
428	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
429	N	N	N	S	S	S	K	K	T	K	S	S	N	K	N	N	T
430	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
431	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
432	K	R	R	K	K	K	K	L	K	R	K	R	K	S	K	K	K
433	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
434	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
435	S	T	T	T	S	T	T	S	S	G	S	T	T	T	S	A	S
436	K	K	K	R	K	K	K	R	R	K	K	H	K	K	K	K	R
437	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
438	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
439	K	T	T	T	K	A	K	K	K	K	T	A	A	S	K	K	K
440	H	L	L	K	H	K	K	R	L	L	H	L	L	L	H	L	L
441	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P
442	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
443	A	A	D	S	A	S	S	E	S	A	A	K	A	T	A	A	S
444	K	Q	Q	E	E	E	E	E	E	K	E	K	D	E	K	K	E
445	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
446	M	L	L	M	L	M	M	L	L	M	L	L	L	L	M	M	L
447	P	P	P	P	P	P	S	S	P	P	S	P	P	S	P	P	P
448	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
449	A	V	V	T	V	T	A	A	S	A	A	V	V	T	A	A	S
450	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
451	D	D	D	D	D	D	D	D	N	D	D	D	D	N	D	D	N
452	Y	Y	Y	Y	Y	Y	F	Y	H	Y	Y	Y	Y	Y	Y	Y	H
453	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
454	S	S	S	S	S	S	S	S	A	S	S	S	S	A	S	S	A
455	V	A	A	L	V	L	V	L	L	L	V	A	A	L	V	V	L
456	V	I	I	I	V	I	V	V	A	V	V	I	I	I	V	V	A
457	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
458	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
459	Q	R	R	R	R	R	R	R	R	R	R	R	H	R	Q	R	R
460	L	L	V	L	L	L	L	L	L	L	L	V	L	L	L	L	L
461	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
462	V	V	L	V	V	V	V	V	V	V	V	L	V	I	V	V	V
463	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
464	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
465	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
466	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
467	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
468	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
469	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
470	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
471	D	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	E
472	R	K	H	K	K	K	R	K	K	R	R	Q	Q	R	R	K	K
473	V	V	V	V	V	V	V	V	I	I	V	V	V	V	V	V	I
474	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
475	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
476	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
477	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
478	T	S	S	T	S	T	S	T	T	T	T	S	T	T	T	T	T
479	E	G	G	E	E	E	E	E	D	E	E	G	G	E	E	E	D
480	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
481	L	L	L	L	L	L	L	L	L	L	L	L	V	L	L	L	L
482	V	V	V	V	V	V	V	V	A	V	V	V	V	V	V	V	A
483	N	E	E	N	D	N	N	N	E	N	N	E	E	N	N	N	E
484	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
485	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
486	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
487	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
488	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
489	S	S	S	S	S	S	S	S	S	T	S	S	S	S	S	S	S
490	A	A	A	A	A	D	G	A	A	A	A	A	A	A	A	A	A
491	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
492	E	T	T	T	G	T	E	T	E	Q	Q	P	P	H	E	E	E
493	V	V	V	P	P	L	V	P	L	T	V	V	V	V	V	L	L
494	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
495	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
496	T	T	T	T	T	T	T	T	G	T	T	T	H	T	T	A	G
497	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
498	V	V	V	V	V	V	V	K	I	V	V	V	V	V	V	V	V
499	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
500	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
501	E	E	E	A	E	P	E	E	E	E	E	E	E	P	E	A	E
502	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
503	N	K	K	D	N	D	N	V	K	N	S	K	K	H	N	N	K
504	A	A	A	E	A	E	A	E	A	A	A	A	A	A	A	A	A
505	E	E	E	K	E	K	E	G	E	E	E	E	E	D	E	E	E
