



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 17, 2024 – 07:31 AM EDT

PDB ID : 5OSI
Title : Structure of retromer VPS29-VPS35C subunits complexed with RidL harpin loop (163-176)
Authors : Romano-Moreno, M.; Rojas, A.L.; Lucas, M.; Isupov, M.N.; Hierro, A.
Deposited on : 2017-08-17
Resolution : 2.52 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 : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.37.1
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) : 2.37.1

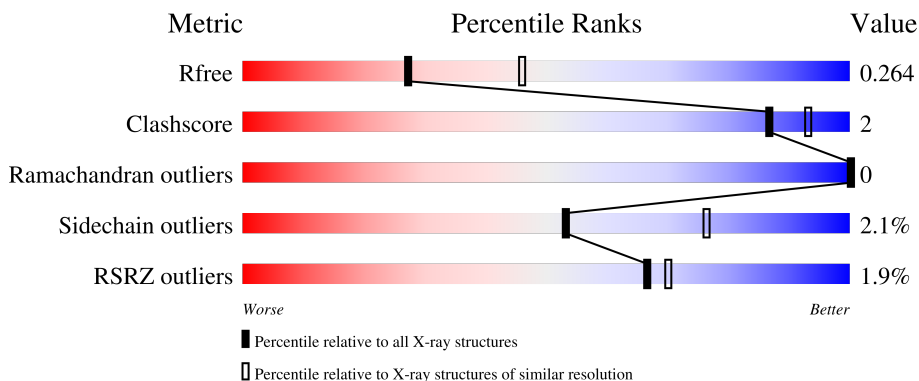
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.52 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	5743 (2.54-2.50)
Clashscore	141614	6463 (2.54-2.50)
Ramachandran outliers	138981	6335 (2.54-2.50)
Sidechain outliers	138945	6337 (2.54-2.50)
RSRZ outliers	127900	5630 (2.54-2.50)

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	182	 92% 8%
1	D	182	 93% 7%
1	G	182	 94% 6%
1	J	182	 90% 9%
2	B	311	 90% 6%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
2	E	311	<p>90% 7%</p>
2	H	311	<p>85% 5% 9%</p>
2	K	311	<p>88% 6% 6%</p>
3	C	14	<p>71% 7% 7% 14%</p>
3	F	14	<p>79% 21%</p>
3	I	14	<p>86% 7% 7%</p>

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 15918 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 Vacuolar protein sorting-associated protein 29.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	182	1447	936	242	263	6	0	0	0
1	D	182	1452	940	242	263	7	0	1	0
1	G	182	1447	936	242	263	6	0	0	0
1	J	182	1447	936	242	263	6	0	0	0

- Molecule 2 is a protein called Vacuolar protein sorting-associated protein 35.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	299	2424	1539	423	452	10	0	0	0
2	E	302	2454	1558	429	457	10	0	1	0
2	H	283	2307	1472	405	420	10	0	2	0
2	K	293	2389	1519	418	442	10	0	1	0

- Molecule 3 is a protein called Interaptin.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	C	12	95	63	13	19	0	0	0
3	F	11	87	57	12	18	0	0	0
3	I	12	95	63	13	19	0	0	0

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	D	1	Total C O 4 2 2	0	0
4	D	1	Total C O 4 2 2	0	0
4	G	1	Total C O 4 2 2	0	0
4	H	1	Total C O 4 2 2	0	0
4	J	1	Total C O 4 2 2	0	0
4	J	1	Total C O 4 2 2	0	0
4	K	1	Total C O 4 2 2	0	0
4	K	1	Total C O 4 2 2	0	0
4	K	1	Total C O 4 2 2	0	0

- Molecule 5 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	E	1	Total Na 1 1	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	H	1	Total 1	Na 1	0	0
5	K	2	Total 2	Na 2	0	0

