



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 12:04 PM UTC

PDB ID : 3MDO / pdb_00003mdo
Title : Crystal structure of a Putative phosphoribosylformylglycinamide cyclo-ligase (BDI_2101) from Parabacteroides distasonis ATCC 8503 at 1.91 Å resolution
Authors : Joint Center for Structural Genomics (JCSG)
Deposited on : 2010-03-30
Resolution : 1.91 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
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (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

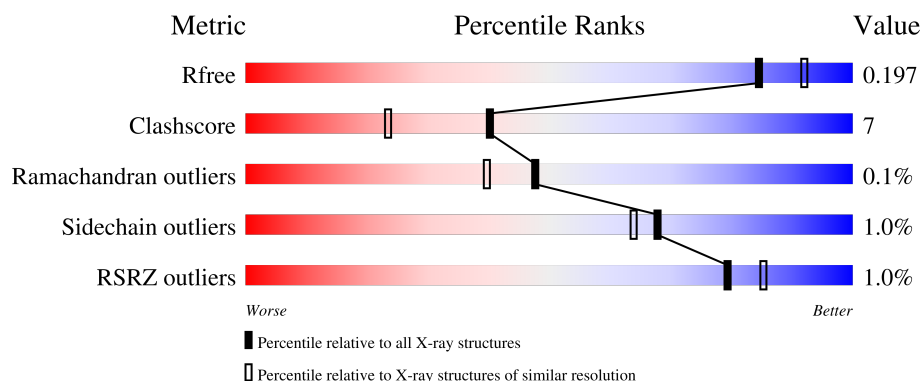
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

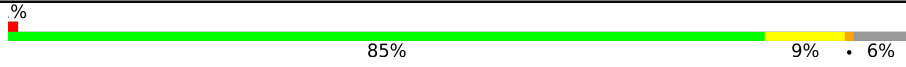
The reported resolution of this entry is 1.91 Å.

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	1188 (1.92-1.92)
Clashscore	190562	1209 (1.92-1.92)
Ramachandran outliers	187476	1195 (1.92-1.92)
Sidechain outliers	187428	1195 (1.92-1.92)
RSRZ outliers	180081	1188 (1.92-1.92)

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	389	
1	B	389	

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	ACT	B	395	-	-	X	-

2 Entry composition

There are 10 unique types of molecules in this entry. The entry contains 6351 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 Putative phosphoribosylformylglycinamide cyclo-ligase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	365	Total	C	N	O	S	Se	0	19	0
			2859	1817	468	554	6	14			
1	B	363	Total	C	N	O	S	Se	0	19	0
			2832	1799	465	548	6	14			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	GLY	-	expression tag	UNP A6LDR8
B	0	GLY	-	expression tag	UNP A6LDR8

- Molecule 2 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	4	Total	Ca	0	0
			4	4		
2	B	3	Total	Ca	0	0
			3	3		

- Molecule 3 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total	Cl	0	0
			2	2		
3	B	2	Total	Cl	0	0
			2	2		

- Molecule 4 is ACETATE ION (CCD ID: ACT) (formula: C₂H₃O₂).



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

- Molecule 5 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: $C_4H_{10}O_3$).



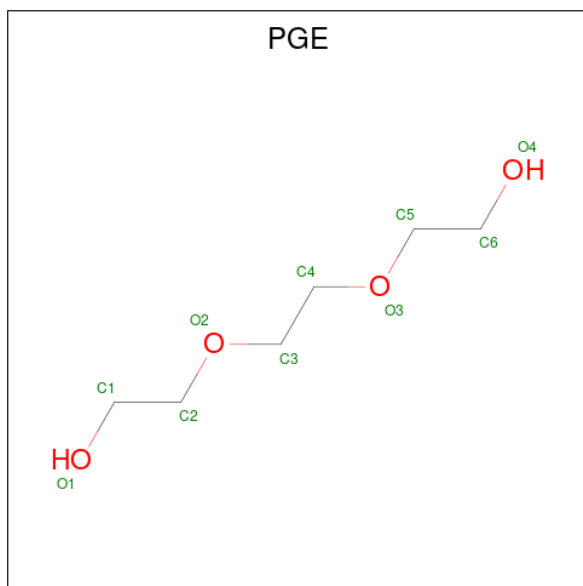
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			7	4	3		
5	A	1	Total	C	O	0	0
			7	4	3		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			7	4	3		
5	A	1	Total	C	O	0	0
			7	4	3		
5	A	1	Total	C	O	0	0
			7	4	3		
5	A	1	Total	C	O	0	0
			7	4	3		
5	B	1	Total	C	O	0	0
			7	4	3		
5	B	1	Total	C	O	0	0
			7	4	3		
5	B	1	Total	C	O	0	0
			7	4	3		
5	B	1	Total	C	O	0	0
			7	4	3		

- Molecule 6 is TRIETHYLENE GLYCOL (CCD ID: PGE) (formula: $C_6H_{14}O_4$).



