



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 02:40 PM GMT

PDB ID : 4A5P
Title : Structure of the Shigella flexneri MxiA protein
Authors : Abrusci, P.; Vegara-Irigaray, M.; Johnson, S.; Roversi, P.; Friede, M.E.; Deane, J.E.; Tang, C.M.; Lea, S.M.
Deposited on : 2011-10-26
Resolution : 3.15 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

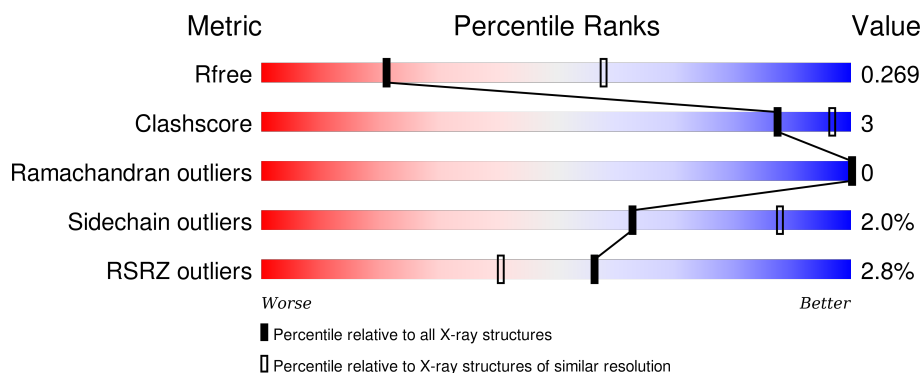
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.15 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}	91344	1112 (3.20-3.12)
Clashscore	102246	1249 (3.20-3.12)
Ramachandran outliers	100387	1222 (3.20-3.12)
Sidechain outliers	100360	1221 (3.20-3.12)
RSRZ outliers	91569	1117 (3.20-3.12)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	383	<div> <div>2%</div> <div>71% 6% 23%</div> </div>
1	B	383	<div> <div>2%</div> <div>73% 6% 20%</div> </div>
1	C	383	<div> <div>2%</div> <div>72% 6% 22%</div> </div>

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
2	EDO	A	1687	-	-	-	X

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 7421 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 PROTEIN MXIA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	295	Total	C	N	O	S	0	0	0
			2429	1559	413	449	8			
1	B	305	Total	C	N	O	S	0	1	0
			2517	1621	424	464	8			
1	C	297	Total	C	N	O	S	0	0	0
			2451	1578	412	453	8			

There are 42 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	304	MET	-	EXPRESSION TAG	UNP P0A1I5
A	305	GLY	-	EXPRESSION TAG	UNP P0A1I5
A	306	SER	-	EXPRESSION TAG	UNP P0A1I5
A	307	SER	-	EXPRESSION TAG	UNP P0A1I5
A	308	HIS	-	EXPRESSION TAG	UNP P0A1I5
A	309	HIS	-	EXPRESSION TAG	UNP P0A1I5
A	310	HIS	-	EXPRESSION TAG	UNP P0A1I5
A	311	HIS	-	EXPRESSION TAG	UNP P0A1I5
A	312	HIS	-	EXPRESSION TAG	UNP P0A1I5
A	313	HIS	-	EXPRESSION TAG	UNP P0A1I5
A	314	SER	-	EXPRESSION TAG	UNP P0A1I5
A	315	GLN	-	EXPRESSION TAG	UNP P0A1I5
A	316	ASP	-	EXPRESSION TAG	UNP P0A1I5
A	317	PRO	-	EXPRESSION TAG	UNP P0A1I5
B	304	MET	-	EXPRESSION TAG	UNP P0A1I5
B	305	GLY	-	EXPRESSION TAG	UNP P0A1I5
B	306	SER	-	EXPRESSION TAG	UNP P0A1I5
B	307	SER	-	EXPRESSION TAG	UNP P0A1I5
B	308	HIS	-	EXPRESSION TAG	UNP P0A1I5
B	309	HIS	-	EXPRESSION TAG	UNP P0A1I5
B	310	HIS	-	EXPRESSION TAG	UNP P0A1I5
B	311	HIS	-	EXPRESSION TAG	UNP P0A1I5
B	312	HIS	-	EXPRESSION TAG	UNP P0A1I5

