Full wwPDB X-ray Structure Validation Report (i)

Nov 14, 2026 – 09:05 am GMT

PDB ID	:	31BK / pdb_000031bk
Title	:	Crystal structure of inactive ThomasA-H539A/E540A in complex with IgA1 Fab and hinge region (PVPS residues)
Authors	:	Marquez-Monino, M.A.; Martinez Gascuena, A.; Castillo Calvente, C.; Hernandez-Aleman, H.; Trastoy, B.
Deposited on	:	2026-05-22
Resolution	:	2.50 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 (i)) were used in the production of this report:

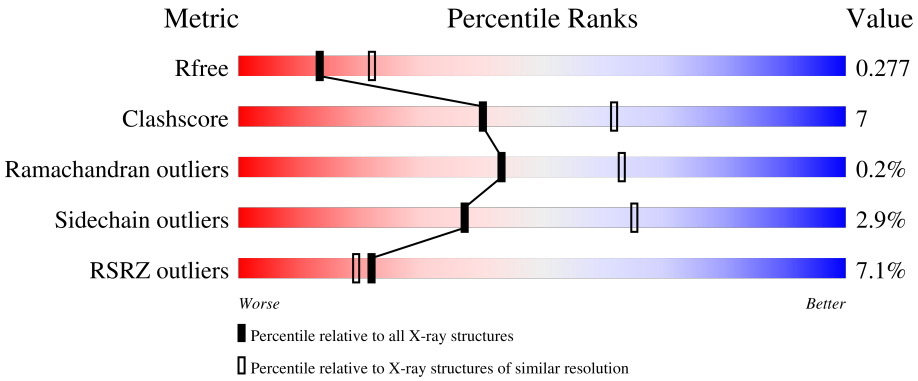
MolProbity	:	4-5-2 with Phenix2.2
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.2
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

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 2.50 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	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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 <=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	560	9% 81% 17%
2	H	234	7% 74% 21%
3	L	213	% 89% 10%

2 Entry composition (i)

There are 9 unique types of molecules in this entry. The entry contains 8010 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 IgA protease.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	556	4377	2774	729	857	17	0	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	319	GLY	-	expression tag	UNP Q9AES2
A	320	GLY	-	expression tag	UNP Q9AES2
A	321	SER	-	expression tag	UNP Q9AES2
A	322	GLY	-	expression tag	UNP Q9AES2
A	539	ALA	HIS	engineered mutation	UNP Q9AES2
A	540	ALA	GLU	engineered mutation	UNP Q9AES2

- Molecule 2 is a protein called IgA1 Heavy Chain Fab.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	H	228	1732	1096	287	341	8	0	2	0

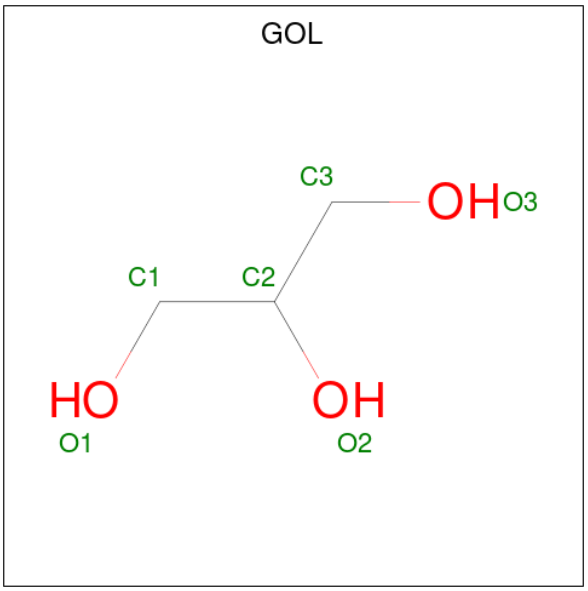
- Molecule 3 is a protein called IgA1 Light Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	L	213	1653	1027	279	340	7	0	2	0

- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn).

