Full wwPDB X-ray Structure Validation Report (i)

Nov 1, 2026 – 12:05 PM EST

PDB ID	:	9Z5A / pdb_00009z5a
Title	:	Crystal structure of MPXV-A35 in complex with antibody A35-Ab9gr1
Authors	:	Zhang, D.; Wilson, I.A.
Deposited on	:	2025-11-11
Resolution	:	3.01 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:

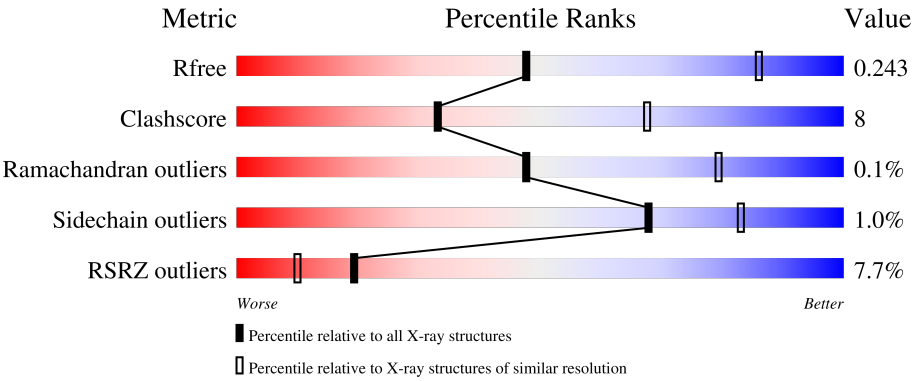
MolProbity	:	4-5-2 with Phenix2.2
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.2
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal 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 3.01 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.



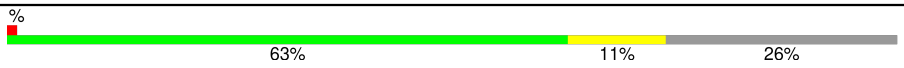
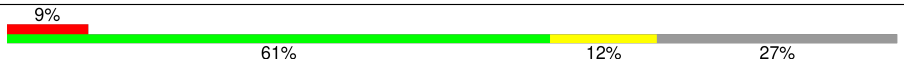
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	3131 (3.04-3.00)
Clashscore	190562	3444 (3.04-3.00)
Ramachandran outliers	187476	3319 (3.04-3.00)
Sidechain outliers	187428	3322 (3.04-3.00)
RSRZ outliers	180081	3130 (3.04-3.00)

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	228	2% 79% 20%
1	H	228	% 80% 20%
2	B	216	9% 83% 15%
2	L	216	3% 85% 12%
3	C	100	% 58% 16% 26%

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Mol	Chain	Length	Quality of chain
3	D	100	
3	E	100	
3	F	100	

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 8970 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 A35-Ab9gr1 antibody heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	H	228	Total	C	N	O	S	0	0	0
			1687	1066	283	332	6			
1	A	226	Total	C	N	O	S	0	0	0
			1675	1060	281	329	5			

- Molecule 2 is a protein called A35-Ab9gr1 antibody light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	L	212	Total	C	N	O	S	0	0	0
			1616	1010	273	328	5			
2	B	214	Total	C	N	O	S	0	0	0
			1629	1018	275	331	5			

- Molecule 3 is a protein called Protein OPG161.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	74	Total	C	N	O	S	0	0	0
			584	366	92	122	4			
3	D	74	Total	C	N	O	S	0	0	0
			581	364	92	121	4			
3	E	73	Total	C	N	O	S	0	0	0
			578	363	91	120	4			
3	F	76	Total	C	N	O	S	0	0	0
			594	372	94	124	4			

There are 32 discrepancies between the modelled and reference sequences:

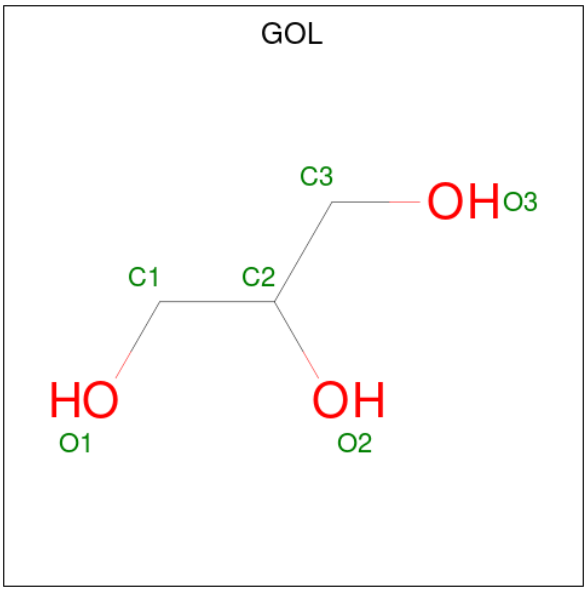
Chain	Residue	Modelled	Actual	Comment	Reference
C	182	GLY	-	expression tag	UNP A0A7H0DND2
C	183	SER	-	expression tag	UNP A0A7H0DND2
C	184	HIS	-	expression tag	UNP A0A7H0DND2
C	185	HIS	-	expression tag	UNP A0A7H0DND2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	186	HIS	-	expression tag	UNP A0A7H0DND2
C	187	HIS	-	expression tag	UNP A0A7H0DND2
C	188	HIS	-	expression tag	UNP A0A7H0DND2
C	189	HIS	-	expression tag	UNP A0A7H0DND2
D	182	GLY	-	expression tag	UNP A0A7H0DND2
D	183	SER	-	expression tag	UNP A0A7H0DND2
D	184	HIS	-	expression tag	UNP A0A7H0DND2
D	185	HIS	-	expression tag	UNP A0A7H0DND2
D	186	HIS	-	expression tag	UNP A0A7H0DND2
D	187	HIS	-	expression tag	UNP A0A7H0DND2
D	188	HIS	-	expression tag	UNP A0A7H0DND2
D	189	HIS	-	expression tag	UNP A0A7H0DND2
E	182	GLY	-	expression tag	UNP A0A7H0DND2
E	183	SER	-	expression tag	UNP A0A7H0DND2
E	184	HIS	-	expression tag	UNP A0A7H0DND2
E	185	HIS	-	expression tag	UNP A0A7H0DND2
E	186	HIS	-	expression tag	UNP A0A7H0DND2
E	187	HIS	-	expression tag	UNP A0A7H0DND2
E	188	HIS	-	expression tag	UNP A0A7H0DND2
E	189	HIS	-	expression tag	UNP A0A7H0DND2
F	182	GLY	-	expression tag	UNP A0A7H0DND2
F	183	SER	-	expression tag	UNP A0A7H0DND2
F	184	HIS	-	expression tag	UNP A0A7H0DND2
F	185	HIS	-	expression tag	UNP A0A7H0DND2
F	186	HIS	-	expression tag	UNP A0A7H0DND2
F	187	HIS	-	expression tag	UNP A0A7H0DND2
F	188	HIS	-	expression tag	UNP A0A7H0DND2
F	189	HIS	-	expression tag	UNP A0A7H0DND2

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	H	1	Total C O 6 3 3	0	0
4	L	1	Total C O 6 3 3	0	0
4	D	1	Total C O 6 3 3	0	0
4	D	1	Total C O 6 3 3	0	0

- Molecule 5 is water.

