Full wwPDB X-ray Structure Validation Report ⓘ

Nov 13, 2023 – 12:23 am GMT

PDB ID	:	8BLJ
Title	:	Crystal structure of the ligand-binding domain (LBD) of human iGluR Delta-1 (GluD1), apo state
Authors	:	Heroven, C.; Malinauskas, T.; Aricescu, A.R.
Deposited on	:	2022-11-09
Resolution	:	2.18 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:

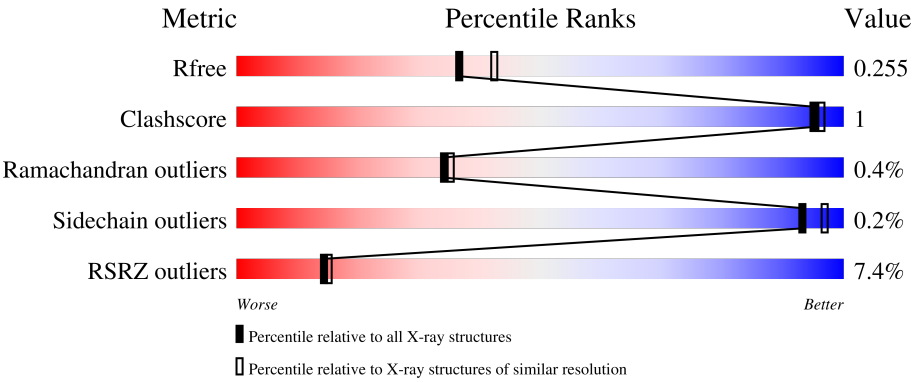
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	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 2.18 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	6864 (2.20-2.16)
Clashscore	141614	7689 (2.20-2.16)
Ramachandran outliers	138981	7564 (2.20-2.16)
Sidechain outliers	138945	7564 (2.20-2.16)
RSRZ outliers	127900	6738 (2.20-2.16)

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 <=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	282	5% 91% · 6%
1	B	282	7% 92% · 6%
1	C	282	7% 90% · 7%
1	D	282	8% 90% · 6%
1	E	282	10% 85% 6% 9%

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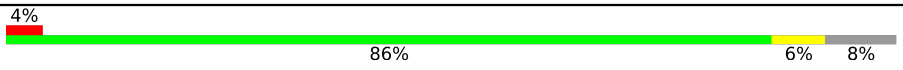
Mol	Chain	Length	Quality of chain
1	F	282	

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 25266 atoms, of which 12413 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 Glutamate receptor ionotropic, delta-1,Isoform 2 of Glutamate receptor ionotropic, delta-1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	265	Total	C	H	N	O	S	0	1	0
			4162	1331	2069	353	401	8			
1	B	264	Total	C	H	N	O	S	0	1	0
			4162	1329	2073	355	397	8			
1	C	261	Total	C	H	N	O	S	0	1	0
			4111	1315	2045	350	393	8			
1	D	266	Total	C	H	N	O	S	0	1	0
			4190	1338	2085	359	400	8			
1	E	258	Total	C	H	N	O	S	0	0	0
			4046	1294	2012	344	388	8			
1	F	260	Total	C	H	N	O	S	0	3	0
			4117	1318	2045	354	392	8			

