



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 12, 2026 – 06:05 AM UTC

PDB ID : 6AOD / pdb_00006aod
Title : FXIa antibody complex
Authors : Lolicato, M.; Minor, D.L.
Deposited on : 2017-08-15
Resolution : 1.80 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

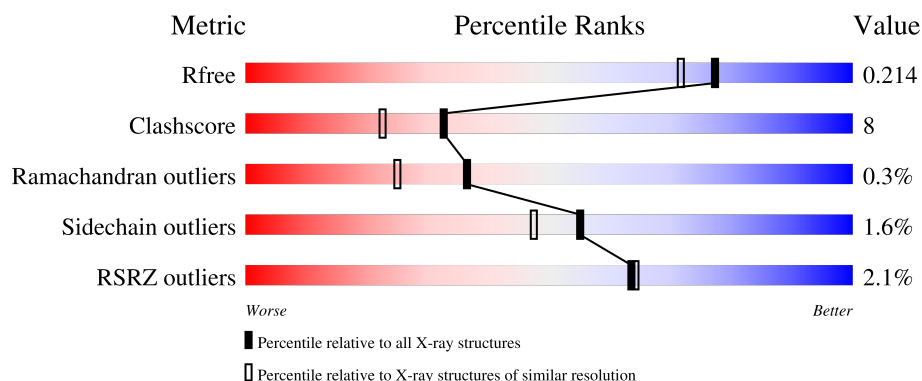
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 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}	180053	7662 (1.80-1.80)
Clashscore	190562	8479 (1.80-1.80)
Ramachandran outliers	187476	8391 (1.80-1.80)
Sidechain outliers	187428	8390 (1.80-1.80)
RSRZ outliers	180081	7663 (1.80-1.80)

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	214	2% 80% 13% . .
2	B	229	% 84% 7% 8%
3	C	245	3% 77% 17% . .

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
4	SO4	A	301	-	-	X	-
4	SO4	B	305	-	-	X	-
5	GOL	A	304	-	-	X	-
5	GOL	B	307	-	X	-	-
5	GOL	C	710	-	-	X	-

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 5751 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 FXIa Antibody FAB Light Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	207	Total	C	N	O	S	0	4	0
			1592	995	270	321	6			

- Molecule 2 is a protein called FXIa Antibody FAB Heavy Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	211	Total	C	N	O	S	0	1	0
			1606	1016	269	312	9			

- Molecule 3 is a protein called Coagulation factor XI.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	236	Total	C	N	O	S	0	3	0
			1891	1198	332	349	12			

There are 12 discrepancies between the modelled and reference sequences:

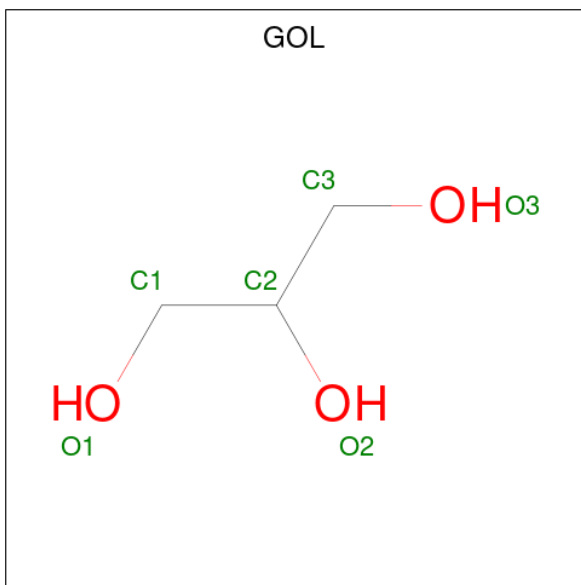
Chain	Residue	Modelled	Actual	Comment	Reference
C	432	GLN	ASN	engineered mutation	UNP P03951
C	473	GLN	ASN	engineered mutation	UNP P03951
C	482	SER	CYS	engineered mutation	UNP P03951
C	557	ALA	SER	engineered mutation	UNP P03951
C	607	HIS	-	expression tag	UNP P03951
C	608	HIS	-	expression tag	UNP P03951
C	609	HIS	-	expression tag	UNP P03951
C	610	HIS	-	expression tag	UNP P03951
C	611	HIS	-	expression tag	UNP P03951
C	612	HIS	-	expression tag	UNP P03951
C	613	HIS	-	expression tag	UNP P03951
C	614	HIS	-	expression tag	UNP P03951

- Molecule 4 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).

