



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 01:16 PM UTC

PDB ID : 1CQI / pdb_00001cqi
Title : Crystal Structure of the Complex of ADP and MG2+ with Dephosphorylated
E. Coli Succinyl-CoA Synthetase
Authors : Joyce, M.A.; Fraser, M.E.; James, M.N.G.; Bridger, W.A.; Wolodko, W.T.
Deposited on : 1999-08-06
Resolution : 3.30 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

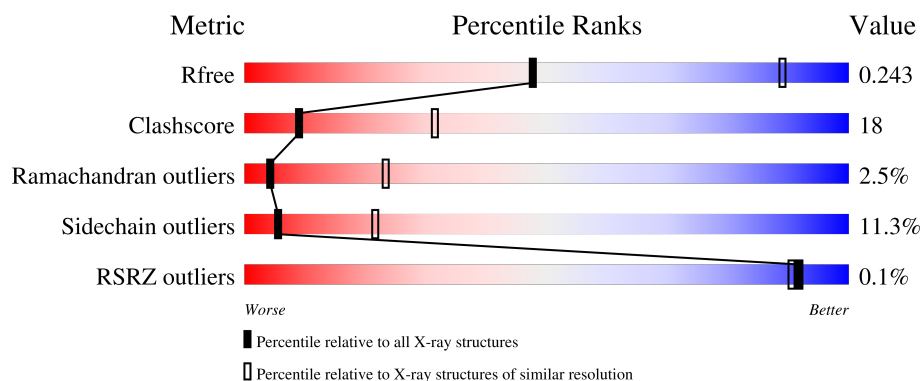
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.30 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}	180053	1169 (3.32-3.28)
Clashscore	190562	1209 (3.32-3.28)
Ramachandran outliers	187476	1188 (3.32-3.28)
Sidechain outliers	187428	1187 (3.32-3.28)
RSRZ outliers	180081	1169 (3.32-3.28)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	286	
1	D	286	
2	B	385	
2	E	385	

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 10054 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.

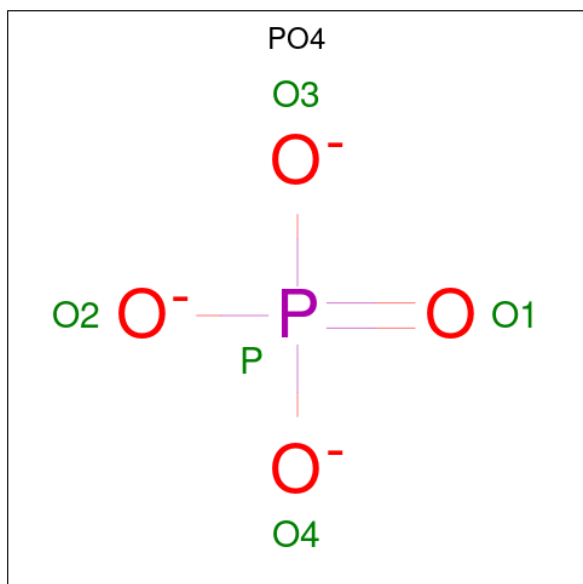
- Molecule 1 is a protein called PROTEIN (SUCCINYL-COA SYNTHETASE ALPHA CHAIN).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	286	Total	C	N	O	S	0	0	0
			2061	1307	345	398	11			
1	D	286	Total	C	N	O	S	0	0	0
			2061	1307	345	398	11			

- Molecule 2 is a protein called PROTEIN (SUCCINYL-COA SYNTHETASE BETA CHAIN).

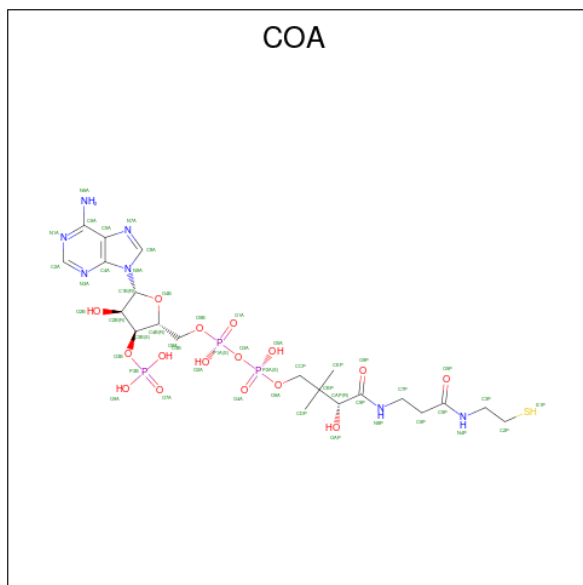
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	385	Total	C	N	O	S	0	0	0
			2885	1823	505	544	13			
2	E	385	Total	C	N	O	S	0	0	0
			2885	1823	505	544	13			

- Molecule 3 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O P 5 4 1	0	0
3	D	1	Total O P 5 4 1	0	0

- Molecule 4 is COENZYME A (CCD ID: COA) (formula: $C_{21}H_{36}N_7O_{16}P_3S$).

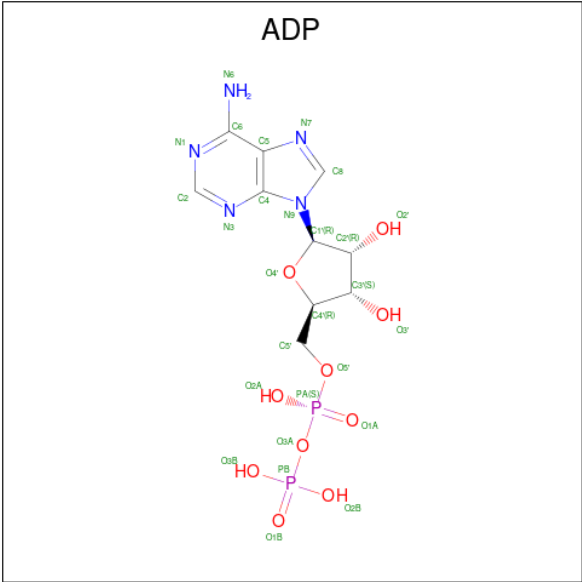


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C N O P S 48 21 7 16 3 1	0	0
4	D	1	Total C N O P S 48 21 7 16 3 1	0	0

- Molecule 5 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total Mg 1 1	0	0
5	E	1	Total Mg 1 1	0	0

- Molecule 6 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).

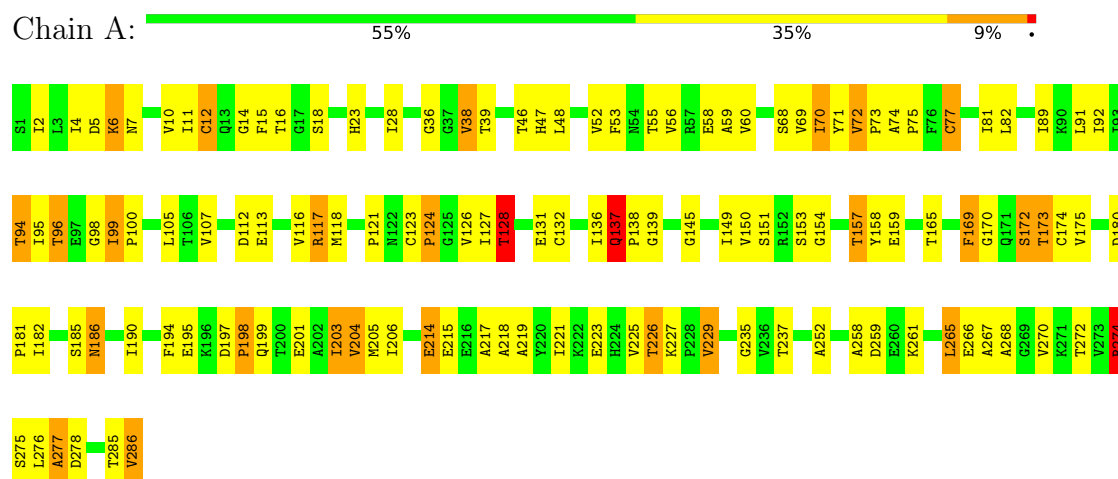


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	B	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
6	E	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

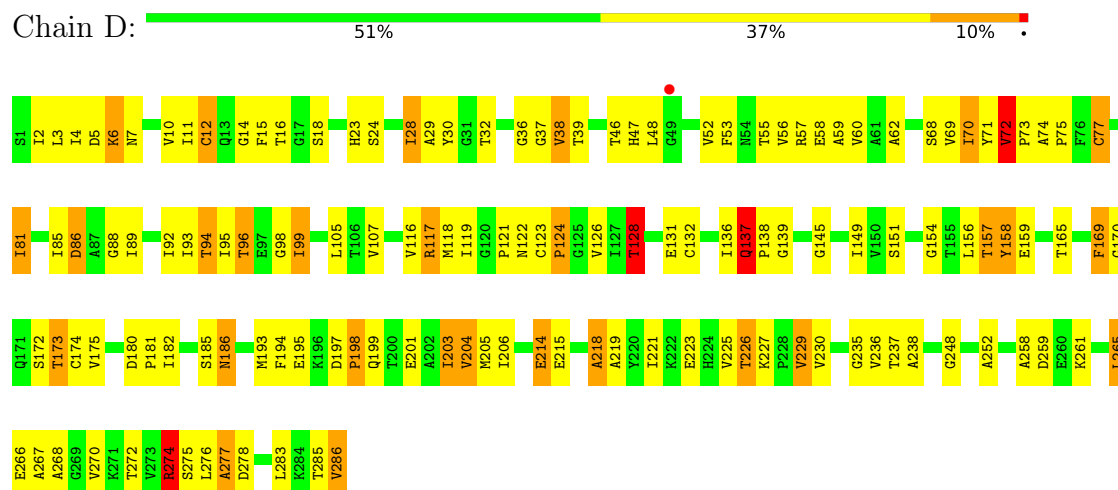
3 Residue-property plots

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: PROTEIN (SUCCINYL-COA SYNTHETASE ALPHA CHAIN)

