



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 26, 2024 – 04:06 PM EST

PDB ID : 9B82
Title : Crystal structure of SARS-CoV-2 receptor binding domain in complex with neutralizing antibody COVA2-15
Authors : Yuan, M.; Zhu, X.; Wilson, I.A.
Deposited on : 2024-03-28
Resolution : 3.38 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 : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.21
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.004 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.40

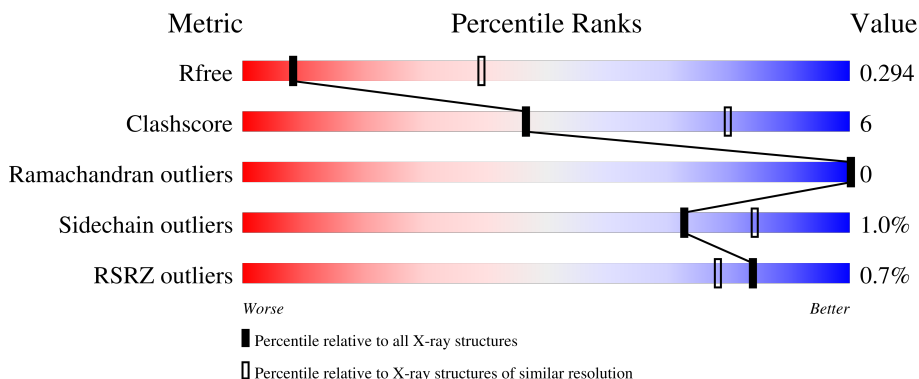
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.38 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}	164625	1137 (3.44-3.32)
Clashscore	180529	1165 (3.44-3.32)
Ramachandran outliers	177936	1164 (3.44-3.32)
Sidechain outliers	177891	1164 (3.44-3.32)
RSRZ outliers	164620	1137 (3.44-3.32)

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	205	 81% 13% 6%
1	B	205	 83% 8% 9%
1	C	205	 85% 9% 6%
1	D	205	 83% 11% 6%
1	E	205	 83% 11% 6%

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Mol	Chain	Length	Quality of chain
1	F	205	<p>2% 85% 9% 6%</p>
2	H	232	<p>78% 20%</p>
2	I	232	<p>75% 20%</p>
2	K	232	<p>2% 79% 17%</p>
2	N	232	<p>76% 19%</p>
2	P	232	<p>2% 78% 18%</p>
2	R	232	<p>2% 75% 21%</p>
3	G	219	<p>87% 12%</p>
3	J	219	<p>2% 87% 12%</p>
3	L	219	<p>88% 11%</p>
3	M	219	<p>91% 8%</p>
3	O	219	<p>90% 9%</p>
3	Q	219	<p>89% 11%</p>

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 29362 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 Spike protein S1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	193	1529	980	255	286	8	0	0	0
1	C	193	1529	980	255	286	8	0	0	0
1	B	187	1487	952	247	280	8	0	0	0
1	D	193	1526	977	255	286	8	0	0	0
1	E	193	1529	980	255	286	8	0	0	0
1	F	193	1529	980	255	286	8	0	0	0

There are 42 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	531	GLY	-	expression tag	UNP P0DTC2
A	532	HIS	-	expression tag	UNP P0DTC2
A	533	HIS	-	expression tag	UNP P0DTC2
A	534	HIS	-	expression tag	UNP P0DTC2
A	535	HIS	-	expression tag	UNP P0DTC2
A	536	HIS	-	expression tag	UNP P0DTC2
A	537	HIS	-	expression tag	UNP P0DTC2
C	531	GLY	-	expression tag	UNP P0DTC2
C	532	HIS	-	expression tag	UNP P0DTC2
C	533	HIS	-	expression tag	UNP P0DTC2
C	534	HIS	-	expression tag	UNP P0DTC2
C	535	HIS	-	expression tag	UNP P0DTC2
C	536	HIS	-	expression tag	UNP P0DTC2
C	537	HIS	-	expression tag	UNP P0DTC2
B	531	GLY	-	expression tag	UNP P0DTC2
B	532	HIS	-	expression tag	UNP P0DTC2
B	533	HIS	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	534	HIS	-	expression tag	UNP P0DTC2
B	535	HIS	-	expression tag	UNP P0DTC2
B	536	HIS	-	expression tag	UNP P0DTC2
B	537	HIS	-	expression tag	UNP P0DTC2
D	531	GLY	-	expression tag	UNP P0DTC2
D	532	HIS	-	expression tag	UNP P0DTC2
D	533	HIS	-	expression tag	UNP P0DTC2
D	534	HIS	-	expression tag	UNP P0DTC2
D	535	HIS	-	expression tag	UNP P0DTC2
D	536	HIS	-	expression tag	UNP P0DTC2
D	537	HIS	-	expression tag	UNP P0DTC2
E	531	GLY	-	expression tag	UNP P0DTC2
E	532	HIS	-	expression tag	UNP P0DTC2
E	533	HIS	-	expression tag	UNP P0DTC2
E	534	HIS	-	expression tag	UNP P0DTC2
E	535	HIS	-	expression tag	UNP P0DTC2
E	536	HIS	-	expression tag	UNP P0DTC2
E	537	HIS	-	expression tag	UNP P0DTC2
F	531	GLY	-	expression tag	UNP P0DTC2
F	532	HIS	-	expression tag	UNP P0DTC2
F	533	HIS	-	expression tag	UNP P0DTC2
F	534	HIS	-	expression tag	UNP P0DTC2
F	535	HIS	-	expression tag	UNP P0DTC2
F	536	HIS	-	expression tag	UNP P0DTC2
F	537	HIS	-	expression tag	UNP P0DTC2

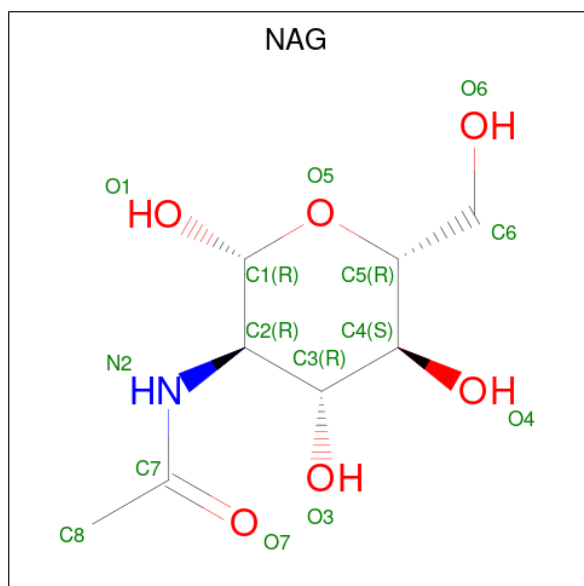
- Molecule 2 is a protein called COVA2-15 antibody heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	227	Total	C	N	O	S	0	0	0
			1680	1055	282	335	8			
2	I	224	Total	C	N	O	S	0	0	0
			1659	1043	278	330	8			
2	K	225	Total	C	N	O	S	0	0	0
			1663	1045	279	331	8			
2	N	223	Total	C	N	O	S	0	0	0
			1653	1040	277	328	8			
2	P	224	Total	C	N	O	S	0	0	0
			1659	1043	278	330	8			
2	R	225	Total	C	N	O	S	0	0	0
			1657	1040	278	331	8			

