SUPPORTING INFORMATION

Linkage Isomerism in the Binding of Pentapeptide Ac-His(Ala)$_3$His-NH$_2$ to (ethylenediamine)palladium(II): Effect of the Binding Mode on Peptide Conformation[1]

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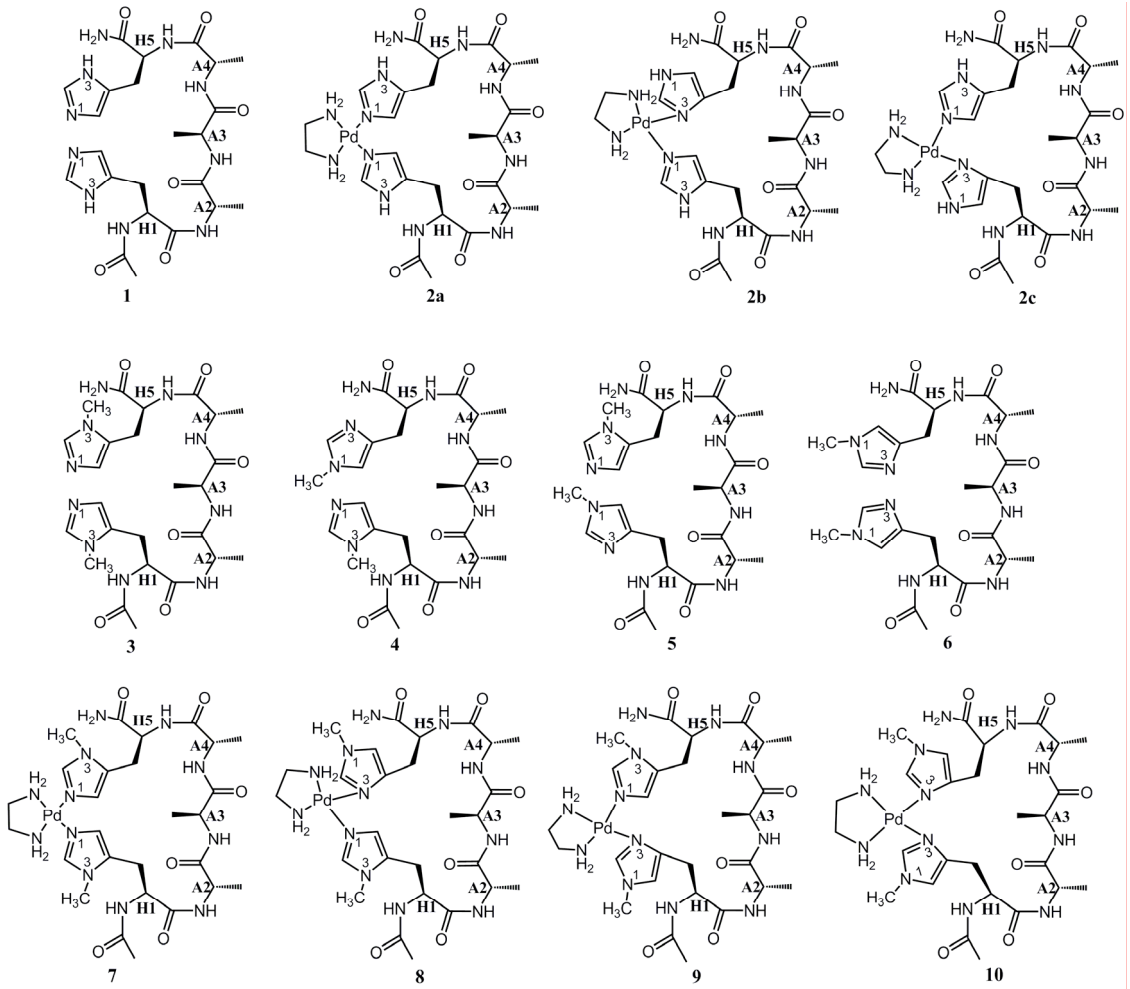

Scheme S1. Chemical structures for peptides and metallopeptides **1, 2a, 2b, 2c, 3, 4, 5, 6, 7, 8, 9** and **10**.

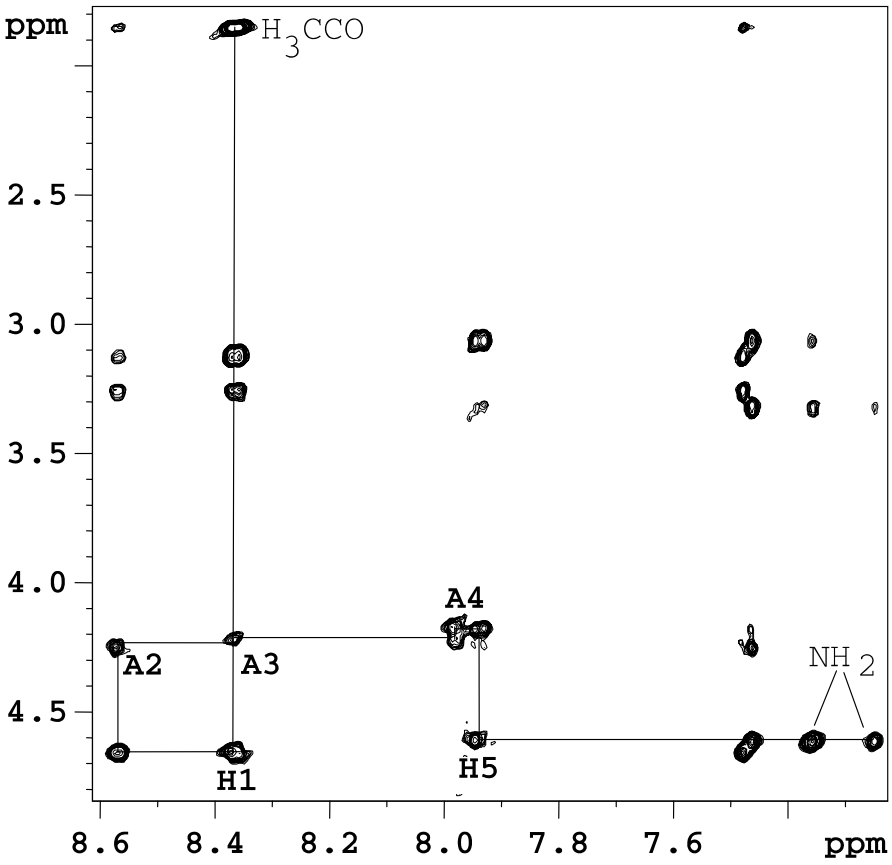

Figure S1. 500 MHz T-ROESY spectrum (dmf-d^7, 298 K, mixing time 250 ms, spin-lock 16dB (3kHz)) for free peptide **1**. Sequential connectivity for **1** (solid line). Intraresidue NH-CHα cross-peaks are labeled according to standard one letter amino acid code and by their residue numbers in **1**. Sequential cross-peaks from N-terminal acetyl (CH_3) and C-terminal amide (NH_2) group are also shown. Note the absence of non-sequential cross-peaks indicating that **1** is unstructured in solution.

