WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Mar 10, 2024 – 09:20 AM EDT

PDB ID	:	4L08
Title	:	Crystal structure of the maleamate amidase Ami(C149A) in complex with maleate from Pseudomonas putida S16
Authors	:	Chen, D.D.; Lu, Y.; Zhang, Z.; Wu, G.; Xu, P.
Deposited on	:	2013-05-31
Resolution	:	2.66 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
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

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 2.66 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.
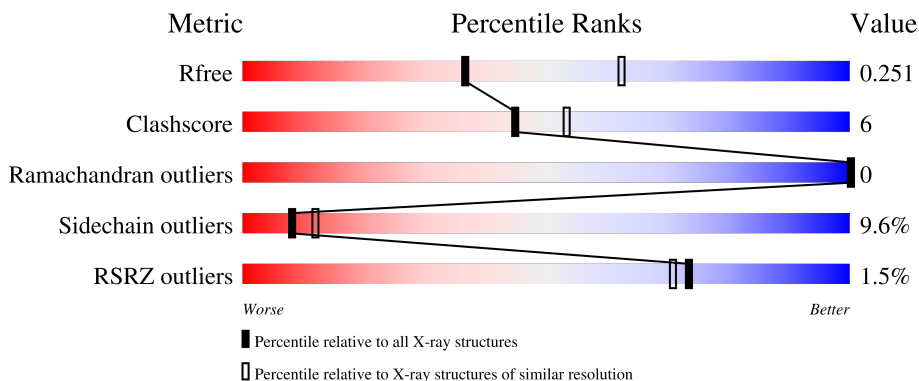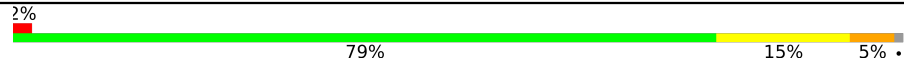

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1332 (2.68-2.64)
Clashscore	141614	1374 (2.68-2.64)
Ramachandran outliers	138981	1349 (2.68-2.64)
Sidechain outliers	138945	1349 (2.68-2.64)
RSRZ outliers	127900	1318 (2.68-2.64)

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	208	84% ... 12% ..
1	B	208	83% ... 12% ..
1	C	208	2% / 82% ... 13% ..
1	D	208	2% / 81% ... 15% ..
1	E	208	2% / 80% ... 15% ..

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Mol	Chain	Length	Quality of chain
1	F	208	2% 79% 15% 5%
1	G	208	% 81% 14%
1	H	208	% 81% 13%

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 12324 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.
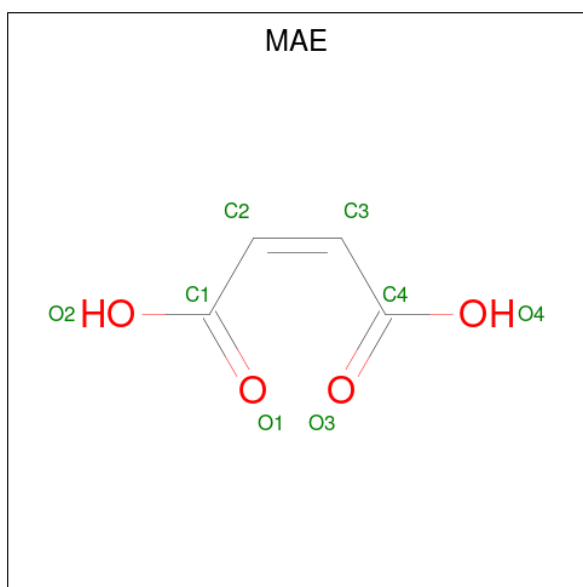
- Molecule 1 is a protein called Hydrolase, isochorismatase family.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	206	Total	C	N	O	S	0	0	0
			1533	972	254	300	7			
1	A	206	Total	C	N	O	S	0	0	0
			1532	971	254	300	7			
1	C	206	Total	C	N	O	S	0	0	0
			1529	970	254	298	7			
1	D	206	Total	C	N	O	S	0	0	0
			1533	972	254	300	7			
1	E	206	Total	C	N	O	S	0	0	0
			1530	971	253	299	7			
1	F	206	Total	C	N	O	S	0	0	0
			1534	973	254	300	7			
1	G	206	Total	C	N	O	S	0	0	0
			1532	971	254	300	7			
1	H	206	Total	C	N	O	S	0	0	0
			1532	971	254	300	7			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	149	ALA	CYS	engineered mutation	UNP F8G0M0
A	149	ALA	CYS	engineered mutation	UNP F8G0M0
C	149	ALA	CYS	engineered mutation	UNP F8G0M0
D	149	ALA	CYS	engineered mutation	UNP F8G0M0
E	149	ALA	CYS	engineered mutation	UNP F8G0M0
F	149	ALA	CYS	engineered mutation	UNP F8G0M0
G	149	ALA	CYS	engineered mutation	UNP F8G0M0
H	149	ALA	CYS	engineered mutation	UNP F8G0M0