- Molecule 3 is a protein called COVA2-15 antibody light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	L	219	Total 1699	C 1058	N 295	O 339	S 7	0	0	0
3	G	219	Total 1699	C 1058	N 295	O 339	S 7	0	0	0
3	J	218	Total 1689	C 1052	N 293	O 338	S 6	0	0	0
3	M	219	Total 1699	C 1058	N 295	O 339	S 7	0	0	0
3	O	219	Total 1699	C 1058	N 295	O 339	S 7	0	0	0
3	Q	218	Total 1693	C 1055	N 294	O 338	S 6	0	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
			Total	C	N	O		
4	A	1	Total 14	C 8	N 1	O 5	0	0
4	C	1	Total 14	C 8	N 1	O 5	0	0
4	B	1	Total 14	C 8	N 1	O 5	0	0
4	D	1	Total 14	C 8	N 1	O 5	0	0
4	E	1	Total 14	C 8	N 1	O 5	0	0

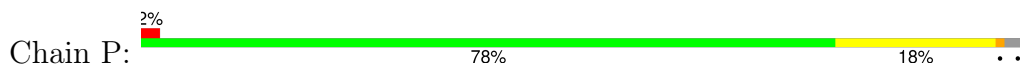
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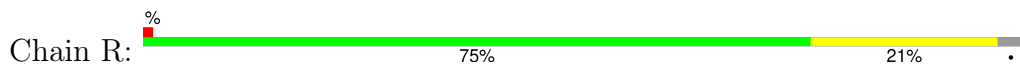
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
4	F	1	14	8	1	5	0	0



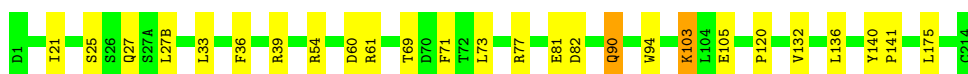
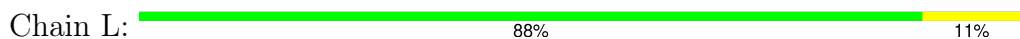
- Molecule 2: COVA2-15 antibody heavy chain



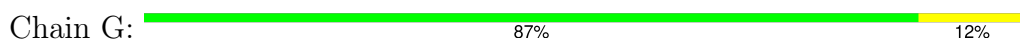
- Molecule 2: COVA2-15 antibody heavy chain



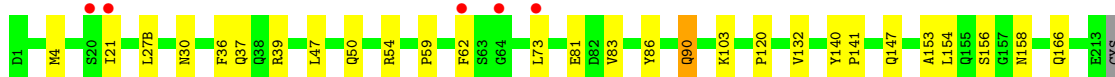
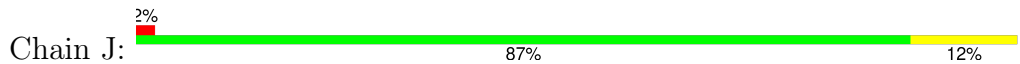
- Molecule 3: COVA2-15 antibody light chain



- Molecule 3: COVA2-15 antibody light chain

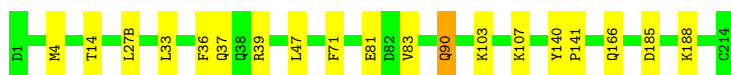


- Molecule 3: COVA2-15 antibody light chain



- Molecule 3: COVA2-15 antibody light chain

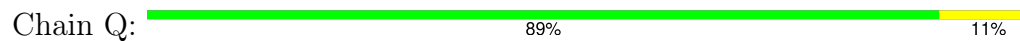




- Molecule 3: COVA2-15 antibody light chain



- Molecule 3: COVA2-15 antibody light chain



4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	101.05Å 218.66Å 122.73Å 90.00° 112.34° 90.00°	Depositor
Resolution (Å)	33.14 – 3.38 33.14 – 3.38	Depositor EDS
% Data completeness (in resolution range)	98.7 (33.14-3.38) 98.6 (33.14-3.38)	Depositor EDS
R_{merge}	0.21	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.35 (at 3.39Å)	Xtrriage
Refinement program	PHENIX (1.21rc1_5127: ???)	Depositor
R, R_{free}	0.242 , 0.295 0.243 , 0.294	Depositor DCC
R_{free} test set	3313 reflections (4.83%)	wwPDB-VP
Wilson B-factor (Å ²)	94.0	Xtrriage
Anisotropy	0.156	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 68.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	0.038 for h,-k,-h-l	Xtrriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	29362	wwPDB-VP
Average B, all atoms (Å ²)	113.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.84% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.25	0/1572	0.48	0/2139
1	B	0.25	0/1527	0.46	0/2075
1	C	0.25	0/1572	0.48	0/2139
1	D	0.25	0/1569	0.47	0/2135
1	E	0.25	0/1572	0.47	0/2139
1	F	0.25	0/1572	0.47	0/2139
2	H	0.26	0/1718	0.52	0/2336
2	I	0.27	0/1697	0.51	0/2309
2	K	0.26	0/1701	0.49	0/2314
2	N	0.25	0/1691	0.49	0/2301
2	P	0.25	0/1697	0.50	0/2309
2	R	0.25	0/1695	0.50	0/2307
3	G	0.25	0/1736	0.50	0/2355
3	J	0.25	0/1726	0.49	0/2343
3	L	0.25	0/1736	0.50	0/2355
3	M	0.25	0/1736	0.49	0/2355
3	O	0.25	0/1736	0.48	0/2355
3	Q	0.25	0/1730	0.48	0/2347
All	All	0.25	0/29983	0.49	0/40752

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	1529	0	1445	21	0
1	B	1487	0	1400	10	0
1	C	1529	0	1445	11	0
1	D	1526	0	1436	14	0
1	E	1529	0	1445	16	0
1	F	1529	0	1445	13	0
2	H	1680	0	1634	33	0
2	I	1659	0	1611	32	0
2	K	1663	0	1612	29	0
2	N	1653	0	1606	31	0
2	P	1659	0	1611	31	0
2	R	1657	0	1594	37	0
3	G	1699	0	1648	17	0
3	J	1689	0	1632	18	0
3	L	1699	0	1648	15	0
3	M	1699	0	1648	10	0
3	O	1699	0	1648	12	0
3	Q	1693	0	1643	15	0
4	A	14	0	13	0	0
4	B	14	0	13	0	0
4	C	14	0	13	1	0
4	D	14	0	13	0	0
4	E	14	0	13	0	0
4	F	14	0	13	0	0
All	All	29362	0	28229	320	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 6.

