



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2024 – 06:46 AM EST

PDB ID : 3D8E
Title : Crystal structure of the human Fe65-PTB1 domain (trigonal crystal form)
Authors : Radzimanowski, J.; Ravaud, S.; Sinning, I.; Wild, K.
Deposited on : 2008-05-23
Resolution : 2.80 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 : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

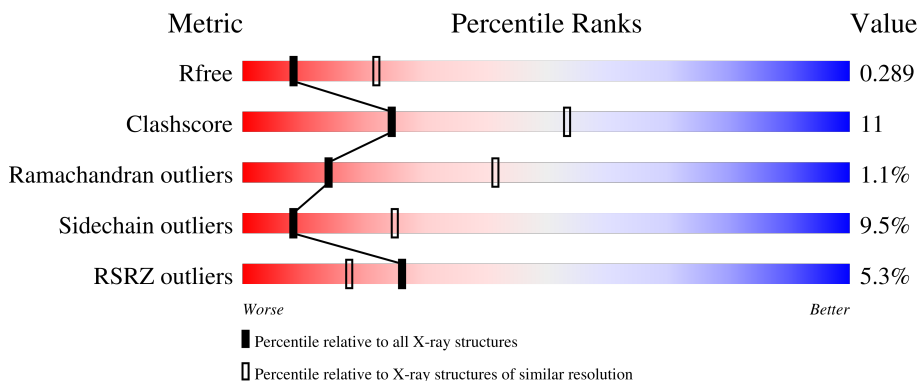
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	148	
1	B	148	
1	C	148	
1	D	148	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 3835 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 Amyloid beta A4 precursor protein-binding family B member 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	123	970	610	171	181	8	0	0	0
1	B	120	944	591	170	175	8	0	0	0
1	C	122	961	604	169	180	8	0	0	0
1	D	122	960	603	172	177	8	0	0	0

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	506	LEU	-	expression tag	UNP O00213
A	507	GLU	-	expression tag	UNP O00213
A	508	HIS	-	expression tag	UNP O00213
A	509	HIS	-	expression tag	UNP O00213
A	510	HIS	-	expression tag	UNP O00213
A	511	HIS	-	expression tag	UNP O00213
A	512	HIS	-	expression tag	UNP O00213
A	513	HIS	-	expression tag	UNP O00213
B	506	LEU	-	expression tag	UNP O00213
B	507	GLU	-	expression tag	UNP O00213
B	508	HIS	-	expression tag	UNP O00213
B	509	HIS	-	expression tag	UNP O00213
B	510	HIS	-	expression tag	UNP O00213
B	511	HIS	-	expression tag	UNP O00213
B	512	HIS	-	expression tag	UNP O00213
B	513	HIS	-	expression tag	UNP O00213
C	506	LEU	-	expression tag	UNP O00213
C	507	GLU	-	expression tag	UNP O00213
C	508	HIS	-	expression tag	UNP O00213
C	509	HIS	-	expression tag	UNP O00213

Continued on next page...

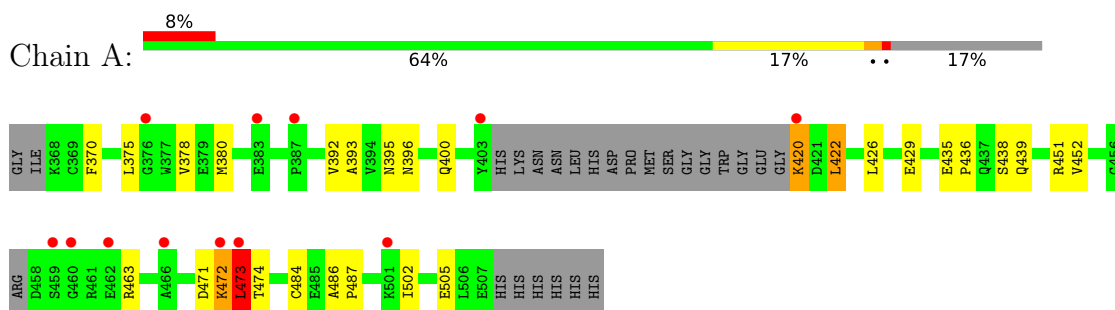
Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	510	HIS	-	expression tag	UNP O00213
C	511	HIS	-	expression tag	UNP O00213
C	512	HIS	-	expression tag	UNP O00213
C	513	HIS	-	expression tag	UNP O00213
D	506	LEU	-	expression tag	UNP O00213
D	507	GLU	-	expression tag	UNP O00213
D	508	HIS	-	expression tag	UNP O00213
D	509	HIS	-	expression tag	UNP O00213
D	510	HIS	-	expression tag	UNP O00213
D	511	HIS	-	expression tag	UNP O00213
D	512	HIS	-	expression tag	UNP O00213
D	513	HIS	-	expression tag	UNP O00213