- Molecule 2 is MALEIC ACID (three-letter code: MAE) (formula: $C_4H_4O_4$).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total 8	C 4	O 4	0	0
2	A	1	Total 8	C 4	O 4	0	0
2	C	1	Total 8	C 4	O 4	0	0
2	D	1	Total 8	C 4	O 4	0	0
2	E	1	Total 8	C 4	O 4	0	0
2	F	1	Total 8	C 4	O 4	0	0
2	G	1	Total 8	C 4	O 4	0	0
2	H	1	Total 8	C 4	O 4	0	0

- Molecule 3 is water.

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

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: Hydrolase, isochorismatase family

Chain B:
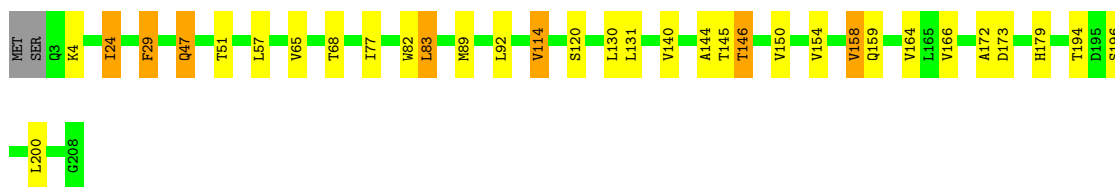
• Molecule 1: Hydrolase, isochorismatase family

Chain A:
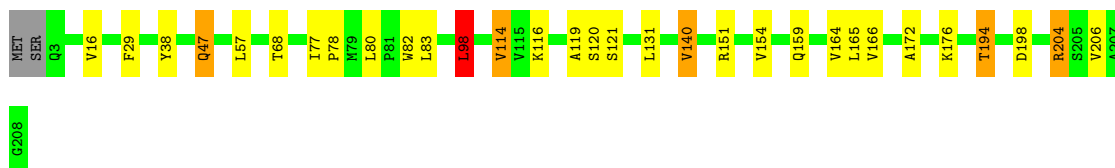
• Molecule 1: Hydrolase, isochorismatase family

Chain C:

• Molecule 1: Hydrolase, isochorismatase family

Chain D:

K176 H179 Q188 L200 K201 W202 V206 A207 G208

- Molecule 1: Hydrolase, isochorismatase family

Chain E:

2%
80% 15%

MET SER Q3 K4 V16 I24 V27 D28 F29 Y38 Q47 R50 L57 T68 A71 I77 P78 L83 L92 L93 L98 V99 I107 Q108 P109 V114 V115 K116 A119 S120 S121 F122 F123 G124 S125 T126 L130 L131 V140 V141 T142

V154 V158 Q159 K163 V164 L165 V166 D169 A172 W202 V206 A207 G208

- Molecule 1: Hydrolase, isochorismatase family

Chain F:

2%
79% 15% 5%

MET SER Q3 Y7 F12 V16 I24 D35 L36 Q37 D43 Q47 T51 L57 T68 I77 W82 L83 A90 A91 L92 L93 Q108 P109 V114 V115 K116 S121 F122 F123 G124 S125 L130 V140 T146 V150 R151 V154 V155

D156 A157 V158 Q159 V164 L165 V166 P167 C171 A172 D173 H179 Q187 Q188 T194 D197 L200 K201 G208

- Molecule 1: Hydrolase, isochorismatase family

Chain G:

%
81% 14%

MET SER Q3 K4 V16 I24 V27 D28 F29 Q47 L57 T68 I77 P78 L83 S87 L92 L98 I107 V114 V115 K116 A119 S120 S121 F122 S128 S129 L130 L131 V140 T146 V150 R151 D156 A157 V158 Q159 S160 K163

V166 C171 A172 H179 K189 Y190 W202 V206 A207 G208

- Molecule 1: Hydrolase, isochorismatase family

Chain H:

%
81% 13%

MET SER Q3 V16 I24 I25 F29 Y38 P39 Q47 L57 I77 W82 L83 A91 L92 L93 L98 K116 A119 S120 S121 G124 S125 T126 L127 L130 L131 V140 T146 V150 V154 V158 Q159 P167 A172 D173 K176

