Full wwPDB X-ray Structure Validation Report (i)

Jan 9, 2025 – 12:06 PM EST

PDB ID	:	8W3I
Title	:	Crystal structure of prefusion-stabilized RSV F protein UFCR1-L2
Authors	:	Lee, Y.Z.; Stanfield, R.L.; Wilson, I.A.; Zhu, J.
Deposited on	:	2024-02-22
Resolution	:	2.30 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 (i) 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 (1)) were used in the production of this report:

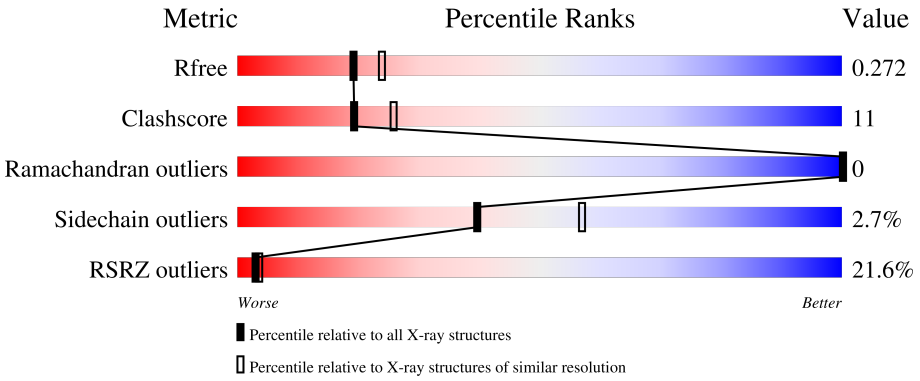
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	5963 (2.30-2.30)
Clashscore	180529	6698 (2.30-2.30)
Ramachandran outliers	177936	6640 (2.30-2.30)
Sidechain outliers	177891	6640 (2.30-2.30)
RSRZ outliers	164620	5963 (2.30-2.30)

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 <=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	F	507	19% 67% 20% • 12%

2 Entry composition (i)

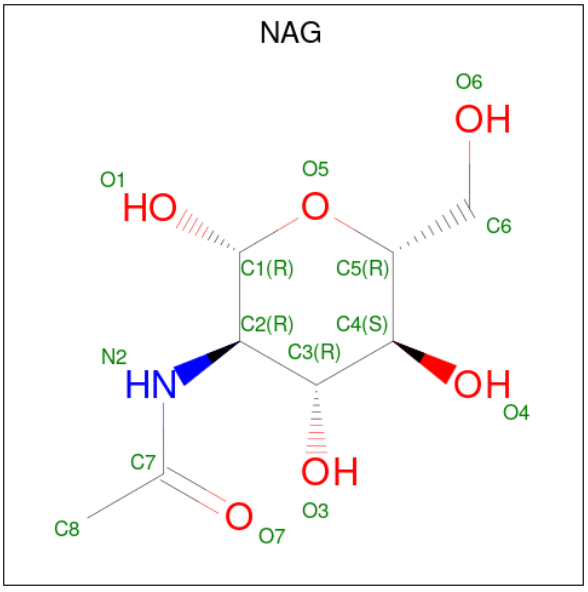
There are 4 unique types of molecules in this entry. The entry contains 3549 atoms, of which 10 are hydrogens and 0 are deuteriums.

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 Prefusion-stabilized RSV F protein UFCR1-L2.

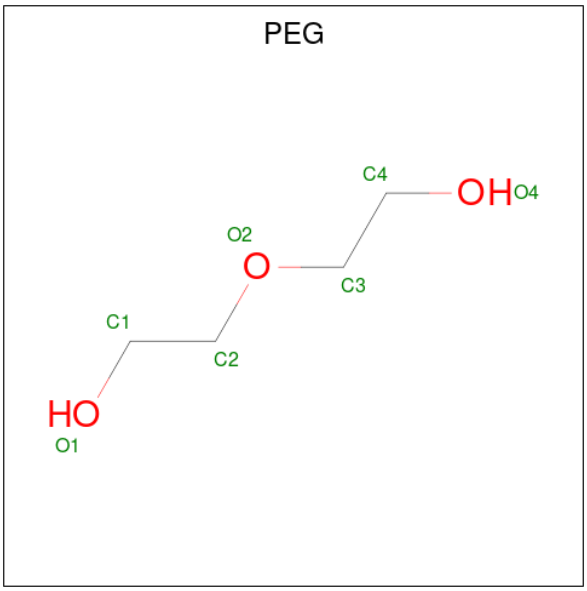
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	F	445	3435	2164	570	678	23	0	1	0

- Molecule 2 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		
2	F	1	14	8	1	5	0	0

- Molecule 3 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
3	F	1	17	4	10	3	0	0

- Molecule 4 is water.

