



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 22, 2022 – 05:01 am BST

PDB ID : 7QU8
Title : ADGRG3/GPR97 Extracellular Region
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Deposited on : 2022-01-17
Resolution : 3.37 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at <http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.30
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0267
CCP4 : 7.1.010 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.30

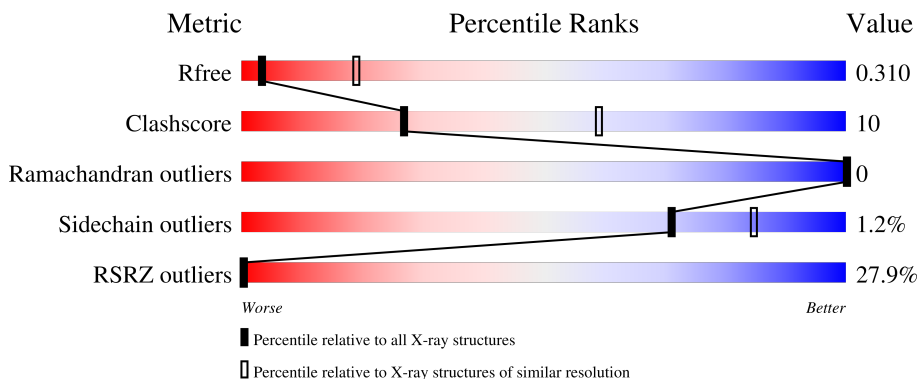
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.37 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1691 (3.46-3.30)
Clashscore	141614	1762 (3.46-3.30)
Ramachandran outliers	138981	1732 (3.46-3.30)
Sidechain outliers	138945	1731 (3.46-3.30)
RSRZ outliers	127900	1635 (3.46-3.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	272	
1	B	272	
1	C	272	
1	D	272	

2 Entry composition i

There is only 1 type of molecule in this entry. The entry contains 3640 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Adhesion G protein-coupled receptor G3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	222	Total 1729	C 1082	N 306	O 327	S 14	0	0	0
1	B	222	Total 1729	C 1082	N 306	O 327	S 14	0	0	0
1	C	11	Total 91	C 64	N 14	O 13		0	0	0
1	D	11	Total 91	C 64	N 14	O 13		0	0	0

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	265	THR	-	expression tag	UNP Q86Y34
A	266	LYS	-	expression tag	UNP Q86Y34
A	267	HIS	-	expression tag	UNP Q86Y34
A	268	HIS	-	expression tag	UNP Q86Y34
A	269	HIS	-	expression tag	UNP Q86Y34
A	270	HIS	-	expression tag	UNP Q86Y34
A	271	HIS	-	expression tag	UNP Q86Y34
A	272	HIS	-	expression tag	UNP Q86Y34
B	265	THR	-	expression tag	UNP Q86Y34
B	266	LYS	-	expression tag	UNP Q86Y34
B	267	HIS	-	expression tag	UNP Q86Y34
B	268	HIS	-	expression tag	UNP Q86Y34
B	269	HIS	-	expression tag	UNP Q86Y34
B	270	HIS	-	expression tag	UNP Q86Y34
B	271	HIS	-	expression tag	UNP Q86Y34
B	272	HIS	-	expression tag	UNP Q86Y34
C	265	THR	-	expression tag	UNP Q86Y34
C	266	LYS	-	expression tag	UNP Q86Y34
C	267	HIS	-	expression tag	UNP Q86Y34
C	268	HIS	-	expression tag	UNP Q86Y34
C	269	HIS	-	expression tag	UNP Q86Y34

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Chain	Residue	Modelled	Actual	Comment	Reference
C	270	HIS	-	expression tag	UNP Q86Y34
C	271	HIS	-	expression tag	UNP Q86Y34
C	272	HIS	-	expression tag	UNP Q86Y34
D	265	THR	-	expression tag	UNP Q86Y34
D	266	LYS	-	expression tag	UNP Q86Y34
D	267	HIS	-	expression tag	UNP Q86Y34
D	268	HIS	-	expression tag	UNP Q86Y34
D	269	HIS	-	expression tag	UNP Q86Y34
D	270	HIS	-	expression tag	UNP Q86Y34
D	271	HIS	-	expression tag	UNP Q86Y34
D	272	HIS	-	expression tag	UNP Q86Y34

