Full wwPDB X-ray Structure Validation Report ⓘ

May 26, 2025 – 04:17 AM EDT

PDB ID	:	3BA6 / pdb_00003ba6
Title	:	Structure of the Ca2E1P phosphoenzyme intermediate of the SERCA Ca2+-ATPase
Authors	:	Picard, M.; Winther, A.M.L.; Olesen, C.; Gyrup, C.; Morth, J.P.; Oxvig, C.; Moller, J.V.; Nissen, P.
Deposited on	:	2007-11-07
Resolution	:	2.80 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:

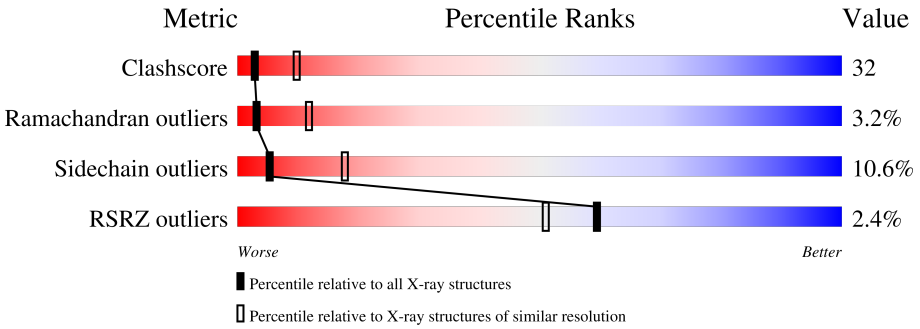
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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))
Clashscore	180529	4123 (2.80-2.80)
Ramachandran outliers	177936	4071 (2.80-2.80)
Sidechain outliers	177891	4073 (2.80-2.80)
RSRZ outliers	164620	3659 (2.80-2.80)

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

Mol	Chain	Length	Quality of chain
1	A	994	2% 47% 44% 8%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 7714 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
1	A	994	Total	C	N	O	P	S	0	0	0
			7674	4876	1287	1453	1	57			

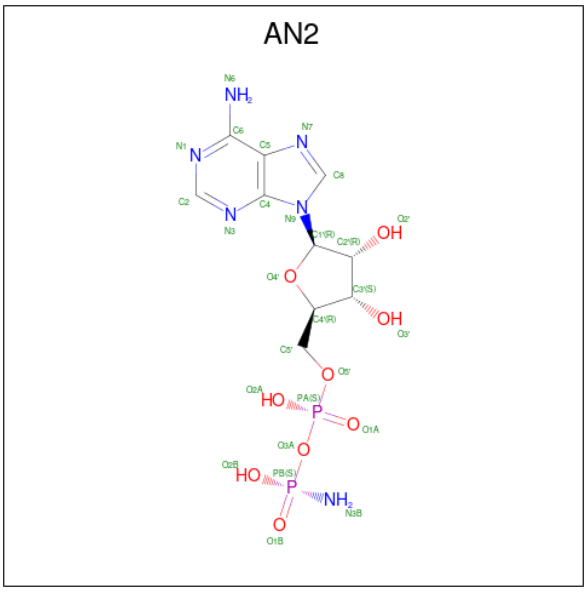
- Molecule 2 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	3	Total	Ca	0	0
			3	3		

- Molecule 3 is POTASSIUM ION (CCD ID: K) (formula: K).

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

- Molecule 4 is AMP PHOSPHORAMIDATE (CCD ID: AN2) (formula: $C_{10}H_{16}N_6O_9P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			27	10	6	9	2		

- Molecule 5 is water.

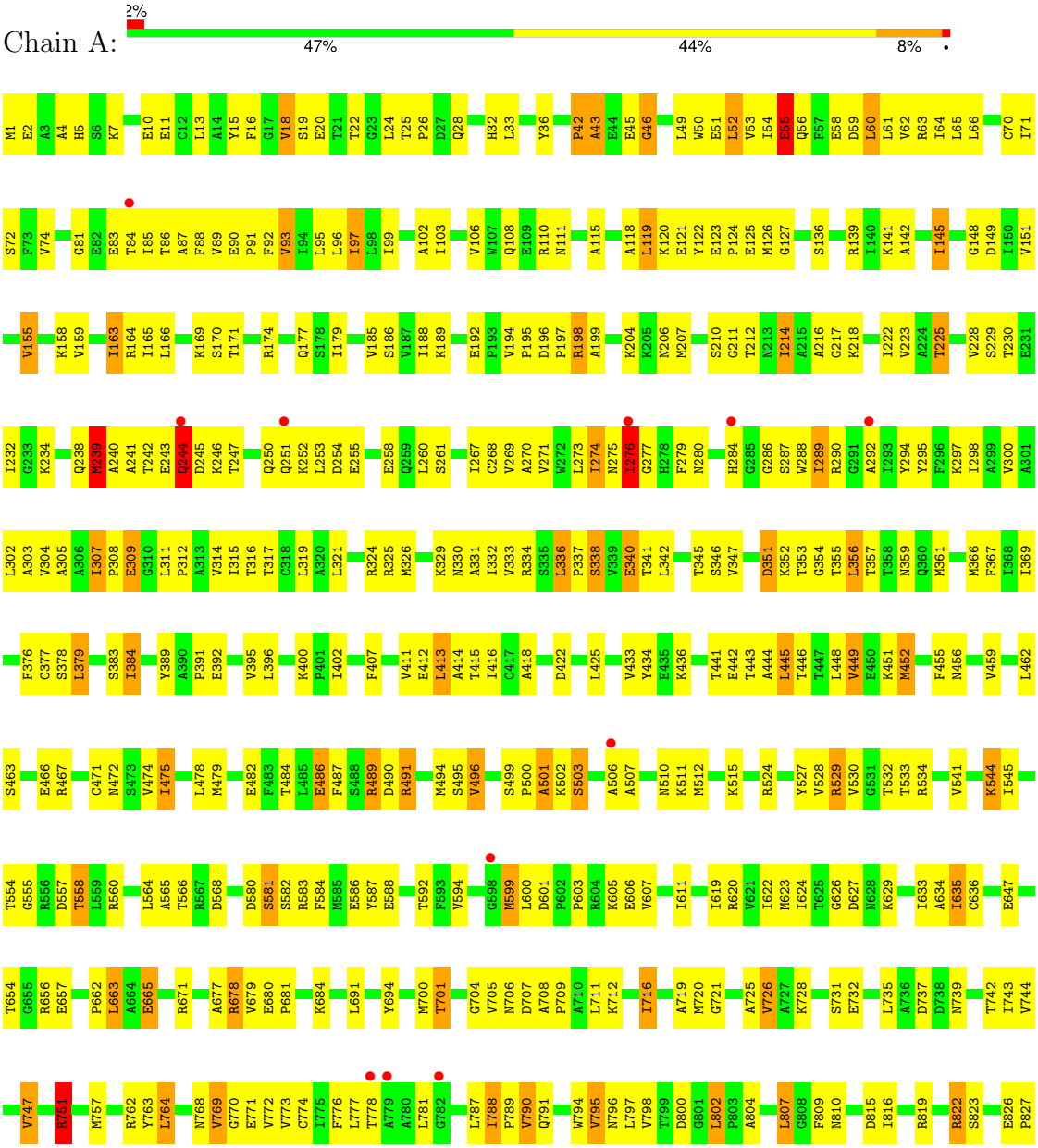
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	9	Total	O	0	0
			9	9		

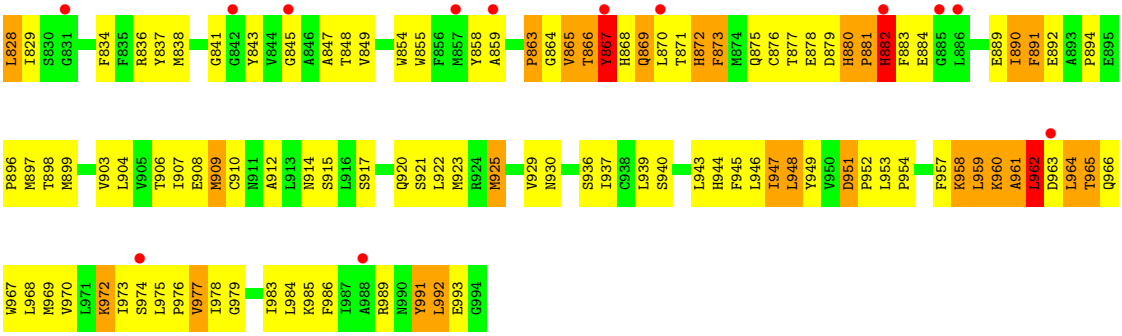
3 Residue-property plots (i)

