



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 14, 2016 – 10:07 PM EDT

PDB ID : 5A3Q
Title : Crystal structure of the (SR) Calcium ATPase E2-vanadate complex bound to thapsigargin and TNP-AMPPCP
Authors : Clausen, J.D.; Bublitz, M.; Arnou, B.; Olesen, C.; Andersen, J.P.; Moller, J.V.; Nissen, P.
Deposited on : 2015-06-02
Resolution : 3.05 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 : 1.7.1 (RC1), CSD as537be (2016)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20027107
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) : rb-20027107

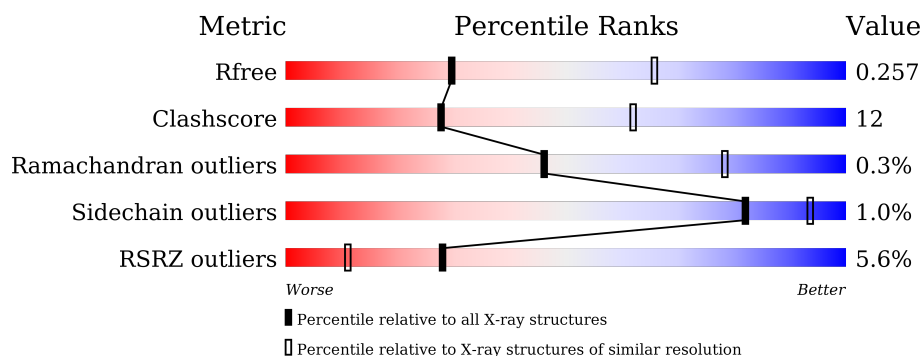
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.05 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	1191 (3.10-3.02)
Clashscore	102246	1303 (3.10-3.02)
Ramachandran outliers	100387	1254 (3.10-3.02)
Sidechain outliers	100360	1254 (3.10-3.02)
RSRZ outliers	91569	1197 (3.10-3.02)

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	995	<div> <div>6%</div> <div>74%</div> <div>25%</div> <div>.</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
4	DL5	A	1002	X	-	-	-

2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 7775 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.

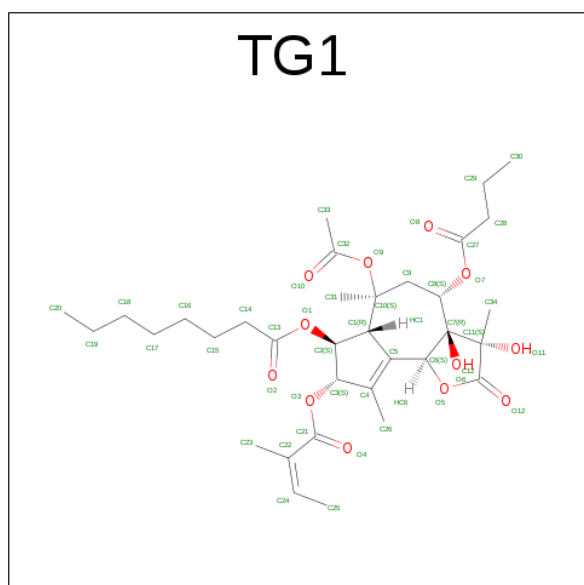
- Molecule 1 is a protein called SARCOPLASMIC/ENDOPLASMIC RETICULUM CALCIUM ATPASE 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	995	7667	4874	1286	1450	57	0	0	1

There is a discrepancy between the modelled and reference sequences:

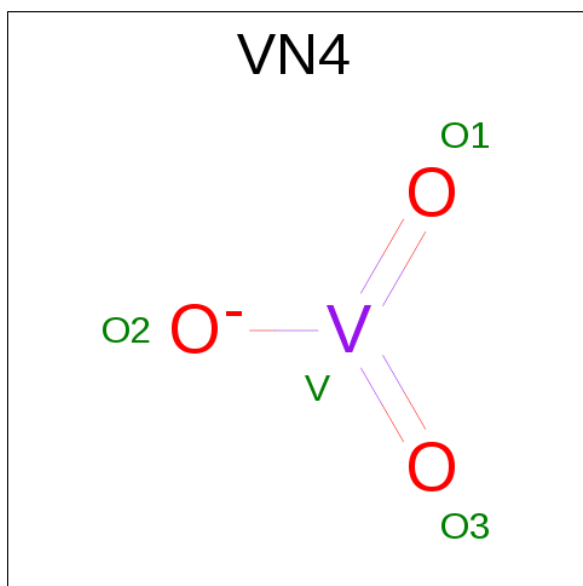
Chain	Residue	Modelled	Actual	Comment	Reference
A	0	ACE	-	ACETYLATION	UNP P04191