4 Data and refinement statistics

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α , β , γ	96.28Å 96.28Å 172.84Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	84.11 – 3.37 84.11 – 3.37	Depositor EDS
% Data completeness (in resolution range)	99.4 (84.11-3.37) 99.4 (84.11-3.37)	Depositor EDS
R_{merge}	0.03	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.94 (at 3.41Å)	Xtrriage
Refinement program	BUSTER 2.10.3, REFMAC 5.8.0267	Depositor
R, R_{free}	0.266 , 0.313 0.269 , 0.310	Depositor DCC
R_{free} test set	1040 reflections (8.66%)	wwPDB-VP
Wilson B-factor (Å ²)	110.5	Xtrriage
Anisotropy	0.159	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	(Not available) , (Not available)	EDS
L-test for twinning ²	$\langle L \rangle = 0.42$, $\langle L^2 \rangle = 0.25$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.89	EDS
Total number of atoms	3640	wwPDB-VP
Average B, all atoms (Å ²)	134.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.59% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.31	0/1766	0.65	0/2396
1	B	0.31	0/1766	0.64	0/2396
1	C	0.31	0/93	0.71	0/126
1	D	0.31	0/93	0.73	0/126
All	All	0.31	0/3718	0.65	0/5044

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1729	0	1707	39	0
1	B	1729	0	1707	37	0
1	C	91	0	100	7	0
1	D	91	0	100	6	0
All	All	3640	0	3614	74	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 10.

All (74) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:181:LEU:HD11	1:D:251:PHE:HB3	1.25	1.19
1:A:164:LYS:HB3	1:A:168:LEU:HD11	1.24	1.16
1:B:164:LYS:HB3	1:B:168:LEU:HD11	1.17	1.10
1:A:33:LEU:HD21	1:A:60:ASP:O	1.53	1.07
1:A:181:LEU:HD11	1:C:251:PHE:HB3	1.36	1.07
1:B:164:LYS:HB3	1:B:168:LEU:CD1	1.88	1.04
1:B:164:LYS:CB	1:B:168:LEU:HD11	1.88	1.03
1:B:33:LEU:HD21	1:B:60:ASP:O	1.59	1.01
1:A:164:LYS:HB3	1:A:168:LEU:CD1	1.89	1.01
1:A:164:LYS:CB	1:A:168:LEU:HD11	1.91	1.00
1:B:157:ILE:HD13	1:B:163:PHE:HB2	1.52	0.89
1:A:157:ILE:HD13	1:A:163:PHE:HB2	1.55	0.89
1:B:181:LEU:HD11	1:D:251:PHE:CB	2.03	0.88
1:A:104:ALA:H	1:A:135:LYS:HE2	1.43	0.84
1:B:104:ALA:H	1:B:135:LYS:HE2	1.43	0.82
1:A:214:THR:HG21	1:C:257:ARG:HH21	1.47	0.78
1:B:181:LEU:CD1	1:D:251:PHE:HB3	2.13	0.75
1:A:174:SER:HB2	1:C:256:LEU:O	1.87	0.74
1:B:174:SER:HB2	1:D:256:LEU:O	1.89	0.72
1:A:127:PRO:HG2	1:A:130:ARG:HB3	1.75	0.69
1:B:127:PRO:HG2	1:B:130:ARG:HB3	1.75	0.68
1:A:181:LEU:HD11	1:C:251:PHE:CB	2.20	0.68
1:A:157:ILE:HD13	1:A:163:PHE:CB	2.25	0.66
1:B:157:ILE:HD13	1:B:163:PHE:CB	2.25	0.66
1:B:157:ILE:CD1	1:B:163:PHE:HB2	2.26	0.64
1:A:157:ILE:CD1	1:A:163:PHE:HB2	2.28	0.60
1:A:104:ALA:H	1:A:135:LYS:CE	2.13	0.60
1:A:173:GLY:O	1:C:258:PRO:HD3	2.02	0.59
1:A:104:ALA:HA	1:A:135:LYS:HD2	1.85	0.59
1:A:164:LYS:HD2	1:A:168:LEU:HD11	1.86	0.58
1:B:104:ALA:HA	1:B:135:LYS:HD2	1.86	0.57
1:B:104:ALA:H	1:B:135:LYS:CE	2.14	0.56
1:A:164:LYS:CD	1:A:168:LEU:HD11	2.36	0.55
1:B:213:LEU:CD1	1:D:256:LEU:HG	2.37	0.55
1:A:231:GLU:HA	1:B:231:GLU:HA	1.90	0.54
1:B:164:LYS:HD2	1:B:168:LEU:HD11	1.92	0.51
1:A:164:LYS:HD2	1:A:168:LEU:CD1	2.42	0.49
1:B:164:LYS:HA	1:B:168:LEU:HD21	1.94	0.49
1:B:164:LYS:CD	1:B:168:LEU:HD11	2.42	0.49
1:A:181:LEU:CD1	1:C:251:PHE:HB3	2.26	0.48
1:A:157:ILE:CD1	1:A:163:PHE:CB	2.89	0.47
1:A:164:LYS:CG	1:A:168:LEU:HD11	2.44	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:164:LYS:HA	1:A:168:LEU:HD21	1.96	0.47
1:A:214:THR:O	1:C:255:LEU:HB3	2.15	0.46
1:B:67:LEU:O	1:B:70:TYR:HB3	2.14	0.46
1:B:157:ILE:CD1	1:B:163:PHE:CB	2.90	0.45
1:B:214:THR:HG21	1:D:257:ARG:HH21	1.81	0.45
1:B:221:THR:O	1:B:221:THR:OG1	2.31	0.45
1:A:55:ARG:HG3	1:A:56:GLN:N	2.31	0.45
1:B:55:ARG:HG3	1:B:56:GLN:N	2.32	0.45
1:B:99:LEU:HD11	1:B:150:LEU:HD22	1.98	0.44
1:A:99:LEU:HD11	1:A:150:LEU:HD22	1.99	0.44
1:A:67:LEU:O	1:A:70:TYR:HB3	2.17	0.44
1:B:164:LYS:CG	1:B:168:LEU:HD11	2.45	0.44
1:B:164:LYS:HD2	1:B:168:LEU:CD1	2.47	0.44
1:B:33:LEU:HG	1:B:61:SER:O	2.18	0.43
1:B:111:LEU:HD11	1:B:131:VAL:HB	2.01	0.43
1:A:33:LEU:HG	1:A:61:SER:O	2.19	0.42
1:A:164:LYS:CA	1:A:168:LEU:HD11	2.48	0.42
1:B:224:THR:HG22	1:B:225:THR:HG23	2.02	0.42
1:A:93:LYS:HB2	1:A:154:ILE:HG23	2.02	0.42
1:A:193:LYS:NZ	1:B:214:THR:HG22	2.35	0.42
1:B:73:ASN:O	1:B:76:ALA:HB3	2.19	0.42
1:B:33:LEU:HD11	1:B:60:ASP:O	2.20	0.42
1:A:73:ASN:O	1:A:76:ALA:HB3	2.20	0.42
1:A:103:THR:HG21	1:A:107:PHE:CE2	2.55	0.42
1:B:93:LYS:HB2	1:B:154:ILE:HG23	2.02	0.41
1:A:111:LEU:HD11	1:A:131:VAL:HB	2.01	0.41
1:B:237:VAL:HA	1:B:242:THR:HG22	2.01	0.41
1:A:237:VAL:HA	1:A:242:THR:HG22	2.02	0.41
1:B:103:THR:HG21	1:B:107:PHE:CE2	2.56	0.41
1:A:33:LEU:CD2	1:A:60:ASP:O	2.44	0.41
1:A:33:LEU:HD11	1:A:60:ASP:O	2.22	0.40
1:A:224:THR:HG22	1:A:225:THR:HG23	2.02	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries

