



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 7, 2017 – 08:56 PM EDT

PDB ID : 5VPJ
Title : The crystal structure of a thioesterase from *Actinomadura verrucosospora*.
Authors : Tan, K.; Joachimiak, G.; Endres, M.; Phillips Jr., G.N.; Joachmiak, A.; Midwest Center for Structural Genomics (MCSG); Enzyme Discovery for Natural Product Biosynthesis (NatPro)
Deposited on : unknown
Resolution : 2.35 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 : 1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20029824
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
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) : rb-20029824

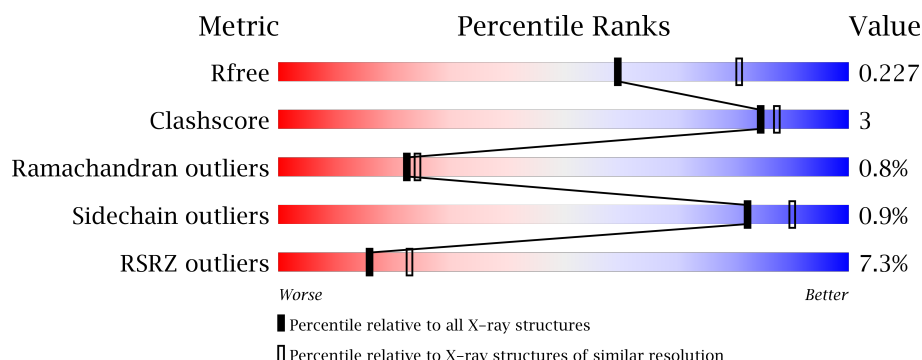
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.35 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}	100719	1522 (2.38-2.34)
Clashscore	112137	1626 (2.38-2.34)
Ramachandran outliers	110173	1605 (2.38-2.34)
Sidechain outliers	110143	1606 (2.38-2.34)
RSRZ outliers	101464	1528 (2.38-2.34)

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	159	<div> <div>2%</div> <div>81% 6% 13%</div> </div>
1	B	159	<div> <div>7%</div> <div>79% 8% 13%</div> </div>
1	C	159	<div> <div>13%</div> <div>79% 8% 13%</div> </div>
1	D	159	<div> <div>3%</div> <div>82% 5% 13%</div> </div>
1	E	159	<div> <div>9%</div> <div>75% 9% 15%</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	159	
1	G	159	
1	H	159	
1	I	159	
1	J	159	
1	K	159	
1	L	159	

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	CL	A	201	-	-	-	X
2	CL	G	201	-	-	-	X
2	CL	K	202	-	-	-	X
3	PG4	D	201	-	-	-	X

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 13045 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 Thioesterase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	138	Total	C	N	O	S	Se	0	0	0
			1085	691	182	205	4	3			
1	B	138	Total	C	N	O	S	Se	0	0	0
			1079	687	183	202	4	3			
1	C	139	Total	C	N	O	S	Se	0	0	0
			1058	677	177	197	4	3			
1	D	138	Total	C	N	O	S	Se	0	0	0
			1084	690	182	205	4	3			
1	E	135	Total	C	N	O	S	Se	0	0	0
			1049	672	176	194	4	3			
1	F	139	Total	C	N	O	S	Se	0	0	0
			1084	690	181	206	4	3			
1	G	136	Total	C	N	O	S	Se	0	0	0
			1070	682	178	203	4	3			
1	H	136	Total	C	N	O	S	Se	0	0	0
			1065	681	176	201	4	3			
1	I	136	Total	C	N	O	S	Se	0	0	0
			1070	684	178	201	4	3			
1	J	133	Total	C	N	O	S	Se	0	0	0
			1025	652	174	192	4	3			
1	K	131	Total	C	N	O	S	Se	0	0	0
			1022	654	171	190	4	3			
1	L	139	Total	C	N	O	S	Se	0	0	0
			1090	693	184	206	4	3			