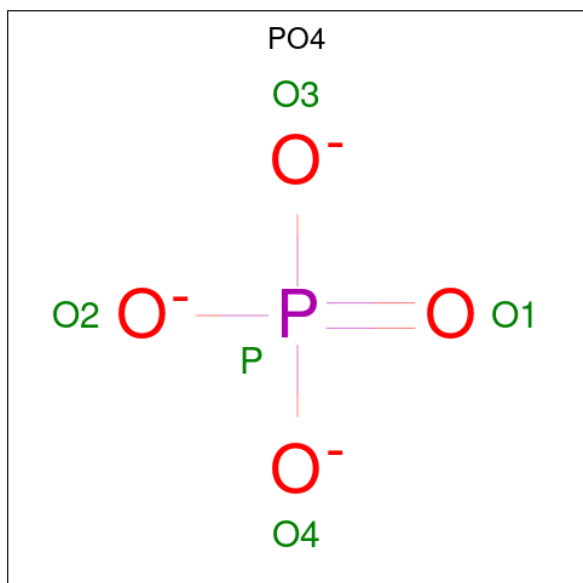


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 6 3 3	0	0
5	A	1	Total C O 6 3 3	0	0
5	A	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0

- Molecule 6 is COBALT (II) ION (CCD ID: CO) (formula: Co).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	B	2	Total Co 2 2	0	0
6	C	1	Total Co 1 1	0	0

- Molecule 7 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	1	Total O P 5 4 1	0	0
7	C	1	Total O P 5 4 1	0	0
7	C	1	Total O P 5 4 1	0	0
7	C	1	Total O P 5 4 1	0	0
7	C	1	Total O P 5 4 1	0	0

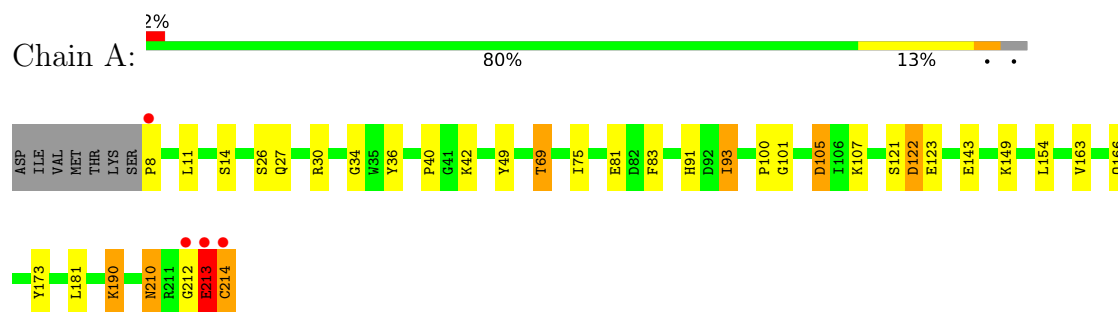
- Molecule 8 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	193	Total O 193 193	0	0
8	B	217	Total O 217 217	0	0
8	C	150	Total O 150 150	0	0

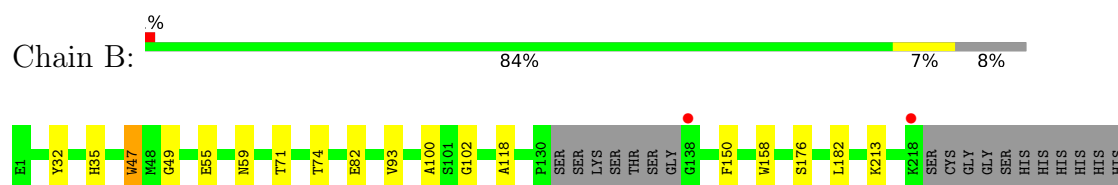
3 Residue-property plots

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.