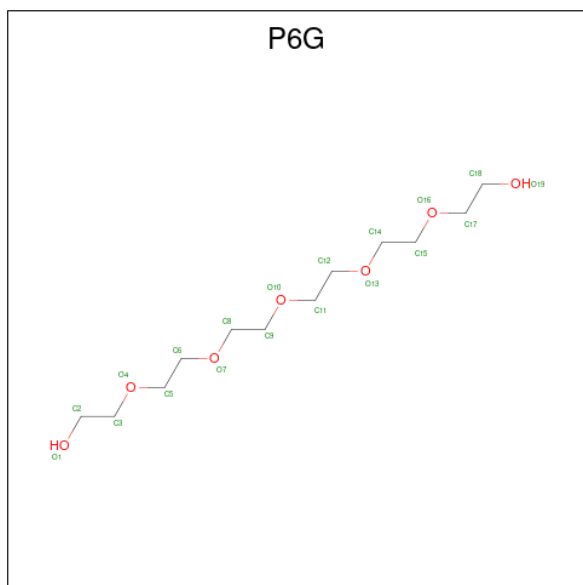
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			10	6	4		
6	A	1	Total	C	O	0	0
			10	6	4		

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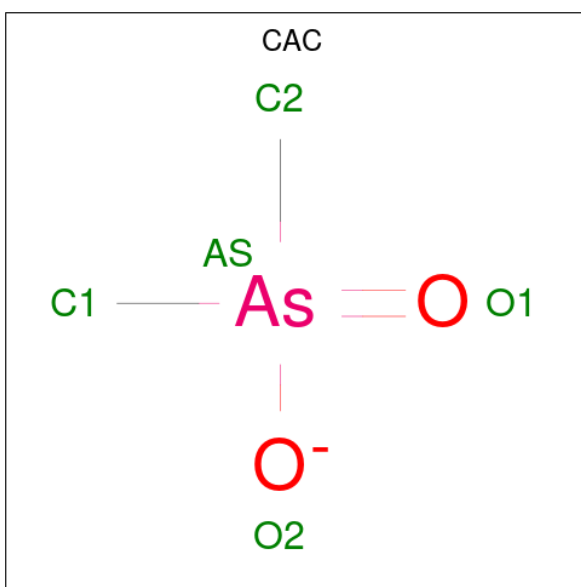
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total	C	O	0	0
			10	6	4		
6	B	1	Total	C	O	0	0
			10	6	4		
6	B	1	Total	C	O	0	0
			10	6	4		

- Molecule 7 is HEXAETHYLENE GLYCOL (CCD ID: P6G) (formula: $C_{12}H_{26}O_7$).



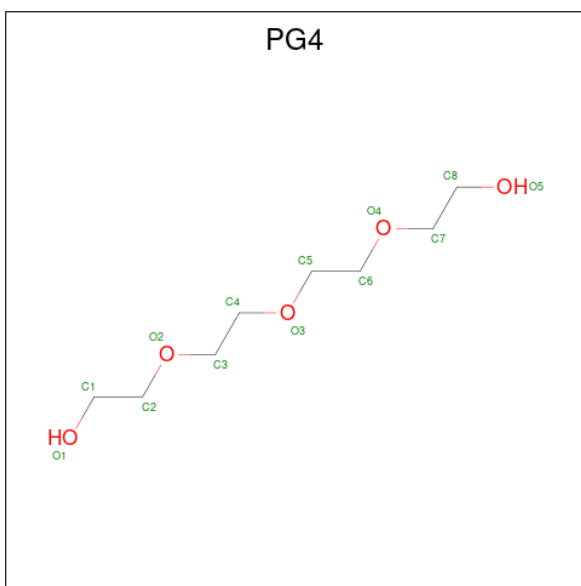
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O	0	0
			19	12	7		

- Molecule 8 is CACODYLATE ION (CCD ID: CAC) (formula: $C_2H_6AsO_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
8	B	1	Total	As	C	O	0	0
			5	1	2	2		

- Molecule 9 is TETRAETHYLENE GLYCOL (CCD ID: PG4) (formula: $C_8H_{18}O_5$).



