



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 19, 2016 – 11:30 AM EDT

PDB ID : 5JCZ
Title : Rab11 bound to MyoVa-GTD
Authors : Pylypenko, O.; Attanda, W.; Gauquelin, C.; Malherbes, G.; Houdusse, A.
Deposited on : 2016-04-15
Resolution : 2.06 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.7.1 (RC1), CSD as537be (2016)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20027939
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20027939

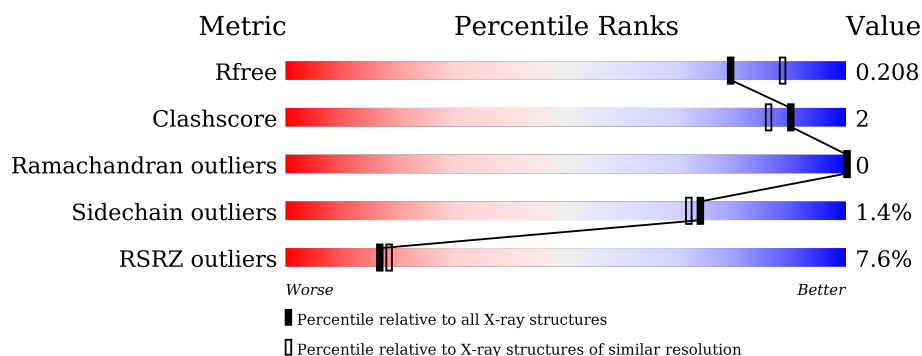
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.06 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}	91344	1799 (2.08-2.04)
Clashscore	102246	1910 (2.08-2.04)
Ramachandran outliers	100387	1893 (2.08-2.04)
Sidechain outliers	100360	1893 (2.08-2.04)
RSRZ outliers	91569	1802 (2.08-2.04)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	179	<div> <div>90%</div> <div>6% .</div> </div>
1	D	179	<div> <div>%</div> <div>92%</div> <div>. . .</div> </div>
1	I	179	<div> <div>48%</div> <div>81%</div> <div>. 18%</div> </div>
2	B	397	<div> <div>4%</div> <div>85%</div> <div>6% . 8%</div> </div>
2	C	397	<div> <div>%</div> <div>85%</div> <div>7% 8%</div> </div>
2	E	397	<div> <div>3%</div> <div>83%</div> <div>7% . 9%</div> </div>

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
6	EDO	A	205	-	-	-	X
6	EDO	B	1901	-	-	-	X
6	EDO	B	1902	-	-	-	X
6	EDO	C	1902	-	-	-	X
6	EDO	C	1904	-	-	-	X
6	EDO	D	204	-	-	-	X
6	EDO	E	1901	-	-	-	X
7	ACT	A	207	-	-	-	X
8	GOL	B	1903	-	-	-	X

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 13842 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 Ras-related protein Rab-11A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	172	Total	C	N	O	S	0	6	0
			1391	883	236	271	1			
1	D	173	Total	C	N	O	S	0	3	0
			1386	880	239	266	1			
1	I	147	Total	C	N	O	S	0	0	0
			980	606	176	197	1			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP P62491
A	0	ALA	-	expression tag	UNP P62491
D	-1	GLY	-	expression tag	UNP P62491
D	0	ALA	-	expression tag	UNP P62491
I	-1	GLY	-	expression tag	UNP P62491
I	0	ALA	-	expression tag	UNP P62491

- Molecule 2 is a protein called Unconventional myosin-Va.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	364	Total	C	N	O	S	0	3	0
			2891	1852	490	526	23			
2	C	364	Total	C	N	O	S	0	8	0
			2948	1882	501	541	24			
2	E	361	Total	C	N	O	S	0	6	0
			2920	1861	500	537	22			

There are 15 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	1457	GLY	-	expression tag	UNP Q9Y4I1
B	1458	ALA	-	expression tag	UNP Q9Y4I1

Continued on next page...

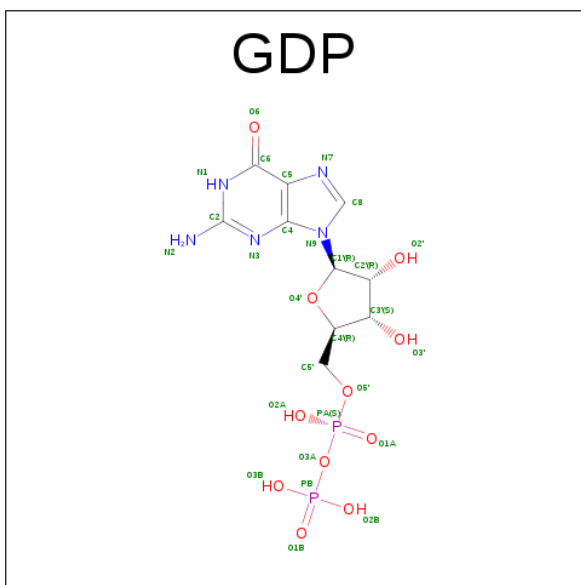
Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	1459	MET	-	expression tag	UNP Q9Y4I1
B	1460	GLY	-	expression tag	UNP Q9Y4I1
B	1461	SER	-	expression tag	UNP Q9Y4I1
C	1457	GLY	-	expression tag	UNP Q9Y4I1
C	1458	ALA	-	expression tag	UNP Q9Y4I1
C	1459	MET	-	expression tag	UNP Q9Y4I1
C	1460	GLY	-	expression tag	UNP Q9Y4I1
C	1461	SER	-	expression tag	UNP Q9Y4I1
E	1457	GLY	-	expression tag	UNP Q9Y4I1
E	1458	ALA	-	expression tag	UNP Q9Y4I1
E	1459	MET	-	expression tag	UNP Q9Y4I1
E	1460	GLY	-	expression tag	UNP Q9Y4I1
E	1461	SER	-	expression tag	UNP Q9Y4I1