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Chain	Residue	Modelled	Actual	Comment	Reference
B	313	HIS	-	EXPRESSION TAG	UNP P0A1I5
B	314	SER	-	EXPRESSION TAG	UNP P0A1I5
B	315	GLN	-	EXPRESSION TAG	UNP P0A1I5
B	316	ASP	-	EXPRESSION TAG	UNP P0A1I5
B	317	PRO	-	EXPRESSION TAG	UNP P0A1I5
C	304	MET	-	EXPRESSION TAG	UNP P0A1I5
C	305	GLY	-	EXPRESSION TAG	UNP P0A1I5
C	306	SER	-	EXPRESSION TAG	UNP P0A1I5
C	307	SER	-	EXPRESSION TAG	UNP P0A1I5
C	308	HIS	-	EXPRESSION TAG	UNP P0A1I5
C	309	HIS	-	EXPRESSION TAG	UNP P0A1I5
C	310	HIS	-	EXPRESSION TAG	UNP P0A1I5
C	311	HIS	-	EXPRESSION TAG	UNP P0A1I5
C	312	HIS	-	EXPRESSION TAG	UNP P0A1I5
C	313	HIS	-	EXPRESSION TAG	UNP P0A1I5
C	314	SER	-	EXPRESSION TAG	UNP P0A1I5
C	315	GLN	-	EXPRESSION TAG	UNP P0A1I5
C	316	ASP	-	EXPRESSION TAG	UNP P0A1I5
C	317	PRO	-	EXPRESSION TAG	UNP P0A1I5

- Molecule 2 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



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

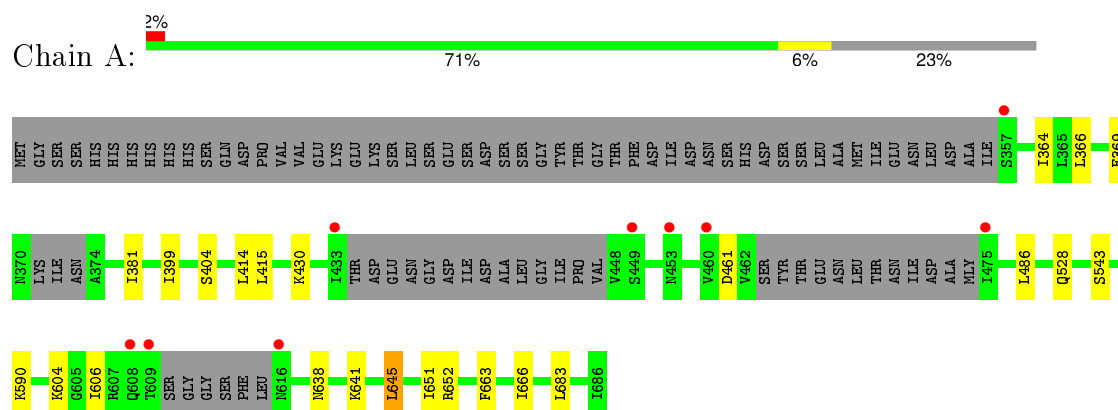
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	5	Total 5	O 5	0	0
3	B	8	Total 8	O 8	0	0
3	C	3	Total 3	O 3	0	0