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	548	GLY	-	linker	UNP Q9ULK0
A	549	THR	-	linker	UNP Q9ULK0
A	824	GLY	-	expression tag	UNP Q9ULK0-2
A	825	THR	-	expression tag	UNP Q9ULK0-2
A	826	LEU	-	expression tag	UNP Q9ULK0-2
A	827	GLU	-	expression tag	UNP Q9ULK0-2
A	828	VAL	-	expression tag	UNP Q9ULK0-2
A	829	LEU	-	expression tag	UNP Q9ULK0-2
A	830	PHE	-	expression tag	UNP Q9ULK0-2
A	831	GLN	-	expression tag	UNP Q9ULK0-2
B	548	GLY	-	linker	UNP Q9ULK0
B	549	THR	-	linker	UNP Q9ULK0
B	824	GLY	-	expression tag	UNP Q9ULK0-2
B	825	THR	-	expression tag	UNP Q9ULK0-2
B	826	LEU	-	expression tag	UNP Q9ULK0-2
B	827	GLU	-	expression tag	UNP Q9ULK0-2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	828	VAL	-	expression tag	UNP Q9ULK0-2
B	829	LEU	-	expression tag	UNP Q9ULK0-2
B	830	PHE	-	expression tag	UNP Q9ULK0-2
B	831	GLN	-	expression tag	UNP Q9ULK0-2
C	548	GLY	-	linker	UNP Q9ULK0
C	549	THR	-	linker	UNP Q9ULK0
C	824	GLY	-	expression tag	UNP Q9ULK0-2
C	825	THR	-	expression tag	UNP Q9ULK0-2
C	826	LEU	-	expression tag	UNP Q9ULK0-2
C	827	GLU	-	expression tag	UNP Q9ULK0-2
C	828	VAL	-	expression tag	UNP Q9ULK0-2
C	829	LEU	-	expression tag	UNP Q9ULK0-2
C	830	PHE	-	expression tag	UNP Q9ULK0-2
C	831	GLN	-	expression tag	UNP Q9ULK0-2
D	548	GLY	-	linker	UNP Q9ULK0
D	549	THR	-	linker	UNP Q9ULK0
D	824	GLY	-	expression tag	UNP Q9ULK0-2
D	825	THR	-	expression tag	UNP Q9ULK0-2
D	826	LEU	-	expression tag	UNP Q9ULK0-2
D	827	GLU	-	expression tag	UNP Q9ULK0-2
D	828	VAL	-	expression tag	UNP Q9ULK0-2
D	829	LEU	-	expression tag	UNP Q9ULK0-2
D	830	PHE	-	expression tag	UNP Q9ULK0-2
D	831	GLN	-	expression tag	UNP Q9ULK0-2
E	548	GLY	-	linker	UNP Q9ULK0
E	549	THR	-	linker	UNP Q9ULK0
E	824	GLY	-	expression tag	UNP Q9ULK0-2
E	825	THR	-	expression tag	UNP Q9ULK0-2
E	826	LEU	-	expression tag	UNP Q9ULK0-2
E	827	GLU	-	expression tag	UNP Q9ULK0-2
E	828	VAL	-	expression tag	UNP Q9ULK0-2
E	829	LEU	-	expression tag	UNP Q9ULK0-2
E	830	PHE	-	expression tag	UNP Q9ULK0-2
E	831	GLN	-	expression tag	UNP Q9ULK0-2
F	548	GLY	-	linker	UNP Q9ULK0
F	549	THR	-	linker	UNP Q9ULK0
F	824	GLY	-	expression tag	UNP Q9ULK0-2
F	825	THR	-	expression tag	UNP Q9ULK0-2
F	826	LEU	-	expression tag	UNP Q9ULK0-2
F	827	GLU	-	expression tag	UNP Q9ULK0-2
F	828	VAL	-	expression tag	UNP Q9ULK0-2
F	829	LEU	-	expression tag	UNP Q9ULK0-2

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Chain	Residue	Modelled	Actual	Comment	Reference
F	830	PHE	-	expression tag	UNP Q9ULK0-2
F	831	GLN	-	expression tag	UNP Q9ULK0-2

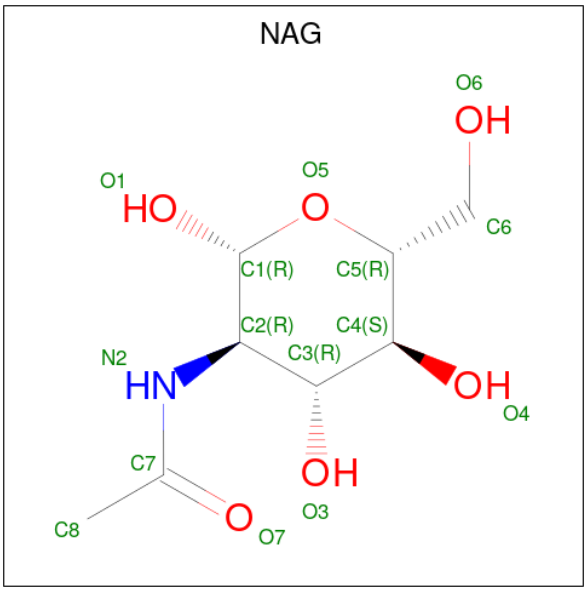
- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	3	Total Ca 3 3	0	0
2	B	2	Total Ca 2 2	0	0
2	C	2	Total Ca 2 2	0	0
2	D	1	Total Ca 1 1	0	0
2	E	1	Total Ca 1 1	0	0
2	F	2	Total Ca 2 2	0	0