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

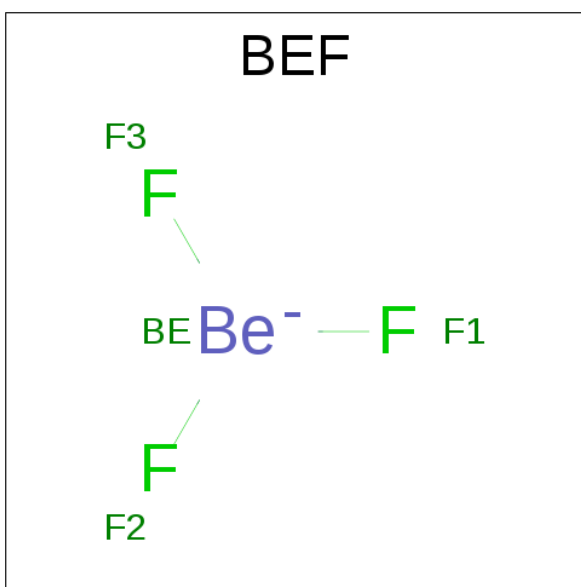
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	I	1	Total Mg 1 1	0	0
3	A	1	Total Mg 1 1	0	0
3	D	1	Total Mg 1 1	0	0
3	C	1	Total Mg 1 1	0	0

- Molecule 4 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: C₁₀H₁₅N₅O₁₁P₂).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total 28	C 10	N 5	O 11	P 2	0	0
4	D	1	Total 28	C 10	N 5	O 11	P 2	0	0
4	I	1	Total 28	C 10	N 5	O 11	P 2	0	0

- Molecule 5 is BERYLLIUM TRIFLUORIDE ION (three-letter code: BEF) (formula: BeF_3).



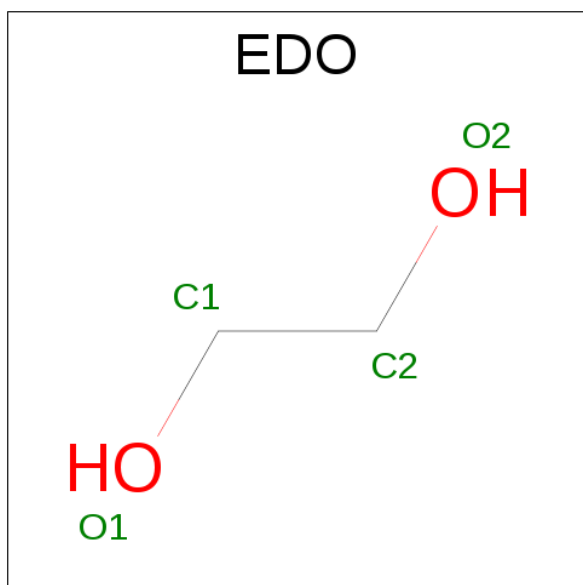
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	Be	F	0	0
			4	1	3		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	D	1	Total 4	Be 1	F 3	0	0
5	I	1	Total 4	Be 1	F 3	0	0

- Molecule 6 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



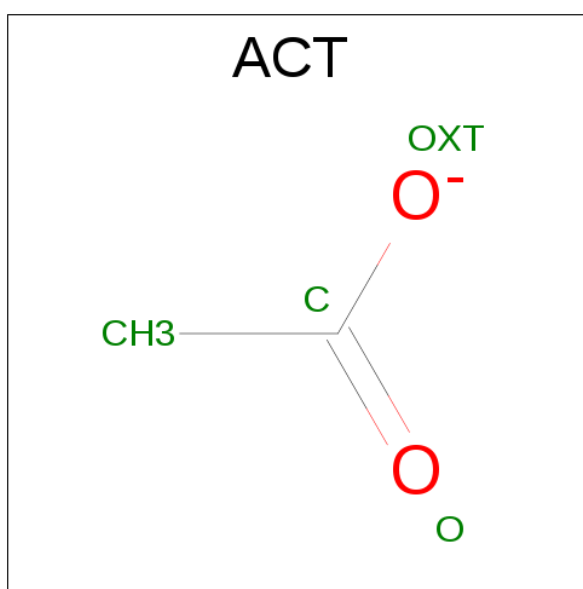
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total 4	C 2	O 2	0	0
6	A	1	Total 4	C 2	O 2	0	0
6	A	1	Total 4	C 2	O 2	0	0
6	B	1	Total 4	C 2	O 2	0	0
6	B	1	Total 4	C 2	O 2	0	0
6	C	1	Total 4	C 2	O 2	0	0
6	C	1	Total 4	C 2	O 2	0	0
6	C	1	Total 4	C 2	O 2	0	0
6	C	1	Total 4	C 2	O 2	0	0

Continued on next page...