H179 E180 G191 T194 D195 L200 V206 A207 G208

4 Data and refinement statistics (i)

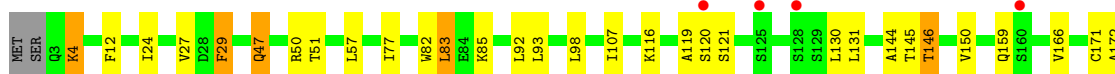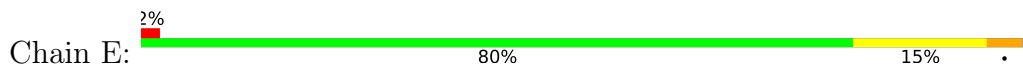| Property	Value	Source
Space group	P 2 21 21	Depositor
Cell constants a, b, c, α, β, γ	74.45Å 167.04Å 175.02Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.66 46.98 – 2.66	Depositor EDS
% Data completeness (in resolution range)	98.7 (50.00-2.66) 98.8 (46.98-2.66)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.19 (at 2.65Å)	Xtriage
Refinement program	REFMAC 5.6.0117	Depositor
R, R_{free}	0.222 , 0.255 0.218 , 0.251	Depositor DCC
R_{free} test set	3195 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å^2)	63.6	Xtriage
Anisotropy	0.028	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 18.7	EDS
L-test for twinning[2]	$<|L|>$ = 0.49, $<L^2>$ = 0.33	Xtriage
Estimated twinning fraction	0.017 for -h,l,k	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	12324	wwPDB-VP
Average B, all atoms (Å^2)	60.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.84% 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 ⓘ

5.1 Standard geometry ⓘ

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

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	1/1563 (0.1%)	0.54	1/2131 (0.0%)
1	B	0.43	1/1564 (0.1%)	0.54	0/2132
1	C	0.42	2/1560 (0.1%)	0.54	0/2127
1	D	0.50	3/1564 (0.2%)	0.52	0/2132
1	E	0.41	0/1561	0.53	0/2128
1	F	0.42	1/1565 (0.1%)	0.52	0/2133
1	G	0.41	0/1563	0.52	0/2131
1	H	0.53	3/1563 (0.2%)	0.55	1/2131 (0.0%)
All	All	0.45	11/12503 (0.1%)	0.53	2/17045 (0.0%)

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	H	176	LYS	CD-CE	10.67	1.77	1.51
1	D	4	LYS	CE-NZ	8.76	1.71	1.49
1	H	93	LEU	CG-CD1	5.33	1.71	1.51
1	D	82	TRP	CD2-CE2	5.26	1.47	1.41
1	D	176	LYS	CE-NZ	5.25	1.62	1.49
1	B	82	TRP	CD2-CE2	5.16	1.47	1.41
1	C	82	TRP	CD2-CE2	5.16	1.47	1.41
1	A	82	TRP	CD2-CE2	5.12	1.47	1.41
1	H	82	TRP	CD2-CE2	5.11	1.47	1.41
1	F	82	TRP	CD2-CE2	5.10	1.47	1.41
1	C	202	TRP	CD2-CE2	5.02	1.47	1.41

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	98	LEU	CA-CB-CG	5.70	128.42	115.30
1	H	98	LEU	CA-CB-CG	5.03	126.86	115.30

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	1532	0	1509	21	0
1	B	1533	0	1512	20	0
1	C	1529	0	1508	19	0
1	D	1533	0	1512	21	0
1	E	1530	0	1507	24	0
1	F	1534	0	1515	25	0
1	G	1532	0	1509	23	0
1	H	1532	0	1509	31	0
2	A	8	0	2	0	0
2	B	8	0	2	0	0
2	C	8	0	2	0	0
2	D	8	0	2	0	0
2	E	8	0	2	0	0
2	F	8	0	2	0	0
2	G	8	0	2	0	0
2	H	8	0	2	0	0
3	A	1	0	0	0	0
3	B	2	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
All	All	12324	0	12097	158	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 6.

All (158) 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:H:176:LYS:CD	1:H:176:LYS:CE	1.77	1.61
1:D:4:LYS:CE	1:D:4:LYS:NZ	1.71	1.53
1:B:196:SER:O	1:B:200:LEU:HD23	1.58	1.03