of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	220/272 (81%)	209 (95%)	11 (5%)	0	100	100
1	B	220/272 (81%)	207 (94%)	13 (6%)	0	100	100
1	C	9/272 (3%)	8 (89%)	1 (11%)	0	100	100
1	D	9/272 (3%)	8 (89%)	1 (11%)	0	100	100
All	All	458/1088 (42%)	432 (94%)	26 (6%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	199/242 (82%)	198 (100%)	1 (0%)	88	94
1	B	199/242 (82%)	197 (99%)	2 (1%)	76	87
1	C	10/242 (4%)	9 (90%)	1 (10%)	7	28
1	D	10/242 (4%)	9 (90%)	1 (10%)	7	28
All	All	418/968 (43%)	413 (99%)	5 (1%)	71	85

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	62	CYS
1	B	60	ASP
1	B	62	CYS
1	C	250	THR
1	D	250	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	222/272 (81%)	1.57	73 (32%) 0 0	77, 121, 212, 270	0
1	B	222/272 (81%)	1.35	51 (22%) 0 1	86, 124, 216, 256	0
1	C	11/272 (4%)	1.45	3 (27%) 0 0	81, 95, 137, 157	0
1	D	11/272 (4%)	1.58	3 (27%) 0 0	85, 94, 176, 182	0
All	All	466/1088 (42%)	1.46	130 (27%) 0 0	77, 123, 213, 270	0

