



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 08:27 PM GMT

PDB ID : 4RVN
Title : Crystal structure of a Putative Acyl-CoA ligase (BT_0428) from Bacteroides
thetaiotaomicron VPI-5482 at 2.20 Å resolution
Authors : Joint Center for Structural Genomics (JCSG)
Deposited on : 2014-11-26
Resolution : 2.20 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

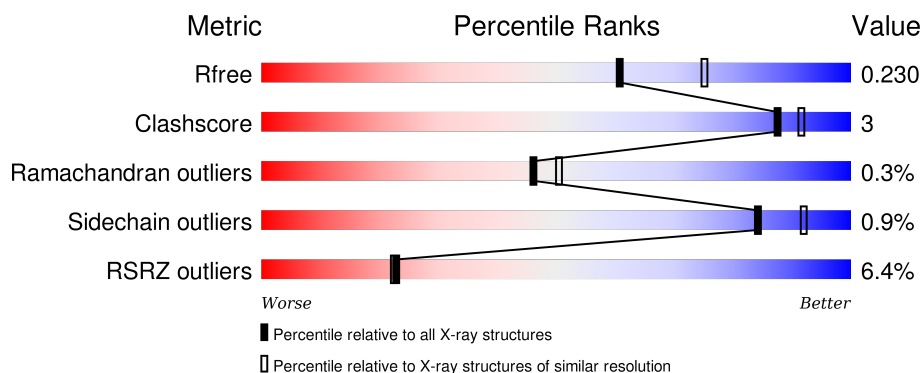
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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	3774 (2.20-2.20)
Clashscore	102246	4477 (2.20-2.20)
Ramachandran outliers	100387	4404 (2.20-2.20)
Sidechain outliers	100360	4405 (2.20-2.20)
RSRZ outliers	91569	3781 (2.20-2.20)

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	436	<div> <div>3%</div> <div>94%</div> <div>6%</div> </div>
1	B	436	<div> <div>11%</div> <div>92%</div> <div>5%</div> </div>
1	C	436	<div> <div>4%</div> <div>93%</div> <div>7%</div> </div>
1	D	436	<div> <div>6%</div> <div>92%</div> <div>6%</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
6	UNL	A	507	-	-	X	X
6	UNL	B	503	-	-	X	X
6	UNL	C	507	-	-	X	X
6	UNL	D	503	-	-	X	X
8	EDO	A	510	-	-	-	X
8	EDO	A	512	-	-	-	X
8	EDO	B	505	-	-	-	X
8	EDO	C	511	-	-	-	X
8	EDO	D	505	-	-	-	X

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 14520 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 Phenylacetate-coenzyme A ligase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	433	Total	C	N	O	S	Se	0	6	0
			3445	2173	593	658	6	15			
1	B	424	Total	C	N	O	S	Se	0	8	0
			3356	2115	581	639	6	15			
1	C	434	Total	C	N	O	S	Se	0	3	0
			3427	2162	597	647	6	15			
1	D	426	Total	C	N	O	S	Se	0	6	0
			3362	2124	577	640	6	15			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	GLY	-	EXPRESSION TAG	UNP Q8AAN6
B	0	GLY	-	EXPRESSION TAG	UNP Q8AAN6
C	0	GLY	-	EXPRESSION TAG	UNP Q8AAN6
D	0	GLY	-	EXPRESSION TAG	UNP Q8AAN6

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

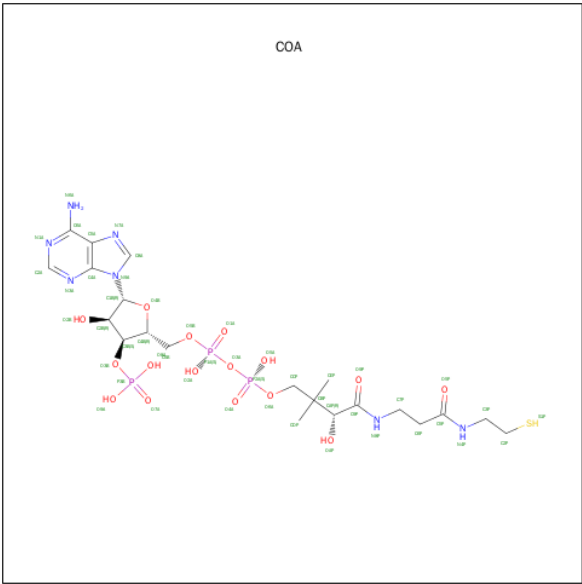
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	1	Total	Zn	0	0
			1	1		
2	A	1	Total	Zn	0	0
			1	1		
2	D	1	Total	Zn	0	0
			1	1		
2	C	1	Total	Zn	0	0
			1	1		