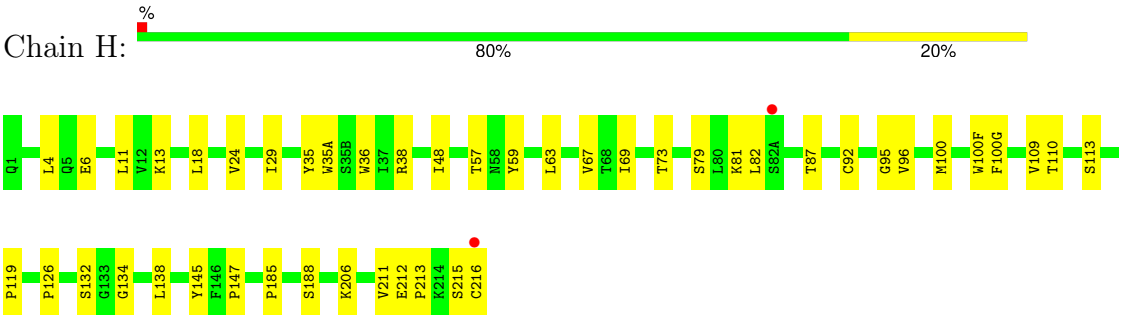
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total O 1 1	0	0
5	D	1	Total O 1 1	0	0

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.

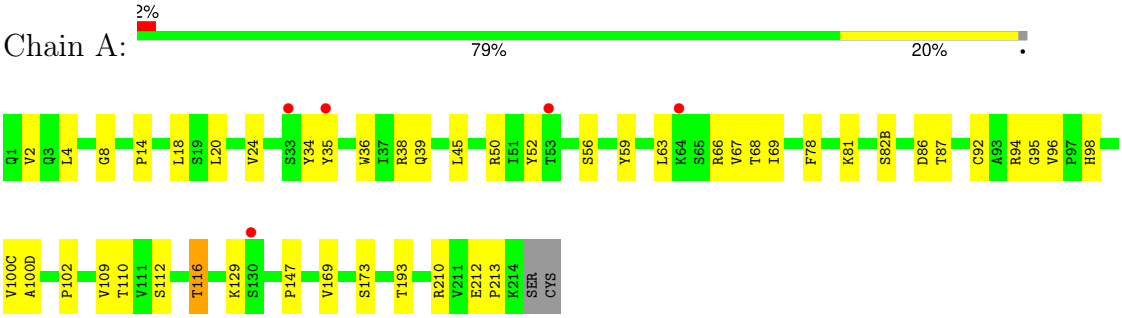
• Molecule 1: A35-Ab9gr1 antibody heavy chain

Chain H:



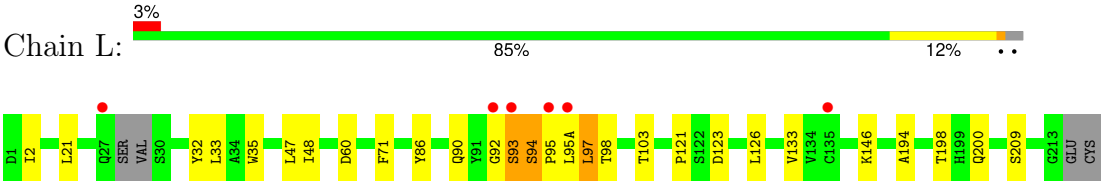
• Molecule 1: A35-Ab9gr1 antibody heavy chain

Chain A:



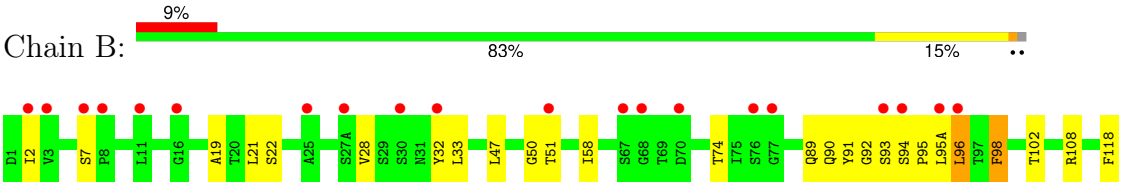
• Molecule 2: A35-Ab9gr1 antibody light chain

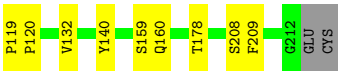
Chain L:



• Molecule 2: A35-Ab9gr1 antibody light chain

Chain B:

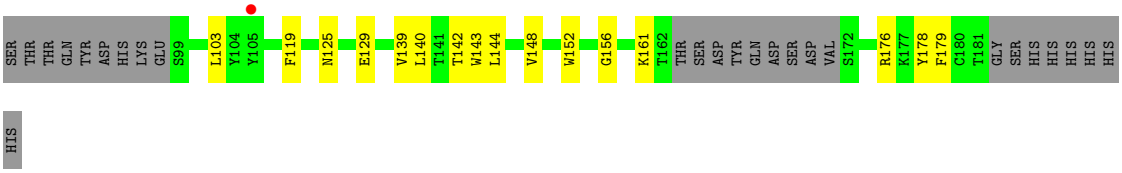




• Molecule 3: Protein OPG161

Chain C:

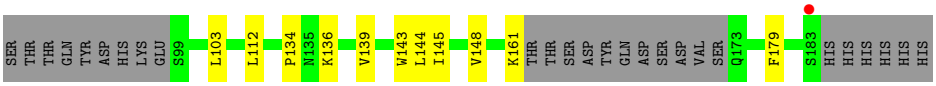




• Molecule 3: Protein OPG161

Chain D:

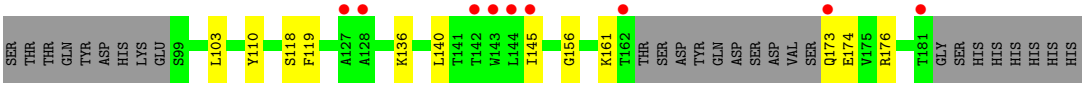




• Molecule 3: Protein OPG161

Chain E:

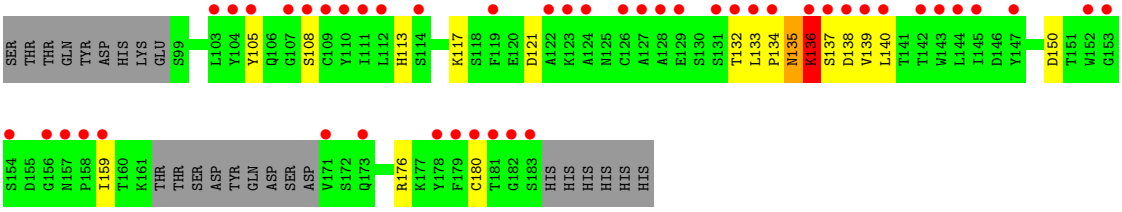




• Molecule 3: Protein OPG161

Chain F:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, α, β, γ	119.01Å 119.01Å 188.25Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	38.95 – 3.01 38.95 – 3.01	Depositor EDS
% Data completeness (in resolution range)	97.8 (38.95-3.01) 97.0 (38.95-3.01)	Depositor EDS
R_{merge}	0.28	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.56 (at 3.01Å)	Xtriage
Refinement program	PHENIX (1.21.2_5419: ???)	Depositor
R, R_{free}	0.196 , 0.243 0.198 , 0.243	Depositor DCC
R_{free} test set	2030 reflections (6.92%)	wwPDB-VP
Wilson B-factor (Å^2)	43.1	Xtriage
Anisotropy	0.231	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 68.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.28$	Xtriage
Estimated twinning fraction	0.074 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	8970	wwPDB-VP
Average B, all atoms (Å^2)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.50% 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: 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	0.34	0/1719	0.54	0/2350
1	H	0.43	0/1731	0.66	0/2366
2	B	0.31	0/1664	0.52	1/2260 (0.0%)
2	L	0.36	0/1650	0.56	0/2239
3	C	0.11	0/597	0.32	0/810
3	D	0.12	0/594	0.38	0/805
3	E	0.10	0/591	0.34	0/802
3	F	0.28	0/607	0.49	0/823
All	All	0.32	0/9153	0.53	1/12455 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	98	PHE	CA-CB-CG	5.91	119.71	113.80