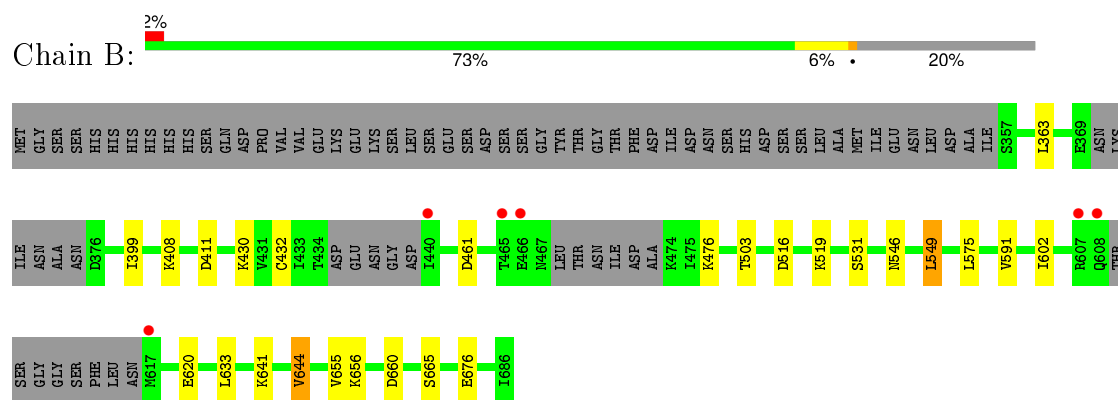
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

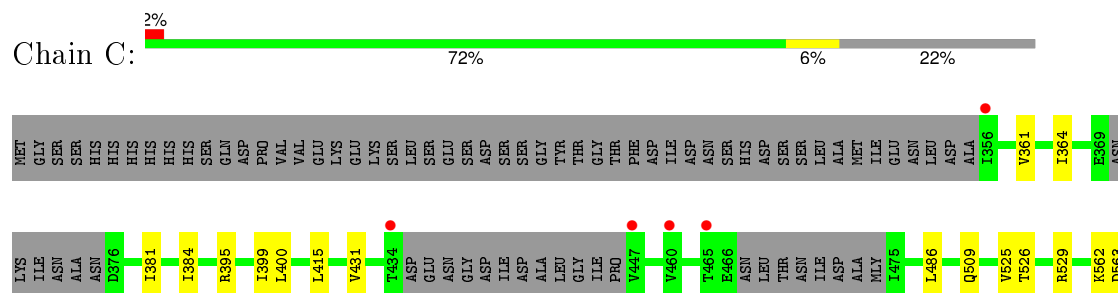
• Molecule 1: PROTEIN MXIA

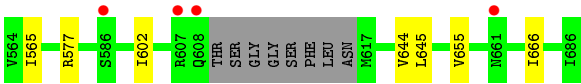


• Molecule 1: PROTEIN MXIA



• Molecule 1: PROTEIN MXIA





4 Data and refinement statistics

Property	Value	Source
Space group	P 63	Depositor
Cell constants a, b, c, α , β , γ	160.61Å 160.61Å 100.49Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	35.72 – 3.15 34.07 – 3.15	Depositor EDS
% Data completeness (in resolution range)	93.4 (35.72-3.15) 93.9 (34.07-3.15)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.17 (at 3.18Å)	Xtriage
Refinement program	BUSTER 2.11.2	Depositor
R, R_{free}	0.231 , 0.251 0.245 , 0.269	Depositor DCC
R_{free} test set	1226 reflections (5.40%)	DCC
Wilson B-factor (Å ²)	70.8	Xtriage
Anisotropy	0.226	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 49.3	EDS
Estimated twinning fraction	0.046 for h,-h-k,-l	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	0 of 23949 reflections	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	7421	wwPDB-VP
Average B, all atoms (Å ²)	76.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.23% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: MLY, EDO

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	0.42	0/2328	0.54	0/3153
1	B	0.42	0/2410	0.54	0/3268
1	C	0.42	0/2349	0.53	0/3182
All	All	0.42	0/7087	0.54	0/9603

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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	2429	0	2497	12	0
1	B	2517	0	2599	13	0
1	C	2451	0	2525	14	0
2	A	4	0	6	1	0
2	B	4	0	6	1	0
3	A	5	0	0	0	0
3	B	8	0	0	0	0
3	C	3	0	0	0	0
All	All	7421	0	7633	39	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 3.