All (320) 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)
2:H:130:SER:HG	2:H:136:GLY:N	1.78	0.82
2:K:82:MET:HB3	2:K:82(C):LEU:HD21	1.63	0.80
2:P:82:MET:HB3	2:P:82(C):LEU:HD21	1.63	0.79
2:H:82:MET:HB3	2:H:82(C):LEU:HD21	1.63	0.79
2:I:82:MET:HB3	2:I:82(C):LEU:HD21	1.65	0.79
2:N:82:MET:HB3	2:N:82(C):LEU:HD21	1.66	0.76
2:R:82:MET:HB3	2:R:82(C):LEU:HD21	1.66	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:27:GLN:HG3	3:G:27:GLN:HG3	1.68	0.74
3:G:27(B):LEU:HD21	3:G:90:GLN:HG2	1.71	0.73
2:H:51:ILE:HD11	2:H:69:ILE:HG12	1.72	0.71
2:H:47:TRP:HH2	2:H:100(L):PRO:HG3	1.55	0.70
2:I:51:ILE:HD11	2:I:69:ILE:HG12	1.73	0.70
2:H:100:GLY:N	2:H:100(C):CYS:SG	2.63	0.68
2:N:51:ILE:HD11	2:N:69:ILE:HG12	1.76	0.67
2:N:108:LEU:HD22	2:N:151:PRO:HD3	1.77	0.67
3:L:39:ARG:NH1	3:L:81:GLU:O	2.27	0.67
2:R:51:ILE:HD11	2:R:69:ILE:HG12	1.76	0.66
1:A:449:TYR:OH	2:H:100(I):ARG:O	2.10	0.66
1:C:449:TYR:OH	2:I:100(I):ARG:O	2.08	0.66
2:K:11:LEU:HB2	2:K:149:PRO:HG3	1.76	0.66
1:D:365:TYR:H	1:D:388:ASN:HD21	1.41	0.66
2:P:126:PRO:HG2	2:P:227:PRO:HB3	1.78	0.66
1:E:448:ASN:HA	2:P:98:TYR:HB3	1.78	0.65
2:K:51:ILE:HD11	2:K:69:ILE:HG12	1.78	0.65
2:P:126:PRO:HD3	2:P:140:LEU:HB3	1.78	0.65
2:R:66:ARG:NH2	2:R:86:ASP:OD2	2.30	0.65
3:Q:106:ILE:O	3:Q:166:GLN:NE2	2.27	0.65
1:B:448:ASN:HA	2:K:98:TYR:HB3	1.78	0.65
3:L:27(B):LEU:HD21	3:L:90:GLN:HG2	1.79	0.65
2:R:47:TRP:HH2	2:R:100(L):PRO:HG3	1.62	0.64
2:I:66:ARG:NH2	2:I:86:ASP:OD2	2.31	0.63
1:D:449:TYR:OH	2:N:100(I):ARG:O	2.08	0.63
2:R:11:LEU:HB2	2:R:149:PRO:HG3	1.79	0.63
2:N:47:TRP:HH2	2:N:100(L):PRO:HG3	1.63	0.63
3:J:83:VAL:HG21	3:J:166:GLN:HB3	1.81	0.63
2:H:66:ARG:NH2	2:H:86:ASP:OD2	2.32	0.63
2:K:47:TRP:HH2	2:K:100(L):PRO:HG3	1.64	0.63
2:P:51:ILE:HD11	2:P:69:ILE:HG12	1.80	0.62
2:I:47:TRP:HH2	2:I:100(L):PRO:HG3	1.64	0.62
2:N:66:ARG:NH2	2:N:86:ASP:OD2	2.32	0.62
1:C:358:ILE:HB	1:C:395:VAL:HB	1.81	0.62
3:G:120:PRO:HD3	3:G:132:VAL:HG22	1.81	0.61
1:D:448:ASN:HA	2:N:98:TYR:HB3	1.81	0.61
2:P:47:TRP:HH2	2:P:100(L):PRO:HG3	1.63	0.61
2:H:108:LEU:HD21	2:H:110:THR:HG23	1.81	0.61
2:P:95:ASP:HA	2:P:100(L):PRO:HA	1.80	0.61
1:B:358:ILE:HB	1:B:395:VAL:HB	1.82	0.61
2:P:94:LYS:O	2:P:101:ASP:N	2.34	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:11:LEU:HB2	2:H:149:PRO:HG3	1.83	0.60
3:O:83:VAL:HG21	3:O:166:GLN:HB3	1.82	0.60
2:I:108:LEU:HD21	2:I:110:THR:HG23	1.82	0.60
2:N:94:LYS:O	2:N:101:ASP:N	2.34	0.60
1:F:365:TYR:H	1:F:388:ASN:HD21	1.47	0.60
3:J:39:ARG:NH1	3:J:81:GLU:O	2.35	0.60
3:Q:120:PRO:HD3	3:Q:132:VAL:HG22	1.84	0.60
3:J:54:ARG:NH1	3:J:59:PRO:O	2.35	0.60
3:Q:27(B):LEU:HD21	3:Q:90:GLN:HG2	1.84	0.59
2:R:94:LYS:O	2:R:101:ASP:N	2.36	0.59
1:E:365:TYR:H	1:E:388:ASN:HD21	1.49	0.59
3:G:54:ARG:NH1	3:G:62:PHE:O	2.36	0.59
1:F:358:ILE:HB	1:F:395:VAL:HB	1.85	0.59
2:I:11:LEU:HB2	2:I:149:PRO:HG3	1.83	0.59
1:E:449:TYR:OH	2:P:100(I):ARG:O	2.17	0.59
2:K:66:ARG:NH2	2:K:86:ASP:OD2	2.36	0.58
2:R:34:MET:HB3	2:R:78:LEU:HD22	1.84	0.58
2:K:34:MET:HB3	2:K:78:LEU:HD22	1.86	0.58
2:P:11:LEU:HB2	2:P:149:PRO:HG3	1.86	0.58
3:J:147:GLN:HB3	3:J:154:LEU:HD11	1.85	0.58
2:P:66:ARG:NH2	2:P:86:ASP:OD2	2.36	0.58
2:N:11:LEU:HD22	2:N:149:PRO:HD3	1.86	0.57
1:E:350:VAL:HG22	1:E:422:ASN:HB3	1.86	0.57
2:H:130:SER:O	2:H:136:GLY:N	2.37	0.57
3:L:77:ARG:HH12	2:N:195:SER:HB3	1.70	0.57
3:M:83:VAL:HG21	3:M:166:GLN:HB3	1.87	0.57
2:P:34:MET:HB3	2:P:78:LEU:HD22	1.86	0.57
3:J:27(B):LEU:HD21	3:J:90:GLN:HG2	1.86	0.57
2:N:126:PRO:HD3	2:N:140:LEU:HB3	1.86	0.57
3:J:120:PRO:HD3	3:J:132:VAL:HG22	1.86	0.57
1:D:358:ILE:HB	1:D:395:VAL:HB	1.86	0.57
3:M:27(B):LEU:HD21	3:M:90:GLN:HG2	1.86	0.56
2:N:95:ASP:HA	2:N:100(L):PRO:HA	1.86	0.56
1:E:358:ILE:HB	1:E:395:VAL:HB	1.88	0.56
2:R:108:LEU:HD21	2:R:110:THR:HG23	1.88	0.56
2:I:95:ASP:HA	2:I:100(L):PRO:HA	1.87	0.56
1:A:350:VAL:HG22	1:A:422:ASN:HB3	1.87	0.55
3:L:25:SER:O	3:L:69:THR:OG1	2.19	0.55
2:R:176:ALA:HB2	2:R:187:LEU:HD23	1.88	0.55
3:Q:25:SER:O	3:Q:69:THR:OG1	2.18	0.55