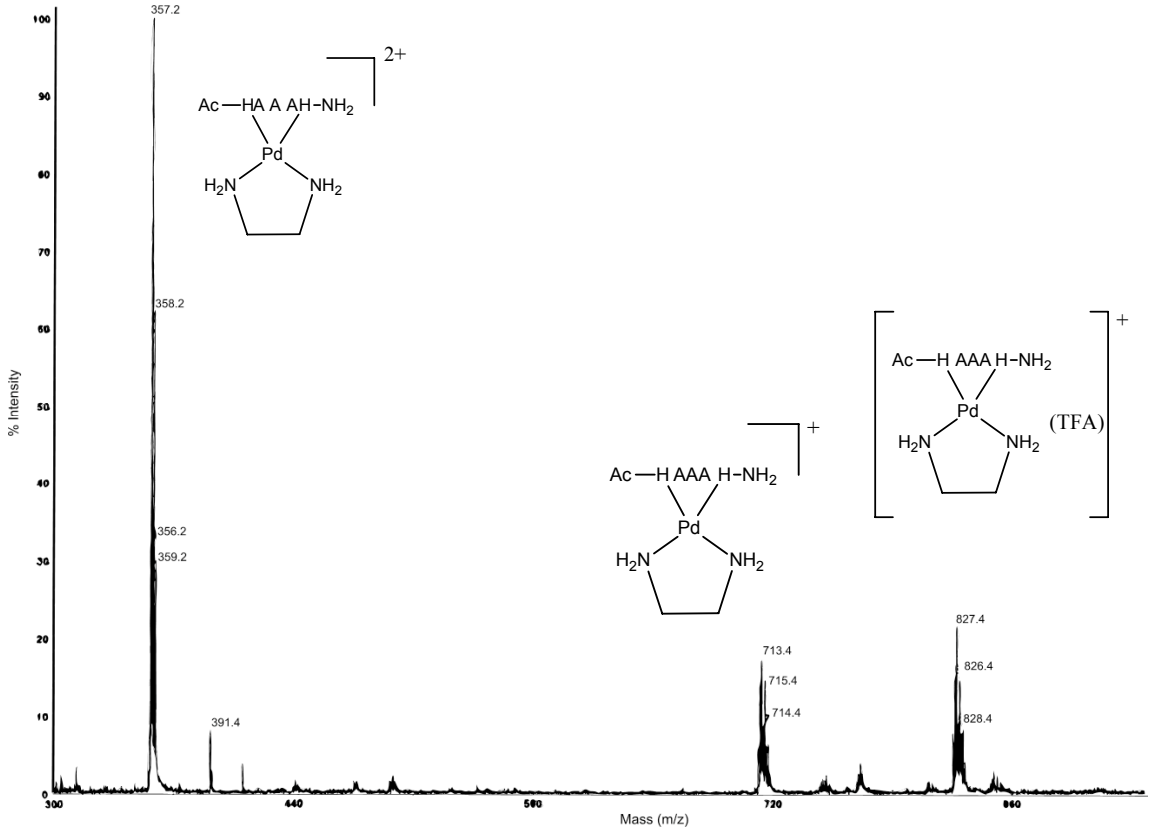

Figure S2. The ESMS spectrum for the solution from reacting [Pd(en)$(ONO)_2$] with Ac-HAAAH-NH_2 (**1**) in water.

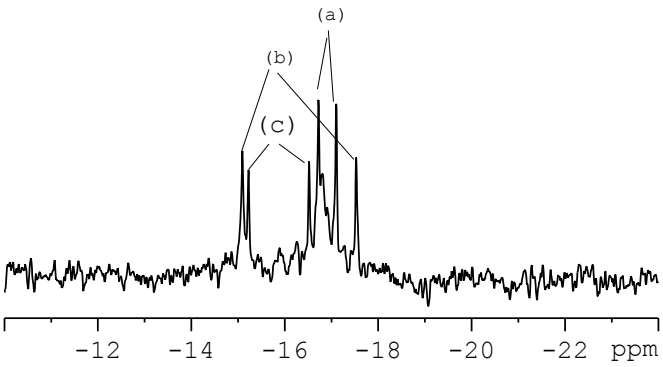

Figure S3. 40.5 MHz ^{15}N (dept) NMR spectrum shows three sets of peaks labeled as (a), (b) and (c) corresponding to three isomers of $[Pd(en)(peptide)]^{2+}$, **2a**, **2b** and **2c** in 90% H_2O 10% D_2O.