- Molecule 2 is OCTANOIC ACID [3S-[3ALPHA, 3ABETA, 4ALPHA, 6BETA, 6ABETA, 7BETA, 8ALPHA(Z), 9BALPHA]]-6-(ACETYLOXY)-2,3,-3A,4,5,6,6A,7,8,9B-DECAHYDRO-3,3A-DIHYDROXY-3,6,9-TRIMETHYL-8-[(2-METHYL-1-OXO-2-BUTENYL)OXY]-2-OXO-4-(1-OXOBUTOXY)-AZULENO[4,5-B]FURAN-7-YL ESTER (three-letter code: TG1) (formula: C₃₄H₅₀O₁₂).



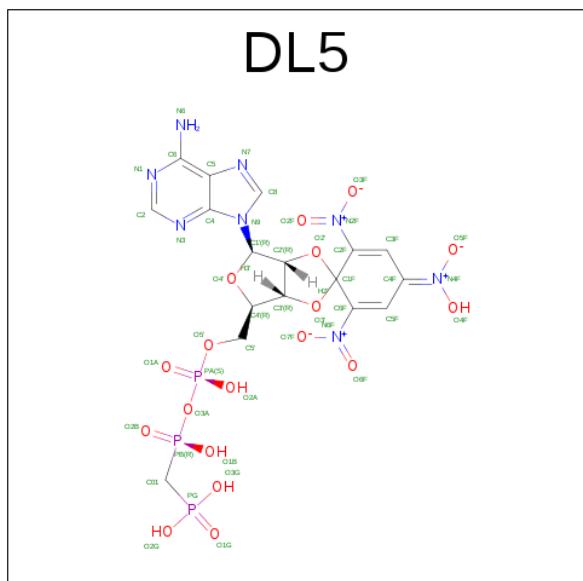
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			46	34	12		

- Molecule 3 is OXIDO(DIOXO)VANADIUM (three-letter code: VN4) (formula: O_3V).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	O	V	0	0
			4	3	1		

- Molecule 4 is SPIRO(2,4,6-TRINITROBENZENE[1,2A]-O2',O3'-METHYLENE-ADENOSINE (BETA,GAMMA-METHYLENE)TRIPHOSPHATE (three-letter code: DL5) (formula: $C_{17}H_{19}N_8O_{18}P_3$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			46	17	8	18	3		

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	2	Total	Mg	0	0
			2	2		

- Molecule 6 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	K	0	0
			1	1		

- Molecule 7 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	1	Total	Cl	0	0
			1	1		

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	8	Total	O	0	0
			8	8		

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	86.43Å 118.78Å 141.83Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	73.80 – 3.05 73.80 – 3.05	Depositor EDS
% Data completeness (in resolution range)	99.9 (73.80-3.05) 99.9 (73.80-3.05)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.15 (at 3.07Å)	Xtriage
Refinement program	PHENIX (1.10 _2152: ???)	Depositor
R, R_{free}	0.200 , 0.258 0.205 , 0.257	Depositor DCC
R_{free} test set	1448 reflections (5.35%)	DCC
Wilson B-factor (Å ²)	82.7	Xtriage
Anisotropy	0.235	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.28 , 75.2	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	0 of 28501 reflections	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	7775	wwPDB-VP
Average B, all atoms (Å ²)	114.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.30% 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: MG, TG1, ACE, CL, K, VN4, DL5

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	0.31	0/7803	0.49	2/10575 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	864	GLY	N-CA-C	8.17	133.52	113.10
1	A	865	VAL	N-CA-CB	7.90	128.88	111.50

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	7667	0	7754	178	0
2	A	46	0	50	11	0
3	A	4	0	0	0	0
4	A	46	0	0	3	0
5	A	2	0	0	0	0
6	A	1	0	0	0	0
7	A	1	0	0	0	0
8	A	8	0	0	0	0
All	All	7775	0	7804	183	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 12.