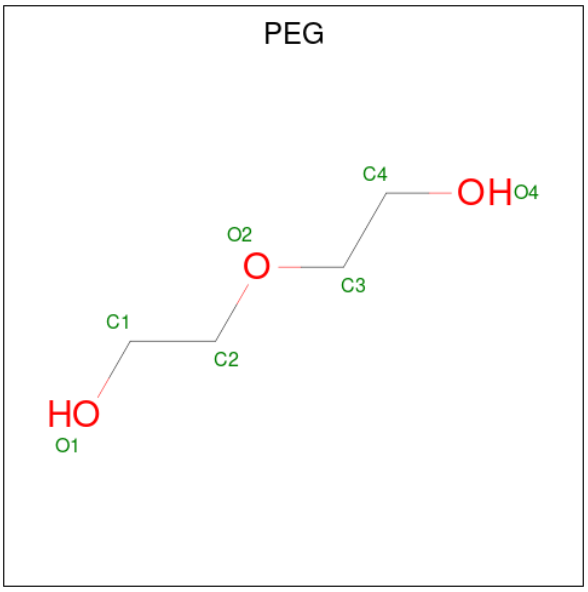
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Zn		
4	A	1	1	1	0	0

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



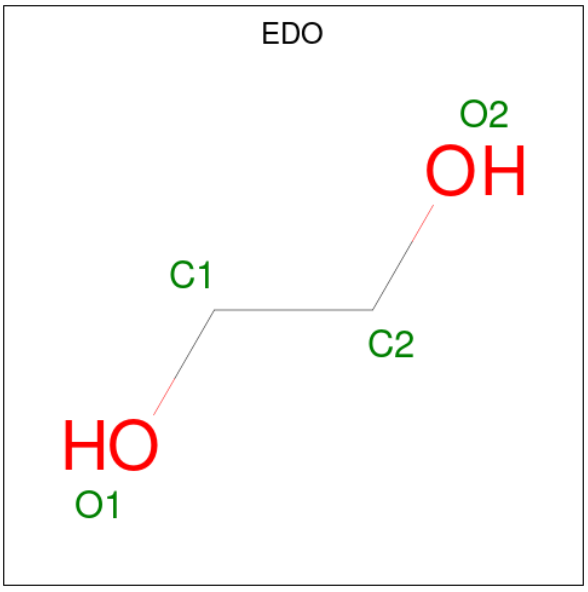
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 6 3 3	0	0
5	A	1	Total C O 6 3 3	0	0
5	A	1	Total C O 6 3 3	0	0
5	A	1	Total C O 6 3 3	0	0
5	H	1	Total C O 6 3 3	0	0
5	L	1	Total C O 6 3 3	0	0

- Molecule 6 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: $C_4H_{10}O_3$).



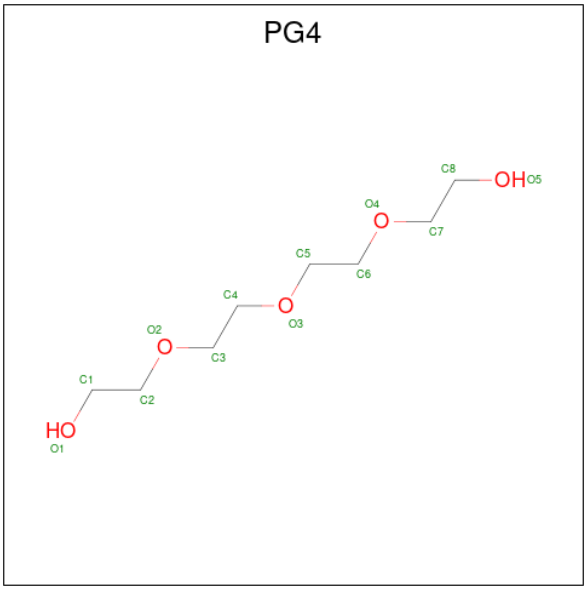
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 7 4 3	0	0
6	A	1	Total C O 7 4 3	0	0
6	H	1	Total C O 7 4 3	0	0
6	H	1	Total C O 7 4 3	0	0

- Molecule 7 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: $C_2H_6O_2$).