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: Sarcoplasmic/endoplasmic reticulum calcium ATPase 1

Chain A:




L828 I829 S830 G831 F834 F835 R836 Y837 M838 G841 G842 Y843 V844 G845 A846 A847 T848 V849 W854 W855 F856 M857 Y858 A859 P863 G864 V865 T866 Y867 H868 Q869 L870 T871 H872 F873 M874 Q875 C876 T877 E878 D879 H880 P881 H882 F883 E884 G885 L886 E889 I890 F891 E892 A893 P894 E895
P896 M897 T898 M899 V903 L904 V905 T906 I907 E908 M909 C910 N911 A912 L913 N914 S915 L916 S917 Q920 S921 L922 M923 R924 M925 V929 N930 S936 I937 C938 L939 S940 L943 H944 F945 L946 I947 L948 Y949 V950 D951 P952 L953 P954 F957 K958 L959 K960 A961 L962 D963 L964 T965 Q966
W967 L968 M969 V970 L971 K972 I973 S974 L975 P976 V977 I978 G979 I983 L984 K985 F986 I987 A988 R989 N990 Y991 L992 E993 Q994

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	162.51Å 75.97Å 152.41Å 90.00° 109.01° 90.00°	Depositor
Resolution (Å)	10.00 – 2.80 10.00 – 2.80	Depositor EDS
% Data completeness (in resolution range)	92.0 (10.00-2.80) 92.5 (10.00-2.80)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$< I/\sigma(I) >$ [1]	1.07 (at 2.58Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.210 , 0.288 0.249 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å^2)	65.9	Xtriage
Anisotropy	0.896	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 89.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	7714	wwPDB-VP
Average B, all atoms (Å^2)	116.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.37% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PHD, K, CA, AN2

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	0.56	0/7802	0.96	17/10578 (0.2%)

There are no bond length outliers.

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	802	LEU	CA-C-N	-9.10	109.54	119.19
1	A	802	LEU	C-N-CA	-9.10	109.54	119.19
1	A	5	HIS	N-CA-C	-7.67	101.07	113.19
1	A	601	ASP	CA-C-N	7.07	127.66	120.38
1	A	601	ASP	C-N-CA	7.07	127.66	120.38
1	A	925	MET	CA-C-N	6.59	127.17	120.38
1	A	925	MET	C-N-CA	6.59	127.17	120.38
1	A	872	HIS	N-CA-C	6.10	116.33	108.34
1	A	869	GLN	N-CA-C	-6.08	105.82	113.23
1	A	503	SER	N-CA-C	-5.65	106.34	113.23
1	A	347	VAL	N-CA-C	5.54	115.87	108.11
1	A	635	ILE	N-CA-C	5.50	115.70	110.42
1	A	163	ILE	N-CA-C	5.50	116.66	108.46
1	A	751	ARG	N-CA-C	-5.44	105.43	111.36
1	A	93	VAL	N-CA-C	-5.42	106.56	113.22
1	A	721	GLY	N-CA-C	-5.38	106.16	113.37
1	A	169	LYS	N-CA-C	5.00	116.42	111.07

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	7674	0	7765	492	0
2	A	3	0	0	0	0
3	A	1	0	0	0	0
4	A	27	0	14	7	0
5	A	9	0	0	0	0
All	All	7714	0	7779	493	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 32.