Continued from previous page...

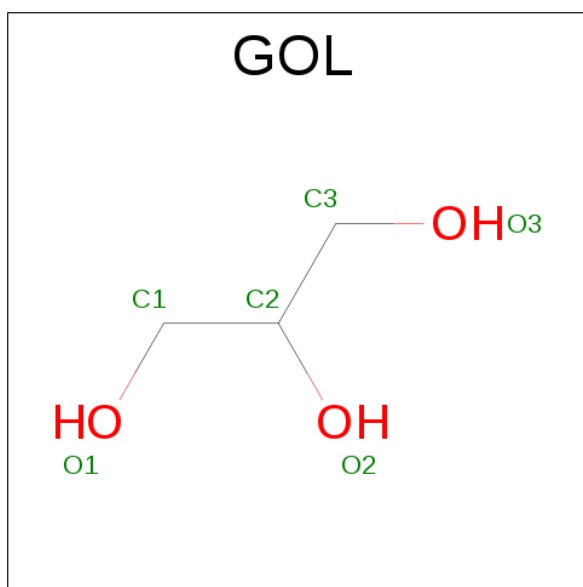
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	D	1	Total	C	O	0	0
			4	2	2		
6	D	1	Total	C	O	0	0
			4	2	2		
6	E	1	Total	C	O	0	0
			4	2	2		
6	E	1	Total	C	O	0	0
			4	2	2		

- Molecule 7 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O	0	0
			4	2	2		
7	C	1	Total	C	O	0	0
			4	2	2		

- Molecule 8 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	A	1	Total	C	O	0	0
			6	3	3		
8	B	1	Total	C	O	0	0
			6	3	3		

- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	210	Total	O	0	0
			210	210		
9	B	163	Total	O	0	0
			163	163		
9	C	377	Total	O	0	0
			377	377		
9	D	146	Total	O	0	0
			146	146		
9	E	250	Total	O	0	0
			250	250		
9	I	8	Total	O	0	0
			8	8		

3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

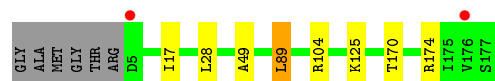
- Molecule 1: Ras-related protein Rab-11A

Chain A: 




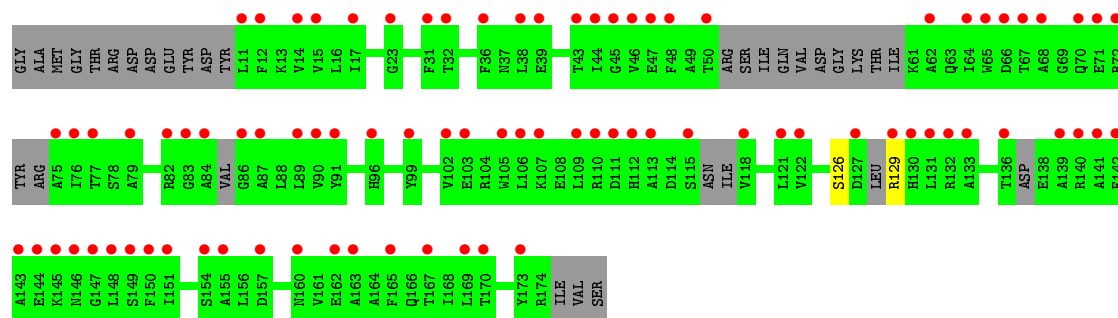
- Molecule 1: Ras-related protein Rab-11A

Chain D: 




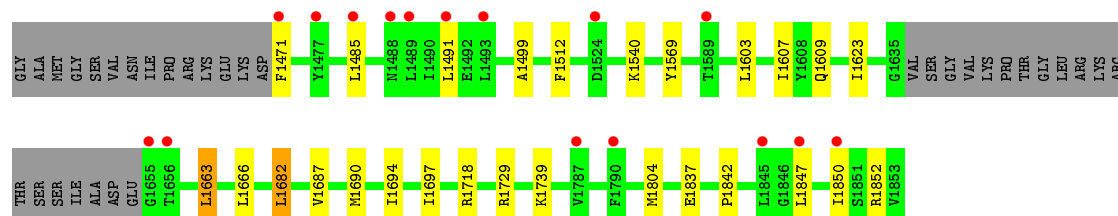
- Molecule 1: Ras-related protein Rab-11A

Chain I: 