- Molecule 2 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

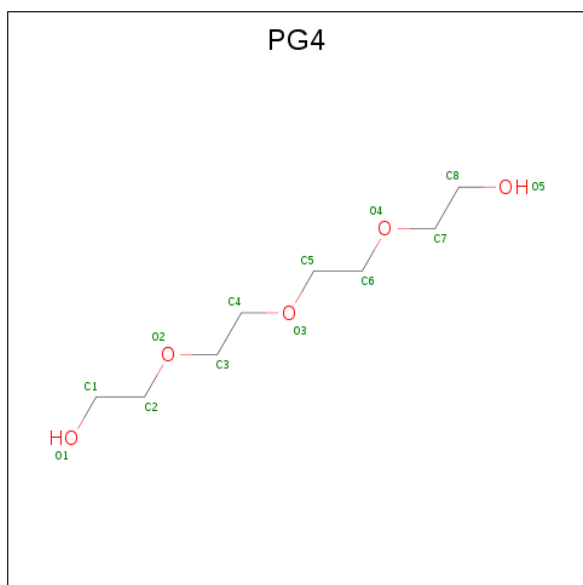
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	H	1	Total	Cl	0	0
			1	1		
2	G	1	Total	Cl	0	0
			1	1		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Cl	0	0
			1	1		
2	K	2	Total	Cl	0	0
			2	2		

- Molecule 3 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: C₈H₁₈O₅).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	D	1	Total	C	O	0	0
			13	8	5		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	32	Total	O	0	0
			32	32		
4	B	22	Total	O	0	0
			22	22		
4	C	25	Total	O	0	0
			25	25		
4	D	38	Total	O	0	0
			38	38		
4	E	7	Total	O	0	0
			7	7		
4	F	18	Total	O	0	0
			18	18		

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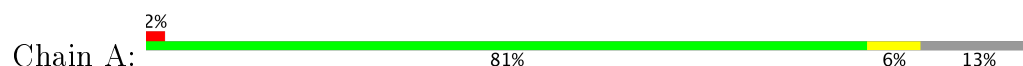
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	G	34	Total 34	O 34	0	0
4	H	15	Total 15	O 15	0	0
4	I	26	Total 26	O 26	0	0
4	J	8	Total 8	O 8	0	0
4	K	10	Total 10	O 10	0	0
4	L	11	Total 11	O 11	0	0

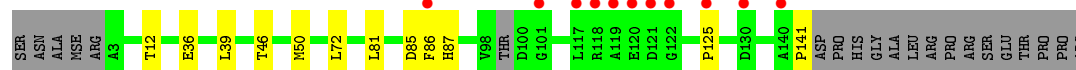
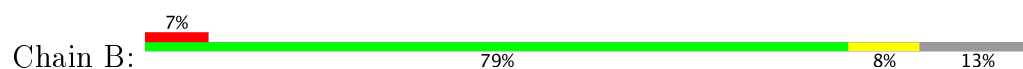
3 Residue-property plots [i](#)

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

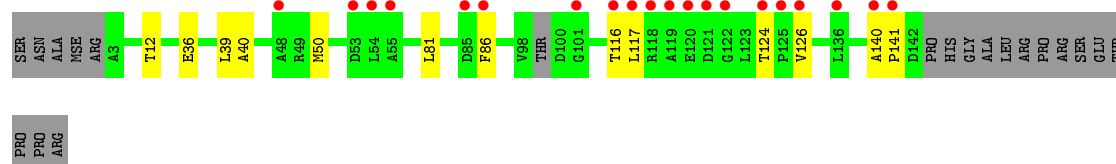
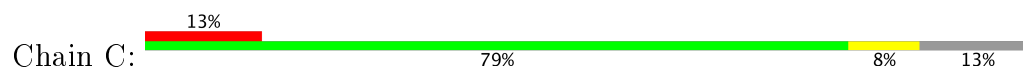
• Molecule 1: Thioesterase