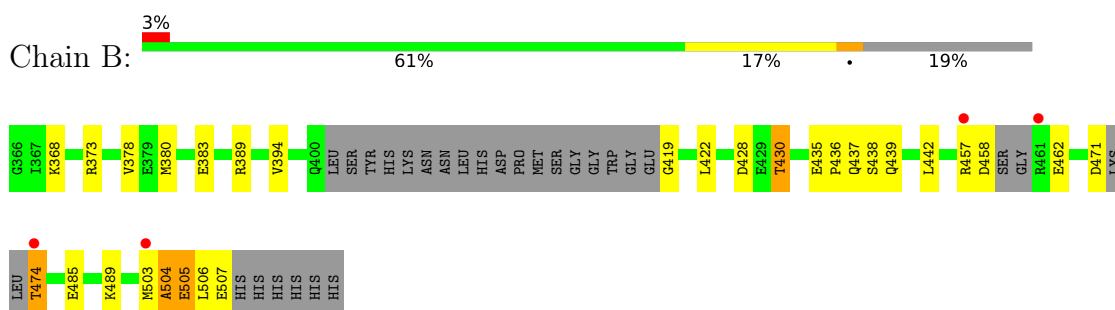
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

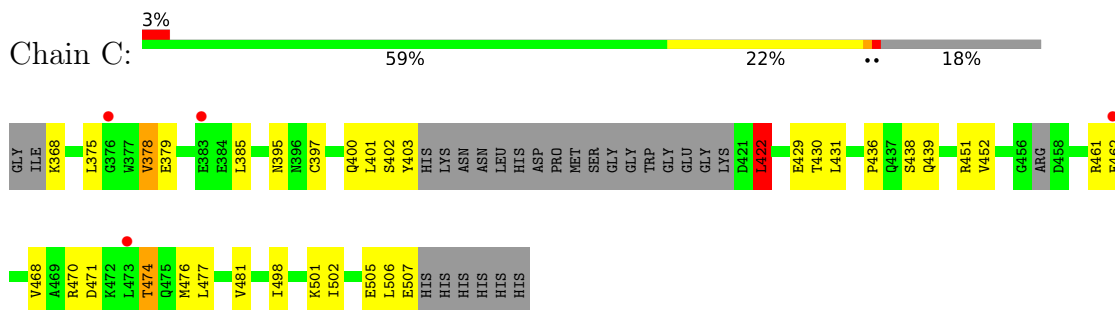
- Molecule 1: Amyloid beta A4 precursor protein-binding family B member 1