All (183) 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:A:862:GLY:C	1:A:863:PRO:CA	2.44	0.85
1:A:894:PRO:HB3	1:A:959:LEU:H	1.41	0.84
1:A:862:GLY:C	1:A:863:PRO:CD	2.48	0.82
1:A:603:PRO:HB3	1:A:639:ILE:HD11	1.70	0.74
1:A:864:GLY:O	1:A:865:VAL:HG23	1.92	0.70
1:A:155:VAL:HG12	1:A:216:ALA:HA	1.74	0.70
1:A:113:GLU:HB3	1:A:729:THR:HG23	1.73	0.69
1:A:864:GLY:O	1:A:865:VAL:CG2	2.42	0.68
1:A:837:TYR:HB2	2:A:1000:TG1:H331	1.74	0.68
1:A:396:LEU:HD13	1:A:399:ASP:HA	1.75	0.68
1:A:837:TYR:HA	1:A:840:ILE:HG22	1.75	0.68
1:A:256:PHE:CE1	2:A:1000:TG1:H231	2.28	0.68
1:A:62:VAL:HG23	1:A:98:LEU:HD22	1.74	0.68
1:A:179:ILE:H	1:A:179:ILE:HD12	1.58	0.67
1:A:773:VAL:HG11	1:A:842:GLY:HA2	1.77	0.67
1:A:827:PRO:HG2	1:A:830:SER:HB3	1.76	0.67
1:A:799:THR:HG21	1:A:905:VAL:HG22	1.76	0.67
1:A:203:ASP:OD1	1:A:678:ARG:NH2	2.21	0.66
1:A:947:ILE:HD12	1:A:953:LEU:HD13	1.78	0.66
1:A:389:TYR:HB3	1:A:425:LEU:HD11	1.81	0.63
1:A:366:MET:HG2	1:A:384:ILE:HD11	1.81	0.62
1:A:473:SER:HA	1:A:476:ARG:HD2	1.80	0.62
1:A:260:LEU:HD11	1:A:306:ALA:HB1	1.82	0.62
1:A:481:LYS:HG3	1:A:496:VAL:HG13	1.81	0.62
1:A:705:VAL:HG22	1:A:726:VAL:HG11	1.82	0.61
1:A:786:ALA:HB2	1:A:852:ALA:HB2	1.82	0.61
1:A:837:TYR:CB	2:A:1000:TG1:H331	2.29	0.61
1:A:786:ALA:HA	1:A:897:MET:HA	1.83	0.61
1:A:783:LEU:HD21	1:A:870:LEU:HG	1.81	0.61
1:A:125:GLU:HG3	1:A:126:MET:HG2	1.84	0.60
1:A:836:ARG:HH22	1:A:918:GLU:HA	1.66	0.60
1:A:115:ALA:HB1	1:A:239:MET:HE2	1.83	0.60
1:A:256:PHE:HE1	2:A:1000:TG1:H231	1.67	0.59
1:A:239:MET:HE3	1:A:708:ALA:HB1	1.84	0.59
1:A:235:ILE:O	1:A:239:MET:HG3	2.03	0.59
1:A:24:LEU:HD22	1:A:149:ASP:HB3	1.85	0.58
1:A:620:ARG:NH2	1:A:622:ILE:HD11	2.19	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:919:ASN:HA	1:A:985:LYS:HG3	1.85	0.58
1:A:326:MET:HE1	1:A:339:VAL:HG22	1.85	0.57
1:A:59:ASP:HB3	1:A:62:VAL:HG12	1.86	0.57
1:A:52:LEU:HD11	1:A:109:GLU:HG2	1.85	0.57
1:A:560:ARG:NH2	4:A:1002:DL5:O1B	2.31	0.57
1:A:500:PRO:HG2	1:A:508:VAL:HB	1.87	0.56
1:A:604:ARG:HB2	1:A:607:VAL:HG23	1.88	0.56
1:A:778:THR:HB	1:A:783:LEU:O	2.05	0.56
1:A:653:TYR:OH	1:A:672:ARG:NH2	2.31	0.56
1:A:78:PHE:O	1:A:84:THR:HG21	2.06	0.56
1:A:179:ILE:HD13	1:A:212:THR:HA	1.86	0.55
1:A:862:GLY:CA	1:A:863:PRO:CD	2.85	0.55
1:A:415:THR:HA	1:A:475:ILE:HD13	1.89	0.55
1:A:491:ARG:NH2	1:A:584:PHE:HD2	2.04	0.55
1:A:957:PHE:O	1:A:958:LYS:HB2	2.06	0.55
1:A:266:LEU:HA	1:A:269:VAL:HG22	1.89	0.55
2:A:1000:TG1:H233	2:A:1000:TG1:C31	2.37	0.54
1:A:512:MET:HB2	1:A:567:ARG:HB3	1.90	0.54
1:A:65:LEU:HD11	1:A:307:ILE:HG21	1.89	0.54
1:A:843:TYR:CE2	1:A:973:ILE:HG23	2.43	0.53
1:A:315:ILE:HG22	1:A:760:PHE:HE1	1.73	0.52
1:A:855:TRP:CD1	1:A:896:PRO:HG3	2.45	0.52
1:A:960:LYS:HE2	1:A:967:TRP:CH2	2.44	0.52
2:A:1000:TG1:H311	2:A:1000:TG1:H233	1.92	0.52