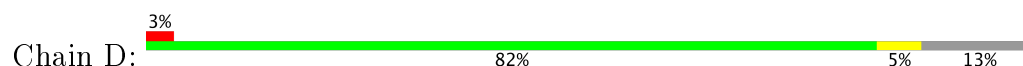
• Molecule 1: Thioesterase



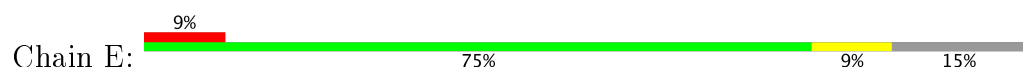
• Molecule 1: Thioesterase



• Molecule 1: Thioesterase

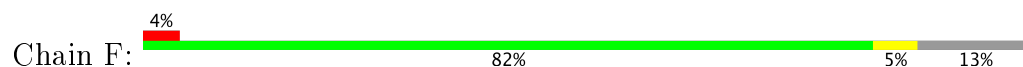


• Molecule 1: Thioesterase



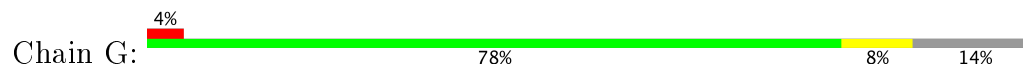
PRO
HIS
GLY
ALA
LEU
ARG
PRO
ARG
SER
GLU
THR
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PRO
ARG

• Molecule 1: Thioesterase



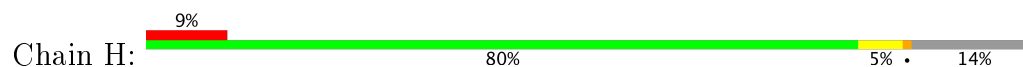
SER ASN ALA MSE R2 T12 A33 A40 L56 F86 Y96 R97 A103 A119 E120 ASP G122 L123 D137 P141 ASP PRO HIS GLY ALA LEU ARG PRO ARG SER GLU THR PRO PRO ARG

• Molecule 1: Thioesterase



SER ASN ALA MSE A3 T12 N17 L28 R35 E36 L39 M50 L72 L81 F86 V98 T99 D100 G101 P102 Q111 A119 GLU ASP GLY L123 P141 ASP PRO HIS GLY ALA LEU ARG PRO ARG SER GLU THR PRO PRO ARG

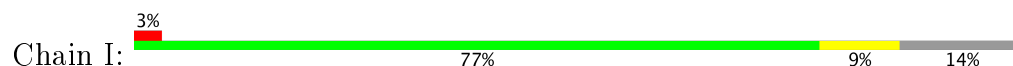
• Molecule 1: Thioesterase



SER ASN ALA MSE R2 E6 Y7 R8 T12 F13 A14 N17 L28 E36 D52 D53 L54 L72 F86 D100 G101 L117 R118 A119 ASP GLY LEU T124 P125 V126 L136 D137 A138 Y139 A140 P141 ASP PRO HIS GLY ALA LEU ARG PRO ARG SER GLU THR PRO ARG GLU THR

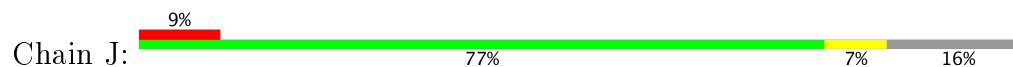
PRO
PRO
ARG

• Molecule 1: Thioesterase



SER ASN ALA MSE A3 T12 L28 R37 F38 L39 M50 L56 C63 L72 L81 F86 T99 P102 G109 L117 R118 ALA GLU ASP L123 D137 P141 D142 PRO HIS GLY ALA LEU ARG PRO ARG SER GLU THR PRO ARG