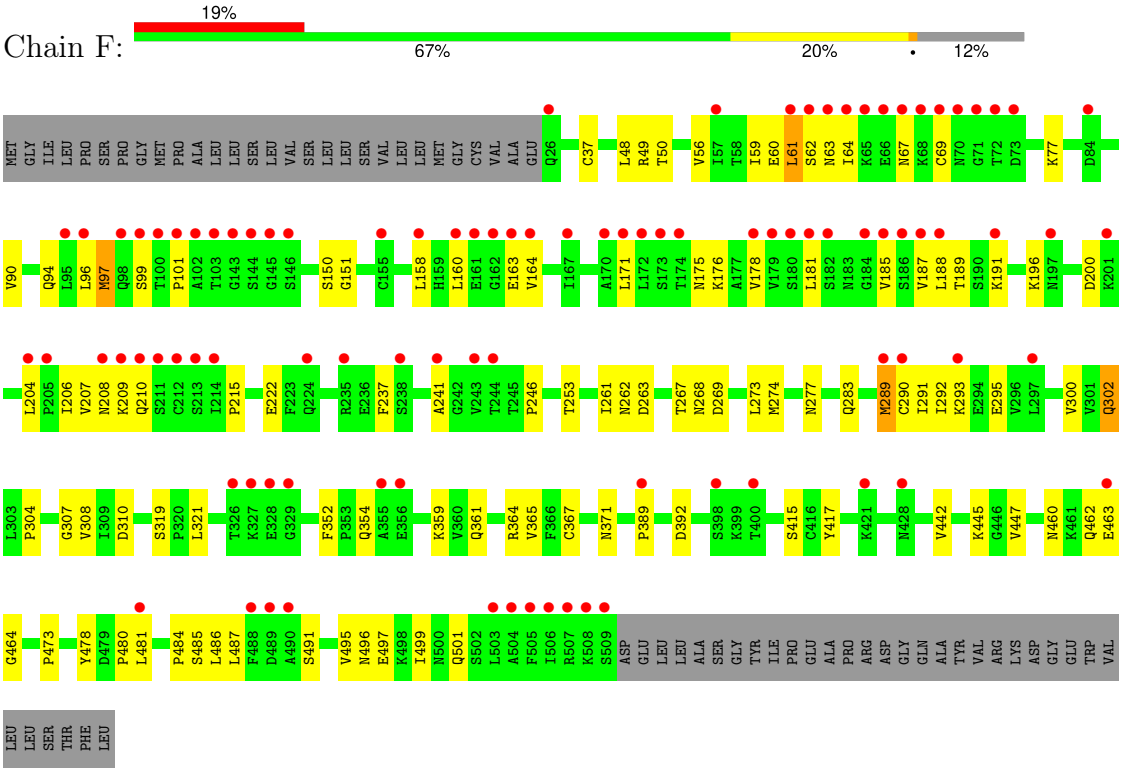
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
4	F	83	83	83	0	0

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: Prefusion-stabilized RSV F protein UFCR1-L2

Chain F:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 41 3 2	Depositor
Cell constants a, b, c, α, β, γ	169.00Å 169.00Å 169.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.79 – 2.30 48.79 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.8 (48.79-2.30) 99.8 (48.79-2.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.15 (at 2.29Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.240 , 0.272 0.244 , 0.272	Depositor DCC
R_{free} test set	1824 reflections (4.92%)	wwPDB-VP
Wilson B-factor (Å^2)	48.8	Xtriage
Anisotropy	0.000	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 30.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	3549	wwPDB-VP
Average B, all atoms (Å^2)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.63% 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: PEG, 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	F	0.53	1/3488 (0.0%)	0.83	0/4730