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	1675	0	1655	30	1
1	H	1687	0	1665	30	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	1629	0	1583	29	0
2	L	1616	0	1568	21	0
3	C	584	0	534	10	0
3	D	581	0	530	6	0
3	E	578	0	529	11	0
3	F	594	0	544	14	0
4	D	12	0	16	0	0
4	H	6	0	8	0	0
4	L	6	0	8	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
All	All	8970	0	8640	137	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 8.

All (137) 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:B:93:SER:HB3	2:B:95(A):LEU:HD12	1.63	0.80
2:L:93:SER:HB3	2:L:95:PRO:HD2	1.67	0.76
1:H:126:PRO:HG3	1:H:138:LEU:HB3	1.68	0.75
2:B:95:PRO:HD3	3:E:173:GLN:HB2	1.68	0.75
1:H:100(G):PHE:HE2	2:L:97:LEU:HD21	1.53	0.72
2:B:94:SER:HG	3:E:173:GLN:N	1.87	0.72
3:C:140:LEU:HD11	3:C:161:LYS:HA	1.75	0.68
1:A:8:GLY:HA3	1:A:20:LEU:HD23	1.75	0.68
2:B:90:GLN:HE22	2:B:95(A):LEU:HB3	1.59	0.68
1:A:87:THR:HG23	1:A:110:THR:HA	1.75	0.68
3:C:142:THR:HG22	3:C:144:LEU:H	1.59	0.67
2:B:95:PRO:CD	3:E:173:GLN:HB2	2.24	0.67
1:H:29:ILE:HD11	1:H:73:THR:HA	1.78	0.65
3:F:135:ASN:O	3:F:136:LYS:C	2.41	0.63
2:L:121:PRO:HD3	2:L:133:VAL:HG22	1.81	0.63
1:H:100(G):PHE:CE2	2:L:97:LEU:HD21	2.34	0.62
2:B:2:ILE:HD13	2:B:28:VAL:HG22	1.82	0.62
1:H:38:ARG:HB3	1:H:48:ILE:HD11	1.82	0.61
2:B:33:LEU:HB3	2:B:51:THR:HG22	1.83	0.60
2:B:120:PRO:HD3	2:B:132:VAL:HG22	1.83	0.60
1:H:18:LEU:HD13	1:H:109:VAL:HG11	1.84	0.59
1:H:126:PRO:HD3	1:H:211:VAL:HG12	1.85	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:126:PRO:HD2	1:H:213:PRO:HA	1.84	0.58
2:L:200:GLN:NE2	1:A:173:SER:O	2.37	0.58
1:H:36:TRP:HD1	1:H:69:ILE:HD12	1.69	0.57
2:B:7:SER:OG	2:B:22:SER:OG	2.21	0.56
3:F:113:HIS:NE2	3:F:180:CYS:SG	2.79	0.56
1:H:87:THR:HG23	1:H:110:THR:HA	1.88	0.55
3:E:136:LYS:O	3:E:140:LEU:HD23	2.05	0.55
1:A:2:VAL:HG13	1:A:102:PRO:HG3	1.89	0.55
1:H:119:PRO:HB3	1:H:145:TYR:HB3	1.89	0.54
1:H:59:TYR:HE1	1:H:69:ILE:HG22	1.72	0.54
1:H:132:SER:O	1:H:134:GLY:N	2.41	0.53
3:F:136:LYS:O	3:F:140:LEU:N	2.37	0.53
2:B:89:GLN:HB2	2:B:98:PHE:CD2	2.43	0.53
1:A:100(D):ALA:HB1	2:B:91:TYR:O	2.08	0.52
1:H:69:ILE:HA	1:H:79:SER:O	2.09	0.52
3:F:150:ASP:OD1	3:F:176:ARG:NE	2.38	0.52
1:A:59:TYR:HE1	1:A:69:ILE:HG22	1.74	0.52
2:L:60:ASP:N	2:L:60:ASP:OD1	2.40	0.51
3:F:135:ASN:O	3:F:138:ASP:N	2.41	0.51
2:B:19:ALA:O	2:B:74:THR:HA	2.10	0.51
1:A:36:TRP:HD1	1:A:69:ILE:HD12	1.76	0.51
1:A:94:ARG:HB3	1:A:102:PRO:HD2	1.93	0.50
2:L:2:ILE:HG13	2:L:95:PRO:HG2	1.92	0.50
2:L:95:PRO:C	2:L:97:LEU:H	2.20	0.50
3:F:134:PRO:HG2	3:F:159:ILE:HD11	1.92	0.50
2:L:90:GLN:HG2	2:L:92:GLY:H	1.76	0.50
1:A:68:THR:HB	1:A:81:LYS:HD3	1.93	0.50
2:B:94:SER:N	2:B:95:PRO:HD2	2.27	0.50
1:H:63:LEU:O	1:H:67:VAL:HG12	2.12	0.50
1:A:66:ARG:NH1	1:A:82(B):SER:O	2.44	0.49
1:A:98:HIS:HB2	2:B:91:TYR:CE1	2.48	0.49
3:E:173:GLN:HG3	3:E:176:ARG:HH12	1.77	0.49
2:B:21:LEU:HD23	2:B:102:THR:HB	1.94	0.48
2:B:93:SER:OG	2:B:95:PRO:HD2	2.13	0.48
1:H:35:TYR:CE1	1:H:95:GLY:HA3	2.48	0.48
1:A:63:LEU:O	1:A:67:VAL:HG12	2.13	0.48
2:L:35:TRP:HB2	2:L:48:ILE:HB	1.94	0.48
3:E:140:LEU:HD13	3:E:145:ILE:HD12	1.95	0.48
1:H:4:LEU:HD22	1:H:24:VAL:HG22	1.96	0.48
2:L:33:LEU:HD22	2:L:71:PHE:CG	2.49	0.48
3:D:136:LYS:HA	3:D:139:VAL:HG22	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:144:LEU:O	3:C:148:VAL:HG22	2.13	0.48
2:B:108:ARG:HG2	2:B:140:TYR:CD2	2.49	0.48
1:H:185:PRO:O	1:H:188:SER:OG	2.32	0.48
3:D:145:ILE:HG13	3:D:161:LYS:HE2	1.96	0.48
2:B:47:LEU:HD23	2:B:58:ILE:HD12	1.95	0.47
2:L:194:ALA:HB2	2:L:209:SER:HB3	1.96	0.47
1:A:116:THR:HG23	1:A:147:PRO:HD2	1.96	0.47
2:B:50:GLY:O	2:B:51:THR:OG1	2.27	0.47
1:A:4:LEU:HD22	1:A:24:VAL:HG22	1.96	0.47
1:A:39:GLN:HB2	1:A:45:LEU:HD23	1.96	0.47
1:A:52:TYR:CD1	1:A:56:SER:HB2	2.50	0.47
2:B:32:TYR:HD2	2:B:92:GLY:HA2	1.79	0.47
3:E:103:LEU:HB2	3:E:110:TYR:HB2	1.96	0.47
1:H:215:SER:O	1:H:216:CYS:C	2.57	0.47
1:A:35:TYR:CE2	1:A:95:GLY:HA3	2.48	0.47
2:L:94:SER:O	2:L:95:PRO:C	2.58	0.47
1:H:59:TYR:CE1	1:H:69:ILE:HG22	2.50	0.47
3:F:105:TYR:O	3:F:108:SER:OG	2.32	0.46
2:L:123:ASP:HA	2:L:126:LEU:HD12	1.97	0.45
2:L:32:TYR:HD2	2:L:92:GLY:HA2	1.81	0.45
1:H:100:MET:HB3	1:H:100:MET:HE3	1.70	0.45
3:D:134:PRO:HD3	3:D:179:PHE:O	2.16	0.45
2:L:146:LYS:HB3	2:L:198:THR:OG1	2.16	0.45
2:L:95(A):LEU:HD21	3:C:176:ARG:HH22	1.82	0.45
3:F:136:LYS:O	3:F:137:SER:C	2.60	0.44
3:C:125:ASN:O	3:C:129:GLU:HG2	2.17	0.44
3:D:144:LEU:O	3:D:148:VAL:HG22	2.18	0.44
1:A:34:TYR:CD1	1:A:96:VAL:HG22	2.53	0.43
1:H:13:LYS:HB2	1:H:13:LYS:HE2	1.84	0.43
1:A:116:THR:HG23	1:A:147:PRO:CD	2.49	0.43
2:B:94:SER:H	2:B:95:PRO:HD2	1.83	0.43
3:E:161:LYS:HA	3:E:161:LYS:HD2	1.84	0.43
1:H:29:ILE:HA	1:H:35(A):TRP:CZ2	2.53	0.43
3:D:112:LEU:HB2	3:D:179:PHE:CE2	2.53	0.43
2:L:2:ILE:O	2:L:98:THR:HG21	2.18	0.43
1:A:18:LEU:HD13	1:A:109:VAL:HG11	2.01	0.43
3:E:118:SER:HA	3:E:174:GLU:O	2.19	0.43
1:H:11:LEU:HD13	1:H:147:PRO:HG3	2.01	0.43
2:L:21:LEU:HD23	2:L:103:THR:HB	2.00	0.43
1:H:96:VAL:HB	1:H:100(F):TRP:NE1	2.34	0.42
3:E:119:PHE:CE1	3:E:156:GLY:HA2	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:139:VAL:HG21	3:F:159:ILE:HD13	2.01	0.42
3:C:139:VAL:HG11	3:C:148:VAL:HG21	2.01	0.42
1:A:129:LYS:HD2	2:B:208:SER:O	2.18	0.42
1:H:6:GLU:HG3	1:H:92:CYS:SG	2.60	0.42
1:H:57:THR:HB	1:H:59:TYR:CE1	2.55	0.42
3:C:148:VAL:HG12	3:C:179:PHE:CD1	2.55	0.42
3:F:135:ASN:O	3:F:137:SER:N	2.53	0.42
2:L:95(A):LEU:HD22	2:L:95(A):LEU:HA	1.83	0.42
3:F:117:LYS:HB3	3:F:121:ASP:HB2	2.00	0.42
3:F:133:LEU:HD23	3:F:133:LEU:HA	1.93	0.42
2:B:91:TYR:HA	2:B:96:LEU:CD2	2.50	0.42
1:A:50:ARG:HH12	2:B:94:SER:CB	2.33	0.41
2:B:159:SER:HA	2:B:178:THR:O	2.20	0.41
2:B:119:PRO:HB3	2:B:209:PHE:CE2	2.56	0.41
1:H:82:LEU:HD23	1:H:82:LEU:HA	1.86	0.41
3:C:119:PHE:CD1	3:C:156:GLY:HA2	2.55	0.41
3:C:152:TRP:HB2	3:C:178:TYR:HB3	2.02	0.41
3:F:140:LEU:HD12	3:F:140:LEU:HA	1.93	0.41
1:A:59:TYR:CE1	1:A:69:ILE:HG22	2.53	0.41
1:A:78:PHE:CZ	1:A:92:CYS:HB2	2.56	0.41
1:H:212:GLU:HA	1:H:213:PRO:HD3	1.94	0.41
1:A:38:ARG:NH1	1:A:86:ASP:OD1	2.37	0.41
1:H:18:LEU:O	1:H:81:LYS:HA	2.20	0.41
1:A:169:VAL:HG11	2:B:160:GLN:HG3	2.02	0.41
1:A:14:PRO:HD3	1:A:112:SER:O	2.21	0.41
1:A:50:ARG:HH12	2:B:94:SER:HB2	1.86	0.41
3:F:135:ASN:C	3:F:137:SER:N	2.78	0.41
3:D:103:LEU:HD22	3:D:143:TRP:HZ3	1.86	0.40
1:A:212:GLU:HA	1:A:213:PRO:HD3	1.91	0.40
2:B:118:PHE:HA	2:B:119:PRO:HD3	1.96	0.40
1:A:100(C):VAL:HG21	3:E:176:ARG:HG2	2.02	0.40
2:L:47:LEU:HD11	2:L:86:TYR:HE2	1.86	0.40
3:C:103:LEU:HD22	3:C:143:TRP:HZ3	1.86	0.40