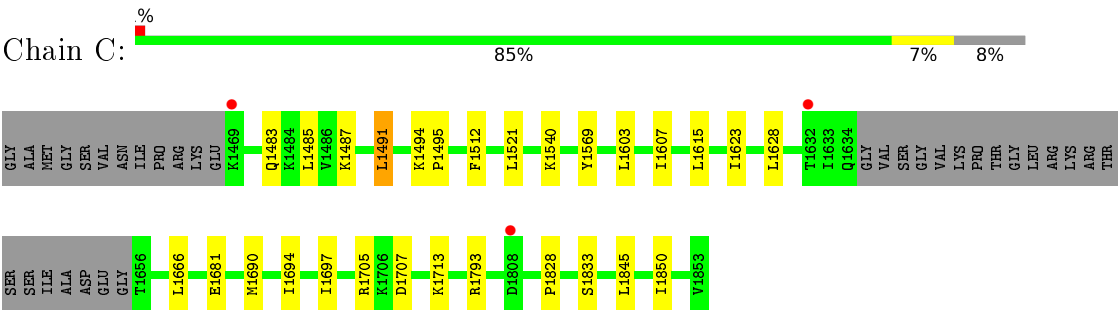


- Molecule 2: Unconventional myosin-Va

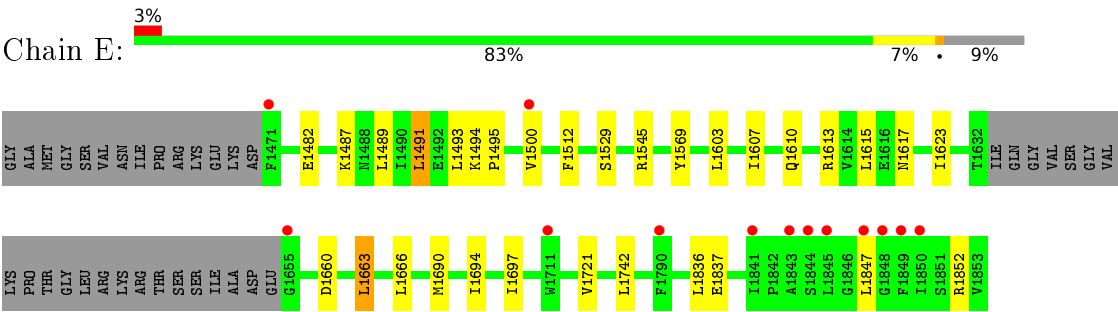
Chain B: 



● Molecule 2: Unconventional myosin-Va



● Molecule 2: Unconventional myosin-Va



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	215.79Å 128.42Å 89.02Å 90.00° 98.27° 90.00°	Depositor
Resolution (Å)	48.88 – 2.06 48.88 – 2.06	Depositor EDS
% Data completeness (in resolution range)	98.6 (48.88-2.06) 98.6 (48.88-2.06)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.30 (at 2.05Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.9_1692)	Depositor
R, R_{free}	0.180 , 0.208 0.179 , 0.208	Depositor DCC
R_{free} test set	7337 reflections (5.00%)	DCC
Wilson B-factor (Å ²)	47.3	Xtriage
Anisotropy	0.299	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 61.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	13842	wwPDB-VP
Average B, all atoms (Å ²)	60.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.97% 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: GDP, GOL, MG, BEF, EDO, ACT

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	0.21	0/1431	0.40	0/1934
1	D	0.21	0/1411	0.39	0/1908
1	I	0.21	0/986	0.38	0/1339
2	B	0.21	0/2949	0.37	0/3982
2	C	0.21	0/3021	0.37	0/4077
2	E	0.21	0/2988	0.37	0/4034
All	All	0.21	0/12786	0.38	0/17274

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	1391	0	1388	8	0
1	D	1386	0	1375	4	0
1	I	980	0	804	1	0
2	B	2891	0	2917	16	0
2	C	2948	0	3012	16	0
2	E	2920	0	2965	16	0
3	A	1	0	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	I	1	0	0	0	0
4	A	28	0	12	1	0
4	D	28	0	12	1	0
4	I	28	0	12	0	0
5	A	4	0	0	0	0
5	D	4	0	0	0	0
5	I	4	0	0	0	0
6	A	12	0	18	2	0
6	B	8	0	12	0	0
6	C	16	0	24	2	0
6	D	8	0	12	0	0
6	E	8	0	12	0	0
7	A	4	0	3	0	0
7	C	4	0	3	0	0
8	A	6	0	8	0	0
8	B	6	0	8	2	0
9	A	210	0	0	0	0
9	B	163	0	0	0	0
9	C	377	0	0	2	0
9	D	146	0	0	0	0
9	E	250	0	0	1	0
9	I	8	0	0	0	0
All	All	13842	0	12597	59	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 (59) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:28[B]:LEU:HD11	1:A:49:ALA:HB3	1.68	0.74
2:C:1623:ILE:HD12	2:C:1697:ILE:HD12	1.70	0.73
2:C:1491:LEU:HG	6:C:1903:EDO:H12	1.70	0.72
2:B:1623[A]:ILE:HD12	2:B:1697:ILE:HD12	1.73	0.71
1:D:28[B]:LEU:HD11	1:D:49:ALA:HB3	1.71	0.71
2:C:1623:ILE:HD13	2:C:1694:ILE:HA	1.76	0.66
2:B:1623[A]:ILE:HD13	2:B:1694:ILE:HA	1.80	0.63
2:E:1623:ILE:HD12	2:E:1697:ILE:HD12	1.83	0.60
2:C:1615:LEU:HD13	2:C:1690:MET:HG2	1.85	0.59