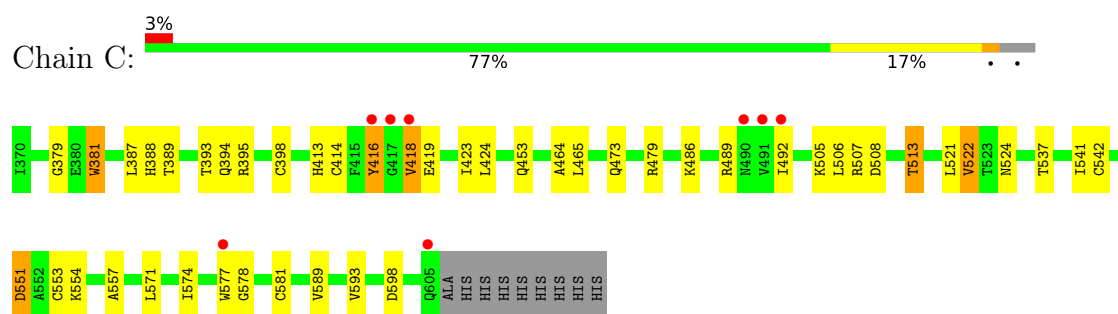
• Molecule 1: FXIa Antibody FAB Light Chain



• Molecule 2: FXIa Antibody FAB Heavy Chain



• Molecule 3: Coagulation factor XI



4 Data and refinement statistics

Property	Value	Source
Space group	I 4 2 2	Depositor
Cell constants a, b, c, α , β , γ	136.13Å 136.13Å 175.96Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	107.90 – 1.80 107.67 – 1.80	Depositor EDS
% Data completeness (in resolution range)	100.0 (107.90-1.80) 100.0 (107.67-1.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.99 (at 1.79Å)	Xtriage
Refinement program	REFMAC 5.8.0158	Depositor
R, R_{free}	0.182 , 0.207 0.192 , 0.214	Depositor DCC
R_{free} test set	3813 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	34.1	Xtriage
Anisotropy	0.006	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 48.9	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	0.97	EDS
Total number of atoms	5751	wwPDB-VP
Average B, all atoms (Å ²)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.07% 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: CO, PO4, SO4, GOL

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	1.58	16/1638 (1.0%)	1.18	7/2221 (0.3%)
2	B	1.54	10/1649 (0.6%)	1.09	0/2245
3	C	1.62	16/1946 (0.8%)	1.11	1/2637 (0.0%)
All	All	1.58	42/5233 (0.8%)	1.13	8/7103 (0.1%)