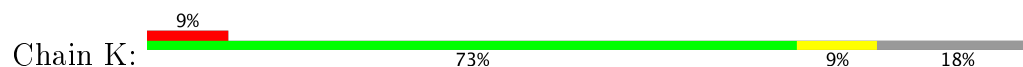
• Molecule 1: Thioesterase



SER ASN ALA MSE ARG ALA Y4 T12 L28 R35 E36 A40 T46 V47 A48 H51 D52 ASP L54 S67 F93 D100 G101 P102 A103 R104 Q111 L117 R118 ALA GLU ASP L123 V126 E127 V128 P129 D130 E131 L136 Y139 A140 P141 ASP PRO

HIS
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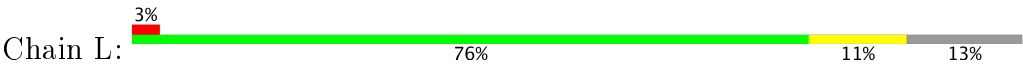
• Molecule 1: Thioesterase



SER ASN ALA MSE ALA Y4 F24 L28 R35 E36 L39 V47 A48 R49 M50 D53 L54 F65 L72 I84 D85 F86 H87 R97 V98 T99 D100 A103 R104 Q111 C115 T116 L117 ARG ALA GLU ASP GLY LEU T124 P125 V126 F129 A140

PRO
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ARG

● Molecule 1: Thioesterase



SER	ASN	ALA	M1	R2	L10	M17	L28	R35	E36	L39	A40	T46	M50	H51	D52	L56	E68	L81	F86	Q111	A119	GLU	ASP	G122	I123	T124	P125	L136	F141	ASP	PRO	HIS	GLY	ALA	LEU	ARG	PRO	ARG	SER	GLU	THR	PRO	PRO	ARG
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4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	105.68Å 96.36Å 114.16Å 90.00° 99.16° 90.00°	Depositor
Resolution (Å)	33.68 – 2.35 33.68 – 2.35	Depositor EDS
% Data completeness (in resolution range)	86.8 (33.68-2.35) 86.8 (33.68-2.35)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	6.15 (at 2.34Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.186 , 0.227 0.187 , 0.227	Depositor DCC
R_{free} test set	4165 reflections (5.09%)	DCC
Wilson B-factor (Å ²)	31.2	Xtriage
Anisotropy	0.080	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 46.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	13045	wwPDB-VP
Average B, all atoms (Å ²)	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.17% 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: PG4, CL

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	0.21	0/1106	0.36	0/1500
1	B	0.21	0/1100	0.36	0/1491
1	C	0.21	0/1079	0.38	0/1467
1	D	0.25	0/1105	0.38	0/1499
1	E	0.21	0/1070	0.37	0/1453
1	F	0.21	0/1105	0.36	0/1499
1	G	0.21	0/1091	0.36	0/1480
1	H	0.21	0/1086	0.37	0/1473
1	I	0.21	0/1091	0.36	0/1480
1	J	0.21	0/1044	0.37	0/1416
1	K	0.21	0/1042	0.36	0/1413
1	L	0.23	0/1111	0.37	0/1506
All	All	0.22	0/13030	0.37	0/17677