- Molecule 3 is ADENOSINE MONOPHOSPHATE (three-letter code: AMP) (formula: C₁₀H₁₄N₅O₇P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	1
			23	10	5	7	1		
3	B	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
3	C	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
3	D	1	Total	C	N	O	P	0	0
			23	10	5	7	1		

- Molecule 4 is COENZYME A (three-letter code: COA) (formula: C₂₁H₃₆N₇O₁₆P₃S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			31	10	5	13	3		
4	C	1	Total	C	N	O	P	0	0
			31	10	5	13	3		

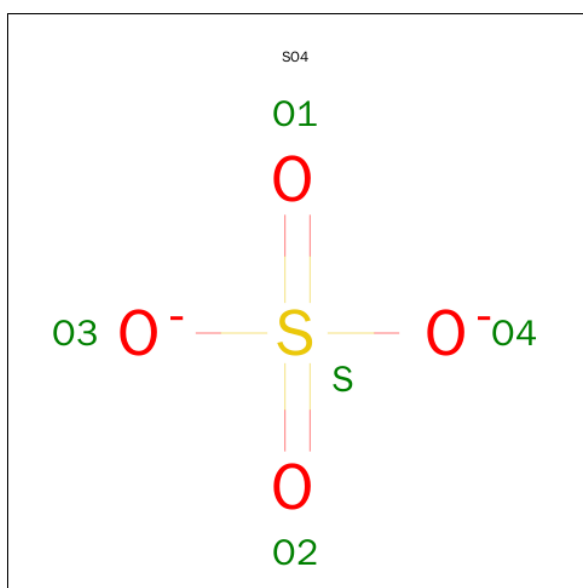
- Molecule 5 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	3	Total	K	0	0
			3	3		
5	C	3	Total	K	0	0
			3	3		

- Molecule 6 is UNKNOWN LIGAND (three-letter code: UNL) (formula:).

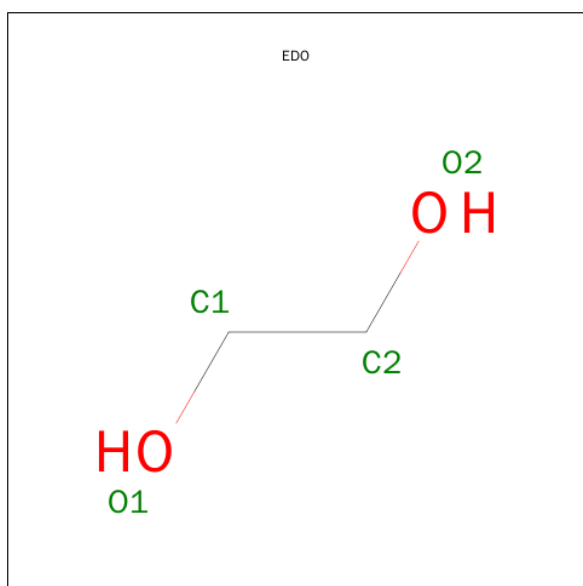
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	1	Total	O	0	0
			9	9		
6	A	1	Total	O	0	0
			10	10		
6	D	1	Total	O	0	0
			7	7		
6	C	1	Total	O	0	0
			6	6		

- Molecule 7 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



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

- Molecule 8 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



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

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	C	1	Total 4	C 2	O 2	0	0
8	C	1	Total 4	C 2	O 2	0	0
8	D	1	Total 4	C 2	O 2	0	0
8	D	1	Total 4	C 2	O 2	0	0

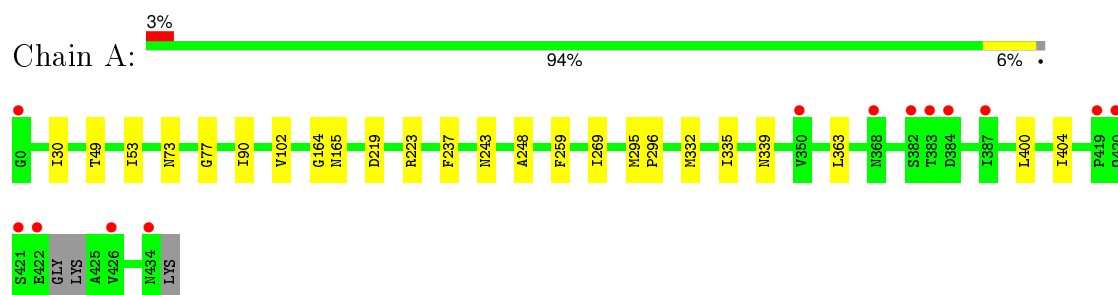
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	213	Total 214	O 214	0	1
9	B	142	Total 143	O 143	0	1
9	C	134	Total 135	O 135	0	1
9	D	173	Total 173	O 173	0	1