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

- Molecule 8 is TETRAETHYLENE GLYCOL (CCD ID: PG4) (formula: $C_8H_{18}O_5$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	H	1	Total C O 13 8 5	0	0

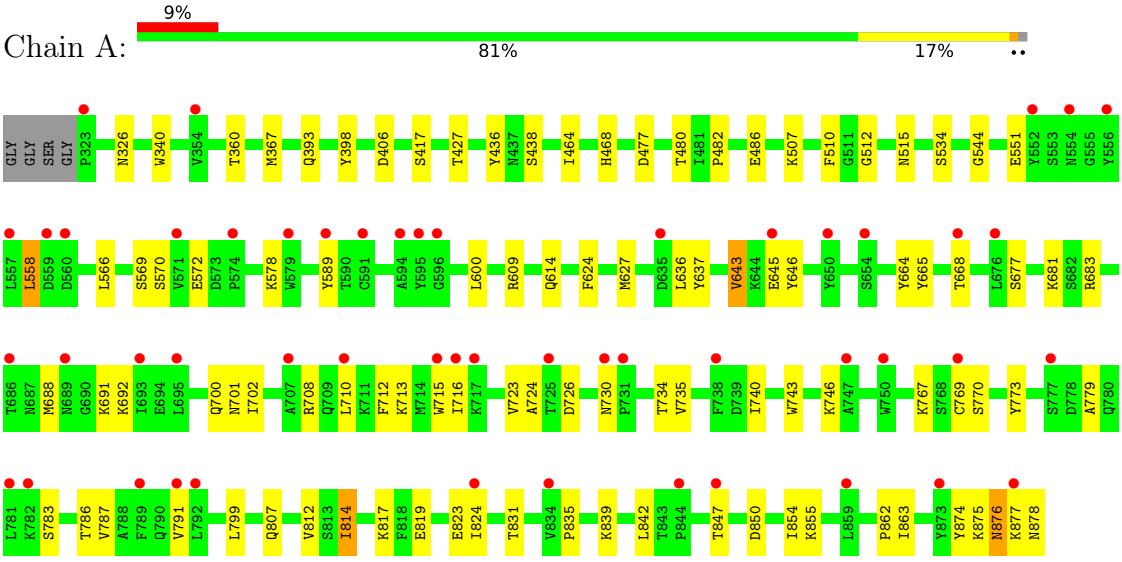
- Molecule 9 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	74	Total O 74 74	0	0
9	H	31	Total O 31 31	0	0
9	L	45	Total O 45 45	0	0

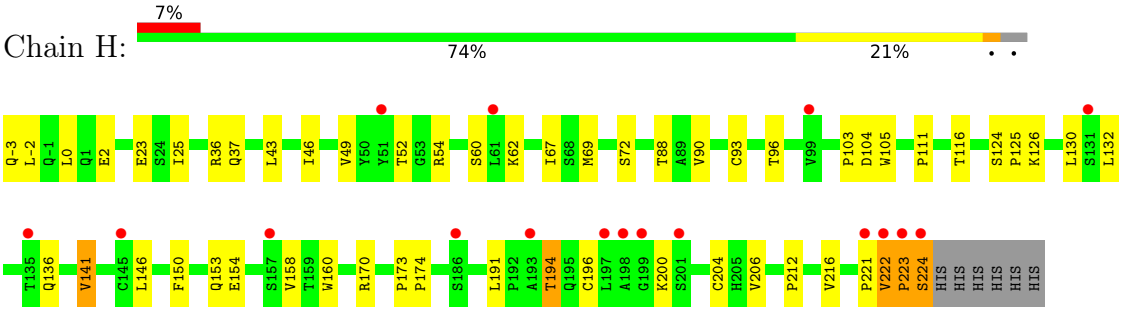
3 Residue-property plots (i)

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.