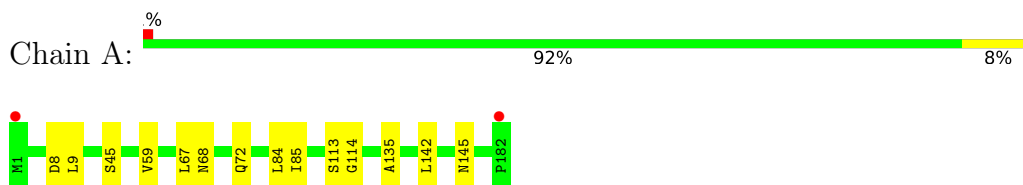
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	15	Total 15	O 15	0	0
6	B	26	Total 26	O 26	0	0
6	D	22	Total 22	O 22	0	0
6	E	36	Total 36	O 36	0	0
6	G	12	Total 12	O 12	0	0
6	H	17	Total 17	O 17	0	0
6	I	1	Total 1	O 1	0	0
6	J	33	Total 33	O 33	0	0
6	K	64	Total 64	O 64	0	0

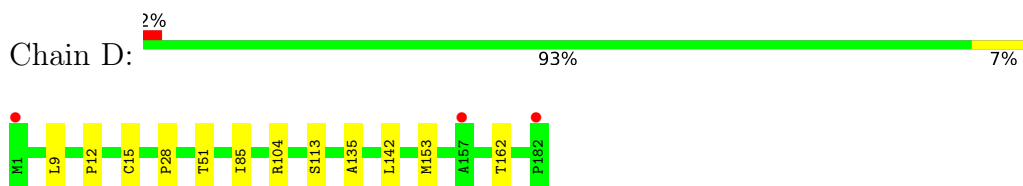
3 Residue-property plots [i](#)

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.

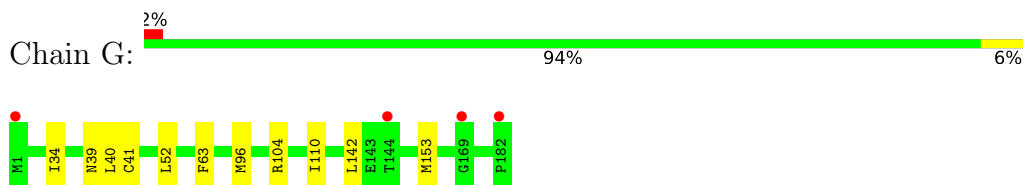
- Molecule 1: Vacuolar protein sorting-associated protein 29



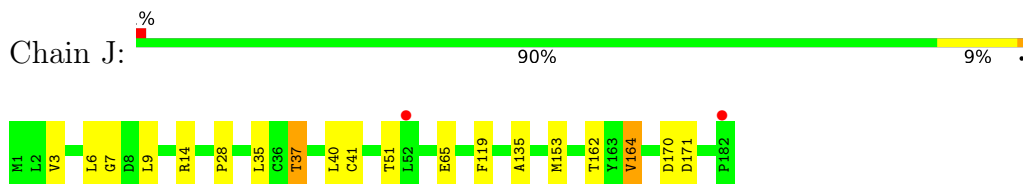
- Molecule 1: Vacuolar protein sorting-associated protein 29



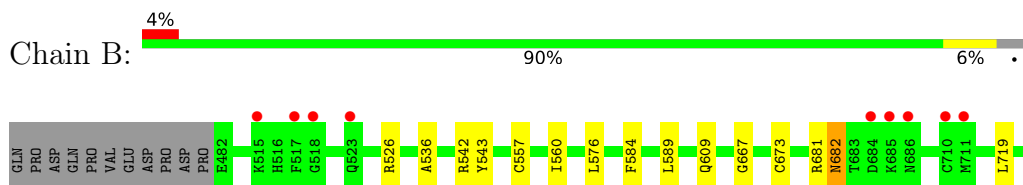
- Molecule 1: Vacuolar protein sorting-associated protein 29