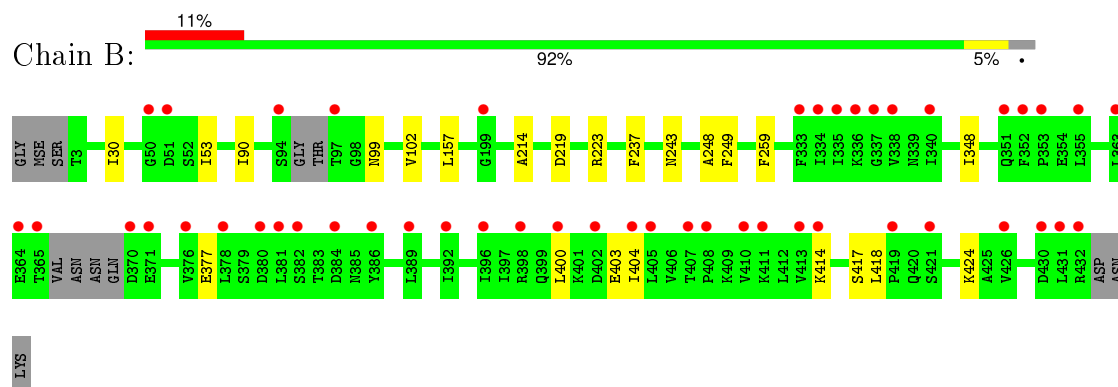
3 Residue-property plots

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.

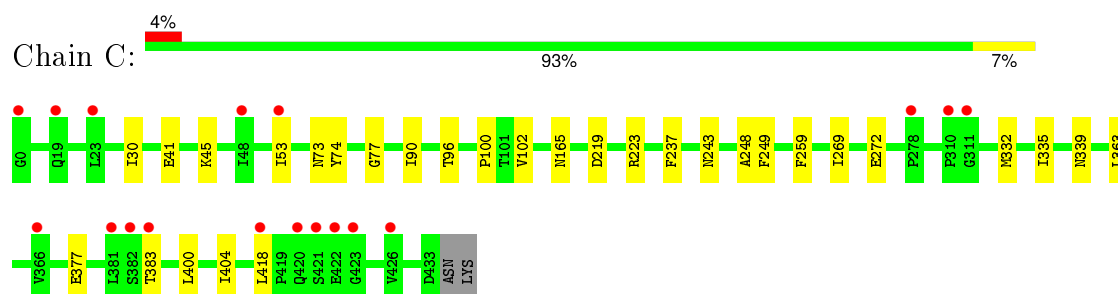
- Molecule 1: Phenylacetate-coenzyme A ligase



- Molecule 1: Phenylacetate-coenzyme A ligase

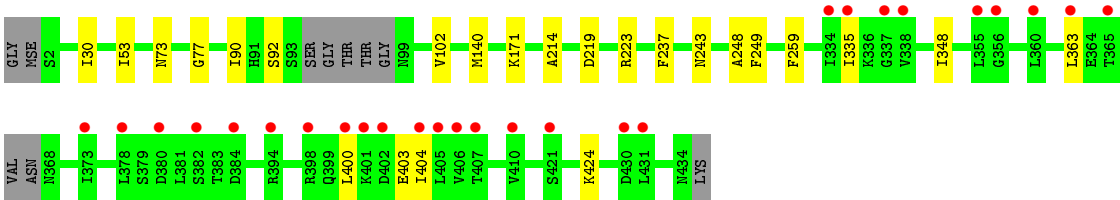


- Molecule 1: Phenylacetate-coenzyme A ligase



- Molecule 1: Phenylacetate-coenzyme A ligase





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	127.78 Å 211.30 Å 71.98 Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.78 – 2.20 47.78 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.9 (47.78-2.20) 99.9 (47.78-2.20)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.11 (at 2.20 Å)	Xtriage
Refinement program	BUSTER 2.10.0	Depositor
R, R_{free}	0.192 , 0.219 0.204 , 0.230	Depositor DCC
R_{free} test set	4990 reflections (5.28%)	DCC
Wilson B-factor (Å ²)	38.1	Xtriage
Anisotropy	0.564	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 43.0	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	1 of 99569 reflections (0.001%)	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	14520	wwPDB-VP
Average B, all atoms (Å ²)	57.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.70% 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: ZN, K, EDO, COA, SO4, AMP, UNL