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:68:THR:HG22	1:E:114:VAL:HG23	1.57	0.86
1:B:68:THR:HG22	1:B:114:VAL:HG22	1.58	0.84
1:G:146:THR:HG22	1:G:171:CYS:HB3	1.61	0.83
1:C:146:THR:HG21	1:C:179:HIS:ND1	1.94	0.82
1:H:176:LYS:CE	1:H:176:LYS:CG	2.58	0.81
1:A:120:SER:H	1:G:159:GLN:HE22	1.28	0.81
1:E:71:ALA:HB2	1:E:99:VAL:HG21	1.64	0.79
1:C:120:SER:H	1:F:159:GLN:HE22	1.32	0.77
1:B:196:SER:O	1:B:200:LEU:CD2	2.34	0.74
1:A:204:ARG:HH11	1:A:204:ARG:HG3	1.52	0.74
1:H:93:LEU:HD12	1:H:93:LEU:N	2.03	0.72
1:D:120:SER:H	1:H:159:GLN:HE22	1.37	0.71
1:D:159:GLN:HE22	1:H:120:SER:H	1.38	0.71
1:B:146:THR:HG23	1:B:173:ASP:HB2	1.73	0.71
1:G:107:ILE:HD13	1:G:107:ILE:H	1.57	0.70
1:B:146:THR:HG21	1:B:179:HIS:ND1	2.06	0.70
1:D:146:THR:HG21	1:D:179:HIS:ND1	2.07	0.69
1:B:159:GLN:HE22	1:E:120:SER:H	1.37	0.69
1:C:194:THR:OG1	1:C:195:ASP:N	2.25	0.69
1:D:146:THR:HA	1:D:150:VAL:HB	1.74	0.69
1:D:119:ALA:H	1:H:159:GLN:HE21	1.42	0.68
1:B:120:SER:H	1:E:159:GLN:HE22	1.40	0.68
1:A:204:ARG:HH11	1:A:204:ARG:CG	2.07	0.67
1:A:194:THR:HG21	1:A:198:ASP:OD2	1.94	0.67
1:H:176:LYS:CD	1:H:176:LYS:NZ	2.57	0.66
1:G:158:VAL:HG11	1:G:190:TYR:O	1.96	0.66
1:E:68:THR:HG22	1:E:114:VAL:CG2	2.25	0.66
1:H:57:LEU:HD12	1:H:200:LEU:HD12	1.78	0.65
1:C:146:THR:HA	1:C:150:VAL:HB	1.79	0.65
1:B:47:GLN:HG3	1:B:172:ALA:HB2	1.78	0.64
1:G:92:LEU:HD12	1:G:98:LEU:HB3	1.80	0.64
1:B:120:SER:H	1:E:159:GLN:NE2	1.97	0.63
1:A:80:LEU:HB2	1:A:83:LEU:HD23	1.80	0.63
1:A:47:GLN:HG3	1:A:172:ALA:HB2	1.81	0.61
1:F:47:GLN:O	1:F:51:THR:HG23	2.01	0.61
1:E:71:ALA:HB2	1:E:99:VAL:CG2	2.28	0.61
1:D:120:SER:H	1:H:159:GLN:NE2	1.99	0.61
1:A:159:GLN:HE22	1:G:120:SER:H	1.49	0.61
1:A:119:ALA:H	1:G:159:GLN:HE21	1.49	0.60
1:B:77:ILE:HA	1:B:83:LEU:HD23	1.84	0.60
1:D:159:GLN:NE2	1:H:120:SER:H	2.00	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:35:ASP:OD1	1:F:37:GLN:HG2	2.01	0.60
1:H:146:THR:HG21	1:H:179:HIS:ND1	2.16	0.60
1:B:159:GLN:NE2	1:E:120:SER:H	2.00	0.59
1:H:154:VAL:O	1:H:158:VAL:HG23	2.01	0.59
1:D:202:TRP:O	1:D:206:VAL:HG23	2.02	0.59
1:F:77:ILE:HA	1:F:83:LEU:HD23	1.83	0.59
1:C:120:SER:H	1:F:159:GLN:NE2	2.00	0.58
1:C:77:ILE:HA	1:C:83:LEU:HD23	1.85	0.58
1:F:146:THR:HG22	1:F:171:CYS:HB3	1.85	0.58
1:D:116:LYS:HD2	1:D:121:SER:HA	1.86	0.57
1:G:146:THR:CG2	1:G:171:CYS:HB3	2.33	0.57
1:E:47:GLN:HG3	1:E:172:ALA:HB2	1.87	0.57
1:F:47:GLN:HG3	1:F:172:ALA:HB2	1.86	0.57
1:G:24:ILE:HD13	1:G:140:VAL:HG13	1.86	0.57
1:G:202:TRP:O	1:G:206:VAL:HG12	2.05	0.56
1:B:146:THR:HA	1:B:150:VAL:HB	1.88	0.56
1:C:92:LEU:HD23	1:C:98:LEU:HB3	1.86	0.56
1:A:120:SER:H	1:G:159:GLN:NE2	2.02	0.56
1:F:7:TYR:CD1	1:F:188:GLN:HG2	2.40	0.56
1:H:146:THR:HA	1:H:150:VAL:HB	1.87	0.56
1:F:146:THR:HA	1:F:150:VAL:HB	1.88	0.56
1:D:119:ALA:N	1:H:159:GLN:HE21	2.03	0.55
1:C:146:THR:HB	1:C:171:CYS:HB3	1.87	0.55
1:F:57:LEU:HD12	1:F:200:LEU:HD12	1.89	0.55
1:B:154:VAL:O	1:B:158:VAL:HG23	2.08	0.54
1:G:47:GLN:HG3	1:G:172:ALA:HB2	1.90	0.54
1:H:146:THR:HG23	1:H:173:ASP:HB2	1.90	0.53
1:A:159:GLN:HE21	1:G:119:ALA:H	1.56	0.53
1:F:154:VAL:O	1:F:158:VAL:HG23	2.08	0.52
1:F:12:PHE:HB3	1:F:188:GLN:HG3	1.92	0.52
1:H:47:GLN:HG3	1:H:172:ALA:HB2	1.90	0.52
1:C:85:LYS:NZ	1:F:187:GLN:O	2.42	0.51
1:H:77:ILE:HA	1:H:83:LEU:HD23	1.91	0.51
1:C:47:GLN:HG3	1:C:172:ALA:HB2	1.91	0.51
1:C:119:ALA:H	1:F:159:GLN:HE21	1.59	0.50
1:H:194:THR:OG1	1:H:195:ASP:N	2.44	0.50
1:D:159:GLN:HE21	1:H:119:ALA:H	1.60	0.50
1:F:146:THR:HG23	1:F:173:ASP:HB2	1.93	0.49
1:H:24:ILE:HD13	1:H:140:VAL:HG13	1.93	0.49
1:E:77:ILE:HA	1:E:83:LEU:HD23	1.93	0.49
1:B:29:PHE:HE2	1:B:51:THR:HG21	1.78	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:98:LEU:H	1:H:98:LEU:HD23	1.78	0.49
1:E:24:ILE:HD13	1:E:140:VAL:HG13	1.94	0.49
1:A:159:GLN:NE2	1:G:120:SER:H	2.09	0.48
1:C:116:LYS:HD2	1:C:121:SER:HA	1.95	0.48
1:F:90:ALA:O	1:F:93:LEU:CD1	2.61	0.48