All (42) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	101	GLY	N-CA	8.17	1.57	1.45
3	C	465	LEU	CA-C	-7.44	1.43	1.52
3	C	551	ASP	CG-OD2	7.30	1.39	1.25
3	C	424	LEU	N-CA	6.99	1.55	1.46
2	B	93	VAL	N-CA	-6.53	1.38	1.46
1	A	40	PRO	N-CA	6.46	1.54	1.47
2	B	150	PHE	C-O	-6.36	1.17	1.24
1	A	14	SER	N-CA	6.32	1.53	1.45
3	C	508	ASP	CA-C	-6.22	1.47	1.53
1	A	105	ASP	CA-CB	6.15	1.62	1.53
1	A	100	PRO	C-O	6.01	1.31	1.24
3	C	589	VAL	N-CA	-6.01	1.39	1.46
2	B	82	GLU	N-CA	-5.91	1.39	1.46
2	B	32	TYR	CA-C	-5.91	1.45	1.52
3	C	479	ARG	CZ-NH1	5.89	1.41	1.32
1	A	210	ASN	CA-C	-5.85	1.45	1.52
1	A	122	ASP	C-O	-5.76	1.17	1.24
3	C	393	THR	CA-C	5.76	1.59	1.52
3	C	381	TRP	N-CA	5.64	1.52	1.46
1	A	30	ARG	CZ-NH2	-5.63	1.26	1.33
2	B	74	THR	N-CA	-5.57	1.39	1.46
2	B	158	TRP	N-CA	-5.54	1.39	1.46
3	C	578	GLY	CA-C	5.53	1.57	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	47	TRP	CA-C	-5.51	1.45	1.52
1	A	69	THR	N-CA	-5.48	1.38	1.46
3	C	464	ALA	N-CA	-5.45	1.39	1.45
3	C	577	TRP	CA-CB	5.45	1.63	1.53
2	B	118	ALA	C-O	-5.33	1.17	1.23
3	C	513	THR	CA-C	-5.31	1.46	1.52
2	B	71	THR	CA-C	-5.27	1.46	1.52
3	C	571	LEU	CA-CB	-5.24	1.46	1.52
1	A	107	LYS	CA-C	5.22	1.59	1.53
1	A	11	LEU	C-O	-5.16	1.18	1.23
1	A	214	CYS	C-O	5.16	1.33	1.23
1	A	81	GLU	CD-OE1	5.13	1.35	1.25
3	C	593	VAL	C-N	-5.12	1.27	1.34
3	C	453	GLN	CA-CB	-5.10	1.44	1.53
2	B	59	ASN	C-O	-5.09	1.18	1.23
1	A	181	LEU	CA-C	-5.05	1.46	1.52
1	A	83	PHE	C-O	-5.03	1.18	1.24
1	A	163	VAL	C-O	-5.01	1.19	1.24
3	C	574	ILE	CA-CB	-5.01	1.47	1.54

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	419	GLU	N-CA-C	-7.60	103.86	113.43
1	A	75	ILE	N-CA-C	-5.41	99.37	107.37
1	A	213	GLU	N-CA-CB	5.38	119.59	110.49
1	A	212	GLY	CA-C-N	5.30	131.66	121.54
1	A	212	GLY	C-N-CA	5.30	131.66	121.54
1	A	93	ILE	N-CA-C	5.14	115.86	110.62
1	A	100	PRO	CA-C-N	-5.01	111.59	121.41
1	A	100	PRO	C-N-CA	-5.01	111.59	121.41

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	1592	0	1553	37	0
2	B	1606	0	1567	6	0
3	C	1891	0	1859	48	0
4	A	5	0	0	4	0
4	B	15	0	0	4	0
5	A	18	0	24	15	0
5	B	6	0	8	1	0
5	C	30	0	40	12	0
6	B	2	0	0	0	0
6	C	1	0	0	0	0
7	B	5	0	0	0	0
7	C	20	0	0	0	0
8	A	193	0	0	4	0
8	B	217	0	0	3	0
8	C	150	0	0	4	0
All	All	5751	0	5051	81	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 8.

