Full wwPDB X-ray Structure Validation Report ⓘ

Mar 23, 2024 – 02:46 PM EDT

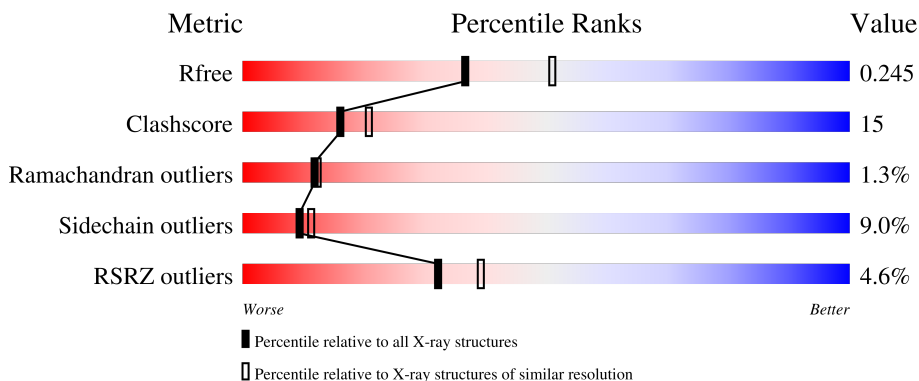|		
PDB ID	:	3RIP
Title	:	Crystal Structure of human gamma-tubulin complex protein 4 (GCP4)
Authors	:	Gregory-Pauron, L.; Guillet, V.; Mourey, L.
Deposited on	:	2011-04-14
Resolution	:	2.30 Å(reported)

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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 2.30 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	Percentile Ranks	Value
Rfree		0.245
Clashscore		15
Ramachandran outliers		1.3%
Sidechain outliers		9.0%
RSRZ outliers		4.6%

Worse *Better*

▌Percentile relative to all X-ray structures

▯Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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	677	4% · 61% · 18% · 5% · 16%

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
3	GOL	A	686	-	-	-	X

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 4843 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 Gamma-tubulin complex component 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	568	Total 4572	C 2963	N 774	O 816	S 19	0	4	0

There are 11 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	667	CYS	-	expression tag	UNP Q9UGJ1
A	668	GLY	-	expression tag	UNP Q9UGJ1
A	669	ARG	-	expression tag	UNP Q9UGJ1
A	670	LEU	-	expression tag	UNP Q9UGJ1
A	671	GLU	-	expression tag	UNP Q9UGJ1
A	672	HIS	-	expression tag	UNP Q9UGJ1
A	673	HIS	-	expression tag	UNP Q9UGJ1
A	674	HIS	-	expression tag	UNP Q9UGJ1
A	675	HIS	-	expression tag	UNP Q9UGJ1
A	676	HIS	-	expression tag	UNP Q9UGJ1
A	677	HIS	-	expression tag	UNP Q9UGJ1

- Molecule 2 is (4R)-2-METHYLPENTANE-2,4-DIOL (three-letter code: MRD) (formula: $C_6H_{14}O_2$).

MRD

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 8	C 6	O 2	0	0

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).