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:206:LYS:NZ	1:A:210:ARG:NH2[5_565]	1.98	0.22

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	224/228 (98%)	219 (98%)	5 (2%)	0	100 100
1	H	226/228 (99%)	219 (97%)	7 (3%)	0	100 100
2	B	212/216 (98%)	201 (95%)	11 (5%)	0	100 100
2	L	208/216 (96%)	196 (94%)	12 (6%)	0	100 100
3	C	70/100 (70%)	68 (97%)	2 (3%)	0	100 100
3	D	70/100 (70%)	69 (99%)	1 (1%)	0	100 100
3	E	69/100 (69%)	66 (96%)	3 (4%)	0	100 100
3	F	72/100 (72%)	70 (97%)	1 (1%)	1 (1%)	9 34
All	All	1151/1288 (89%)	1108 (96%)	42 (4%)	1 (0%)	48 79

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	F	136	LYS

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	191/193 (99%)	189 (99%)	2 (1%)	68 83
1	H	193/193 (100%)	192 (100%)	1 (0%)	81 88
2	B	184/186 (99%)	183 (100%)	1 (0%)	81 88
2	L	182/186 (98%)	179 (98%)	3 (2%)	55 78

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
3	C	66/91 (72%)	66 (100%)	0	100 100
3	D	65/91 (71%)	65 (100%)	0	100 100
3	E	65/91 (71%)	65 (100%)	0	100 100
3	F	67/91 (74%)	64 (96%)	3 (4%)	24 57
All	All	1013/1122 (90%)	1003 (99%)	10 (1%)	68 83

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H	113	SER
2	L	93	SER
2	L	94	SER
2	L	97	LEU
1	A	116	THR
1	A	193	THR
2	B	96	LEU
3	F	132	THR
3	F	135	ASN
3	F	136	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	H	16	GLN
1	H	39	GLN
2	L	31	ASN
2	L	38	GLN
2	L	148	GLN
2	L	153	ASN
2	L	161	GLN
3	D	135	ASN
1	A	3	GLN
1	A	39	GLN
1	A	77	GLN
2	B	38	GLN
2	B	53	ASN
2	B	90	GLN
2	B	160	GLN
2	B	166	GLN
3	F	157	ASN