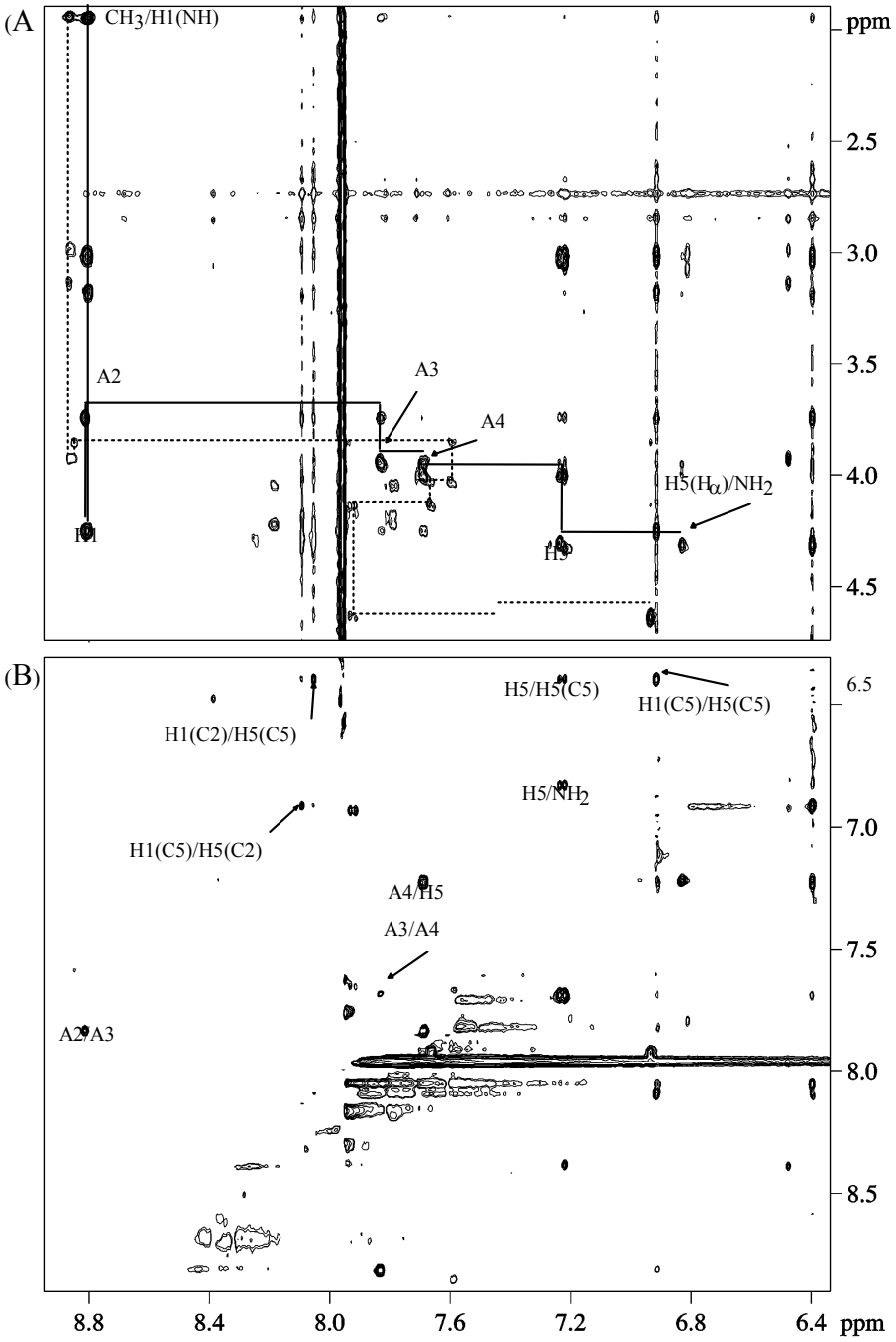

Figure S4. 500 MHz T-ROESY spectrum (298 K) for **2a** and **2b** in dmf-d^7 (mixing time 250 ms, spin-lock 16dB (3kHz)). (A) Sequential connectivity for the major product **2a** (solid line) and a linkage isomer **2b** (dashed line). The sequential connectivity for the less

abundant linkage isomer **2c** is not shown. Intra-residue NH-CHα cross-peaks are labeled for His (H1, H5) and Ala (A2, A3, A4) residues of **2a**. Sequential cross-peaks from N-terminal acetyl (CH_3) and C-terminal amide (NH_2) groups are also shown. (B) Amide NH-NH cross-peaks are labeled by their residue numbers in **2a** and aromatic His cross-peaks are labeled by residue number and imidazole ring position (C2 or C5).

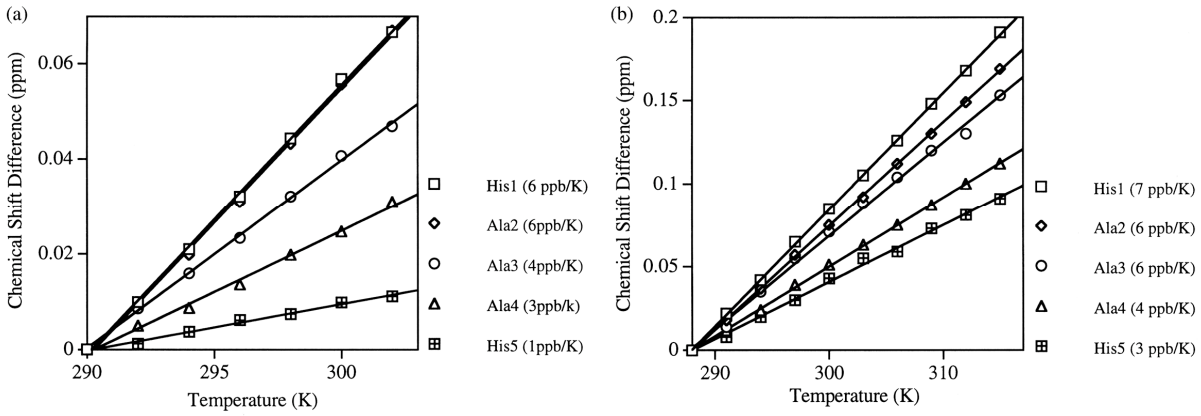

Figure S5. Temperature dependence of the amide NH chemical shifts for **2a**. Line slopes indicating temperature coefficients (Δδ/T) for each residue are shown (in brackets) in the legend. (a) in dmf-d^7 and (b) in 90% H_2O 10% D_2O.

A/ B/

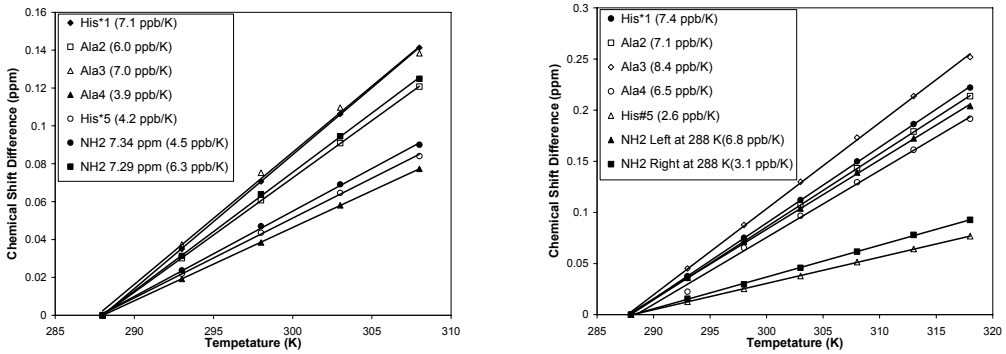

Figure S6. Temperature dependence of the amide NH chemical shifts in 90% H_2O 10% D_2O**.** (A) for **7** and (B) for **8**. Line slopes indicating temperature coefficients ($\Delta\delta/T$) for each residue are shown (in brackets) in the inserts.