All (493) 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:60:LEU:H	1:A:60:LEU:HD23	1.21	1.06
1:A:894:PRO:HB2	1:A:959:LEU:HB2	1.40	1.04
1:A:788:ILE:HG12	1:A:789:PRO:HD2	1.44	0.97
1:A:866:THR:HG22	1:A:867:TYR:H	1.34	0.91
1:A:909:MET:HG2	1:A:937:ILE:HG23	1.55	0.87
1:A:342:LEU:HD13	1:A:716:ILE:HG13	1.54	0.87
1:A:230:THR:HG22	1:A:232:ILE:H	1.42	0.84
1:A:944:HIS:O	1:A:947:ILE:HG22	1.79	0.83
1:A:763:TYR:CE1	1:A:912:ALA:HB2	2.14	0.82
1:A:716:ILE:N	1:A:716:ILE:HD13	1.95	0.82
1:A:624:ILE:O	1:A:684:LYS:HE2	1.79	0.81
1:A:311:LEU:HB3	1:A:312:PRO:HD3	1.63	0.81
1:A:957:PHE:O	1:A:958:LYS:NZ	2.12	0.81
1:A:866:THR:HG22	1:A:867:TYR:N	1.95	0.81
1:A:962:LEU:HA	1:A:966:GLN:HB2	1.63	0.80
1:A:341:THR:HG22	1:A:716:ILE:HD12	1.64	0.80
1:A:624:ILE:CG2	1:A:684:LYS:HG2	2.11	0.79
1:A:958:LYS:HE3	1:A:958:LYS:HA	1.65	0.78
1:A:155:VAL:HA	1:A:214:ILE:HG22	1.64	0.78
1:A:921:SER:H	1:A:989:ARG:HH22	1.28	0.78
1:A:126:MET:HE1	1:A:141:LYS:HG2	1.64	0.77
1:A:716:ILE:HD13	1:A:716:ILE:H	1.50	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:865:VAL:O	1:A:866:THR:O	2.01	0.77
1:A:795:VAL:HG11	1:A:904:LEU:HD23	1.67	0.77
1:A:624:ILE:HG21	1:A:684:LYS:HG2	1.68	0.76
1:A:60:LEU:H	1:A:60:LEU:CD2	1.95	0.75
1:A:807:LEU:HD12	1:A:810:ASN:HD21	1.51	0.75
1:A:126:MET:HE1	1:A:141:LYS:CG	2.17	0.75
1:A:174:ARG:HB2	1:A:216:ALA:HB3	1.69	0.75
1:A:762:ARG:HA	1:A:837:TYR:HE1	1.52	0.75
1:A:704:GLY:O	1:A:707:ASP:HB2	1.87	0.74
1:A:558:THR:HG21	1:A:635:ILE:HG13	1.69	0.74
1:A:794:TRP:CE2	1:A:947:ILE:HD12	2.23	0.74
1:A:629:LYS:HD2	1:A:654:THR:CG2	2.18	0.74
1:A:342:LEU:HG	1:A:747:VAL:HG12	1.70	0.73
1:A:308:PRO:HB3	1:A:764:LEU:HD12	1.69	0.73
1:A:865:VAL:HG13	1:A:870:LEU:HG	1.71	0.73
1:A:909:MET:CG	1:A:937:ILE:HG23	2.18	0.73
1:A:960:LYS:O	1:A:961:ALA:HB2	1.89	0.73
1:A:326:MET:HE2	1:A:326:MET:HA	1.71	0.72
1:A:24:LEU:HD22	1:A:149:ASP:HB3	1.70	0.72
1:A:441:THR:HG23	1:A:560:ARG:HH12	1.54	0.71
1:A:948:LEU:HB3	1:A:949:TYR:CE2	2.24	0.71
1:A:798:VAL:HG22	1:A:940:SER:HB3	1.73	0.70
1:A:947:ILE:HA	1:A:953:LEU:HD23	1.74	0.70
1:A:528:VAL:HG21	1:A:541:VAL:HG11	1.72	0.70
1:A:866:THR:CG2	1:A:867:TYR:H	2.05	0.70
1:A:459:VAL:HA	1:A:462:LEU:HD12	1.73	0.70
1:A:171:THR:HG23	1:A:486:GLU:OE2	1.92	0.69
1:A:869:GLN:O	1:A:869:GLN:HG2	1.91	0.69
1:A:868:HIS:O	1:A:869:GLN:HB3	1.92	0.69
1:A:441:THR:CG2	1:A:560:ARG:HH12	2.06	0.69
1:A:847:ALA:HB1	1:A:973:ILE:HG22	1.73	0.69
1:A:903:VAL:HA	1:A:970:VAL:HG13	1.75	0.69
1:A:894:PRO:O	1:A:898:THR:HG23	1.93	0.69
1:A:762:ARG:HA	1:A:837:TYR:CE1	2.28	0.68
1:A:414:ALA:HB2	1:A:452:MET:HE2	1.73	0.68
1:A:964:LEU:O	1:A:966:GLN:N	2.26	0.68
1:A:529:ARG:NH2	1:A:592:THR:HG21	2.09	0.68
1:A:769:VAL:O	1:A:773:VAL:HG23	1.93	0.68
1:A:95:LEU:O	1:A:99:ILE:HG12	1.94	0.67
1:A:607:VAL:O	1:A:611:ILE:HG12	1.94	0.67
1:A:198:ARG:HD3	1:A:199:ALA:N	2.10	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:626:GLY:HA3	4:A:1001:AN2:O1A	1.95	0.67
1:A:871:THR:HG22	1:A:872:HIS:CE1	2.30	0.66
1:A:478:LEU:HD23	1:A:479:MET:HG2	1.76	0.66
1:A:119:LEU:HD11	1:A:330:ASN:C	2.20	0.66
1:A:340:GLU:HG2	1:A:341:THR:N	2.10	0.66
4:A:1001:AN2:O2B	4:A:1001:AN2:H5'2	1.95	0.66
1:A:119:LEU:HD13	1:A:332:ILE:HG13	1.77	0.65
1:A:170:SER:CB	1:A:486:GLU:HG2	2.27	0.65
1:A:115:ALA:O	1:A:118:ALA:HB3	1.95	0.65
1:A:354:GLY:HA2	1:A:359:ASN:HB2	1.77	0.65
1:A:81:GLY:O	1:A:84:THR:HG23	1.97	0.65
1:A:700:MET:HE3	1:A:701:THR:O	1.96	0.65
1:A:921:SER:OG	1:A:923:MET:HG2	1.96	0.65
1:A:54:ILE:O	1:A:56:GLN:N	2.28	0.64
1:A:71:ILE:HD11	1:A:300:VAL:HG11	1.80	0.64
1:A:629:LYS:HD2	1:A:654:THR:HG23	1.79	0.64
1:A:951:ASP:O	1:A:954:PRO:HD2	1.98	0.64
1:A:708:ALA:HB3	1:A:709:PRO:HD3	1.80	0.64
1:A:751:ARG:HB3	1:A:816:ILE:HD11	1.80	0.64
1:A:744:VAL:O	1:A:747:VAL:HG22	1.98	0.63
1:A:49:LEU:HB2	1:A:52:LEU:HD23	1.80	0.63
1:A:13:LEU:HD11	1:A:20:GLU:HB2	1.80	0.63
1:A:671:ARG:HD2	1:A:694:TYR:CE1	2.33	0.63
1:A:580:ASP:HB3	1:A:583:ARG:HE	1.63	0.62
1:A:13:LEU:CD1	1:A:20:GLU:HB2	2.29	0.62
1:A:230:THR:CG2	1:A:232:ILE:HG22	2.29	0.62
1:A:275:ASN:C	1:A:277:GLY:H	2.08	0.62
1:A:777:LEU:O	1:A:781:LEU:HB2	2.00	0.62
1:A:948:LEU:HB3	1:A:949:TYR:CD2	2.33	0.62
1:A:499:SER:HB2	1:A:500:PRO:HD2	1.81	0.62
1:A:501:ALA:C	1:A:503:SER:H	2.08	0.62
1:A:533:THR:HG22	1:A:534:ARG:N	2.15	0.61
1:A:991:TYR:CG	1:A:991:TYR:O	2.53	0.61
1:A:737:ASP:OD1	1:A:739:ASN:HB2	1.99	0.61
1:A:2:GLU:HG3	1:A:16:PHE:CE1	2.36	0.61
1:A:274:ILE:HD12	1:A:776:PHE:CE1	2.35	0.61
1:A:361:MET:CE	1:A:560:ARG:HD3	2.31	0.61
1:A:414:ALA:HB2	1:A:452:MET:CE	2.31	0.61
1:A:847:ALA:HB1	1:A:973:ILE:CG2	2.31	0.61
1:A:195:PRO:O	1:A:197:PRO:HD3	2.00	0.61
1:A:791:GLN:NE2	1:A:958:LYS:HG3	2.16	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:155:VAL:HG22	1:A:217:GLY:N	2.16	0.60
1:A:53:VAL:HG12	1:A:106:VAL:HG22	1.83	0.60
1:A:90:GLU:HB2	1:A:91:PRO:HD3	1.84	0.60
1:A:351:PHD:OP2	1:A:353:THR:N	2.33	0.60
1:A:361:MET:HE2	1:A:560:ARG:HD3	1.83	0.60
1:A:891:PHE:HD2	1:A:891:PHE:N	1.99	0.60
1:A:762:ARG:NH1	1:A:836:ARG:HH21	1.99	0.60
1:A:228:VAL:C	1:A:230:THR:H	2.10	0.60
1:A:891:PHE:N	1:A:891:PHE:CD2	2.69	0.60
1:A:279:PHE:CZ	1:A:288:TRP:C	2.80	0.60
1:A:333:VAL:HG13	1:A:338:SER:OG	2.01	0.60
1:A:276:ILE:O	1:A:279:PHE:HB2	2.02	0.60
1:A:279:PHE:HZ	1:A:288:TRP:C	2.09	0.59
1:A:305:ALA:HA	1:A:796:ASN:OD1	2.01	0.59
1:A:580:ASP:OD2	1:A:582:SER:HB3	2.02	0.59
1:A:489:ARG:NH1	4:A:1001:AN2:O2A	2.33	0.59
1:A:770:GLY:HA2	1:A:841:GLY:O	2.02	0.59