2:P:108:LEU:HD21	2:P:110:THR:HG23	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:P:87:THR:HG23	2:P:110:THR:HA	1.89	0.55
1:C:448:ASN:HA	2:I:98:TYR:HB3	1.88	0.54
2:N:108:LEU:HD21	2:N:110:THR:HG23	1.90	0.54
3:J:158:ASN:HB3	1:E:468:ILE:HD11	1.88	0.54
1:A:444:LYS:HD2	2:H:98:TYR:HD2	1.71	0.54
1:B:350:VAL:HG22	1:B:422:ASN:HB3	1.89	0.54
2:P:100:GLY:N	2:P:100(C):CYS:SG	2.67	0.54
2:K:87:THR:HG23	2:K:110:THR:HA	1.89	0.54
1:A:405:ASP:O	1:A:408:ARG:NH2	2.41	0.54
2:H:94:LYS:O	2:H:101:ASP:N	2.41	0.54
3:G:13:VAL:HG23	3:G:17:GLN:HE21	1.72	0.54
2:R:126:PRO:HD3	2:R:140:LEU:HB3	1.88	0.54
2:I:100:GLY:N	2:I:100(C):CYS:SG	2.71	0.54
1:A:408:ARG:NH1	2:K:196:SER:O	2.42	0.53
2:P:198:LEU:HB3	2:P:227:PRO:HG3	1.90	0.53
2:R:119:PRO:HB3	2:R:147:TYR:HB3	1.89	0.53
1:E:376:THR:HG23	1:E:378:LYS:HE2	1.89	0.53
2:I:100(L):PRO:HD2	3:G:36:PHE:HZ	1.74	0.53
2:R:87:THR:HG23	2:R:110:THR:HA	1.91	0.53
1:A:358:ILE:HB	1:A:395:VAL:HB	1.91	0.53
2:K:93:ALA:HB1	2:K:100(L):PRO:HB3	1.91	0.53
1:A:408:ARG:NH1	2:K:198:LEU:O	2.34	0.52
2:K:108:LEU:HD21	2:K:110:THR:HG23	1.90	0.52
2:R:108:LEU:HD22	2:R:151:PRO:HD3	1.89	0.52
3:O:27(B):LEU:HD21	3:O:90:GLN:HG2	1.91	0.52
2:K:100(L):PRO:HD2	3:J:36:PHE:HZ	1.75	0.52
3:O:39:ARG:NH1	3:O:81:GLU:O	2.41	0.52
3:M:39:ARG:NH1	3:M:81:GLU:O	2.42	0.52
2:P:94:LYS:NZ	2:P:101:ASP:OD2	2.43	0.52
2:K:94:LYS:O	2:K:101:ASP:N	2.43	0.51
1:D:393:THR:HA	1:D:522:ALA:HA	1.92	0.51
2:N:34:MET:HB3	2:N:78:LEU:HD22	1.90	0.51
2:I:34:MET:HB3	2:I:78:LEU:HD22	1.92	0.51
3:O:120:PRO:HD3	3:O:132:VAL:HG22	1.91	0.51
2:P:119:PRO:HB3	2:P:147:TYR:HB3	1.93	0.51
2:R:176:ALA:HA	2:R:187:LEU:HB3	1.93	0.51
3:J:153:ALA:HB2	1:E:355:ARG:HD2	1.93	0.51
2:P:100(L):PRO:HD2	3:O:36:PHE:HZ	1.76	0.51
2:R:100(L):PRO:HD2	3:Q:36:PHE:HZ	1.76	0.51
1:F:448:ASN:HA	2:R:98:TYR:HB3	1.93	0.51
2:R:100:GLY:N	2:R:100(C):CYS:SG	2.71	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:449:TYR:OH	2:R:100(I):ARG:O	2.17	0.50
3:L:33:LEU:HD22	3:L:71:PHE:CG	2.46	0.50
3:G:33:LEU:HD22	3:G:71:PHE:CG	2.47	0.50
1:B:393:THR:HA	1:B:522:ALA:HA	1.94	0.50
2:K:108:LEU:HD22	2:K:151:PRO:HD3	1.93	0.50
1:D:350:VAL:HG22	1:D:422:ASN:HB3	1.92	0.50
1:B:449:TYR:OH	2:K:100(I):ARG:O	2.12	0.50
1:C:384:PRO:HA	1:C:387:LEU:HD12	1.93	0.50
2:I:87:THR:HG23	2:I:110:THR:HA	1.94	0.50
3:J:140:TYR:CG	3:J:141:PRO:HA	2.46	0.50
1:A:384:PRO:HA	1:A:387:LEU:HD12	1.94	0.50
2:H:119:PRO:HB3	2:H:147:TYR:HB3	1.93	0.50
1:C:350:VAL:HG22	1:C:422:ASN:HB3	1.94	0.50
2:I:94:LYS:O	2:I:101:ASP:N	2.44	0.50
1:B:498:GLN:NE2	3:J:50:GLN:OE1	2.45	0.49
2:R:95:ASP:HA	2:R:100(L):PRO:HA	1.94	0.49
3:J:37:GLN:HB2	3:J:47:LEU:HD11	1.94	0.49
1:D:346:ARG:NH1	2:N:100(A):ASP:OD1	2.46	0.49
2:H:22:CYS:HB3	2:H:78:LEU:HB3	1.96	0.48
3:G:37:GLN:HB2	3:G:47:LEU:HD11	1.95	0.48
3:O:147:GLN:HB3	3:O:154:LEU:HD11	1.95	0.48
2:I:22:CYS:HB3	2:I:78:LEU:HB3	1.95	0.48
3:O:37:GLN:NE2	3:O:86:TYR:OH	2.46	0.48
2:N:40:ALA:HB3	2:N:43:LYS:HB2	1.96	0.48
1:B:501:ASN:ND2	3:J:30:ASN:OD1	2.45	0.48
2:K:176:ALA:HB2	2:K:187:LEU:HD23	1.96	0.48
2:H:100(L):PRO:HD2	3:L:36:PHE:HZ	1.79	0.48
1:C:365:TYR:CD2	1:C:387:LEU:HB3	2.49	0.48
2:K:119:PRO:HB3	2:K:147:TYR:HB3	1.96	0.48
2:N:119:PRO:HB3	2:N:147:TYR:HB3	1.95	0.47
2:P:104:GLY:O	3:O:43:SER:OG	2.20	0.47
1:F:387:LEU:HA	1:F:390:LEU:HD12	1.95	0.47
3:L:120:PRO:HD3	3:L:132:VAL:HG22	1.95	0.47
1:C:342:PHE:HB2	4:C:601:NAG:H83	1.96	0.47
3:G:83:VAL:HG21	3:G:166:GLN:HB3	1.97	0.47
3:M:140:TYR:CG	3:M:141:PRO:HA	2.49	0.47
2:R:40:ALA:HB3	2:R:43:LYS:HB2	1.95	0.47
2:N:87:THR:HG23	2:N:110:THR:HA	1.96	0.47
1:A:365:TYR:H	1:A:388:ASN:HD21	1.63	0.47
2:H:34:MET:HB3	2:H:78:LEU:HD22	1.96	0.47
2:I:119:PRO:HB3	2:I:147:TYR:HB3	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:K:52:SER:HB2	2:K:100(C):CYS:SG	2.55	0.47
2:H:53:SER:HB3	2:H:100(A):ASP:HA	1.96	0.47
1:B:444:LYS:HZ2	2:K:32:TYR:HE2	1.63	0.47
2:R:96:THR:OG1	3:Q:46:ARG:NH1	2.48	0.47
2:I:145:LYS:NZ	3:G:131:SER:OG	2.41	0.46
1:A:405:ASP:HA	1:A:408:ARG:HH22	1.80	0.46
2:I:176:ALA:HA	2:I:187:LEU:HB3	1.97	0.46
2:H:40:ALA:HB3	2:H:43:LYS:HB2	1.96	0.46
2:H:87:THR:HG23	2:H:110:THR:HA	1.96	0.46
