



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 28, 2024 – 02:53 pm BST

PDB ID : 2BO6
Title : DISSECTION OF MANNOSYLGLYCERATE SYNTHASE: AN ARCHETYPAL MANNOSYLTRANSFERASE
Authors : Flint, J.; Taylor, E.; Yang, M.; Bolam, D.N.; Tailford, L.E.; Martinez-Fleites, C.; Dodson, E.J.; Davis, B.G.; Gilbert, H.J.; Davies, G.J.
Deposited on : 2005-04-08
Resolution : 2.45 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 : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.36.2
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

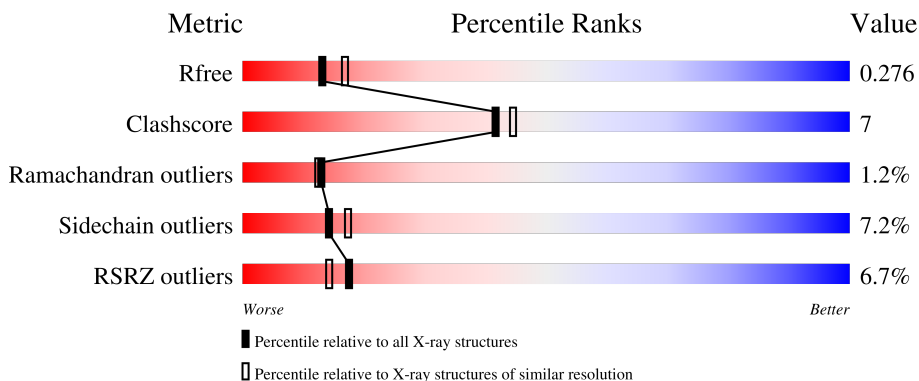
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.45 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}	130704	1544 (2.48-2.44)
Clashscore	141614	1613 (2.48-2.44)
Ramachandran outliers	138981	1598 (2.48-2.44)
Sidechain outliers	138945	1598 (2.48-2.44)
RSRZ outliers	127900	1523 (2.48-2.44)

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	397	 6% 73% 20% . .
1	B	397	 7% 76% 17% . .

2 Entry composition [i](#)

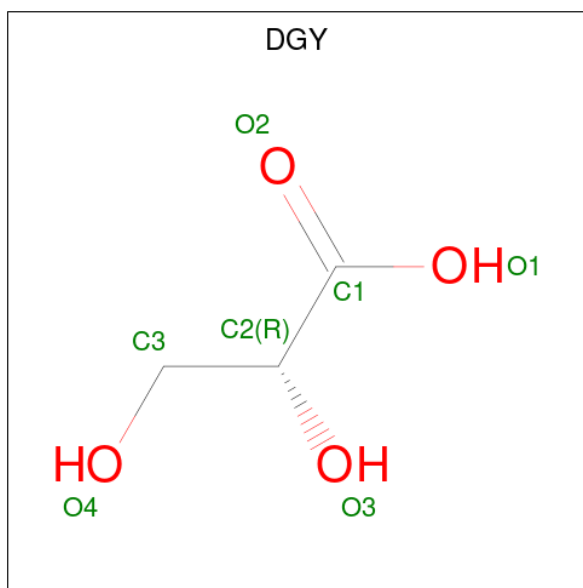
There are 4 unique types of molecules in this entry. The entry contains 6392 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 MANNOSYLGLYCERATE SYNTHASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	381	Total 3138	C 2006	N 558	O 559	S 15	0	0	1
1	B	381	Total 3138	C 2006	N 558	O 559	S 15	0	0	1

- Molecule 2 is (2R)-2,3-DIHYDROXYPROPANOIC ACID (three-letter code: DGY) (formula: C₃H₆O₄).