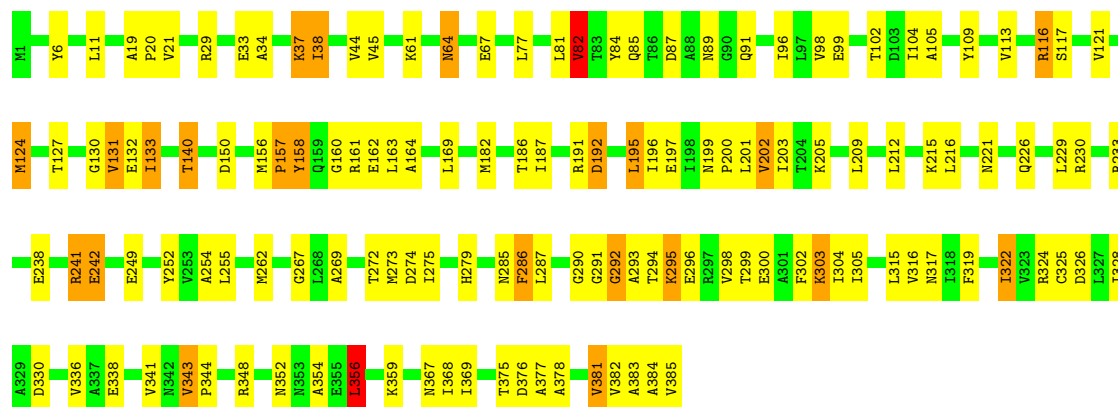


• Molecule 1: PROTEIN (SUCCINYL-COA SYNTHETASE ALPHA CHAIN)



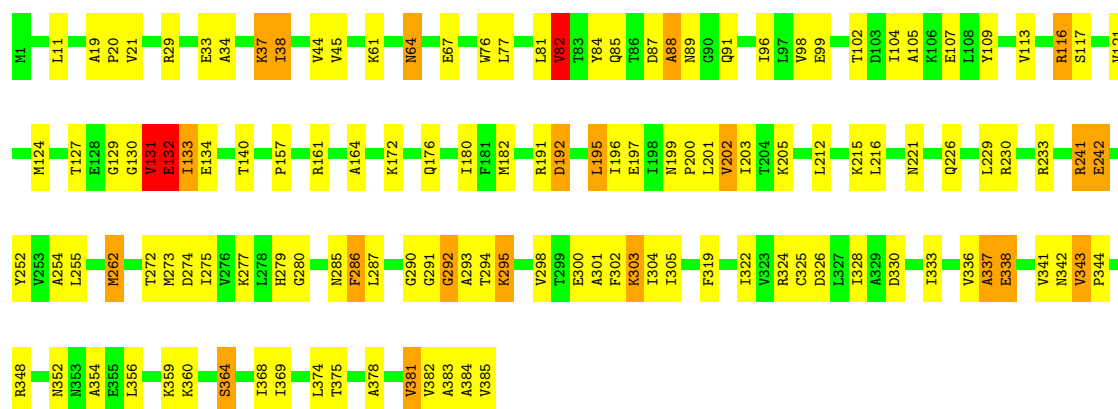
• Molecule 2: PROTEIN (SUCCINYL-COA SYNTHETASE BETA CHAIN)





• Molecule 2: PROTEIN (SUCCINYL-COA SYNTHETASE BETA CHAIN)

Chain E: 66% 28% 5% •



4 Data and refinement statistics

Property	Value	Source
Space group	P 43 2 2	Depositor
Cell constants a, b, c, α , β , γ	99.86Å 99.86Å 407.15Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.30 20.00 – 3.30	Depositor EDS
% Data completeness (in resolution range)	99.0 (20.00-3.30) 98.5 (20.00-3.30)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.50 (at 3.29Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.191 , 0.247 0.195 , 0.243	Depositor DCC
R_{free} test set	3470 reflections (10.93%)	wwPDB-VP
Wilson B-factor (Å ²)	52.9	Xtriage
Anisotropy	0.023	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.24 , 34.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	10054	wwPDB-VP
Average B, all atoms (Å ²)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.98% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ADP, COA, PO4, MG

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	0.99	2/2095 (0.1%)	1.39	34/2838 (1.2%)
1	D	0.98	1/2095 (0.0%)	1.40	37/2838 (1.3%)
2	B	1.02	2/2927 (0.1%)	1.27	27/3961 (0.7%)
2	E	1.02	4/2927 (0.1%)	1.25	23/3961 (0.6%)
All	All	1.00	9/10044 (0.1%)	1.32	121/13598 (0.9%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	1

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	124	MET	SD-CE	9.49	2.03	1.79
2	E	124	MET	SD-CE	5.88	1.94	1.79
2	B	322	ILE	CA-CB	5.55	1.61	1.54
2	E	180	ILE	CA-CB	-5.47	1.47	1.54
2	E	113	VAL	CA-CB	-5.32	1.47	1.54
1	A	123	CYS	CA-C	-5.18	1.49	1.53
2	E	132	GLU	CA-C	-5.18	1.45	1.52
1	A	89	ILE	CA-CB	-5.04	1.48	1.54
1	D	193	MET	SD-CE	5.02	1.92	1.79

All (121) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	203	ILE	N-CA-C	9.42	122.49	108.46
2	B	91	GLN	CA-C-N	8.95	129.50	119.83
2	B	91	GLN	C-N-CA	8.95	129.50	119.83
1	A	203	ILE	N-CA-C	8.76	121.52	108.46
1	A	132	CYS	N-CA-C	8.72	122.75	109.23
2	E	104	ILE	N-CA-C	8.32	120.85	108.54
2	E	91	GLN	CA-C-N	8.29	128.78	119.83
2	E	91	GLN	C-N-CA	8.29	128.78	119.83
2	B	104	ILE	N-CA-C	8.29	120.80	108.54
1	D	132	CYS	N-CA-C	8.23	121.98	109.23
1	A	72	VAL	CA-C-N	8.05	128.11	119.90
1	A	72	VAL	C-N-CA	8.05	128.11	119.90
1	D	72	VAL	CA-C-N	7.91	127.97	119.90
1	D	72	VAL	C-N-CA	7.91	127.97	119.90
1	A	139	GLY	N-CA-C	7.59	125.26	115.32
2	E	19	ALA	CA-C-N	-7.41	113.09	120.21
2	E	19	ALA	C-N-CA	-7.41	113.09	120.21
1	D	14	GLY	N-CA-C	-7.38	101.09	114.46
1	D	229	VAL	N-CA-C	7.34	118.69	108.12
2	E	374	LEU	N-CA-C	7.22	118.84	110.97
1	D	10	VAL	N-CA-C	7.00	118.89	108.46
1	D	123	CYS	CA-C-N	-6.95	111.16	119.84
1	D	123	CYS	C-N-CA	-6.95	111.16	119.84
1	A	81	ILE	N-CA-C	-6.83	103.65	110.62
1	D	139	GLY	N-CA-C	6.82	124.25	115.32
1	D	89	ILE	N-CA-C	-6.81	98.41	108.97
1	A	229	VAL	N-CA-C	6.79	117.89	108.12
2	E	202	VAL	N-CA-C	6.78	119.61	109.17
2	B	202	VAL	N-CA-C	6.77	119.60	109.17
1	A	10	VAL	N-CA-C	6.65	118.37	108.46
1	A	182	ILE	CA-C-N	6.65	126.83	120.31
1	A	182	ILE	C-N-CA	6.65	126.83	120.31
2	B	37	LYS	N-CA-C	-6.65	103.85	112.23
1	A	70	ILE	N-CA-C	6.58	117.39	108.17
2	B	343	VAL	CA-C-N	6.57	126.33	119.76
2	B	343	VAL	C-N-CA	6.57	126.33	119.76
1	D	165	THR	N-CA-C	-6.55	103.41	111.40
1	A	48	LEU	N-CA-C	-6.51	102.63	111.55
1	D	137	GLN	N-CA-C	6.51	119.57	110.20
1	D	223	GLU	N-CA-C	6.50	120.41	112.23
2	B	19	ALA	CA-C-N	-6.46	114.00	120.21
2	B	19	ALA	C-N-CA	-6.46	114.00	120.21
2	B	150	ASP	CA-C-N	-6.43	112.99	120.12

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	150	ASP	C-N-CA	-6.43	112.99	120.12
2	E	113	VAL	CB-CA-C	-6.38	100.83	111.29
1	D	214	GLU	N-CA-C	-6.35	103.98	111.03
1	D	81	ILE	N-CA-C	-6.34	103.17	111.09
1	D	70	ILE	N-CA-C	6.30	117.00	108.17
2	B	328	ILE	N-CA-C	-6.30	104.61	110.53
2	E	205	LYS	N-CA-C	-6.22	104.50	111.28
1	A	128	THR	CA-C-N	6.19	127.58	119.84
1	A	128	THR	C-N-CA	6.19	127.58	119.84
2	E	201	LEU	N-CA-C	-6.15	97.68	108.20
1	A	223	GLU	N-CA-C	6.14	119.97	112.23
1	D	38	VAL	N-CA-C	6.11	116.92	108.12
2	B	117	SER	N-CA-C	6.11	117.73	111.14
1	D	128	THR	CA-C-N	5.98	127.32	119.84
1	D	128	THR	C-N-CA	5.98	127.32	119.84
1	A	137	GLN	N-CA-C	5.90	118.69	110.20
2	E	277	LYS	N-CA-C	-5.88	104.83	112.23
1	A	165	THR	N-CA-C	-5.83	104.28	111.40
2	E	328	ILE	N-CA-C	-5.83	105.05	110.53
2	B	163	LEU	N-CA-C	-5.80	104.87	111.14
1	D	252	ALA	N-CA-C	5.80	117.74	108.41
2	B	205	LYS	N-CA-C	-5.79	104.88	111.07
1	A	99	ILE	CA-C-N	5.76	127.04	119.84
1	A	99	ILE	C-N-CA	5.76	127.04	119.84
2	E	381	VAL	CB-CA-C	-5.71	104.59	112.24
1	A	89	ILE	N-CA-C	-5.67	100.15	109.12
1	D	277	ALA	N-CA-C	-5.66	106.05	113.12
1	A	214	GLU	N-CA-C	-5.64	105.04	111.14
2	E	64	ASN	N-CA-C	5.64	121.96	114.12
2	E	343	VAL	CA-C-N	5.63	125.39	119.76
2	E	343	VAL	C-N-CA	5.63	125.39	119.76
1	A	172	SER	N-CA-C	-5.62	104.79	111.03
1	A	277	ALA	N-CA-C	-5.62	106.10	113.12
1	A	123	CYS	CA-C-N	-5.59	112.85	119.84
1	A	123	CYS	C-N-CA	-5.59	112.85	119.84
2	B	121	VAL	N-CA-C	-5.53	101.60	108.89
1	A	259	ASP	N-CA-C	5.52	117.74	111.11
1	D	37	GLY	N-CA-C	5.50	119.17	111.14
2	B	356	LEU	N-CA-C	-5.50	105.69	112.90
1	D	259	ASP	N-CA-C	5.49	117.70	111.11
2	B	82	VAL	CB-CA-C	-5.46	103.90	110.99
2	B	113	VAL	CB-CA-C	-5.44	102.36	111.29