2:P:100(F):LYS:HA	3:O:94:TRP:CD1	2.50	0.46
3:L:61:ARG:NH2	3:L:82:ASP:OD1	2.48	0.46
3:J:54:ARG:NH1	3:J:62:PHE:O	2.46	0.46
2:N:176:ALA:HB2	2:N:187:LEU:HD23	1.96	0.46
1:F:401:VAL:HG22	1:F:509:ARG:HG2	1.98	0.46
3:O:140:TYR:CG	3:O:141:PRO:HA	2.51	0.46
2:K:95:ASP:HA	2:K:100(L):PRO:HA	1.96	0.46
1:D:502:GLY:O	1:D:506:GLN:HG3	2.16	0.46
2:N:176:ALA:HA	2:N:187:LEU:HB3	1.98	0.46
2:R:52:SER:HB2	2:R:100(C):CYS:SG	2.56	0.46
1:D:439:ASN:HD21	1:D:499:PRO:HA	1.81	0.46
1:A:379:CYS:HA	1:A:432:CYS:HA	1.98	0.45
3:J:21:ILE:HD12	3:J:73:LEU:HD23	1.99	0.45
2:R:116:THR:HG22	2:R:215:SER:HB3	1.98	0.45
2:H:193:VAL:HG21	2:H:206:TYR:OH	2.17	0.45
3:G:140:TYR:CG	3:G:141:PRO:HA	2.52	0.45
3:G:147:GLN:HB3	3:G:154:LEU:HD11	1.99	0.45
2:N:52(A):GLY:HA3	2:N:100:GLY:HA2	1.98	0.45
3:L:103:LYS:HE2	3:L:105:GLU:HB3	1.98	0.45
3:L:140:TYR:CG	3:L:141:PRO:HA	2.51	0.45
2:I:126:PRO:HD3	2:I:140:LEU:HB3	1.97	0.45
3:L:60:ASP:OD2	2:N:137:THR:OG1	2.32	0.45
2:K:176:ALA:HA	2:K:187:LEU:HB3	1.98	0.45
1:F:350:VAL:HG22	1:F:422:ASN:HB3	1.98	0.45
2:K:52(A):GLY:HA3	2:K:100:GLY:HA2	1.99	0.45
2:R:52(A):GLY:HA3	2:R:100:GLY:HA2	1.98	0.45
2:I:157:TRP:CH2	2:I:208:CYS:HB3	2.53	0.44
1:D:387:LEU:HA	1:D:390:LEU:HD12	1.99	0.44
3:Q:113:PRO:HB3	3:Q:139:PHE:HB3	1.99	0.44
1:A:498:GLN:H	1:A:501:ASN:ND2	2.14	0.44
2:H:68:THR:HG23	2:H:81:GLN:HB3	2.00	0.44
2:H:100(F):LYS:HA	3:L:94:TRP:CD1	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:K:68:THR:HG23	2:K:81:GLN:HB3	1.99	0.44
1:E:366:SER:O	1:E:370:ASN:HB2	2.17	0.44
3:J:156:SER:HB3	1:E:467:ASP:HA	2.00	0.44
1:F:418:ILE:HA	1:F:422:ASN:HD22	1.83	0.44
2:H:193:VAL:HG22	2:H:194:PRO:HD2	1.99	0.44
2:I:40:ALA:HB3	2:I:43:LYS:HB2	1.99	0.44
2:N:22:CYS:HB3	2:N:78:LEU:HB3	2.00	0.44
2:I:58:TYR:OH	3:G:95:PRO:HB3	2.17	0.44
2:P:68:THR:HG23	2:P:81:GLN:HB3	2.00	0.44
1:F:365:TYR:CD2	1:F:387:LEU:HB3	2.53	0.44
2:I:52(A):GLY:HA3	2:I:100:GLY:HA2	2.00	0.44
2:P:52:SER:HB2	2:P:100(C):CYS:SG	2.58	0.44
3:G:25:SER:O	3:G:69:THR:OG1	2.22	0.44
1:D:360:ASN:H	1:D:523:THR:HB	1.83	0.44
2:N:68:THR:HG23	2:N:81:GLN:HB3	1.99	0.44
2:N:100:GLY:N	2:N:100(C):CYS:SG	2.72	0.44
2:R:36:TRP:CD1	2:R:80:LEU:HB2	2.52	0.44
1:A:376:THR:HG23	1:A:378:LYS:HE2	1.99	0.43
2:H:47:TRP:CH2	2:H:100(L):PRO:HG3	2.45	0.43
2:I:56:SER:HB3	2:I:100(E):ILE:HG22	1.99	0.43
2:K:116:THR:HG22	2:K:215:SER:HB3	1.99	0.43
1:A:346:ARG:NH1	2:H:100(A):ASP:OD2	2.50	0.43
1:A:502:GLY:O	1:A:506:GLN:HG3	2.18	0.43
2:I:32:TYR:CG	2:I:94:LYS:HE2	2.53	0.43
3:G:120:PRO:HG3	3:G:130:ALA:HB1	2.00	0.43
2:N:93:ALA:HB1	2:N:100(L):PRO:HB3	2.00	0.43
3:M:33:LEU:HD22	3:M:71:PHE:CG	2.53	0.43
2:R:94:LYS:NZ	2:R:101:ASP:OD2	2.50	0.43
2:R:100(E):ILE:C	2:R:100(G):LEU:H	2.21	0.43
1:A:408:ARG:NH2	2:K:196:SER:HA	2.34	0.43
1:B:502:GLY:O	1:B:506:GLN:HG3	2.19	0.43
2:N:100(L):PRO:HD2	3:M:36:PHE:HZ	1.83	0.43
1:F:450:ASN:OD1	2:R:100(C):CYS:HB3	2.18	0.43
2:I:53:SER:HB3	2:I:100(A):ASP:HA	2.00	0.43
2:P:116:THR:HG22	2:P:149:PRO:HD3	2.00	0.43
1:C:360:ASN:H	1:C:523:THR:HB	1.84	0.43
2:I:63:VAL:HB	2:I:67:PHE:CD2	2.54	0.43
1:D:386:LYS:HD3	1:D:386:LYS:HA	1.82	0.43
1:F:386:LYS:HA	1:F:386:LYS:HD3	1.85	0.43
2:N:63:VAL:HB	2:N:67:PHE:CD2	2.54	0.42
2:H:126:PRO:HG2	2:H:227:PRO:HB3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:157:TRP:CH2	2:H:208:CYS:HB3	2.54	0.42
1:B:384:PRO:HA	1:B:387:LEU:HD12	2.01	0.42
2:K:100:GLY:N	2:K:100(C):CYS:SG	2.72	0.42
2:I:104:GLY:O	3:G:43:SER:OG	2.31	0.42
1:E:386:LYS:HA	1:E:386:LYS:HD3	1.84	0.42
2:P:100(E):ILE:HG13	2:P:100(F):LYS:H	1.84	0.42
3:Q:120:PRO:HG3	3:Q:130:ALA:HB1	2.02	0.42
2:H:100(E):ILE:O	2:H:100(F):LYS:HB2	2.19	0.42
1:C:347:PHE:CE2	1:C:399:SER:HB2	2.54	0.42
2:R:100(F):LYS:HA	3:Q:94:TRP:CD1	2.55	0.42
2:H:36:TRP:CD1	2:H:80:LEU:HB2	2.54	0.42
2:I:68:THR:HG23	2:I:81:GLN:HB3	2.00	0.42
2:P:100(E):ILE:C	2:P:100(G):LEU:H	2.23	0.42
2:R:100(K):GLY:HA3	3:Q:34:ASN:HD21	1.84	0.42
2:H:11:LEU:HD22	2:H:149:PRO:HD3	2.00	0.42
2:I:100(F):LYS:HA	3:G:94:TRP:CD1	2.55	0.42
2:K:63:VAL:HB	2:K:67:PHE:CD2	2.54	0.42