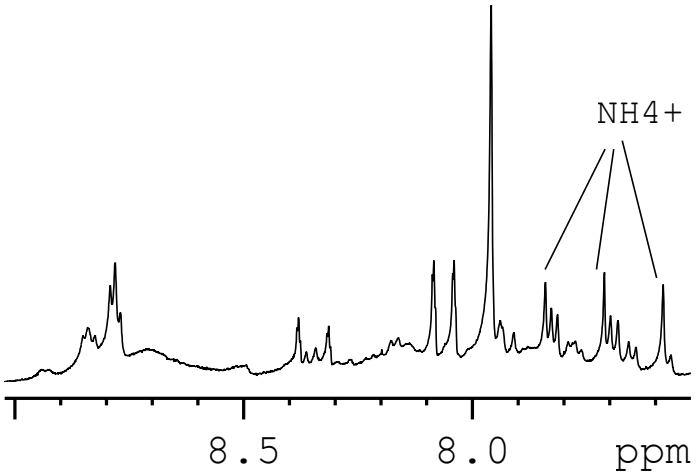

Figure S7. 500 MHz ^{1}H NMR spectrum shows the signal for NH_4^+ ion in DMF solution for reaction between **1** and [Pd(en)(ONO_2)$_2$] aged for 7 days. Approximately 50% of the peptide H5-CO-NH2 has been hydrolysed to peptide-H5-CO_2H and NH_4^+.

Table S1 ^{1}H chemical shifts for free peptide **3,4, 5** and **6** in dmf-d^{7}

3	**NH**	**H_α**	**H_β**	**Other**
Ac-His*1	8.376	4.722	3.075, 3.262	CH_3 1.861; N-CH_3 3.901; H2 8.908; H5 7.442
Ala2	8.554	4.264	1.271	
Ala3	8.110	4.227	1.260	
Ala4	7.944	4.200	1.210	
His*5-NH_2	7.960	4.643	3.044, 3.294	N-CH_3 3.922; H2 8.921; H5 7.382; NH_2 7.476, 7.296

4	**NH**	**H_α**	**H_β**	**Other**
Ac-His*1	8.471	4.734	3.264, 3.109	CH_3 1.850; N-CH_3 3.750; H2 8.987; H5 7.475
Ala2	8.684	4.277	1.283	
Ala3	8.249	4.231	1.283	
Ala4	7.956	4.184	1.244	
His$^{\#}$5-NH_2	8.034	4.602	3.279, 3.024	N-CH_3 3.650; H2 8.883; H5 7.438; NH_2 7.361, 7.228

5	**NH**	**H_α**	**H_β**	**Other**
Ac-His$^{\#}$1	8.307	4.606	3.050, 3.166	CH_3 1.860; N-CH_3 3.871; H2 8.722; H5 7.411
Ala2	8.526	4.211	1.279	
Ala3	8.440	4.234	1.279	
Ala4	7.932	4.180	1.209	
His*5-NH_2	7.921	4.636	3.066, 3.298	N-CH_3 3.942; H2 9.008; H5 7.444; NH_2 7.444, 7.308

6	**NH**	**H_α**	**H_β**	**Other**
Ac-His$^{\#}$1	8.346	4.606	3.058, 3.192	CH_3 1.860; N-CH_3 3.912; H2 8.753; H5 7.428
Ala2	8.592	4.224	1.291	
Ala3	8.547	4.210	1.291	
Ala4	7.901	4.160	1.234	
His$^{\#}$5-NH_2	7.952	4.570	3.023, 3.291	N-CH_3 3.879; H2 8.929; H5 7.473; NH_2 7.297, 7.251

Table S2 ^{15}N NMR chemical shift assignments for Pd(II) complexes and metallopeptides in (top) 90% H_2O 10% D_2O and (bottom) DMF at 298K.

Complexes in Water[a]	pH	δ_N	Ligand trans
$[Pd(^{15}en)(OH_2)_2]^{2+}$	2.0	-27.4	OH_2
$[Pd(^{15}en)(OH_2)(OH)]^{+}$	6.5	-24.3	OH_2
		-29.0	^{-}OH
$[Pd(^{15}en)(OH)_2]$	6.5	-29.5	^{-}OH
$[Pd(^{15}en)_2]^{2+}$	4	-20.0	$NH_2(CH_2)_2NH_2$
$[Pd(^{15}en)$(N1,N1-peptide)$]^{2+}$ (**2a**)	4	-16.8	N1-His1
		-17.2	N1-His5
$[Pd(^{15}en)$(N1,N3-peptide)$]^{2+}$ (**2b**)	4	-15.3	N3-His5
		-16.6	N1-His1
$[Pd(^{15}en)$(N3,N1-peptide)$]^{2+}$ (**2c**)	4	-15.2	N3-His1
		-17.6	N1-His5

Complexes in DMF[a]	δ_N	Ligand trans
$[Pd(^{15}en)(ONO_2)_2]$	-24.7	ONO_2^-
$[Pd(^{15}en)(ONO_2)$(O-DMF)$]^{+}$	-24.7	ONO_2^-
	-26.3	O-DMF
$[Pd(^{15}en)$(O-DMF)$_2]^{2+}$	-26.3	O-DMF
$[Pd(^{15}en)(ONO_2)(Cl)]$	-24.7	ONO_2^-
	-16.7	Cl^-
$[Pd(^{15}en)_2]^{2+}$	-18.8	^{15}en
$[Pd(^{15}en)$(HAAAH-*N*1,*N*1)$]^{2+}$ (**2a**)	-15.6	N1-H1
	-16.2	N1-H5
$[Pd(^{15}en)$(HAAAH-*N*1,*N*3)$]^{2+}$ (**2b**)	-14.8	N3-H5
	-16.0	N1-H1
$[Pd(^{15}en)$(HAAAH-*N*3,*N*1)$]^{2+}$ (**2c**)	-14.7	N3-H1
	-16.6	N1-H5
$[Pd(^{15}en)(H^*AAAH^*)]^{2+}$ (**7**)	-16.01	N1-H*1
	-16.38	N1-H*5
$[Pd(^{15}en)(H^*AAAH^{\#})]^{2+}$ (**8**)	-14.99	N1-H*1
	-15.92	N3-H$^{\#}$5
$[Pd(^{15}en)(H^{\#}AAAH^*)]^{2+}$ (**9**)	-14.56	N3-H$^{\#}$1
	-16.56	N1-H*5