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

- Molecule 3 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Mn 1 1	0	0
3	B	1	Total Mn 1 1	0	0

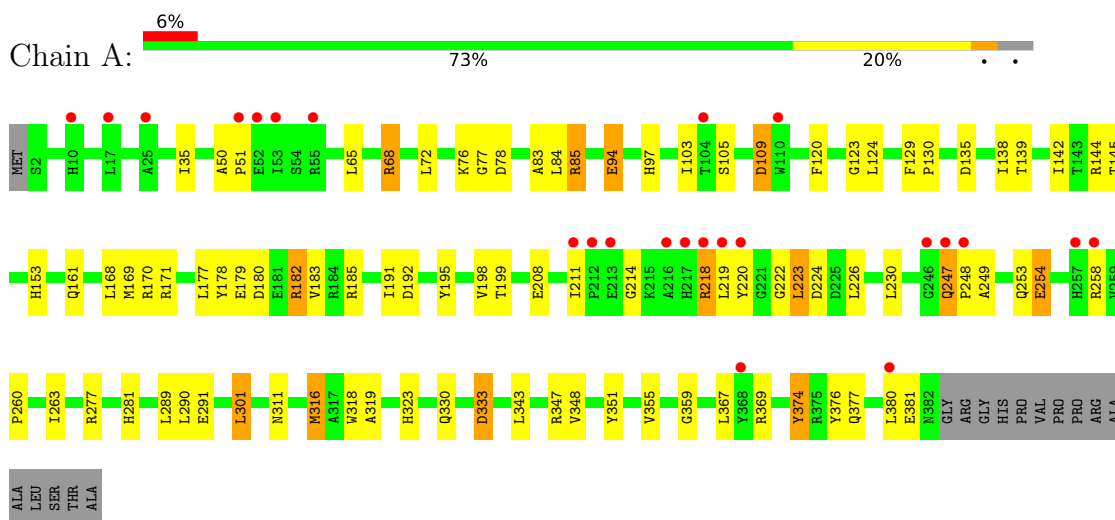
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	47	Total O 47 47	0	0
4	B	53	Total O 53 53	0	0

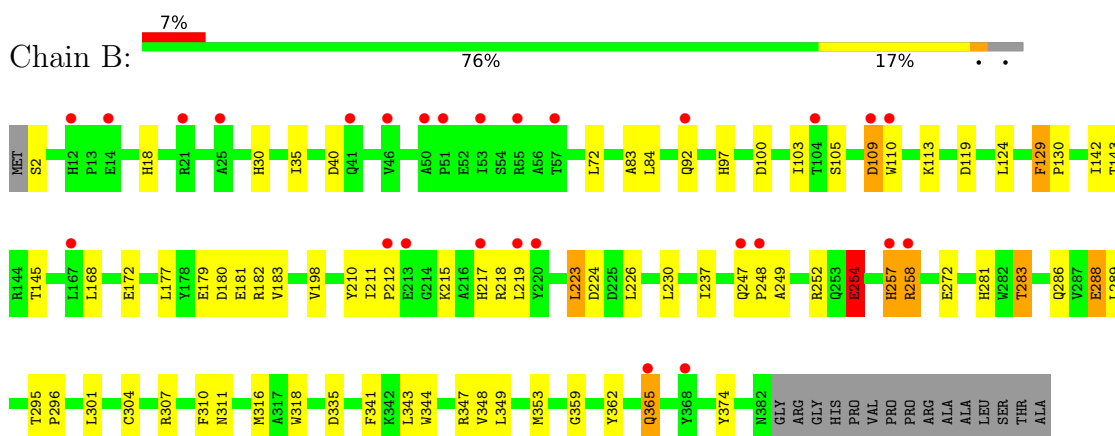
3 Residue-property plots [i](#)

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: MANNOSYLGLYCERATE SYNTHASE



• Molecule 1: MANNOSYLGLYCERATE SYNTHASE



4 Data and refinement statistics

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α , β , γ	150.23Å 150.23Å 154.28Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	36.99 – 2.45 36.98 – 2.45	Depositor EDS
% Data completeness (in resolution range)	98.6 (36.99-2.45) 98.6 (36.98-2.45)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.21 (at 2.45Å)	Xtrriage
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.253 , 0.277 0.255 , 0.276	Depositor DCC
R_{free} test set	3694 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	58.6	Xtrriage
Anisotropy	0.067	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 41.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.017 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	6392	wwPDB-VP
Average B, all atoms (Å ²)	30.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.74% 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 [i](#)