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

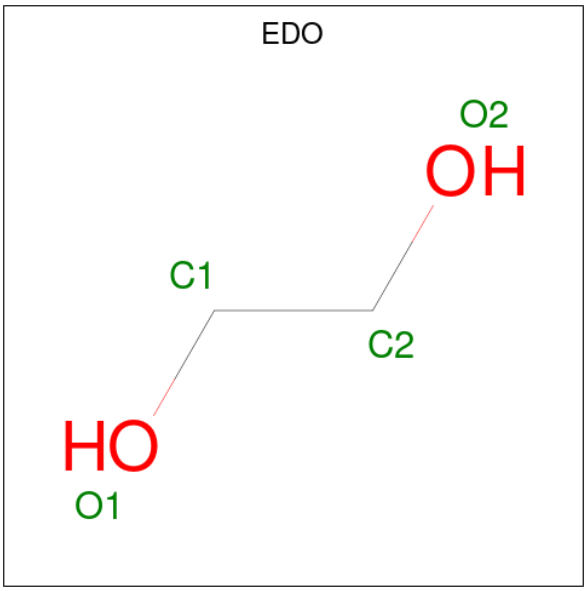
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	2	Total Cl 2 2	0	0
3	C	2	Total Cl 2 2	0	0
3	E	1	Total Cl 1 1	0	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	H	N	O	0	0
			27	8	13	1	5		
4	B	1	Total	C	H	N	O	0	0
			27	8	13	1	5		
4	C	1	Total	C	H	N	O	0	0
			27	8	13	1	5		
4	D	1	Total	C	H	N	O	0	0
			27	8	13	1	5		
4	E	1	Total	C	H	N	O	0	0
			27	8	13	1	5		
4	F	1	Total	C	H	N	O	0	0
			27	8	13	1	5		

- Molecule 5 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total C H O 10 2 6 2	0	0

- Molecule 6 is water.

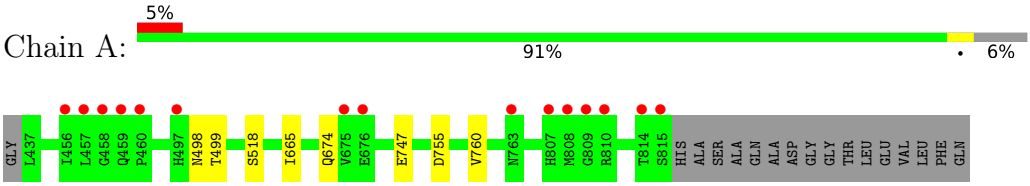
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	70	Total O 70 70	0	0
6	B	41	Total O 41 41	0	0
6	C	55	Total O 55 55	0	0
6	D	42	Total O 42 42	0	0
6	E	29	Total O 29 29	0	0
6	F	53	Total O 53 53	0	0

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.

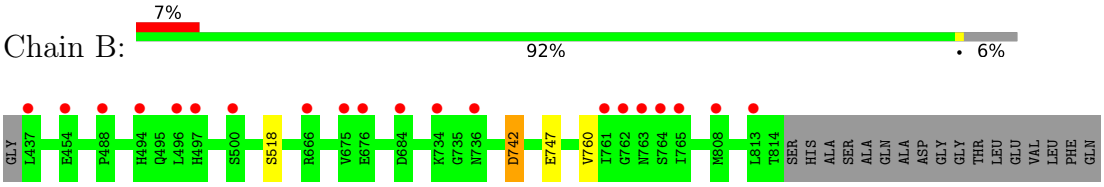
• Molecule 1: Glutamate receptor ionotropic, delta-1,Isoform 2 of Glutamate receptor ionotropic, delta-1