1:B:89:MET:HA	1:B:92:LEU:HD23	1.94	0.48
1:E:27:VAL:HG13	1:E:142:THR:O	2.14	0.48
1:G:68:THR:HG22	1:G:114:VAL:HG22	1.94	0.48
1:H:93:LEU:N	1:H:93:LEU:CD1	2.75	0.48
1:H:91:ALA:C	1:H:93:LEU:HD12	2.34	0.48
1:D:47:GLN:O	1:D:51:THR:HG23	2.14	0.48
1:D:159:GLN:HE21	1:H:119:ALA:N	2.11	0.47
1:D:85:LYS:HE3	1:H:191:GLY:C	2.35	0.47
1:G:83:LEU:O	1:G:87:SER:HA	2.15	0.47
1:E:50:ARG:HD2	1:E:169:ASP:HB3	1.97	0.47
1:H:167:PRO:HA	1:H:194:THR:O	2.15	0.47
1:D:47:GLN:HG3	1:D:172:ALA:HB2	1.95	0.47
1:D:77:ILE:HA	1:D:83:LEU:HD23	1.96	0.47
1:E:27:VAL:HA	1:E:68:THR:OG1	2.14	0.47
1:C:202:TRP:O	1:C:206:VAL:HG12	2.15	0.46
1:E:38:TYR:CZ	1:E:98:LEU:HD22	2.50	0.46
1:F:108:GLN:HG3	1:F:109:PRO:HD2	1.97	0.46
1:H:25:ILE:HD12	1:H:127:LEU:HD11	1.98	0.46
1:H:38:TYR:CZ	1:H:98:LEU:HD22	2.50	0.46
1:G:146:THR:HA	1:G:150:VAL:HB	1.96	0.46
1:E:202:TRP:O	1:E:206:VAL:HG12	2.16	0.46
1:A:38:TYR:CE1	1:A:98:LEU:HD22	2.51	0.45
1:A:116:LYS:HD3	1:A:121:SER:HA	1.96	0.45
1:F:154:VAL:HG13	1:F:164:VAL:HG11	1.98	0.45
1:C:108:GLN:HG3	1:C:109:PRO:HD2	1.98	0.45
1:B:196:SER:C	1:B:200:LEU:HD23	2.31	0.45
1:A:98:LEU:H	1:A:98:LEU:HD23	1.82	0.45
1:A:68:THR:HG22	1:A:114:VAL:HG22	1.99	0.45
1:E:16:VAL:HG21	1:E:163:LYS:HB3	1.99	0.45
1:A:38:TYR:CZ	1:A:98:LEU:HD22	2.52	0.44
1:F:116:LYS:HD2	1:F:121:SER:HA	2.00	0.44
1:A:77:ILE:HB	1:A:78:PRO:HD3	2.00	0.44
1:G:77:ILE:HB	1:G:78:PRO:HD3	1.99	0.44
1:A:154:VAL:HG13	1:A:164:VAL:HG11	2.00	0.43
1:E:154:VAL:HG13	1:E:164:VAL:HG11	1.99	0.43
1:G:16:VAL:HG21	1:G:163:LYS:HB3	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:146:THR:HB	1:D:171:CYS:HB3	2.00	0.43
1:A:119:ALA:N	1:G:159:GLN:HE21	2.14	0.43
1:E:29:PHE:HD1	1:E:29:PHE:HA	1.75	0.43
1:F:146:THR:HG21	1:F:179:HIS:ND1	2.32	0.43
1:B:159:GLN:HE21	1:E:119:ALA:H	1.67	0.43
1:H:98:LEU:HD23	1:H:98:LEU:N	2.33	0.43
1:E:68:THR:HG21	1:E:121:SER:HB3	1.99	0.43
1:G:116:LYS:HD2	1:G:121:SER:HA	2.00	0.42
1:B:24:ILE:HG23	1:B:65:VAL:HG22	2.00	0.42
1:B:144:ALA:HA	1:B:145:THR:HA	1.79	0.42
1:F:68:THR:HG22	1:F:114:VAL:HG22	2.01	0.42
1:F:166:VAL:HA	1:F:167:PRO:HD3	1.86	0.42
1:F:197:ASP:O	1:F:201:LYS:HG3	2.18	0.42
1:H:116:LYS:CD	1:H:121:SER:HA	2.49	0.42
1:C:151:ARG:HD3	1:F:151:ARG:NH1	2.34	0.42
1:G:146:THR:HG21	1:G:179:HIS:CE1	2.54	0.42
1:E:77:ILE:HB	1:E:78:PRO:HD3	2.01	0.42
1:E:108:GLN:HG3	1:E:109:PRO:HD2	2.00	0.42
1:C:140:VAL:HA	1:C:165:LEU:O	2.20	0.41
1:B:154:VAL:HG13	1:B:164:VAL:HG11	2.02	0.41
1:C:29:PHE:HD1	1:C:29:PHE:HA	1.77	0.41
1:D:144:ALA:HA	1:D:145:THR:HA	1.82	0.41
1:E:116:LYS:HD2	1:E:121:SER:HA	2.01	0.41
1:A:204:ARG:CG	1:A:204:ARG:NH1	2.71	0.41
1:C:93:LEU:HD12	1:C:93:LEU:H	1.85	0.41
1:F:24:ILE:HG23	1:F:140:VAL:HG22	2.03	0.41
1:G:146:THR:HG21	1:G:179:HIS:ND1	2.34	0.41
1:D:12:PHE:HB3	1:D:188:GLN:HG3	2.02	0.41
1:D:29:PHE:HD1	1:D:29:PHE:HA	1.80	0.41
1:H:38:TYR:HA	1:H:39:PRO:HD3	1.94	0.41
1:A:140:VAL:HA	1:A:165:LEU:O	2.22	0.40
1:C:25:ILE:HD11	1:C:131:LEU:HD21	2.03	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	204/208 (98%)	201 (98%)	3 (2%)	0	100	100
1	B	204/208 (98%)	201 (98%)	3 (2%)	0	100	100
1	C	204/208 (98%)	203 (100%)	1 (0%)	0	100	100
1	D	204/208 (98%)	201 (98%)	3 (2%)	0	100	100
1	E	204/208 (98%)	201 (98%)	3 (2%)	0	100	100
1	F	204/208 (98%)	202 (99%)	2 (1%)	0	100	100
1	G	204/208 (98%)	200 (98%)	4 (2%)	0	100	100
1	H	204/208 (98%)	199 (98%)	5 (2%)	0	100	100
All	All	1632/1664 (98%)	1608 (98%)	24 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	163/169 (96%)	149 (91%)	14 (9%)	10	15
1	B	164/169 (97%)	150 (92%)	14 (8%)	10	15
1	C	163/169 (96%)	148 (91%)	15 (9%)	9	13
1	D	164/169 (97%)	148 (90%)	16 (10%)	8	11
1	E	162/169 (96%)	145 (90%)	17 (10%)	7	10
1	F	165/169 (98%)	151 (92%)	14 (8%)	10	15
1	G	163/169 (96%)	144 (88%)	19 (12%)	5	7
1	H	163/169 (96%)	147 (90%)	16 (10%)	8	11
All	All	1307/1352 (97%)	1182 (90%)	125 (10%)	8	12