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:1487:LYS:HA	2:C:1491:LEU:HB2	1.85	0.57
2:E:1623:ILE:HD13	2:E:1694:ILE:HA	1.86	0.57
2:E:1615:LEU:HD13	2:E:1690:MET:HG2	1.86	0.56
2:E:1617[B]:ASN:ND2	9:E:2004:HOH:O	2.33	0.55
2:E:1491:LEU:O	2:E:1545:ARG:NH1	2.41	0.54
2:C:1540:LYS:HE2	6:C:1903:EDO:H11	1.90	0.53
2:B:1837:GLU:O	2:B:1852:ARG:NH1	2.41	0.53
2:E:1610[A]:GLN:OE1	2:E:1613:ARG:NH1	2.33	0.51
2:E:1603:LEU:O	2:E:1607:ILE:HG13	2.12	0.50
2:E:1837:GLU:O	2:E:1852:ARG:NH1	2.42	0.49
2:E:1487:LYS:HA	2:E:1491:LEU:HB2	1.94	0.49
1:A:17:ILE:HG22	6:A:204:EDO:H21	1.94	0.48
1:D:125:LYS:HG2	4:D:202:GDP:C6	2.48	0.48
2:C:1793:ARG:NH1	9:C:2015:HOH:O	2.46	0.48
2:E:1721:VAL:HG13	2:E:1742:LEU:HD23	1.96	0.48
1:A:125:LYS:HG2	4:A:202:GDP:C6	2.49	0.47
1:A:129:ARG:HB3	6:A:205:EDO:H12	1.97	0.47
2:B:1499:ALA:HB1	2:B:1842:PRO:HG2	1.96	0.47
2:C:1628:LEU:O	2:C:1713:LYS:NZ	2.36	0.47
2:C:1603:LEU:O	2:C:1607:ILE:HG13	2.15	0.46
2:B:1603:LEU:O	2:B:1607:ILE:HG13	2.14	0.46
2:C:1485:LEU:HG	2:C:1850:ILE:HD11	1.97	0.45
2:C:1512:PHE:CZ	2:C:1569:TYR:HB2	2.51	0.45
2:B:1512:PHE:CZ	2:B:1569:TYR:HB2	2.51	0.45
2:E:1489:LEU:HD13	2:E:1847:LEU:HD11	1.99	0.45
1:A:33:ARG:HD2	2:B:1729:ARG:NH2	2.33	0.44
2:C:1705:ARG:HB3	2:C:1707:ASP:OD1	2.18	0.44
2:E:1512:PHE:CZ	2:E:1569:TYR:HB2	2.53	0.44
2:C:1483:GLN:NE2	9:C:2008:HOH:O	2.36	0.43
2:E:1493:LEU:HD21	2:E:1500:VAL:HG21	2.00	0.43
1:A:94:ALA:O	2:C:1833[B]:SER:OG	2.35	0.43
2:B:1491:LEU:HD11	2:B:1540:LYS:HD3	2.01	0.42
2:B:1682:LEU:HA	2:B:1682:LEU:HD12	1.91	0.42
1:D:17:ILE:HD11	1:D:89:LEU:HG	2.02	0.42
1:A:12:PHE:CE1	1:A:60:ILE:HD13	2.55	0.41
1:D:170:THR:O	1:D:174:ARG:HG2	2.19	0.41
2:E:1482:GLU:OE2	2:E:1529:SER:OG	2.24	0.41
2:B:1663:LEU:HA	2:B:1663:LEU:HD12	1.83	0.41
1:A:145:LYS:HB2	1:A:145:LYS:HE3	1.83	0.41
2:B:1485:LEU:HD13	2:B:1850:ILE:HD11	2.01	0.41
2:C:1494:LYS:HA	2:C:1495:PRO:HD3	1.96	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:1494:LYS:HA	2:E:1495:PRO:HD3	1.88	0.41
2:B:1718:ARG:HA	2:B:1718:ARG:HD2	1.89	0.40
2:B:1847:LEU:HB3	2:B:1850:ILE:HD12	2.03	0.40
2:E:1663:LEU:HD12	2:E:1663:LEU:HA	1.89	0.40
1:I:126:SER:O	1:I:129:ARG:HB2	2.21	0.40
2:B:1687:VAL:HA	2:B:1690:MET:HE2	2.02	0.40
2:C:1681:GLU:HB2	2:C:1828:PRO:HG3	2.02	0.40
2:B:1718:ARG:NH2	8:B:1903:GOL:H11	2.36	0.40
2:B:1739:LYS:HZ1	8:B:1903:GOL:H12	1.86	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	176/179 (98%)	175 (99%)	1 (1%)	0	100	100
1	D	174/179 (97%)	173 (99%)	1 (1%)	0	100	100
1	I	133/179 (74%)	130 (98%)	3 (2%)	0	100	100
2	B	363/397 (91%)	353 (97%)	10 (3%)	0	100	100
2	C	368/397 (93%)	359 (98%)	9 (2%)	0	100	100
2	E	363/397 (91%)	359 (99%)	4 (1%)	0	100	100
All	All	1577/1728 (91%)	1549 (98%)	28 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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	150/150 (100%)	149 (99%)	1 (1%)	88	88
1	D	146/150 (97%)	144 (99%)	2 (1%)	74	72
1	I	77/150 (51%)	77 (100%)	0	100	100
2	B	316/360 (88%)	310 (98%)	6 (2%)	65	61
2	C	335/360 (93%)	331 (99%)	4 (1%)	78	76
2	E	328/360 (91%)	323 (98%)	5 (2%)	72	70
All	All	1352/1530 (88%)	1334 (99%)	18 (1%)	74	74