1:A:321:LEU:HD21	1:A:325:ARG:CZ	2.32	0.59
1:A:326:MET:HE2	1:A:329:LYS:HD2	1.84	0.59
1:A:871:THR:HG22	1:A:872:HIS:NE2	2.18	0.59
1:A:155:VAL:HG22	1:A:217:GLY:H	1.66	0.59
1:A:54:ILE:C	1:A:56:GLN:H	2.10	0.59
1:A:558:THR:HG21	1:A:635:ILE:CG1	2.32	0.59
1:A:826:GLU:OE1	1:A:827:PRO:HD2	2.03	0.59
1:A:624:ILE:HG22	1:A:684:LYS:HG2	1.85	0.58
1:A:230:THR:HG21	1:A:232:ILE:HG22	1.85	0.58
1:A:243:GLU:O	1:A:244:GLN:O	2.21	0.58
1:A:442:GLU:O	1:A:445:LEU:HB2	2.04	0.58
1:A:743:ILE:O	1:A:747:VAL:HG13	2.03	0.58
1:A:873:PHE:C	1:A:873:PHE:CD2	2.78	0.58
1:A:392:GLU:O	1:A:451:LYS:HE2	2.04	0.58
1:A:836:ARG:HG3	1:A:984:LEU:HD23	1.86	0.58
1:A:97:ILE:HD11	1:A:800:ASP:O	2.04	0.57
1:A:815:ASP:HB2	1:A:819:ARG:NH2	2.19	0.57
1:A:24:LEU:HD13	1:A:149:ASP:HA	1.87	0.57
1:A:678:ARG:NH2	4:A:1001:AN2:O3'	2.38	0.57
1:A:369:ILE:HG13	1:A:528:VAL:CG1	2.35	0.56
1:A:921:SER:H	1:A:989:ARG:NH2	2.02	0.56
1:A:170:SER:HB2	1:A:486:GLU:HG2	1.88	0.56
1:A:415:THR:HA	1:A:475:ILE:HD13	1.87	0.56
1:A:25:THR:O	1:A:28:GLN:N	2.39	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:843:TYR:OH	1:A:976:PRO:HB2	2.06	0.56
1:A:768:ASN:HA	1:A:771:GLU:HG3	1.87	0.56
1:A:275:ASN:O	1:A:276:ILE:HG22	2.06	0.56
1:A:873:PHE:O	1:A:873:PHE:CG	2.56	0.56
1:A:90:GLU:HG2	1:A:790:VAL:HG22	1.86	0.56
1:A:196:ASP:OD1	1:A:198:ARG:HD2	2.06	0.55
1:A:352:LYS:HD2	1:A:635:ILE:HD12	1.88	0.55
1:A:142:ALA:O	1:A:145:ILE:HG23	2.05	0.55
1:A:873:PHE:HA	1:A:891:PHE:HE1	1.71	0.55
1:A:158:LYS:HE3	1:A:211:GLY:HA2	1.88	0.55
1:A:875:GLN:HA	1:A:880:HIS:HB3	1.87	0.55
1:A:60:LEU:HG	1:A:61:LEU:H	1.72	0.55
1:A:501:ALA:O	1:A:503:SER:N	2.39	0.55
1:A:177:GLN:HB3	1:A:212:THR:HG21	1.88	0.55
1:A:441:THR:HG23	1:A:560:ARG:NH1	2.21	0.55
1:A:794:TRP:CD2	1:A:947:ILE:HD12	2.41	0.55
1:A:496:VAL:O	1:A:512:MET:HA	2.06	0.55
1:A:530:VAL:O	1:A:533:THR:HB	2.07	0.55
1:A:868:HIS:O	1:A:871:THR:N	2.40	0.55
1:A:979:GLY:O	1:A:983:ILE:HG12	2.07	0.55
1:A:626:GLY:O	1:A:678:ARG:HA	2.06	0.55
1:A:965:THR:H	1:A:968:LEU:HD12	1.71	0.55
1:A:341:THR:CG2	1:A:716:ILE:HD12	2.35	0.54
1:A:515:LYS:HE3	4:A:1001:AN2:C2	2.37	0.54
1:A:788:ILE:CG1	1:A:789:PRO:HD2	2.27	0.54
1:A:864:GLY:C	1:A:866:THR:H	2.15	0.54
1:A:920:GLN:HA	1:A:989:ARG:HH21	1.71	0.54
1:A:308:PRO:CB	1:A:764:LEU:HD12	2.36	0.54
1:A:171:THR:HG21	1:A:584:PHE:CZ	2.42	0.54
1:A:58:GLU:HG3	1:A:63:ARG:NH2	2.22	0.54
1:A:366:MET:HE2	1:A:384:ILE:HD11	1.89	0.54
1:A:515:LYS:HE3	4:A:1001:AN2:N1	2.23	0.54
1:A:533:THR:CG2	1:A:534:ARG:N	2.70	0.54
1:A:962:LEU:HB2	1:A:967:TRP:CD1	2.42	0.54
1:A:55:GLU:OE2	1:A:55:GLU:N	2.41	0.54
1:A:868:HIS:C	1:A:871:THR:H	2.16	0.54
1:A:351:PHD:HB2	1:A:355:THR:HB	1.90	0.54
1:A:32:HIS:O	1:A:36:TYR:HB2	2.08	0.54
1:A:59:ASP:HB3	1:A:60:LEU:HD23	1.89	0.54
1:A:627:ASP:N	4:A:1001:AN2:O2B	2.42	0.54
1:A:823:SER:HB3	1:A:826:GLU:HG2	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:794:TRP:CZ2	1:A:947:ILE:HD12	2.43	0.53
1:A:920:GLN:HA	1:A:989:ARG:NH2	2.24	0.53
1:A:230:THR:O	1:A:234:LYS:HG3	2.08	0.53
1:A:302:LEU:O	1:A:305:ALA:HB3	2.08	0.53
1:A:19:SER:HB2	1:A:22:THR:OG1	2.07	0.53
1:A:366:MET:HE2	1:A:384:ILE:CD1	2.39	0.53
1:A:230:THR:HG22	1:A:232:ILE:N	2.19	0.53
1:A:407:PHE:O	1:A:411:VAL:HG23	2.08	0.53
1:A:898:THR:HG21	1:A:959:LEU:O	2.09	0.53
1:A:495:SER:HB3	1:A:588:GLU:OE2	2.09	0.53
1:A:788:ILE:HG22	1:A:791:GLN:HG3	1.91	0.52
1:A:904:LEU:O	1:A:908:GLU:HG3	2.08	0.52
1:A:906:THR:HG22	1:A:974:SER:CB	2.39	0.52
1:A:487:PHE:HB2	1:A:494:MET:HB2	1.89	0.52
1:A:606:GLU:HG3	1:A:739:ASN:OD1	2.09	0.52
1:A:279:PHE:CE2	1:A:288:TRP:HA	2.44	0.52
1:A:338:SER:HB3	1:A:732:GLU:HB3	1.91	0.52
1:A:345:THR:O	1:A:619:ILE:HG12	2.09	0.52
1:A:880:HIS:O	1:A:881:PRO:C	2.52	0.52
1:A:247:THR:H	1:A:250:GLN:NE2	2.08	0.52
1:A:471:CYS:O	1:A:474:VAL:HB	2.10	0.52
1:A:773:VAL:HB	1:A:845:GLY:HA3	1.91	0.52
1:A:50:TRP:CD1	1:A:110:ARG:HH21	2.28	0.52
1:A:366:MET:HE1	1:A:452:MET:SD	2.49	0.52
1:A:383:SER:C	1:A:384:ILE:HD13	2.35	0.52
1:A:716:ILE:N	1:A:716:ILE:CD1	2.67	0.52
1:A:778:THR:HG22	1:A:849:VAL:HG13	1.91	0.52
1:A:124:PRO:HB2	1:A:126:MET:HE3	1.91	0.51
1:A:501:ALA:C	1:A:503:SER:N	2.67	0.51
1:A:102:ALA:O	1:A:106:VAL:HG23	2.09	0.51
1:A:969:MET:O	1:A:973:ILE:HG13	2.09	0.51
1:A:15:TYR:C	1:A:15:TYR:CD2	2.88	0.51
1:A:192:GLU:OE1	1:A:192:GLU:HA	2.10	0.51
1:A:671:ARG:HD2	1:A:694:TYR:CZ	2.46	0.51
1:A:894:PRO:CB	1:A:959:LEU:HB2	2.28	0.51
1:A:170:SER:HB3	1:A:486:GLU:HG2	1.92	0.51
1:A:86:THR:HG22	1:A:790:VAL:HG21	1.92	0.51
1:A:247:THR:H	1:A:250:GLN:HE21	1.58	0.51
1:A:459:VAL:HA	1:A:462:LEU:CD1	2.41	0.51
1:A:908:GLU:C	1:A:910:CYS:H	2.19	0.51
1:A:963:ASP:O	1:A:964:LEU:C	2.53	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:321:LEU:O	1:A:325:ARG:HG3	2.09	0.51
1:A:773:VAL:CG1	1:A:845:GLY:HA3	2.41	0.51
1:A:865:VAL:O	1:A:865:VAL:HG12	2.10	0.51
1:A:287:SER:HB3	1:A:290:ARG:HB2	1.93	0.50
1:A:491:ARG:NH1	1:A:588:GLU:OE2	2.45	0.50
1:A:774:CYS:HB2	1:A:848:THR:HG21	1.93	0.50
1:A:960:LYS:O	1:A:961:ALA:CB	2.55	0.50
1:A:124:PRO:HB2	1:A:126:MET:CE	2.42	0.50
1:A:879:ASP:HB3	1:A:882:HIS:CD2	2.47	0.50
1:A:271:VAL:HG22	1:A:776:PHE:HE1	1.76	0.50
1:A:395:VAL:O	1:A:396:LEU:HD23	2.12	0.50
1:A:330:ASN:HB2	1:A:737:ASP:HB2	1.94	0.50
1:A:357:THR:HG22	1:A:603:PRO:HA	1.93	0.50
1:A:65:LEU:HD22	1:A:309:GLU:HG3	1.93	0.50
1:A:85:ILE:C	1:A:87:ALA:N	2.70	0.50
1:A:90:GLU:CG	1:A:790:VAL:HG22	2.41	0.50
1:A:92:PHE:O	1:A:96:LEU:HB2	2.12	0.50
1:A:294:TYR:OH	1:A:788:ILE:HG13	2.11	0.50