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	310	ASP	C-N	-5.19	1.22	1.34

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	F	3435	0	3486	80	1
2	F	14	0	13	2	0
3	F	7	10	10	0	0
4	F	83	0	0	1	0
All	All	3539	10	3509	80	1

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 (80) 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:200:ASP:HA	1:F:204:LEU:HG	1.57	0.86
1:F:277:ASN:ND2	1:F:361:GLN:OE1	2.10	0.83
1:F:151:GLY:H	1:F:302:GLN:NE2	1.77	0.82
1:F:291:ILE:HD11	1:F:293:LYS:HD3	1.62	0.81
1:F:151:GLY:H	1:F:302:GLN:HE21	1.29	0.80
1:F:163:GLU:OE1	1:F:181:LEU:HD23	1.85	0.76
1:F:267:THR:HG22	1:F:269:ASP:H	1.51	0.75
1:F:90:VAL:HG13	1:F:292:ILE:HD11	1.67	0.74
1:F:151:GLY:N	1:F:302:GLN:HE21	1.90	0.69
1:F:237:PHE:CD2	1:F:289:MET:HG2	2.27	0.69
1:F:64:ILE:HD12	1:F:204:LEU:HD22	1.79	0.65
1:F:60:GLU:OE1	1:F:191:LYS:NZ	2.31	0.64
1:F:290:CYS:SG	1:F:300:VAL:HG23	2.39	0.63
1:F:188:LEU:HD11	1:F:263:ASP:HB3	1.79	0.63
1:F:96:LEU:O	1:F:96:LEU:HD23	2.02	0.60
1:F:101:PRO:HG3	1:F:241:ALA:O	2.02	0.59
1:F:354:GLN:HE22	1:F:371:ASN:HB3	1.67	0.59
1:F:478:TYR:O	1:F:480:PRO:HD3	2.04	0.58
1:F:164:VAL:HB	1:F:293:LYS:HE2	1.85	0.58
1:F:181:LEU:HD12	1:F:187:VAL:HG13	1.86	0.58
1:F:48:LEU:HD22	1:F:367:CYS:HB2	1.85	0.57
1:F:481:LEU:HD22	1:F:481:LEU:H	1.69	0.57
1:F:496:ASN:HB3	2:F:601:NAG:H82	1.87	0.57
1:F:56:VAL:HB	1:F:189:THR:HG22	1.86	0.56
1:F:171:LEU:HD22	1:F:175:ASN:O	2.05	0.56
1:F:445:LYS:NZ	1:F:464:GLY:O	2.39	0.55
1:F:237:PHE:CE2	1:F:289:MET:HG2	2.41	0.55
1:F:206:ILE:HD13	1:F:215:PRO:HB3	1.89	0.54
1:F:291:ILE:CD1	1:F:293:LYS:HD3	2.36	0.54
1:F:267:THR:HG22	1:F:268:ASN:N	2.23	0.54
1:F:37:CYS:SG	1:F:319:SER:HB3	2.49	0.52
1:F:96:LEU:HD11	1:F:237:PHE:HB3	1.91	0.52
1:F:96:LEU:HD23	1:F:96:LEU:C	2.30	0.52
1:F:196:LYS:HZ1	1:F:295:GLU:CD	2.13	0.51
1:F:59:ILE:HG22	1:F:61:LEU:HD12	1.93	0.51
1:F:59:ILE:O	1:F:61:LEU:HD13	2.11	0.51
1:F:267:THR:CG2	1:F:268:ASN:N	2.73	0.50
1:F:495:VAL:O	1:F:499:ILE:HG13	2.11	0.50