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	0/3506	0.60	0/4709
1	B	0.42	0/3423	0.59	0/4601
1	C	0.42	0/3480	0.60	0/4675
1	D	0.42	0/3423	0.60	0/4602
All	All	0.42	0/13832	0.60	0/18587

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	3445	0	3434	14	0
1	B	3356	0	3309	13	0
1	C	3427	0	3417	13	0
1	D	3362	0	3307	14	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
3	A	23	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	23	0	12	2	0
3	C	23	0	12	3	0
3	D	23	0	12	2	0
4	A	31	0	11	1	0
4	C	31	0	11	0	0
5	A	3	0	0	0	0
5	C	3	0	0	0	0
6	A	10	0	0	7	0
6	B	9	0	0	3	0
6	C	6	0	0	5	0
6	D	7	0	0	5	0
7	A	10	0	0	0	0
7	B	5	0	0	0	0
7	C	5	0	0	0	0
7	D	5	0	0	0	0
8	A	20	0	30	2	0
8	B	4	0	6	0	0
8	C	12	0	18	0	0
8	D	8	0	12	0	0
9	A	214	0	0	1	0
9	B	143	0	0	0	0
9	C	135	0	0	0	0
9	D	173	0	0	0	0
All	All	14520	0	13591	72	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 (72) 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)
3:D:502:AMP:O1P	6:D:503:UNL:O2	1.65	1.13
6:D:503:UNL:O2	6:D:503:UNL:O1	1.96	0.84
6:D:503:UNL:O2	6:D:503:UNL:O3	1.98	0.81
3:D:502:AMP:P	6:D:503:UNL:O2	2.39	0.80
3:B:502:AMP:O2P	6:B:503:UNL:O3	1.99	0.80
3:A:502[A]:AMP:O3P	6:A:507:UNL:O4	2.06	0.73
6:C:507:UNL:O5	6:C:507:UNL:O6	2.10	0.70
1:B:214:ALA:HB1	1:B:424:LYS:HE2	1.74	0.69
3:C:502:AMP:P	6:C:507:UNL:O1	2.51	0.68
3:C:502:AMP:O2P	6:C:507:UNL:O1	2.12	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:502:AMP:O3P	6:C:507:UNL:O1	2.14	0.65
1:A:30:ILE:HD13	1:A:53:ILE:HG13	1.80	0.64
1:D:30:ILE:HD13	1:D:53:ILE:HG13	1.80	0.63
6:A:507:UNL:O2	6:A:507:UNL:O4	2.17	0.63
1:B:30:ILE:HD13	1:B:53:ILE:HG13	1.81	0.62
1:C:30:ILE:HD13	1:C:53:ILE:HG13	1.81	0.62
6:C:507:UNL:O1	6:C:507:UNL:O2	2.18	0.62
1:D:90:ILE:HG23	1:D:102:VAL:HG13	1.83	0.60
6:A:507:UNL:O5	6:A:507:UNL:O4	2.21	0.59
6:A:507:UNL:O6	6:A:507:UNL:O5	2.21	0.58
1:D:348:ILE:HD12	1:D:400:LEU:HD23	1.87	0.57
1:B:348:ILE:HD12	1:B:400:LEU:HD23	1.87	0.57
1:D:214:ALA:HB1	1:D:424:LYS:HE2	1.89	0.54
6:B:503:UNL:O2	6:B:503:UNL:O3	2.27	0.52
1:D:335:ILE:HD13	1:D:363:LEU:HD22	1.92	0.52
1:C:335:ILE:HD13	1:C:363:LEU:HD22	1.92	0.51
1:A:335:ILE:HD13	1:A:363:LEU:HD22	1.94	0.50
1:C:237:PHE:HB3	1:C:248:ALA:HB3	1.95	0.49
1:C:41:GLU:HG3	1:C:45:LYS:HE2	1.96	0.48
1:A:296:PRO:HD2	9:A:606:HOH:O	2.13	0.48
1:B:237:PHE:HB3	1:B:248:ALA:HB3	1.96	0.48
1:D:237:PHE:HB3	1:D:248:ALA:HB3	1.95	0.47
1:D:30:ILE:CD1	1:D:53:ILE:HG13	2.44	0.47
1:A:295:MSE:HE1	8:A:512:EDO:H22	1.97	0.46
1:C:96:THR:HA	1:D:171:LYS:HD2	1.98	0.46
1:A:30:ILE:CD1	1:A:53:ILE:HG13	2.46	0.45
1:A:332:MSE:SE	1:A:339:ASN:HB3	2.67	0.45