GOL

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

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

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	215	Total 215	O 215	0	2

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: Gamma-tubulin complex component 4
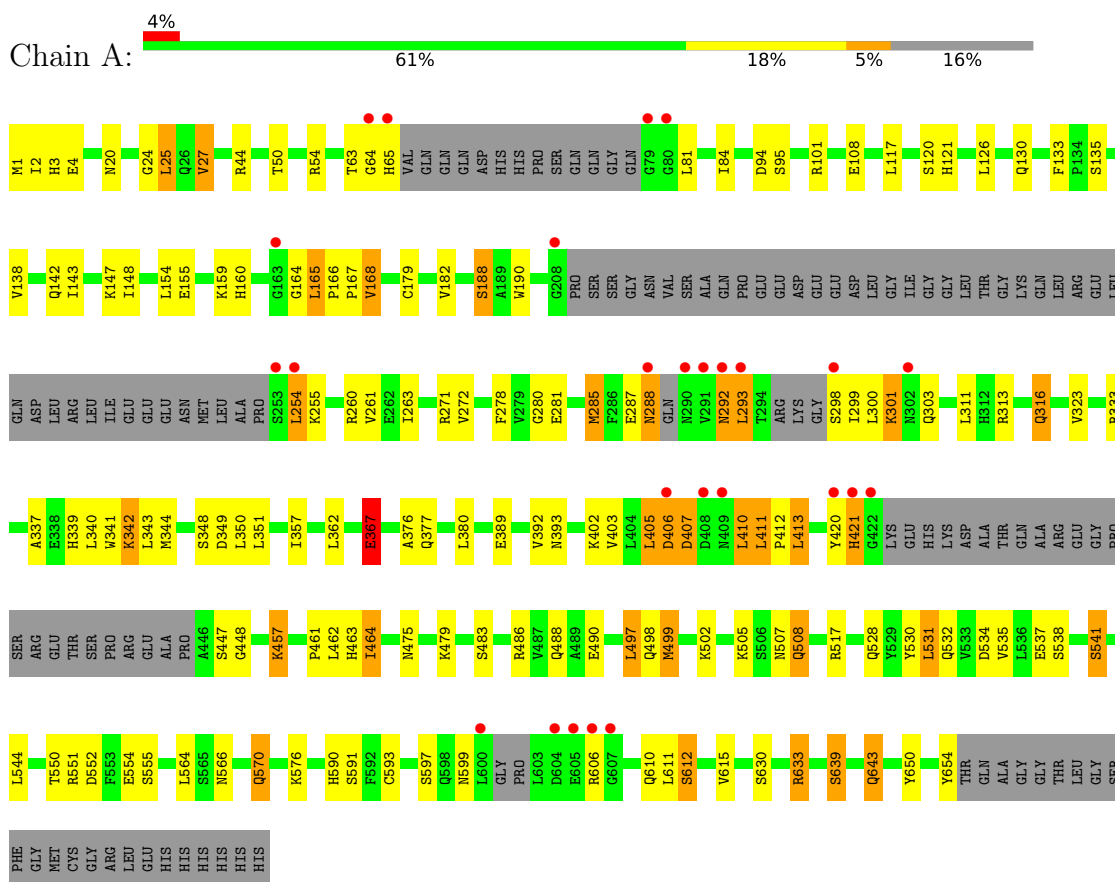
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 63 2 2	Depositor
Cell constants a, b, c, α, β, γ	214.95Å 214.95Å 128.66Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	20.00 – 2.30 34.51 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.5 (20.00-2.30) 99.4 (34.51-2.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.85 (at 2.20Å)	Xtriage
Refinement program	REFMAC 5.5.0072	Depositor
R, R_{free}	0.227 , 0.260 0.217 , 0.245	Depositor DCC
R_{free} test set	4414 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	49.4	Xtriage
Anisotropy	0.371	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 55.6	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	4843	wwPDB-VP
Average B, all atoms (Å^2)	53.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.54% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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 (i)

5.1 Standard geometry (i)

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

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	1.01	2/4676 (0.0%)	1.01	16/6334 (0.3%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	367[A]	GLU	CD-OE2	8.72	1.35	1.25
1	A	367[B]	GLU	CD-OE2	8.72	1.35	1.25

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	633	ARG	NE-CZ-NH2	-16.28	112.16	120.30
1	A	633	ARG	NE-CZ-NH1	12.51	126.56	120.30
1	A	367[A]	GLU	CG-CD-OE1	10.78	139.85	118.30
1	A	367[B]	GLU	CG-CD-OE1	10.78	139.85	118.30
1	A	367[A]	GLU	OE1-CD-OE2	-8.23	113.42	123.30
1	A	367[B]	GLU	OE1-CD-OE2	-8.23	113.42	123.30
1	A	413	LEU	CA-CB-CG	7.82	133.29	115.30
1	A	27	VAL	CB-CA-C	-7.23	97.66	111.40
1	A	54	ARG	NE-CZ-NH2	-6.65	116.98	120.30
1	A	260	ARG	NE-CZ-NH1	6.21	123.41	120.30
1	A	367[A]	GLU	CG-CD-OE2	-5.93	106.45	118.30
1	A	367[B]	GLU	CG-CD-OE2	-5.93	106.45	118.30
1	A	260	ARG	NE-CZ-NH2	-5.39	117.61	120.30
1	A	54	ARG	NE-CZ-NH1	5.23	122.92	120.30
1	A	643	GLN	CB-CA-C	-5.21	99.99	110.40
1	A	133	PHE	C-N-CD	5.19	139.30	128.40

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	4572	0	4505	132	0
2	A	8	0	14	4	0
3	A	48	0	64	4	0
4	A	215	0	0	11	0
All	All	4843	0	4583	134	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 15.