- Molecule 1: Amyloid beta A4 precursor protein-binding family B member 1



- Molecule 1: Amyloid beta A4 precursor protein-binding family B member 1



- Molecule 1: Amyloid beta A4 precursor protein-binding family B member 1



4 Data and refinement statistics i

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α , β , γ	145.89Å 145.89Å 79.05Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	25.00 – 2.80 24.78 – 2.80	Depositor EDS
% Data completeness (in resolution range)	100.0 (25.00-2.80) 99.8 (24.78-2.80)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.34 (at 2.80Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.240 , 0.304 0.232 , 0.289	Depositor DCC
R_{free} test set	1535 reflections (9.96%)	wwPDB-VP
Wilson B-factor (Å ²)	66.4	Xtrriage
Anisotropy	0.160	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 44.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.031 for h,-h-k,-l	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	3835	wwPDB-VP
Average B, all atoms (Å ²)	59.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 76.33 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.0631e-06. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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	0.79	0/983	0.81	0/1323
1	B	0.79	0/955	0.84	0/1283
1	C	0.83	1/974 (0.1%)	0.86	1/1312 (0.1%)
1	D	0.78	0/971	0.87	0/1305
All	All	0.80	1/3883 (0.0%)	0.84	1/5223 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	397	CYS	CB-SG	-5.06	1.73	1.81

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	422	LEU	CA-CB-CG	6.14	129.41	115.30

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	970	0	982	23	0
1	B	944	0	954	20	0
1	C	961	0	969	30	0
1	D	960	0	976	22	0
All	All	3835	0	3881	84	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 11.