All (125) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	4	LYS
1	B	24	ILE
1	B	29	PHE
1	B	47	GLN
1	B	57	LEU
1	B	83	LEU
1	B	114	VAL
1	B	130	LEU
1	B	131	LEU
1	B	140	VAL
1	B	146	THR
1	B	158	VAL
1	B	166	VAL
1	B	194	THR
1	A	16	VAL
1	A	29	PHE
1	A	47	GLN
1	A	57	LEU
1	A	98	LEU
1	A	114	VAL
1	A	131	LEU
1	A	140	VAL
1	A	151	ARG
1	A	166	VAL
1	A	176	LYS
1	A	194	THR
1	A	204	ARG
1	A	206	VAL
1	C	16	VAL
1	C	47	GLN
1	C	53	GLU
1	C	57	LEU
1	C	83	LEU
1	C	93	LEU
1	C	98	LEU
1	C	114	VAL
1	C	130	LEU
1	C	131	LEU
1	C	146	THR
1	C	158	VAL
1	C	166	VAL
1	C	194	THR
1	C	206	VAL

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Mol	Chain	Res	Type
1	D	24	ILE
1	D	27	VAL
1	D	29	PHE
1	D	47	GLN
1	D	50	ARG
1	D	57	LEU
1	D	83	LEU
1	D	92	LEU
1	D	93	LEU
1	D	98	LEU
1	D	107	ILE
1	D	130	LEU
1	D	131	LEU
1	D	146	THR
1	D	166	VAL
1	D	200	LEU
1	E	4	LYS
1	E	16	VAL
1	E	29	PHE
1	E	47	GLN
1	E	57	LEU
1	E	83	LEU
1	E	92	LEU
1	E	93	LEU
1	E	98	LEU
1	E	107	ILE
1	E	114	VAL
1	E	130	LEU
1	E	131	LEU
1	E	140	VAL
1	E	158	VAL
1	E	166	VAL
1	E	206	VAL
1	F	16	VAL
1	F	47	GLN
1	F	57	LEU
1	F	83	LEU
1	F	92	LEU
1	F	114	VAL
1	F	130	LEU
1	F	146	THR
1	F	151	ARG