506	T	T	T	L	T	F	T	T	T	T	T	T	S	S	T	T	T
507	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
508	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
509	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
510	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
511	A	S	S	A	A	A	A	A	A	A	A	A	A	A	A	A	A
512	D	D	D	D	D	D	D	D	D	D	D	N	D	D	D	D	D
513	I	I	I	I	I	I	L	L	I	L	L	I	I	I	I	M	I
514	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
515	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
516	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
517	S	P	P	P	P	P	P	P	P	P	P	P	P	P	S	S	P
518	E	D	E	D	E	D	E	E	E	E	E	E	D	E	E	E	E
519	K	K	K	T	T	T	A	D	D	E	A	K	K	K	K	K	D
520	E	E	E	E	E	E	E	E	E	Q	E	E	E	E	E	E	E
521	R	K	K	K	R	K	K	K	K	K	K	K	K	K	R	K	K
522	Q	Q	Q	Q	K	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
523	I	I	I	I	I	I	V	I	I	I	I	M	I	V	I	V	I
524	K	K	K	K	K	K	K	K	K	K	K	E	K	K	K	K	K
525	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
526	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
527	T	T	T	T	T	T	T	T	S	S	S	T	T	M	T	T	S
528	A	A	A	A	A	A	A	A	A	V	A	A	A	A	A	A	A
529	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
530	V	A	A	V	V	V	V	V	A	V	V	A	A	V	V	V	A
531	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
532	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
533	V	V	V	L	V	L	L	L	V	V	L	V	V	V	V	V	V
534	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
535	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
536	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
537	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
538	K	K	K	K	H	K	K	H	K	K	K	Q	K	K	K	K	K
539	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
540	T	T	T	T	T	T	T	T	T	T	T	T	T	S	T	T	T
541	K	E	A	E	N	D	D	E	K	D	E	E	G	E	K	K	K
542	E	D	E	E	D	E	E	E	E	E	E	E	D	E	E	E	E
543	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
544	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L
545	K	K	K	K	K	K	K	R	K	K	K	K	K	K	K	K	K
546	A	T	T	T	T	T	T	T	T	T	T	K	T	T	A	G	T
547	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
548	M	M	M	M	V	M	M	L	L	T	M	M	M	M	M	M	L

No.	Human	Rat	Mouse	Cow	Rabbit	Sheep	Dog	Pig	Donkey	Elephant	Cat	Gerbil	Vole	Guinea Pig	Orangutan	Monkey	Horse
549	D	G	D	E	G	E	G	G	G	G	G	G	G	G	D	D	G
550	D	D	D	N	E	N	D	N	N	Q	D	D	E	D	D	N	N
551	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
552	A	A	A	V	T	V	G	A	S	T	G	A	S	A	A	A	S
553	A	Q	Q	A	A	A	A	A	A	G	S	E	A	A	A	A	A
554	F	F	F	F	L	F	F	F	F	M	F	F	F	F	F	F	F
555	V	V	L	V	L	V	V	V	V	V	V	L	L	L	V	V	V
556	E	D	D	D	D	D	E	Q	A	E	D	E	E	K	E	E	A
557	K	K	T	K	K	K	K	K	K	K	K	K	K	K	K	K	K
558	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
559	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
560	K	K	K	A	S	A	A	A	G	A	A	K	K	D	K	K	G
561	A	A	A	A	A	A	A	A	A	A	A	Q	A	A	A	A	R
562	D	A	A	D	E	D	E	P	E	E	E	E	D	D	D	D	E
563	D	D	D	D	D	D	N	D	D	D	D	D	D	N	D	D	D
564	K	K	K	K	K	K	K	H	K	K	K	K	K	K	K	K	K
565	E	D	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E
566	T	N	T	A	A	G	G	A	A	A	A	A	A	A	T	A	A
567	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
568	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
569	A	A	S	A	A	V	S	A	A	A	A	S	S	T	A	A	A
570	E	T	T	V	V	L	E	V	E	E	E	T	E	E	E	E	E
571	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	E	E
572	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
573	K	P	P	P	P	P	P	P	P	P	P	P	P	P	K	P	P
574	K	N	N	K	K	K	K	K	K	K	K	K	K	K	K	K	K
575	L	L	L	L	L	L	L	F	L	L	L	L	L	L	L	F	L
576	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
577	A	A	T	V	E	A	A	I	A	T	A	A	A	A	A	A	A
578	A	R	R	S	S	S	A	E	S	A	A	E	T	K	A	A	S
579	S	S	C	T	S	T	A	I	S	S	A	S	S	C	S	S	S
580	Q	K	K	Q	K	Q	Q	R	Q	Q	Q	Q	Q	Q	Q	Q	Q
581	A	E	D	T	A	A	A	G	L	A	A	K	A	A	A	A	L
582	A	A	A	A	T	A	A	I	A	A	A	A	A	T	A	A	A
583	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
584	G	A	A	A	G	A		A	A		A	A		A	G	A	A
585	L														L		

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