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	121	VAL	N-CA-C	-5.44	100.61	108.87
2	E	37	LYS	N-CA-C	-5.40	105.56	111.82
1	A	252	ALA	N-CA-C	5.39	117.42	108.20
2	E	131	VAL	N-CA-C	5.38	115.39	107.75
1	D	99	ILE	CA-C-N	5.37	126.55	119.84
1	D	99	ILE	C-N-CA	5.37	126.55	119.84
2	B	162	GLU	N-CA-C	5.37	117.83	111.33
1	A	174	CYS	N-CA-C	5.36	117.26	108.52
1	D	274	ARG	N-CA-C	5.35	119.65	113.18
2	B	156	MET	CA-C-N	5.34	126.52	119.84
2	B	156	MET	C-N-CA	5.34	126.52	119.84
1	A	274	ARG	N-CA-C	5.33	119.62	113.18
1	D	182	ILE	CA-C-N	5.32	125.52	120.31
1	D	182	ILE	C-N-CA	5.32	125.52	120.31
2	B	169	LEU	N-CA-C	-5.32	102.65	110.52
1	D	174	CYS	N-CA-C	5.32	117.19	108.52
2	B	381	VAL	CB-CA-C	-5.29	105.16	112.24
2	B	201	LEU	N-CA-C	-5.23	99.26	108.20
1	D	24	SER	N-CA-C	-5.20	105.06	111.40
1	A	169	PHE	N-CA-C	5.19	121.86	110.80
1	A	123	CYS	CB-CA-C	-5.19	106.49	111.00
2	E	117	SER	N-CA-C	5.17	116.73	111.14
1	D	238	ALA	CA-C-N	5.14	125.35	120.31
1	D	238	ALA	C-N-CA	5.14	125.35	120.31
2	E	82	VAL	CB-CA-C	-5.14	104.31	110.99
1	A	14	GLY	N-CA-C	-5.12	101.05	113.18
1	A	38	VAL	N-CA-C	5.12	115.49	108.12
1	D	172	SER	N-CA-C	-5.09	105.38	111.03
1	D	169	PHE	N-CA-C	5.08	121.62	110.80
1	D	48	LEU	N-CA-C	-5.06	104.62	111.55
1	A	217	ALA	N-CA-C	-5.04	105.67	111.07
2	B	195	LEU	N-CA-C	5.04	116.18	108.52
2	E	262	MET	N-CA-C	-5.03	99.11	107.80
2	E	280	GLY	N-CA-C	5.02	122.53	115.30
1	D	30	TYR	N-CA-C	-5.01	107.00	113.01
2	B	64	ASN	N-CA-C	5.00	121.07	114.12

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	158	TYR	Sidechain

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	2061	0	2117	105	0
1	D	2061	0	2117	108	0
2	B	2885	0	2941	86	0
2	E	2885	0	2941	85	0
3	A	5	0	0	0	0
3	D	5	0	0	0	0
4	A	48	0	31	2	0
4	D	48	0	31	2	0
5	B	1	0	0	0	0
5	E	1	0	0	0	0
6	B	27	0	12	1	0
6	E	27	0	12	1	0
All	All	10054	0	10202	372	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 18.