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	104	ARG
2	B	1471	PHE
2	B	1609	GLN
2	B	1663	LEU
2	B	1666	LEU
2	B	1682	LEU
2	B	1804	MET
2	C	1491	LEU
2	C	1521	LEU
2	C	1666	LEU
2	C	1845	LEU
1	D	89	LEU
1	D	104	ARG
2	E	1491	LEU
2	E	1660	ASP
2	E	1663	LEU
2	E	1666	LEU
2	E	1836	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
2	C	1586	HIS
2	C	1609	GLN
2	E	1517	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry ⓘ

Of 27 ligands modelled in this entry, 4 are monoatomic - leaving 23 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	GDP	A	202	3,5	24,30,30	1.13	2 (8%)	26,47,47	1.87	4 (15%)
5	BEF	A	203	4	0,3,3	0.00	-	0,3,3	0.00	-
6	EDO	A	204	-	3,3,3	0.46	0	2,2,2	0.37	0
6	EDO	A	205	-	3,3,3	0.44	0	2,2,2	0.41	0
6	EDO	A	206	-	3,3,3	0.44	0	2,2,2	0.40	0
7	ACT	A	207	-	0,3,3	0.00	-	0,3,3	0.00	-
8	GOL	A	208	-	5,5,5	0.32	0	5,5,5	0.25	0
6	EDO	B	1901	-	3,3,3	0.46	0	2,2,2	0.36	0
6	EDO	B	1902	-	3,3,3	0.45	0	2,2,2	0.39	0
8	GOL	B	1903	-	5,5,5	0.34	0	5,5,5	0.31	0
6	EDO	C	1901	-	3,3,3	0.46	0	2,2,2	0.37	0
6	EDO	C	1902	-	3,3,3	0.44	0	2,2,2	0.37	0
6	EDO	C	1903	-	3,3,3	0.44	0	2,2,2	0.40	0
6	EDO	C	1904	-	3,3,3	0.44	0	2,2,2	0.42	0
7	ACT	C	1906	-	0,3,3	0.00	-	0,3,3	0.00	-
4	GDP	D	202	3,5	24,30,30	1.16	2 (8%)	26,47,47	1.88	5 (19%)
5	BEF	D	203	4	0,3,3	0.00	-	0,3,3	0.00	-

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	EDO	D	204	-	3,3,3	0.44	0	2,2,2	0.39	0
6	EDO	D	205	-	3,3,3	0.44	0	2,2,2	0.36	0
6	EDO	E	1901	-	3,3,3	0.46	0	2,2,2	0.34	0
6	EDO	E	1902	-	3,3,3	0.45	0	2,2,2	0.34	0
4	GDP	I	202	3,5	24,30,30	1.14	2 (8%)	26,47,47	1.83	4 (15%)
5	BEF	I	203	4	0,3,3	0.00	-	0,3,3	0.00	-

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	GDP	A	202	3,5	-	0/12/32/32	0/3/3/3
5	BEF	A	203	4	-	0/0/0/0	0/0/0/0
6	EDO	A	204	-	-	0/1/1/1	0/0/0/0
6	EDO	A	205	-	-	0/1/1/1	0/0/0/0
6	EDO	A	206	-	-	0/1/1/1	0/0/0/0
7	ACT	A	207	-	-	0/0/0/0	0/0/0/0
8	GOL	A	208	-	-	0/4/4/4	0/0/0/0
6	EDO	B	1901	-	-	0/1/1/1	0/0/0/0
6	EDO	B	1902	-	-	0/1/1/1	0/0/0/0
8	GOL	B	1903	-	-	0/4/4/4	0/0/0/0
6	EDO	C	1901	-	-	0/1/1/1	0/0/0/0
6	EDO	C	1902	-	-	0/1/1/1	0/0/0/0
6	EDO	C	1903	-	-	0/1/1/1	0/0/0/0
6	EDO	C	1904	-	-	0/1/1/1	0/0/0/0
7	ACT	C	1906	-	-	0/0/0/0	0/0/0/0
4	GDP	D	202	3,5	-	0/12/32/32	0/3/3/3
5	BEF	D	203	4	-	0/0/0/0	0/0/0/0
6	EDO	D	204	-	-	0/1/1/1	0/0/0/0
6	EDO	D	205	-	-	0/1/1/1	0/0/0/0
6	EDO	E	1901	-	-	0/1/1/1	0/0/0/0
6	EDO	E	1902	-	-	0/1/1/1	0/0/0/0
4	GDP	I	202	3,5	-	0/12/32/32	0/3/3/3
5	BEF	I	203	4	-	0/0/0/0	0/0/0/0