Chain A:



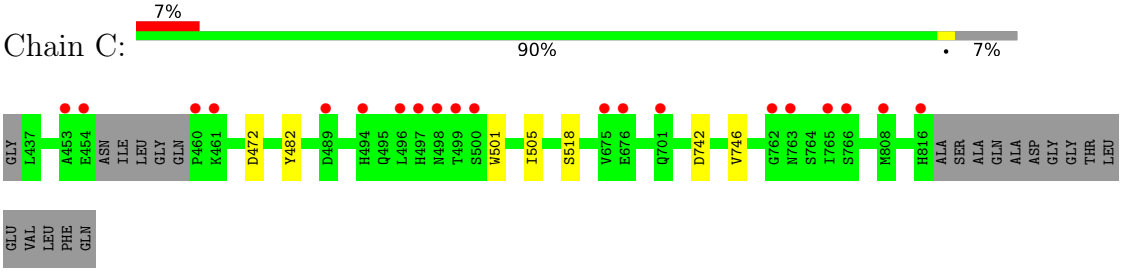
• Molecule 1: Glutamate receptor ionotropic, delta-1,Isoform 2 of Glutamate receptor ionotropic, delta-1

Chain B:



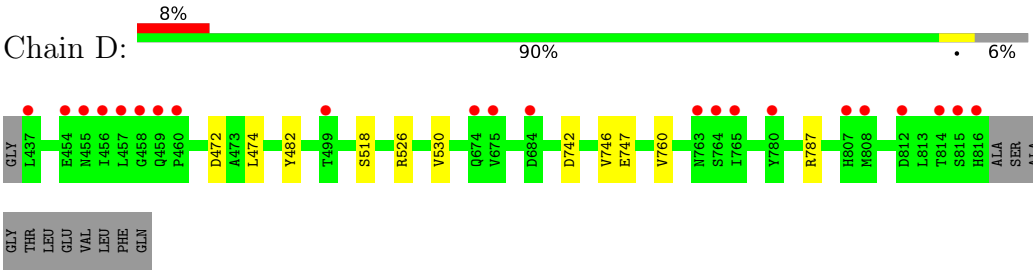
• Molecule 1: Glutamate receptor ionotropic, delta-1,Isoform 2 of Glutamate receptor ionotropic, delta-1

Chain C:



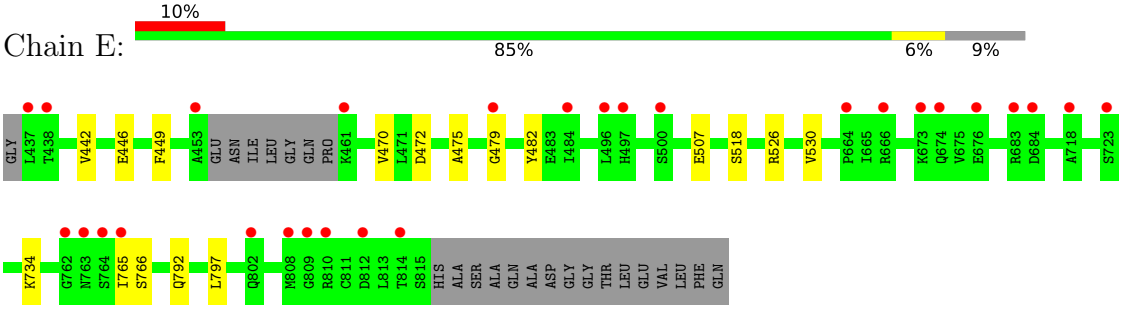
• Molecule 1: Glutamate receptor ionotropic, delta-1,Isoform 2 of Glutamate receptor ionotropic, delta-1

Chain D:



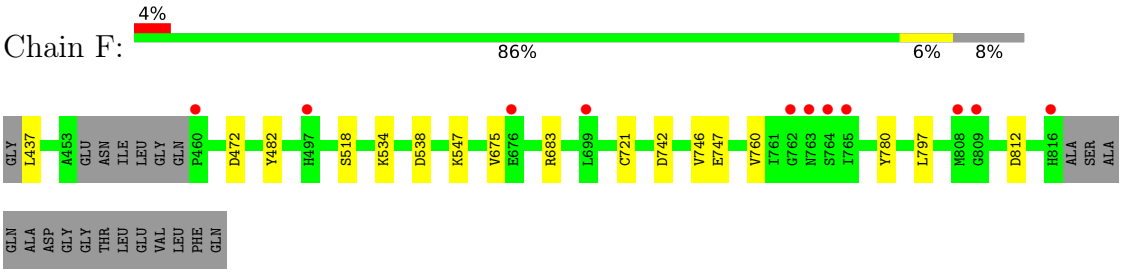
• Molecule 1: Glutamate receptor ionotropic, delta-1,Isoform 2 of Glutamate receptor ionotropic, delta-1

Chain E:



• Molecule 1: Glutamate receptor ionotropic, delta-1,Isoform 2 of Glutamate receptor ionotropic, delta-1

Chain F:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	86.29Å 107.57Å 98.56Å 90.00° 94.08° 90.00°	Depositor
Resolution (Å)	62.59 – 2.18 98.31 – 2.18	Depositor EDS
% Data completeness (in resolution range)	59.8 (62.59-2.18) 56.5 (98.31-2.18)	Depositor EDS
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.07 (at 2.18Å)	Xtriage
Refinement program	REFMAC 5.8.0270, PHENIX dev_4761	Depositor
R, R_{free}	0.206 , 0.244 0.220 , 0.255	Depositor DCC
R_{free} test set	2698 reflections (4.79%)	wwPDB-VP
Wilson B-factor (Å^2)	25.1	Xtriage
Anisotropy	0.005	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 44.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	25266	wwPDB-VP
Average B, all atoms (Å^2)	53.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 15.62% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: EDO, CL, CA, NAG

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	0.24	0/2140	0.46	0/2896
1	B	0.24	0/2136	0.46	0/2890
1	C	0.24	0/2113	0.46	0/2856
1	D	0.24	0/2153	0.46	0/2913
1	E	0.24	0/2076	0.46	0/2807
1	F	0.24	0/2125	0.47	0/2872
All	All	0.24	0/12743	0.46	0/17234

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

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	2093	2069	2071	4	0
1	B	2089	2073	2073	2	0
1	C	2066	2045	2045	3	0
1	D	2105	2085	2085	5	0
1	E	2034	2012	2012	9	0
1	F	2072	2045	2056	9	0
2	A	3	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	2	0	0	0	0
3	A	2	0	0	0	0
3	C	2	0	0	0	0
3	E	1	0	0	1	0
4	A	14	13	13	0	0
4	B	14	13	13	0	0
4	C	14	13	13	0	0
4	D	14	13	13	0	0
4	E	14	13	13	0	0
4	F	14	13	13	0	0
5	C	4	6	6	0	0
6	A	70	0	0	0	0
6	B	41	0	0	0	0
6	C	55	0	0	0	0
6	D	42	0	0	0	0
6	E	29	0	0	0	0
6	F	53	0	0	0	0
All	All	12853	12413	12426	30	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 1.