All (372) 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)
2:B:124:MET:SD	2:B:124:MET:CE	2.03	1.47
1:A:128:THR:HG23	1:A:173:THR:OG1	1.78	0.84
1:D:2:ILE:HG12	1:D:173:THR:HG21	1.60	0.82
1:A:2:ILE:HG12	1:A:173:THR:HG21	1.59	0.82
1:D:128:THR:HG23	1:D:173:THR:OG1	1.79	0.81
2:B:192:ASP:HB2	2:B:226:GLN:HE21	1.44	0.81
1:D:261:LYS:O	1:D:265:LEU:HB2	1.82	0.79
1:A:23:HIS:CD2	1:A:136:ILE:HG22	2.17	0.79
1:A:261:LYS:O	1:A:265:LEU:HB2	1.82	0.79
1:A:274:ARG:HG3	1:A:274:ARG:HH11	1.49	0.77
1:D:221:ILE:HA	1:D:225:VAL:HG23	1.65	0.77
1:A:285:THR:O	1:A:286:VAL:HG13	1.85	0.77
2:B:279:HIS:O	2:B:382:VAL:HG11	1.85	0.77
2:B:368:ILE:C	2:B:369:ILE:HD12	2.10	0.76
1:A:181:PRO:HB2	2:B:116:ARG:HD3	1.68	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:149:ILE:HG12	1:D:204:VAL:HG23	1.68	0.76
1:A:221:ILE:HA	1:A:225:VAL:HG23	1.68	0.74
1:D:181:PRO:HB2	2:E:116:ARG:HD3	1.68	0.74
1:D:237:THR:HG23	2:E:274:ASP:OD1	1.87	0.74
2:E:192:ASP:HB2	2:E:226:GLN:HE21	1.51	0.74
1:A:285:THR:C	1:A:286:VAL:HG22	2.13	0.73
1:A:23:HIS:NE2	1:A:136:ILE:HG22	2.01	0.73
2:B:45:VAL:HG12	2:B:98:VAL:HG22	1.71	0.73
2:E:368:ILE:C	2:E:369:ILE:HD12	2.14	0.72
1:D:23:HIS:CD2	1:D:136:ILE:HG22	2.23	0.72
2:B:105:ALA:HB3	2:B:203:ILE:O	1.89	0.72
1:A:285:THR:O	1:A:286:VAL:HG22	1.90	0.71
2:E:324:ARG:O	2:E:326:ASP:N	2.23	0.71
1:D:285:THR:O	1:D:286:VAL:HG13	1.91	0.71
1:D:266:GLU:C	1:D:268:ALA:H	1.98	0.71
1:D:274:ARG:HH11	1:D:274:ARG:HG3	1.55	0.70
1:A:221:ILE:HG12	1:A:225:VAL:HG21	1.72	0.70
1:A:72:VAL:HG13	1:A:73:PRO:HD2	1.73	0.70
2:E:45:VAL:HG12	2:E:98:VAL:HG22	1.73	0.70
2:E:279:HIS:O	2:E:382:VAL:HG11	1.92	0.69
1:D:149:ILE:HG12	1:D:204:VAL:CG2	2.22	0.69
1:D:105:LEU:C	1:D:105:LEU:HD23	2.18	0.69
2:B:336:VAL:HG13	2:B:341:VAL:HB	1.75	0.69
1:A:6:LYS:HG2	1:A:131:GLU:OE2	1.93	0.68
1:A:145:GLY:HA3	1:A:170:GLY:HA3	1.76	0.68
2:E:215:LYS:O	2:E:216:LEU:HD23	1.92	0.68
1:D:53:PHE:HD2	1:D:59:ALA:HB2	1.58	0.68
1:D:221:ILE:HG12	1:D:225:VAL:HG21	1.76	0.68
1:D:285:THR:C	1:D:286:VAL:HG22	2.19	0.68
2:B:294:THR:O	2:B:298:VAL:HG23	1.95	0.67
1:D:275:SER:C	1:D:277:ALA:H	2.01	0.67
1:A:186:ASN:H	1:A:186:ASN:HD22	1.40	0.67
1:A:266:GLU:C	1:A:268:ALA:H	2.03	0.67
2:E:105:ALA:HB3	2:E:203:ILE:O	1.94	0.67
1:D:71:TYR:CE1	1:D:95:ILE:HG13	2.30	0.66
1:D:23:HIS:NE2	1:D:136:ILE:HG22	2.10	0.66
1:A:74:ALA:HB3	1:A:75:PRO:HD3	1.77	0.66
2:B:161:ARG:O	2:B:164:ALA:HB3	1.97	0.65
1:A:149:ILE:HG12	1:A:204:VAL:HG23	1.79	0.65
1:D:285:THR:O	1:D:286:VAL:HG22	1.97	0.65
1:D:197:ASP:O	1:D:227:LYS:NZ	2.30	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:55:THR:OG1	1:D:58:GLU:HG3	1.97	0.64
1:D:186:ASN:H	1:D:186:ASN:HD22	1.44	0.64
1:A:195:GLU:OE2	1:A:226:THR:HG23	1.97	0.63
1:A:105:LEU:HD23	1:A:105:LEU:C	2.24	0.63
1:D:145:GLY:HA3	1:D:170:GLY:HA3	1.80	0.63
2:B:369:ILE:HD12	2:B:369:ILE:N	2.14	0.63
2:E:272:THR:O	2:E:275:ILE:HG22	1.98	0.63
2:E:255:LEU:N	2:E:255:LEU:HD12	2.15	0.62
1:A:275:SER:C	1:A:277:ALA:H	2.07	0.62
1:D:92:ILE:HG22	1:D:118:MET:HG3	1.82	0.62
1:A:197:ASP:O	1:A:227:LYS:NZ	2.32	0.62
1:D:180:ASP:HB3	1:D:181:PRO:HD2	1.82	0.61
1:D:275:SER:O	1:D:277:ALA:N	2.33	0.61
1:A:70:ILE:HB	1:A:94:THR:HG23	1.83	0.61
1:D:53:PHE:CD2	1:D:59:ALA:HA	2.36	0.61
2:E:202:VAL:CG1	2:E:203:ILE:N	2.63	0.61
2:B:215:LYS:O	2:B:216:LEU:HD23	1.99	0.61
1:D:70:ILE:HB	1:D:94:THR:HG23	1.82	0.61
2:E:202:VAL:HG12	2:E:203:ILE:N	2.15	0.61
2:B:272:THR:O	2:B:275:ILE:HG22	2.01	0.61
2:B:348:ARG:HD3	2:B:348:ARG:C	2.26	0.61
2:B:324:ARG:O	2:B:326:ASP:N	2.34	0.61
1:A:237:THR:HG23	2:B:274:ASP:OD1	2.00	0.61
1:D:266:GLU:O	1:D:268:ALA:N	2.34	0.61
2:E:369:ILE:HD12	2:E:369:ILE:N	2.16	0.60
1:A:154:GLY:O	1:A:157:THR:HB	2.00	0.60
1:A:55:THR:OG1	1:A:58:GLU:HG3	2.01	0.60
1:D:266:GLU:C	1:D:268:ALA:N	2.59	0.60
1:A:53:PHE:CD2	1:A:59:ALA:HA	2.37	0.59
2:E:294:THR:O	2:E:298:VAL:HG23	2.02	0.59
1:D:72:VAL:HG13	1:D:73:PRO:HD2	1.85	0.59
1:A:274:ARG:HG3	1:A:274:ARG:NH1	2.18	0.59
2:B:109:TYR:CD1	2:B:109:TYR:C	2.81	0.59
1:D:6:LYS:HG2	1:D:131:GLU:OE2	2.02	0.59
1:D:72:VAL:O	1:D:96:THR:OG1	2.21	0.58
1:D:229:VAL:O	1:D:270:VAL:HG13	2.03	0.58
1:D:53:PHE:CE2	1:D:59:ALA:HA	2.37	0.58
1:D:195:GLU:OE2	1:D:226:THR:HG23	2.04	0.58
2:E:81:LEU:HD12	2:E:82:VAL:N	2.18	0.58
1:A:149:ILE:HG12	1:A:204:VAL:CG2	2.34	0.57
2:E:109:TYR:CD1	2:E:109:TYR:C	2.81	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:266:GLU:C	1:A:268:ALA:N	2.62	0.57
1:A:126:VAL:HG22	1:A:175:VAL:HG22	1.86	0.57
1:A:151:SER:HB2	1:A:206:ILE:HB	1.86	0.57
1:D:221:ILE:HG23	1:D:225:VAL:HB	1.86	0.57
2:E:157:PRO:HG3	2:E:182:MET:HE2	1.86	0.57
2:E:254:ALA:C	2:E:255:LEU:HD12	2.30	0.57
1:D:266:GLU:HG3	1:D:272:THR:HG21	1.86	0.56
1:D:92:ILE:CG2	1:D:118:MET:HG3	2.35	0.56
1:D:194:PHE:O	1:D:197:ASP:N	2.31	0.56
1:D:221:ILE:HA	1:D:225:VAL:CG2	2.36	0.56
1:D:126:VAL:HG22	1:D:175:VAL:HG22	1.87	0.56
1:D:128:THR:HG23	1:D:173:THR:CB	2.35	0.56
1:A:128:THR:HG23	1:A:173:THR:CB	2.35	0.56
2:E:44:VAL:HG21	6:E:802:ADP:C6	2.41	0.56
1:D:53:PHE:HD2	1:D:59:ALA:CB	2.19	0.56
1:D:215:GLU:O	1:D:218:ALA:HB3	2.06	0.56
2:E:295:LYS:NZ	2:E:295:LYS:HB3	2.21	0.55
1:D:15:PHE:CE2	1:D:47:HIS:HB3	2.41	0.55
2:E:324:ARG:C	2:E:326:ASP:H	2.14	0.55
2:E:381:VAL:HG23	2:E:382:VAL:N	2.22	0.55
2:B:381:VAL:HG23	2:B:382:VAL:N	2.22	0.55
2:E:34:ALA:O	2:E:38:ILE:HG13	2.07	0.55
2:E:81:LEU:HD12	2:E:82:VAL:H	1.70	0.55
1:A:180:ASP:HB3	1:A:181:PRO:HD2	1.89	0.55
2:B:130:GLY:O	2:B:131:VAL:HG23	2.06	0.55
2:E:322:ILE:HG12	2:E:322:ILE:O	2.07	0.55
2:B:202:VAL:CG1	2:B:203:ILE:N	2.69	0.54
1:D:203:ILE:HB	1:D:229:VAL:HG22	1.88	0.54
1:D:137:GLN:HB2	1:D:138:PRO:HD2	1.88	0.54
1:A:98:GLY:HA2	2:B:221:ASN:ND2	2.21	0.54
1:A:266:GLU:O	1:A:268:ALA:N	2.41	0.54
2:B:191:ARG:C	2:B:226:GLN:NE2	2.66	0.54
2:B:254:ALA:C	2:B:255:LEU:HD12	2.32	0.54
1:D:98:GLY:HA2	2:E:221:ASN:ND2	2.22	0.54
2:E:348:ARG:HD3	2:E:348:ARG:C	2.33	0.54
1:A:95:ILE:HA	1:A:124:PRO:HD2	1.90	0.54
1:A:275:SER:O	1:A:277:ALA:N	2.40	0.53
2:E:378:ALA:O	2:E:382:VAL:HG23	2.07	0.53
1:A:71:TYR:CE1	1:A:95:ILE:HG13	2.42	0.53
2:E:336:VAL:HG13	2:E:341:VAL:HB	1.90	0.53
2:B:34:ALA:HA	2:B:37:LYS:HE3	1.89	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:198:PRO:HG2	1:D:199:GLN:H	1.74	0.53
1:D:235:GLY:O	1:D:258:ALA:HB2	2.07	0.53
1:A:53:PHE:CE2	1:A:59:ALA:HA	2.43	0.53
2:B:286:PHE:CD1	2:B:286:PHE:C	2.87	0.53
1:D:70:ILE:HD12	1:D:94:THR:HG23	1.91	0.53
2:E:84:TYR:CD1	2:E:84:TYR:C	2.86	0.53
1:D:28:ILE:HG22	1:D:29:ALA:N	2.24	0.53
1:D:274:ARG:HG3	1:D:274:ARG:NH1	2.23	0.53
1:A:72:VAL:O	1:A:96:THR:OG1	2.23	0.53
1:A:92:ILE:HG22	1:A:118:MET:HG3	1.91	0.53
2:B:255:LEU:HD12	2:B:255:LEU:N	2.22	0.53
1:A:15:PHE:CE2	1:A:47:HIS:HB3	2.44	0.52
1:A:221:ILE:HG23	1:A:225:VAL:HB	1.91	0.52
1:D:151:SER:HB2	1:D:206:ILE:HB	1.90	0.52
2:E:34:ALA:HA	2:E:37:LYS:HE3	1.91	0.52
1:A:2:ILE:HG12	1:A:173:THR:CG2	2.35	0.52
1:A:137:GLN:HB2	1:A:138:PRO:HD2	1.91	0.52
2:B:300:GLU:O	2:B:304:ILE:HG13	2.10	0.52
1:D:136:ILE:HD12	4:D:702:COA:H21	1.91	0.52
1:D:236:VAL:HG23	2:E:274:ASP:OD2	2.10	0.52
1:A:194:PHE:O	1:A:195:GLU:C	2.53	0.52
1:A:266:GLU:HG3	1:A:272:THR:HG21	1.91	0.52
2:E:29:ARG:O	2:E:33:GLU:HG3	2.10	0.52
2:E:241:ARG:HH11	2:E:252:TYR:HE2	1.58	0.51
1:A:70:ILE:HD12	1:A:94:THR:HG23	1.92	0.51
2:B:157:PRO:O	2:B:160:GLY:N	2.43	0.51
1:D:95:ILE:HD13	1:D:124:PRO:HD2	1.92	0.51
1:D:116:VAL:HG12	1:D:117:ARG:N	2.26	0.51
1:D:94:THR:O	1:D:121:PRO:HA	2.11	0.51
1:A:136:ILE:HD12	4:A:701:COA:H21	1.93	0.51
2:E:199:ASN:OD1	2:E:199:ASN:C	2.53	0.51
1:A:145:GLY:HA3	1:A:170:GLY:CA	2.41	0.51
1:A:235:GLY:O	1:A:258:ALA:HB2	2.11	0.51
2:B:322:ILE:HG12	2:B:322:ILE:O	2.11	0.51
2:B:34:ALA:O	2:B:38:ILE:HG13	2.11	0.51
2:E:77:LEU:HD21	2:E:96:ILE:HG12	1.93	0.51
2:B:369:ILE:N	2:B:369:ILE:CD1	2.75	0.50
1:D:2:ILE:HG12	1:D:173:THR:CG2	2.37	0.50
1:D:145:GLY:HA3	1:D:170:GLY:C	2.36	0.50
2:B:202:VAL:HG12	2:B:203:ILE:N	2.26	0.50
2:B:324:ARG:C	2:B:326:ASP:H	2.19	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:352:ASN:C	2:E:354:ALA:H	2.19	0.50
1:A:275:SER:C	1:A:277:ALA:N	2.68	0.50
1:D:218:ALA:O	1:D:219:ALA:C	2.55	0.50
2:E:195:LEU:C	2:E:195:LEU:HD23	2.37	0.50
1:A:221:ILE:HA	1:A:225:VAL:CG2	2.40	0.49
1:D:70:ILE:HB	1:D:94:THR:CG2	2.42	0.49
1:D:186:ASN:HD22	1:D:186:ASN:N	2.06	0.49