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

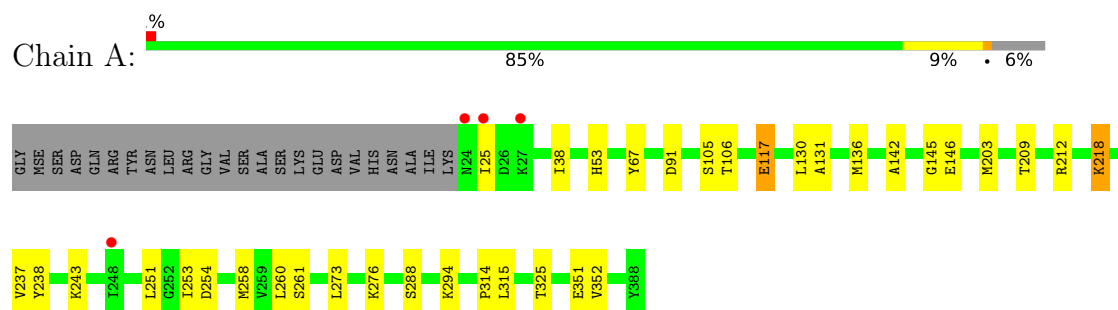
- Molecule 10 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	243	Total 246	O 246	0	3
10	B	216	Total 218	O 218	0	2

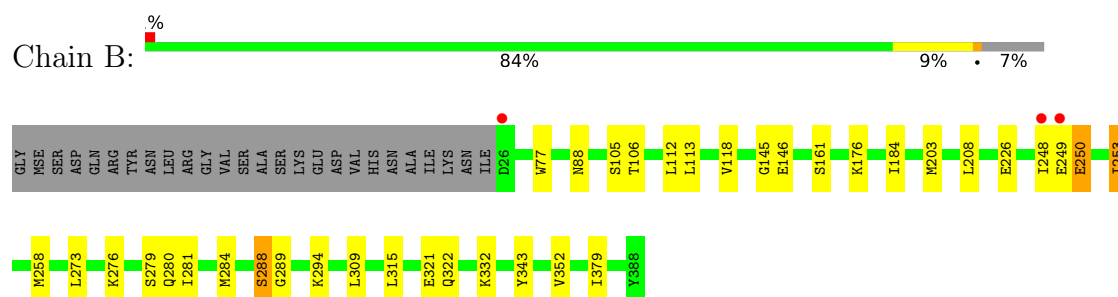
3 Residue-property plots

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: Putative phosphoribosylformylglycinamide cyclo-ligase



- Molecule 1: Putative phosphoribosylformylglycinamide cyclo-ligase



4 Data and refinement statistics

Property	Value	Source
Space group	P 41 21 2	Depositor
Cell constants a, b, c, α , β , γ	99.94Å 99.94Å 163.02Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.62 – 1.91 29.62 – 1.91	Depositor EDS
% Data completeness (in resolution range)	99.8 (29.62-1.91) 99.8 (29.62-1.91)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.63 (at 1.91Å)	Xtriage
Refinement program	REFMAC 5.5.0053, PHENIX	Depositor
R, R_{free}	0.154 , 0.190 0.167 , 0.197	Depositor DCC
R_{free} test set	3265 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	26.2	Xtriage
Anisotropy	0.405	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 44.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	6351	wwPDB-VP
Average B, all atoms (Å ²)	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.57% 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: PEG, P6G, CL, CAC, CA, PGE, ACT, PG4

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	0.88	1/2954 (0.0%)	0.84	2/3968 (0.1%)
1	B	0.85	1/2934 (0.0%)	0.86	10/3942 (0.3%)
All	All	0.86	2/5888 (0.0%)	0.85	12/7910 (0.2%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	284	MSE	SE-CE	-7.92	1.71	1.95
1	A	131	ALA	CA-CB	5.43	1.61	1.53

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	249[A]	GLU	N-CA-C	7.17	119.77	111.02
1	B	249[B]	GLU	N-CA-C	7.17	119.77	111.02
1	A	203[A]	MSE	N-CA-C	-6.94	100.00	110.28
1	A	203[B]	MSE	N-CA-C	-6.94	100.00	110.28
1	B	203[A]	MSE	N-CA-C	5.69	122.92	110.80
1	B	203[B]	MSE	N-CA-C	5.69	122.92	110.80
1	B	288[A]	SER	CB-CA-C	5.61	121.58	110.42
1	B	288[B]	SER	CB-CA-C	5.61	121.58	110.42
1	B	250[A]	GLU	N-CA-C	5.12	121.71	110.80
1	B	250[B]	GLU	N-CA-C	5.12	121.71	110.80
1	B	250[A]	GLU	N-CA-CB	-5.00	102.04	110.49
1	B	250[B]	GLU	N-CA-CB	-5.00	102.04	110.49