1:A:49:THR:HA	8:A:510:EDO:H21	1.98	0.45
1:A:90:ILE:HG23	1:A:102:VAL:HG13	1.98	0.45
1:B:90:ILE:HG23	1:B:102:VAL:HG13	1.99	0.44
6:A:507:UNL:O6	6:A:507:UNL:O7	2.35	0.44
1:A:237:PHE:HB3	1:A:248:ALA:HB3	1.99	0.44
6:D:503:UNL:O1	6:D:503:UNL:O5	2.36	0.44
1:B:30:ILE:CD1	1:B:53:ILE:HG13	2.46	0.44
1:B:414:LYS:HB3	1:B:417:SER:OG	2.17	0.44
1:D:92:SER:HB3	1:D:140:MSE:HE3	2.00	0.43
1:C:400:LEU:O	1:C:404:ILE:HG12	2.18	0.43
1:C:219:ASP:O	1:C:223:ARG:HG2	2.19	0.43
1:B:400:LEU:O	1:B:404:ILE:HG12	2.19	0.43
1:D:348:ILE:HD11	1:D:403:GLU:HG2	2.01	0.43
1:D:348:ILE:HD11	1:D:403:GLU:CB	2.49	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:74:TYR:CE1	1:C:100:PRO:HD2	2.53	0.43
1:A:400:LEU:O	1:A:404:ILE:HG12	2.18	0.43
1:C:30:ILE:CD1	1:C:53:ILE:HG13	2.47	0.43
1:A:90:ILE:HD11	1:B:157:LEU:HD21	2.01	0.43
1:D:400:LEU:O	1:D:404:ILE:HG12	2.19	0.42
1:C:73:ASN:HB3	1:C:77:GLY:HA3	2.00	0.42
1:D:219:ASP:O	1:D:223:ARG:HG2	2.19	0.42
1:B:377:GLU:HG3	1:B:418:LEU:HD12	2.01	0.42
1:A:219:ASP:O	1:A:223:ARG:HG2	2.19	0.42
1:B:348:ILE:HD11	1:B:403:GLU:HG2	2.00	0.42
1:A:73:ASN:HB3	1:A:77:GLY:HA3	2.01	0.42
1:B:348:ILE:HD11	1:B:403:GLU:CB	2.49	0.42
1:B:219:ASP:O	1:B:223:ARG:HG2	2.19	0.42
1:A:164:GLY:HA2	4:A:503:COA:H1B	2.01	0.42
1:C:332:MSE:SE	1:C:339:ASN:HB3	2.70	0.41
1:D:73:ASN:HB3	1:D:77:GLY:HA3	2.01	0.41
1:C:90:ILE:HG23	1:C:102:VAL:HG13	2.02	0.41
3:B:502:AMP:O2P	6:B:503:UNL:O2	2.38	0.41
1:C:377:GLU:HG3	1:C:418:LEU:HD12	2.02	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	435/436 (100%)	418 (96%)	16 (4%)	1 (0%)	52	59
1	B	426/436 (98%)	411 (96%)	14 (3%)	1 (0%)	52	59
1	C	435/436 (100%)	414 (95%)	19 (4%)	2 (0%)	34	35
1	D	426/436 (98%)	408 (96%)	17 (4%)	1 (0%)	52	59
All	All	1722/1744 (99%)	1651 (96%)	66 (4%)	5 (0%)	46	50

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	243	ASN
1	B	243	ASN
1	C	243	ASN
1	D	243	ASN
1	C	383	THR

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	377/370 (102%)	374 (99%)	3 (1%)	86	93
1	B	363/370 (98%)	360 (99%)	3 (1%)	86	93
1	C	371/370 (100%)	366 (99%)	5 (1%)	76	87
1	D	361/370 (98%)	359 (99%)	2 (1%)	90	95
All	All	1472/1480 (100%)	1459 (99%)	13 (1%)	84	92

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	165	ASN
1	A	259	PHE
1	A	269	ILE
1	B	99	ASN
1	B	249	PHE
1	B	259	PHE
1	C	165	ASN
1	C	249	PHE
1	C	259	PHE
1	C	269	ILE
1	C	272	GLU
1	D	249	PHE
1	D	259	PHE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such

sidechains are listed below:

Mol	Chain	Res	Type
1	A	369	GLN
1	C	369	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 carbohydrates in this entry.