All (134) 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:612:SER:HB3	4:A:888:HOH:O	1.44	1.14
1:A:288:ASN:HD22	1:A:288:ASN:H	1.11	0.99
1:A:410:LEU:HD23	1:A:411:LEU:N	1.80	0.96
1:A:550:THR:HG22	1:A:552:ASP:H	1.35	0.91
1:A:639:SER:O	1:A:643:GLN:HG2	1.73	0.89
1:A:1[B]:MET:HE2	1:A:3:HIS:H	1.39	0.85
1:A:497:LEU:C	1:A:497:LEU:HD23	1.98	0.83
1:A:164:GLY:O	1:A:165:LEU:HG	1.80	0.82
1:A:316:GLN:HA	1:A:316:GLN:OE1	1.81	0.81
1:A:117:LEU:HD11	1:A:121:HIS:HD2	1.48	0.79
1:A:288:ASN:H	1:A:288:ASN:ND2	1.79	0.79
1:A:606:ARG:O	1:A:610:GLN:HG2	1.85	0.77
1:A:534:ASP:OD2	1:A:633:ARG:CD	2.34	0.75
1:A:502[A]:LYS:HG2	4:A:901:HOH:O	1.86	0.74
1:A:188:SER:HB2	1:A:311:LEU:HD12	1.70	0.74
1:A:165:LEU:HB2	1:A:168:VAL:HG13	1.72	0.71
1:A:316:GLN:OE1	1:A:316:GLN:CA	2.39	0.70
1:A:505:LYS:NZ	1:A:599:ASN:OD1	2.22	0.70
1:A:285:MET:C	1:A:285:MET:SD	2.70	0.70
1:A:508:GLN:NE2	1:A:508:GLN:HA	2.06	0.70
1:A:534:ASP:OD2	1:A:633:ARG:HD2	1.93	0.69
2:A:678:MRD:O2	2:A:678:MRD:H5C2	1.92	0.69
1:A:117:LEU:HD11	1:A:121:HIS:CD2	2.29	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:135:SER:O	1:A:138:VAL:HG22	1.95	0.67
1:A:497:LEU:HD23	1:A:497:LEU:O	1.96	0.65
1:A:534:ASP:OD2	1:A:633:ARG:HD3	1.97	0.65
1:A:84:ILE:HD12	1:A:182:VAL:HG13	1.80	0.64
1:A:142:GLN:OE1	1:A:160:HIS:NE2	2.28	0.64
1:A:554:GLU:OE1	3:A:685:GOL:O3	2.15	0.64
1:A:20:ASN:O	1:A:24:GLY:N	2.27	0.64
1:A:650:TYR:CE1	1:A:654:TYR:HB2	2.34	0.63
1:A:81:LEU:HD21	1:A:147:LYS:HA	1.80	0.62
1:A:63:THR:O	1:A:65:HIS:N	2.26	0.61
1:A:285:MET:SD	1:A:285:MET:O	2.60	0.59
1:A:566:ASN:O	1:A:570:GLN:HG2	2.03	0.59
1:A:1[B]:MET:CE	1:A:3:HIS:H	2.11	0.59
1:A:190:TRP:CE2	1:A:280:GLY:HA3	2.37	0.59
1:A:287:GLU:O	1:A:287:GLU:HG3	2.04	0.58
1:A:410:LEU:HD23	1:A:411:LEU:H	1.66	0.57
1:A:497:LEU:C	1:A:497:LEU:CD2	2.70	0.57
1:A:550:THR:HG21	1:A:555:SER:CB	2.34	0.57
1:A:550:THR:HG21	1:A:555:SER:HB2	1.86	0.57
1:A:410:LEU:HD23	1:A:410:LEU:C	2.25	0.56
1:A:508:GLN:NE2	1:A:508:GLN:CA	2.68	0.56
1:A:288:ASN:ND2	1:A:288:ASN:N	2.51	0.55
1:A:531:LEU:O	1:A:535:VAL:HB	2.06	0.54
1:A:411:LEU:N	1:A:412:PRO:HD2	2.23	0.54
1:A:344:MET:HE2	1:A:461:PRO:HG2	1.89	0.53
1:A:287:GLU:O	1:A:287:GLU:CG	2.56	0.53
1:A:281:GLU:OE2	4:A:834:HOH:O	2.18	0.53
2:A:678:MRD:O2	2:A:678:MRD:C5	2.56	0.53
1:A:508:GLN:CA	1:A:508:GLN:HE21	2.21	0.53
1:A:143:ILE:HA	1:A:148:ILE:HG13	1.91	0.53
1:A:488:GLN:OE1	1:A:528:GLN:NE2	2.36	0.53
1:A:271:ARG:HG2	1:A:272:VAL:N	2.23	0.52
1:A:1[B]:MET:HE2	1:A:2:ILE:N	2.25	0.52
1:A:155:GLU:OE2	1:A:159:LYS:HE2	2.09	0.52
1:A:166:PRO:HB2	1:A:167:PRO:HD3	1.90	0.52
1:A:505:LYS:HE2	4:A:692:HOH:O	2.09	0.51
1:A:188:SER:HB2	1:A:311:LEU:CD1	2.41	0.50
1:A:108:GLU:HG3	4:A:792:HOH:O	2.10	0.50
1:A:341:TRP:NE1	1:A:550:THR:O	2.45	0.50
1:A:550:THR:HG22	1:A:551:ARG:N	2.27	0.49
1:A:420:TYR:O	1:A:421:HIS:HB2	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:84:ILE:HD12	1:A:182:VAL:CG1	2.41	0.49