All (84) 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:A:375:LEU:HD22	1:B:485:GLU:HG2	1.20	1.15
1:C:385:LEU:HD12	1:C:477:LEU:HD13	1.57	0.84
1:A:375:LEU:CD2	1:B:485:GLU:HG2	2.07	0.84
1:B:428:ASP:O	1:B:430:THR:HG22	1.79	0.82
1:C:375:LEU:HD22	1:D:485:GLU:HG2	1.63	0.80
1:D:506:LEU:O	1:D:507:GLU:HG2	1.81	0.79
1:B:507:GLU:H	1:B:507:GLU:CD	1.84	0.79
1:C:385:LEU:CD1	1:C:477:LEU:HD13	2.12	0.79
1:D:428:ASP:O	1:D:430:THR:HG22	1.83	0.78
1:C:402:SER:O	1:C:403:TYR:CB	2.36	0.74
1:C:375:LEU:HD22	1:D:485:GLU:CG	2.19	0.73
1:C:403:TYR:H	1:C:461:ARG:NH2	1.87	0.72
1:C:403:TYR:H	1:C:461:ARG:HH22	1.37	0.71
1:A:451:ARG:O	1:A:452:VAL:HG13	1.93	0.68
1:B:504:ALA:O	1:B:506:LEU:N	2.25	0.68
1:A:463:ARG:HG3	1:A:463:ARG:HH11	1.61	0.66
1:B:435:GLU:HG2	1:B:437:GLN:OE1	1.96	0.66
1:B:428:ASP:O	1:B:430:THR:CG2	2.44	0.66
1:B:505:GLU:O	1:B:506:LEU:HD23	1.96	0.65
1:C:474:THR:HG23	1:C:476:MET:H	1.63	0.64
1:B:437:GLN:HG2	1:B:438:SER:N	2.13	0.63
1:C:400:GLN:O	1:D:490:ASN:ND2	2.32	0.63
1:C:402:SER:O	1:C:403:TYR:HB3	1.99	0.61
1:A:420:LYS:HB3	1:A:422:LEU:HD21	1.83	0.59
1:C:385:LEU:HD12	1:C:477:LEU:CD1	2.32	0.58
1:C:378:VAL:HG12	1:C:401:LEU:HD11	1.86	0.57
1:C:471:ASP:HB3	1:C:474:THR:HG22	1.85	0.57
1:A:471:ASP:CG	1:A:474:THR:HG22	2.24	0.57
1:A:375:LEU:HD22	1:B:485:GLU:CG	2.13	0.56
1:D:505:GLU:O	1:D:506:LEU:HD23	2.06	0.56
1:D:428:ASP:O	1:D:430:THR:CG2	2.53	0.56
1:D:487:PRO:O	1:D:490:ASN:HB2	2.07	0.54
1:A:435:GLU:HG3	1:A:438:SER:OG	2.08	0.54
1:B:507:GLU:CD	1:B:507:GLU:N	2.60	0.53
1:C:506:LEU:O	1:C:507:GLU:HG3	2.09	0.51
1:D:380:MET:HE2	1:D:385:LEU:HD21	1.92	0.51
1:C:403:TYR:HB2	1:D:487:PRO:HD3	1.93	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:403:TYR:CD2	1:D:463:ARG:HD3	2.45	0.51
1:A:393:ALA:HA	1:A:396:ASN:HD22	1.76	0.50
1:C:429:GLU:CG	1:C:502:ILE:HD11	2.42	0.50
1:A:370:PHE:N	1:A:370:PHE:CD1	2.78	0.49
1:B:439:GLN:NE2	1:B:439:GLN:HA	2.27	0.49
1:B:471:ASP:CB	1:B:474:THR:HG22	2.43	0.49
1:A:451:ARG:O	1:A:452:VAL:CG1	2.61	0.49
1:A:429:GLU:HG3	1:A:502:ILE:HD11	1.95	0.48
1:C:375:LEU:CD2	1:D:485:GLU:HG2	2.39	0.48
1:A:486:ALA:HB1	1:A:487:PRO:HD2	1.96	0.47
1:C:402:SER:HB3	1:C:461:ARG:HH21	1.79	0.47
1:D:474:THR:O	1:D:475:GLN:HB2	2.14	0.47
1:C:438:SER:O	1:C:439:GLN:HB2	2.15	0.47
1:C:451:ARG:O	1:C:452:VAL:HG13	2.15	0.47
1:A:436:PRO:O	1:A:439:GLN:NE2	2.48	0.47
1:B:437:GLN:CG	1:B:438:SER:N	2.76	0.46
1:C:429:GLU:HG3	1:C:502:ILE:HD11	1.97	0.46
1:D:380:MET:HE2	1:D:385:LEU:CD2	2.45	0.46
1:C:401:LEU:HD12	1:C:481:VAL:CG2	2.46	0.45
1:C:375:LEU:HD22	1:D:485:GLU:HG3	1.96	0.45
1:C:422:LEU:HA	1:C:436:PRO:HD3	1.98	0.45
1:D:424:LEU:O	1:D:424:LEU:HD23	2.17	0.45
1:A:463:ARG:HH11	1:A:463:ARG:CG	2.27	0.45
1:A:472:LYS:HG2	1:A:473:LEU:N	2.32	0.45
1:D:457:ARG:O	1:D:457:ARG:HG2	2.18	0.44
1:A:392:VAL:HG12	1:A:396:ASN:HD21	1.83	0.44
1:D:380:MET:CE	1:D:385:LEU:CD2	2.96	0.44
1:A:429:GLU:CG	1:A:502:ILE:HD11	2.48	0.43
1:C:379:GLU:HG3	1:C:476:MET:HG3	1.99	0.43
1:D:380:MET:CE	1:D:385:LEU:HD23	2.49	0.43
1:B:504:ALA:C	1:B:506:LEU:H	2.15	0.43
1:C:402:SER:O	1:C:403:TYR:HB2	2.17	0.43
1:D:455:VAL:HG11	1:D:489:LYS:HA	2.01	0.43
1:B:506:LEU:HD23	1:B:506:LEU:HA	1.77	0.42
1:A:438:SER:O	1:A:439:GLN:HB2	2.20	0.42
1:B:373:ARG:HG3	1:B:419:GLY:O	2.19	0.42
1:A:400:GLN:OE1	1:B:368:LYS:NZ	2.41	0.42
1:C:502:ILE:O	1:C:506:LEU:HG	2.20	0.42
1:A:505:GLU:O	1:A:505:GLU:HG2	2.21	0.41
1:C:431:LEU:C	1:C:431:LEU:HD23	2.41	0.41
1:B:435:GLU:HA	1:B:436:PRO:HD3	1.92	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:385:LEU:HD21	1:C:468:VAL:HG11	2.02	0.41
1:D:438:SER:O	1:D:439:GLN:HB2	2.21	0.41
1:A:463:ARG:CG	1:A:463:ARG:NH1	2.84	0.40
1:A:426:LEU:HD23	1:A:426:LEU:HA	1.94	0.40
1:D:489:LYS:HE2	1:D:489:LYS:HB3	1.95	0.40
1:B:504:ALA:C	1:B:506:LEU:N	2.74	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	117/148 (79%)	108 (92%)	8 (7%)	1 (1%)	17	46
1	B	112/148 (76%)	102 (91%)	8 (7%)	2 (2%)	8	28
1	C	116/148 (78%)	106 (91%)	8 (7%)	2 (2%)	9	29
1	D	114/148 (77%)	108 (95%)	6 (5%)	0	100	100
All	All	459/592 (78%)	424 (92%)	30 (6%)	5 (1%)	14	41