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Mol	Chain	Res	Type
1	F	158	VAL
1	F	166	VAL
1	F	194	THR
1	F	200	LEU
1	F	201	LYS
1	G	4	LYS
1	G	16	VAL
1	G	27	VAL
1	G	29	PHE
1	G	47	GLN
1	G	57	LEU
1	G	83	LEU
1	G	92	LEU
1	G	107	ILE
1	G	114	VAL
1	G	130	LEU
1	G	131	LEU
1	G	140	VAL
1	G	151	ARG
1	G	156	ASP
1	G	158	VAL
1	G	166	VAL
1	G	189	LYS
1	G	206	VAL
1	H	16	VAL
1	H	29	PHE
1	H	47	GLN
1	H	57	LEU
1	H	83	LEU
1	H	93	LEU
1	H	98	LEU
1	H	130	LEU
1	H	131	LEU
1	H	140	VAL
1	H	146	THR
1	H	158	VAL
1	H	180	GLU
1	H	194	THR
1	H	200	LEU
1	H	206	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	159	GLN
1	A	159	GLN
1	C	3	GLN
1	C	14	ASN
1	C	47	GLN
1	C	159	GLN
1	D	14	ASN
1	D	47	GLN
1	D	159	GLN
1	E	47	GLN
1	E	159	GLN
1	F	3	GLN
1	F	14	ASN
1	F	159	GLN
1	G	14	ASN
1	G	37	GLN
1	G	47	GLN
1	G	159	GLN
1	H	3	GLN
1	H	110	ASN
1	H	159	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