All (39) 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:B:516:ASP:HA	1:B:519:MLY:HD3	1.77	0.66
1:B:641:MLY:HH13	1:B:641:MLY:HG3	1.83	0.61
1:A:604:MLY:HH22	1:A:604:MLY:HA	1.83	0.59
1:C:562:MLY:HH22	1:C:563:ASP:HA	1.87	0.55
1:C:562:MLY:HE2	1:C:563:ASP:HA	1.89	0.55
1:B:503:THR:HG21	1:B:531:SER:HA	1.88	0.55
1:A:430:MLY:HD2	1:A:461:ASP:HA	1.88	0.55
1:A:641:MLY:HE2	1:A:641:MLY:HA	1.88	0.54
1:C:395:ARG:HH22	1:C:509:GLN:HE22	1.55	0.54
1:B:575:LEU:HD23	2:B:1687:EDO:H22	1.93	0.50
1:B:656:MLY:HE2	1:B:660:ASP:HB3	1.92	0.50
1:A:543:SER:HB3	2:A:1687:EDO:H12	1.94	0.49
1:A:366:LEU:HD22	1:A:404:SER:HB2	1.96	0.47
1:C:526:THR:H	1:C:529:ARG:HD2	1.79	0.46
1:B:430:MLY:HG3	1:B:461:ASP:HA	1.97	0.46
1:C:361:VAL:HG23	1:C:364:ILE:HD11	1.98	0.46
1:C:529:ARG:NH2	1:C:562:MLY:HH12	2.32	0.46
1:C:602:ILE:HD13	1:C:655:VAL:HG22	1.98	0.46
1:B:591:VAL:HG12	1:B:644:VAL:HG12	1.98	0.45
1:C:645:LEU:HB2	1:C:666:ILE:HD11	1.98	0.45
1:B:363:LEU:HB3	1:B:399:ILE:HG23	1.99	0.45
1:A:381:ILE:HG23	1:A:399:ILE:HD12	1.99	0.44
1:A:645:LEU:HB2	1:A:666:ILE:HD11	2.00	0.43
1:C:381:ILE:HG23	1:C:399:ILE:HD12	1.99	0.43
1:A:364:ILE:HB	1:A:415:LEU:HB2	1.99	0.43
1:B:432:CYS:HB2	1:B:476:MLY:HB2	2.00	0.43
1:A:590:MLY:HB2	1:A:683:LEU:HD11	2.01	0.43
1:B:363:LEU:HD22	1:B:399:ILE:HG12	2.00	0.43
1:A:606:ILE:HD11	1:A:651:ILE:HG22	2.01	0.42
1:C:525:VAL:HG12	1:C:529:ARG:HD3	2.00	0.42
1:B:546:ASN:HD21	1:B:549:LEU:HD13	1.83	0.41
1:C:384:ILE:HG21	1:C:486:LEU:HD23	2.01	0.41
1:B:602:ILE:HD13	1:B:655:VAL:HG22	2.01	0.41
1:C:565:ILE:H	1:C:565:ILE:HG13	1.76	0.41
1:B:408:MLY:HH22	1:B:408:MLY:HD3	1.93	0.41
1:C:364:ILE:HG12	1:C:400:LEU:HD23	2.02	0.40
1:A:414:LEU:HD13	1:A:486:LEU:HD11	2.02	0.40
1:A:604:MLY:HE3	1:A:604:MLY:HB3	1.78	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:364:ILE:HB	1:C:415:LEU:HB2	2.03	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	273/383 (71%)	268 (98%)	5 (2%)	0	100	100
1	B	284/383 (74%)	278 (98%)	6 (2%)	0	100	100
1	C	275/383 (72%)	269 (98%)	6 (2%)	0	100	100
All	All	832/1149 (72%)	815 (98%)	17 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	261/337 (77%)	255 (98%)	6 (2%)	58	86
1	B	270/337 (80%)	263 (97%)	7 (3%)	54	85
1	C	264/337 (78%)	261 (99%)	3 (1%)	80	93
All	All	795/1011 (79%)	779 (98%)	16 (2%)	63	88