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

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	1085	0	1037	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	1079	0	1031	8	0
1	C	1058	0	992	8	0
1	D	1084	0	1038	5	0
1	E	1049	0	1000	8	0
1	F	1084	0	1031	4	0
1	G	1070	0	1024	7	0
1	H	1065	0	1018	5	0
1	I	1070	0	1028	10	0
1	J	1025	0	957	7	0
1	K	1022	0	968	8	0
1	L	1090	0	1045	10	0
2	A	1	0	0	0	0
2	G	1	0	0	0	0
2	H	1	0	0	0	0
2	K	2	0	0	0	0
3	D	13	0	18	1	0
4	A	32	0	0	0	0
4	B	22	0	0	0	0
4	C	25	0	0	0	0
4	D	38	0	0	0	0
4	E	7	0	0	0	0
4	F	18	0	0	0	0
4	G	34	0	0	0	0
4	H	15	0	0	0	0
4	I	26	0	0	0	0
4	J	8	0	0	0	0
4	K	10	0	0	0	0
4	L	11	0	0	0	0
All	All	13045	0	12187	67	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 (67) 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:E:39:LEU:HD13	1:E:50:MSE:HE1	1.75	0.68
1:G:35:ARG:NH1	1:G:111:GLN:OE1	2.28	0.67
1:K:28:LEU:HD13	1:L:28:LEU:HG	1.77	0.67
1:G:39:LEU:HD13	1:G:50:MSE:HE1	1.79	0.64
1:I:28:LEU:HD13	1:J:28:LEU:HG	1.78	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:72:LEU:HD22	1:L:40:ALA:HB2	1.84	0.60
1:H:12:THR:HG23	1:H:14:ALA:H	1.67	0.59
1:I:39:LEU:HD13	1:I:50:MSE:HE1	1.84	0.59
1:C:116:THR:OG1	1:C:124:THR:N	2.37	0.57
1:G:28:LEU:HD13	1:H:28:LEU:HG	1.87	0.57
1:K:47:VAL:HA	1:K:50:MSE:HE3	1.86	0.57
1:I:50:MSE:O	1:I:118:ARG:NH2	2.41	0.54
1:D:91:MSE:SE	3:D:201:PG4:H41	2.57	0.54
1:K:39:LEU:HD13	1:K:50:MSE:HE1	1.91	0.53
1:E:35:ARG:NH1	1:E:111:GLN:OE1	2.39	0.53
1:K:35:ARG:NH1	1:K:111:GLN:OE1	2.42	0.53
1:L:35:ARG:NH1	1:L:111:GLN:OE1	2.40	0.52
1:C:117:LEU:HG	1:C:126:VAL:HG21	1.91	0.52
1:A:72:LEU:HD22	1:D:40:ALA:HB2	1.92	0.52
1:D:2:ARG:NE	1:I:137:ASP:OD2	2.44	0.51
1:E:6:GLU:OE1	1:E:8:ARG:NH1	2.44	0.50
1:E:40:ALA:HB2	1:H:72:LEU:HD22	1.93	0.49
1:J:46:THR:N	1:J:131:GLU:OE1	2.46	0.49
1:F:33:ALA:HA	1:G:12:THR:HG21	1.95	0.49
1:A:50:MSE:HE2	1:A:56:LEU:HD13	1.95	0.49
1:I:50:MSE:HE2	1:I:56:LEU:HD13	1.95	0.48
1:B:72:LEU:HD22	1:C:40:ALA:HB2	1.95	0.48