8 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	MAE	C	301	-	7,7,7	1.11	0	8,8,8	0.83	0
2	MAE	A	301	-	7,7,7	1.15	0	8,8,8	0.67	0
2	MAE	H	301	-	7,7,7	1.11	0	8,8,8	0.73	0
2	MAE	E	301	-	7,7,7	1.13	0	8,8,8	0.56	0
2	MAE	B	301	-	7,7,7	1.11	0	8,8,8	0.49	0
2	MAE	D	301	-	7,7,7	1.12	0	8,8,8	0.71	0
2	MAE	F	301	-	7,7,7	1.14	0	8,8,8	0.75	0
2	MAE	G	301	-	7,7,7	1.12	0	8,8,8	0.76	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	MAE	C	301	-	-	4/5/5/5	-
2	MAE	A	301	-	-	4/5/5/5	-
2	MAE	H	301	-	-	4/5/5/5	-
2	MAE	E	301	-	-	4/5/5/5	-
2	MAE	B	301	-	-	2/5/5/5	-
2	MAE	D	301	-	-	4/5/5/5	-
2	MAE	F	301	-	-	4/5/5/5	-
2	MAE	G	301	-	-	4/5/5/5	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (30) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	G	301	MAE	O2-C1-C2-C3
2	G	301	MAE	C2-C3-C4-O3
2	G	301	MAE	C2-C3-C4-O4
2	G	301	MAE	O1-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
2	H	301	MAE	O1-C1-C2-C3
2	H	301	MAE	O2-C1-C2-C3
2	B	301	MAE	O1-C1-C2-C3
2	C	301	MAE	C2-C3-C4-O4
2	D	301	MAE	O2-C1-C2-C3
2	E	301	MAE	O1-C1-C2-C3
2	F	301	MAE	O2-C1-C2-C3
2	H	301	MAE	C2-C3-C4-O3
2	C	301	MAE	C2-C3-C4-O3
2	D	301	MAE	O1-C1-C2-C3
2	F	301	MAE	C2-C3-C4-O3
2	A	301	MAE	C2-C3-C4-O3
2	C	301	MAE	O2-C1-C2-C3
2	E	301	MAE	O2-C1-C2-C3
2	F	301	MAE	O1-C1-C2-C3
2	H	301	MAE	C2-C3-C4-O4
2	B	301	MAE	O2-C1-C2-C3
2	A	301	MAE	C2-C3-C4-O4
2	C	301	MAE	O1-C1-C2-C3
2	F	301	MAE	C2-C3-C4-O4
2	A	301	MAE	O2-C1-C2-C3
2	D	301	MAE	C2-C3-C4-O4
2	E	301	MAE	C2-C3-C4-O4
2	D	301	MAE	C2-C3-C4-O3
2	E	301	MAE	C2-C3-C4-O3
2	A	301	MAE	O1-C1-C2-C3

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	206/208 (99%)	-0.17	0	100	100	45, 56, 68, 79	2 (0%)
1	B	206/208 (99%)	-0.11	0	100	100	45, 55, 68, 76	6 (2%)
1	C	206/208 (99%)	-0.03	5 (2%)	59	54	44, 55, 69, 79	4 (1%)
1	D	206/208 (99%)	-0.01	4 (1%)	66	63	46, 58, 75, 88	4 (1%)
1	E	206/208 (99%)	0.01	5 (2%)	59	54	47, 60, 75, 82	3 (1%)
1	F	206/208 (99%)	-0.00	5 (2%)	59	54	47, 62, 77, 83	2 (0%)
1	G	206/208 (99%)	0.02	3 (1%)	73	71	48, 62, 78, 85	1 (0%)
1	H	206/208 (99%)	0.07	2 (0%)	82	81	48, 62, 79, 86	3 (1%)
All	All	1648/1664 (99%)	-0.03	24 (1%)	73	71	44, 58, 76, 88	25 (1%)

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	124	GLY	3.5
1	F	124	GLY	3.0
1	G	160	SER	2.9
1	F	43	ASP	2.6
1	F	125	SER	2.6
1	G	128	SER	2.5
1	E	125	SER	2.4
1	D	125	SER	2.3
1	H	124	GLY	2.3
1	C	160	SER	2.3
1	F	122	PHE	2.3
1	C	125	SER	2.3
1	D	160	SER	2.3
1	D	128	SER	2.2
1	E	123	PHE	2.2
1	E	121	SER	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	123	PHE	2.2
1	E	126	THR	2.2
1	C	120	SER	2.2
1	H	125	SER	2.2
1	F	156	ASP	2.1
1	G	122	PHE	2.1
1	C	128	SER	2.0
1	D	120	SER	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($\mathring{A}^2$)	Q<0.9
2	MAE	B	301	8/8	0.87	0.22	66,69,74,76	0
2	MAE	C	301	8/8	0.92	0.15	62,64,65,65	0
2	MAE	H	301	8/8	0.92	0.21	76,78,80,82	0
2	MAE	F	301	8/8	0.93	0.20	65,67,69,69	0
2	MAE	G	301	8/8	0.93	0.19	73,74,78,78	0
2	MAE	D	301	8/8	0.93	0.20	77,78,81,82	0
2	MAE	E	301	8/8	0.96	0.23	74,76,76,76	0
2	MAE	A	301	8/8	0.96	0.20	65,68,69,72	0

6.5 Other polymers ⓘ

There are no such residues in this entry.