2:A:1000:TG1:H232	2:A:1000:TG1:H262	1.92	0.52
1:A:61:LEU:HB2	1:A:307:ILE:HD12	1.92	0.52
1:A:894:PRO:HB3	1:A:959:LEU:N	2.17	0.51
1:A:486:GLU:O	1:A:491:ARG:NH2	2.43	0.51
1:A:943:LEU:O	1:A:947:ILE:HB	2.11	0.51
1:A:115:ALA:HB1	1:A:239:MET:CE	2.41	0.51
1:A:239:MET:CE	1:A:708:ALA:HB1	2.41	0.51
1:A:625:THR:HG21	1:A:632:ALA:HB2	1.94	0.50
1:A:777:LEU:HB2	1:A:849:VAL:HG21	1.93	0.50
1:A:361:MET:HG3	1:A:599:MET:HG2	1.94	0.50
1:A:894:PRO:HA	1:A:958:LYS:HD3	1.94	0.50
1:A:944:HIS:O	1:A:947:ILE:HG22	2.11	0.50
1:A:450:GLU:OE1	1:A:467:ARG:NH1	2.43	0.50
1:A:926:PRO:HB3	1:A:928:TRP:CE2	2.47	0.50
1:A:894:PRO:HA	1:A:958:LYS:HB3	1.94	0.50
1:A:560:ARG:HG3	4:A:1002:DL5:N1	2.26	0.50
1:A:979:GLY:O	1:A:983:ILE:HG12	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:1000:TG1:H161	2:A:1000:TG1:O4	2.13	0.49
1:A:795:VAL:HG13	1:A:799:THR:HB	1.95	0.49
1:A:483:PHE:HE2	1:A:573:ARG:HG3	1.76	0.49
1:A:113:GLU:HG3	1:A:334:ARG:HH22	1.78	0.48
1:A:894:PRO:HB3	1:A:958:LYS:HB3	1.95	0.48
1:A:580:ASP:OD1	1:A:582:SER:HB3	2.13	0.48
1:A:628:ASN:ND2	1:A:678:ARG:HH11	2.12	0.48
1:A:931:ILE:HD12	1:A:931:ILE:H	1.79	0.48
1:A:76:ALA:HB1	1:A:88:PHE:CD2	2.48	0.48
1:A:832:TRP:CD1	1:A:988:ALA:HB2	2.49	0.48
1:A:785:GLU:HG2	1:A:856:PHE:HZ	1.77	0.47
1:A:47:LYS:HE3	1:A:112:ALA:HB3	1.96	0.47
1:A:922:LEU:HD23	1:A:927:PRO:HG3	1.96	0.47
1:A:954:PRO:O	1:A:958:LYS:N	2.43	0.47
1:A:847:ALA:HB2	1:A:973:ILE:HG21	1.96	0.47
1:A:246:LYS:HE3	1:A:254:ASP:OD2	2.14	0.47
1:A:757:MET:HA	1:A:760:PHE:CE2	2.49	0.47
1:A:559:LEU:HD22	1:A:600:LEU:HB2	1.97	0.46
1:A:628:ASN:HD21	1:A:678:ARG:HH11	1.62	0.46
1:A:561:CYS:HA	1:A:597:VAL:O	2.15	0.46
1:A:75:LEU:HD11	1:A:300:VAL:HG11	1.98	0.46
1:A:416:ILE:HG23	1:A:513:PHE:HB3	1.98	0.46
1:A:518:PRO:HB3	1:A:549:ILE:HD13	1.96	0.46
1:A:347:VAL:HB	1:A:698:THR:HG22	1.98	0.46
1:A:769:VAL:O	1:A:773:VAL:HG23	2.16	0.46
1:A:315:ILE:HG22	1:A:760:PHE:CE1	2.51	0.45
1:A:692:GLN:NE2	1:A:715:GLU:OE1	2.47	0.45
1:A:913:LEU:HB3	1:A:922:LEU:HD21	1.97	0.45
1:A:950:VAL:O	1:A:954:PRO:HD3	2.17	0.45
1:A:840:ILE:O	1:A:844:VAL:HG13	2.16	0.45
1:A:572:LYS:HB2	1:A:575:GLU:HG2	1.99	0.45
1:A:735:LEU:HD11	1:A:743:ILE:HG13	1.99	0.45
1:A:353:THR:HA	1:A:357:THR:OG1	2.16	0.45
1:A:90:GLU:OE2	1:A:789:PRO:HB2	2.17	0.45
1:A:113:GLU:CB	1:A:729:THR:HG23	2.44	0.45
1:A:352:LYS:HD2	1:A:635:ILE:HG13	1.98	0.44
1:A:692:GLN:OE1	1:A:713:LYS:HE2	2.17	0.44
1:A:894:PRO:CA	1:A:958:LYS:HB3	2.48	0.44
1:A:326:MET:HE3	1:A:326:MET:HB2	1.76	0.44
1:A:795:VAL:HG21	1:A:901:LEU:HD11	1.99	0.44
1:A:276:ILE:HA	1:A:279:PHE:CD2	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:247:THR:HG22	1:A:249:LEU:H	1.82	0.44
1:A:907:ILE:HD11	1:A:973:ILE:HG22	2.00	0.44
1:A:427:PHE:HA	1:A:434:TYR:HA	2.00	0.44