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	369	GLU
1	A	528	GLN
1	A	638	ASN
1	A	645	LEU
1	A	652	ARG
1	A	663	PHE
1	B	411	ASP
1	B	549	LEU
1	B	620	GLU
1	B	633	LEU
1	B	644	VAL
1	B	665	SER
1	B	676	GLU
1	C	431	VAL
1	C	577	ARG
1	C	644	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	541	ASN
1	A	638	ASN
1	B	488	GLN
1	B	535	GLN
1	B	541	ASN
1	B	546	ASN
1	C	509	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

37 non-standard protein/DNA/RNA residues 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
1	MLY	A	408	1	9,10,11	0.50	0	9,11,13	1.20	1 (11%)
1	MLY	A	430	1	9,10,11	0.55	0	9,11,13	1.08	0
1	MLY	A	476	1	7,8,11	0.48	0	6,8,13	1.14	1 (16%)
1	MLY	A	519	1	9,10,11	0.45	0	9,11,13	1.32	1 (11%)
1	MLY	A	562	1	9,10,11	0.51	0	9,11,13	1.30	1 (11%)
1	MLY	A	590	1	9,10,11	0.47	0	9,11,13	1.30	1 (11%)
1	MLY	A	604	1	9,10,11	0.57	0	9,11,13	1.16	1 (11%)
1	MLY	A	640	1	9,10,11	0.95	1 (11%)	9,11,13	1.06	0
1	MLY	A	641	1	9,10,11	0.71	0	9,11,13	1.11	0
1	MLY	A	656	1	9,10,11	0.55	0	9,11,13	1.17	1 (11%)
1	MLY	A	664	1	9,10,11	0.45	0	9,11,13	1.34	1 (11%)
1	MLY	A	684	1	9,10,11	0.48	0	9,11,13	1.24	1 (11%)
1	MLY	B	408	1	9,10,11	0.56	0	9,11,13	1.00	1 (11%)
1	MLY	B	430	1	9,10,11	0.49	0	9,11,13	1.28	1 (11%)
1	MLY	B	474	1	9,10,11	0.49	0	9,11,13	1.29	1 (11%)
1	MLY	B	476	1	9,10,11	0.44	0	9,11,13	1.26	1 (11%)
1	MLY	B	519	1	9,10,11	0.49	0	9,11,13	1.27	1 (11%)
1	MLY	B	562	1	9,10,11	0.96	1 (11%)	9,11,13	1.13	1 (11%)
1	MLY	B	590	1	9,10,11	0.45	0	9,11,13	1.26	1 (11%)
1	MLY	B	604	1	9,10,11	0.57	0	9,11,13	1.41	2 (22%)
1	MLY	B	640	1	9,10,11	0.47	0	9,11,13	1.23	0
1	MLY	B	641	1	9,10,11	0.75	0	9,11,13	0.94	1 (11%)
1	MLY	B	656	1	9,10,11	0.62	0	9,11,13	1.25	1 (11%)
1	MLY	B	664	1	9,10,11	0.68	0	9,11,13	1.47	2 (22%)
1	MLY	B	684	1	9,10,11	0.48	0	9,11,13	1.23	1 (11%)
1	MLY	C	408	1	9,10,11	0.56	0	9,11,13	1.15	1 (11%)
1	MLY	C	430	1	9,10,11	0.70	0	9,11,13	0.92	1 (11%)
1	MLY	C	476	1	9,10,11	0.59	0	9,11,13	0.95	1 (11%)
1	MLY	C	519	1	9,10,11	0.55	0	9,11,13	1.36	1 (11%)
1	MLY	C	562	1	9,10,11	1.18	1 (11%)	9,11,13	1.50	1 (11%)
1	MLY	C	590	1	9,10,11	0.49	0	9,11,13	1.53	2 (22%)
1	MLY	C	604	1	9,10,11	0.75	0	9,11,13	1.86	4 (44%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	MLY	C	640	1	9,10,11	0.45	0	9,11,13	1.46	1 (11%)
1	MLY	C	641	1	9,10,11	0.57	0	9,11,13	1.25	1 (11%)
1	MLY	C	656	1	9,10,11	0.47	0	9,11,13	1.32	1 (11%)
1	MLY	C	664	1	9,10,11	0.44	0	9,11,13	1.34	1 (11%)
1	MLY	C	684	1	9,10,11	0.67	0	9,11,13	1.09	1 (11%)