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	2859	0	2867	38	0
1	B	2832	0	2827	37	0
2	A	4	0	0	0	0
2	B	3	0	0	0	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
4	A	4	0	3	0	0
4	B	4	0	3	4	0
5	A	42	0	60	2	0
5	B	35	0	50	1	0
6	A	20	0	28	3	0
6	B	30	0	42	5	0
7	A	19	0	26	1	0
8	B	5	0	0	0	0
9	B	26	0	36	0	0
10	A	246	0	0	4	0
10	B	218	0	0	7	0
All	All	6351	0	5942	78	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 (78) 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:253:ILE:HD11	1:A:258[B]:MSE:SE	1.27	1.84
1:A:253:ILE:CD1	1:A:258[B]:MSE:SE	2.21	1.36
1:A:258[B]:MSE:HA	1:A:258[B]:MSE:CE	1.72	1.15
1:B:253:ILE:HD11	1:B:258[B]:MSE:SE	2.00	1.11
1:A:258[B]:MSE:HA	1:A:258[B]:MSE:HE2	1.10	1.09
1:A:253:ILE:HD12	1:A:258[B]:MSE:HE3	1.47	0.97
1:A:253:ILE:CD1	1:A:258[B]:MSE:CE	2.48	0.92
1:B:253:ILE:HD11	1:B:258[B]:MSE:CE	2.03	0.86
1:A:258[B]:MSE:HE2	1:A:258[B]:MSE:CA	2.01	0.86
1:B:253:ILE:HD11	1:B:258[B]:MSE:HE3	1.60	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:253:ILE:CD1	1:A:258[B]:MSE:HE3	2.10	0.81
1:A:253:ILE:HD11	1:A:258[B]:MSE:CE	2.09	0.81
1:B:253:ILE:CD1	1:B:258[B]:MSE:HE3	2.12	0.80
1:B:322:GLN:HE22	6:B:403:PGE:H22	1.49	0.77
1:A:253:ILE:HD11	1:A:258[B]:MSE:CG	2.17	0.75
1:B:258[B]:MSE:HE2	1:B:258[B]:MSE:HA	1.70	0.72
1:A:294:LYS:HZ2	6:A:403:PGE:H22	1.56	0.70
1:A:294:LYS:NZ	6:A:403:PGE:H22	2.08	0.69
1:B:88:ASN:ND2	1:B:161:SER:OG	2.25	0.68
1:A:276:LYS:HE3	1:A:351:GLU:OE1	1.94	0.67
1:A:243:LYS:HZ3	5:A:400:PEG:H31	1.59	0.66
1:B:253:ILE:CD1	1:B:258[B]:MSE:SE	2.89	0.65
1:B:279[A]:SER:OG	1:B:280[A]:GLN:NE2	2.29	0.64
1:A:294:LYS:HZ2	6:A:403:PGE:C2	2.11	0.63
1:B:289[B]:GLY:H	4:B:395:ACT:H3	1.63	0.61
1:B:258[A]:MSE:HG2	1:B:315:LEU:HD13	1.83	0.61
1:B:322:GLN:HE22	6:B:403:PGE:C2	2.13	0.60
1:A:258[B]:MSE:CE	1:A:258[B]:MSE:CA	2.64	0.60
1:A:273[B]:LEU:HD11	1:A:352:VAL:HG22	1.83	0.60
1:B:258[B]:MSE:CE	1:B:258[B]:MSE:HA	2.33	0.58
1:B:288[A]:SER:O	4:B:395:ACT:H3	2.02	0.58
1:B:273[B]:LEU:HG	1:B:281:ILE:HD11	1.85	0.57