1:A:769:VAL:HG12	1:A:841:GLY:HA3	2.00	0.44
1:A:41:LEU:O	1:A:120:LYS:NZ	2.50	0.44
1:A:786:ALA:H	1:A:897:MET:HG2	1.83	0.44
1:A:720:MET:HE1	1:A:735:LEU:HD12	1.99	0.43
1:A:249:LEU:HD13	1:A:754:TYR:HE1	1.83	0.43
1:A:259:GLN:HB3	2:A:1000:TG1:C26	2.48	0.43
1:A:75:LEU:HD13	1:A:297:LYS:HZ3	1.83	0.43
1:A:620:ARG:NH2	1:A:670:CYS:O	2.42	0.43
1:A:114:ASN:ND2	1:A:117:GLU:HB2	2.34	0.43
1:A:713:LYS:HD2	1:A:713:LYS:HA	1.84	0.43
1:A:342:LEU:HD12	1:A:716:ILE:HD13	2.00	0.43
2:A:1000:TG1:O10	2:A:1000:TG1:H313	2.19	0.43
1:A:769:VAL:HG13	2:A:1000:TG1:H151	2.00	0.43
1:A:777:LEU:O	1:A:781:LEU:HG	2.19	0.43
1:A:129:VAL:HG12	1:A:151:VAL:HG22	1.99	0.43
1:A:696:GLU:O	1:A:698:THR:HG23	2.19	0.43
1:A:761:ILE:O	1:A:765:ILE:HG12	2.18	0.43
1:A:133:ASP:N	1:A:133:ASP:OD1	2.52	0.42
1:A:788:ILE:HG22	1:A:790:VAL:H	1.84	0.42
1:A:571:PRO:HG2	1:A:576:MET:SD	2.59	0.42
1:A:560:ARG:HG3	4:A:1002:DL5:C6	2.49	0.42
1:A:473:SER:O	1:A:477:GLN:HG3	2.20	0.42
1:A:752:ALA:HB1	1:A:812:PRO:HB3	2.02	0.42
1:A:368:ILE:HD12	1:A:409:GLY:HA3	2.02	0.42
1:A:819:ARG:HB3	1:A:819:ARG:HE	1.68	0.42
1:A:116:ILE:HG23	1:A:236:ARG:HG3	2.02	0.42
1:A:483:PHE:CE2	1:A:573:ARG:HG3	2.54	0.42
1:A:491:ARG:NH1	1:A:588:GLU:OE2	2.53	0.41
1:A:19:SER:HB3	1:A:22:THR:OG1	2.19	0.41
1:A:27:ASP:O	1:A:31:ARG:HG3	2.19	0.41
1:A:256:PHE:CZ	1:A:765:ILE:HD12	2.56	0.41
1:A:369:ILE:HG13	1:A:528:VAL:CG1	2.49	0.41
1:A:549:ILE:HD11	1:A:596:VAL:HG21	2.01	0.41
1:A:72:SER:OG	1:A:300:VAL:HG21	2.19	0.41
1:A:114:ASN:HD22	1:A:117:GLU:HB2	1.86	0.41
1:A:911:ASN:HA	1:A:914:ASN:HB2	2.02	0.41
1:A:948:LEU:HB3	1:A:960:LYS:HB2	2.01	0.41
1:A:54:ILE:O	1:A:58:GLU:HG3	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:611:ILE:HG13	1:A:639:ILE:HG23	2.02	0.41
1:A:648:VAL:O	1:A:648:VAL:HG12	2.20	0.41
1:A:355:THR:HG23	1:A:720:MET:HE3	2.02	0.41
1:A:459:VAL:HA	1:A:462:LEU:HG	2.02	0.41
1:A:684:LYS:HB2	1:A:710:ALA:HB2	2.02	0.41
1:A:921:SER:O	1:A:925:MET:HB2	2.20	0.41
1:A:454:VAL:HG23	1:A:455:PHE:CD2	2.56	0.41
1:A:712:LYS:HB3	1:A:712:LYS:HE3	1.96	0.41
1:A:724:THR:O	1:A:728:LYS:HG3	2.21	0.41
1:A:747:VAL:O	1:A:751:ARG:HB2	2.21	0.41
1:A:305:ALA:HB2	1:A:775:ILE:HD12	2.01	0.41
1:A:837:TYR:O	1:A:841:GLY:N	2.54	0.41
1:A:124:PRO:HG3	1:A:158:LYS:O	2.20	0.41
1:A:166:LEU:HG	1:A:221:GLY:HA2	2.03	0.41
1:A:170:SER:HB2	1:A:172:THR:O	2.21	0.41
1:A:403:ARG:HD3	1:A:404:SER:H	1.86	0.40
1:A:413:LEU:HD11	1:A:564:LEU:HD13	2.04	0.40
1:A:907:ILE:HG12	1:A:974:SER:HA	2.03	0.40
1:A:873:PHE:CE1	1:A:874:MET:HG3	2.57	0.40
1:A:416:ILE:HG12	1:A:513:PHE:CD1	2.56	0.40
1:A:528:VAL:HG21	1:A:541:VAL:HG11	2.03	0.40
1:A:679:VAL:HB	1:A:683:HIS:HB2	2.03	0.40
1:A:951:ASP:O	1:A:954:PRO:HD2	2.22	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	989/995 (99%)	934 (94%)	52 (5%)	3 (0%)	46 78