1:A:537:GLU:O	1:A:541:SER:HB2	2.12	0.49
1:A:593:CYS:SG	2:A:678:MRD:H5C1	2.53	0.49
1:A:271:ARG:CG	1:A:272:VAL:N	2.75	0.49
1:A:486:ARG:O	1:A:490:GLU:HG3	2.12	0.49
1:A:1[B]:MET:HE2	1:A:3:HIS:N	2.18	0.49
1:A:502[B]:LYS:HE3	4:A:811:HOH:O	2.13	0.48
1:A:405:LEU:HD12	1:A:406:ASP:N	2.28	0.48
1:A:313:ARG:O	1:A:316:GLN:HB2	2.13	0.48
1:A:532:GLN:O	1:A:537:GLU:HG2	2.13	0.48
1:A:502[A]:LYS:HE3	4:A:727:HOH:O	2.13	0.48
1:A:126:LEU:O	1:A:130:GLN:HG3	2.14	0.48
1:A:254:LEU:O	1:A:255:LYS:HB2	2.14	0.48
1:A:340:LEU:HD23	1:A:340:LEU:HA	1.69	0.48
1:A:463:HIS:N	1:A:463:HIS:ND1	2.62	0.47
1:A:643:GLN:HG2	1:A:643:GLN:H	1.58	0.47
1:A:292:ASN:O	1:A:293:LEU:CB	2.62	0.47
1:A:389:GLU:O	1:A:393:ASN:ND2	2.41	0.47
1:A:351:LEU:HD23	1:A:351:LEU:HA	1.60	0.46
1:A:333:ARG:HD2	3:A:685:GOL:H11	1.97	0.46
1:A:479:LYS:NZ	4:A:830:HOH:O	2.49	0.46
1:A:1[B]:MET:HG2	1:A:4:GLU:HG2	1.98	0.45
1:A:285:MET:O	1:A:285:MET:CG	2.65	0.45
1:A:117:LEU:CD1	1:A:121:HIS:CD2	2.99	0.45
1:A:263:ILE:O	1:A:263:ILE:HG23	2.17	0.45
1:A:299:ILE:O	1:A:339:HIS:ND1	2.49	0.45
1:A:457:LYS:N	1:A:457:LYS:CD	2.80	0.45
1:A:341:TRP:HE3	1:A:342:LYS:N	2.14	0.45
1:A:498:GLN:CD	1:A:593:CYS:HB2	2.37	0.45
1:A:337:ALA:HB1	1:A:552:ASP:OD1	2.17	0.45
1:A:281:GLU:OE1	3:A:686:GOL:O2	2.28	0.45
1:A:351:LEU:HD22	1:A:544:LEU:HD22	1.98	0.45
1:A:410:LEU:CD2	1:A:411:LEU:N	2.66	0.45
1:A:154:LEU:HD23	1:A:179:CYS:HB3	1.98	0.45
1:A:344:MET:HE2	1:A:462:LEU:HD23	1.97	0.45
1:A:566:ASN:O	1:A:570:GLN:CG	2.64	0.45
1:A:406:ASP:O	1:A:407:ASP:C	2.55	0.45
1:A:570:GLN:HG2	1:A:570:GLN:H	1.59	0.44
1:A:278:PHE:HB2	3:A:686:GOL:H2	1.98	0.44
1:A:94:ASP:OD1	1:A:101:ARG:NH2	2.51	0.44
1:A:342:LYS:O	1:A:343:LEU:C	2.55	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:341:TRP:CZ2	1:A:551:ARG:NH1	2.85	0.44
1:A:507:ASN:OD1	1:A:507:ASN:C	2.56	0.44
1:A:25:LEU:HB2	1:A:50:THR:OG1	2.18	0.44
1:A:155:GLU:O	1:A:159:LYS:HG2	2.18	0.44
1:A:344:MET:CE	1:A:461:PRO:HG2	2.48	0.44
1:A:499:MET:CE	1:A:517:ARG:HD3	2.48	0.44
1:A:349:ASP:HA	4:A:720:HOH:O	2.18	0.43
1:A:461:PRO:O	1:A:464:ILE:HG23	2.19	0.43
1:A:499:MET:HE2	1:A:517:ARG:HD3	2.01	0.42
1:A:344:MET:HE1	1:A:461:PRO:O	2.19	0.42
1:A:590:HIS:ND1	2:A:678:MRD:H5C3	2.35	0.42
1:A:448:GLY:HA3	4:A:900:HOH:O	2.20	0.41
1:A:164:GLY:O	1:A:165:LEU:CG	2.60	0.41
1:A:350:LEU:N	4:A:720:HOH:O	2.54	0.41
1:A:402:LYS:O	1:A:402:LYS:HG2	2.20	0.41
1:A:611:LEU:O	1:A:615:VAL:HG23	2.20	0.41
1:A:380:LEU:HD21	1:A:392:VAL:HG21	2.03	0.41
1:A:164:GLY:O	1:A:165:LEU:CB	2.69	0.41
1:A:300:LEU:O	1:A:301:LYS:CB	2.69	0.40
1:A:530:TYR:CD1	1:A:633:ARG:HD3	2.56	0.40
1:A:376:ALA:O	1:A:377:GLN:C	2.58	0.40
1:A:475:ASN:O	1:A:479:LYS:HG3	2.22	0.40
1:A:457:LYS:N	1:A:457:LYS:HD2	2.36	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	557/677 (82%)	525 (94%)	25 (4%)	7 (1%)	12	12