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	505	GLU
1	A	473	LEU
1	C	505	GLU
1	B	504	ALA
1	C	498	ILE

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	107/127 (84%)	99 (92%)	8 (8%)	13	37
1	B	103/127 (81%)	89 (86%)	14 (14%)	3	11
1	C	106/127 (84%)	97 (92%)	9 (8%)	10	31
1	D	105/127 (83%)	96 (91%)	9 (9%)	10	30
All	All	421/508 (83%)	381 (90%)	40 (10%)	8	25

All (40) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	378	VAL
1	A	380	MET
1	A	395	ASN
1	A	420	LYS
1	A	422	LEU
1	A	472	LYS
1	A	473	LEU
1	A	484	CYS
1	B	378	VAL
1	B	380	MET
1	B	383	GLU
1	B	389	ARG
1	B	394	VAL
1	B	422	LEU
1	B	430	THR
1	B	442	LEU
1	B	457	ARG
1	B	458	ASP
1	B	462	GLU
1	B	474	THR
1	B	489	LYS
1	B	503	MET
1	C	368	LYS
1	C	378	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	395	ASN
1	C	422	LEU
1	C	430	THR
1	C	462	GLU
1	C	470	ARG
1	C	474	THR
1	C	501	LYS
1	D	378	VAL
1	D	383	GLU
1	D	391	SER
1	D	395	ASN
1	D	430	THR
1	D	435	GLU
1	D	457	ARG
1	D	474	THR
1	D	501	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	396	ASN
1	B	425	GLN
1	B	439	GLN
1	B	496	HIS
1	C	425	GLN
1	D	396	ASN
1	D	425	GLN
1	D	480	HIS

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	123/148 (83%)	0.48	12 (9%) 7 4	41, 59, 85, 94	0
1	B	120/148 (81%)	0.22	4 (3%) 46 36	41, 59, 81, 93	0
1	C	122/148 (82%)	0.34	4 (3%) 46 36	33, 54, 77, 85	0
1	D	122/148 (82%)	0.23	6 (4%) 29 20	37, 58, 82, 94	0
All	All	487/592 (82%)	0.32	26 (5%) 26 17	33, 58, 82, 94	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	473	LEU	6.8
1	A	460	GLY	4.6
1	A	420	LYS	4.6
1	D	474	THR	4.0
1	D	457	ARG	3.6
1	D	458	ASP	3.1
1	A	403	TYR	3.1
1	B	457	ARG	3.0
1	A	472	LYS	2.7
1	B	474	THR	2.7
1	B	461	ARG	2.7
1	C	376	GLY	2.5
1	C	473	LEU	2.5
1	A	387	PRO	2.4
1	A	462	GLU	2.4
1	D	507	GLU	2.4
1	A	466	ALA	2.3
1	A	473	LEU	2.3
1	C	383	GLU	2.3
1	A	383	GLU	2.3
1	A	459	SER	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	376	GLY	2.2
1	B	503	MET	2.1
1	D	387	PRO	2.1
1	C	462	GLU	2.0
1	A	501	LYS	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.