1:A:288[B]:SER:O	1:A:288[B]:SER:OG	2.21	0.55
1:A:253:ILE:HG13	1:A:258[B]:MSE:HG2	1.90	0.54
1:A:351:GLU:HG3	10:A:443:HOH:O	2.08	0.52
1:A:243:LYS:NZ	5:A:400:PEG:H31	2.26	0.51
1:B:106[B]:THR:HG23	10:B:415:HOH:O	2.10	0.51
1:A:288[A]:SER:O	10:A:629:HOH:O	2.19	0.49
1:B:253:ILE:HD11	1:B:258[B]:MSE:CG	2.42	0.49
1:A:209:THR:HA	1:A:212[A]:ARG:HH21	1.78	0.49
1:B:294:LYS:HE3	6:B:402:PGE:H3	1.95	0.49
1:A:251:LEU:HD21	1:A:314:PRO:HG2	1.95	0.48
1:A:258[A]:MSE:HG2	1:A:315:LEU:HD13	1.95	0.48
4:B:395:ACT:H1	10:B:522:HOH:O	2.13	0.48
1:A:136[B]:MSE:HB3	1:A:136[B]:MSE:HE2	1.64	0.48
1:B:184:ILE:HG12	1:B:343:TYR:CE2	2.48	0.48
1:B:105:SER:O	1:B:145:GLY:HA3	2.13	0.48
1:B:294:LYS:HZ1	6:B:402:PGE:H3	1.79	0.48
1:B:294:LYS:NZ	6:B:402:PGE:H52	2.29	0.48
1:B:253:ILE:CG1	1:B:258[B]:MSE:HG2	2.44	0.47
1:A:325:THR:OG1	7:A:404:P6G:H22	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:321[A]:GLU:HG3	10:B:577:HOH:O	2.15	0.47
1:B:309:LEU:HD11	1:B:379:ILE:HG23	1.97	0.47
4:B:395:ACT:H1	10:B:616:HOH:O	2.15	0.47
1:A:276:LYS:CE	1:A:351:GLU:OE1	2.62	0.46
1:B:253:ILE:HD12	1:B:258[B]:MSE:HE3	1.92	0.46
1:B:253:ILE:CD1	1:B:258[B]:MSE:CE	2.79	0.45
1:A:25:ILE:HG23	1:A:38:ILE:HG21	1.99	0.45
10:A:423:HOH:O	1:B:112[B]:LEU:HD11	2.16	0.45
1:B:332:LYS:NZ	10:B:615:HOH:O	2.47	0.45
1:B:248:ILE:HG13	1:B:258[A]:MSE:SE	2.67	0.44
1:A:106[B]:THR:HG23	10:B:406:HOH:O	2.18	0.44
1:A:260:LEU:O	1:A:261:SER:C	2.60	0.44
1:B:113:LEU:HD13	1:B:226:GLU:HG3	2.00	0.44
10:A:535:HOH:O	1:B:112[B]:LEU:HD12	2.20	0.42
1:A:130:LEU:CD1	1:A:142:ALA:HB2	2.50	0.42
1:A:67:TYR:OH	1:A:254[B]:ASP:OD2	2.21	0.42
1:B:77:TRP:CD2	1:B:118:VAL:HG13	2.55	0.41
1:A:237:VAL:O	1:A:238:TYR:C	2.63	0.41
1:A:53:HIS:CE1	1:A:91:ASP:OD2	2.73	0.41
1:A:117:GLU:CD	1:A:117:GLU:H	2.29	0.41
1:B:273[B]:LEU:HD11	1:B:352:VAL:HG22	2.03	0.41
1:B:276:LYS:HZ1	5:B:399:PEG:C2	2.34	0.40
1:A:105:SER:O	1:A:145:GLY:HA3	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	382/389 (98%)	368 (96%)	14 (4%)	0	100	100
1	B	380/389 (98%)	362 (95%)	16 (4%)	2 (0%)	24	14