- Molecule 1: Vacuolar protein sorting-associated protein 29

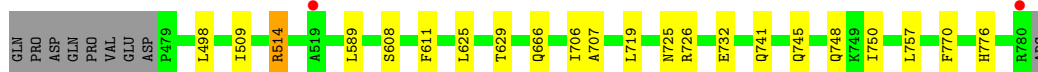
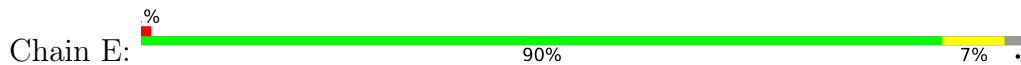


- Molecule 2: Vacuolar protein sorting-associated protein 35

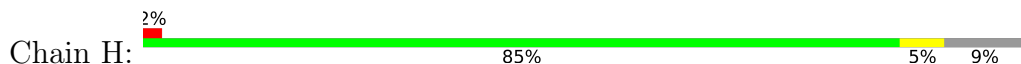




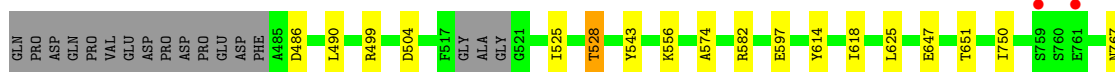
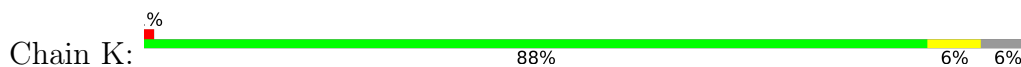
• Molecule 2: Vacuolar protein sorting-associated protein 35



• Molecule 2: Vacuolar protein sorting-associated protein 35



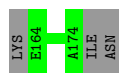
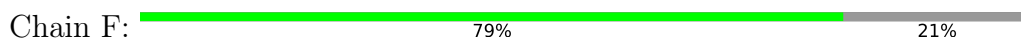
• Molecule 2: Vacuolar protein sorting-associated protein 35



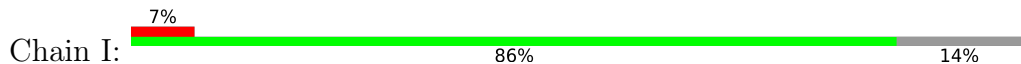
• Molecule 3: Interaptin



• Molecule 3: Interaptin



• Molecule 3: Interaptin





4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	58.55Å 138.99Å 126.64Å 90.00° 92.78° 90.00°	Depositor
Resolution (Å)	126.49 – 2.52 126.49 – 2.52	Depositor EDS
% Data completeness (in resolution range)	99.4 (126.49-2.52) 99.4 (126.49-2.52)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.18 (at 2.52Å)	Xtrriage
Refinement program	REFMAC 5.8.0158	Depositor
R, R_{free}	0.205 , 0.267 0.207 , 0.264	Depositor DCC
R_{free} test set	3453 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å ²)	42.1	Xtrriage
Anisotropy	0.065	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 41.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.035 for h,-k,-l	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	15918	wwPDB-VP
Average B, all atoms (Å ²)	53.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.61% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	0.41	0/1481	0.67	0/2008
1	D	0.42	0/1489	0.64	0/2018
1	G	0.39	0/1481	0.63	0/2008
1	J	0.41	0/1481	0.64	0/2008
2	B	0.42	0/2471	0.60	0/3327
2	E	0.43	0/2506	0.61	0/3375
2	H	0.43	0/2358	0.61	0/3174
2	K	0.45	0/2437	0.67	0/3279
3	C	0.46	0/98	0.55	0/135
3	F	0.44	0/90	0.53	0/124
3	I	0.42	0/98	0.46	0/135
All	All	0.42	0/15990	0.63	0/21591