5.1 Standard geometry [i](#)

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

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	0.87	5/3229 (0.2%)	0.87	9/4394 (0.2%)
1	B	0.83	7/3229 (0.2%)	0.81	4/4394 (0.1%)
All	All	0.85	12/6458 (0.2%)	0.84	13/8788 (0.1%)

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	254	GLU	CD-OE1	14.99	1.42	1.25
1	B	254	GLU	CG-CD	10.56	1.67	1.51
1	B	288	GLU	CD-OE2	10.11	1.36	1.25
1	A	333	ASP	CG-OD2	9.76	1.47	1.25
1	A	359	GLY	C-O	6.39	1.33	1.23
1	B	311	ASN	CB-CG	6.17	1.65	1.51
1	B	359	GLY	C-O	5.58	1.32	1.23
1	B	254	GLU	CD-OE1	5.37	1.31	1.25
1	A	316	MET	SD-CE	5.29	2.07	1.77
1	B	365	GLN	CG-CD	5.13	1.62	1.51
1	B	181	GLU	CD-OE1	5.03	1.31	1.25
1	A	374	TYR	CD2-CE2	5.03	1.46	1.39

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	333	ASP	CB-CG-OD1	-12.38	107.16	118.30
1	A	333	ASP	CB-CG-OD2	9.16	126.55	118.30
1	A	182	ARG	NE-CZ-NH1	7.84	124.22	120.30
1	A	144	ARG	NE-CZ-NH1	7.42	124.01	120.30
1	B	224	ASP	CB-CG-OD2	7.20	124.78	118.30
1	A	68	ARG	NE-CZ-NH2	6.31	123.46	120.30
1	B	119	ASP	CB-CG-OD2	6.29	123.96	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	40	ASP	CB-CG-OD2	6.04	123.74	118.30
1	A	135	ASP	CB-CG-OD2	5.98	123.68	118.30
1	B	109	ASP	CB-CG-OD2	5.89	123.60	118.30
1	A	109	ASP	CB-CG-OD2	5.70	123.43	118.30
1	A	218	ARG	NE-CZ-NH1	5.22	122.91	120.30
1	A	78	ASP	CB-CG-OD2	5.16	122.94	118.30

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	3138	0	3037	50	1
1	B	3138	0	3037	38	1
2	A	7	0	5	0	0
2	B	7	0	5	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	47	0	0	1	0
4	B	53	0	0	1	0
All	All	6392	0	6084	86	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 7.