All (81) 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)
3:C:418:VAL:CG1	3:C:423:ILE:HD11	1.56	1.36
3:C:418:VAL:HG12	3:C:423:ILE:HD11	1.30	1.10
3:C:506:LEU:H	5:C:710:GOL:H32	1.22	0.99
3:C:505:LYS:HB2	5:C:710:GOL:H2	1.45	0.99
1:A:27:GLN:HB3	3:C:416[B]:TYR:OH	1.66	0.95
3:C:418:VAL:HG13	3:C:423:ILE:HD11	1.51	0.93
4:B:305:SO4:O3	3:C:507:ARG:NH1	2.00	0.93
3:C:551:ASP:OD1	8:C:801:HOH:O	1.90	0.89
1:A:122:ASP:N	5:A:304:GOL:H12	1.89	0.87
1:A:27:GLN:CB	3:C:416[B]:TYR:OH	2.23	0.87
1:A:26:SER:OG	3:C:416[B]:TYR:CE2	2.32	0.81
1:A:42:LYS:HD2	8:A:557:HOH:O	1.81	0.81
3:C:489:ARG:HD3	8:C:940:HOH:O	1.82	0.78
1:A:190:LYS:NZ	8:A:401:HOH:O	2.14	0.78
4:B:305:SO4:O4	8:B:401:HOH:O	2.02	0.78
1:A:26:SER:HG	3:C:416[B]:TYR:HE2	1.32	0.77
1:A:26:SER:OG	3:C:416[B]:TYR:HE2	1.68	0.76
5:C:710:GOL:O3	8:C:802:HOH:O	2.02	0.76
1:A:91:HIS:NE2	4:A:301:SO4:O3	2.20	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:122:ASP:H	5:A:304:GOL:H12	1.52	0.73
2:B:55:GLU:HB2	8:B:419:HOH:O	1.90	0.71
2:B:35:HIS:NE2	4:B:305:SO4:O1	2.24	0.70
1:A:122:ASP:H	5:A:304:GOL:C1	2.04	0.70
1:A:122:ASP:HB2	5:A:304:GOL:H11	1.72	0.70
3:C:388:HIS:HD1	3:C:394:GLN:HE21	1.38	0.69
3:C:506:LEU:H	5:C:710:GOL:C3	2.05	0.68
3:C:418:VAL:CG1	3:C:423:ILE:CD1	2.52	0.67
3:C:418:VAL:HG12	3:C:423:ILE:CD1	2.19	0.66
1:A:123:GLU:H	5:A:304:GOL:H31	1.61	0.65
3:C:379:GLY:H	5:C:707:GOL:H12	1.61	0.65
3:C:505:LYS:HB2	5:C:710:GOL:C2	2.25	0.65
1:A:93:ILE:CD1	3:C:554:LYS:HB3	2.27	0.64
1:A:121:SER:HB2	5:A:304:GOL:H32	1.80	0.63
3:C:413:HIS:HB2	3:C:416[B]:TYR:OH	1.99	0.62
1:A:166:GLN:HG3	1:A:173:TYR:CZ	2.36	0.60
1:A:210:ASN:H	1:A:214:CYS:C	2.11	0.59
1:A:36:TYR:OH	4:A:301:SO4:O1	2.17	0.59
2:B:100:ALA:HA	4:B:305:SO4:O3	2.02	0.58
1:A:69:THR:CG2	3:C:416[B]:TYR:CE1	2.85	0.58
1:A:123:GLU:OE2	2:B:213:LYS:NZ	2.35	0.58
4:A:301:SO4:O3	3:C:507:ARG:NH2	2.38	0.56
3:C:506:LEU:N	5:C:710:GOL:H32	2.07	0.56