1:A:215:GLU:O	1:A:218:ALA:HB3	2.12	0.49
2:B:348:ARG:HD3	2:B:348:ARG:O	2.12	0.49
2:B:241:ARG:O	2:B:242:GLU:C	2.55	0.49
2:E:84:TYR:HD1	2:E:84:TYR:O	1.95	0.49
2:E:34:ALA:HA	2:E:37:LYS:HG3	1.94	0.49
1:A:203:ILE:HB	1:A:229:VAL:HG22	1.94	0.49
1:D:197:ASP:OD1	1:D:198:PRO:HD2	2.13	0.49
1:A:94:THR:O	1:A:121:PRO:HA	2.13	0.49
1:D:57:ARG:O	1:D:58:GLU:C	2.55	0.49
1:A:229:VAL:O	1:A:270:VAL:HG13	2.12	0.48
2:B:34:ALA:HA	2:B:37:LYS:HG3	1.93	0.48
2:B:84:TYR:CD1	2:B:84:TYR:C	2.91	0.48
1:A:150:VAL:HG12	1:A:190:ILE:HG21	1.95	0.48
1:D:159:GLU:OE2	2:E:319:PHE:HD2	1.96	0.48
2:E:191:ARG:C	2:E:226:GLN:NE2	2.71	0.48
1:A:116:VAL:HG12	1:A:117:ARG:N	2.29	0.48
1:D:218:ALA:O	1:D:221:ILE:N	2.38	0.48
1:D:145:GLY:HA3	1:D:170:GLY:CA	2.41	0.48
1:D:214:GLU:HG2	1:D:261:LYS:HD3	1.96	0.48
2:E:241:ARG:NH1	2:E:252:TYR:HE2	2.11	0.48
2:E:255:LEU:HD13	2:E:285:ASN:HA	1.95	0.48
2:B:295:LYS:NZ	2:B:295:LYS:HB3	2.29	0.48
1:A:285:THR:C	1:A:286:VAL:CG2	2.85	0.48
1:A:72:VAL:HG13	1:A:73:PRO:CD	2.44	0.48
2:E:241:ARG:O	2:E:242:GLU:C	2.57	0.48
2:B:81:LEU:HD12	2:B:82:VAL:N	2.29	0.48
1:A:198:PRO:HG2	1:A:199:GLN:H	1.78	0.47
2:E:45:VAL:HG23	2:E:45:VAL:O	2.13	0.47
1:D:86:ASP:C	1:D:88:GLY:H	2.22	0.47
2:B:199:ASN:OD1	2:B:199:ASN:C	2.56	0.47
2:E:369:ILE:N	2:E:369:ILE:CD1	2.77	0.47
2:B:140:THR:O	2:B:140:THR:OG1	2.30	0.47
2:B:291:GLY:O	2:B:292:GLY:O	2.32	0.47
1:D:12:CYS:HB2	1:D:69:VAL:HG13	1.94	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:92:ILE:O	1:D:118:MET:HA	2.14	0.47
2:B:273:MET:SD	2:B:286:PHE:HB2	2.55	0.47
1:A:70:ILE:HB	1:A:94:THR:CG2	2.44	0.47
2:B:157:PRO:HD3	2:B:182:MET:HE2	1.96	0.47
1:D:5:ASP:O	1:D:7:ASN:N	2.48	0.47
1:A:12:CYS:HB2	1:A:69:VAL:HG13	1.96	0.47
1:A:218:ALA:O	1:A:219:ALA:C	2.57	0.47
2:B:302:PHE:O	2:B:303:LYS:C	2.57	0.47
2:B:324:ARG:C	2:B:326:ASP:N	2.73	0.47
1:D:154:GLY:O	1:D:157:THR:HB	2.14	0.47
2:E:84:TYR:CD1	2:E:84:TYR:O	2.67	0.47
1:D:275:SER:C	1:D:277:ALA:N	2.66	0.46
2:E:172:LYS:HD2	2:E:176:GLN:HE21	1.79	0.46
2:E:383:ALA:C	2:E:385:VAL:H	2.23	0.46
1:D:77:CYS:SG	1:D:99:ILE:HD11	2.56	0.46
1:D:136:ILE:CD1	4:D:702:COA:H21	2.46	0.46
1:A:53:PHE:HD2	1:A:59:ALA:HB2	1.80	0.46
1:D:12:CYS:O	1:D:15:PHE:HB2	2.15	0.46
2:B:196:ILE:HG22	2:B:197:GLU:N	2.30	0.46
1:D:11:ILE:HA	1:D:36:GLY:O	2.16	0.46
1:D:95:ILE:HA	1:D:124:PRO:HD2	1.95	0.46
1:D:12:CYS:HB2	1:D:69:VAL:CG1	2.46	0.46
1:A:11:ILE:HA	1:A:36:GLY:O	2.16	0.46
1:A:92:ILE:CG2	1:A:118:MET:HG3	2.46	0.46
1:A:145:GLY:HA3	1:A:170:GLY:C	2.40	0.46
2:E:298:VAL:O	2:E:301:ALA:HB3	2.15	0.46
1:D:60:VAL:HG12	1:D:60:VAL:O	2.16	0.46
1:A:195:GLU:HA	1:A:227:LYS:HE3	1.97	0.45
2:E:352:ASN:C	2:E:354:ALA:N	2.74	0.45
1:A:92:ILE:O	1:A:118:MET:HA	2.16	0.45
1:D:2:ILE:O	1:D:4:ILE:N	2.48	0.45
2:E:20:PRO:HG2	2:E:99:GLU:OE1	2.15	0.45
1:A:153:SER:OG	2:B:267:GLY:HA3	2.16	0.45
2:B:352:ASN:C	2:B:354:ALA:H	2.23	0.45
1:A:56:VAL:O	1:A:60:VAL:HG23	2.16	0.45
2:B:241:ARG:NH1	2:B:252:TYR:HE2	2.14	0.45
2:E:302:PHE:O	2:E:303:LYS:C	2.59	0.45
2:B:81:LEU:HD12	2:B:82:VAL:H	1.81	0.45
1:D:194:PHE:O	1:D:195:GLU:C	2.59	0.45
1:D:195:GLU:HA	1:D:227:LYS:HE3	1.99	0.45
1:A:60:VAL:O	1:A:60:VAL:HG12	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:205:MET:HE3	1:D:265:LEU:HD11	1.98	0.45
2:E:343:VAL:HB	2:E:344:PRO:CD	2.47	0.45
2:B:191:ARG:HA	2:B:226:GLN:NE2	2.32	0.45
2:E:87:ASP:OD2	2:E:89:ASN:ND2	2.51	0.44
1:D:194:PHE:CB	1:D:203:ILE:HD11	2.47	0.44
2:E:286:PHE:CD1	2:E:286:PHE:C	2.95	0.44
2:E:324:ARG:C	2:E:326:ASP:N	2.71	0.44
1:A:5:ASP:O	1:A:7:ASN:N	2.50	0.44
1:A:214:GLU:HG2	1:A:261:LYS:HD3	2.00	0.44
2:E:191:ARG:HA	2:E:226:GLN:NE2	2.32	0.44
2:E:337:ALA:O	2:E:338:GLU:C	2.59	0.44
2:B:319:PHE:CD1	2:B:319:PHE:C	2.96	0.44
1:D:53:PHE:CD2	1:D:59:ALA:CA	2.99	0.44
2:B:77:LEU:HD21	2:B:96:ILE:HG12	1.99	0.44
2:B:383:ALA:C	2:B:385:VAL:H	2.25	0.44
1:A:72:VAL:HA	1:A:73:PRO:HD3	1.83	0.44
1:A:194:PHE:CB	1:A:203:ILE:HD11	2.48	0.44
1:D:230:VAL:HG21	1:D:283:LEU:HD23	1.99	0.44
2:E:229:LEU:O	2:E:230:ARG:C	2.58	0.44
2:E:300:GLU:O	2:E:304:ILE:HG13	2.18	0.44
1:A:12:CYS:O	1:A:15:PHE:HB2	2.18	0.44
2:E:287:LEU:HD22	2:E:305:ILE:HD11	2.00	0.44
2:E:107:GLU:O	2:E:129:GLY:HA3	2.18	0.44
2:B:133:ILE:HA	2:B:133:ILE:HD12	1.52	0.43
1:D:81:ILE:O	1:D:85:ILE:HG13	2.18	0.43
2:E:130:GLY:O	2:E:131:VAL:HG23	2.17	0.43
2:B:262:MET:HG3	2:B:287:LEU:HD23	2.00	0.43
2:E:322:ILE:O	2:E:322:ILE:CG1	2.66	0.43
2:B:241:ARG:HH11	2:B:252:TYR:HE2	1.66	0.43
2:B:255:LEU:HD13	2:B:285:ASN:HA	2.00	0.43
2:B:84:TYR:HD1	2:B:84:TYR:O	2.01	0.43
1:D:229:VAL:HG12	1:D:270:VAL:HG13	2.00	0.43
1:A:23:HIS:NE2	1:A:136:ILE:CG2	2.76	0.43
2:B:84:TYR:CD1	2:B:84:TYR:O	2.72	0.43
2:E:191:ARG:HA	2:E:191:ARG:HD2	1.81	0.43
2:B:287:LEU:HD22	2:B:305:ILE:HD11	2.01	0.43
2:B:319:PHE:C	2:B:319:PHE:HD1	2.27	0.43
1:D:158:TYR:N	1:D:158:TYR:CD1	2.87	0.43
1:A:4:ILE:HD11	1:A:126:VAL:HG12	2.01	0.43
1:D:56:VAL:O	1:D:60:VAL:HG23	2.18	0.43
1:A:194:PHE:O	1:A:197:ASP:N	2.35	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:378:ALA:O	2:B:381:VAL:HG22	2.18	0.43
2:B:378:ALA:O	2:B:382:VAL:HG23	2.19	0.43
1:A:127:ILE:O	1:A:127:ILE:HG23	2.19	0.42
1:A:112:ASP:O	1:A:113:GLU:C	2.62	0.42
1:D:93:ILE:CD1	1:D:119:ILE:HB	2.49	0.42
1:A:136:ILE:CD1	4:A:701:COA:H21	2.49	0.42
1:A:186:ASN:HD22	1:A:186:ASN:N	2.05	0.42
1:A:197:ASP:OD1	1:A:198:PRO:HD2	2.18	0.42
1:D:39:THR:O	1:D:39:THR:HG22	2.17	0.42
1:D:159:GLU:OE2	2:E:319:PHE:CD2	2.73	0.42
1:A:172:SER:OG	1:A:173:THR:N	2.52	0.42
1:A:150:VAL:O	1:A:150:VAL:HG23	2.20	0.42
1:D:248:GLY:O	2:E:116:ARG:NH2	2.52	0.42
2:E:272:THR:O	2:E:273:MET:C	2.62	0.42
2:E:202:VAL:HG21	2:E:212:LEU:HD22	2.02	0.42
1:A:77:CYS:SG	1:A:99:ILE:HD11	2.59	0.42
2:B:87:ASP:OD2	2:B:89:ASN:ND2	2.53	0.42
1:D:214:GLU:CG	1:D:261:LYS:HD3	2.49	0.42
1:A:12:CYS:HB2	1:A:69:VAL:CG1	2.49	0.42
1:A:172:SER:HA	1:A:199:GLN:HE21	1.85	0.42
2:B:352:ASN:C	2:B:354:ALA:N	2.78	0.42
1:D:11:ILE:O	1:D:68:SER:HA	2.20	0.42
1:D:156:LEU:HD23	1:D:156:LEU:HA	1.87	0.42
2:E:131:VAL:HG13	2:E:132:GLU:N	2.35	0.42
1:A:218:ALA:O	1:A:221:ILE:N	2.41	0.41
2:B:343:VAL:HB	2:B:344:PRO:CD	2.50	0.41
1:D:186:ASN:H	1:D:186:ASN:ND2	2.13	0.41
2:E:262:MET:HG3	2:E:287:LEU:HD23	2.01	0.41
2:B:186:THR:O	2:B:187:ILE:C	2.63	0.41
2:B:315:LEU:HB2	2:B:381:VAL:HG11	2.01	0.41
1:D:74:ALA:HB3	1:D:75:PRO:HD3	2.02	0.41
1:A:23:HIS:CE1	1:A:136:ILE:HG22	2.56	0.41
1:A:91:LEU:HA	1:A:91:LEU:HD12	1.68	0.41
2:B:229:LEU:O	2:B:230:ARG:C	2.62	0.41
2:E:291:GLY:O	2:E:292:GLY:O	2.37	0.41
1:A:158:TYR:CD1	1:A:158:TYR:N	2.86	0.41
2:B:157:PRO:HD3	2:B:182:MET:CE	2.49	0.41
2:B:269:ALA:O	2:B:273:MET:HG3	2.21	0.41
2:B:299:THR:O	2:B:302:PHE:N	2.53	0.41
1:D:121:PRO:O	1:D:122:ASN:HB3	2.20	0.41
2:E:333:ILE:HD13	2:E:364:SER:HB2	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:378:ALA:O	2:E:381:VAL:HG22	2.19	0.41
2:B:6:TYR:CD1	2:B:6:TYR:C	2.98	0.41
2:E:215:LYS:HE2	2:E:215:LYS:HB3	1.90	0.41
2:E:196:ILE:HG22	2:E:197:GLU:N	2.35	0.41
2:B:296:GLU:O	2:B:299:THR:HB	2.21	0.41
2:B:20:PRO:HG2	2:B:99:GLU:OE1	2.20	0.41
2:E:161:ARG:O	2:E:164:ALA:HB3	2.20	0.41
1:A:159:GLU:OE2	2:B:319:PHE:HD2	2.04	0.41
1:A:205:MET:HE3	1:A:265:LEU:HD11	2.03	0.41
2:B:29:ARG:O	2:B:33:GLU:HG3	2.21	0.41
2:B:44:VAL:HG21	6:B:801:ADP:C6	2.56	0.41
2:B:376:ASP:O	2:B:377:ALA:C	2.64	0.41
1:A:39:THR:O	1:A:39:THR:HG22	2.21	0.41
1:A:95:ILE:HD13	1:A:124:PRO:HD2	2.02	0.41
2:B:124:MET:CE	2:B:124:MET:CG	2.96	0.41
2:B:316:VAL:HG12	2:B:317:ASN:N	2.35	0.41
2:B:356:LEU:O	2:B:356:LEU:HD12	2.21	0.41
1:D:151:SER:CB	1:D:206:ILE:HB	2.51	0.41
1:A:229:VAL:HG12	1:A:270:VAL:HG13	2.03	0.40
2:B:209:LEU:HA	2:B:209:LEU:HD23	1.80	0.40
1:A:274:ARG:NH1	1:A:274:ARG:CG	2.81	0.40
2:E:87:ASP:O	2:E:88:ALA:C	2.65	0.40
2:E:133:ILE:HA	2:E:133:ILE:HD12	1.55	0.40
1:A:11:ILE:O	1:A:68:SER:HA	2.21	0.40
2:E:76:TRP:O	2:E:77:LEU:C	2.62	0.40
2:B:191:ARG:HA	2:B:191:ARG:HD2	1.87	0.40
1:D:95:ILE:O	1:D:96:THR:C	2.64	0.40
2:E:134:GLU:H	2:E:134:GLU:HG3	1.73	0.40
2:E:343:VAL:HA	2:E:344:PRO:HD3	1.91	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	284/286 (99%)	242 (85%)	34 (12%)	8 (3%)	4	21
1	D	284/286 (99%)	236 (83%)	37 (13%)	11 (4%)	2	16
2	B	383/385 (100%)	342 (89%)	36 (9%)	5 (1%)	9	35
2	E	383/385 (100%)	349 (91%)	24 (6%)	10 (3%)	4	23
All	All	1334/1342 (99%)	1169 (88%)	131 (10%)	34 (2%)	4	23