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Mol	Chain	Res	Type
3	F	173	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

4 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	GOL	D	202	-	5,5,5	0.35	0	5,5,5	0.39	0
4	GOL	L	300	-	5,5,5	0.36	0	5,5,5	0.49	0
4	GOL	H	301	-	5,5,5	0.38	0	5,5,5	0.59	0
4	GOL	D	201	-	5,5,5	0.35	0	5,5,5	0.45	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	GOL	D	202	-	-	1/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	L	300	-	-	0/4/4/4	-
4	GOL	H	301	-	-	0/4/4/4	-
4	GOL	D	201	-	-	2/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

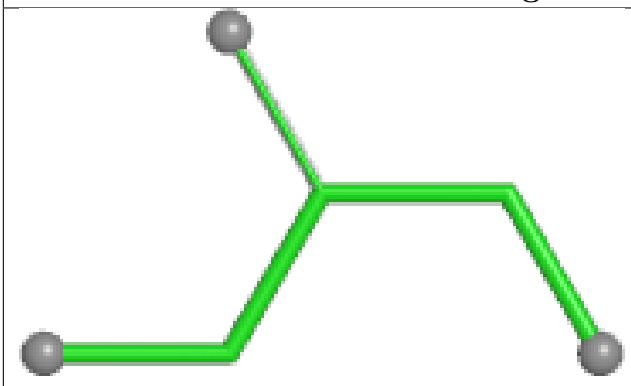
Mol	Chain	Res	Type	Atoms
4	D	201	GOL	C1-C2-C3-O3
4	D	202	GOL	O1-C1-C2-C3
4	D	201	GOL	O2-C2-C3-O3

There are no ring outliers.

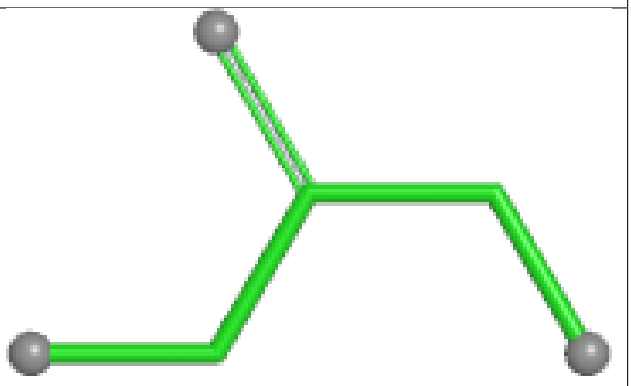
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