1:F:59:ILE:HG22	1:F:61:LEU:CD1	2.41	0.50
1:F:196:LYS:NZ	1:F:295:GLU:OE1	2.39	0.49
1:F:365:VAL:HG12	1:F:367:CYS:SG	2.53	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:185:VAL:HG12	1:F:187:VAL:HG12	1.93	0.48
1:F:267:THR:HG22	1:F:269:ASP:N	2.24	0.48
1:F:160:LEU:HB2	1:F:163:GLU:HG3	1.94	0.48
1:F:354:GLN:NE2	1:F:371:ASN:HB3	2.27	0.48
1:F:209:LYS:O	1:F:209:LYS:HG3	2.12	0.48
1:F:209:LYS:O	1:F:210:GLN:HB2	2.13	0.47
1:F:442:VAL:CG2	1:F:447:VAL:HG21	2.43	0.47
1:F:246:PRO:HB3	1:F:283:GLN:HA	1.95	0.47
1:F:442:VAL:HG21	1:F:447:VAL:HG21	1.96	0.47
1:F:261:ILE:HD13	1:F:274:MET:CB	2.45	0.47
1:F:352:PHE:CE2	1:F:367:CYS:HB3	2.51	0.46
1:F:50:THR:OG1	1:F:307:GLY:HA3	2.16	0.46
1:F:273:LEU:HD11	1:F:364:ARG:HD2	1.98	0.46
1:F:485:SER:O	1:F:486:LEU:HB2	2.17	0.45
1:F:62:SER:HB3	1:F:196:LYS:HA	1.98	0.45
1:F:261:ILE:HD13	1:F:274:MET:HB2	1.99	0.45
1:F:49:ARG:HG3	1:F:304:PRO:CB	2.47	0.45
1:F:208:ASN:OD1	1:F:209:LYS:N	2.50	0.45
1:F:415:SER:HB3	1:F:417:TYR:CE2	2.52	0.45
1:F:392:ASP:OD2	1:F:491:SER:CB	2.66	0.44
1:F:56:VAL:O	1:F:189:THR:HA	2.17	0.44
1:F:62:SER:O	1:F:63:ASN:HB3	2.18	0.44
1:F:49:ARG:HG3	1:F:304:PRO:HB2	1.99	0.44
1:F:389:PRO:HA	4:F:763:HOH:O	2.18	0.44
1:F:158:LEU:HD23	1:F:158:LEU:HA	1.80	0.43
1:F:94:GLN:HG3	1:F:292:ILE:HD13	2.00	0.43
1:F:67:ASN:HB3	1:F:207:VAL:HB	2.00	0.43
1:F:496:ASN:CB	2:F:601:NAG:H82	2.49	0.43
1:F:206:ILE:CD1	1:F:215:PRO:HB3	2.48	0.42
1:F:48:LEU:HB2	1:F:308:VAL:HB	2.01	0.42
1:F:321:LEU:HD11	1:F:473:PRO:HB3	2.01	0.42
1:F:96:LEU:CD1	1:F:237:PHE:HB3	2.50	0.41
1:F:97:MET:O	1:F:97:MET:HG2	2.19	0.41
1:F:392:ASP:OD2	1:F:491:SER:HB2	2.20	0.41
1:F:497:GLU:HG3	1:F:501:GLN:NE2	2.35	0.41
1:F:460:ASN:OD1	1:F:462:GLN:HB2	2.21	0.41
1:F:484:PRO:HB2	1:F:487:LEU:HD11	2.02	0.41
1:F:283:GLN:OE1	1:F:359:LYS:HD2	2.21	0.40
1:F:178:VAL:HG22	1:F:188:LEU:CD2	2.52	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:77:LYS:NZ	1:F:222:GLU:OE2[5_555]	2.18	0.02