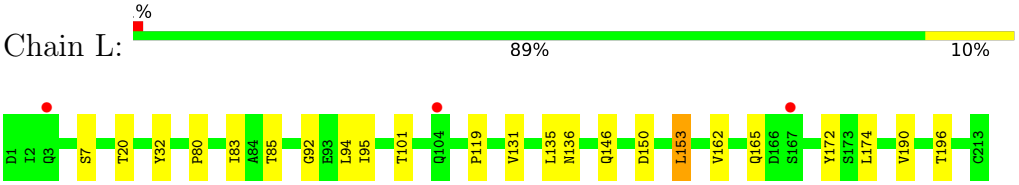
• Molecule 1: IgA protease



• Molecule 2: IgA1 Heavy Chain Fab



• Molecule 3: IgA1 Light Chain



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	253.25Å 53.48Å 79.38Å 90.00° 92.52° 90.00°	Depositor
Resolution (Å)	65.90 – 2.50 65.90 – 2.50	Depositor EDS
% Data completeness (in resolution range)	94.7 (65.90-2.50) 94.8 (65.90-2.50)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.62 (at 2.32Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487)	Depositor
R, R_{free}	0.248 , 0.282 0.246 , 0.277	Depositor DCC
R_{free} test set	2172 reflections (4.66%)	wwPDB-VP
Wilson B-factor (Å^2)	43.1	Xtriage
Anisotropy	0.151	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 47.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	0.067 for -h,-k,l	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	8010	wwPDB-VP
Average B, all atoms (Å^2)	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.99% 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: EDO, ZN, PEG, PG4, 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	0.30	0/4486	0.47	0/6091
2	H	0.23	0/1782	0.43	0/2450
3	L	0.19	0/1687	0.40	0/2289
All	All	0.26	0/7955	0.45	0/10830

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4377	0	4113	58	0
2	H	1732	0	1676	34	0
3	L	1653	0	1579	12	0
4	A	1	0	0	0	0
5	A	24	0	32	1	0
5	H	6	0	8	1	0
5	L	6	0	8	0	0
6	A	14	0	20	0	0
6	H	14	0	20	0	0
7	A	8	0	12	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	H	4	0	6	0	0
7	L	8	0	12	0	0
8	H	13	0	18	1	0
9	A	74	0	0	0	0
9	H	31	0	0	0	0
9	L	45	0	0	0	0
All	All	8010	0	7504	101	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 7.