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	762/778 (98%)	730 (96%)	30 (4%)	2 (0%)	48 26

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	250[A]	GLU
1	B	250[B]	GLU

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	312/311 (100%)	307 (98%)	5 (2%)	55 44
1	B	309/311 (99%)	305 (99%)	4 (1%)	61 53
All	All	621/622 (100%)	612 (99%)	9 (1%)	68 50

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

Mol	Chain	Res	Type
1	A	117	GLU
1	A	146[A]	GLU
1	A	146[B]	GLU
1	A	218[A]	LYS
1	A	218[B]	LYS
1	B	146[A]	GLU
1	B	146[B]	GLU
1	B	176	LYS
1	B	253	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	206	ASN
1	A	301	ASN

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Mol	Chain	Res	Type
1	A	348	HIS
1	B	322	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 33 ligands modelled in this entry, 11 are monoatomic - leaving 22 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	$\# Z > 2$
9	PG4	B	405	-	12,12,12	0.46	0	11,11,11	0.31	0
7	P6G	A	404	-	18,18,18	0.46	0	17,17,17	0.49	0
5	PEG	B	400	-	6,6,6	0.40	0	5,5,5	0.57	0
6	PGE	A	403	2	9,9,9	0.62	0	8,8,8	0.44	0
5	PEG	A	400	-	6,6,6	0.37	0	5,5,5	0.41	0
5	PEG	B	398	-	6,6,6	0.50	0	5,5,5	0.48	0
9	PG4	B	404	-	12,12,12	0.49	0	11,11,11	0.40	0
5	PEG	A	398	-	6,6,6	0.30	0	5,5,5	0.79	0
5	PEG	B	397	-	6,6,6	0.55	0	5,5,5	0.46	0
5	PEG	B	399	-	6,6,6	0.41	0	5,5,5	0.38	0
5	PEG	A	396	-	6,6,6	0.38	0	5,5,5	0.46	0
6	PGE	A	402	-	9,9,9	0.40	0	8,8,8	0.45	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	PEG	A	401	-	6,6,6	0.46	0	5,5,5	0.50	0
5	PEG	A	399	-	6,6,6	0.45	0	5,5,5	0.28	0
6	PGE	B	401	-	9,9,9	0.43	0	8,8,8	0.32	0
6	PGE	B	402	-	9,9,9	0.51	0	8,8,8	0.68	0
5	PEG	A	397	-	6,6,6	0.39	0	5,5,5	0.42	0
8	CAC	B	394	2	2,4,4	3.20	2 (100%)	4,6,6	2.18	1 (25%)
4	ACT	A	395	-	3,3,3	0.67	0	3,3,3	1.34	0
6	PGE	B	403	-	9,9,9	0.50	0	8,8,8	0.42	0
4	ACT	B	395	2	3,3,3	0.72	0	3,3,3	1.69	2 (66%)
5	PEG	B	396	-	6,6,6	0.54	0	5,5,5	0.29	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
9	PG4	B	405	-	-	6/10/10/10	-
7	P6G	A	404	-	-	9/16/16/16	-
5	PEG	B	400	-	-	2/4/4/4	-
6	PGE	A	403	2	-	5/7/7/7	-
5	PEG	A	400	-	-	3/4/4/4	-
5	PEG	B	398	-	-	2/4/4/4	-
9	PG4	B	404	-	-	4/10/10/10	-
5	PEG	A	398	-	-	2/4/4/4	-
5	PEG	B	397	-	-	2/4/4/4	-
5	PEG	B	399	-	-	2/4/4/4	-
5	PEG	A	396	-	-	3/4/4/4	-
6	PGE	A	402	-	-	3/7/7/7	-
5	PEG	A	401	-	-	2/4/4/4	-
5	PEG	A	399	-	-	2/4/4/4	-
6	PGE	B	401	-	-	2/7/7/7	-
6	PGE	B	402	-	-	3/7/7/7	-
5	PEG	A	397	-	-	3/4/4/4	-
6	PGE	B	403	-	-	3/7/7/7	-
5	PEG	B	396	-	-	3/4/4/4	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	B	394	CAC	AS-C2	3.32	1.98	1.90
8	B	394	CAC	AS-C1	3.07	1.97	1.90

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	B	394	CAC	O1-AS-C2	-4.28	106.18	111.50
4	B	395	ACT	OXT-C-CH3	2.12	123.93	115.05
4	B	395	ACT	OXT-C-O	-2.01	114.55	122.03

There are no chirality outliers.

All (61) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	B	405	PG4	O3-C5-C6-O4
6	B	401	PGE	O2-C3-C4-O3
5	A	396	PEG	O2-C3-C4-O4
5	A	398	PEG	O1-C1-C2-O2
7	A	404	P6G	O16-C17-C18-O19
9	B	405	PG4	O4-C7-C8-O5
5	B	398	PEG	C1-C2-O2-C3
6	B	403	PGE	O2-C3-C4-O3
5	A	401	PEG	O2-C3-C4-O4
5	B	399	PEG	O1-C1-C2-O2
5	B	399	PEG	O2-C3-C4-O4
5	B	400	PEG	O2-C3-C4-O4
6	A	402	PGE	O3-C5-C6-O4
9	B	405	PG4	O1-C1-C2-O2
6	B	402	PGE	O2-C3-C4-O3
5	A	399	PEG	O1-C1-C2-O2
7	A	404	P6G	O4-C5-C6-O7
9	B	404	PG4	O2-C3-C4-O3
5	A	396	PEG	O1-C1-C2-O2
5	B	396	PEG	O2-C3-C4-O4
5	B	400	PEG	O1-C1-C2-O2
6	A	402	PGE	O1-C1-C2-O2
7	A	404	P6G	O10-C11-C12-O13
5	B	396	PEG	O1-C1-C2-O2
5	B	397	PEG	O1-C1-C2-O2
5	A	397	PEG	O2-C3-C4-O4
5	B	397	PEG	O2-C3-C4-O4
7	A	404	P6G	O1-C2-C3-O4