All (30) 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:F:472:ASP:OD1	1:F:482:TYR:OH	2.09	0.67
1:F:742:ASP:O	1:F:746:VAL:HG22	1.95	0.67
1:E:472:ASP:OD1	1:E:482:TYR:OH	2.13	0.64
1:D:747:GLU:HA	1:D:760:VAL:HG21	1.81	0.61
1:D:472:ASP:OD1	1:D:482:TYR:OH	2.19	0.57
1:F:437:LEU:HD21	1:F:780:TYR:OH	2.04	0.57
1:A:498:ASN:O	1:A:499:THR:OG1	2.19	0.55
1:E:442:VAL:HG21	1:E:507:GLU:HG3	1.92	0.51
1:E:526:ARG:O	1:E:530:VAL:HG22	2.12	0.49
1:F:547:LYS:NZ	1:F:812:ASP:O	2.35	0.49
1:B:747:GLU:HA	1:B:760:VAL:HG21	1.97	0.47
1:D:474:LEU:HD23	1:D:787[A]:ARG:HG2	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:765:ILE:HD11	1:F:538:ASP:HB2	1.97	0.47
1:B:742:ASP:N	1:B:742:ASP:OD1	2.48	0.46
3:E:902:CL:CL	1:F:534:LYS:NZ	2.86	0.45
1:A:747:GLU:HA	1:A:760:VAL:HG21	1.98	0.45
1:C:742:ASP:O	1:C:746:VAL:HG22	2.17	0.45
1:E:470:VAL:HG22	1:E:797:LEU:HD21	1.99	0.45
1:D:742:ASP:O	1:D:746:VAL:HG22	2.17	0.45
1:D:526:ARG:O	1:D:530:VAL:HG22	2.18	0.43
1:A:755:ASP:OD1	1:E:734:LYS:NZ	2.49	0.43
1:C:472:ASP:OD1	1:C:482:TYR:OH	2.27	0.43
1:E:792:GLN:HG3	1:E:797:LEU:HD12	2.00	0.43
1:F:747:GLU:HA	1:F:760:VAL:HG21	2.02	0.41
1:E:446:GLU:O	1:E:449:PHE:N	2.53	0.41
1:E:475:ALA:O	1:E:479:GLY:N	2.54	0.41
1:F:675:VAL:O	1:F:675:VAL:HG12	2.21	0.41
1:F:683:ARG:NH1	1:F:721:CYS:O	2.53	0.41
1:A:665:ILE:HD11	1:A:674:GLN:HG3	2.03	0.41
1:C:501:TRP:CE3	1:C:505:ILE:HG21	2.57	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	264/282 (94%)	258 (98%)	5 (2%)	1 (0%)	34	35
1	B	263/282 (93%)	258 (98%)	4 (2%)	1 (0%)	34	35
1	C	258/282 (92%)	252 (98%)	5 (2%)	1 (0%)	34	35
1	D	265/282 (94%)	260 (98%)	4 (2%)	1 (0%)	34	35
1	E	254/282 (90%)	248 (98%)	5 (2%)	1 (0%)	34	35
1	F	259/282 (92%)	254 (98%)	4 (2%)	1 (0%)	34	35

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	1563/1692 (92%)	1530 (98%)	27 (2%)	6 (0%)	34 35

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	518	SER
1	C	518	SER
1	D	518	SER
1	E	518	SER
1	F	518	SER
1	B	518	SER

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	227/237 (96%)	227 (100%)	0	100 100
1	B	226/237 (95%)	225 (100%)	1 (0%)	91 95
1	C	224/237 (94%)	224 (100%)	0	100 100
1	D	228/237 (96%)	228 (100%)	0	100 100
1	E	220/237 (93%)	219 (100%)	1 (0%)	88 94
1	F	225/237 (95%)	224 (100%)	1 (0%)	91 95
All	All	1350/1422 (95%)	1347 (100%)	3 (0%)	93 97

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	742	ASP
1	E	766	SER
1	F	797	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	459	GLN
1	A	486	GLN
1	B	459	GLN
1	B	494	HIS
1	C	494	HIS
1	C	763	ASN
1	C	802	GLN
1	D	494	HIS
1	F	486	GLN
1	F	669	GLN

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)

Of 23 ligands modelled in this entry, 16 are monoatomic - leaving 7 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	NAG	C	905	1	14,14,15	0.41	0	17,19,21	1.12	1 (5%)
4	NAG	E	903	1	14,14,15	0.46	0	17,19,21	1.03	1 (5%)
5	EDO	C	906	-	3,3,3	0.27	0	2,2,2	0.24	0
4	NAG	A	906	1	14,14,15	0.51	0	17,19,21	1.10	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	NAG	B	903	1	14,14,15	0.42	0	17,19,21	1.72	3 (17%)
4	NAG	F	903	1	14,14,15	0.42	0	17,19,21	1.19	1 (5%)
4	NAG	D	902	1	14,14,15	0.47	0	17,19,21	1.03	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	C	905	1	-	3/6/23/26	0/1/1/1
4	NAG	E	903	1	-	2/6/23/26	0/1/1/1
5	EDO	C	906	-	-	0/1/1/1	-
4	NAG	A	906	1	-	2/6/23/26	0/1/1/1
4	NAG	B	903	1	-	3/6/23/26	0/1/1/1
4	NAG	F	903	1	-	2/6/23/26	0/1/1/1
4	NAG	D	902	1	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	903	NAG	C1-C2-N2	4.38	117.97	110.49
4	F	903	NAG	C1-O5-C5	3.79	117.33	112.19
4	B	903	NAG	O5-C1-C2	-3.48	105.79	111.29
4	C	905	NAG	C1-O5-C5	3.20	116.52	112.19
4	A	906	NAG	O5-C5-C6	3.04	111.96	107.20
4	D	902	NAG	O5-C5-C6	2.73	111.48	107.20
4	E	903	NAG	O5-C5-C6	2.57	111.23	107.20
4	B	903	NAG	C4-C3-C2	-2.29	107.67	111.02