1:A:149:LYS:HG3	1:A:154:LEU:HD23	1.88	0.56
1:A:123:GLU:HB2	5:A:304:GOL:H31	1.88	0.56
3:C:524:ASN:ND2	3:C:537:THR:O	2.39	0.55
3:C:492:ILE:HD11	8:C:940:HOH:O	2.07	0.54
3:C:553:CYS:SG	3:C:581[B]:CYS:SG	3.06	0.53
3:C:506:LEU:HB3	5:C:710:GOL:H11	1.89	0.53
3:C:522:VAL:HG22	3:C:542:CYS:HB2	1.91	0.53
3:C:398[B]:CYS:HB2	3:C:557:ALA:O	2.10	0.52
1:A:122:ASP:N	5:A:304:GOL:C1	2.64	0.51
1:A:34:GLY:HA3	4:A:301:SO4:O2	2.09	0.51
1:A:93:ILE:HD13	3:C:554:LYS:HB3	1.92	0.51
5:A:302:GOL:H31	3:C:395:ARG:HH22	1.75	0.51
1:A:123:GLU:H	5:A:304:GOL:C3	2.24	0.50
3:C:418:VAL:HG13	3:C:423:ILE:CD1	2.32	0.50
1:A:123:GLU:N	5:A:304:GOL:H31	2.26	0.50
1:A:122:ASP:CB	5:A:304:GOL:H11	2.41	0.48
1:A:123:GLU:HB2	5:A:304:GOL:C3	2.43	0.48
2:B:47:TRP:CH2	2:B:49:GLY:HA2	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:486:LYS:HD2	3:C:598:ASP:OD1	2.15	0.47
1:A:26:SER:HA	3:C:416[B]:TYR:CE2	2.50	0.46
3:C:505:LYS:HB2	5:C:710:GOL:C3	2.46	0.46
1:A:8:PRO:HD3	8:A:552:HOH:O	2.16	0.46
3:C:513:THR:OG1	5:C:706:GOL:H12	2.16	0.46
3:C:381:TRP:H	5:C:707:GOL:C3	2.29	0.45
3:C:473:GLN:HB2	5:C:708:GOL:H2	2.00	0.44
1:A:149:LYS:HD3	8:A:567:HOH:O	2.18	0.44
1:A:49:TYR:CE1	2:B:102:GLY:HA2	2.53	0.44
3:C:398[B]:CYS:SG	3:C:414:CYS:SG	3.16	0.43
1:A:93:ILE:HD11	3:C:554:LYS:HB3	2.00	0.43
1:A:149:LYS:CG	1:A:154:LEU:HD23	2.51	0.41
5:A:302:GOL:H31	3:C:395:ARG:NH2	2.35	0.41
3:C:413:HIS:CD2	3:C:413:HIS:C	2.99	0.41
1:A:123:GLU:CB	5:A:304:GOL:H31	2.51	0.40
1:A:27:GLN:N	3:C:416[B]:TYR:OH	2.51	0.40
3:C:521:LEU:HD13	3:C:541:ILE:HD11	2.02	0.40
5:B:307:GOL:C3	8:B:443:HOH:O	2.69	0.40
3:C:389:THR:O	3:C:394:GLN:HA	2.21	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	209/214 (98%)	204 (98%)	4 (2%)	1 (0%)	24	14
2	B	208/229 (91%)	206 (99%)	2 (1%)	0	100	100
3	C	237/245 (97%)	228 (96%)	7 (3%)	2 (1%)	16	6
All	All	654/688 (95%)	638 (98%)	13 (2%)	3 (0%)	36	14