1:A:108:GLN:HG2	1:A:317:THR:HG23	1.95	0.49
1:A:379:LEU:CD2	1:A:544:LYS:HD2	2.42	0.49
1:A:314:VAL:HG13	1:A:757:MET:HE1	1.94	0.49
1:A:921:SER:N	1:A:989:ARG:HH22	2.02	0.49
1:A:929:VAL:HG23	1:A:930:ASN:N	2.26	0.49
1:A:331:ALA:HB2	1:A:742:THR:HG21	1.94	0.49
1:A:866:THR:HG22	1:A:867:TYR:CG	2.47	0.49
1:A:361:MET:HE1	1:A:560:ARG:NH1	2.27	0.49
1:A:560:ARG:O	1:A:599:MET:HB2	2.13	0.49
1:A:159:VAL:HG12	1:A:210:SER:HA	1.95	0.48
1:A:64:ILE:HG21	1:A:307:ILE:HD12	1.96	0.48
1:A:241:ALA:C	1:A:243:GLU:H	2.20	0.48
1:A:413:LEU:HD12	1:A:452:MET:CE	2.43	0.48
1:A:2:GLU:HG3	1:A:16:PHE:CZ	2.48	0.48
1:A:326:MET:HB3	1:A:331:ALA:HB3	1.94	0.48
1:A:866:THR:HG22	1:A:867:TYR:CD1	2.48	0.48
1:A:992:LEU:HD12	1:A:993:GLU:H	1.78	0.48
1:A:120:LYS:C	1:A:122:TYR:H	2.20	0.48
1:A:769:VAL:HG21	1:A:838:MET:HE1	1.96	0.48
1:A:822:ARG:HD2	1:A:823:SER:O	2.13	0.48
1:A:936:SER:O	1:A:939:LEU:HB3	2.13	0.48
1:A:258:GLU:O	1:A:261:SER:HB3	2.12	0.48
1:A:294:TYR:O	1:A:297:LYS:HB2	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:662:PRO:HD2	1:A:665:GLU:HB2	1.95	0.48
1:A:50:TRP:O	1:A:54:ILE:HG12	2.13	0.48
1:A:59:ASP:O	1:A:63:ARG:HG3	2.14	0.48
1:A:89:VAL:O	1:A:93:VAL:HG23	2.13	0.48
1:A:881:PRO:O	1:A:883:PHE:N	2.46	0.48
1:A:787:LEU:HA	1:A:791:GLN:OE1	2.13	0.47
1:A:869:GLN:OE1	1:A:871:THR:O	2.31	0.47
1:A:914:ASN:HD21	1:A:978:ILE:HA	1.79	0.47
1:A:127:GLY:O	1:A:139:ARG:HA	2.13	0.47
1:A:352:LYS:HG3	1:A:623:MET:HE2	1.95	0.47
1:A:962:LEU:HD12	1:A:967:TRP:CE2	2.50	0.47
1:A:418:ALA:HB3	1:A:475:ILE:HG21	1.96	0.47
1:A:478:LEU:C	1:A:501:ALA:HB2	2.39	0.47
1:A:524:ARG:HD2	1:A:588:GLU:O	2.14	0.47
1:A:845:GLY:O	1:A:848:THR:HG22	2.14	0.47
1:A:1:MET:HG3	1:A:225:THR:CG2	2.44	0.47
1:A:62:VAL:O	1:A:66:LEU:HB2	2.14	0.47
1:A:416:ILE:HD11	1:A:566:THR:OG1	2.15	0.47
1:A:711:LEU:HD23	1:A:711:LEU:HA	1.72	0.47
1:A:735:LEU:HD13	1:A:739:ASN:O	2.14	0.47
1:A:899:MET:O	1:A:903:VAL:HG23	2.14	0.47
1:A:975:LEU:N	1:A:976:PRO:CD	2.77	0.47
1:A:65:LEU:HG	1:A:304:VAL:HG13	1.97	0.47
1:A:412:GLU:OE2	1:A:529:ARG:NH1	2.47	0.47
1:A:804:ALA:HA	1:A:807:LEU:HD23	1.96	0.47
1:A:4:ALA:HB1	1:A:7:LYS:HG2	1.95	0.47
1:A:629:LYS:HD2	1:A:654:THR:HG22	1.92	0.47
1:A:898:THR:HG22	1:A:958:LYS:HB2	1.96	0.47
1:A:241:ALA:C	1:A:243:GLU:N	2.72	0.47
1:A:564:LEU:N	1:A:564:LEU:HD12	2.29	0.47
1:A:908:GLU:C	1:A:910:CYS:N	2.72	0.47
1:A:413:LEU:HD13	1:A:413:LEU:C	2.40	0.47
1:A:436:LYS:CB	1:A:443:THR:HG21	2.45	0.47
1:A:829:ILE:HD13	1:A:837:TYR:HE2	1.79	0.47
1:A:705:VAL:C	1:A:707:ASP:H	2.23	0.47
1:A:242:THR:O	1:A:242:THR:HG22	2.14	0.46
1:A:352:LYS:HB3	1:A:352:LYS:HE3	1.65	0.46
1:A:829:ILE:HD13	1:A:837:TYR:CE2	2.50	0.46
1:A:951:ASP:N	1:A:952:PRO:HD2	2.30	0.46
1:A:274:ILE:HD12	1:A:776:PHE:CZ	2.49	0.46
1:A:605:LYS:HE2	1:A:605:LYS:HB3	1.74	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:751:ARG:HG2	1:A:816:ILE:HG12	1.97	0.46
1:A:267:ILE:O	1:A:270:ALA:HB3	2.15	0.46
1:A:288:TRP:CD1	1:A:289:ILE:HG13	2.50	0.46
1:A:838:MET:HA	1:A:838:MET:HE2	1.97	0.46
1:A:65:LEU:HD22	1:A:309:GLU:CG	2.46	0.46
1:A:20:GLU:HG3	1:A:166:LEU:HD13	1.98	0.46
1:A:463:SER:OG	1:A:466:GLU:HG3	2.16	0.46
1:A:42:PRO:O	1:A:43:ALA:C	2.59	0.46
1:A:280:ASN:O	1:A:286:GLY:HA2	2.15	0.46
1:A:867:TYR:C	1:A:868:HIS:CG	2.92	0.46
1:A:342:LEU:HD12	1:A:342:LEU:HA	1.65	0.46
1:A:903:VAL:HG22	1:A:970:VAL:HA	1.97	0.46
1:A:922:LEU:HA	1:A:925:MET:O	2.16	0.46
1:A:177:GLN:HB3	1:A:212:THR:CG2	2.45	0.46
1:A:446:THR:HG23	1:A:472:ASN:ND2	2.31	0.46
1:A:565:ALA:HA	1:A:594:VAL:HG23	1.98	0.46
1:A:294:TYR:HD2	1:A:295:TYR:CD2	2.34	0.45
1:A:81:GLY:C	1:A:83:GLU:H	2.24	0.45
1:A:361:MET:HA	1:A:600:LEU:O	2.16	0.45
1:A:467:ARG:O	1:A:467:ARG:HG3	2.16	0.45
1:A:679:VAL:O	1:A:679:VAL:HG23	2.15	0.45
1:A:965:THR:N	1:A:968:LEU:HD12	2.30	0.45
1:A:123:GLU:OE1	1:A:123:GLU:HA	2.17	0.45
1:A:246:LYS:HG3	1:A:251:GLN:CG	2.46	0.45
1:A:308:PRO:HA	1:A:764:LEU:HD12	1.98	0.45
1:A:894:PRO:HA	1:A:897:MET:HE3	1.99	0.45
1:A:90:GLU:OE2	1:A:790:VAL:HG22	2.16	0.45
1:A:654:THR:OG1	1:A:657:GLU:HG3	2.16	0.45
1:A:389:TYR:HB3	1:A:425:LEU:HD21	1.98	0.45
1:A:70:CYS:O	1:A:74:VAL:HG23	2.16	0.45
1:A:796:ASN:O	1:A:798:VAL:N	2.50	0.45
1:A:148:GLY:O	1:A:222:ILE:HG13	2.17	0.45
1:A:356:LEU:HA	1:A:356:LEU:HD12	1.66	0.45
1:A:828:LEU:C	1:A:828:LEU:HD12	2.42	0.45
1:A:185:VAL:HG12	1:A:186:SER:N	2.31	0.45
1:A:635:ILE:O	1:A:636:CYS:C	2.59	0.45
1:A:843:TYR:CD2	1:A:843:TYR:C	2.95	0.45
1:A:921:SER:CB	1:A:923:MET:HG2	2.47	0.45
1:A:983:ILE:O	1:A:986:PHE:HB3	2.16	0.45
1:A:86:THR:HG22	1:A:86:THR:O	2.17	0.45
1:A:268:CYS:O	1:A:269:VAL:C	2.59	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:807:LEU:HD12	1:A:915:SER:O	2.16	0.45
1:A:855:TRP:NE1	1:A:896:PRO:HD3	2.32	0.45
1:A:880:HIS:CB	1:A:881:PRO:HD2	2.46	0.45
1:A:962:LEU:HA	1:A:966:GLN:OE1	2.16	0.45
1:A:10:GLU:O	1:A:11:GLU:C	2.59	0.45
1:A:276:ILE:HD11	1:A:292:ALA:HB2	1.99	0.45
1:A:145:ILE:HD12	1:A:223:VAL:HG21	1.99	0.44
1:A:188:ILE:CG2	1:A:189:LYS:N	2.80	0.44
1:A:326:MET:HE2	1:A:326:MET:CA	2.45	0.44
1:A:455:PHE:O	1:A:456:ASN:C	2.60	0.44
1:A:633:ILE:O	1:A:634:ALA:C	2.58	0.44
1:A:865:VAL:O	1:A:865:VAL:CG1	2.65	0.44
1:A:88:PHE:C	1:A:91:PRO:HD2	2.42	0.44
1:A:250:GLN:O	1:A:254:ASP:HB2	2.18	0.44
1:A:267:ILE:HG21	1:A:772:VAL:HG11	1.98	0.44
1:A:268:CYS:SG	1:A:303:ALA:HB2	2.58	0.44
1:A:677:ALA:O	1:A:678:ARG:C	2.59	0.44
1:A:720:MET:O	1:A:728:LYS:HE2	2.18	0.44
1:A:796:ASN:C	1:A:798:VAL:N	2.75	0.44