1:A:39:LEU:HD13	1:A:50:MSE:HE1	1.97	0.47
1:D:39:LEU:HD13	1:D:50:MSE:HE1	1.97	0.47
1:J:35:ARG:HG3	1:J:36:GLU:HG3	1.97	0.47
1:L:39:LEU:HD13	1:L:50:MSE:HE1	1.97	0.47
1:I:63:CYS:HA	1:I:109:GLY:HA2	1.97	0.47
1:J:67:SER:OG	1:J:104:ARG:NH2	2.48	0.47
1:J:93:PHE:HE1	1:J:111:GLN:HG2	1.79	0.46
1:C:39:LEU:HD13	1:C:50:MSE:HE1	1.99	0.45
1:E:16:THR:HG21	1:E:71:ALA:HB2	1.98	0.45
1:F:40:ALA:HB2	1:G:72:LEU:HG	1.99	0.45
1:C:81:LEU:HD23	1:C:140:ALA:HB2	1.99	0.44
1:B:81:LEU:O	1:B:141:PRO:HD3	2.18	0.44
1:L:50:MSE:HE2	1:L:56:LEU:HD13	2.00	0.44
1:K:97:ARG:HH21	1:K:104:ARG:HH11	1.65	0.43
1:B:46:THR:O	1:B:50:MSE:HG3	2.19	0.43
1:I:37:ARG:HG2	1:L:10:LEU:HD23	1.99	0.43
1:B:12:THR:HB	1:C:36:GLU:OE1	2.19	0.42
1:L:81:LEU:HD22	1:L:136:LEU:HB3	2.02	0.42
1:B:87:HIS:CD2	1:B:125:PRO:HB3	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:6:GLU:OE2	1:H:8:ARG:NH2	2.49	0.42
1:L:46:THR:HG22	1:L:50:MSE:HE3	2.02	0.42
1:J:40:ALA:HB2	1:K:72:LEU:HD22	2.01	0.42
1:B:36:GLU:OE1	1:C:12:THR:HB	2.20	0.42
1:A:36:GLU:OE1	1:D:12:THR:HB	2.20	0.41
1:G:81:LEU:O	1:G:141:PRO:HD3	2.21	0.41
1:I:81:LEU:O	1:I:141:PRO:HD3	2.20	0.41
1:I:12:THR:HB	1:L:36:GLU:OE1	2.21	0.41
1:B:39:LEU:HD13	1:B:50:MSE:HE1	2.02	0.41
1:K:24:PHE:HB2	1:K:65:PHE:CZ	2.55	0.41
1:L:124:THR:HA	1:L:125:PRO:HD3	1.96	0.41
1:A:81:LEU:O	1:A:141:PRO:HD3	2.21	0.40
1:C:117:LEU:HB2	1:C:124:THR:HB	2.03	0.40
1:E:101:GLY:HA2	1:E:102:PRO:HA	1.87	0.40
1:E:91:MSE:HE3	1:E:111:GLN:HG3	2.03	0.40
1:F:96:TYR:HB3	1:F:103:ALA:HB1	2.03	0.40
1:J:12:THR:HB	1:K:36:GLU:OE1	2.21	0.40
1:B:85:ASP:O	1:B:87:HIS:N	2.55	0.40
1:E:12:THR:HB	1:H:36:GLU:OE1	2.21	0.40
1:A:2:ARG:HB3	1:A:3:ALA:H	1.70	0.40
1:F:12:THR:HB	1:G:36:GLU:OE1	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	134/159 (84%)	130 (97%)	3 (2%)	1 (1%)	25	27
1	B	134/159 (84%)	131 (98%)	2 (2%)	1 (1%)	25	27
1	C	135/159 (85%)	128 (95%)	5 (4%)	2 (2%)	12	10
1	D	134/159 (84%)	131 (98%)	2 (2%)	1 (1%)	25	27