All (86) 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:316:MET:CE	1:A:316:MET:SD	2.07	1.43
1:A:85:ARG:NH1	1:A:85:ARG:HG2	1.55	1.05
1:A:85:ARG:HH11	1:A:85:ARG:CG	1.70	1.03
1:A:85:ARG:HG2	1:A:85:ARG:HH11	0.79	0.96
1:A:94:GLU:HA	1:A:94:GLU:OE1	1.68	0.93
1:A:94:GLU:OE1	1:A:94:GLU:CA	2.35	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:143:THR:HA	1:B:237:ILE:HD11	1.71	0.73
1:A:145:THR:HG23	1:A:374:TYR:CE1	2.27	0.70
1:B:283:THR:HG21	1:B:335:ASP:OD2	1.91	0.70
1:A:319:ALA:HB2	1:A:374:TYR:CE2	2.27	0.69
1:B:316:MET:HA	1:B:316:MET:CE	2.25	0.67
1:A:316:MET:HA	1:A:316:MET:HE3	1.77	0.65
1:A:316:MET:CE	1:A:316:MET:HA	2.29	0.63
1:B:110:TRP:CE2	1:B:211:ILE:HD13	2.34	0.62
1:A:76:LYS:NZ	1:A:192:ASP:OD2	2.34	0.60
1:B:180:ASP:HB3	1:B:183:VAL:HG13	1.83	0.60
1:A:222:GLY:O	1:A:224:ASP:N	2.36	0.59
1:B:142:ILE:HD11	1:B:230:LEU:CD1	2.33	0.58
1:B:362:TYR:O	1:B:365:GLN:NE2	2.37	0.58
1:B:223:LEU:HD21	1:B:348:VAL:HG11	1.84	0.58
1:A:85:ARG:HD3	1:A:178:TYR:OH	2.04	0.57
1:B:316:MET:HA	1:B:316:MET:HE2	1.87	0.57
1:A:208:GLU:HB2	1:A:253:GLN:HB3	1.88	0.56
1:A:177:LEU:CD2	1:A:198:VAL:CG2	2.84	0.56
1:B:18:HIS:NE2	4:B:2002:HOH:O	2.33	0.56
1:A:311:ASN:HD21	1:B:272:GLU:HB3	1.72	0.55
1:B:129:PHE:CE1	1:B:211:ILE:HD12	2.42	0.55
1:A:77:GLY:HA2	1:A:191:ILE:HD13	1.89	0.54
1:B:142:ILE:CD1	1:B:230:LEU:CD1	2.86	0.54
1:A:223:LEU:HD21	1:A:348:VAL:HG11	1.91	0.53
1:B:35:ILE:HD12	1:B:83:ALA:HB2	1.91	0.52
1:B:318:TRP:HB2	1:B:347:ARG:HD3	1.90	0.52
1:A:247:GLN:N	1:A:248:PRO:CD	2.73	0.51
1:A:123:GLY:HA2	1:A:170:ARG:HG3	1.92	0.51
1:B:362:TYR:CG	1:B:365:GLN:NE2	2.79	0.51
1:A:129:PHE:CE1	1:A:211:ILE:HD12	2.47	0.50
1:B:180:ASP:OD1	1:B:182:ARG:HD3	2.11	0.49
1:B:177:LEU:HD23	1:B:198:VAL:CG2	2.42	0.49
1:A:177:LEU:HD23	1:A:198:VAL:CG2	2.42	0.49
1:A:351:TYR:OH	1:A:367:LEU:HD11	2.12	0.48
1:A:195:TYR:O	1:A:199:THR:HG23	2.13	0.48
1:B:113:LYS:NZ	1:B:210:TYR:O	2.43	0.48
1:A:142:ILE:CD1	1:A:230:LEU:CD1	2.92	0.48
1:A:319:ALA:HB2	1:A:374:TYR:HE2	1.78	0.48
1:B:145:THR:HG23	1:B:374:TYR:CE1	2.49	0.48
1:A:218:ARG:NH1	1:A:219:LEU:O	2.47	0.47
1:B:2:SER:N	1:B:30:HIS:HB2	2.29	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:230:LEU:HD22	1:B:344:TRP:CE3	2.50	0.46
1:A:77:GLY:HA2	1:A:191:ILE:CD1	2.45	0.46
1:A:318:TRP:HB2	1:A:347:ARG:HD3	1.98	0.46
1:A:290:LEU:HD21	1:A:301:LEU:HD12	1.98	0.46
1:B:247:GLN:N	1:B:248:PRO:CD	2.79	0.46
1:A:145:THR:HG23	1:A:374:TYR:CD1	2.50	0.46
1:A:153:HIS:HB3	1:A:247:GLN:NE2	2.31	0.45
1:B:129:PHE:HE1	1:B:211:ILE:HD12	1.81	0.45
1:A:323:HIS:HB3	4:A:2042:HOH:O	2.15	0.45
1:A:351:TYR:O	1:A:355:VAL:HB	2.17	0.44
1:A:222:GLY:C	1:A:224:ASP:N	2.71	0.44
1:B:210:TYR:HB3	1:B:254:GLU:OE2	2.17	0.44
1:B:349:LEU:O	1:B:353:MET:HG2	2.18	0.44
1:A:311:ASN:HD21	1:B:272:GLU:CB	2.30	0.44
1:A:220:TYR:CD2	1:A:220:TYR:O	2.71	0.44
1:B:304:CYS:HA	1:B:307:ARG:O	2.19	0.43
1:B:283:THR:HG22	1:B:286:GLN:H	1.84	0.43
1:B:295:THR:HB	1:B:296:PRO:HD3	2.00	0.43
1:B:142:ILE:HD13	1:B:230:LEU:HD12	2.00	0.43
1:A:97:HIS:CE1	1:A:168:LEU:HD12	2.55	0.42
1:A:180:ASP:OD1	1:A:182:ARG:HD3	2.20	0.42
1:B:210:TYR:N	1:B:254:GLU:OE2	2.52	0.42
1:A:129:PHE:HB3	1:A:130:PRO:HD2	2.02	0.42
1:A:277:ARG:CZ	1:A:281:HIS:HD2	2.33	0.42
1:A:50:ALA:N	1:A:51:PRO:CD	2.82	0.42
1:A:377:GLN:O	1:A:381:GLU:HG2	2.20	0.41
1:A:138:ILE:O	1:A:139:THR:C	2.57	0.41
1:A:180:ASP:HB3	1:A:183:VAL:HG13	2.03	0.41
1:A:35:ILE:HD12	1:A:83:ALA:HB2	2.03	0.41
1:B:257:HIS:HD2	1:B:258:ARG:H	1.69	0.41
1:B:97:HIS:NE2	1:B:168:LEU:HD12	2.36	0.41
1:B:129:PHE:HB3	1:B:130:PRO:HD2	2.02	0.41
1:A:103:ILE:HG13	1:A:103:ILE:O	2.21	0.41
1:B:177:LEU:CD2	1:B:198:VAL:CG2	2.99	0.41
1:A:376:TYR:CZ	1:A:380:LEU:HD11	2.56	0.40
1:B:230:LEU:HD21	1:B:341:PHE:HA	2.03	0.40
1:A:260:PRO:HD2	1:A:263:ILE:HD12	2.04	0.40
1:A:330:GLN:OE1	1:A:333:ASP:OD2	2.38	0.40
1:B:129:PHE:CB	1:B:130:PRO:HD2	2.51	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:A:330:GLN:OE1	1:B:288:GLU:OE2[2_664]	2.17	0.03