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	213	GLU
3	C	416[A]	TYR
3	C	416[B]	TYR

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	182/186 (98%)	178 (98%)	4 (2%)	45	34
2	B	178/192 (93%)	176 (99%)	2 (1%)	65	60
3	C	205/210 (98%)	202 (98%)	3 (2%)	57	49
All	All	565/588 (96%)	556 (98%)	9 (2%)	55	47

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	105	ASP
1	A	143	GLU
1	A	190	LYS
1	A	213	GLU
2	B	176	SER
2	B	182	LEU
3	C	387	LEU
3	C	418	VAL
3	C	522	VAL

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

Mol	Chain	Res	Type
3	C	394	GLN
3	C	433	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 21 ligands modelled in this entry, 3 are monoatomic - leaving 18 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	$\# Z > 2$
5	GOL	A	302	-	5,5,5	0.81	0	5,5,5	1.71	1 (20%)
5	GOL	C	709	-	5,5,5	0.26	0	5,5,5	1.02	0
7	PO4	C	703	-	4,4,4	1.41	1 (25%)	6,6,6	1.07	0
4	SO4	B	303	-	4,4,4	0.46	0	6,6,6	0.41	0
5	GOL	C	707	-	5,5,5	1.70	1 (20%)	5,5,5	1.94	1 (20%)
5	GOL	B	307	-	5,5,5	1.28	0	5,5,5	2.38	2 (40%)
7	PO4	C	704	-	4,4,4	0.32	0	6,6,6	1.23	0
4	SO4	A	301	-	4,4,4	1.81	1 (25%)	6,6,6	1.37	1 (16%)
5	GOL	A	303	-	5,5,5	0.82	0	5,5,5	1.19	0
5	GOL	C	706	-	5,5,5	0.71	0	5,5,5	0.60	0
7	PO4	B	306	-	4,4,4	1.88	2 (50%)	6,6,6	1.52	1 (16%)
4	SO4	B	304	-	4,4,4	0.80	0	6,6,6	1.53	2 (33%)
7	PO4	C	702	-	4,4,4	0.98	0	6,6,6	1.24	0
7	PO4	C	705	-	4,4,4	0.92	0	6,6,6	1.91	2 (33%)
5	GOL	C	710	-	5,5,5	0.70	0	5,5,5	1.29	1 (20%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	GOL	C	708	-	5,5,5	0.75	0	5,5,5	0.96	0
5	GOL	A	304	-	5,5,5	1.53	1 (20%)	5,5,5	1.15	0
4	SO4	B	305	-	4,4,4	1.12	0	6,6,6	1.51	1 (16%)

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
5	GOL	A	302	-	-	1/4/4/4	-
5	GOL	C	709	-	-	4/4/4/4	-
5	GOL	C	707	-	-	3/4/4/4	-
5	GOL	B	307	-	-	4/4/4/4	-
5	GOL	A	303	-	-	4/4/4/4	-
5	GOL	C	706	-	-	2/4/4/4	-
5	GOL	C	710	-	-	2/4/4/4	-
5	GOL	C	708	-	-	4/4/4/4	-
5	GOL	A	304	-	-	2/4/4/4	-

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	707	GOL	O1-C1	3.03	1.55	1.42
7	B	306	PO4	P-O3	-2.78	1.46	1.54
7	C	703	PO4	P-O4	-2.26	1.48	1.54
7	B	306	PO4	P-O4	-2.14	1.48	1.54
5	A	304	GOL	O3-C3	2.08	1.51	1.42
4	A	301	SO4	O2-S	-2.01	1.33	1.44

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	307	GOL	O2-C2-C3	4.19	126.52	109.18
5	C	707	GOL	O2-C2-C3	-4.13	92.08	109.18
5	A	302	GOL	O3-C3-C2	3.24	124.95	110.38
7	C	705	PO4	O3-P-O1	3.14	122.05	110.95
7	B	306	PO4	O4-P-O2	3.12	117.62	107.91
4	B	305	SO4	O4-S-O3	-2.59	94.28	108.54
5	B	307	GOL	O2-C2-C1	-2.49	98.86	109.18

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	301	SO4	O3-S-O1	-2.26	97.74	109.56
7	C	705	PO4	O4-P-O2	2.24	114.87	107.91
4	B	304	SO4	O4-S-O1	2.14	120.75	109.56
4	B	304	SO4	O3-S-O2	2.10	120.52	109.56
5	C	710	GOL	O3-C3-C2	-2.03	101.26	110.38

There are no chirality outliers.