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	165	LEU
1	A	292	ASN
1	A	293	LEU
1	A	301	LYS
1	A	407	ASP
1	A	64	GLY
1	A	421	HIS

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	494/604 (82%)	449 (91%)	45 (9%)	9	11

All (45) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	25	LEU
1	A	27	VAL
1	A	44	ARG
1	A	95	SER
1	A	120	SER
1	A	168	VAL
1	A	188	SER
1	A	254	LEU
1	A	261	VAL
1	A	285	MET
1	A	288	ASN
1	A	298	SER
1	A	303	GLN
1	A	316	GLN
1	A	323	VAL
1	A	342	LYS
1	A	348	SER
1	A	357	ILE
1	A	362	LEU
1	A	367[A]	GLU

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Mol	Chain	Res	Type
1	A	367[B]	GLU
1	A	403	VAL
1	A	405	LEU
1	A	406	ASP
1	A	410	LEU
1	A	411	LEU
1	A	413	LEU
1	A	447	SER
1	A	457	LYS
1	A	464	ILE
1	A	483	SER
1	A	497	LEU
1	A	499	MET
1	A	508	GLN
1	A	531	LEU
1	A	538	SER
1	A	541	SER
1	A	564	LEU
1	A	570	GLN
1	A	576	LYS
1	A	591	SER
1	A	597	SER
1	A	612	SER
1	A	630	SER
1	A	639	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	61	GLN
1	A	121	HIS
1	A	207	GLN
1	A	288	ASN
1	A	303	GLN
1	A	508	GLN
1	A	539	GLN
1	A	548	ASN
1	A	566	ASN
1	A	635	HIS
1	A	636	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