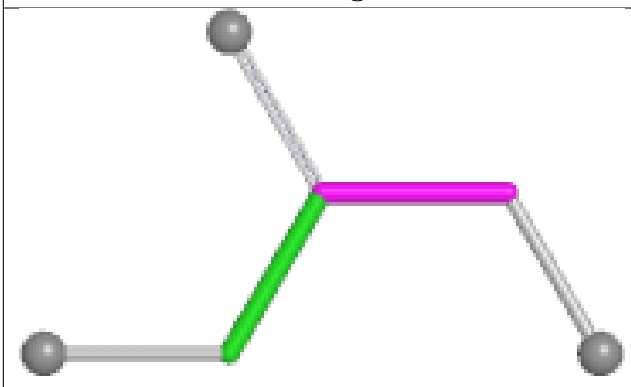
Ligand GOL D 202



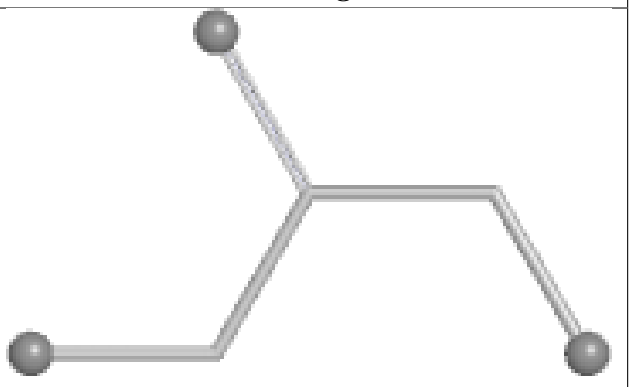
Bond lengths



Bond angles

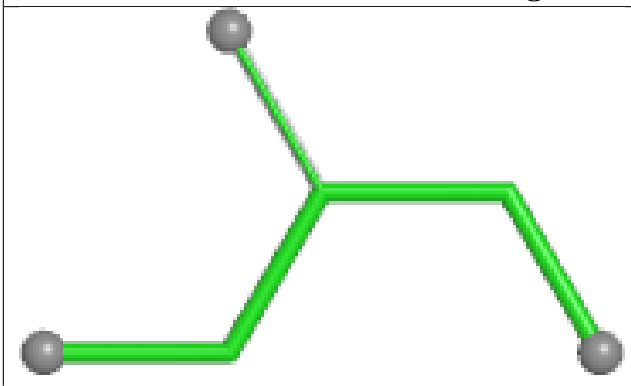


Torsions

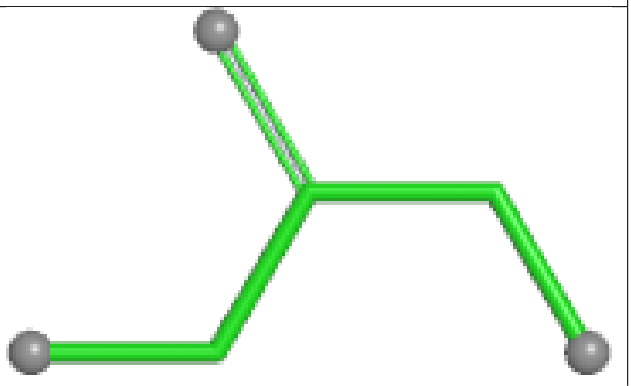


Rings

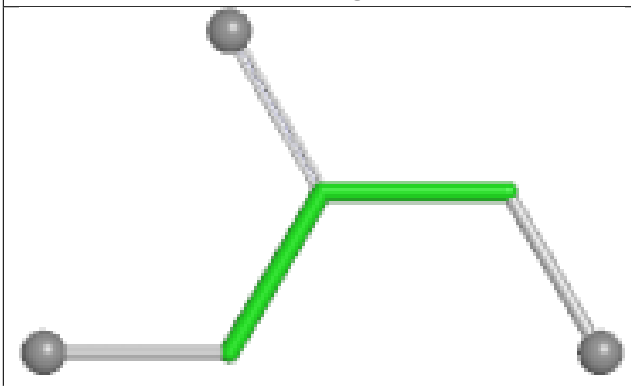
Ligand GOL L 300



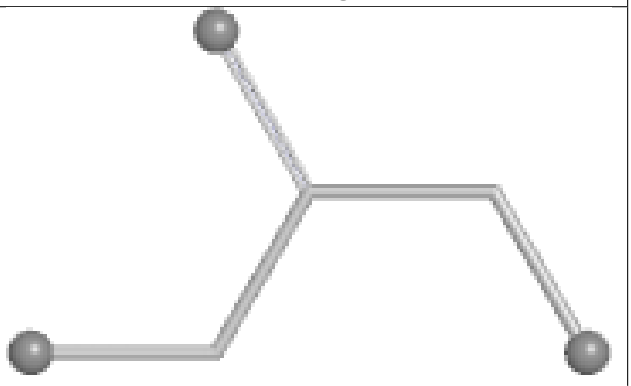
Bond lengths



Bond angles

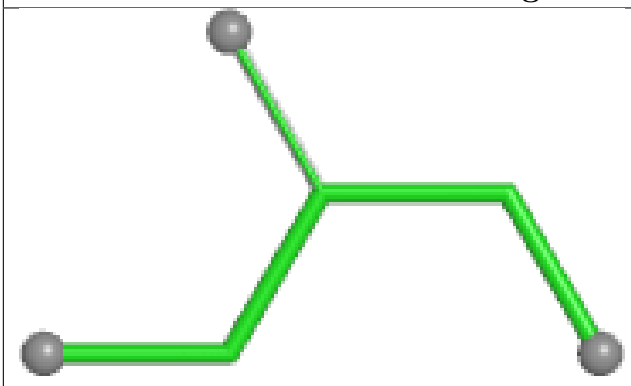


Torsions

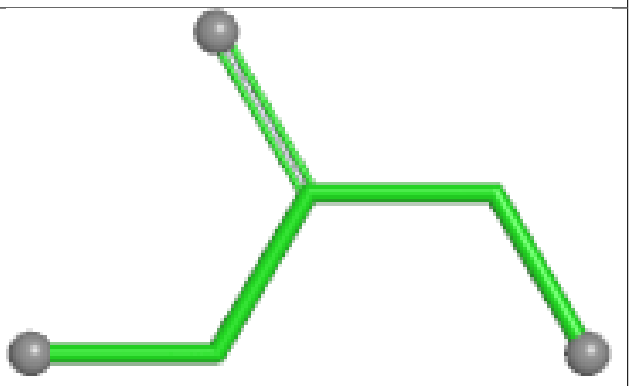


Rings

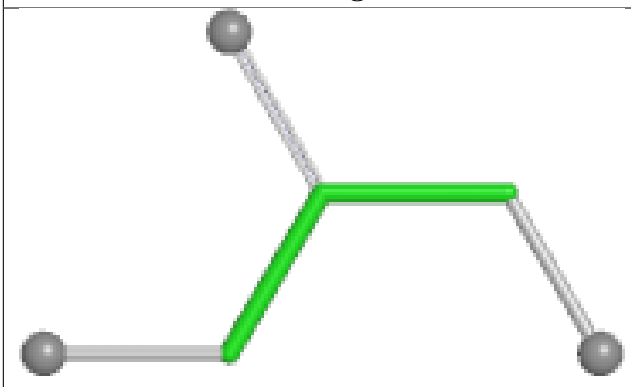
Ligand GOL H 301



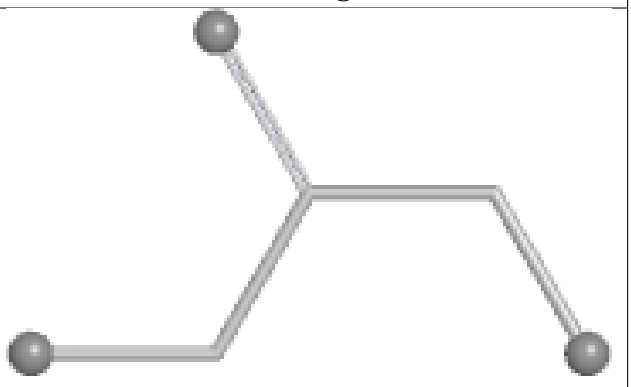
Bond lengths



Bond angles

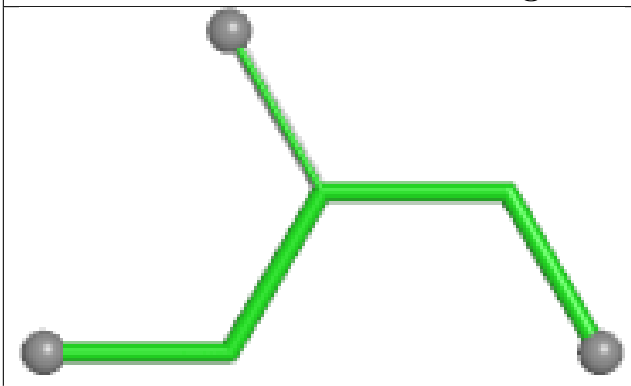


Torsions

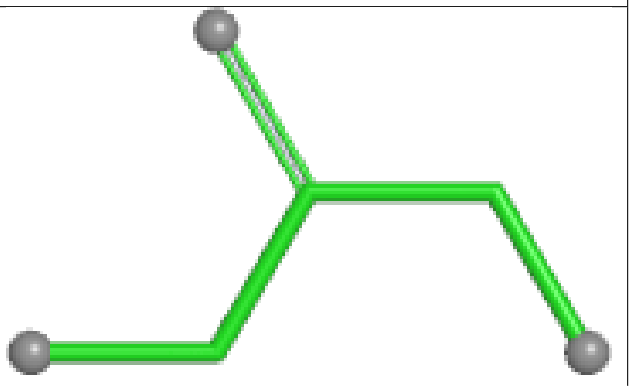


Rings

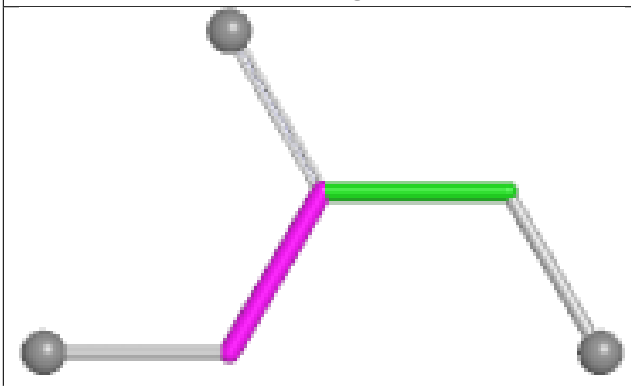
Ligand GOL D 201



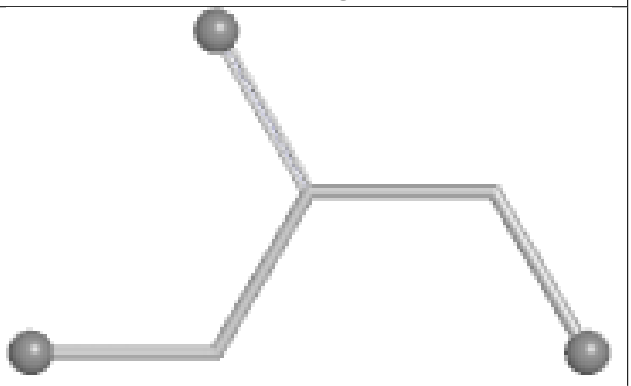
Bond lengths



Bond angles



Torsions



Rings

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	226/228 (99%)	0.27	5 (2%) 62 39	19, 60, 103, 120	0
1	H	228/228 (100%)	-0.24	2 (0%) 81 61	18, 36, 62, 100	0
2	B	214/216 (99%)	0.58	20 (9%) 14 7	25, 60, 125, 142	0
2	L	212/216 (98%)	-0.04	6 (2%) 55 32	22, 40, 77, 110	0
3	C	74/100 (74%)	0.07	1 (1%) 73 51	28, 46, 76, 89	0
3	D	74/100 (74%)	0.10	1 (1%) 73 51	30, 47, 78, 92	0
3	E	73/100 (73%)	1.28	9 (12%) 8 5	81, 109, 142, 156	0
3	F	76/100 (76%)	2.30	47 (61%) 0 0	110, 147, 167, 179	0
All	All	1177/1288 (91%)	0.34	91 (7%) 19 10	18, 48, 142, 179	0