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	202	GDP	C5-C4	3.00	1.47	1.40
4	I	202	GDP	C5-C4	3.06	1.47	1.40

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	202	GDP	C5-C4	3.10	1.47	1.40
4	A	202	GDP	C6-C5	3.54	1.48	1.41
4	D	202	GDP	C6-C5	3.61	1.48	1.41
4	I	202	GDP	C6-C5	3.62	1.48	1.41

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	202	GDP	C5-C6-N1	-4.33	117.86	123.52
4	I	202	GDP	C5-C6-N1	-4.28	117.93	123.52
4	D	202	GDP	C5-C6-N1	-4.25	117.96	123.52
4	D	202	GDP	N3-C2-N1	-3.57	122.71	127.56
4	A	202	GDP	N3-C2-N1	-3.51	122.78	127.56
4	I	202	GDP	N3-C2-N1	-3.50	122.80	127.56
4	D	202	GDP	C6-C5-C4	-3.49	116.86	120.86
4	A	202	GDP	C6-C5-C4	-3.34	117.04	120.86
4	I	202	GDP	C6-C5-C4	-3.25	117.14	120.86
4	D	202	GDP	C1'-N9-C4	-2.03	124.54	126.81
4	I	202	GDP	C6-N1-C2	5.59	122.43	115.88
4	D	202	GDP	C6-N1-C2	5.67	122.53	115.88
4	A	202	GDP	C6-N1-C2	5.71	122.57	115.88

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

6 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	202	GDP	1	0
6	A	204	EDO	1	0
6	A	205	EDO	1	0
8	B	1903	GOL	2	0
6	C	1903	EDO	2	0
4	D	202	GDP	1	0

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 ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	172/179 (96%)	-0.03	0 100 100	35, 45, 66, 107	0
1	D	173/179 (96%)	-0.05	2 (1%) 81 83	41, 56, 84, 125	0
1	I	147/179 (82%)	2.72	86 (58%) 0 0	41, 51, 62, 72	147 (100%)
2	B	364/397 (91%)	0.21	16 (4%) 38 42	42, 72, 110, 131	0
2	C	364/397 (91%)	-0.06	3 (0%) 87 89	36, 49, 74, 120	1 (0%)
2	E	361/397 (90%)	0.17	13 (3%) 46 52	38, 57, 98, 120	1 (0%)
All	All	1581/1728 (91%)	0.32	120 (7%) 17 18	35, 55, 98, 131	149 (9%)