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	906	NAG	O5-C5-C6-O6
4	C	905	NAG	O5-C5-C6-O6
4	D	902	NAG	O5-C5-C6-O6
4	E	903	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
4	F	903	NAG	O5-C5-C6-O6
4	B	903	NAG	O5-C5-C6-O6
4	A	906	NAG	C4-C5-C6-O6
4	C	905	NAG	C4-C5-C6-O6
4	D	902	NAG	C4-C5-C6-O6
4	E	903	NAG	C4-C5-C6-O6
4	F	903	NAG	C4-C5-C6-O6
4	B	903	NAG	C4-C5-C6-O6
4	B	903	NAG	C3-C2-N2-C7
4	C	905	NAG	C3-C2-N2-C7

There are no ring outliers.

No monomer is involved in short contacts.

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, 95^{th} 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	265/282 (93%)	0.32	15 (5%)	23	25	15, 33, 82, 128	0
1	B	264/282 (93%)	0.45	20 (7%)	13	14	19, 47, 83, 128	0
1	C	261/282 (92%)	0.44	20 (7%)	13	14	23, 42, 87, 135	0
1	D	266/282 (94%)	0.64	22 (8%)	11	11	26, 51, 104, 152	0
1	E	258/282 (91%)	0.72	28 (10%)	5	6	27, 58, 88, 139	0
1	F	260/282 (92%)	0.28	11 (4%)	36	37	18, 35, 72, 129	0
All	All	1574/1692 (93%)	0.47	116 (7%)	14	15	15, 44, 88, 152	0

All (116) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	765	ILE	11.4
1	A	763	ASN	10.5
1	D	816	HIS	10.5
1	D	763	ASN	10.4
1	A	457	LEU	9.3
1	A	809	GLY	9.1
1	C	765	ILE	8.9
1	D	815	SER	8.1
1	D	456	ILE	7.7
1	B	763	ASN	7.7
1	E	763	ASN	7.0
1	E	764	SER	5.6
1	D	459	GLN	5.5
1	D	457	LEU	5.4
1	A	675	VAL	5.4
1	E	718	ALA	5.4
1	B	765	ILE	5.3
1	D	437	LEU	4.9
1	D	764	SER	4.9

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Mol	Chain	Res	Type	RSRZ
1	F	763	ASN	4.6
1	C	454	GLU	4.5
1	D	675	VAL	4.4
1	F	816	HIS	4.4
1	C	499	THR	4.3
1	E	479	GLY	4.3
1	A	456	ILE	4.2
1	D	454	GLU	4.1
1	D	807	HIS	4.1
1	A	458	GLY	4.0
1	C	816	HIS	4.0
1	C	461	LYS	3.9
1	E	765	ILE	3.9
1	A	459	GLN	3.8
1	D	458	GLY	3.8
1	C	497	HIS	3.8
1	C	460	PRO	3.8
1	D	455	ASN	3.8
1	A	460	PRO	3.8
1	C	494	HIS	3.7
1	B	496	LEU	3.7
1	C	763	ASN	3.7
1	A	814	THR	3.7
1	E	437	LEU	3.7
1	E	762	GLY	3.6
1	E	484	ILE	3.6
1	D	808	MET	3.5
1	C	496	LEU	3.5
1	B	764	SER	3.5
1	A	810	ARG	3.3
1	E	461	LYS	3.3
1	E	666	ARG	3.3
1	D	674	GLN	3.2
1	E	500	SER	3.2
1	B	736	ASN	3.2
1	F	460	PRO	3.2
1	F	497	HIS	3.2
1	D	684	ASP	3.2
1	E	664	PRO	3.2
1	E	674	GLN	3.2
1	C	766	SER	3.1
1	D	460	PRO	3.1