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	379/397 (96%)	357 (94%)	18 (5%)	4 (1%)	14	14
1	B	379/397 (96%)	360 (95%)	14 (4%)	5 (1%)	12	11
All	All	758/794 (96%)	717 (95%)	32 (4%)	9 (1%)	13	12

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	223	LEU
1	A	120	PHE
1	A	249	ALA
1	B	249	ALA
1	B	217	HIS
1	B	310	PHE
1	A	214	GLY
1	B	103	ILE
1	B	212	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	326/338 (96%)	303 (93%)	23 (7%)	14	17
1	B	326/338 (96%)	302 (93%)	24 (7%)	13	16
All	All	652/676 (96%)	605 (93%)	47 (7%)	14	17

All (47) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	65	LEU
1	A	68	ARG
1	A	72	LEU
1	A	84	LEU
1	A	85	ARG
1	A	94	GLU
1	A	105	SER
1	A	109	ASP
1	A	124	LEU
1	A	161	GLN
1	A	169	MET
1	A	171	ARG
1	A	179	GLU
1	A	185	ARG
1	A	226	LEU
1	A	247	GLN
1	A	254	GLU
1	A	258	ARG
1	A	289	LEU
1	A	291	GLU
1	A	301	LEU
1	A	343	LEU
1	A	369	ARG
1	B	72	LEU
1	B	84	LEU
1	B	92	GLN
1	B	100	ASP
1	B	105	SER
1	B	109	ASP
1	B	124	LEU
1	B	129	PHE
1	B	172	GLU
1	B	179	GLU
1	B	215	LYS
1	B	218	ARG