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1447	0	1459	6	0
1	D	1452	0	1468	7	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	G	1447	0	1459	6	0
1	J	1447	0	1459	9	0
2	B	2424	0	2407	11	0
2	E	2454	0	2439	16	0
2	H	2307	0	2318	8	0
2	K	2389	0	2389	9	0
3	C	95	0	95	1	0
3	F	87	0	84	0	0
3	I	95	0	95	0	0
4	A	4	0	6	0	0
4	B	4	0	6	0	0
4	D	8	0	12	0	0
4	G	4	0	6	0	0
4	H	4	0	6	0	0
4	J	8	0	12	0	0
4	K	12	0	18	0	0
5	E	1	0	0	0	0
5	H	1	0	0	0	0
5	K	2	0	0	0	0
6	A	15	0	0	0	0
6	B	26	0	0	0	0
6	D	22	0	0	0	0
6	E	36	0	0	0	0
6	G	12	0	0	0	0
6	H	17	0	0	0	0
6	I	1	0	0	0	0
6	J	33	0	0	0	0
6	K	64	0	0	1	0
All	All	15918	0	15738	67	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 2.

All (67) 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:E:514[A]:ARG:HH11	2:E:514[A]:ARG:CG	1.74	1.01
2:E:514[A]:ARG:HH11	2:E:514[A]:ARG:HG2	1.31	0.94
2:E:514[A]:ARG:HG2	2:E:514[A]:ARG:NH1	2.03	0.74
2:E:498:LEU:HD13	2:E:509:ILE:HD11	1.72	0.71
2:E:514[A]:ARG:CG	2:E:514[A]:ARG:NH1	2.46	0.70