All (120) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	148	LEU	9.4
1	I	31	PHE	9.1
1	I	44	ILE	8.3
1	I	115	SER	6.1
1	I	102	VAL	6.1
1	I	142	PHE	6.0
1	I	106	LEU	6.0
1	I	76	ILE	6.0
1	I	79	ALA	6.0
1	I	149	SER	6.0
1	I	121	LEU	5.9
1	I	169	LEU	5.9
1	I	122	VAL	5.8
1	I	165	PHE	5.5
1	I	67	THR	5.5
1	I	110	ARG	5.3
1	I	91	TYR	5.3
1	I	150	PHE	5.3
2	E	1790	PHE	5.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	I	15	VAL	5.1
2	B	1790	PHE	5.1
1	I	105	TRP	5.0
1	I	131	LEU	4.9
1	I	111	ASP	4.9
1	I	147	GLY	4.8
1	I	14	VAL	4.7
2	B	1655	GLY	4.6
1	I	46	VAL	4.4
1	I	90	VAL	4.3
1	I	118	VAL	4.3
1	I	143	ALA	4.2
1	I	89	LEU	4.2
2	E	1850	ILE	4.2
2	B	1656	THR	4.2
1	D	5	ASP	4.1
1	I	99	TYR	4.1
1	I	12	PHE	4.1
2	E	1845	LEU	4.1
1	I	146	ASN	4.0
1	I	96	HIS	4.0
2	E	1848	GLY	3.9
1	I	160	ASN	3.9
1	I	45	GLY	3.9
1	I	83	GLY	3.9
2	E	1849	PHE	3.7
1	I	87	ALA	3.6
1	I	75	ALA	3.6
2	E	1847	LEU	3.6
1	I	145	LYS	3.5
1	I	103	GLU	3.5
2	B	1850	ILE	3.5
2	B	1787	VAL	3.5
1	I	84	ALA	3.5
1	D	176	VAL	3.5
1	I	11	LEU	3.5
1	I	86	GLY	3.5
2	E	1655	GLY	3.4
2	E	1843	ALA	3.4
2	C	1469	LYS	3.4
1	I	173	TYR	3.4
1	I	130	HIS	3.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	I	62	ALA	3.3
1	I	155	ALA	3.3
2	B	1491	LEU	3.3
1	I	144	GLU	3.2
1	I	71	GLU	3.2
1	I	157	ASP	3.2
1	I	82	ARG	3.2
1	I	113	ALA	3.1
1	I	23	GLY	3.1
1	I	72	ARG	3.1
1	I	38	LEU	3.1
1	I	141	ALA	3.0
1	I	170	THR	2.9
1	I	162	GLU	2.9
1	I	139	ALA	2.9
1	I	112	HIS	2.8
1	I	64	ILE	2.8
1	I	77	THR	2.7
2	E	1844	SER	2.7
1	I	39	GLU	2.7
2	B	1493	LEU	2.7
1	I	151	ILE	2.6
1	I	129	ARG	2.6
1	I	32	THR	2.6
1	I	136	THR	2.6
2	E	1500	VAL	2.6
2	B	1488	ASN	2.6
1	I	43	THR	2.5
2	C	1632	THR	2.5
1	I	107	LYS	2.4
2	B	1485	LEU	2.3
2	E	1841	ILE	2.3
1	I	133	ALA	2.3
2	B	1489	LEU	2.2
1	I	36	PHE	2.2
1	I	167	THR	2.2
1	I	127	ASP	2.2
1	I	163	ALA	2.2
1	I	154	SER	2.2
2	B	1589	THR	2.2
1	I	17	ILE	2.2
1	I	109	LEU	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	E	1711[A]	TRP	2.1
1	I	140	ARG	2.1
2	B	1477	TYR	2.1
1	I	50	THR	2.1
1	I	68	ALA	2.1
2	B	1471	PHE	2.1
2	E	1471	PHE	2.1
2	C	1808	ASP	2.1
1	I	47	GLU	2.1
1	I	66	ASP	2.0
1	I	132	ARG	2.0
1	I	70	GLN	2.0
2	B	1524	ASP	2.0
2	B	1847	LEU	2.0
1	I	48	PHE	2.0
1	I	65	TRP	2.0
2	B	1845	LEU	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(\AA^2)	Q<0.9
6	EDO	C	1904	4/4	0.86	0.31	9.38	34,48,65,69	0
6	EDO	C	1902	4/4	0.62	0.31	8.80	74,82,86,89	0
7	ACT	A	207	4/4	0.90	0.17	8.41	47,64,69,71	0
6	EDO	D	204	4/4	0.95	0.25	8.18	67,68,71,80	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
8	GOL	B	1903	6/6	0.75	0.20	7.04	64,74,77,83	0
6	EDO	B	1901	4/4	0.89	0.24	6.74	56,59,62,63	0
6	EDO	B	1902	4/4	0.91	0.18	5.94	56,57,58,65	0
6	EDO	A	205	4/4	0.90	0.17	2.13	47,63,67,73	0
6	EDO	E	1901	4/4	0.84	0.21	2.02	45,57,60,67	0
3	MG	C	1905	1/1	0.87	0.24	2.00	85,85,85,85	0
6	EDO	D	205	4/4	0.93	0.14	1.48	56,58,60,61	0
6	EDO	A	204	4/4	0.97	0.13	1.27	42,44,45,46	0
7	ACT	C	1906	4/4	0.94	0.12	0.78	59,61,65,69	0
6	EDO	A	206	4/4	0.94	0.15	0.39	48,49,51,66	0
5	BEF	I	203	4/4	0.77	0.21	-0.30	40,40,40,41	4
6	EDO	C	1901	4/4	0.98	0.12	-0.44	44,45,53,60	0
4	GDP	D	202	28/28	0.98	0.11	-0.48	41,47,51,53	0
4	GDP	A	202	28/28	0.98	0.12	-0.71	35,39,43,44	0
3	MG	D	201	1/1	0.95	0.11	-0.76	47,47,47,47	0
4	GDP	I	202	28/28	0.90	0.20	-0.79	31,45,54,66	28
5	BEF	A	203	4/4	0.94	0.10	-1.05	38,40,40,43	0
3	MG	I	201	1/1	0.82	0.07	-2.21	42,42,42,42	1
5	BEF	D	203	4/4	0.93	0.08	-2.23	46,46,49,49	0
3	MG	A	201	1/1	0.98	0.04	-3.49	43,43,43,43	0
6	EDO	C	1903	4/4	0.93	0.12	-	56,57,65,71	0
6	EDO	E	1902	4/4	0.91	0.19	-	48,51,57,57	0
8	GOL	A	208	6/6	0.79	0.14	-	59,78,84,87	0

6.5 Other polymers [i](#)

There are no such residues in this entry.