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Mol	Chain	Res	Type	Atoms
9	B	404	PG4	O3-C5-C6-O4
5	A	400	PEG	C1-C2-O2-C3
6	B	401	PGE	C6-C5-O3-C4
7	A	404	P6G	C6-C5-O4-C3
9	B	405	PG4	C6-C5-O3-C4
9	B	405	PG4	C8-C7-O4-C6
5	A	399	PEG	O2-C3-C4-O4
9	B	404	PG4	C5-C6-O4-C7
5	A	396	PEG	C1-C2-O2-C3
6	A	403	PGE	C3-C4-O3-C5
5	A	401	PEG	O1-C1-C2-O2
6	A	402	PGE	C4-C3-O2-C2
5	A	397	PEG	O1-C1-C2-O2
5	B	398	PEG	O1-C1-C2-O2
6	A	403	PGE	C6-C5-O3-C4
5	A	400	PEG	O1-C1-C2-O2
6	B	402	PGE	C4-C3-O2-C2
5	B	396	PEG	C1-C2-O2-C3
6	A	403	PGE	O3-C5-C6-O4
9	B	404	PG4	O4-C7-C8-O5
6	B	403	PGE	C1-C2-O2-C3
6	A	403	PGE	O1-C1-C2-O2
7	A	404	P6G	C8-C9-O10-C11
6	B	402	PGE	C1-C2-O2-C3
5	A	400	PEG	O2-C3-C4-O4
7	A	404	P6G	C11-C12-O13-C14
6	B	403	PGE	C4-C3-O2-C2
7	A	404	P6G	C18-C17-O16-C15
5	A	397	PEG	C4-C3-O2-C2
6	A	403	PGE	O2-C3-C4-O3
7	A	404	P6G	O13-C14-C15-O16
5	A	398	PEG	C4-C3-O2-C2
9	B	405	PG4	C4-C3-O2-C2

There are no ring outliers.

7 monomers are involved in 16 short contacts:

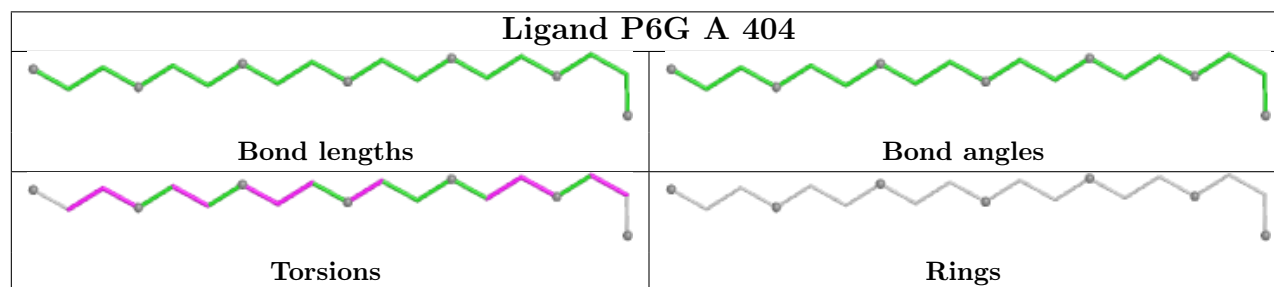
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	404	P6G	1	0
6	A	403	PGE	3	0
5	A	400	PEG	2	0
5	B	399	PEG	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	402	PGE	3	0
6	B	403	PGE	2	0
4	B	395	ACT	4	0

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 than 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.