All (34) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	292	GLY
1	D	96	THR
2	E	292	GLY
2	E	325	CYS
1	A	6	LYS
1	A	96	THR
1	A	124	PRO
1	A	267	ALA
1	A	276	LEU
2	B	290	GLY
2	B	293	ALA
2	B	325	CYS
1	D	6	LYS
1	D	124	PRO
1	D	267	ALA
1	D	276	LEU
2	E	290	GLY
2	E	293	ALA
2	E	384	ALA
2	B	384	ALA
1	D	62	ALA
1	D	169	PHE
1	A	18	SER
1	A	169	PHE
1	D	3	LEU
1	D	18	SER
2	E	337	ALA
2	E	338	GLU
2	E	364	SER
1	D	218	ALA
2	E	88	ALA
1	D	198	PRO
2	E	360	LYS

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Mol	Chain	Res	Type
1	A	198	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	216/216 (100%)	191 (88%)	25 (12%)	5	21
1	D	216/216 (100%)	189 (88%)	27 (12%)	4	19
2	B	296/296 (100%)	261 (88%)	35 (12%)	5	20
2	E	296/296 (100%)	267 (90%)	29 (10%)	7	28
All	All	1024/1024 (100%)	908 (89%)	116 (11%)	5	21

All (116) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	CYS
1	A	16	THR
1	A	28	ILE
1	A	38	VAL
1	A	46	THR
1	A	52	VAL
1	A	77	CYS
1	A	82	LEU
1	A	94	THR
1	A	100	PRO
1	A	107	VAL
1	A	117	ARG
1	A	128	THR
1	A	137	GLN
1	A	157	THR
1	A	173	THR
1	A	185	SER
1	A	186	ASN
1	A	201	GLU
1	A	204	VAL

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Mol	Chain	Res	Type
1	A	226	THR
1	A	265	LEU
1	A	274	ARG
1	A	278	ASP
1	A	286	VAL
2	B	11	LEU
2	B	21	VAL
2	B	38	ILE
2	B	61	LYS
2	B	64	ASN
2	B	67	GLU
2	B	82	VAL
2	B	85	GLN
2	B	102	THR
2	B	116	ARG
2	B	127	THR
2	B	131	VAL
2	B	132	GLU
2	B	133	ILE
2	B	140	THR
2	B	157	PRO
2	B	158	TYR
2	B	192	ASP
2	B	195	LEU
2	B	200	PRO
2	B	212	LEU
2	B	233	ARG
2	B	238	GLU
2	B	241	ARG
2	B	242	GLU
2	B	249	GLU
2	B	286	PHE
2	B	295	LYS
2	B	303	LYS
2	B	330	ASP
2	B	338	GLU
2	B	356	LEU
2	B	359	LYS
2	B	367	ASN
2	B	375	THR
1	D	12	CYS
1	D	16	THR

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Mol	Chain	Res	Type
1	D	28	ILE
1	D	32	THR
1	D	38	VAL
1	D	46	THR
1	D	52	VAL
1	D	72	VAL
1	D	77	CYS
1	D	86	ASP
1	D	94	THR
1	D	107	VAL
1	D	117	ARG
1	D	128	THR
1	D	137	GLN
1	D	157	THR
1	D	158	TYR
1	D	173	THR
1	D	185	SER
1	D	186	ASN
1	D	201	GLU
1	D	204	VAL
1	D	226	THR
1	D	265	LEU
1	D	274	ARG
1	D	278	ASP
1	D	286	VAL
2	E	11	LEU
2	E	21	VAL
2	E	38	ILE
2	E	61	LYS
2	E	64	ASN
2	E	67	GLU
2	E	82	VAL
2	E	85	GLN
2	E	102	THR
2	E	116	ARG
2	E	127	THR
2	E	131	VAL
2	E	132	GLU
2	E	133	ILE
2	E	140	THR
2	E	192	ASP
2	E	195	LEU

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Mol	Chain	Res	Type
2	E	200	PRO
2	E	233	ARG
2	E	241	ARG
2	E	242	GLU
2	E	286	PHE
2	E	295	LYS
2	E	303	LYS
2	E	330	ASP
2	E	342	ASN
2	E	356	LEU
2	E	359	LYS
2	E	375	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	13	GLN
1	A	186	ASN
1	A	199	GLN
2	B	89	ASN
2	B	94	ASN
2	B	145	HIS
2	B	221	ASN
2	B	226	GLN
2	B	342	ASN
2	B	353	ASN
1	D	186	ASN
1	D	199	GLN
2	E	89	ASN
2	E	94	ASN
2	E	221	ASN
2	E	226	GLN
2	E	247	GLN
2	E	353	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 8 ligands modelled in this entry, 2 are monoatomic - leaving 6 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	$\# Z > 2$
6	ADP	B	801	5	28,29,29	0.90	0	43,45,45	0.75	0
3	PO4	A	601	-	4,4,4	1.96	2 (50%)	6,6,6	0.80	0
4	COA	D	702	1	47,50,50	1.12	5 (10%)	69,75,75	1.53	7 (10%)
3	PO4	D	602	-	4,4,4	1.89	2 (50%)	6,6,6	0.64	0
6	ADP	E	802	5	28,29,29	0.97	2 (7%)	43,45,45	0.75	1 (2%)
4	COA	A	701	1	47,50,50	1.10	5 (10%)	69,75,75	1.59	9 (13%)

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
6	ADP	B	801	5	-	3/16/32/32	0/3/3/3
4	COA	D	702	1	-	14/48/64/64	0/3/3/3
6	ADP	E	802	5	-	2/16/32/32	0/3/3/3
4	COA	A	701	1	-	15/48/64/64	0/3/3/3

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	702	COA	P1A-O3A	3.53	1.63	1.59
4	A	701	COA	P1A-O3A	3.05	1.62	1.59
6	E	802	ADP	PA-O3A	2.84	1.62	1.59
3	A	601	PO4	P-O2	-2.75	1.46	1.54
4	A	701	COA	OAP-CAP	2.63	1.47	1.42
3	D	602	PO4	P-O2	-2.62	1.47	1.54
4	D	702	COA	C6P-C5P	2.58	1.56	1.51
4	D	702	COA	P2A-O3A	2.47	1.62	1.59
4	A	701	COA	C3P-N4P	2.34	1.51	1.46
4	D	702	COA	OAP-CAP	2.34	1.46	1.42
4	A	701	COA	C6P-C5P	2.32	1.56	1.51
4	A	701	COA	P2A-O3A	2.31	1.62	1.59
6	E	802	ADP	C2-N1	2.24	1.37	1.33
3	D	602	PO4	P-O3	-2.16	1.48	1.54
4	D	702	COA	CEP-CBP	-2.15	1.49	1.53
3	A	601	PO4	P-O3	-2.13	1.48	1.54

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	701	COA	O6A-CCP-CBP	7.55	122.69	110.55
4	D	702	COA	O6A-CCP-CBP	7.31	122.29	110.55
4	D	702	COA	C6P-C5P-N4P	-5.91	105.58	116.34
4	A	701	COA	C6P-C5P-N4P	-5.44	106.42	116.34
4	D	702	COA	O5P-C5P-N4P	3.73	130.35	123.03
4	A	701	COA	CEP-CBP-CCP	-3.72	102.08	108.22
4	D	702	COA	CEP-CBP-CCP	-3.24	102.87	108.22
4	A	701	COA	O3A-P2A-O4A	-3.18	101.15	110.70
4	A	701	COA	O5P-C5P-N4P	2.97	128.86	123.03
4	D	702	COA	CDP-CBP-CAP	2.60	113.20	108.77
4	D	702	COA	O3A-P2A-O4A	-2.50	103.18	110.70
4	D	702	COA	O4B-C1B-C2B	-2.40	101.47	106.62
4	A	701	COA	C3P-N4P-C5P	2.24	126.99	122.82
4	A	701	COA	O9A-P3B-O8A	2.21	116.09	107.80
4	A	701	COA	O4B-C1B-C2B	-2.20	101.91	106.62
4	A	701	COA	CEP-CBP-CAP	2.18	112.48	108.77
6	E	802	ADP	O3'-C3'-C2'	2.03	118.31	111.82

There are no chirality outliers.