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	131/159 (82%)	125 (95%)	5 (4%)	1 (1%)	22	24
1	F	135/159 (85%)	131 (97%)	3 (2%)	1 (1%)	25	27
1	G	132/159 (83%)	129 (98%)	2 (2%)	1 (1%)	22	24
1	H	132/159 (83%)	126 (96%)	5 (4%)	1 (1%)	22	24
1	I	132/159 (83%)	126 (96%)	5 (4%)	1 (1%)	22	24
1	J	127/159 (80%)	123 (97%)	4 (3%)	0	100	100
1	K	127/159 (80%)	124 (98%)	2 (2%)	1 (1%)	22	24
1	L	135/159 (85%)	131 (97%)	3 (2%)	1 (1%)	25	27
All	All	1588/1908 (83%)	1535 (97%)	41 (3%)	12 (1%)	22	24

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	86	PHE
1	B	86	PHE
1	I	86	PHE
1	L	86	PHE
1	C	86	PHE
1	D	86	PHE
1	F	86	PHE
1	G	86	PHE
1	H	86	PHE
1	K	86	PHE
1	E	85	ASP
1	C	141	PRO

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	114/130 (88%)	114 (100%)	0	100	100
1	B	112/130 (86%)	112 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	106/130 (82%)	106 (100%)	0	100	100
1	D	114/130 (88%)	113 (99%)	1 (1%)	82	90
1	E	108/130 (83%)	107 (99%)	1 (1%)	82	90
1	F	113/130 (87%)	111 (98%)	2 (2%)	64	76
1	G	113/130 (87%)	112 (99%)	1 (1%)	82	90
1	H	112/130 (86%)	110 (98%)	2 (2%)	64	76
1	I	113/130 (87%)	113 (100%)	0	100	100
1	J	104/130 (80%)	104 (100%)	0	100	100
1	K	105/130 (81%)	103 (98%)	2 (2%)	62	75
1	L	114/130 (88%)	111 (97%)	3 (3%)	51	64
All	All	1328/1560 (85%)	1316 (99%)	12 (1%)	82	90

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	17	ASN
1	E	108	ARG
1	F	56	LEU
1	F	97	ARG
1	G	17	ASN
1	H	12	THR
1	H	17	ASN
1	K	87	HIS
1	K	115	CYS
1	L	2	ARG
1	L	17	ASN
1	L	68	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	K	17	ASN

5.3.3 RNA ⓘ

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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 5 are monoatomic - leaving 1 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	$\# Z > 2$
3	PG4	D	201	-	12,12,12	0.68	0	11,11,11	0.24	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	PG4	D	201	-	-	0/10/10/10	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.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	201	PG4	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	135/159 (84%)	-0.19	3 (2%) 62 72	17, 32, 84, 117	0
1	B	135/159 (84%)	0.40	11 (8%) 13 18	20, 43, 94, 117	0
1	C	136/159 (85%)	0.59	20 (14%) 3 4	17, 45, 109, 150	0
1	D	134/159 (84%)	-0.07	4 (2%) 51 62	18, 32, 78, 110	0
1	E	132/159 (83%)	0.52	15 (11%) 6 9	33, 63, 113, 143	0
1	F	136/159 (85%)	0.08	6 (4%) 35 47	22, 45, 89, 121	0
1	G	133/159 (83%)	0.13	7 (5%) 27 39	22, 34, 68, 136	0
1	H	133/159 (83%)	0.47	14 (10%) 7 11	21, 55, 111, 155	0
1	I	133/159 (83%)	-0.09	4 (3%) 51 62	23, 38, 76, 127	0
1	J	130/159 (81%)	0.54	14 (10%) 6 10	29, 62, 117, 135	0
1	K	128/159 (80%)	0.64	15 (11%) 5 9	35, 68, 123, 136	0
1	L	135/159 (84%)	0.12	4 (2%) 51 62	26, 50, 88, 130	0
All	All	1600/1908 (83%)	0.26	117 (7%) 16 23	17, 47, 107, 155	0

All (117) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	119	ALA	6.3
1	I	123	LEU	6.0
1	L	141	PRO	5.6
1	C	126	VAL	5.2
1	H	117	LEU	5.0
1	E	54	LEU	4.9
1	C	121	ASP	4.9
1	B	119	ALA	4.7
1	E	86	PHE	4.7
1	G	101	GLY	4.5
1	C	117	LEU	4.4