All (101) 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:360:THR:HG22	1:A:814:ILE:HD12	1.71	0.72
2:H:90:VAL:HG21	8:H:302:PG4:H52	1.72	0.70
1:A:589:TYR:HB3	1:A:664:TYR:HD1	1.58	0.69
2:H:125:PRO:HB3	2:H:150:PHE:HB3	1.75	0.68
1:A:569:SER:HB2	1:A:578:LYS:HE3	1.74	0.67
1:A:551:GLU:HB2	1:A:609:ARG:HB2	1.77	0.67
2:H:126:LYS:HG2	5:H:301:GOL:H2	1.78	0.65
1:A:367:MET:HE1	1:A:627:MET:HE2	1.80	0.62
2:H:136:GLN:HG3	2:H:141:VAL:HG12	1.80	0.62
5:A:903:GOL:H32	2:H:216:VAL:HG13	1.82	0.62
2:H:25:ILE:HD12	2:H:69:MET:HE3	1.83	0.61
2:H:36:ARG:HB3	2:H:46:ILE:HD11	1.84	0.60
1:A:393:GLN:HG2	1:A:831:THR:O	2.02	0.60
2:H:141:VAL:HG21	2:H:196:CYS:HB3	1.83	0.60
1:A:558:LEU:HD21	2:H:194:THR:HG21	1.83	0.59
3:L:146:GLN:HG2	3:L:153:LEU:HD21	1.85	0.58
2:H:222:VAL:HG22	2:H:223:PRO:HD2	1.86	0.58
1:A:643:VAL:HG21	1:A:787:VAL:HG11	1.84	0.57
1:A:417:SER:HB3	1:A:427:THR:HA	1.88	0.56
1:A:681:LYS:HD3	1:A:786:THR:HG21	1.88	0.56
2:H:130:LEU:HD11	2:H:146:LEU:HB2	1.88	0.56
1:A:791:VAL:HG12	1:A:799:LEU:HD12	1.89	0.55
1:A:734:THR:HG21	1:A:773:TYR:HB2	1.88	0.55
2:H:222:VAL:O	2:H:224:SER:N	2.32	0.54
1:A:636:LEU:HD21	1:A:710:LEU:HD11	1.90	0.54
1:A:716:ILE:HG22	1:A:724:ALA:HB3	1.91	0.53
1:A:743:TRP:CE3	1:A:746:LYS:HG3	2.43	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:701:ASN:HB2	1:A:740:ILE:HG22	1.91	0.52
3:L:150:ASP:HA	3:L:190:VAL:HB	1.92	0.52
1:A:572:GLU:HG3	1:A:600:LEU:HD11	1.92	0.52
3:L:119:PRO:HD3	3:L:131:VAL:HG22	1.92	0.51
1:A:512:GLY:HA2	7:A:908:EDO:H21	1.93	0.50
1:A:646:TYR:HB3	1:A:692:LYS:HB2	1.94	0.50
2:H:52:THR:OG1	2:H:54:ARG:HG2	2.11	0.50
2:H:104[A]:ASP:OD1	2:H:105:TRP:N	2.41	0.49
2:H:222:VAL:C	2:H:224:SER:H	2.20	0.49
1:A:643:VAL:HG12	1:A:677:SER:HB3	1.93	0.49
1:A:477:ASP:HB3	1:A:480:THR:HB	1.94	0.49
1:A:515:ASN:OD1	1:A:544:GLY:HA2	2.13	0.49
1:A:482:PRO:HG2	1:A:486:GLU:HA	1.95	0.49
2:H:-2:LEU:HD22	2:H:23:GLU:HG3	1.95	0.49
2:H:96:THR:HG21	2:H:103:PRO:HB3	1.95	0.49
1:A:406:ASP:OD2	1:A:842:LEU:HD21	2.13	0.48
3:L:162:VAL:HG22	3:L:174:LEU:HD12	1.95	0.48
1:A:360:THR:HB	1:A:842:LEU:HD13	1.94	0.48
1:A:726:ASP:HA	1:A:779:ALA:HA	1.96	0.48
2:H:153:GLN:HG3	2:H:154:GLU:HG2	1.95	0.48
2:H:170:ARG:HH11	2:H:170:ARG:HG3	1.78	0.48
1:A:713:LYS:HG2	1:A:715:TRP:CE3	2.49	0.47
1:A:877:LYS:HD3	1:A:877:LYS:HA	1.46	0.47
1:A:839:LYS:HE2	1:A:862:PRO:HG3	1.96	0.47
3:L:80:PRO:O	3:L:83:ILE:HG12	2.15	0.47