$[Pd(^{15}en)(H^{\#}AAAH^{\#})]^{2+}$ (**10**)	-15.51 -1563	N3-$H^{\#}$1 N3-$H^{\#}$5

[a] $^{15}en = {}^{15}\mathbf{N}H_2(CH_2)_2{}^{15}\mathbf{N}H_2$
$DMF = (CH_3)_2NCHO$
$HAAAH = Ac\text{-}HAAAH\text{-}NH_2$
H^{*} = N3-Methyl histidine
$H^{\#}$ = N1-Methyl histidine

Table S3 ^{1}H and ^{13}C chemical shifts for free peptide, Ac-HAAAH-NH_2 (**1**), complexes (**2a**), (**2b**) and (**2c**) in Water and DMF-d^7 at 298K

Complexes in water		**Ac-HAAAH-NH_2**		(**2a**)[a]		(**2b**)[b]		(**2c**)[c]	
Residues		δ_H	δ_C	δ_H	δ_C	δ_H	δ_C	δ_H	δ_C
His1	N-H	8.375	---	8.411	---	8.450	---	8.377	---
	Cα-H	4.562	52.94	4.258	55.03	4.663	55.34	4.099	53.33
	CH_2	3.128	26.85	3.003	26.40	3.232	26.43	2.923	30.00
	C=O	---	174.48	---	173.06	---	172.80	---	173.16
Imidazole atoms	C2-H	8.556	134.07	7.707	137.24	8.033	137.48	7.591	137.56
	C4	---	128.94	---	128.04	---	127.72	---	125.77
	C5-H	7.584	117.74	6.572	126.03	6.975	125.77	6.603	116.65
His5	N-H	8.412	---	7.645	---	7.884	---	7.928	---
	Cα-H	4.546	52.63	4.489	53.97	4.489	52.56	4.382	52.42
	CH_2	3.176	26.77	3.058	26.66	3.013	26.37	3.023	29.37
	C=O	---	174.61	---	174.88	---	174.67	---	174.56
Imidazole atoms	C2-H	8.556	134.02	7.612	137.23	7.974	137.35	7.410	137.28
	C4	---	128.91	---	127.18	---	125.86	---	126.88
	C5-H	7.588	117.71	6.745	125.10	7.012	116.29	6.471	125.39
Ala2	N-H	8.394	---	8.265	---	8.321	---	8.200	---
	Cα-H	4.160	50.19	3.849	51.67	3.945	51.57	3.906	50.53
	C=O	---	175.19	---	175.64	---	175.57	---	175.45
	CH_3	1.317	16.89	1.288	15.82	1.307	15.83	1.241	15.71
Ala3	N-H	8.300	---	7.783	---	7.900	---	8.082	---
	Cα-H	4.145	50.11	4.134	51.17	4.215	51.33	4.090	49.94
	C=O	---	175.26	---	176.13	---	176.10	---	175.93
	CH_3	1.326	16.86	1.360	15.96	1.279	15.88	1.341	15.96
Ala4	N-H	8.256	---	7.817	---	7.913	---	7.963	---
	Cα-H	4.141	49.96	4.133	50.27	4.115	50.97	4.222	49.77
	C=O	---	175.07	---	174.93	---	175.04	---	175.03
	CH_3	1.289	16.76	1.198	16.29	1.184	16.12	1.284	16.76
Acetyl	CH_3	1.943	22.09	1.967	21.93	1.913	21.82	1.937	21.99
	C=O	---	172.20	---	163.23	---	162.94	---	162.65
NH_2	N-H	7.548	---	7.334	---	7.384	---	7.385	---
		7.177		7.194		7.165		*	
Ethylenediamine (en)	CH_2	---	---	2.594	46.86	2.641	47.13	2.824	47.62

Complexes in DMF		**1**		**2a**		**2b**		**2c**	
		δ_H	δ_C	δ_H	δ_C	δ_H	δ_C	δ_H	δ_C
His1	N-H	8.35	---	8.79	---	8.77	---	8.34	---
	Cα-H	4.66	53.63	4.26	56.54	3.93	57.60	5.18	*
	CH_2	3.02	28.85	3.14	27.17	3.08	31.33	3.20	27.20
	C=O	---	172.07	---	173.89	---	175.30	---	*
	C2-H	9.00	134.89	8.06	138.44	7.97	137.75	8.28	138.33
Imidazole atoms	C4	---	131.07	---	128.46	---	128.15	---	137.05
	C5-H	7.48	118.20	6.92	126.77	6.49	126.20	7.24	117.50
His5	N-H	7.94	---	7.22	---	7.88	---	7.74	---
	Cα-H	4.70	52.81	4.32	53.50	4.67	51.92	4.35	53.20
	CH_2	3.04	28.84	3.03	27.78	*	31.30	*	26.98
	C=O	---	172.80	---	173.43	---	*	---	173.30
	C2-H	8.96	134.77	8.09	138.33	8.35	138.44	7.94	138.13
Imidazole atoms	C4	---	130.93	---	130.21	---	139.00	---	129.38
	C5-H	7.46	118.13	6.40	125.10	6.94	115.00	6.80	126.70
Ala2	N-H	8.57	---	8.80	---	8.78	---	8.92	---
	Cα-H	4.30	50.73	3.75	53.05	3.87	52.43	4.19	50.83
	C=O	---	174.50	---	176.50	---	174.95	---	173.30
	CH_3	1.29	17.48	1.30	16.37	1.32	16.96	1.38	16.95
Ala3	N-H	8.40	---	7.83	---	7.79	---	7.75	---
	Cα-H	4.30	50.38	3.95	52.14	4.06	51.54	4.20	49.81
	C=O	---	173.80	---	175.39	---	174.05	---	173.92
	CH_3	1.28	17.44	1.34	16.48	1.31	17.63	1.25	18.30
Ala4	N-H	7.97	---	7.68	---	7.63	---	8.13	---
	Cα-H	4.23	50.28	4.01	50.83	4.15	51.24	4.05	50.62
	C=O	---	173.13	---	173.56	---	174.30	---	174.03
	CH_3	1.22	17.34	1.24	16.60	1.16	17.65	1.23	16.37
Acetyl	CH_3	1.86	22.65	1.95	22.72	1.94	22.62	1.83	*
	C=O	---	170.99	---	172.49	---	172.52	---	171.30
NH_2	N-H	7.30	---	6.84	---	6.95	---	7.18	---
Ethylenediamine (en)	CH_2	---	---	2.74	47.75	2.71	48.50	2.81	47.92