1:A:903:VAL:O	1:A:907:ILE:HG22	2.17	0.44
1:A:88:PHE:O	1:A:91:PRO:HD2	2.16	0.44
1:A:352:LYS:HA	1:A:356:LEU:HB2	1.98	0.44
1:A:412:GLU:O	1:A:413:LEU:C	2.60	0.44
1:A:663:LEU:HD12	1:A:663:LEU:HA	1.77	0.44
1:A:909:MET:HA	1:A:909:MET:CE	2.48	0.44
1:A:959:LEU:O	1:A:960:LYS:O	2.36	0.44
1:A:25:THR:OG1	1:A:28:GLN:HG3	2.16	0.44
1:A:586:GLU:C	1:A:588:GLU:N	2.76	0.44
1:A:828:LEU:HD12	1:A:828:LEU:O	2.18	0.44
1:A:863:PRO:HG3	1:A:890:ILE:CD1	2.48	0.44
1:A:336:LEU:N	1:A:337:PRO:CD	2.80	0.44
1:A:376:PHE:CZ	1:A:378:SER:HB3	2.53	0.44
1:A:719:ALA:HB2	1:A:731:SER:OG	2.18	0.44
1:A:894:PRO:HB3	1:A:958:LYS:HD3	1.99	0.44
1:A:968:LEU:O	1:A:972:LYS:HD3	2.17	0.44
1:A:51:GLU:O	1:A:54:ILE:HB	2.17	0.44
1:A:85:ILE:C	1:A:87:ALA:H	2.25	0.44
1:A:449:VAL:HA	1:A:452:MET:HG3	2.00	0.44
1:A:880:HIS:HB3	1:A:881:PRO:HD2	2.00	0.44
1:A:49:LEU:HD12	1:A:52:LEU:HD23	1.99	0.44
1:A:230:THR:HG22	1:A:232:ILE:HG22	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:255:GLU:O	1:A:255:GLU:HG2	2.18	0.44
1:A:271:VAL:HG22	1:A:776:PHE:CE1	2.52	0.44
1:A:273:LEU:O	1:A:275:ASN:N	2.51	0.44
1:A:277:GLY:C	1:A:279:PHE:H	2.26	0.44
1:A:18:VAL:HG13	1:A:24:LEU:HD12	1.99	0.43
1:A:529:ARG:HH21	1:A:592:THR:HG21	1.83	0.43
1:A:279:PHE:HZ	1:A:288:TRP:O	2.01	0.43
1:A:355:THR:HA	1:A:720:MET:HE3	2.00	0.43
1:A:445:LEU:O	1:A:448:LEU:HB3	2.18	0.43
1:A:962:LEU:HA	1:A:966:GLN:CB	2.40	0.43
1:A:163:ILE:O	1:A:207:MET:HA	2.18	0.43
1:A:836:ARG:HH22	1:A:985:LYS:HE2	1.82	0.43
1:A:867:TYR:O	1:A:868:HIS:CD2	2.72	0.43
1:A:991:TYR:O	1:A:991:TYR:CD2	2.71	0.43
1:A:253:LEU:HD12	1:A:315:ILE:CD1	2.48	0.43
1:A:533:THR:CG2	1:A:534:ARG:H	2.31	0.43
1:A:963:ASP:C	1:A:964:LEU:O	2.62	0.43
1:A:164:ARG:NH1	1:A:165:ILE:O	2.51	0.43
1:A:260:LEU:HD12	1:A:260:LEU:HA	1.54	0.43
1:A:948:LEU:C	1:A:949:TYR:CD2	2.96	0.43
1:A:45:GLU:O	1:A:46:GLY:C	2.62	0.43
1:A:854:TRP:CD1	1:A:858:TYR:HB2	2.54	0.43
1:A:391:PRO:HD2	1:A:434:TYR:CE1	2.54	0.43
1:A:414:ALA:O	1:A:415:THR:C	2.62	0.43
1:A:921:SER:N	1:A:989:ARG:NH2	2.65	0.43
1:A:984:LEU:HD12	1:A:984:LEU:HA	1.87	0.43
1:A:400:LYS:O	1:A:402:ILE:HG23	2.19	0.43
1:A:581:SER:HA	1:A:584:PHE:CE1	2.54	0.43
1:A:10:GLU:HG3	1:A:11:GLU:H	1.84	0.42
1:A:490:ASP:OD1	1:A:491:ARG:N	2.45	0.42
1:A:855:TRP:HA	1:A:859:ALA:HB2	2.00	0.42
1:A:889:GLU:C	1:A:891:PHE:N	2.76	0.42
1:A:71:ILE:HG13	1:A:72:SER:N	2.34	0.42
1:A:680:GLU:HB3	1:A:681:PRO:HD2	2.00	0.42
1:A:963:ASP:O	1:A:964:LEU:O	2.36	0.42
1:A:49:LEU:HD12	1:A:52:LEU:CD2	2.49	0.42
1:A:238:GLN:O	1:A:239:MET:O	2.37	0.42
1:A:620:ARG:NH2	1:A:622:ILE:HD11	2.34	0.42
1:A:218:LYS:NZ	1:A:422:ASP:O	2.52	0.42
1:A:788:ILE:HG23	1:A:789:PRO:N	2.34	0.42
1:A:240:ALA:C	1:A:242:THR:H	2.27	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:334:ARG:NH1	1:A:731:SER:O	2.50	0.42
1:A:336:LEU:HD22	1:A:336:LEU:HA	1.75	0.42
1:A:762:ARG:CG	1:A:837:TYR:HE1	2.32	0.42
1:A:848:THR:OG1	1:A:904:LEU:HD13	2.20	0.42
1:A:315:ILE:HG12	1:A:757:MET:HE2	2.01	0.42
1:A:482:GLU:HA	1:A:482:GLU:OE1	2.20	0.42
1:A:510:ASN:O	1:A:511:LYS:HD3	2.20	0.42
1:A:86:THR:CG2	1:A:790:VAL:HG21	2.50	0.42
1:A:490:ASP:CG	1:A:491:ARG:N	2.78	0.42
1:A:764:LEU:HD22	1:A:764:LEU:HA	1.68	0.42
1:A:53:VAL:CG1	1:A:106:VAL:HG13	2.50	0.42
1:A:894:PRO:HB3	1:A:958:LYS:HB3	2.01	0.42
1:A:239:MET:O	1:A:240:ALA:HB3	2.19	0.41
1:A:490:ASP:CG	1:A:491:ARG:H	2.27	0.41
1:A:961:ALA:O	1:A:962:LEU:O	2.38	0.41
1:A:977:VAL:CG1	1:A:978:ILE:N	2.83	0.41
1:A:60:LEU:C	1:A:62:VAL:H	2.28	0.41
1:A:581:SER:HA	1:A:584:PHE:CZ	2.55	0.41
1:A:866:THR:O	1:A:867:TYR:C	2.63	0.41
1:A:125:GLU:C	1:A:126:MET:HE2	2.46	0.41
1:A:671:ARG:HG3	1:A:694:TYR:CE2	2.55	0.41
1:A:834:PHE:O	1:A:838:MET:HG2	2.21	0.41
1:A:877:THR:HG22	1:A:878:GLU:N	2.35	0.41
1:A:111:ASN:HB3	1:A:324:ARG:HD2	2.01	0.41
1:A:377:CYS:HB3	1:A:544:LYS:HG3	2.01	0.41
1:A:809:PHE:CD2	1:A:809:PHE:N	2.88	0.41
1:A:194:VAL:HG23	1:A:194:VAL:O	2.21	0.41
1:A:239:MET:HE3	1:A:239:MET:HA	2.03	0.41
1:A:275:ASN:C	1:A:277:GLY:N	2.73	0.41
1:A:491:ARG:HH11	1:A:588:GLU:CD	2.28	0.41
1:A:889:GLU:O	1:A:889:GLU:HG2	2.21	0.41
1:A:1:MET:N	1:A:36:TYR:CZ	2.89	0.41
1:A:99:ILE:O	1:A:103:ILE:HG13	2.21	0.41
1:A:529:ARG:NH2	1:A:568:ASP:OD2	2.54	0.41
1:A:13:LEU:HD13	1:A:20:GLU:HB2	2.03	0.41
1:A:49:LEU:O	1:A:50:TRP:C	2.64	0.41
1:A:246:LYS:HG3	1:A:251:GLN:HG2	2.02	0.41
1:A:506:ALA:O	1:A:507:ALA:HB3	2.20	0.41
1:A:119:LEU:HD23	1:A:119:LEU:HA	1.92	0.41
1:A:204:LYS:C	1:A:206:ASN:H	2.29	0.41
1:A:60:LEU:HD23	1:A:60:LEU:N	2.06	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:361:MET:HE1	1:A:560:ARG:HD3	2.01	0.41
1:A:555:GLY:C	1:A:557:ASP:H	2.29	0.41
1:A:991:TYR:CD1	1:A:991:TYR:C	2.95	0.41
1:A:65:LEU:HD22	1:A:309:GLU:CB	2.51	0.40
1:A:33:LEU:HA	1:A:33:LEU:HD23	1.87	0.40
1:A:413:LEU:HD12	1:A:452:MET:HE1	2.02	0.40
1:A:580:ASP:CG	1:A:582:SER:HB3	2.46	0.40
1:A:763:TYR:CD1	1:A:912:ALA:HB2	2.55	0.40
1:A:228:VAL:O	1:A:230:THR:N	2.54	0.40
1:A:367:PHE:CD2	1:A:367:PHE:C	2.98	0.40
1:A:379:LEU:HD21	1:A:544:LYS:HD2	2.03	0.40
1:A:443:THR:O	1:A:444:ALA:C	2.64	0.40
1:A:489:ARG:HD3	1:A:706:ASN:HB3	2.03	0.40
1:A:945:PHE:O	1:A:946:LEU:C	2.65	0.40
1:A:60:LEU:CD2	1:A:60:LEU:N	2.72	0.40
1:A:873:PHE:HD1	1:A:891:PHE:HD1	1.69	0.40
1:A:268:CYS:C	1:A:270:ALA:N	2.78	0.40
1:A:355:THR:HG23	1:A:720:MET:CE	2.52	0.40
1:A:527:TYR:CD1	1:A:534:ARG:HD3	2.57	0.40
1:A:725:ALA:O	1:A:726:VAL:C	2.65	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	991/994 (100%)	838 (85%)	121 (12%)	32 (3%)	3 12