2:P:63:VAL:HB	2:P:67:PHE:CD2	2.55	0.42
1:A:387:LEU:HA	1:A:390:LEU:HD12	2.01	0.42
1:C:502:GLY:O	1:C:506:GLN:HG3	2.20	0.42
2:P:176:ALA:HA	2:P:187:LEU:HB3	2.01	0.42
2:R:36:TRP:NE1	2:R:80:LEU:HB2	2.35	0.42
3:M:37:GLN:HB2	3:M:47:LEU:HD11	2.02	0.42
2:I:82(C):LEU:HD23	2:I:82(C):LEU:HA	1.87	0.41
1:D:379:CYS:HA	1:D:432:CYS:HA	2.02	0.41
2:K:40:ALA:HB3	2:K:43:LYS:HB2	2.01	0.41
1:E:440:ASN:OD1	1:E:440:ASN:N	2.52	0.41
1:E:444:LYS:HZ2	2:P:32:TYR:HE2	1.69	0.41
3:O:113:PRO:HB3	3:O:139:PHE:HB3	2.02	0.41
3:Q:140:TYR:CG	3:Q:141:PRO:HA	2.56	0.41
2:I:176:ALA:HB2	2:I:187:LEU:HD23	2.01	0.41
2:P:36:TRP:CD1	2:P:80:LEU:HB2	2.55	0.41
1:F:462:LYS:HB2	1:F:462:LYS:HE2	1.91	0.41
3:M:4:MET:SD	3:M:90:GLN:HB2	2.60	0.41
3:M:185:ASP:HA	3:M:188:LYS:HD3	2.02	0.41
2:P:82(C):LEU:HD23	2:P:82(C):LEU:HA	1.87	0.41
3:Q:37:GLN:HB2	3:Q:47:LEU:HD11	2.03	0.41
2:H:19:ARG:HB2	2:H:81:GLN:OE1	2.21	0.41
2:H:126:PRO:HD3	2:H:140:LEU:HB3	2.01	0.41
1:A:347:PHE:CE2	1:A:399:SER:HB2	2.55	0.41
3:L:21:ILE:HD12	3:L:73:LEU:HD23	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:M:14:THR:HB	3:M:107:LYS:NZ	2.36	0.41
3:O:94:TRP:HE3	3:O:95:PRO:HA	1.86	0.41
1:C:498:GLN:H	1:C:501:ASN:ND2	2.19	0.41
1:D:384:PRO:HA	1:D:387:LEU:HD12	2.02	0.41
1:E:387:LEU:HA	1:E:390:LEU:HD12	2.02	0.41
1:F:360:ASN:H	1:F:523:THR:HB	1.86	0.41
2:R:82(C):LEU:HD23	2:R:82(C):LEU:HA	1.90	0.41
2:R:157:TRP:CH2	2:R:208:CYS:HB3	2.56	0.41
2:R:174:PHE:CD2	3:Q:164:THR:HG23	2.55	0.41
1:A:418:ILE:HA	1:A:422:ASN:HB2	2.03	0.41
3:L:136:LEU:HB2	3:L:175:LEU:HB3	2.03	0.41
3:Q:148:TRP:O	3:Q:154:LEU:HD12	2.21	0.41
1:A:462:LYS:HB2	1:A:462:LYS:HE2	1.96	0.40
3:J:37:GLN:NE2	3:J:86:TYR:OH	2.49	0.40
2:H:56:SER:HB3	2:H:100(E):ILE:HG22	2.03	0.40
2:N:100(E):ILE:C	2:N:100(G):LEU:H	2.24	0.40
2:R:63:VAL:HB	2:R:67:PHE:CD2	2.55	0.40
2:R:100(E):ILE:HG13	2:R:100(F):LYS:H	1.86	0.40
2:N:100(E):ILE:HG13	2:N:100(F):LYS:H	1.86	0.40
1:E:462:LYS:HE2	1:E:462:LYS:HB2	1.89	0.40
3:Q:147:GLN:HB3	3:Q:154:LEU:HD11	2.02	0.40
2:N:36:TRP:NE1	2:N:80:LEU:HB2	2.37	0.40
1:E:379:CYS:HA	1:E:432:CYS:HA	2.02	0.40
1:A:440:ASN:OD1	1:A:440:ASN:N	2.54	0.40
3:J:4:MET:SD	3:J:90:GLN:HB2	2.61	0.40
2:R:222:ARG:HE	2:R:226:GLU:CD	2.25	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	191/205 (93%)	186 (97%)	5 (3%)	0	100	100
1	B	183/205 (89%)	179 (98%)	4 (2%)	0	100	100
1	C	191/205 (93%)	187 (98%)	4 (2%)	0	100	100
1	D	191/205 (93%)	186 (97%)	5 (3%)	0	100	100
1	E	191/205 (93%)	187 (98%)	4 (2%)	0	100	100
1	F	191/205 (93%)	187 (98%)	4 (2%)	0	100	100
2	H	223/232 (96%)	217 (97%)	6 (3%)	0	100	100
2	I	220/232 (95%)	215 (98%)	5 (2%)	0	100	100
2	K	221/232 (95%)	215 (97%)	6 (3%)	0	100	100
2	N	219/232 (94%)	214 (98%)	5 (2%)	0	100	100
2	P	220/232 (95%)	215 (98%)	5 (2%)	0	100	100
2	R	221/232 (95%)	215 (97%)	6 (3%)	0	100	100
3	G	217/219 (99%)	213 (98%)	4 (2%)	0	100	100
3	J	216/219 (99%)	211 (98%)	5 (2%)	0	100	100
3	L	217/219 (99%)	212 (98%)	5 (2%)	0	100	100
3	M	217/219 (99%)	212 (98%)	5 (2%)	0	100	100
3	O	217/219 (99%)	213 (98%)	4 (2%)	0	100	100
3	Q	216/219 (99%)	212 (98%)	4 (2%)	0	100	100
All	All	3762/3936 (96%)	3676 (98%)	86 (2%)	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	166/177 (94%)	166 (100%)	0	100	100
1	B	162/177 (92%)	161 (99%)	1 (1%)	84	91
1	C	166/177 (94%)	166 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	165/177 (93%)	165 (100%)	0	100	100
1	E	166/177 (94%)	166 (100%)	0	100	100
1	F	166/177 (94%)	166 (100%)	0	100	100
2	H	186/190 (98%)	184 (99%)	2 (1%)	70	82
2	I	183/190 (96%)	179 (98%)	4 (2%)	47	69
2	K	183/190 (96%)	180 (98%)	3 (2%)	58	75
2	N	182/190 (96%)	179 (98%)	3 (2%)	58	75
2	P	183/190 (96%)	180 (98%)	3 (2%)	58	75
2	R	181/190 (95%)	179 (99%)	2 (1%)	70	82
3	G	195/195 (100%)	192 (98%)	3 (2%)	60	77
3	J	193/195 (99%)	191 (99%)	2 (1%)	73	84
3	L	195/195 (100%)	192 (98%)	3 (2%)	60	77
3	M	195/195 (100%)	193 (99%)	2 (1%)	73	84
3	O	195/195 (100%)	193 (99%)	2 (1%)	73	84
3	Q	194/195 (100%)	192 (99%)	2 (1%)	73	84
All	All	3256/3372 (97%)	3224 (99%)	32 (1%)	73	84