[a] (**2a**) $[Pd(en)(N1\text{-}AcHAAAH\text{-}NH_2\text{-}N1)]^{2+}$
[b] (**2b**) $[Pd(en)(N1\text{-}AcHAAAH\text{-}NH_2\text{-}N3)]^{2+}$
[c] (**2c**) $[Pd(en)(N3\text{-}AcHAAAH\text{-}NH_2\text{-}N1)]^{2+}$
--- Not applicable
* Not observed

Table S4 ^{1}H chemical shifts for free peptide **7,8, 9** and **10** in dmf-d^{7}

7	**NH**	**H_α**	**H_β**	**Other**
Ac-His*1	8.793	4.247	2.994, 3.181	CH_3 1.951; N-CH_3 3.706; H2 8.068; H5 6.926
Ala2	8.793	3.649	1.307	
Ala3	7.830	4.010	1.378	
Ala4	7.747	4.061	1.248	
His*5-NH_2	7.344	4.322	3.062, 3.149	N-CH_3 3.728; H2 8.101; H5 6.488; NH_2 7.334, 6.926

8	**NH**	**H_α**	**H_β**	**Other**
Ac-His*1	8.745	4.055	3.041, 2.681	CH_3 1.950; N-CH_3 3.660; H2 8.021; H5 6.556
Ala2	8.760	3.914	1.303	
Ala3	7.925	4.040	1.317	
Ala4	7.859	4.125	1.219	
His$^{\#}$5-NH_2	7.837	4.505	2.696, 2.858	N-CH_3 3.790; H2 8.310; H5 6.962; NH_2 7.379, 7.057

9	**NH**	**H_α**	**H_β**	**Other**
Ac-His$^{\#}$1	8.386	5.069	3.117, 3.268	CH_3 1.850; N-CH_3 3.750; H2 8.263; H5 7.258
Ala2	8.738	3.966	1.315	
Ala3	7.806	4.202	1.268	
Ala4	8.070	4.051	1.231	
His*5-NH_2	7.644	4.390	3.023, 3.277	N-CH_3 3.650; H2 8.021; H5 6.859; NH_2 7.258, 7.199

10	**NH**	**H_α**	**H_β**	**Other**
Ac-His$^{\#}$1	8.373	4.620	3.115, 3.301	CH_3 1.860; N-CH_3 3.871; H2 8.233; H5 7.082
Ala2	8.504	4.319	1.432	
Ala3	8.233	4.053	1.339	
Ala4	7.885	4.139	1.259	
His$^{\#}$5-NH_2	8.046	4.339	3.308, 3.507	N-CH_3 3.942; H2 8.281; H5 7.082; NH_2 7.444, 7.308

Table S5. NOE derived distance and $^{3}J_{NHCH\alpha}$ derived ϕ–angle restraints use for calculating the solution structure of **2a** in dmf-d^{7} (A) and in water (B).

(A)

Atom A	Atom B	Upper Distance Constraint (Å) & Comment
Ac-CH_3	His1-NH	4.2 Strong + 1.5 Å correction
Ac-CH_3	Ala3-NH	7.5 Very weak + 1.5 Å correction
His1-Hα	His1-NH	3.5 Medium
His1-Hα	Ala2-NH	3.5 Medium
His1-Hα	His1-H5	5.0 Weak
His1-Hα	Ala3-NH	6.0 Very Weak
His1-Hα	Ala4-NH	6.0 Very Weak
His1-Hβ1	His1-NH	3.5 Medium
His1-Hβ2	His1-NH	3.5 Medium
His1-H5	Ala2-Hα	6.0 Very Weak
His1-H5	Ala4-Hβ*	7.0 Very Weak + 1.0 Å correction
His1-H5	His5-H5	3.5 Medium
His1-H5	His5-H2	5.0 Weak
His1-H2	His5-H5	5.0 Weak
His1-H2	Ala4-Hβ*	7.0 Very Weak + 1.0 Å correction
Ala2-Hα	Ala2-NH	3.5 Medium
Ala2-Hα	Ala3-NH	5.0 Weak
Ala2-Hα	Ala4-NH	6.0 Very Weak
Ala2-Hα	His5-NH	6.0 Very Weak
Ala2-Hα	His5-Hβ*	6.0 Weak + 1.0 Å correction
Ala2-Hα	His5-H5	3.5 Medium
Ala2-Hβ*	Ala2-NH	4.2 Strong + 1.5 Å correction
Ala2-Hβ*	Ala3-NH	6.5 Weak + 1.5 Å correction
Ala2-NH	Ala3-NH	3.5 Medium
Ala3-Hα	Ala3-NH	5.0 Weak
Ala3-Hα	Ala4-NH	5.0 Weak
Ala3-Hα	His5-NH	6.0 Very Weak
Ala3-Hα	His5-NH_2*	7.0 Very Weak + 1.5 Å correction
Ala3-Hβ*	Ala3-NH	4.2 Strong + 1.5 Å correction
Ala3-Hβ*	Ala4-NH	6.5 Weak + 1.5 Å correction

Ala3-NH	Ala4-Hβ*	7.5 Very Weak + 1.5 Å correction
Ala3-NH	Ala4-NH	3.5 Medium
Ala4-Hα	Ala4-NH	5.0 Weak
Ala4-Hα	His5-NH	5.0 Weak
Ala4-Hα	His5-NH_2*	6.5 Weak + 1.5 Å correction
Ala4-Hβ*	Ala4-NH	5.0 Medium + 1.5 Å correction
Ala4-Hβ*	His5-NH	6.5 Weak + 1.5 Å correction
Ala4-Hβ*	His5-H5	6.5 Weak + 1.5 Å correction
Ala4-Hβ*	His5-H2	7.5 Very Weak + 1.5 Å correction
Ala4-NH	His5-NH	3.5 Medium
His5-Hα	His5-NH	3.5 Medium
His5-Hα	His5-H5	5.0 Weak
His5-Hα	His5-NH_2*	6.0 Weak + 1.0 Å correction
His5-Hβ*	His5-NH	5.0 Medium + 1.5 Å correction
His5-H5	His5-NH	5.0 Weak