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:514[A]:ARG:HH11	2:E:514[A]:ARG:HG3	1.62	0.62
1:A:8:ASP:OD2	1:A:114:GLY:O	2.18	0.61
1:G:39:ASN:HD21	1:G:63:PHE:H	1.50	0.58
1:G:104:ARG:NH1	2:H:725:ASN:OD1	2.38	0.57
1:D:142:LEU:HD21	2:E:589:LEU:HD22	1.87	0.56
2:H:584:PHE:CZ	2:H:609:GLN:HG2	2.40	0.56
1:J:9:LEU:CD2	1:J:135:ALA:HB3	2.37	0.54
2:K:614:TYR:CD1	2:K:618:ILE:HD11	2.43	0.54
2:E:741:GLN:HE21	2:E:745:GLN:HE21	1.57	0.53
2:E:625:LEU:O	2:E:629:THR:HG23	2.09	0.52
1:D:85:ILE:O	1:D:113:SER:HA	2.10	0.52
2:K:525:ILE:HA	2:K:528:THR:HG22	1.90	0.52
2:B:584:PHE:CZ	2:B:609:GLN:HG2	2.45	0.51
2:K:525:ILE:HD11	2:K:574:ALA:HB2	1.94	0.50
1:J:119:PHE:CE2	1:J:164:VAL:HG11	2.46	0.50
2:B:543:TYR:CE2	2:B:560:ILE:HD11	2.47	0.49
2:K:647:GLU:O	2:K:651:THR:HG23	2.12	0.49
2:B:667:GLY:HA3	2:B:719:LEU:HD21	1.94	0.49
2:B:557:CYS:HA	2:B:560:ILE:HD12	1.94	0.48
2:E:498:LEU:CD1	2:E:509:ILE:HD11	2.41	0.48
1:J:7:GLY:HA3	1:J:37:THR:HG22	1.96	0.47
2:K:582:ARG:NH2	6:K:901:HOH:O	2.47	0.47
1:A:142:LEU:HD21	2:B:589:LEU:HD22	1.97	0.47
1:D:12:PRO:HA	1:D:15:CYS:O	2.14	0.47
1:J:153:MET:HG2	1:J:162:THR:HG22	1.96	0.47
2:K:525:ILE:HD11	2:K:574:ALA:CB	2.44	0.47
1:A:67:LEU:HD23	1:A:67:LEU:O	2.15	0.46
1:D:153:MET:HG2	1:D:162:THR:HG22	1.97	0.46
1:D:28:PRO:HG3	1:D:51:THR:HG22	1.97	0.46
2:B:743:LEU:O	2:B:747:ILE:HG23	2.16	0.45
2:B:543:TYR:CD2	2:B:560:ILE:HD11	2.52	0.45
2:K:750:ILE:HG21	2:K:770:PHE:CD1	2.52	0.45
1:J:3:VAL:HG11	1:J:35:LEU:HD12	1.98	0.45
1:J:40:LEU:N	1:J:41:CYS:HA	2.32	0.45
2:K:543:TYR:CE1	2:K:556:LYS:HD3	2.52	0.44
2:B:536:ALA:HB1	2:B:560:ILE:HG22	1.99	0.44
1:D:9:LEU:CD2	1:D:135:ALA:HB3	2.48	0.44
2:H:495:ILE:HD13	2:H:535:ALA:HB2	2.00	0.43
2:B:526:ARG:HG3	2:B:576:LEU:HD11	2.01	0.43
2:B:763:THR:O	2:B:767:ASN:ND2	2.51	0.43
2:H:650:ARG:HD3	2:H:677:PHE:CE2	2.53	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:9:LEU:HD23	1:J:135:ALA:HB3	2.01	0.43
1:J:14:ARG:O	2:K:499:ARG:NH2	2.52	0.43
1:A:59:VAL:HG13	1:A:84:LEU:HD23	2.01	0.43
1:A:85:ILE:O	1:A:113:SER:HA	2.19	0.42
1:G:34:ILE:HD11	1:G:52:LEU:HB2	2.01	0.42
1:G:40:LEU:N	1:G:41:CYS:HA	2.33	0.42
1:G:110:ILE:HD13	1:G:153:MET:HE1	2.00	0.42
2:H:581:LEU:C	2:H:581:LEU:HD23	2.39	0.42
1:A:9:LEU:CD2	1:A:135:ALA:HB3	2.49	0.42
2:H:614:TYR:HA	2:H:618:ILE:HD12	2.01	0.42
2:E:707:ALA:HA	2:E:719:LEU:HD23	2.02	0.41
2:E:732:GLU:OE2	2:E:776:HIS:NE2	2.49	0.41
1:D:104:ARG:NH1	2:E:725:ASN:OD1	2.53	0.41
2:H:724:LEU:HD12	2:H:773:THR:HG21	2.01	0.41
2:E:666:GLN:HG3	2:E:706:ILE:HD13	2.02	0.41
2:B:682:ASN:HD22	2:B:682:ASN:C	2.24	0.41
2:E:741:GLN:HE21	2:E:745:GLN:NE2	2.17	0.41
2:E:750:ILE:HG21	2:E:770:PHE:CD1	2.56	0.41
1:J:28:PRO:HG3	1:J:51:THR:HG22	2.02	0.41
3:C:165:GLU:HB3	3:C:175:ILE:HD12	2.03	0.40
1:G:142:LEU:HD21	2:H:589:LEU:HD11	2.02	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	180/182 (99%)	175 (97%)	5 (3%)	0	100	100
1	D	181/182 (100%)	176 (97%)	5 (3%)	0	100	100
1	G	180/182 (99%)	173 (96%)	7 (4%)	0	100	100
1	J	180/182 (99%)	172 (96%)	8 (4%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	B	297/311 (96%)	287 (97%)	10 (3%)	0	100	100
2	E	301/311 (97%)	293 (97%)	8 (3%)	0	100	100
2	H	281/311 (90%)	274 (98%)	7 (2%)	0	100	100
2	K	290/311 (93%)	281 (97%)	9 (3%)	0	100	100
3	C	10/14 (71%)	10 (100%)	0	0	100	100
3	F	9/14 (64%)	8 (89%)	1 (11%)	0	100	100
3	I	10/14 (71%)	10 (100%)	0	0	100	100
All	All	1919/2014 (95%)	1859 (97%)	60 (3%)	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	160/160 (100%)	156 (98%)	4 (2%)	47	72
1	D	161/160 (101%)	161 (100%)	0	100	100
1	G	160/160 (100%)	159 (99%)	1 (1%)	86	94
1	J	160/160 (100%)	154 (96%)	6 (4%)	33	56
2	B	260/272 (96%)	255 (98%)	5 (2%)	57	79
2	E	264/272 (97%)	257 (97%)	7 (3%)	44	69
2	H	248/272 (91%)	242 (98%)	6 (2%)	49	73
2	K	258/272 (95%)	251 (97%)	7 (3%)	44	69
3	C	11/13 (85%)	10 (91%)	1 (9%)	9	17
3	F	10/13 (77%)	10 (100%)	0	100	100
3	I	11/13 (85%)	11 (100%)	0	100	100
All	All	1703/1767 (96%)	1666 (98%)	37 (2%)	53	75