1:A:812:VAL:HG12	1:A:863:ILE:HG21	1.97	0.47
3:L:165:GLN:HG3	3:L:172:TYR:CZ	2.51	0.46
1:A:683:ARG:HE	1:A:683:ARG:HB2	1.60	0.46
2:H:141:VAL:HG23	2:H:191:LEU:HD23	1.98	0.45
1:A:712:PHE:CE2	1:A:791:VAL:HG13	2.52	0.45
1:A:819:GLU:HG2	1:A:877:LYS:NZ	2.31	0.45
2:H:160:TRP:CZ3	2:H:204:CYS:HB3	2.51	0.45
1:A:624:PHE:CE2	1:A:637:TYR:HB2	2.52	0.45
2:H:158:VAL:HG22	2:H:206:VAL:HG22	1.99	0.44
1:A:637:TYR:HB3	1:A:700:GLN:HB3	1.99	0.44
1:A:688:MET:HA	1:A:691:LYS:HG3	1.99	0.44
2:H:62:LYS:HE3	2:H:62:LYS:HB3	1.79	0.44
1:A:340:TRP:CE2	2:H:212:PRO:HG3	2.52	0.44
2:H:49:VAL:HB	2:H:67:ILE:HG12	1.98	0.44
3:L:32:TYR:HD2	3:L:92:GLY:HA2	1.83	0.44
1:A:726:ASP:N	1:A:730:ASN:O	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:701:ASN:O	1:A:743:TRP:HB2	2.17	0.44
1:A:398:TYR:HD2	1:A:614:GLN:HG3	1.83	0.43
1:A:708:ARG:HB2	1:A:740:ILE:HB	2.00	0.43
1:A:566:LEU:H	1:A:566:LEU:HD12	1.83	0.43
1:A:702:ILE:O	1:A:746:LYS:HE3	2.18	0.43
2:H:0:LEU:O	2:H:111:PRO:HD3	2.18	0.43
1:A:712:PHE:O	1:A:735:VAL:HA	2.19	0.43
1:A:824:ILE:HD11	1:A:874:TYR:HB2	2.01	0.43
3:L:153:LEU:HD22	3:L:153:LEU:HA	1.91	0.43
1:A:665:TYR:O	1:A:668:THR:HG22	2.19	0.42
1:A:876:ASN:ND2	1:A:878:ASN:OXT	2.51	0.42
2:H:37:GLN:HB2	2:H:43:LEU:HD23	2.00	0.42
2:H:132:LEU:HB2	2:H:136:GLN:HE22	1.84	0.42
1:A:807:GLN:OE1	1:A:835:PRO:HB3	2.19	0.42
3:L:135:LEU:C	3:L:136:ASN:HD22	2.28	0.42
2:H:173:PRO:HA	2:H:174:PRO:HD3	1.93	0.42
3:L:135:LEU:HB2	3:L:174:LEU:HB3	2.01	0.42
1:A:636:LEU:HD12	1:A:700:GLN:O	2.20	0.41
1:A:767:LYS:HG2	1:A:769:CYS:SG	2.60	0.41
1:A:645:GLU:CD	1:A:688:MET:HE1	2.45	0.41
2:H:-3:GLN:HB3	2:H:-2:LEU:H	1.51	0.41
2:H:88:THR:HG23	2:H:116:THR:HA	2.02	0.41
1:A:589:TYR:HB3	1:A:664:TYR:CD1	2.47	0.41
1:A:817:LYS:HG2	1:A:823:GLU:HA	2.02	0.41
1:A:854:ILE:HG22	1:A:855:LYS:HG2	2.01	0.41
1:A:854:ILE:HD11	1:A:875:LYS:HB2	2.02	0.41
3:L:94:LEU:O	3:L:95:ILE:HD13	2.21	0.40
1:A:436:TYR:CE2	2:H:221:PRO:HA	2.57	0.40
1:A:464:ILE:HA	1:A:468:HIS:HB2	2.02	0.40
2:H:2:GLU:HG3	2:H:93:CYS:SG	2.61	0.40
2:H:200:LYS:HE2	2:H:200:LYS:HB3	1.96	0.40
1:A:875:LYS:HG3	1:A:876:ASN:N	2.37	0.40
3:L:85:THR:HA	3:L:101:THR:O	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	554/560 (99%)	525 (95%)	28 (5%)	1 (0%)	43 63
2	H	228/234 (97%)	212 (93%)	15 (7%)	1 (0%)	30 49
3	L	213/213 (100%)	206 (97%)	7 (3%)	0	100 100
All	All	995/1007 (99%)	943 (95%)	50 (5%)	2 (0%)	43 63