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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	353/389 (90%)	-0.38	4 (1%) 78 84	13, 24, 37, 68	16 (4%)
1	B	351/389 (90%)	-0.28	3 (0%) 81 86	13, 25, 36, 59	15 (4%)
All	All	704/778 (90%)	-0.33	7 (0%) 79 85	13, 24, 37, 68	31 (4%)

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	25	ILE	3.9
1	A	248	ILE	3.2
1	B	26	ASP	3.0
1	A	27	LYS	3.0
1	B	248	ILE	2.5
1	B	249[A]	GLU	2.4
1	A	24	ASN	2.4

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](#)

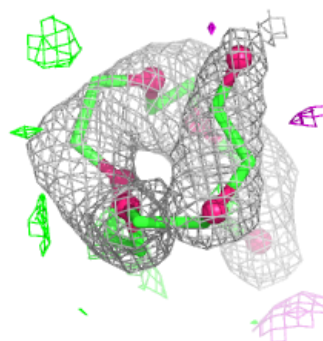
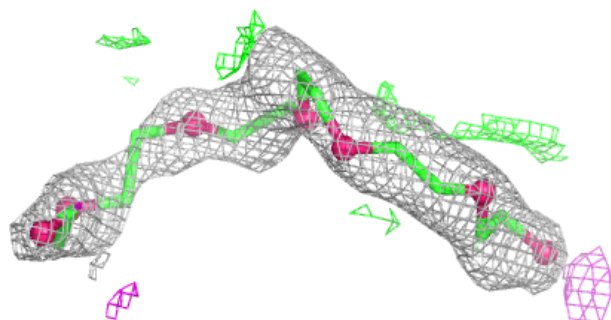
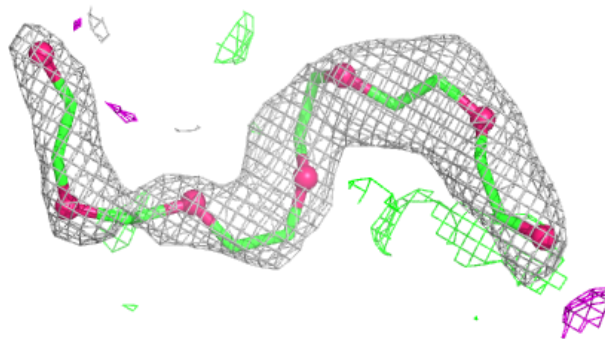
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q < 0.9’ lists 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
5	PEG	A	401	7/7	0.73	0.23	47,53,59,62	7
5	PEG	B	399	7/7	0.75	0.19	49,54,60,63	7
6	PGE	A	403	10/10	0.75	0.17	57,61,66,67	0
5	PEG	B	397	7/7	0.76	0.21	46,49,61,66	7
5	PEG	B	396	7/7	0.78	0.20	46,51,56,56	7
9	PG4	B	405	13/13	0.79	0.23	56,61,64,64	13
5	PEG	B	400	7/7	0.81	0.22	50,52,57,57	7
5	PEG	A	399	7/7	0.81	0.17	58,66,70,72	0
5	PEG	A	400	7/7	0.81	0.15	45,47,55,59	7
9	PG4	B	404	13/13	0.82	0.19	53,62,70,70	13
5	PEG	B	398	7/7	0.82	0.15	69,71,74,74	0
6	PGE	B	402	10/10	0.83	0.15	54,65,72,73	0
6	PGE	B	403	10/10	0.83	0.16	49,59,65,74	0
6	PGE	A	402	10/10	0.83	0.14	61,67,72,72	0
4	ACT	B	395	4/4	0.83	0.16	63,64,65,65	0
2	CA	B	391	1/1	0.86	0.12	85,85,85,85	0
5	PEG	A	396	7/7	0.87	0.13	58,60,66,68	0
7	P6G	A	404	19/19	0.87	0.15	37,57,79,80	0
6	PGE	B	401	10/10	0.88	0.14	45,59,71,75	0
5	PEG	A	398	7/7	0.88	0.16	29,36,42,44	7
5	PEG	A	397	7/7	0.89	0.17	23,35,44,52	7
4	ACT	A	395	4/4	0.90	0.12	51,53,54,55	0
2	CA	A	391	1/1	0.91	0.08	51,51,51,51	0
2	CA	A	390	1/1	0.93	0.08	66,66,66,66	0
2	CA	A	392	1/1	0.95	0.08	60,60,60,60	0
3	CL	B	392	1/1	0.96	0.11	41,41,41,41	0
8	CAC	B	394	5/5	0.97	0.12	20,28,33,37	5
3	CL	B	393	1/1	0.97	0.09	37,37,37,37	0
3	CL	A	393	1/1	0.97	0.07	38,38,38,38	0
2	CA	B	389	1/1	0.98	0.07	50,50,50,50	0
3	CL	A	394	1/1	0.98	0.11	37,37,37,37	0
2	CA	B	390	1/1	0.99	0.02	32,32,32,32	0
2	CA	A	389	1/1	0.99	0.03	31,31,31,31	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 P6G A 404:

$2mF_o-DF_c$ (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.