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Mol	Chain	Res	Type	RSRZ
1	D	814	THR	3.1
1	E	814	THR	3.0
1	C	453	ALA	2.9
1	F	809	GLY	2.9
1	A	808	MET	2.9
1	B	684	ASP	2.9
1	C	489	ASP	2.9
1	C	500	SER	2.9
1	B	676	GLU	2.8
1	B	437	LEU	2.8
1	B	666	ARG	2.8
1	A	676	GLU	2.8
1	B	497	HIS	2.8
1	C	762	GLY	2.8
1	E	453	ALA	2.8
1	D	499	THR	2.8
1	F	762	GLY	2.7
1	B	494	HIS	2.7
1	A	497	HIS	2.7
1	A	807	HIS	2.6
1	E	808	MET	2.6
1	E	497	HIS	2.6
1	E	723	SER	2.6
1	B	808	MET	2.6
1	C	676	GLU	2.6
1	E	684	ASP	2.5
1	E	496	LEU	2.5
1	A	815	SER	2.5
1	B	762	GLY	2.5
1	E	673	LYS	2.5
1	F	764	SER	2.5
1	B	761	ILE	2.5
1	C	701	GLN	2.5
1	C	498	ASN	2.5
1	F	676	GLU	2.4
1	F	808	MET	2.4
1	F	699	LEU	2.3
1	E	683	ARG	2.3
1	E	810	ARG	2.3
1	E	812	ASP	2.3
1	E	809	GLY	2.3
1	B	454	GLU	2.3

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Mol	Chain	Res	Type	RSRZ
1	C	808	MET	2.2
1	B	734	LYS	2.2
1	E	676	GLU	2.2
1	B	500	SER	2.2
1	E	802	GLN	2.2
1	E	438	THR	2.2
1	C	675	VAL	2.1
1	D	812	ASP	2.1
1	D	765	ILE	2.1
1	D	780	TYR	2.1
1	B	813	LEU	2.1
1	B	675	VAL	2.1
1	B	488	PRO	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)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	NAG	B	903	14/15	0.62	0.36	82,102,123,129	0
4	NAG	C	905	14/15	0.62	0.29	101,115,137,142	0
4	NAG	D	902	14/15	0.78	0.21	52,89,106,108	0
4	NAG	E	903	14/15	0.81	0.24	77,92,111,111	0
2	CA	B	902	1/1	0.82	0.09	65,65,65,65	0
4	NAG	F	903	14/15	0.83	0.30	60,81,107,111	0
4	NAG	A	906	14/15	0.85	0.20	57,79,98,101	0
2	CA	A	903	1/1	0.86	0.08	59,59,59,59	0
5	EDO	C	906	4/4	0.91	0.15	37,46,53,53	0
2	CA	F	901	1/1	0.93	0.09	47,47,47,47	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	CA	C	901	1/1	0.93	0.09	50,50,50,50	0
2	CA	A	902	1/1	0.95	0.07	62,62,62,62	0
3	CL	A	905	1/1	0.95	0.10	51,51,51,51	0
2	CA	E	901	1/1	0.95	0.12	52,52,52,52	0
3	CL	C	903	1/1	0.96	0.13	49,49,49,49	0
2	CA	F	902	1/1	0.96	0.14	41,41,41,41	0
3	CL	C	904	1/1	0.97	0.10	47,47,47,47	0
2	CA	D	901	1/1	0.97	0.16	51,51,51,51	0
2	CA	B	901	1/1	0.97	0.07	46,46,46,46	0
2	CA	C	902	1/1	0.97	0.12	43,43,43,43	0
2	CA	A	901	1/1	0.98	0.09	39,39,39,39	0
3	CL	E	902	1/1	0.99	0.13	44,44,44,44	0
3	CL	A	904	1/1	0.99	0.12	32,32,32,32	0

6.5 Other polymers

There are no such residues in this entry.