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	865	VAL
1	A	958	LYS
1	A	500	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	838/840 (100%)	830 (99%)	8 (1%)	82 93

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	24	LEU
1	A	123	GLU
1	A	170	SER
1	A	244	GLN
1	A	309	GLU
1	A	340	GLU
1	A	491	ARG
1	A	918	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 7 ligands modelled in this entry, 4 are monoatomic - leaving 3 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	$\# Z > 2$
2	TG1	A	1000	-	40,48,48	0.88	0	46,72,72	1.26	5 (10%)
3	VN4	A	1001	1,8,5	0,3,3	0.00	-	0,3,3	0.00	-
4	DL5	A	1002	5	38,50,50	1.35	4 (10%)	34,80,80	1.34	4 (11%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	TG1	A	1000	-	-	0/33/99/99	0/3/3/3
3	VN4	A	1001	1,8,5	-	0/0/0/0	0/0/0/0
4	DL5	A	1002	5	1/1/14/16	0/23/80/80	0/5/5/5

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1002	DL5	C8-N7	-2.35	1.30	1.34
4	A	1002	DL5	C5F-C4F	-2.02	1.32	1.40
4	A	1002	DL5	PA-O1A	2.12	1.59	1.51
4	A	1002	DL5	C5F-C6F	4.73	1.51	1.37