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	876	ASN
2	H	223	PRO

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	471/497 (95%)	457 (97%)	14 (3%)	36 64
2	H	198/203 (98%)	191 (96%)	7 (4%)	32 58
3	L	188/187 (100%)	184 (98%)	4 (2%)	47 74
All	All	857/887 (97%)	832 (97%)	25 (3%)	37 65

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	326	ASN

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Mol	Chain	Res	Type
1	A	438	SER
1	A	507	LYS
1	A	510	PHE
1	A	534	SER
1	A	558	LEU
1	A	570	SER
1	A	643	VAL
1	A	723	VAL
1	A	770	SER
1	A	783	SER
1	A	814	ILE
1	A	847	THR
1	A	850	ASP
2	H	60	SER
2	H	72	SER
2	H	124	SER
2	H	141	VAL
2	H	194	THR
2	H	222	VAL
2	H	224	SER
3	L	7	SER
3	L	20	THR
3	L	153	LEU
3	L	196	THR

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

Mol	Chain	Res	Type
1	A	358	GLN
3	L	188	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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 17 ligands modelled in this entry, 1 is monoatomic - leaving 16 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	L	301	-	5,5,5	0.08	0	5,5,5	0.38	0
5	GOL	H	301	-	5,5,5	0.10	0	5,5,5	0.32	0
5	GOL	A	903	-	5,5,5	0.08	0	5,5,5	0.32	0
6	PEG	H	303	-	6,6,6	0.11	0	5,5,5	0.10	0
6	PEG	H	304	-	6,6,6	0.11	0	5,5,5	0.09	0
7	EDO	L	302	-	3,3,3	0.44	0	2,2,2	0.38	0
7	EDO	L	303	-	3,3,3	0.46	0	2,2,2	0.38	0
5	GOL	A	904	-	5,5,5	0.09	0	5,5,5	0.32	0
5	GOL	A	905	-	5,5,5	0.09	0	5,5,5	0.30	0
7	EDO	H	305	-	3,3,3	0.50	0	2,2,2	0.26	0
8	PG4	H	302	-	12,12,12	0.16	0	11,11,11	0.54	0
6	PEG	A	906	-	6,6,6	0.16	0	5,5,5	0.07	0
7	EDO	A	909	-	3,3,3	0.47	0	2,2,2	0.29	0
6	PEG	A	907	-	6,6,6	0.11	0	5,5,5	0.11	0
5	GOL	A	902	-	5,5,5	0.08	0	5,5,5	0.34	0
7	EDO	A	908	-	3,3,3	0.12	0	2,2,2	0.15	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
5	GOL	L	301	-	-	0/4/4/4	-
5	GOL	H	301	-	-	0/4/4/4	-
5	GOL	A	903	-	-	0/4/4/4	-
6	PEG	H	303	-	-	2/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	PEG	H	304	-	-	2/4/4/4	-
7	EDO	L	302	-	-	0/1/1/1	-
7	EDO	L	303	-	-	1/1/1/1	-
5	GOL	A	904	-	-	0/4/4/4	-
5	GOL	A	905	-	-	0/4/4/4	-
7	EDO	H	305	-	-	0/1/1/1	-
8	PG4	H	302	-	-	5/10/10/10	-
6	PEG	A	906	-	-	1/4/4/4	-
7	EDO	A	909	-	-	1/1/1/1	-
6	PEG	A	907	-	-	2/4/4/4	-
5	GOL	A	902	-	-	0/4/4/4	-
7	EDO	A	908	-	-	0/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	907	PEG	O1-C1-C2-O2
8	H	302	PG4	O4-C7-C8-O5
7	A	909	EDO	O1-C1-C2-O2
7	L	303	EDO	O1-C1-C2-O2
6	H	303	PEG	O2-C3-C4-O4
6	A	907	PEG	C1-C2-O2-C3
6	A	906	PEG	C1-C2-O2-C3
6	H	303	PEG	C1-C2-O2-C3
8	H	302	PG4	C6-C5-O3-C4
8	H	302	PG4	C1-C2-O2-C3
6	H	304	PEG	O2-C3-C4-O4
8	H	302	PG4	C3-C4-O3-C5
8	H	302	PG4	O3-C5-C6-O4
6	H	304	PEG	C4-C3-O2-C2

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	H	301	GOL	1	0
5	A	903	GOL	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	H	302	PG4	1	0
7	A	908	EDO	1	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

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	A	556/560 (99%)	0.93	51 (9%)	14	13	31, 59, 83, 91	0
2	H	228/234 (97%)	0.75	17 (7%)	20	18	20, 42, 66, 74	2 (0%)
3	L	213/213 (100%)	0.57	3 (1%)	73	70	17, 43, 62, 72	2 (0%)
All	All	997/1007 (99%)	0.81	71 (7%)	22	19	17, 47, 75, 91	4 (0%)