All (34) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	701	COA	OAP-CAP-CBP-CEP

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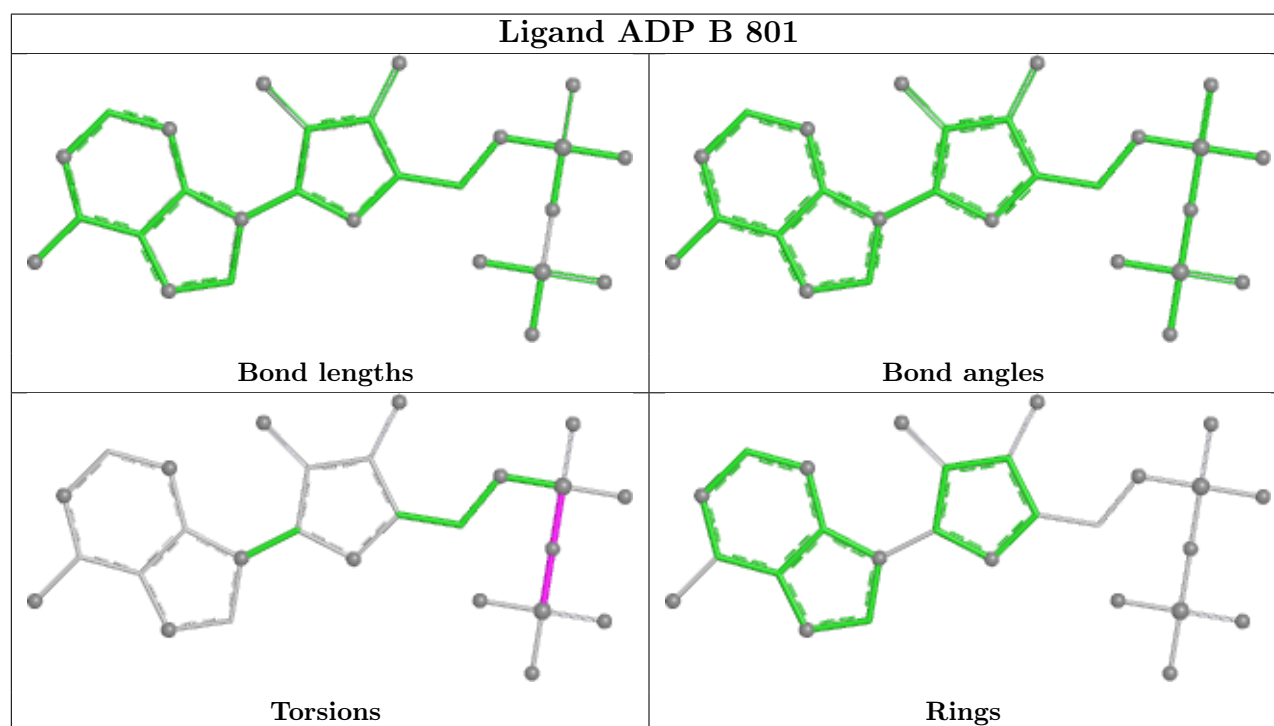
Mol	Chain	Res	Type	Atoms
4	A	701	COA	C9P-CAP-CBP-CEP
4	D	702	COA	OAP-CAP-CBP-CEP
4	D	702	COA	C9P-CAP-CBP-CEP
4	A	701	COA	O5P-C5P-C6P-C7P
4	A	701	COA	OAP-CAP-CBP-CDP
4	D	702	COA	OAP-CAP-CBP-CDP
4	A	701	COA	C3B-O3B-P3B-O8A
4	D	702	COA	N4P-C5P-C6P-C7P
4	D	702	COA	C2B-C1B-N9A-C8A
4	A	701	COA	C2B-C1B-N9A-C8A
6	E	802	ADP	PB-O3A-PA-O2A
4	D	702	COA	O5P-C5P-C6P-C7P
4	A	701	COA	CCP-O6A-P2A-O4A
4	A	701	COA	OAP-CAP-CBP-CCP
4	D	702	COA	CCP-O6A-P2A-O4A
4	D	702	COA	OAP-CAP-CBP-CCP
6	B	801	ADP	PB-O3A-PA-O2A
4	D	702	COA	C2B-C1B-N9A-C4A
4	A	701	COA	N4P-C5P-C6P-C7P
4	D	702	COA	C3B-O3B-P3B-O8A
4	A	701	COA	C3B-O3B-P3B-O7A
4	D	702	COA	C3B-O3B-P3B-O7A
4	D	702	COA	O4B-C1B-N9A-C8A
6	B	801	ADP	PA-O3A-PB-O2B
4	A	701	COA	O4B-C1B-N9A-C8A
6	B	801	ADP	PB-O3A-PA-O1A
6	E	802	ADP	PB-O3A-PA-O1A
4	D	702	COA	C3B-O3B-P3B-O9A
4	A	701	COA	C2B-C1B-N9A-C4A
4	A	701	COA	C9P-CAP-CBP-CCP
4	A	701	COA	C5P-C6P-C7P-N8P
4	D	702	COA	N8P-C9P-CAP-OAP
4	A	701	COA	P2A-O3A-P1A-O2A

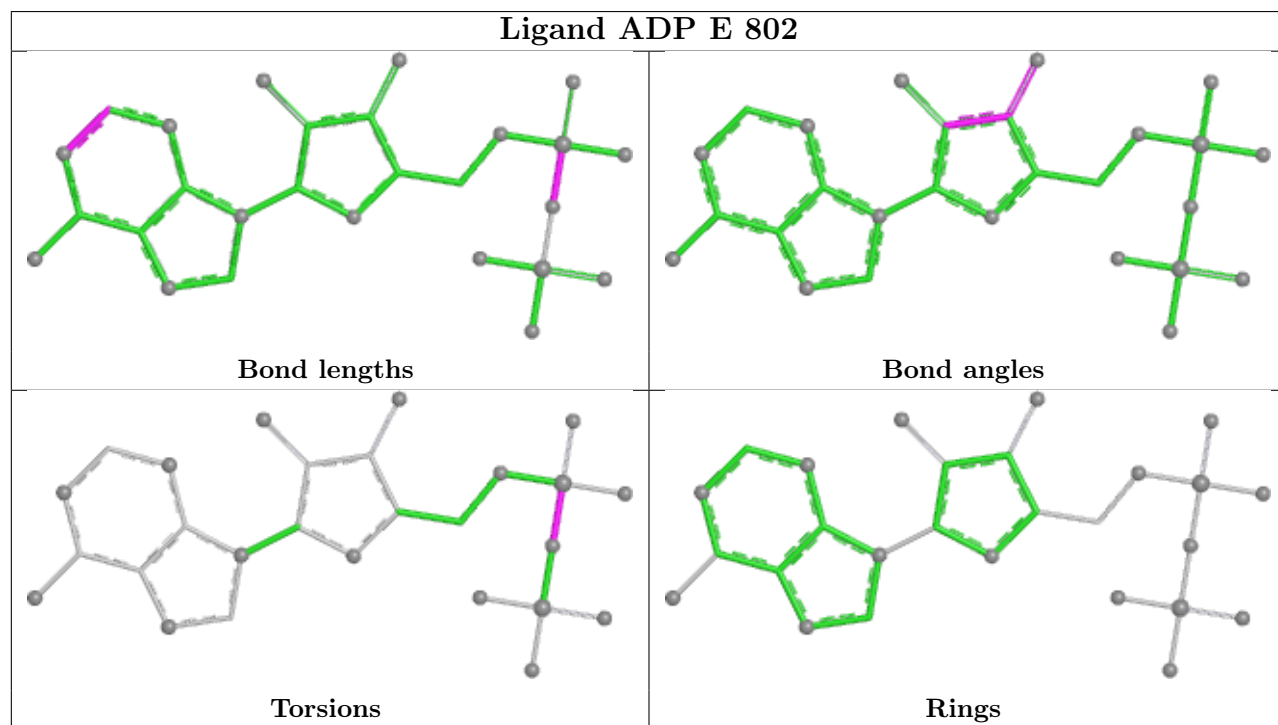
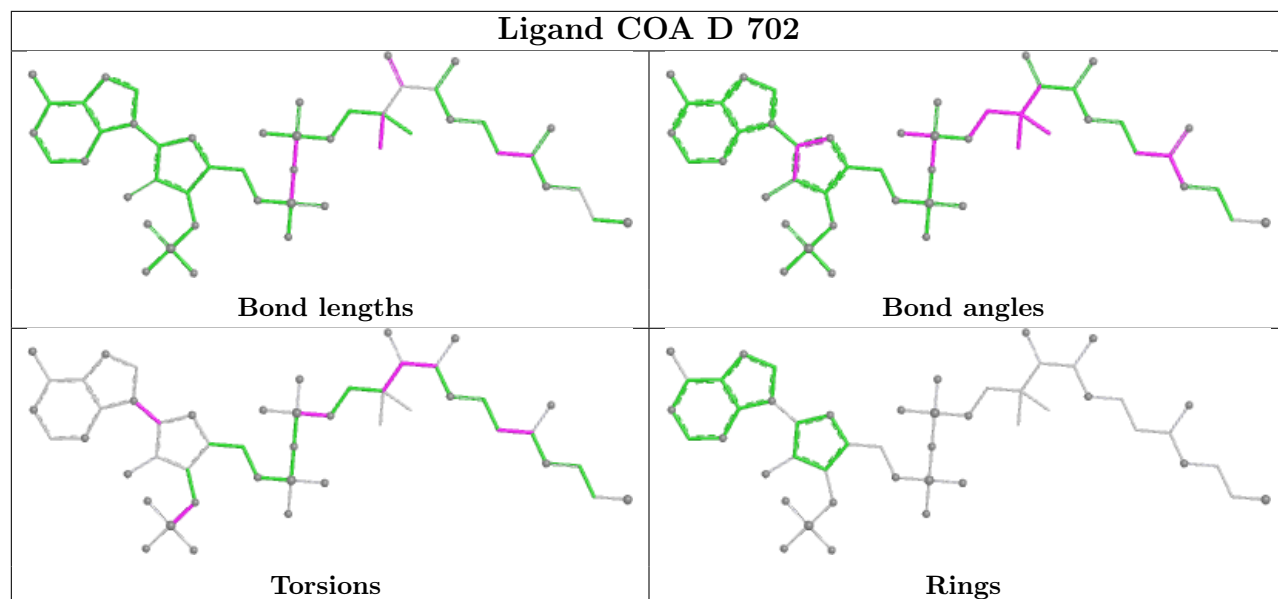
There are no ring outliers.