5.6 Ligand geometry ⓘ

Of 36 ligands modelled in this entry, 4 are unknown and 10 are monoatomic - leaving 22 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
3	AMP	A	502[A]	-	20,25,25	0.59	0	22,38,38	0.54	0
4	COA	A	503	-	26,33,50	0.68	0	33,52,75	1.73	7 (21%)
7	SO4	A	508	-	4,4,4	0.27	0	6,6,6	0.15	0
7	SO4	A	509	-	4,4,4	0.14	0	6,6,6	0.07	0
8	EDO	A	510	-	3,3,3	0.60	0	2,2,2	0.26	0
8	EDO	A	511	-	3,3,3	0.57	0	2,2,2	0.44	0
8	EDO	A	512	-	3,3,3	0.46	0	2,2,2	0.42	0
8	EDO	A	513	-	3,3,3	0.67	0	2,2,2	0.29	0
8	EDO	A	514	-	3,3,3	0.57	0	2,2,2	0.44	0
3	AMP	B	502	-	20,25,25	0.56	0	22,38,38	0.54	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
7	SO4	B	504	-	4,4,4	0.20	0	6,6,6	0.15	0
8	EDO	B	505	-	3,3,3	0.56	0	2,2,2	0.43	0
3	AMP	C	502	5	20,25,25	0.55	0	22,38,38	0.53	0
4	COA	C	503	-	26,33,50	0.75	1 (3%)	33,52,75	1.73	7 (21%)
7	SO4	C	508	-	4,4,4	0.15	0	6,6,6	0.10	0
8	EDO	C	509	-	3,3,3	0.56	0	2,2,2	0.44	0
8	EDO	C	510	-	3,3,3	0.60	0	2,2,2	0.36	0
8	EDO	C	511	-	3,3,3	0.61	0	2,2,2	0.34	0
3	AMP	D	502	-	20,25,25	0.54	0	22,38,38	0.50	0
7	SO4	D	504	-	4,4,4	0.17	0	6,6,6	0.13	0
8	EDO	D	505	-	3,3,3	0.60	0	2,2,2	0.35	0
8	EDO	D	506	-	3,3,3	0.58	0	2,2,2	0.42	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	AMP	A	502[A]	-	-	0/6/26/26	0/3/3/3
4	COA	A	503	-	-	0/17/37/64	0/3/3/3
7	SO4	A	508	-	-	0/0/0/0	0/0/0/0
7	SO4	A	509	-	-	0/0/0/0	0/0/0/0
8	EDO	A	510	-	-	0/1/1/1	0/0/0/0
8	EDO	A	511	-	-	0/1/1/1	0/0/0/0
8	EDO	A	512	-	-	0/1/1/1	0/0/0/0
8	EDO	A	513	-	-	0/1/1/1	0/0/0/0
8	EDO	A	514	-	-	0/1/1/1	0/0/0/0
3	AMP	B	502	-	-	0/6/26/26	0/3/3/3
7	SO4	B	504	-	-	0/0/0/0	0/0/0/0
8	EDO	B	505	-	-	0/1/1/1	0/0/0/0
3	AMP	C	502	5	-	0/6/26/26	0/3/3/3
4	COA	C	503	-	-	0/17/37/64	0/3/3/3
7	SO4	C	508	-	-	0/0/0/0	0/0/0/0
8	EDO	C	509	-	-	0/1/1/1	0/0/0/0
8	EDO	C	510	-	-	0/1/1/1	0/0/0/0
8	EDO	C	511	-	-	0/1/1/1	0/0/0/0
3	AMP	D	502	-	-	0/6/26/26	0/3/3/3
7	SO4	D	504	-	-	0/0/0/0	0/0/0/0
8	EDO	D	505	-	-	0/1/1/1	0/0/0/0
8	EDO	D	506	-	-	0/1/1/1	0/0/0/0

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	503	COA	P2A-O6A	2.30	1.63	1.54