ϕ-angle restraints

Residue	$^3J_{NHCH\alpha}$	ϕ-restraint
His1	4.2	-65 ± 30˚
Ala2	3.5	-65 ± 30˚
Ala3	5.3	-65 ± 30˚

H-Bond restraints

His5-N<u>H</u>	His1-C<u>O</u>	2.3 (Lower limit 1.58 Å)
His5-<u>N</u>H	His1-C<u>O</u>	3.2 (Lower limit 1.58 Å)
Ala4-N<u>H</u>	Ac-C<u>O</u>	2.3 (Lower limit 1.58 Å)
Ala4-<u>N</u>H	Ac-C<u>O</u>	3.2 (Lower limit 1.58 Å)

(B)

Atom A	Atom B	Upper Distance Constraint (Å) & Comment
Ac-CH_3	His1-NH	4.2 Strong + 1.5 Å correction
Ac-CH_3	Ala3-NH	7.5 Very weak + 1.5 Å correction
His1-Hα	His1-NH	3.5 Medium
His1-Hα	Ala2-NH	3.5 Medium
His1-Hα	His1-H5	5.0 Weak

His1-Hα	Ala3-NH	6.0 Very Weak
His1-Hα	Ala4-NH	5.0 Very Weak
His1-Hβ1	His1-NH	3.5 Medium
His1-Hβ2	His1-NH	3.5 Medium
His1-H5	Ala2-HN	6.0 Very Weak
His1-H5	Ala4-Hβ#	7.0 Very Weak + 1.0 Å correction
His1-H5	His5-H5	3.5 Medium
His1-H5	His5-H2	5.0 Weak
His1-H2	His5-H5	5.0 Weak
His1-HN	Ala2-HN	5.0 Weak
Ala2-Hα	Ala2-NH	3.5 Medium
Ala2-Hα	Ala3-NH	3.5 Medium
Ala2-Hα	His5-NH	5.0 Weak
Ala2-Hα	His5-Hβ#	7.0 Very Weak + 1.0 Å correction
Ala2-Hα	His5-H5	5.0 Weak
Ala2-Hβ#	Ala2-NH	5.0 Weak + 1.5 Å correction
Ala2-NH	Ala3-NH	3.5 Medium
Ala3-Hα	Ala3-NH	2.7 Strong
Ala3-Hα	Ala4-NH	2.7 Strong
Ala3-Hα	His5-NH	7.0 Very Weak
Ala3-Hβ#	Ala3-NH	4.2 Strong + 1.5 Å correction
Ala3-Hβ#	Ala4-NH	7.5 Weak + 1.5 Å correction
Ala3-NH	Ala4-Hβ#	6.5 Very Weak + 1.0 Å correction
Ala4-Hα	Ala4-NH	2.7 Strong
Ala4-Hα	His5-NH	5.0 Weak
Ala4-Hα	His5-NH_2#	7.5 Weak + 1.0 Å correction
Ala4-Hβ#	Ala4-NH	4.2 Strong + 1.0 Å correction
Ala4-Hβ#	His5-NH	6.5 Weak + 1.5 Å correction
Ala4-Hβ#	His5-H5	6.5 Weak + 1.5 Å correction
Ala4-Hβ#	His5-H2	7.5 Very Weak + 1.5 Å correction
Ala4-NH	His5-NH	3.5 Medium
His5-Hα	His5-NH	3.5 Medium
His5-H□	His5-H5	5.0 Weak
His5-Hα	His5-NH_2#	7.0 Weak + 1.0 Å correction
His5-Hβ#	His5-NH	5.0 Medium + 1.5 Å correction
His5-H5	His5-NH	5.0 Weak

ϕ-angle restraints

Residue	$^3J_{NHCH\alpha}$ (Hz)	ϕ-restraint
His1	4.9	-60 ± 30˚
Ala2	4.0	-60 ± 30˚
Ala3	5.0	-60 ± 30˚

H-Bond restraints		Distance (Å)
His5-N<u>H</u>	His1-C<u>O</u>	2.3 (Lower limit 1.58 Å)
His5-<u>N</u>H	His1-C<u>O</u>	3.2 (Lower limit 1.58 Å)
Ala4-N<u>H</u>	Ac-C<u>O</u>	2.3 (Lower limit 1.58 Å)
Ala4-<u>N</u>H	Ac-C<u>O</u>	3.2 (Lower limit 1.58 Å)

Table S6 $^{3}J_{NHCH\alpha}$ coupling constants for **2a, 7, 8, 9** im DMF-d^7 and 10%D_2O 90% H_2O

	$^{3}J_{NHCH\alpha}$ (Hz) in DMF/Water				
Complexes	His1	Ala2	Ala3	Ala4	His5
2a	4.2/4.9	3.5/4.0	5.3/5.0	6.3/6.0	8.4/7.5
7	4.2/4.8	4.2/4.0	5.2/4.6	6.6/6.5	7.6/7.4
8	4.5/4.8	5.2/4.1	4.7/---	6.1/5.3	8.7/6.1
9	7.6/6.6	6.1/4.4	6.1/6.2	6.1/6.3	8.5/7.6

---: Broad signal.

Table S7 NOE table for the complex **7** with two N3-methylated imidazole rings in dmf-d^7 and water.