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	45	SER
1	A	68	ASN
1	A	72	GLN
1	A	145	ASN
2	B	542	ARG
2	B	673	CYS
2	B	681	ARG
2	B	682	ASN
2	B	726	ARG
3	C	165	GLU
2	E	514[A]	ARG
2	E	514[B]	ARG
2	E	608	SER
2	E	611	PHE
2	E	726	ARG
2	E	748	GLN
2	E	757	LEU
1	G	96	MET
2	H	493	ARG
2	H	528	THR
2	H	551	ASP
2	H	582	ARG
2	H	609	GLN
2	H	719	LEU
1	J	6	LEU
1	J	37	THR
1	J	65	GLU
1	J	164	VAL
1	J	170	ASP
1	J	171	ASP
2	K	486	ASP
2	K	490	LEU
2	K	504	ASP
2	K	528	THR
2	K	597	GLU
2	K	625	LEU
2	K	767	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	72	GLN
2	B	682	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	D	115	HIS
1	D	156	GLN
2	E	609	GLN
2	E	666	GLN
2	E	741	GLN
1	G	10	HIS
1	G	39	ASN
1	G	156	GLN
2	H	609	GLN
2	H	716	GLN
1	J	115	HIS
2	K	538	GLN
2	K	769	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](#)

Of 15 ligands modelled in this entry, 4 are monoatomic - leaving 11 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	EDO	D	201	-	3,3,3	0.48	0	2,2,2	0.22	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	EDO	H	801	-	3,3,3	0.47	0	2,2,2	0.33	0
4	EDO	K	801	-	3,3,3	0.41	0	2,2,2	0.23	0
4	EDO	G	201	-	3,3,3	0.48	0	2,2,2	0.33	0
4	EDO	J	201	-	3,3,3	0.53	0	2,2,2	0.20	0
4	EDO	D	202	-	3,3,3	0.47	0	2,2,2	0.21	0
4	EDO	B	801	-	3,3,3	0.43	0	2,2,2	0.52	0
4	EDO	K	802	-	3,3,3	0.48	0	2,2,2	0.06	0
4	EDO	K	803	-	3,3,3	0.55	0	2,2,2	0.16	0
4	EDO	A	201	-	3,3,3	0.51	0	2,2,2	0.14	0
4	EDO	J	202	-	3,3,3	0.49	0	2,2,2	0.23	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
4	EDO	D	201	-	-	0/1/1/1	-
4	EDO	H	801	-	-	0/1/1/1	-
4	EDO	K	801	-	-	1/1/1/1	-
4	EDO	G	201	-	-	0/1/1/1	-
4	EDO	J	201	-	-	0/1/1/1	-
4	EDO	D	202	-	-	1/1/1/1	-
4	EDO	B	801	-	-	0/1/1/1	-
4	EDO	K	802	-	-	1/1/1/1	-
4	EDO	K	803	-	-	1/1/1/1	-
4	EDO	A	201	-	-	1/1/1/1	-
4	EDO	J	202	-	-	1/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	D	202	EDO	O1-C1-C2-O2
4	J	202	EDO	O1-C1-C2-O2
4	A	201	EDO	O1-C1-C2-O2
4	K	801	EDO	O1-C1-C2-O2
4	K	803	EDO	O1-C1-C2-O2
4	K	802	EDO	O1-C1-C2-O2