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Mol	Chain	Res	Type	RSRZ
1	K	140	ALA	4.3
1	K	99	THR	4.2
1	K	116	THR	4.2
1	B	120	GLU	4.2
1	G	123	LEU	4.1
1	C	86	PHE	4.1
1	G	119	ALA	4.1
1	C	125	PRO	4.0
1	L	119	ALA	4.0
1	G	100	ASP	3.9
1	C	122	GLY	3.9
1	E	99	THR	3.9
1	K	86	PHE	3.9
1	G	99	THR	3.8
1	B	86	PHE	3.8
1	B	122	GLY	3.8
1	C	119	ALA	3.8
1	A	141	PRO	3.8
1	G	102	PRO	3.8
1	H	101	GLY	3.6
1	E	55	ALA	3.5
1	K	54	LEU	3.5
1	F	120	GLU	3.5
1	K	53	ASP	3.4
1	H	126	VAL	3.4
1	C	124	THR	3.4
1	F	123	LEU	3.4
1	E	102	PRO	3.3
1	E	101	GLY	3.3
1	J	140	ALA	3.3
1	D	141	PRO	3.2
1	J	48	ALA	3.2
1	B	118	ARG	3.2
1	I	117	LEU	3.1
1	E	100	ASP	3.1
1	E	141	PRO	3.1
1	J	130	ASP	3.1
1	J	117	LEU	3.0
1	E	115	CYS	3.0
1	J	126	VAL	3.0
1	H	100	ASP	3.0
1	C	141	PRO	3.0

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Mol	Chain	Res	Type	RSRZ
1	K	125	PRO	2.9
1	H	52	ASP	2.9
1	F	137	ASP	2.9
1	J	101	GLY	2.8
1	E	126	VAL	2.8
1	I	102	PRO	2.8
1	K	100	ASP	2.8
1	J	102	PRO	2.8
1	H	141	PRO	2.7
1	E	17	ASN	2.7
1	F	119	ALA	2.7
1	C	53	ASP	2.7
1	C	136	LEU	2.7
1	J	54	LEU	2.7
1	C	140	ALA	2.6
1	K	117	LEU	2.6
1	C	120	GLU	2.6
1	E	124	THR	2.6
1	E	87	HIS	2.6
1	C	116	THR	2.6
1	H	53	ASP	2.6
1	H	86	PHE	2.5
1	H	136	LEU	2.5
1	I	99	THR	2.4
1	C	54	LEU	2.4
1	C	101	GLY	2.3
1	D	51	HIS	2.3
1	D	138	ALA	2.3
1	C	48	ALA	2.3
1	K	48	ALA	2.3
1	K	84	ILE	2.3
1	D	137	ASP	2.3
1	H	54	LEU	2.2
1	H	2	ARG	2.2
1	L	2	ARG	2.2
1	C	85	ASP	2.2
1	E	52	ASP	2.2
1	G	98	VAL	2.2
1	B	101	GLY	2.2
1	J	51	HIS	2.2
1	C	118	ARG	2.2
1	A	122	GLY	2.2

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Mol	Chain	Res	Type	RSRZ
1	J	100	ASP	2.2
1	K	87	HIS	2.2
1	B	130	ASP	2.2
1	J	128	VAL	2.2
1	F	141	PRO	2.2
1	B	125	PRO	2.1
1	K	126	VAL	2.1
1	H	140	ALA	2.1
1	L	52	ASP	2.1
1	E	140	ALA	2.1
1	J	103	ALA	2.1
1	C	55	ALA	2.1
1	F	2	ARG	2.1
1	K	103	ALA	2.1
1	K	129	PRO	2.0
1	B	121	ASP	2.0
1	J	136	LEU	2.0
1	B	140	ALA	2.0
1	J	139	TYR	2.0
1	B	117	LEU	2.0
1	A	137	ASP	2.0
1	H	138	ALA	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 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	CL	G	201	1/1	0.88	0.44	13.60	85,85,85,85	0
2	CL	A	201	1/1	0.93	0.30	8.69	84,84,84,84	0
3	PG4	D	201	13/13	0.85	0.20	4.40	46,59,64,66	0
2	CL	K	202	1/1	0.93	0.23	4.17	73,73,73,73	0
2	CL	K	201	1/1	0.96	0.17	1.26	62,62,62,62	0
2	CL	H	201	1/1	0.98	0.15	0.33	35,35,35,35	1

6.5 Other polymers [i](#)

There are no such residues in this entry.