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	H	99	CYS
2	H	100(I)	ARG
3	L	54	ARG
3	L	90	GLN
3	L	103	LYS
2	I	13	GLN
2	I	98	TYR
2	I	99	CYS
2	I	100(I)	ARG
3	G	54	ARG
3	G	90	GLN
3	G	103	LYS
1	B	386	LYS
2	K	98	TYR
2	K	99	CYS
2	K	100(I)	ARG
3	J	90	GLN

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Mol	Chain	Res	Type
3	J	103	LYS
2	N	98	TYR
2	N	99	CYS
2	N	100(I)	ARG
3	M	90	GLN
3	M	103	LYS
2	P	98	TYR
2	P	99	CYS
2	P	100(I)	ARG
3	O	90	GLN
3	O	103	LYS
2	R	99	CYS
2	R	100(I)	ARG
3	Q	90	GLN
3	Q	103	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
3	L	17	GLN
3	G	17	GLN
3	J	17	GLN
3	O	17	GLN
2	R	172	HIS
3	Q	50	GLN
3	Q	137	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry

6 ligands are modelled in this entry.

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	E	1001	1	14,14,15	0.60	0	17,19,21	1.57	1 (5%)
4	NAG	B	1001	1	14,14,15	0.62	0	17,19,21	1.59	1 (5%)
4	NAG	A	1001	1	14,14,15	0.61	0	17,19,21	1.58	1 (5%)
4	NAG	F	1001	1	14,14,15	0.61	0	17,19,21	1.59	1 (5%)
4	NAG	D	1001	1	14,14,15	0.60	0	17,19,21	1.56	1 (5%)
4	NAG	C	601	1	14,14,15	0.69	0	17,19,21	2.18	4 (23%)