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	503	COA	O6A-P2A-O5A	-2.45	98.03	107.38
4	C	503	COA	O6A-P2A-O5A	-2.41	98.22	107.38
4	A	503	COA	P1A-O3A-P2A	-2.12	125.57	132.67
4	C	503	COA	P1A-O3A-P2A	-2.09	125.64	132.67
4	A	503	COA	O2A-P1A-O1A	2.01	123.41	112.53
4	C	503	COA	O2A-P1A-O1A	2.05	123.65	112.53
4	C	503	COA	O6A-P2A-O3A	2.68	117.27	105.09
4	A	503	COA	O6A-P2A-O3A	3.07	119.02	105.09
4	C	503	COA	O5A-P2A-O4A	3.42	121.60	110.58
4	A	503	COA	O5A-P2A-O4A	3.75	122.64	110.58
4	A	503	COA	O3B-P3B-O7A	3.97	117.03	107.11
4	C	503	COA	O3B-P3B-O7A	4.06	117.25	107.11
4	A	503	COA	O3A-P1A-O5B	5.11	116.50	102.94
4	C	503	COA	O3A-P1A-O5B	5.62	117.86	102.94

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

7 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	502[A]	AMP	1	0
4	A	503	COA	1	0
8	A	510	EDO	1	0
8	A	512	EDO	1	0
3	B	502	AMP	2	0
3	C	502	AMP	3	0
3	D	502	AMP	2	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	418/436 (95%)	-0.08	13 (3%) 52 51	28, 47, 83, 133	0
1	B	410/436 (94%)	0.50	48 (11%) 6 6	32, 57, 107, 133	0
1	C	419/436 (96%)	0.14	18 (4%) 39 38	33, 58, 95, 114	0
1	D	412/436 (94%)	0.22	27 (6%) 22 21	30, 51, 92, 119	0
All	All	1659/1744 (95%)	0.19	106 (6%) 23 22	28, 54, 98, 133	0

All (106) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	421	SER	8.9
1	D	405	LEU	6.1
1	A	426	VAL	5.8
1	D	338	VAL	5.7
1	B	400	LEU	5.7
1	B	431	LEU	5.6
1	B	334	ILE	5.4
1	B	340	ILE	4.9
1	C	53	ILE	4.9
1	B	363	LEU	4.8
1	B	338	VAL	4.8
1	B	396	ILE	4.6
1	B	402	ASP	4.5
1	B	398[A]	ARG	4.5
1	B	335	ILE	4.4
1	B	364	GLU	4.4
1	B	365	THR	4.3
1	B	333	PHE	4.3
1	B	389	LEU	4.2
1	B	370	ASP	4.2
1	B	392	ILE	4.1

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Mol	Chain	Res	Type	RSRZ
1	B	94	SER	4.0
1	C	382	SER	4.0
1	B	371	GLU	4.0
1	D	378	LEU	4.0
1	B	405	LEU	3.9
1	D	335	ILE	3.9
1	B	410	VAL	3.9
1	B	411	LYS	3.9
1	B	407	THR	3.8
1	C	0	GLY	3.8
1	B	430	ASP	3.7
1	A	419	PRO	3.6
1	B	404	ILE	3.6
1	C	383	THR	3.6
1	B	337	GLY	3.5
1	D	373	ILE	3.5
1	B	408	PRO	3.5
1	A	422	GLU	3.4
1	D	400	LEU	3.4
1	B	352	PHE	3.4
1	C	421	SER	3.3
1	D	363	LEU	3.3
1	D	382	SER	3.3
1	D	355	LEU	3.2
1	C	423	GLY	3.2
1	A	383	THR	3.2
1	B	50	GLY	3.1
1	C	418	LEU	3.1
1	B	336	LYS	3.1
1	D	431	LEU	3.0
1	B	380	ASP	3.0
1	D	402	ASP	3.0
1	B	381	LEU	3.0
1	B	378	LEU	3.0
1	C	426	VAL	2.9
1	A	368	ASN	2.9
1	A	384	ASP	2.9
1	A	434	ASN	2.9
1	B	384	ASP	2.8
1	C	310	PRO	2.8
1	A	350	VAL	2.7
1	D	380	ASP	2.7