All (32) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	43	ALA

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Mol	Chain	Res	Type
1	A	46	GLY
1	A	55	GLU
1	A	239	MET
1	A	244	GLN
1	A	276	ILE
1	A	501	ALA
1	A	866	THR
1	A	876	CYS
1	A	881	PRO
1	A	882	HIS
1	A	892	GLU
1	A	960	LYS
1	A	961	ALA
1	A	962	LEU
1	A	964	LEU
1	A	965	THR
1	A	229	SER
1	A	959	LEU
1	A	121	GLU
1	A	502	LYS
1	A	797	LEU
1	A	863	PRO
1	A	42	PRO
1	A	587	TYR
1	A	316	THR
1	A	155	VAL
1	A	274	ILE
1	A	867	TYR
1	A	26	PRO
1	A	289	ILE
1	A	865	VAL

5.3.2 Protein sidechains (i)

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.

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	839/839 (100%)	750 (89%)	89 (11%)	5 18

All (89) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	18	VAL
1	A	52	LEU
1	A	55	GLU
1	A	60	LEU
1	A	97	ILE
1	A	119	LEU
1	A	136	SER
1	A	145	ILE
1	A	151	VAL
1	A	179	ILE
1	A	198	ARG
1	A	214	ILE
1	A	225	THR
1	A	239	MET
1	A	244	GLN
1	A	245	ASP
1	A	252	LYS
1	A	276	ILE
1	A	284	HIS
1	A	298	ILE
1	A	307	ILE
1	A	309	GLU
1	A	319	LEU
1	A	336	LEU
1	A	338	SER
1	A	340	GLU
1	A	346	SER
1	A	356	LEU
1	A	379	LEU
1	A	384	ILE
1	A	413	LEU
1	A	433	VAL
1	A	445	LEU
1	A	449	VAL
1	A	452	MET

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Mol	Chain	Res	Type
1	A	475	ILE
1	A	484	THR
1	A	486	GLU
1	A	489	ARG
1	A	491	ARG
1	A	496	VAL
1	A	529	ARG
1	A	532	THR
1	A	544	LYS
1	A	545	ILE
1	A	554	THR
1	A	558	THR
1	A	581	SER
1	A	599	MET
1	A	647	GLU
1	A	656	ARG
1	A	663	LEU
1	A	665	GLU
1	A	678	ARG
1	A	691	LEU
1	A	701	THR
1	A	712	LYS
1	A	716	ILE
1	A	726	VAL
1	A	747	VAL
1	A	751	ARG
1	A	764	LEU
1	A	769	VAL
1	A	788	ILE
1	A	790	VAL
1	A	795	VAL
1	A	802	LEU
1	A	807	LEU
1	A	822	ARG
1	A	828	LEU
1	A	867	TYR
1	A	873	PHE
1	A	880	HIS
1	A	882	HIS
1	A	884	GLU
1	A	890	ILE
1	A	891	PHE

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Mol	Chain	Res	Type
1	A	909	MET
1	A	917	SER
1	A	943	LEU
1	A	947	ILE
1	A	948	LEU
1	A	951	ASP
1	A	958	LYS
1	A	962	LEU
1	A	972	LYS
1	A	977	VAL
1	A	991	TYR
1	A	992	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	108	GLN
1	A	111	ASN
1	A	114	ASN
1	A	213	ASN
1	A	250	GLN
1	A	259	GLN
1	A	275	ASN
1	A	280	ASN
1	A	284	HIS
1	A	359	ASN
1	A	398	ASN
1	A	456	ASN
1	A	472	ASN
1	A	692	GLN
1	A	706	ASN
1	A	755	ASN
1	A	875	GLN
1	A	911	ASN
1	A	920	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

1 non-standard protein/DNA/RNA residue is modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
1	PHD	A	351	2,1	9,11,12	2.69	4 (44%)	9,15,17	2.90	6 (66%)

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
1	PHD	A	351	2,1	-	2/8/11/13	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	351	PHD	O-C	6.30	1.43	1.20
1	A	351	PHD	P-OP2	-2.83	1.44	1.54
1	A	351	PHD	P-OD1	2.78	1.64	1.59
1	A	351	PHD	P-OP1	2.23	1.57	1.50

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	351	PHD	OP2-P-OD1	4.81	119.33	105.32
1	A	351	PHD	OP3-P-OP1	-3.97	95.37	110.83
1	A	351	PHD	OD1-CG-CB	3.73	119.72	110.95
1	A	351	PHD	OD1-P-OP1	-2.73	100.72	109.47
1	A	351	PHD	CA-CB-CG	-2.43	107.57	112.78
1	A	351	PHD	OP3-P-OD1	2.02	111.19	105.32

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	351	PHD	CA-CB-CG-OD1
1	A	351	PHD	CA-CB-CG-OD2

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	351	PHD	2	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 5 ligands modelled in this entry, 4 are monoatomic - leaving 1 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	AN2	A	1001	-	24,29,29	3.70	11 (45%)	26,45,45	1.90	5 (19%)

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
4	AN2	A	1001	-	-	4/9/32/32	0/3/3/3