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	E	1001	1	-	4/6/23/26	0/1/1/1
4	NAG	B	1001	1	-	4/6/23/26	0/1/1/1
4	NAG	A	1001	1	-	4/6/23/26	0/1/1/1
4	NAG	F	1001	1	-	4/6/23/26	0/1/1/1
4	NAG	D	1001	1	-	4/6/23/26	0/1/1/1
4	NAG	C	601	1	-	3/6/23/26	0/1/1/1

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
4	C	601	NAG	C1-O5-C5	5.54	119.61	112.19
4	F	1001	NAG	C1-O5-C5	5.53	119.59	112.19
4	B	1001	NAG	C1-O5-C5	5.46	119.51	112.19
4	D	1001	NAG	C1-O5-C5	5.43	119.46	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	1001	NAG	C1-O5-C5	5.43	119.46	112.19
4	E	1001	NAG	C1-O5-C5	5.38	119.40	112.19
4	C	601	NAG	C2-N2-C7	4.03	128.30	122.90
4	C	601	NAG	C1-C2-N2	3.60	116.11	110.43
4	C	601	NAG	O7-C7-N2	2.17	125.81	121.98

There are no chirality outliers.

All (23) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	F	1001	NAG	O5-C5-C6-O6
4	A	1001	NAG	O5-C5-C6-O6
4	B	1001	NAG	O5-C5-C6-O6
4	D	1001	NAG	O5-C5-C6-O6
4	E	1001	NAG	O5-C5-C6-O6
4	A	1001	NAG	C4-C5-C6-O6
4	E	1001	NAG	C4-C5-C6-O6
4	F	1001	NAG	C4-C5-C6-O6
4	A	1001	NAG	C8-C7-N2-C2
4	A	1001	NAG	O7-C7-N2-C2
4	B	1001	NAG	C8-C7-N2-C2
4	B	1001	NAG	O7-C7-N2-C2
4	D	1001	NAG	C8-C7-N2-C2
4	D	1001	NAG	O7-C7-N2-C2
4	E	1001	NAG	C8-C7-N2-C2
4	E	1001	NAG	O7-C7-N2-C2
4	F	1001	NAG	C8-C7-N2-C2
4	F	1001	NAG	O7-C7-N2-C2
4	B	1001	NAG	C4-C5-C6-O6
4	D	1001	NAG	C4-C5-C6-O6
4	C	601	NAG	C3-C2-N2-C7
4	C	601	NAG	C4-C5-C6-O6
4	C	601	NAG	O5-C5-C6-O6

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	601	NAG	1	0

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	193/205 (94%)	-0.48	0 100 100	37, 76, 152, 197	0
1	B	187/205 (91%)	0.21	2 (1%) 77 70	88, 133, 191, 209	0
1	C	193/205 (94%)	-0.38	0 100 100	46, 89, 148, 187	0
1	D	193/205 (94%)	-0.00	2 (1%) 79 71	73, 133, 200, 223	0
1	E	193/205 (94%)	-0.09	0 100 100	91, 140, 204, 216	0
1	F	193/205 (94%)	0.15	3 (1%) 70 62	107, 146, 189, 215	0
2	H	227/232 (97%)	-0.59	0 100 100	30, 58, 91, 142	0
2	I	224/232 (96%)	-0.54	0 100 100	35, 59, 89, 114	0
2	K	225/232 (96%)	-0.02	5 (2%) 62 53	83, 119, 145, 172	0
2	N	223/232 (96%)	-0.18	0 100 100	84, 130, 171, 187	0
2	P	224/232 (96%)	0.14	5 (2%) 62 53	81, 130, 176, 203	0
2	R	225/232 (96%)	0.05	3 (1%) 74 66	86, 141, 171, 193	0
3	G	219/219 (100%)	-0.44	0 100 100	45, 74, 103, 165	2 (0%)
3	J	218/219 (99%)	0.04	5 (2%) 61 51	73, 121, 150, 180	3 (1%)
3	L	219/219 (100%)	-0.46	0 100 100	38, 70, 110, 153	2 (0%)
3	M	219/219 (100%)	-0.12	0 100 100	84, 128, 158, 202	1 (0%)
3	O	219/219 (100%)	-0.19	1 (0%) 87 83	69, 115, 151, 184	2 (0%)
3	Q	218/219 (99%)	-0.01	0 100 100	79, 151, 185, 194	0
All	All	3812/3936 (96%)	-0.16	26 (0%) 84 78	30, 117, 176, 223	10 (0%)

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	432	CYS	4.6
2	K	128	SER	3.3
1	B	410	ILE	3.0

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Mol	Chain	Res	Type	RSRZ
2	R	97	GLY	3.0
2	K	100(J)	GLY	2.8
2	K	100(H)	ILE	2.7
1	F	423	TYR	2.7
2	P	100(J)	GLY	2.6
2	P	97	GLY	2.6
2	R	100(J)	GLY	2.6
1	F	432	CYS	2.5
2	K	97	GLY	2.4
3	J	73	LEU	2.3
2	P	29	PHE	2.2
2	P	140	LEU	2.2
1	F	338	PHE	2.1
1	D	341	VAL	2.1
2	R	96	THR	2.1
3	J	62	PHE	2.1
1	D	510	VAL	2.1
2	P	93	ALA	2.1
3	J	20	SER	2.1
3	J	21	ILE	2.0
2	K	100(K)	GLY	2.0
3	J	64	GLY	2.0
3	O	36	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](#)

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, 95th 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.

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
4	NAG	F	1001	14/15	0.49	0.14	126,167,186,200	0
4	NAG	E	1001	14/15	0.69	0.10	142,162,186,189	0
4	NAG	C	601	14/15	0.72	0.10	102,156,177,179	0
4	NAG	D	1001	14/15	0.80	0.10	121,161,174,183	0
4	NAG	B	1001	14/15	0.85	0.08	156,181,193,195	0
4	NAG	A	1001	14/15	0.86	0.07	75,116,133,140	0

6.5 Other polymers [i](#)

There are no such residues in this entry.