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Mol	Chain	Res	Type	RSRZ
1	D	337	GLY	2.7
1	B	421	SER	2.7
1	D	404	ILE	2.6
1	B	419	PRO	2.6
1	D	406	VAL	2.6
1	A	387	ILE	2.5
1	C	420	GLN	2.5
1	B	351[A]	GLN	2.5
1	A	382	SER	2.5
1	D	334	ILE	2.5
1	B	386	TYR	2.5
1	D	356	GLY	2.5
1	D	407	THR	2.5
1	B	376	VAL	2.4
1	B	426	VAL	2.4
1	A	0	GLY	2.4
1	D	394	ARG	2.4
1	D	401	LYS	2.4
1	C	48	ILE	2.3
1	B	97	THR	2.3
1	B	353	PRO	2.3
1	C	311	GLY	2.3
1	B	432	ARG	2.3
1	D	398	ARG	2.3
1	B	413	VAL	2.2
1	D	410	VAL	2.2
1	D	360	LEU	2.2
1	C	381	LEU	2.2
1	D	365	THR	2.2
1	D	430	ASP	2.1
1	C	278	PRO	2.1
1	C	422	GLU	2.1
1	A	420	GLN	2.1
1	B	382	SER	2.1
1	B	51	ASP	2.1
1	B	355	LEU	2.1
1	B	199	GLY	2.1
1	C	23	LEU	2.1
1	B	414	LYS	2.1
1	D	421[A]	SER	2.1
1	D	384	ASP	2.1
1	C	19	GLN	2.0

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Mol	Chain	Res	Type	RSRZ
1	C	366	VAL	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(Å ²)	Q<0.9
8	EDO	A	510	4/4	0.73	0.26	7.80	54,55,55,55	0
6	UNL	C	507	6/-	0.85	0.31	6.95	34,42,56,71	0
8	EDO	C	511	4/4	0.74	0.23	6.84	51,52,53,54	0
8	EDO	D	505	4/4	0.77	0.24	6.48	76,77,78,78	0
8	EDO	A	512	4/4	0.89	0.23	5.98	60,60,61,61	0
6	UNL	B	503	9/-	0.83	0.48	5.26	40,42,59,60	0
8	EDO	B	505	4/4	0.75	0.26	5.18	78,78,78,79	0
6	UNL	A	507	10/-	0.81	0.25	5.14	26,36,54,56	0
6	UNL	D	503	7/-	0.85	0.35	4.78	32,43,56,62	0
8	EDO	A	513	4/4	0.95	0.13	1.33	38,39,39,40	0
4	COA	A	503	31/48	0.84	0.18	1.16	82,90,109,110	0
7	SO4	B	504	5/5	0.92	0.13	1.15	103,103,103,104	0
7	SO4	D	504	5/5	0.94	0.11	0.75	86,86,87,87	0
7	SO4	C	508	5/5	0.85	0.18	0.49	114,114,114,114	0
4	COA	C	503	31/48	0.90	0.14	0.20	71,76,90,90	0
3	AMP	B	502	23/23	0.96	0.10	-0.93	45,48,49,50	0
7	SO4	A	508	5/5	0.98	0.07	-0.99	51,51,53,54	0
3	AMP	C	502	23/23	0.97	0.11	-1.08	39,42,43,45	0
3	AMP	D	502	23/23	0.96	0.10	-1.19	35,39,52,55	0
5	K	C	505	1/1	0.98	0.09	-1.24	37,37,37,37	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
3	AMP	A	502[A]	23/23	0.98	0.09	-1.31	29,32,34,36	0
2	ZN	A	501	1/1	0.99	0.07	-1.59	43,43,43,43	0
5	K	A	505	1/1	0.95	0.08	-1.74	43,43,43,43	0
2	ZN	D	501	1/1	0.98	0.07	-1.86	48,48,48,48	0
5	K	C	506	1/1	0.96	0.07	-2.09	38,38,38,38	0
2	ZN	C	501	1/1	0.95	0.05	-2.19	57,57,57,57	0
5	K	A	506	1/1	0.99	0.06	-2.46	30,30,30,30	0
5	K	A	504	1/1	0.99	0.06	-3.13	38,38,38,38	0
2	ZN	B	501	1/1	0.96	0.07	-3.59	47,47,47,47	0
5	K	C	504	1/1	0.98	0.07	-5.03	44,44,44,44	0
8	EDO	A	511	4/4	0.90	0.23	-	73,73,74,75	0
8	EDO	C	510	4/4	0.77	0.22	-	68,68,69,69	0
8	EDO	D	506	4/4	0.84	0.20	-	55,56,57,58	0
8	EDO	A	514	4/4	0.78	0.19	-	74,74,74,75	0
8	EDO	C	509	4/4	0.83	0.22	-	69,69,70,70	0
7	SO4	A	509	5/5	0.84	0.11	-	127,127,127,127	0

6.5 Other polymers

There are no such residues in this entry.