All (91) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	L	93	SER	4.8
3	F	128	ALA	4.8
3	F	134	PRO	4.6
3	F	110	TYR	4.4
3	F	153	GLY	4.3
3	F	181	THR	4.1
3	F	171	VAL	3.8
2	B	96	LEU	3.7
3	F	119	PHE	3.7
3	F	179	PHE	3.6
2	B	94	SER	3.6
2	B	25	ALA	3.5
3	F	139	VAL	3.5
3	F	114	SER	3.4
1	A	53	THR	3.2
3	F	108	SER	3.1

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Mol	Chain	Res	Type	RSRZ
3	F	129	GLU	3.0
3	E	162	THR	3.0
3	E	181	THR	3.0
2	L	27	GLN	3.0
3	F	152	TRP	2.9
3	F	156	GLY	2.9
3	F	182	GLY	2.9
2	B	2	ILE	2.9
2	B	51	THR	2.9
3	F	122	ALA	2.9
3	F	126	CYS	2.9
3	F	183	SER	2.9
2	B	70	ASP	2.9
3	F	136	LYS	2.8
3	F	111	ILE	2.8
3	F	142	THR	2.8
3	F	143	TRP	2.7
2	L	95(A)	LEU	2.7
2	L	92	GLY	2.7
3	F	138	ASP	2.7
3	F	158	PRO	2.7
3	E	127	ALA	2.7
3	E	144	LEU	2.7
3	F	180	CYS	2.6
2	B	95(A)	LEU	2.6
3	F	144	LEU	2.6
3	F	127	ALA	2.6
3	F	137	SER	2.5
3	F	145	ILE	2.5
3	F	159	ILE	2.5
3	E	143	TRP	2.5
3	F	112	LEU	2.5
3	E	128	ALA	2.5
2	B	8	PRO	2.5
3	F	140	LEU	2.5
3	D	183	SER	2.4
1	H	216	CYS	2.4
1	A	130	SER	2.4
3	F	154	SER	2.4
3	F	133	LEU	2.4
3	E	145	ILE	2.3
3	F	104	TYR	2.3

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Mol	Chain	Res	Type	RSRZ
2	B	32	TYR	2.3
3	E	173	GLN	2.3
2	B	93	SER	2.3
2	B	11	LEU	2.3
1	A	64	LYS	2.3
3	F	105	TYR	2.3
3	F	124	ALA	2.3
1	H	82(A)	SER	2.3
3	F	107	GLY	2.2
2	B	67	SER	2.2
3	F	178	TYR	2.2
2	B	68	GLY	2.2
2	B	77	GLY	2.2
3	F	132	THR	2.2
3	C	105	TYR	2.2
3	F	173	GLN	2.2
2	B	7	SER	2.1
3	F	131	SER	2.1
2	B	30	SER	2.1
2	L	95	PRO	2.1
2	B	27(A)	SER	2.1
3	F	103	LEU	2.1
3	E	142	THR	2.1
3	F	147	TYR	2.1
3	F	109	CYS	2.1
2	B	16	GLY	2.1
3	F	123	LYS	2.0
1	A	33	SER	2.0
3	F	157	ASN	2.0
2	B	76	SER	2.0
1	A	35	TYR	2.0
2	L	135	CYS	2.0
2	B	3	VAL	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)

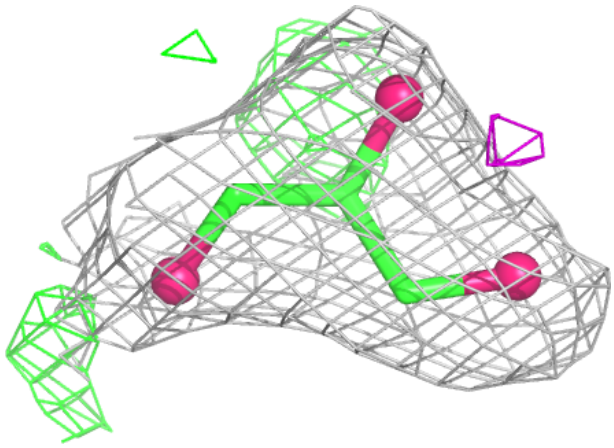
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

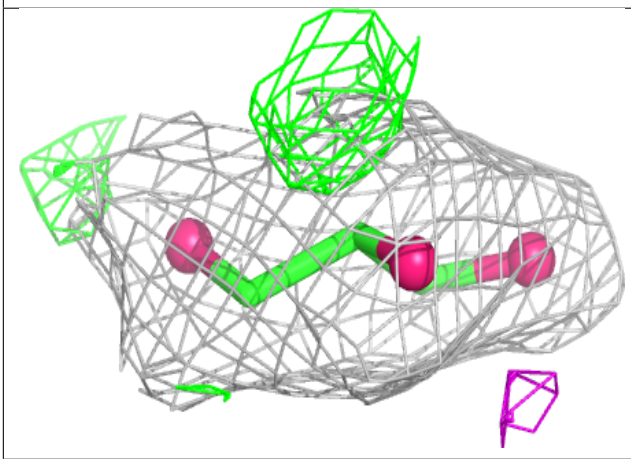
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	GOL	H	301	6/6	0.79	0.19	43,46,51,56	0
4	GOL	D	202	6/6	0.85	0.21	54,64,80,86	0
4	GOL	L	300	6/6	0.89	0.15	43,49,55,58	0
4	GOL	D	201	6/6	0.90	0.16	53,59,63,67	0

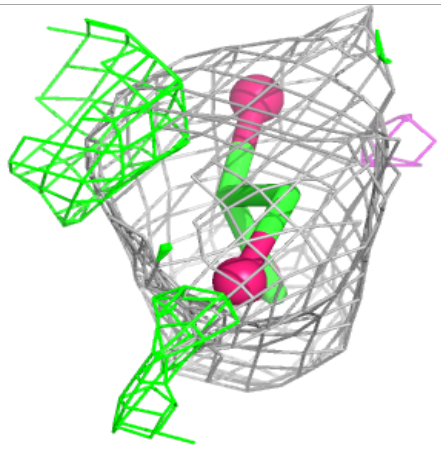
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around GOL H 301:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