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
1	MLY	A	408	1	-	0/7/9/11	0/0/0/0
1	MLY	A	430	1	-	0/7/9/11	0/0/0/0
1	MLY	A	476	1	-	0/5/7/11	0/0/0/0
1	MLY	A	519	1	-	0/7/9/11	0/0/0/0
1	MLY	A	562	1	-	0/7/9/11	0/0/0/0
1	MLY	A	590	1	-	0/7/9/11	0/0/0/0
1	MLY	A	604	1	-	0/7/9/11	0/0/0/0
1	MLY	A	640	1	-	0/7/9/11	0/0/0/0
1	MLY	A	641	1	-	0/7/9/11	0/0/0/0
1	MLY	A	656	1	-	0/7/9/11	0/0/0/0
1	MLY	A	664	1	-	0/7/9/11	0/0/0/0
1	MLY	A	684	1	-	0/7/9/11	0/0/0/0
1	MLY	B	408	1	-	0/7/9/11	0/0/0/0
1	MLY	B	430	1	-	0/7/9/11	0/0/0/0
1	MLY	B	474	1	-	0/7/9/11	0/0/0/0
1	MLY	B	476	1	-	0/7/9/11	0/0/0/0
1	MLY	B	519	1	-	0/7/9/11	0/0/0/0
1	MLY	B	562	1	-	0/7/9/11	0/0/0/0
1	MLY	B	590	1	-	0/7/9/11	0/0/0/0
1	MLY	B	604	1	-	0/7/9/11	0/0/0/0
1	MLY	B	640	1	-	0/7/9/11	0/0/0/0
1	MLY	B	641	1	-	0/7/9/11	0/0/0/0
1	MLY	B	656	1	-	0/7/9/11	0/0/0/0
1	MLY	B	664	1	-	0/7/9/11	0/0/0/0
1	MLY	B	684	1	-	0/7/9/11	0/0/0/0
1	MLY	C	408	1	-	0/7/9/11	0/0/0/0
1	MLY	C	430	1	-	0/7/9/11	0/0/0/0
1	MLY	C	476	1	-	0/7/9/11	0/0/0/0
1	MLY	C	519	1	-	0/7/9/11	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	MLY	C	562	1	-	0/7/9/11	0/0/0/0
1	MLY	C	590	1	-	0/7/9/11	0/0/0/0
1	MLY	C	604	1	-	0/7/9/11	0/0/0/0
1	MLY	C	640	1	-	0/7/9/11	0/0/0/0
1	MLY	C	641	1	-	0/7/9/11	0/0/0/0
1	MLY	C	656	1	-	0/7/9/11	0/0/0/0
1	MLY	C	664	1	-	0/7/9/11	0/0/0/0
1	MLY	C	684	1	-	0/7/9/11	0/0/0/0

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	640	MLY	CB-CA	2.17	1.55	1.53
1	B	562	MLY	CB-CA	2.28	1.55	1.53
1	C	562	MLY	CB-CA	2.86	1.56	1.53