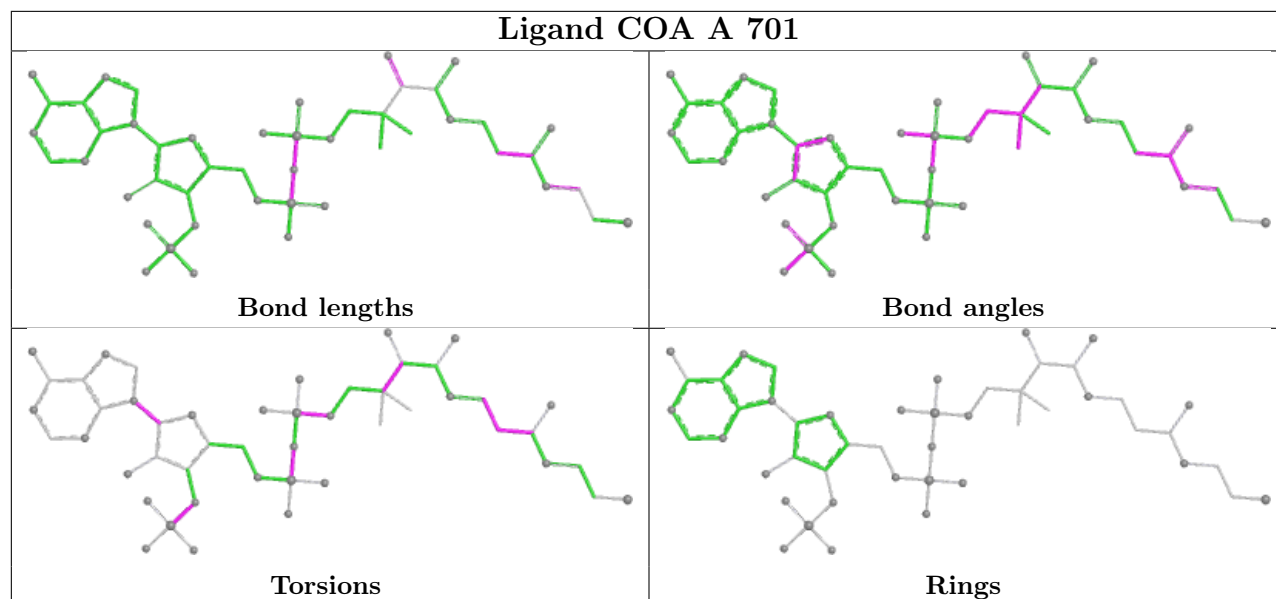
4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	801	ADP	1	0
4	D	702	COA	2	0
6	E	802	ADP	1	0
4	A	701	COA	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	286/286 (100%)	-0.66	0 100 100	2, 27, 66, 86	0
1	D	286/286 (100%)	-0.24	1 (0%) 90 82	2, 40, 80, 100	0
2	B	385/385 (100%)	-0.60	0 100 100	2, 29, 70, 97	0
2	E	385/385 (100%)	-0.59	0 100 100	2, 28, 75, 100	0
All	All	1342/1342 (100%)	-0.53	1 (0%) 92 90	2, 30, 74, 100	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	49	GLY	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 oligosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	COA	A	701	48/48	0.95	0.09	39,47,73,77	0

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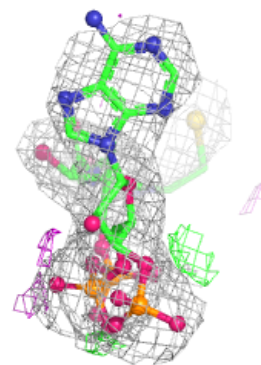
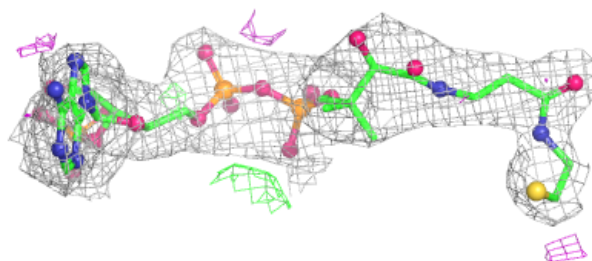
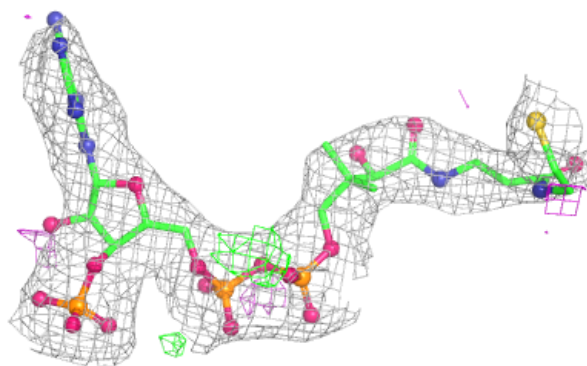
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	MG	E	502	1/1	0.95	0.06	17,17,17,17	0
3	PO4	D	602	5/5	0.96	0.07	27,30,31,33	0
6	ADP	E	802	27/27	0.96	0.07	32,34,38,39	0
6	ADP	B	801	27/27	0.97	0.06	28,29,33,34	0
4	COA	D	702	48/48	0.97	0.08	25,29,70,75	0
3	PO4	A	601	5/5	0.99	0.03	16,18,19,19	0
5	MG	B	501	1/1	1.00	0.06	2,2,2,2	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

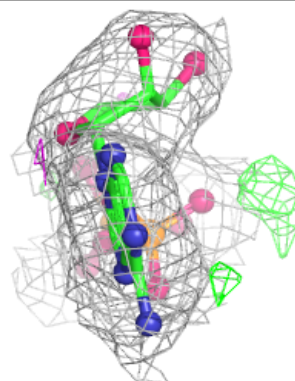
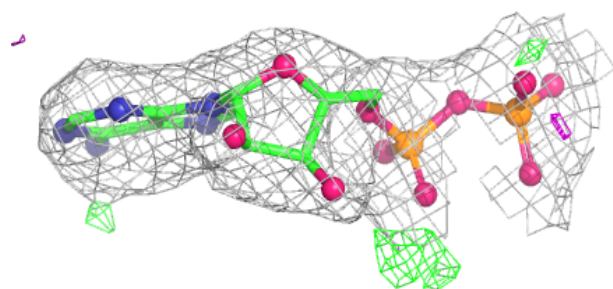
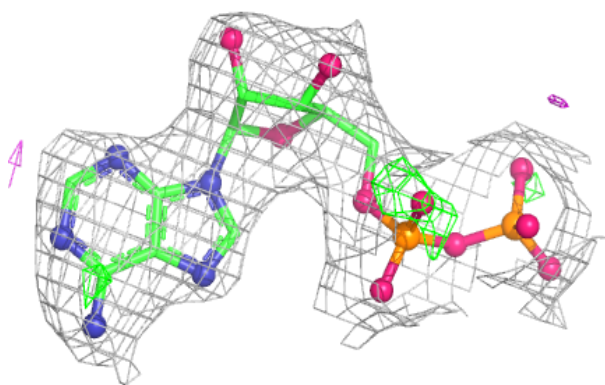
Electron density around COA A 701:

2mF_o-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

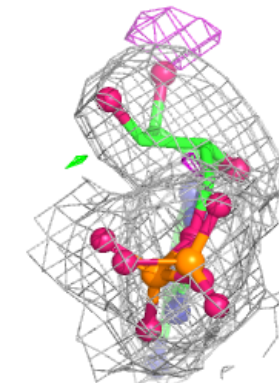
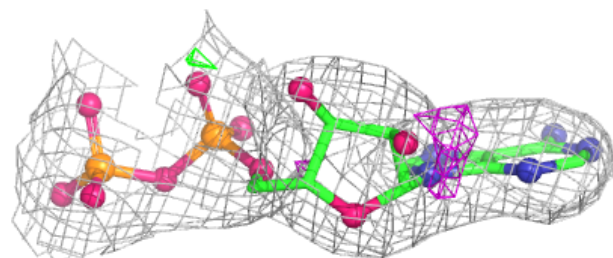
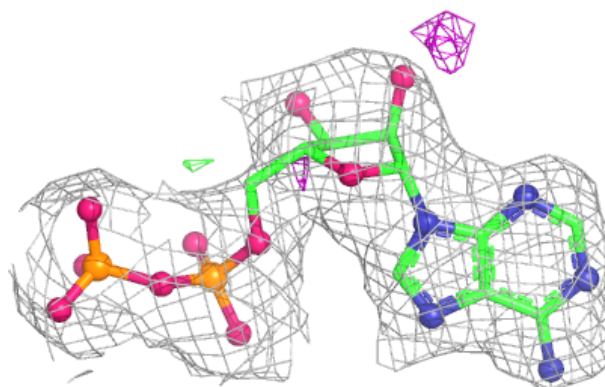


Electron density around ADP E 802:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

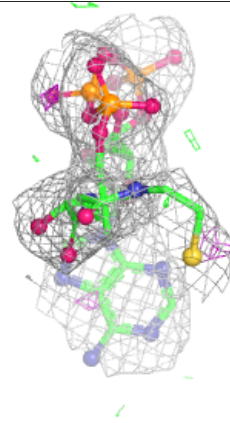
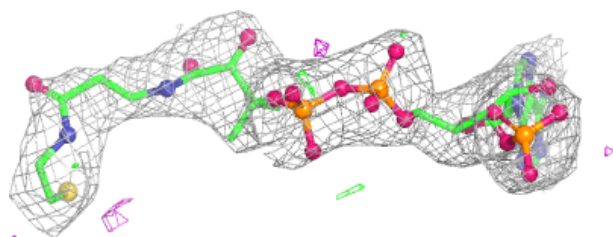
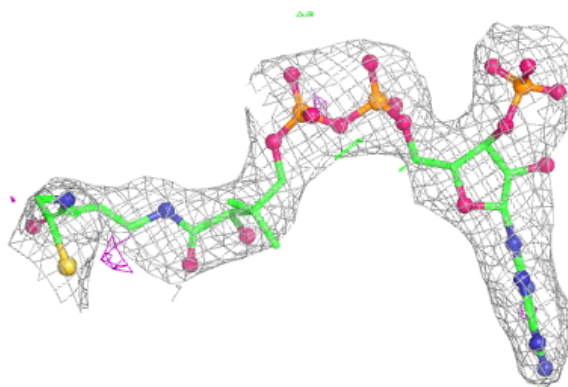
**Electron density around ADP B 801:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around COA D 702:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.5 Other polymers ⓘ

There are no such residues in this entry.