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

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	182/182 (100%)	0.05	2 (1%) 80 83	31, 53, 87, 97	0
1	D	182/182 (100%)	0.09	3 (1%) 72 74	24, 48, 75, 109	0
1	G	182/182 (100%)	0.01	4 (2%) 62 65	35, 56, 83, 99	0
1	J	182/182 (100%)	-0.03	2 (1%) 80 83	23, 50, 81, 98	0
2	B	299/311 (96%)	0.21	13 (4%) 35 39	28, 58, 93, 112	0
2	E	302/311 (97%)	-0.05	2 (0%) 87 89	20, 46, 83, 112	0
2	H	283/311 (90%)	0.04	7 (2%) 57 61	32, 58, 91, 116	0
2	K	293/311 (94%)	-0.12	2 (0%) 87 89	17, 37, 72, 103	0
3	C	12/14 (85%)	0.33	0 100 100	71, 78, 86, 88	0
3	F	11/14 (78%)	0.36	0 100 100	48, 59, 86, 107	0
3	I	12/14 (85%)	0.65	1 (8%) 11 11	71, 91, 102, 103	0
All	All	1940/2014 (96%)	0.03	36 (1%) 66 70	17, 51, 87, 116	0

All (36) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	711	MET	5.3
1	J	182	PRO	4.6
2	B	780	ARG	4.5
1	D	157	ALA	3.7
2	K	759	SER	3.6
1	D	182	PRO	3.5
3	I	175	ILE	3.4
2	H	680	GLY	3.1
2	B	685	LYS	2.9
2	H	520	GLY	2.8
1	A	1	MET	2.7
2	B	523	GLN	2.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	B	515	LYS	2.7
2	B	518	GLY	2.7
1	G	182	PRO	2.6
2	B	738	VAL	2.6
2	K	761	GLU	2.6
1	D	1	MET	2.5
2	E	780	ARG	2.5
2	B	710	CYS	2.5
2	H	523	GLN	2.5
2	H	683	THR	2.4
1	A	182	PRO	2.4
2	H	519	ALA	2.4
2	B	761	GLU	2.3
2	H	742	VAL	2.2
2	H	681	ARG	2.2
2	B	517	PHE	2.2
2	E	519	ALA	2.1
1	J	52	LEU	2.1
1	G	169	GLY	2.1
2	B	684	ASP	2.1
1	G	1	MET	2.0
2	B	736	ASP	2.0
1	G	144	THR	2.0
2	B	686	ASN	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.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
4	EDO	D	202	4/4	0.75	0.29	82,84,85,87	0
4	EDO	J	201	4/4	0.75	0.19	61,64,66,66	0
4	EDO	K	803	4/4	0.79	0.23	61,64,66,66	0
4	EDO	J	202	4/4	0.80	0.17	64,64,65,65	0
4	EDO	K	802	4/4	0.85	0.21	63,64,64,66	0
5	NA	E	801	1/1	0.85	0.30	68,68,68,68	0
5	NA	K	804	1/1	0.85	0.21	47,47,47,47	0
5	NA	K	805	1/1	0.87	0.25	56,56,56,56	0
4	EDO	A	201	4/4	0.88	0.19	71,71,72,73	0
4	EDO	H	801	4/4	0.91	0.16	62,62,63,63	0
4	EDO	B	801	4/4	0.91	0.18	53,53,54,55	0
5	NA	H	802	1/1	0.92	0.17	58,58,58,58	0
4	EDO	G	201	4/4	0.93	0.24	54,54,55,55	0
4	EDO	D	201	4/4	0.93	0.16	43,45,46,46	0
4	EDO	K	801	4/4	0.93	0.30	44,44,44,45	0

6.5 Other polymers [i](#)

There are no such residues in this entry.