All (39) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	604	MLY	CH1-NZ-CE	-2.67	100.17	110.79
1	C	604	MLY	CH2-NZ-CH1	-2.63	102.68	109.72
1	B	664	MLY	O-C-CA	-2.59	118.74	125.49
1	C	664	MLY	O-C-CA	-2.50	118.99	125.49
1	A	664	MLY	O-C-CA	-2.49	119.00	125.49
1	A	656	MLY	O-C-CA	-2.47	119.04	125.49
1	A	562	MLY	O-C-CA	-2.46	119.09	125.49
1	C	562	MLY	O-C-CA	-2.46	119.09	125.49
1	C	641	MLY	O-C-CA	-2.40	119.24	125.49
1	C	604	MLY	O-C-CA	-2.39	119.25	125.49
1	B	656	MLY	O-C-CA	-2.39	119.27	125.49
1	C	656	MLY	O-C-CA	-2.37	119.31	125.49
1	A	519	MLY	O-C-CA	-2.37	119.32	125.49
1	B	519	MLY	O-C-CA	-2.36	119.33	125.49
1	B	604	MLY	O-C-CA	-2.34	119.39	125.49
1	C	408	MLY	O-C-CA	-2.33	119.43	125.49
1	C	640	MLY	CD-CE-NZ	-2.32	107.94	113.92
1	C	519	MLY	O-C-CA	-2.32	119.46	125.49
1	B	664	MLY	CH2-NZ-CH1	-2.31	103.56	109.72
1	A	590	MLY	O-C-CA	-2.24	119.67	125.49
1	A	604	MLY	O-C-CA	-2.22	119.72	125.49
1	B	476	MLY	O-C-CA	-2.21	119.72	125.49
1	C	604	MLY	CG-CB-CA	-2.21	104.88	114.16

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	476	MLY	O-C-CA	-2.20	119.76	125.49
1	B	641	MLY	O-C-CA	-2.19	119.78	125.49
1	B	590	MLY	O-C-CA	-2.18	119.81	125.49
1	C	476	MLY	O-C-CA	-2.18	119.82	125.49
1	B	430	MLY	O-C-CA	-2.15	119.89	125.49
1	B	408	MLY	O-C-CA	-2.14	119.92	125.49
1	A	408	MLY	O-C-CA	-2.08	120.08	125.49
1	A	684	MLY	O-C-CA	-2.07	120.11	125.49
1	C	590	MLY	O-C-CA	-2.06	120.12	125.49
1	C	684	MLY	O-C-CA	-2.06	120.13	125.49
1	B	474	MLY	O-C-CA	-2.05	120.14	125.49
1	B	562	MLY	O-C-CA	-2.04	120.18	125.49
1	B	684	MLY	O-C-CA	-2.01	120.26	125.49
1	C	430	MLY	O-C-CA	-2.00	120.27	125.49
1	B	604	MLY	CB-CA-N	2.24	116.90	110.52
1	C	590	MLY	CB-CA-N	2.79	118.45	110.52

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

11 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	430	MLY	1	0
1	A	590	MLY	1	0
1	A	604	MLY	2	0
1	A	641	MLY	1	0
1	B	408	MLY	1	0
1	B	430	MLY	1	0
1	B	476	MLY	1	0
1	B	519	MLY	1	0
1	B	641	MLY	1	0
1	B	656	MLY	1	0
1	C	562	MLY	3	0

5.5 Carbohydrates

There are no carbohydrates in this entry.