9 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	$\#\|Z\| > 2$
3	GOL	A	679	-	5,5,5	0.69	0	5,5,5	1.31	1 (20%)
3	GOL	A	686	-	5,5,5	0.45	0	5,5,5	0.63	0
3	GOL	A	684	-	5,5,5	1.25	0	5,5,5	1.37	1 (20%)
3	GOL	A	681	-	5,5,5	0.68	0	5,5,5	1.53	1 (20%)
2	MRD	A	678	-	7,7,7	1.11	0	9,10,10	0.36	0
3	GOL	A	680	-	5,5,5	0.83	0	5,5,5	1.03	0
3	GOL	A	683	-	5,5,5	0.78	0	5,5,5	0.68	0
3	GOL	A	685	-	5,5,5	0.59	0	5,5,5	0.64	0
3	GOL	A	682	-	5,5,5	0.56	0	5,5,5	0.70	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
3	GOL	A	679	-	-	4/4/4/4	-
3	GOL	A	686	-	-	2/4/4/4	-
3	GOL	A	684	-	-	4/4/4/4	-
3	GOL	A	681	-	-	4/4/4/4	-
2	MRD	A	678	-	-	2/5/5/5	-
3	GOL	A	680	-	-	2/4/4/4	-
3	GOL	A	683	-	-	2/4/4/4	-
3	GOL	A	685	-	-	0/4/4/4	-
3	GOL	A	682	-	-	2/4/4/4	-

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	684	GOL	C3-C2-C1	-2.74	101.07	111.70
3	A	679	GOL	O1-C1-C2	-2.02	100.51	110.20
3	A	681	GOL	O3-C3-C2	-2.02	100.53	110.20

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	679	GOL	C1-C2-C3-O3
3	A	680	GOL	O1-C1-C2-C3
3	A	681	GOL	O1-C1-C2-O2
3	A	681	GOL	O1-C1-C2-C3
3	A	681	GOL	C1-C2-C3-O3
3	A	682	GOL	C1-C2-C3-O3
3	A	684	GOL	O1-C1-C2-C3
3	A	684	GOL	C1-C2-C3-O3
3	A	686	GOL	O1-C1-C2-O2
3	A	686	GOL	O1-C1-C2-C3
3	A	679	GOL	O2-C2-C3-O3
3	A	682	GOL	O2-C2-C3-O3
3	A	679	GOL	O1-C1-C2-C3
3	A	683	GOL	C1-C2-C3-O3
3	A	684	GOL	O1-C1-C2-O2
3	A	684	GOL	O2-C2-C3-O3
3	A	679	GOL	O1-C1-C2-O2
3	A	680	GOL	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
2	A	678	MRD	C2-C3-C4-C5
2	A	678	MRD	C1-C2-C3-C4
3	A	683	GOL	O2-C2-C3-O3
3	A	681	GOL	O2-C2-C3-O3

There are no ring outliers.

3 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	686	GOL	2	0
2	A	678	MRD	4	0
3	A	685	GOL	2	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(Å²)	Q<0.9
1	A	568/677 (83%)	-0.16	26 (4%)	32	39	29, 51, 82, 119	2 (0%)

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	253	SER	8.4
1	A	79	GLY	7.4
1	A	422	GLY	4.6
1	A	302	ASN	4.3
1	A	64	GLY	4.1
1	A	291	VAL	4.0
1	A	254	LEU	4.0
1	A	208	GLY	3.7
1	A	65	HIS	3.7
1	A	421	HIS	3.7
1	A	606	ARG	3.7
1	A	293	LEU	3.7
1	A	80	GLY	3.7
1	A	292	ASN	3.6
1	A	409	ASN	3.5
1	A	406	ASP	3.3
1	A	420	TYR	3.0
1	A	290	ASN	2.8
1	A	408	ASP	2.5
1	A	298	SER	2.4
1	A	600	LEU	2.3
1	A	607	GLY	2.2
1	A	605	GLU	2.2
1	A	604	ASP	2.2
1	A	288	ASN	2.1
1	A	163	GLY	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 monosaccharides 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(Å^2)	Q<0.9
3	GOL	A	686	6/6	0.71	0.49	63,69,71,74	0
2	MRD	A	678	8/8	0.74	0.29	56,68,77,83	0
3	GOL	A	685	6/6	0.76	0.35	63,72,76,79	0
3	GOL	A	683	6/6	0.80	0.30	39,41,45,46	6
3	GOL	A	679	6/6	0.85	0.17	43,45,49,49	0
3	GOL	A	680	6/6	0.87	0.19	34,36,39,40	6
3	GOL	A	681	6/6	0.92	0.10	46,48,48,49	0
3	GOL	A	682	6/6	0.95	0.10	39,43,46,46	0
3	GOL	A	684	6/6	0.97	0.07	33,35,43,46	6

6.5 Other polymers ⓘ

There are no such residues in this entry.