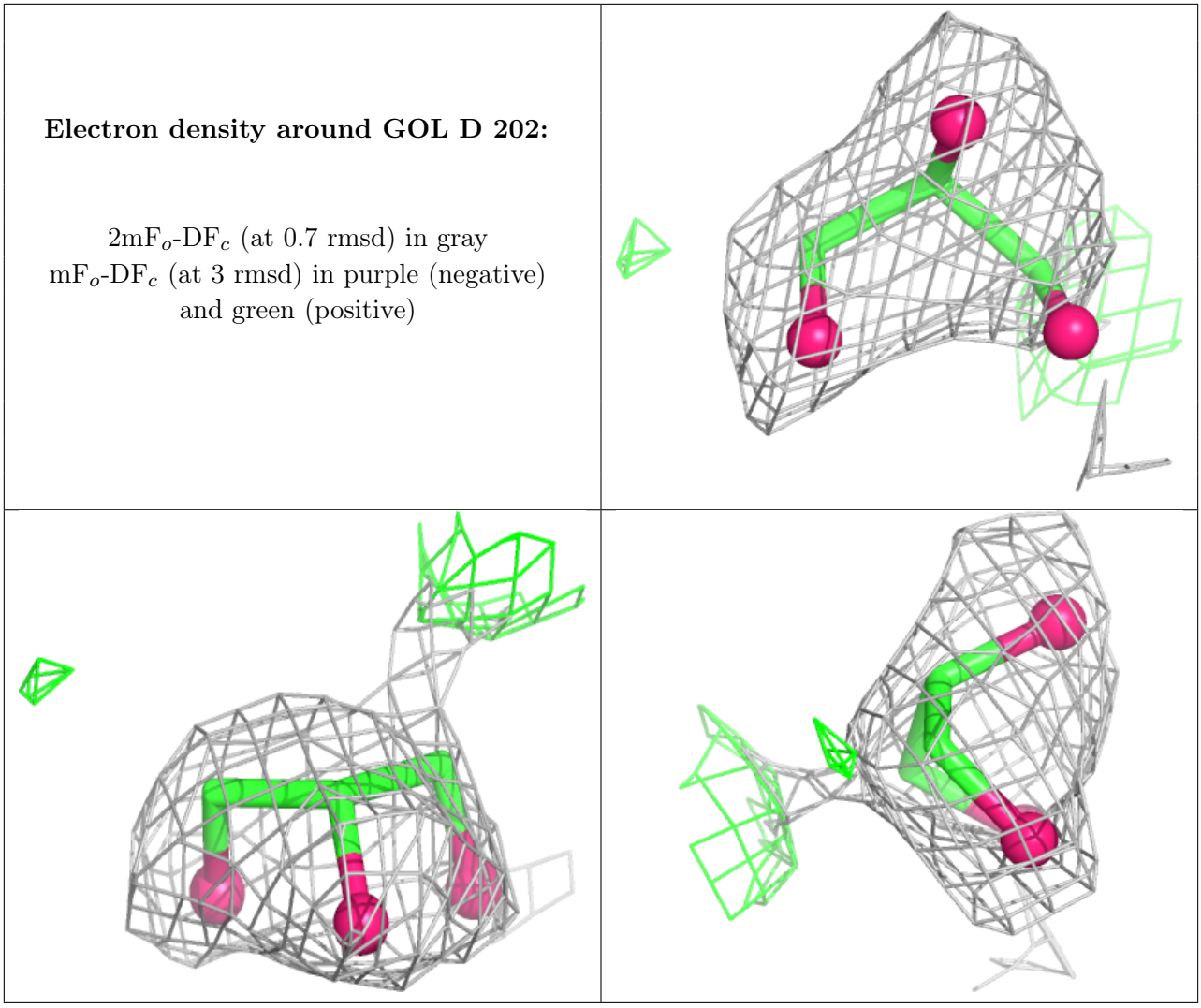






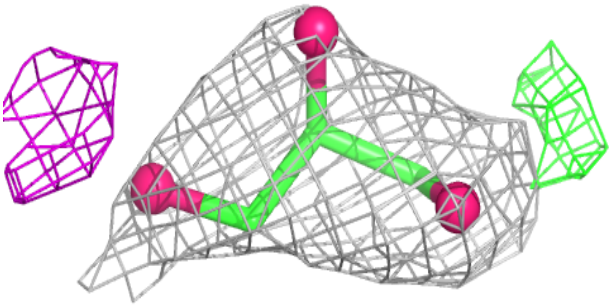
Electron density around GOL D 202:

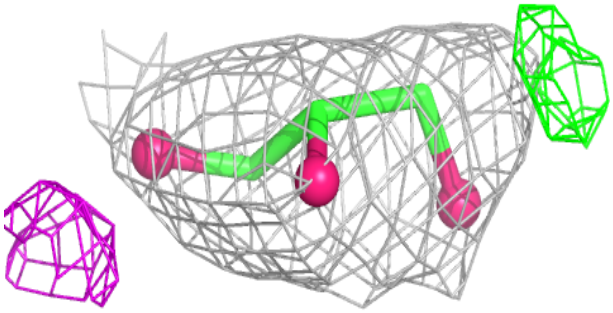
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

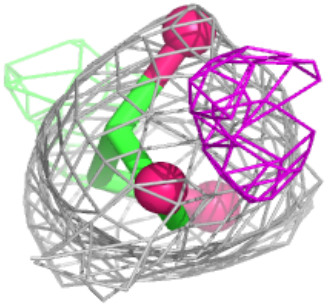


Electron density around GOL L 300:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

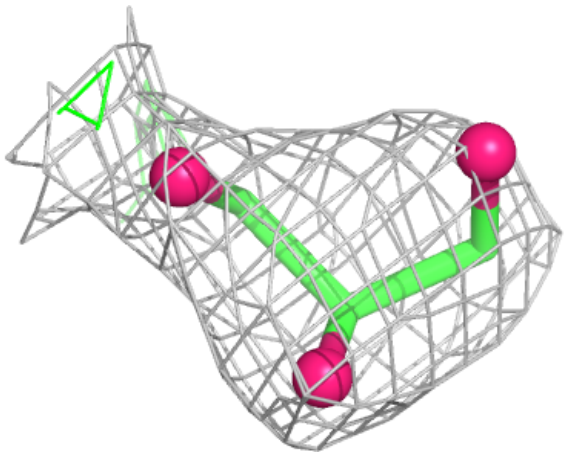


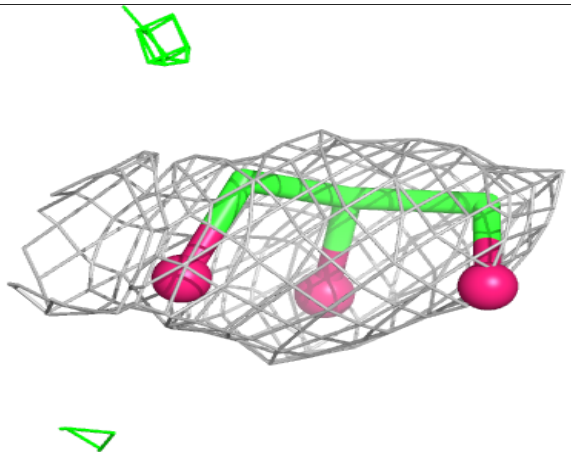


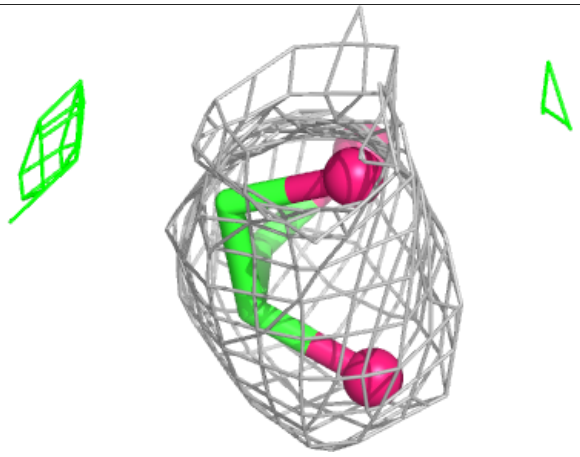


Electron density around GOL D 201:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)







6.5 Other polymers (i)

There are no such residues in this entry.