All (130) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	172	ASP	10.2
1	A	148	VAL	7.6
1	B	191	VAL	7.6
1	A	190	HIS	6.8
1	B	174	SER	5.0
1	A	191	VAL	4.8
1	A	145	ARG	4.7
1	B	190	HIS	4.7
1	B	140	SER	4.7
1	A	249	LEU	4.6
1	B	60	ASP	4.5
1	B	145	ARG	4.5
1	A	107	PHE	4.5
1	A	95	LEU	4.2
1	B	168	LEU	4.2
1	B	249	LEU	4.0
1	A	171	GLY	4.0
1	A	100	SER	4.0
1	B	94	ALA	4.0
1	A	103	THR	3.8
1	B	243	VAL	3.8

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Mol	Chain	Res	Type	RSRZ
1	A	106	ASP	3.8
1	A	127	PRO	3.8
1	B	242	THR	3.8
1	A	99	LEU	3.6
1	B	63	ASN	3.5
1	A	189	MET	3.4
1	A	60	ASP	3.4
1	B	188	GLN	3.3
1	A	94	ALA	3.3
1	B	107	PHE	3.3
1	A	141	LEU	3.2
1	B	95	LEU	3.2
1	B	192	THR	3.2
1	A	119	GLN	3.2
1	B	99	LEU	3.2
1	A	147	VAL	3.2
1	A	97	GLN	3.2
1	A	138	PHE	3.2
1	A	185	SER	3.1
1	B	210	ASN	3.1
1	A	125	ASP	3.1
1	A	150	LEU	3.1
1	A	224	THR	3.0
1	A	139	ARG	3.0
1	A	149	ARG	3.0
1	D	254	LEU	3.0
1	A	155	LEU	2.9
1	A	108	TYR	2.9
1	D	256	LEU	2.9
1	A	85	GLN	2.9
1	A	92	LEU	2.8
1	A	133	LEU	2.8
1	A	109	PHE	2.8
1	A	200	ILE	2.8
1	B	147	VAL	2.8
1	B	236	GLU	2.8
1	A	225	THR	2.8
1	A	56	GLN	2.7
1	A	137	LEU	2.7
1	B	61	SER	2.7
1	B	169	GLY	2.7
1	A	63	ASN	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	157	ILE	2.7
1	B	194	LEU	2.7
1	A	84	THR	2.6
1	B	176	VAL	2.6
1	A	188	GLN	2.6
1	B	92	LEU	2.6
1	A	86	LYS	2.6
1	A	132	ARG	2.6
1	A	243	VAL	2.6
1	A	71	TRP	2.6
1	A	152	VAL	2.6
1	A	126	LYS	2.6
1	B	33	LEU	2.6
1	C	251	PHE	2.6
1	C	250	THR	2.6
1	A	123	ASP	2.6
1	B	162	LEU	2.6
1	B	30	ASN	2.5
1	A	168	LEU	2.5
1	B	96	VAL	2.5
1	C	252	PHE	2.5
1	B	152	VAL	2.5
1	A	111	LEU	2.5
1	B	138	PHE	2.4
1	A	153	THR	2.4
1	A	93	LYS	2.4
1	B	135	LYS	2.4
1	A	201	VAL	2.4
1	B	83	LEU	2.4
1	A	61	SER	2.3
1	B	200	ILE	2.3
1	B	109	PHE	2.3
1	B	228	TRP	2.3
1	B	86	LYS	2.3
1	A	248	HIS	2.3
1	B	244	CYS	2.3
1	B	97	GLN	2.3
1	A	46	ASP	2.3
1	B	28	PRO	2.3
1	B	237	VAL	2.3
1	A	118	ARG	2.3
1	B	180	ARG	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	131	VAL	2.3
1	B	118	ARG	2.3
1	D	251	PHE	2.2
1	A	184	LEU	2.2
1	B	67	LEU	2.2
1	A	180	ARG	2.2
1	A	166	PRO	2.2
1	A	102	ASN	2.2
1	A	144	ASN	2.2
1	A	134	PRO	2.2
1	B	85	GLN	2.1
1	A	213	LEU	2.1
1	B	248	HIS	2.1
1	A	157	ILE	2.1
1	A	91	PHE	2.1
1	A	75	GLU	2.1
1	B	110	SER	2.1
1	B	102	ASN	2.1
1	A	181	LEU	2.1
1	B	212	THR	2.1
1	A	135	LYS	2.0
1	A	173	GLY	2.0
1	A	130	ARG	2.0
1	A	33	LEU	2.0
1	A	42	PHE	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.