5.6 Ligand geometry

2 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	$\# Z > 2$
2	EDO	A	1687	-	3,3,3	0.57	0	2,2,2	0.37	0
2	EDO	B	1687	-	3,3,3	0.57	0	2,2,2	0.41	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
2	EDO	A	1687	-	-	0/1/1/1	0/0/0/0
2	EDO	B	1687	-	-	0/1/1/1	0/0/0/0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1687	EDO	1	0
2	B	1687	EDO	1	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(Å ²)	Q<0.9
1	A	283/383 (73%)	-0.05	9 (3%) 51 34	46, 70, 136, 157	0
1	B	292/383 (76%)	-0.06	6 (2%) 67 50	44, 69, 107, 119	0
1	C	285/383 (74%)	-0.02	9 (3%) 51 34	42, 71, 110, 132	0
All	All	860/1149 (74%)	-0.04	24 (2%) 56 40	42, 70, 113, 157	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	609	THR	5.0
1	A	616	ASN	4.0
1	B	440	ILE	3.8
1	C	460	VAL	3.6
1	C	586	SER	3.3
1	A	475	ILE	3.2
1	C	447	VAL	3.2
1	C	607	ARG	3.1
1	A	433	ILE	3.0
1	C	608	GLN	2.9
1	B	607	ARG	2.7
1	C	465	THR	2.6
1	C	661	ASN	2.6
1	B	608	GLN	2.6
1	C	434	THR	2.5
1	A	608	GLN	2.5
1	B	466	GLU	2.4
1	A	453	ASN	2.3
1	B	617	MET	2.3
1	A	357	SER	2.3
1	A	460	VAL	2.3
1	C	356	ILE	2.2
1	B	465	THR	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	449	SER	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
1	MLY	B	656	11/12	0.95	0.17	-	67,70,74,75	0
1	MLY	C	684	11/12	0.88	0.23	-	70,72,79,82	0
1	MLY	B	476	11/12	0.90	0.24	-	82,83,83,84	0
1	MLY	A	640	11/12	0.64	0.59	-	104,108,115,118	0
1	MLY	A	562	11/12	0.83	0.47	-	67,70,75,76	0
1	MLY	C	562	11/12	0.80	0.52	-	69,72,75,75	0
1	MLY	C	656	11/12	0.91	0.19	-	68,71,75,75	0
1	MLY	C	408	11/12	0.83	0.37	-	89,93,103,104	0
1	MLY	C	476	11/12	0.76	0.55	-	87,89,91,91	0
1	MLY	A	656	11/12	0.93	0.20	-	69,72,77,78	0
1	MLY	B	430	11/12	0.89	0.34	-	79,80,83,83	0
1	MLY	B	640	11/12	0.72	0.46	-	98,101,107,110	0
1	MLY	C	640	11/12	0.82	0.44	-	100,104,108,108	0
1	MLY	A	408	11/12	0.85	0.46	-	91,94,104,107	0
1	MLY	A	590	11/12	0.87	0.34	-	64,67,78,79	0
1	MLY	C	590	11/12	0.91	0.29	-	69,73,83,86	0
1	MLY	B	641	11/12	0.69	0.43	-	88,90,97,98	0
1	MLY	A	604	11/12	0.85	0.38	-	86,92,94,94	0
1	MLY	B	519	11/12	0.87	0.34	-	56,61,69,69	0
1	MLY	B	604	11/12	0.87	0.38	-	77,83,87,88	0
1	MLY	B	684	11/12	0.88	0.33	-	75,77,81,83	0
1	MLY	C	430	11/12	0.87	0.36	-	105,109,115,115	0
1	MLY	B	474	11/12	0.51	0.65	-	92,93,98,98	0
1	MLY	C	604	11/12	0.84	0.36	-	87,95,101,103	0
1	MLY	A	519	11/12	0.86	0.29	-	55,60,66,69	0
1	MLY	C	519	11/12	0.87	0.27	-	57,63,71,73	0
1	MLY	C	641	11/12	0.76	0.42	-	94,96,104,107	0
1	MLY	A	684	11/12	0.87	0.38	-	72,75,86,86	0
1	MLY	A	664	11/12	0.88	0.27	-	83,87,94,98	0
1	MLY	B	562	11/12	0.64	0.61	-	68,73,81,82	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
1	MLY	A	476	9/12	0.82	0.34	-	80,81,82,83	0
1	MLY	B	664	11/12	0.90	0.18	-	84,88,93,96	0
1	MLY	B	590	11/12	0.93	0.25	-	64,66,76,79	0
1	MLY	B	408	11/12	0.88	0.48	-	88,91,98,99	0
1	MLY	A	430	11/12	0.89	0.35	-	100,101,104,105	0
1	MLY	C	664	11/12	0.87	0.24	-	81,84,87,90	0
1	MLY	A	641	11/12	0.69	0.43	-	95,98,103,106	0

6.3 Carbohydrates [i](#)

There are no carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(\AA^2)	Q<0.9
2	EDO	A	1687	4/4	0.91	0.29	2.47	67,67,67,67	0
2	EDO	B	1687	4/4	0.90	0.23	1.73	68,69,69,69	0

6.5 Other polymers [i](#)

There are no such residues in this entry.