All (71) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	556	TYR	4.4
1	A	594	ALA	3.5
2	H	222	VAL	3.4
1	A	782	LYS	3.3
1	A	847	THR	3.3
2	H	135	THR	3.2
1	A	552	TYR	3.2
1	A	791	VAL	3.2
1	A	560	ASP	3.1
3	L	167	SER	3.1
1	A	554	ASN	3.1
1	A	777	SER	3.0
1	A	574	PRO	3.0
2	H	223	PRO	3.0
2	H	199	GLY	3.0
1	A	715	TRP	2.9
1	A	595	TYR	2.9
1	A	571	VAL	2.9
2	H	201	SER	2.8
1	A	676	LEU	2.8
1	A	730	ASN	2.8
1	A	557	LEU	2.8
1	A	789	PHE	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	716	ILE	2.8
1	A	689	ASN	2.6
1	A	747	ALA	2.6
1	A	792	LEU	2.5
2	H	193	ALA	2.5
3	L	104	GLN	2.5
1	A	717	LYS	2.5
2	H	61	LEU	2.4
2	H	99	VAL	2.4
1	A	589	TYR	2.4
1	A	731	PRO	2.3
2	H	197	LEU	2.3
2	H	198	ALA	2.3
1	A	693	ILE	2.3
1	A	710	LEU	2.3
1	A	769	CYS	2.3
2	H	145	CYS	2.3
2	H	51	TYR	2.3
1	A	738	PHE	2.3
1	A	686	THR	2.2
1	A	725	THR	2.2
2	H	131[A]	SER	2.2
1	A	579	TRP	2.2
1	A	781	LEU	2.2
1	A	654	SER	2.2
1	A	824	ILE	2.2
3	L	3	GLN	2.2
1	A	354	VAL	2.2
1	A	695	LEU	2.2
1	A	559	ASP	2.1
2	H	224	SER	2.1
1	A	873	TYR	2.1
2	H	157	SER	2.1
1	A	668	THR	2.1
1	A	834	VAL	2.1
1	A	596	GLY	2.1
1	A	877	LYS	2.1
1	A	650	TYR	2.1
2	H	186	SER	2.1
1	A	323	PRO	2.1
2	H	221	PRO	2.1
1	A	707	ALA	2.0

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Mol	Chain	Res	Type	RSRZ
1	A	750	TRP	2.0
1	A	591	CYS	2.0
1	A	645	GLU	2.0
1	A	859	LEU	2.0
1	A	635	ASP	2.0
1	A	844	PRO	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 oligosaccharides 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
7	EDO	H	305	4/4	0.71	0.17	44,44,45,45	0
6	PEG	H	303	7/7	0.74	0.16	50,50,51,52	0
6	PEG	A	907	7/7	0.77	0.15	44,44,44,44	0
8	PG4	H	302	13/13	0.77	0.15	42,43,43,43	0
7	EDO	L	302	4/4	0.80	0.11	57,57,57,57	0
5	GOL	A	905	6/6	0.80	0.12	51,52,52,53	0
6	PEG	H	304	7/7	0.82	0.14	50,50,51,51	0
5	GOL	A	904	6/6	0.83	0.13	70,70,70,70	0
5	GOL	A	903	6/6	0.83	0.14	39,39,39,39	0
7	EDO	A	909	4/4	0.84	0.13	54,54,55,55	0
7	EDO	L	303	4/4	0.85	0.16	45,45,45,46	0
5	GOL	A	902	6/6	0.86	0.10	50,51,52,52	0
6	PEG	A	906	7/7	0.87	0.15	42,42,42,42	0
5	GOL	L	301	6/6	0.88	0.14	35,36,36,37	0
7	EDO	A	908	4/4	0.90	0.10	46,47,47,48	0
5	GOL	H	301	6/6	0.92	0.14	38,38,39,39	0
4	ZN	A	901	1/1	0.99	0.05	62,62,62,62	0

6.5 Other polymers (i)

There are no such residues in this entry.