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1001	AN2	PB-O1B	-12.93	1.26	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1001	AN2	C8-N7	5.12	1.44	1.34
4	A	1001	AN2	C2-N3	4.71	1.39	1.32
4	A	1001	AN2	PA-O3A	4.71	1.64	1.59
4	A	1001	AN2	PA-O1A	4.69	1.67	1.50
4	A	1001	AN2	C2-N1	3.47	1.40	1.33
4	A	1001	AN2	C6-N6	3.29	1.45	1.34
4	A	1001	AN2	O4'-C1'	3.11	1.45	1.40
4	A	1001	AN2	C4-N3	-2.73	1.31	1.35
4	A	1001	AN2	PB-O3A	2.61	1.62	1.59
4	A	1001	AN2	PB-O2B	2.36	1.63	1.56

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	1001	AN2	PB-O3A-PA	-4.82	116.68	132.10
4	A	1001	AN2	N3-C2-N1	-4.16	123.03	128.67
4	A	1001	AN2	C4'-O4'-C1'	-3.83	106.41	109.92
4	A	1001	AN2	C4-C5-N7	-3.52	105.62	109.34
4	A	1001	AN2	C5'-C4'-C3'	-3.38	103.04	115.21

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1001	AN2	C5'-O5'-PA-O3A
4	A	1001	AN2	C5'-O5'-PA-O1A
4	A	1001	AN2	PB-O3A-PA-O5'
4	A	1001	AN2	C5'-O5'-PA-O2A

There are no ring outliers.

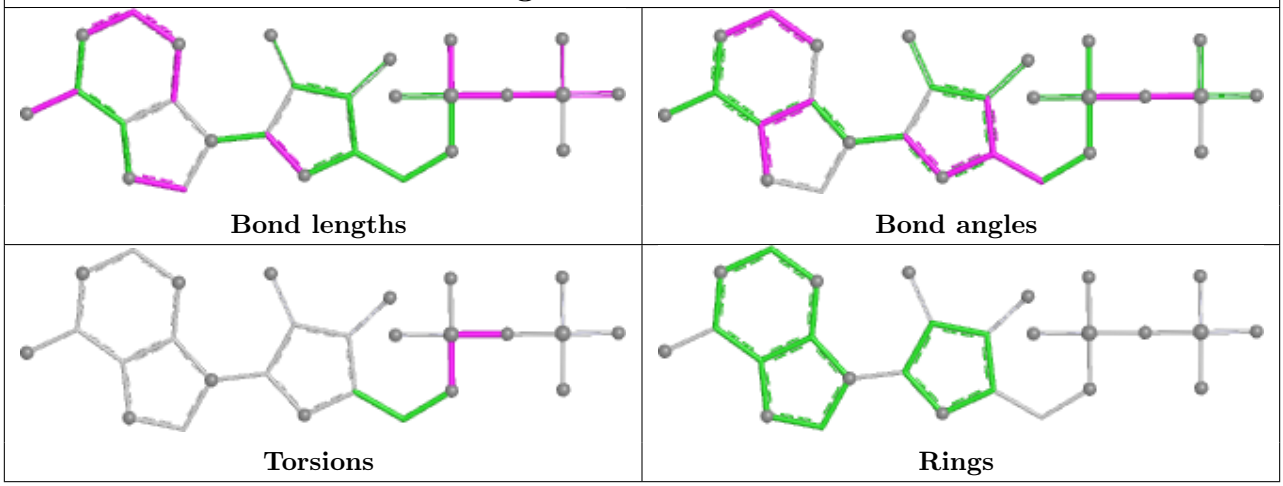
1 monomer is involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1001	AN2	7	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 then 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.

Ligand AN2 A 1001



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, 95^{th} 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	993/994 (99%)	-0.03	24 (2%) 59 51	54, 108, 190, 249	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	506	ALA	6.7
1	A	778	THR	3.6
1	A	831	GLY	3.2
1	A	782	GLY	3.1
1	A	857	MET	3.1
1	A	845	GLY	2.9
1	A	870	LEU	2.8
1	A	292	ALA	2.8
1	A	598	GLY	2.8
1	A	84	THR	2.7
1	A	963	ASP	2.6
1	A	885	GLY	2.6
1	A	886	LEU	2.4
1	A	276	ILE	2.4
1	A	988	ALA	2.4
1	A	974	SER	2.4
1	A	867	TYR	2.3
1	A	882	HIS	2.3
1	A	779	ALA	2.3
1	A	859	ALA	2.3
1	A	244	GLN	2.2
1	A	284	HIS	2.1
1	A	251	GLN	2.1
1	A	842	GLY	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (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, 95^{th} 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
1	PHD	A	351	12/13	0.90	0.14	46,73,95,98	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

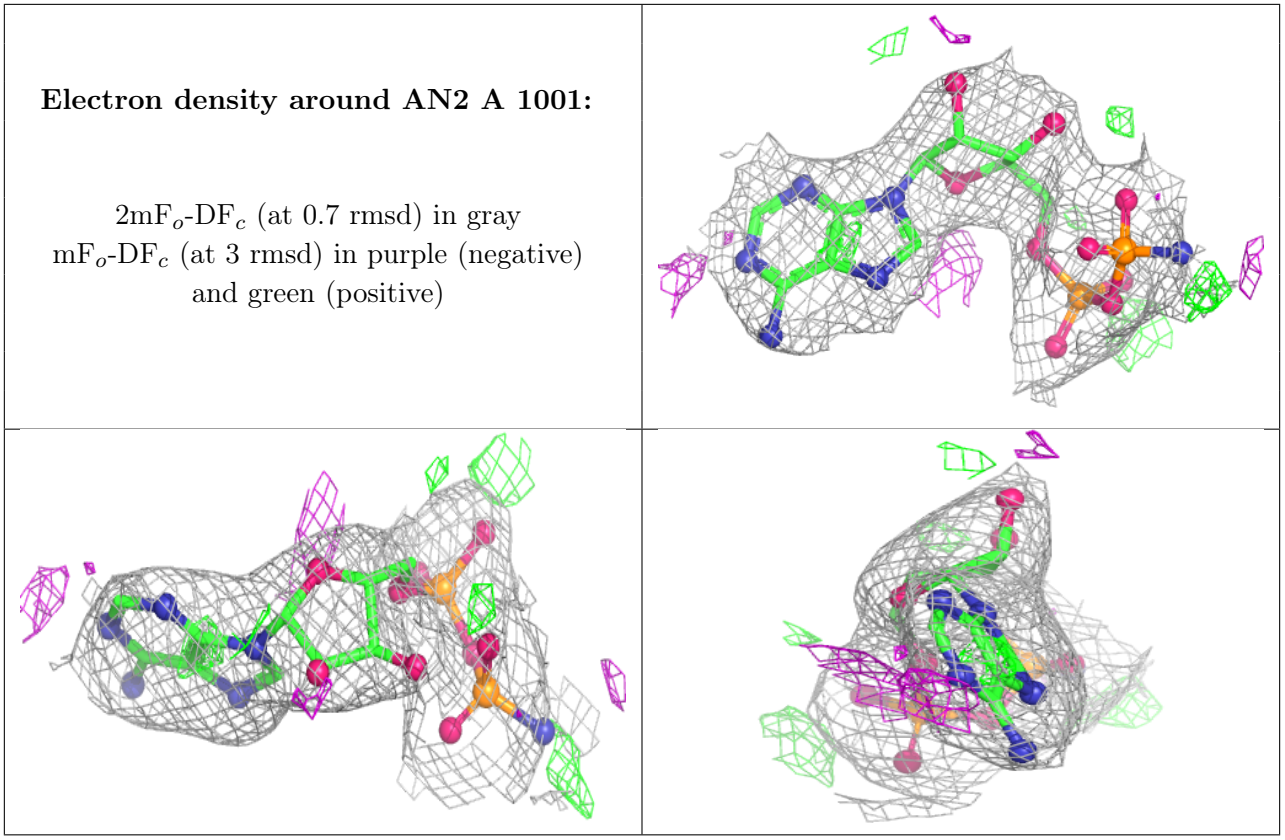
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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
3	K	A	1006	1/1	0.68	0.10	99,99,99,99	0
2	CA	A	1004	1/1	0.92	0.07	92,92,92,92	0
2	CA	A	1003	1/1	0.93	0.06	95,95,95,95	0
2	CA	A	1005	1/1	0.95	0.07	71,71,71,71	0
4	AN2	A	1001	27/27	0.96	0.07	58,68,82,97	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 AN2 A 1001:

$2mF_o$-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.