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	F	444/507 (88%)	424 (96%)	20 (4%)	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	F	407/457 (89%)	395 (97%)	12 (3%)	37 54

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	61	LEU
1	F	69	CYS
1	F	97	MET
1	F	99	SER
1	F	150[A]	SER
1	F	150[B]	SER
1	F	176	LYS
1	F	253	THR

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Mol	Chain	Res	Type
1	F	262	ASN
1	F	289	MET
1	F	302	GLN
1	F	463	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	F	302	GLN
1	F	354	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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

2 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	$\#\|Z\| > 2$
2	NAG	F	601	1	14,14,15	1.42	1 (7%)	17,19,21	0.97	1 (5%)
3	PEG	F	602	-	6,6,6	0.40	0	5,5,5	0.31	0

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
2	NAG	F	601	1	-	1/6/23/26	0/1/1/1
3	PEG	F	602	-	-	2/4/4/4	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	601	NAG	O5-C1	4.81	1.51	1.43

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	F	601	NAG	C1-O5-C5	3.15	116.40	112.19

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	F	602	PEG	O1-C1-C2-O2
3	F	602	PEG	C1-C2-O2-C3
2	F	601	NAG	C1-C2-N2-C7

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	601	NAG	2	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

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	F	445/507 (87%)	1.06	96 (21%)	3	3	33, 60, 99, 129	1 (0%)

All (96) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	102	ALA	9.0
1	F	103	THR	6.5
1	F	100	THR	6.2
1	F	505	PHE	5.3
1	F	172	LEU	5.2
1	F	101	PRO	5.1
1	F	488	PHE	5.0
1	F	211	SER	4.9
1	F	68	LYS	4.6
1	F	400	THR	4.4
1	F	181	LEU	4.4
1	F	210	GLN	4.3
1	F	186	SER	4.3
1	F	69	CYS	4.2
1	F	212	CYS	4.2
1	F	184	GLY	4.1
1	F	170	ALA	4.0
1	F	67	ASN	4.0
1	F	209	LYS	4.0
1	F	71	GLY	3.9
1	F	143	GLY	3.9
1	F	185	VAL	3.8
1	F	174	THR	3.8
1	F	160	LEU	3.7
1	F	328	GLU	3.7
1	F	70	ASN	3.7
1	F	506	ILE	3.6

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Mol	Chain	Res	Type	RSRZ
1	F	509	SER	3.6
1	F	167	ILE	3.6
1	F	26	GLN	3.6
1	F	187	VAL	3.6
1	F	213	SER	3.5
1	F	326	THR	3.5
1	F	205	PRO	3.4
1	F	63	ASN	3.4
1	F	356	GLU	3.3
1	F	62	SER	3.2
1	F	145	GLY	3.2
1	F	179	VAL	3.2
1	F	428	ASN	3.2
1	F	504	ALA	3.1
1	F	171	LEU	3.1
1	F	204	LEU	3.1
1	F	155	CYS	3.0
1	F	327	LYS	3.0
1	F	503	LEU	2.9
1	F	507	ARG	2.8
1	F	481	LEU	2.8
1	F	238	SER	2.8
1	F	490	ALA	2.8
1	F	508	LYS	2.8
1	F	161	GLU	2.8
1	F	489	ASP	2.8
1	F	98	GLN	2.7
1	F	61	LEU	2.7
1	F	96	LEU	2.7
1	F	188	LEU	2.6
1	F	64	ILE	2.6
1	F	73	ASP	2.6
1	F	197	ASN	2.6
1	F	182	SER	2.6
1	F	178	VAL	2.6
1	F	208	ASN	2.6
1	F	65	LYS	2.5
1	F	180	SER	2.5
1	F	158	LEU	2.5
1	F	95	LEU	2.4
1	F	293	LYS	2.4
1	F	72	THR	2.4

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Mol	Chain	Res	Type	RSRZ
1	F	66	GLU	2.4
1	F	146	SER	2.3
1	F	99	SER	2.3
1	F	144	SER	2.3
1	F	201	LYS	2.3
1	F	57	ILE	2.3
1	F	241	ALA	2.2
1	F	290	CYS	2.2
1	F	214	ILE	2.2
1	F	289	MET	2.2
1	F	463	GLU	2.2
1	F	389	PRO	2.2
1	F	244	THR	2.2
1	F	243	VAL	2.2
1	F	329	GLY	2.2
1	F	235	ARG	2.2
1	F	164	VAL	2.1
1	F	173	SER	2.1
1	F	398	SER	2.1
1	F	224	GLN	2.1
1	F	162	GLY	2.1
1	F	297	LEU	2.1
1	F	355	ALA	2.1
1	F	163	GLU	2.1
1	F	421	LYS	2.1
1	F	84	ASP	2.0
1	F	191	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)

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
2	NAG	F	601	14/15	0.56	0.20	79,99,110,112	0
3	PEG	F	602	7/7	0.81	0.17	40,61,81,81	0

6.5 Other polymers (i)

There are no such residues in this entry.