		DMF	Water
Atom A	**Atom B**	**Pd + H*AAAH***	**Pd + H*AAAH***
Ac - CH3	His 1 - NH	Strong (18)	Strong (18)
Ac - CH3	His 1 - C2H		Medium (15)
Ac - CH3	Ala 2 - NH		Weak (9)
Ac - CH3	Ala 3 - NH	Very weak (5)	Weak (10)
Ac - CH3	Ala 4 - NH		Weak (10)
His 1 - Hα	His 1 - NH	Strong (17)	Strong (17)
His 1 - Hα	His 1 - Hβ1		Strong (18)
His 1 - Hα	His 1 - Hβ2		Strong (18)
His 1 - Hα	His 1 - C5H	Strong (17)	Strong (18)
His 1 - Hα	Ala 2 - NH	Strong (17)	Strong (18)
His 1 - Hα	Ala 2 - Hα		Strong (18)
His 1 - Hα	Ala 3 - NH	Very weak (4)	Weak (10)
His 1 - Hα	Ala 4 - NH	Weak (7)	Weak (9)
His 1 - Hβ1	His 1 - NH	Medium (15)	Strong (17)
His 1 - Hβ1	His 1 - C5H	Strong (16)	Strong (18)
His 1 - Hβ1	Ala 2 - NH		Medium (12)
His 1 - Hβ1	Ala 3 - NH		Very Weak (2)
His 1 - Hβ2	His 1 - NH	Medium (15)	Strong (17)
His 1 - Hβ2	His 1 - C5H	Medium (12)	Strong (18)
His 1 - Hβ2	Ala 2 - NH		Medium (12)
His 1 - Hβ2	Ala 3 - NH		Very Weak (2)
His 1 - C2H	His 1 - C5H	Weak (9)	Strong (18)
His 1 - C2H	His 1 - CH3	Strong (18)	Strong (18)
His 1 - C2H	Ala 4 - Hβ*	Weak (9)	Medium (15)
His 1 - C2H	His 5 - C5H	Medium (12)	Strong (17)
His 1 - C2H	en - NH2		Strong (18)
His 1 - C5H	His 1 - NH	Weak (8)	
His 1 - C5H	His 1 - CH3	Weak (10)	Medium (14)
His 1 - C5H	Ala 2 - NH		Weak (10)
His 1 - C5H	Ala 2 - Hα		Medium (14)

His 1 - C5H	Ala 3 - NH		Weak (8)
His 1 - C5H	Ala 3 - Hβ*	Very Weak (3)	Medium (12)
His 1 - C5H	Ala 3/4 - Hα	Weak (9) **???**	
His 1 - C5H	Ala 4 - Hα		Medium (12)
His 1 - C5H	Ala 4 - Hβ*	Medium (12)	Medium (15)
His 1 - C5H	His 5 - NH	Very weak (4)	
His 1 - C5H	His 5 - Hα	Medium (14)	
His 1 - C5H	His 5 - C2H	Medium (14)	Strong (18)
His 1 - C5H	His 5 - C5H	Strong (16)	
His 1 - C5H	His 5 - CH3		Medium (14)
His 1 - C5H	His 5 - NH2*	Very weak (2)	
His 1 - C5H	en - NH2		Strong (18)
Ala 2 - Hα	Ala 2 - NH	Medium (13)	Strong (18)
Ala 2 - Hα	Ala 2 - Hβ*		Strong (18)
Ala 2 - Hα	Ala 3 - NH	Weak (10)	Strong (17)
Ala 2 - Hα	Ala 4 - NH	Very weak (3)	Weak (11)
Ala 2 - Hα	His 5 - NH	Very weak (5)	Weak (8)
Ala 2 - Hα	His 5 - Hβ*	Weak (11)	Very Weak (6 & 4)
Ala 2 - Hα	His 5 - C5H	Medium (14)	Medium (13)
Ala 2 - Hβ*	Ala 2 - NH	Strong (17)	Strong (18)
Ala 2 - Hβ*	Ala 3 - NH	Weak (11)	Medium (15)
Ala 2 - Hβ*	His 5 - C2H	Very weak (4)	
Ala 2 - NH	Ala 3 - NH	Strong (16)	Strong (17)
Ala 3 - Hα	Ala 3 - NH	Medium (13)	Strong (18)
Ala 3 - Hα	Ala 3 - Hβ*		Strong (17)
Ala 3 - Hα	Ala 4 - NH	Medium (13)	Strong (18)
Ala 3 - Hα	His 5 - NH	Medium (12)	Maybe (too close to Ala 3)
Ala 3 - Hα	His 5 - NH2*	Very weak (mixed peak)	
Ala 3 - Hβ*	Ala 3 - NH	Strong (17)	Strong (18)
Ala 3 - Hβ*	Ala 4 - NH	Weak (10)	Medium (14)
Ala 3 - Hβ*	Ala 4 - Hα		Medium (17)
Ala 3 - Hβ*	His 5 - C2H	Very weak (2)	
Ala 3 - Hβ*	His 5 - C5H	Very weak (5)	Weak (10)
Ala 3 - NH	Ala 4 - NH	Medium (14)	

Ala 3 - NH	His 5 - Hβ1		Very Weak (4)
Ala 4 - Hα	Ala 4 - NH	Medium (13)	Strong (18)
Ala 4 - Hα	Ala 4 - Hβ*		Medium (15)
Ala 4 - Hα	His 5 - NH	Medium (12)	Strong (18)
Ala 4 - Hα	His 5 - C5H		Medium (14)
Ala 4 - Hα	His 5 - NH2*	Very weak	Weak (9 & 4)
Ala 4 - Hβ*	Ala 4 - NH	Strong (17)	Strong (18)
Ala 4 - Hβ*	His 5 - NH	Weak (7)	Medium (12)
Ala 4 - Hβ*	His 5 - C2H	Very weak (2)	
Ala 4 - Hβ*	His 5 - C5H	Medium (12)	Strong (17)
Ala 4 - NH	His 5 - NH	Medium (15)	Strong (18)
His 5 - Hα	His 5 - NH	Medium (13)	Strong (18)
His 5 - Hα	His 5 - Hβ1		Strong (18)
His 5 - Hα	His 5 - Hβ2		Strong (18)
His 5 - Hα	His 5 - C5H	Strong (18)	Strong (18)
His 5 - Hα	His 5 - NH2*	Very weak	Medium (16 & 10)
His 5 - Hβ1	His 5 - NH	Medium (14)	Strong (18)
His 5 - Hβ1	His 5 - C5H	Medium (12)	Strong (18)
His 5 - Hβ1	His 5 - NH2*		Weak (8 & 4)
His 5 - Hβ2	His 5 - NH	Medium (14)	Weak (10)
His 5 - Hβ2	His 5 - C5H	Weak (11)	Medium (13)
His 5 - Hβ2	His 5 - NH2*		Weak (8 & 5)
His 5 - C2H	His 5 - C5H	Weak (9)	Medium (15)
His 5 - C2H	His 5 - CH3	Strong (18)	Strong (18)
His 5 - C2H	en - NH2		Strong (18)
His 5 - C5H	His 5 - NH	Weak (10)	
His 5 - C5H	His 5 - CH3	Weak (10)	
His 5 - C5H	en - NH2		Strong (18)