All (26) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	302	GOL	O1-C1-C2-C3
5	A	303	GOL	O1-C1-C2-C3
5	A	303	GOL	C1-C2-C3-O3
5	A	303	GOL	O2-C2-C3-O3
5	A	304	GOL	O1-C1-C2-C3
5	B	307	GOL	O1-C1-C2-C3
5	C	707	GOL	C1-C2-C3-O3
5	C	708	GOL	O1-C1-C2-C3
5	C	708	GOL	C1-C2-C3-O3
5	C	709	GOL	O1-C1-C2-O2
5	C	709	GOL	O1-C1-C2-C3
5	C	709	GOL	C1-C2-C3-O3
5	C	710	GOL	O1-C1-C2-O2
5	C	710	GOL	O1-C1-C2-C3
5	C	708	GOL	O1-C1-C2-O2
5	C	708	GOL	O2-C2-C3-O3
5	C	709	GOL	O2-C2-C3-O3
5	C	706	GOL	C1-C2-C3-O3
5	C	707	GOL	O1-C1-C2-C3
5	A	303	GOL	O1-C1-C2-O2
5	C	707	GOL	O2-C2-C3-O3
5	A	304	GOL	O1-C1-C2-O2
5	B	307	GOL	O1-C1-C2-O2
5	B	307	GOL	O2-C2-C3-O3
5	C	706	GOL	O2-C2-C3-O3
5	B	307	GOL	C1-C2-C3-O3

There are no ring outliers.

9 monomers are involved in 36 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	302	GOL	2	0
5	C	707	GOL	2	0
5	B	307	GOL	1	0
4	A	301	SO4	4	0
5	C	706	GOL	1	0
5	C	710	GOL	8	0
5	C	708	GOL	1	0
5	A	304	GOL	13	0
4	B	305	SO4	4	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, 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	207/214 (96%)	-0.01	4 (1%)	66 66	20, 33, 55, 85	4 (1%)
2	B	211/229 (92%)	-0.09	2 (0%)	81 81	21, 34, 53, 95	1 (0%)
3	C	236/245 (96%)	0.24	8 (3%)	48 48	18, 34, 68, 97	3 (1%)
All	All	654/688 (95%)	0.05	14 (2%)	63 64	18, 34, 58, 97	8 (1%)

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	C	416[A]	TYR	9.3
1	A	214	CYS	5.8
3	C	418	VAL	4.7
1	A	8	PRO	4.0
3	C	491	VAL	3.9
3	C	417	GLY	3.9
3	C	492	ILE	3.5
2	B	218	LYS	3.3
1	A	212	GLY	2.6
3	C	577	TRP	2.5
3	C	490	ASN	2.3
2	B	138	GLY	2.2
1	A	213	GLU	2.0
3	C	605	GLN	2.0

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

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

6.3 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

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($\text{\AA}^2$)	Q<0.9
6	CO	B	301	1/1	0.28	0.23	94,94,94,94	1
5	GOL	A	304	6/6	0.61	0.19	21,25,26,27	6
5	GOL	C	709	6/6	0.77	0.20	58,63,69,81	0
5	GOL	A	303	6/6	0.78	0.19	64,65,84,85	0
5	GOL	C	710	6/6	0.79	0.17	18,21,26,26	6
5	GOL	C	707	6/6	0.79	0.17	39,45,51,54	0
7	PO4	C	705	5/5	0.79	0.11	74,81,100,103	0
5	GOL	B	307	6/6	0.83	0.16	41,52,55,60	0
5	GOL	C	706	6/6	0.85	0.14	42,47,51,66	0
7	PO4	C	703	5/5	0.85	0.08	55,79,87,87	0
5	GOL	A	302	6/6	0.85	0.17	30,52,65,80	0
5	GOL	C	708	6/6	0.86	0.13	36,47,58,58	0
6	CO	B	302	1/1	0.89	0.12	37,37,37,37	1
7	PO4	C	704	5/5	0.90	0.09	63,64,66,71	0
7	PO4	C	702	5/5	0.92	0.07	61,68,71,79	0
4	SO4	B	304	5/5	0.93	0.09	50,59,64,64	0
6	CO	C	701	1/1	0.94	0.12	96,96,96,96	0
4	SO4	B	303	5/5	0.95	0.06	61,62,65,74	0
7	PO4	B	306	5/5	0.96	0.06	45,53,62,66	0
4	SO4	B	305	5/5	0.98	0.14	13,37,39,39	5
4	SO4	A	301	5/5	0.98	0.18	10,29,32,38	5

6.5 Other polymers ⓘ

There are no such residues in this entry.