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Mol	Chain	Res	Type
1	B	219	LEU
1	B	223	LEU
1	B	226	LEU
1	B	252	ARG
1	B	254	GLU
1	B	257	HIS
1	B	258	ARG
1	B	281	HIS
1	B	283	THR
1	B	289	LEU
1	B	301	LEU
1	B	343	LEU

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	10	HIS
1	A	81	ASN
1	A	217	HIS
1	A	247	GLN
1	A	281	HIS
1	A	311	ASN
1	B	10	HIS
1	B	81	ASN
1	B	202	GLN
1	B	253	GLN
1	B	257	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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 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
2	DGY	B	1382	-	6,6,6	0.96	0	6,7,7	2.18	2 (33%)
2	DGY	A	1382	-	6,6,6	0.95	0	6,7,7	2.52	2 (33%)

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
2	DGY	B	1382	-	-	2/6/6/6	-
2	DGY	A	1382	-	-	3/6/6/6	-

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1382	DGY	O1-C1-C2	4.34	122.26	112.72
2	B	1382	DGY	O1-C1-C2	4.13	121.79	112.72
2	A	1382	DGY	O2-C1-C2	-3.72	115.27	122.54
2	B	1382	DGY	O2-C1-C2	-2.27	118.10	122.54

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1382	DGY	O3-C2-C3-O4
2	B	1382	DGY	O3-C2-C3-O4
2	A	1382	DGY	O1-C1-C2-O3
2	A	1382	DGY	O2-C1-C2-O3

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Mol	Chain	Res	Type	Atoms
2	B	1382	DGY	O1-C1-C2-O3

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	381/397 (95%)	0.15	24 (6%) 20 16	27, 29, 32, 36	0
1	B	381/397 (95%)	0.29	27 (7%) 16 12	27, 30, 32, 36	0
All	All	762/794 (95%)	0.22	51 (6%) 17 14	27, 29, 32, 36	0

All (51) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	21	ARG	5.8
1	A	219	LEU	5.5
1	B	247	GLN	5.4
1	B	219	LEU	5.2
1	B	57	THR	5.2
1	A	220	TYR	5.0
1	B	220	TYR	5.0
1	A	247	GLN	4.9
1	B	258	ARG	4.2
1	B	257	HIS	4.2
1	A	217	HIS	4.2
1	B	217	HIS	3.9
1	B	368	TYR	3.7
1	A	257	HIS	3.5
1	A	110	TRP	3.5
1	B	46	VAL	3.4
1	A	213	GLU	3.1
1	B	53	ILE	3.1
1	A	248	PRO	3.0
1	B	55	ARG	3.0
1	B	109	ASP	3.0
1	B	167	LEU	2.9
1	A	218	ARG	2.8
1	A	55	ARG	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	380	LEU	2.7
1	B	213	GLU	2.7
1	B	12	HIS	2.6
1	A	216	ALA	2.6
1	A	211	ILE	2.6
1	B	104	THR	2.6
1	A	51	PRO	2.5
1	A	212	PRO	2.5
1	A	25	ALA	2.4
1	A	368	TYR	2.4
1	A	53	ILE	2.4
1	B	248	PRO	2.4
1	B	212	PRO	2.3
1	A	104	THR	2.3
1	A	258	ARG	2.3
1	B	92	GLN	2.2
1	B	365	GLN	2.2
1	B	110	TRP	2.2
1	B	51	PRO	2.2
1	B	41	GLN	2.1
1	B	50	ALA	2.1
1	A	10	HIS	2.1
1	A	17	LEU	2.1
1	A	52	GLU	2.1
1	A	246	GLY	2.1
1	B	25	ALA	2.0
1	B	14	GLU	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 monosaccharides 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(\AA^2)	Q<0.9
2	DGY	A	1382	7/7	0.89	0.17	34,36,38,41	0
2	DGY	B	1382	7/7	0.92	0.21	28,30,32,33	0
3	MN	A	1383	1/1	0.95	0.20	47,47,47,47	0
3	MN	B	1383	1/1	0.95	0.26	50,50,50,50	0

6.5 Other polymers [i](#)

There are no such residues in this entry.