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1000	TG1	O5-C6-C7	-3.79	100.68	103.94

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	1002	DL5	O4'-C1'-N9	-2.61	103.17	108.11
4	A	1002	DL5	O2G-PG-O1G	-2.15	106.53	112.32
2	A	1000	TG1	C6-O5-C12	-2.10	107.80	110.89
2	A	1000	TG1	C9-C8-C7	2.06	119.06	115.59
2	A	1000	TG1	C10-O9-C32	2.32	126.53	121.92
4	A	1002	DL5	O3G-PG-C01	2.49	112.04	106.13
2	A	1000	TG1	C7-C6-C5	3.62	124.25	114.92
4	A	1002	DL5	C4'-O4'-C1'	4.24	114.13	109.64

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	A	1002	DL5	C4F

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1000	TG1	11	0
4	A	1002	DL5	3	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	994/995 (99%)	-0.00	56 (5%) 28 11	44, 92, 225, 324	0

All (56) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	786	ALA	8.4
1	A	878	GLU	7.1
1	A	785	GLU	6.5
1	A	81	GLY	5.7
1	A	505	ARG	5.2
1	A	504	SER	4.6
1	A	896	PRO	4.4
1	A	80	GLU	4.3
1	A	854	TRP	4.0
1	A	866	THR	3.9
1	A	967	TRP	3.9
1	A	963	ASP	3.7
1	A	899	MET	3.6
1	A	994	GLY	3.6
1	A	781	LEU	3.5
1	A	284	HIS	3.5
1	A	898	THR	3.5
1	A	850	GLY	3.4
1	A	277	GLY	3.4
1	A	77	TRP	3.4
1	A	958	LYS	3.3
1	A	79	GLU	3.2
1	A	895	GLU	3.2
1	A	506	ALA	3.1
1	A	852	ALA	3.1
1	A	82	GLU	3.1
1	A	851	ALA	3.0

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Mol	Chain	Res	Type	RSRZ
1	A	890	ILE	3.0
1	A	877	THR	2.9
1	A	897	MET	2.8
1	A	972	LYS	2.8
1	A	993	GLU	2.8
1	A	787	LEU	2.8
1	A	959	LEU	2.7
1	A	46	GLY	2.6
1	A	945	PHE	2.6
1	A	885	GLY	2.5
1	A	949	TYR	2.5
1	A	960	LYS	2.5
1	A	57	PHE	2.5
1	A	849	VAL	2.4
1	A	889	GLU	2.4
1	A	272	TRP	2.3
1	A	962	LEU	2.3
1	A	968	LEU	2.2
1	A	507	ALA	2.2
1	A	886	LEU	2.2
1	A	948	LEU	2.1
1	A	283	VAL	2.1
1	A	946	LEU	2.1
1	A	864	GLY	2.1
1	A	964	LEU	2.1
1	A	791	GLN	2.1
1	A	280	ASN	2.1
1	A	894	PRO	2.0
1	A	969	MET	2.0

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

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

6.4 Ligands

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. 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
2	TG1	A	1000	46/46	0.91	0.30	1.05	111,146,158,171	0
3	VN4	A	1001	4/4	0.99	0.22	0.96	52,57,63,73	0
4	DL5	A	1002	46/46	0.94	0.20	0.05	93,114,141,160	0
6	K	A	1008	1/1	0.99	0.10	-2.34	73,73,73,73	0
5	MG	A	1003	1/1	0.99	0.12	-3.20	36,36,36,36	0
7	CL	A	1009	1/1	0.92	0.20	-	65,65,65,65	0
5	MG	A	1004	1/1	0.94	0.15	-	103,103,103,103	0

6.5 Other polymers

There are no such residues in this entry.