Full wwPDB X-ray Structure Validation Report ⓘ

Jan 3, 2024 – 01:28 am GMT

PDB ID	:	5AKB
Title	:	MutS in complex with the N-terminal domain of MutL - crystal form 1
Authors	:	Groothuizen, F.S.; Winkler, I.; Cristovao, M.; Fish, A.; Winterwerp, H.H.K.; Reumer, A.; Marx, A.D.; Hermans, N.; Nicholls, R.A.; Murshudov, G.N.; Lebbink, J.H.G.; Friedhoff, P.; Sixma, T.K.
Deposited on	:	2015-03-03
Resolution	:	4.71 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 4.71 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.
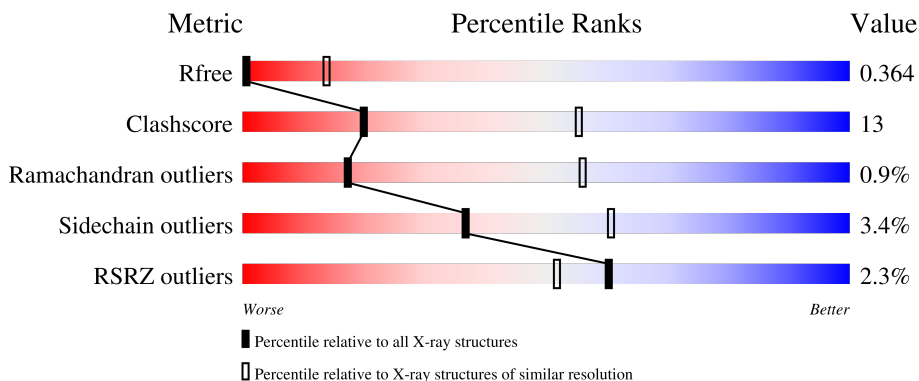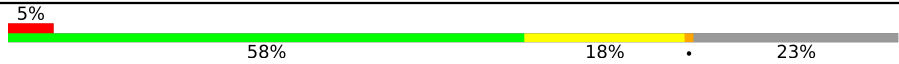

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1085 (5.58-3.80)
Clashscore	141614	1159 (5.60-3.80)
Ramachandran outliers	138981	1094 (5.58-3.80)
Sidechain outliers	138945	1074 (5.58-3.80)
RSRZ outliers	127900	1118 (5.70-3.70)

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	800	% 67% 15% • 17%
1	B	800	% 66% 16% • 17%
1	E	800	2% 48% 24% • 26%
2	C	369	54% 21% • 23%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
2	D	369	5% 58% 18% · 23%
2	F	369	5% 55% 21% · 23%

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 21906 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 DNA MISMATCH REPAIR PROTEIN MUTS.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	663	Total 5226	C 3284	N 938	O 984	S 20	0	0	0
1	B	663	Total 5226	C 3284	N 938	O 984	S 20	0	0	0
1	E	588	Total 4605	C 2894	N 825	O 867	S 19	0	0	0

There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	93	ALA	CYS	engineered mutation	UNP P23909
A	235	SER	CYS	engineered mutation	UNP P23909
A	239	ALA	CYS	engineered mutation	UNP P23909
A	246	CYS	ASP	engineered mutation	UNP P23909
A	297	SER	CYS	engineered mutation	UNP P23909
A	569	SER	CYS	engineered mutation	UNP P23909
A	711	VAL	CYS	engineered mutation	UNP P23909
B	93	ALA	CYS	engineered mutation	UNP P23909
B	235	SER	CYS	engineered mutation	UNP P23909
B	239	ALA	CYS	engineered mutation	UNP P23909
B	246	CYS	ASP	engineered mutation	UNP P23909
B	297	SER	CYS	engineered mutation	UNP P23909
B	569	SER	CYS	engineered mutation	UNP P23909
B	711	VAL	CYS	engineered mutation	UNP P23909
E	93	ALA	CYS	engineered mutation	UNP P23909
E	235	SER	CYS	engineered mutation	UNP P23909
E	239	ALA	CYS	engineered mutation	UNP P23909
E	246	CYS	ASP	engineered mutation	UNP P23909
E	297	SER	CYS	engineered mutation	UNP P23909
E	569	SER	CYS	engineered mutation	UNP P23909
E	711	VAL	CYS	engineered mutation	UNP P23909

- Molecule 2 is a protein called DNA MISMATCH REPAIR PROTEIN MUTL.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	285	Total 2252	C 1423	N 409	O 418	S 2	0	0	0
2	D	285	Total 2252	C 1423	N 409	O 418	S 2	0	0	0
2	F	285	Total 2252	C 1423	N 409	O 418	S 2	0	0	0

There are 75 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-19	MET	-	expression tag	UNP P23367
C	-18	GLY	-	expression tag	UNP P23367
C	-17	SER	-	expression tag	UNP P23367
C	-16	SER	-	expression tag	UNP P23367
C	-15	HIS	-	expression tag	UNP P23367
C	-14	HIS	-	expression tag	UNP P23367
C	-13	HIS	-	expression tag	UNP P23367
C	-12	HIS	-	expression tag	UNP P23367
C	-11	HIS	-	expression tag	UNP P23367
C	-10	HIS	-	expression tag	UNP P23367
C	-9	SER	-	expression tag	UNP P23367
C	-8	SER	-	expression tag	UNP P23367
C	-7	GLY	-	expression tag	UNP P23367
C	-6	LEU	-	expression tag	UNP P23367
C	-5	VAL	-	expression tag	UNP P23367
C	-4	PRO	-	expression tag	UNP P23367
C	-3	ARG	-	expression tag	UNP P23367
C	-2	GLY	-	expression tag	UNP P23367
C	-1	SER	-	expression tag	UNP P23367
C	0	HIS	-	expression tag	UNP P23367
C	61	SER	CYS	engineered mutation	UNP P23367
C	131	CYS	ASN	engineered mutation	UNP P23367
C	216	LEU	CYS	engineered mutation	UNP P23367
C	256	PHE	CYS	engineered mutation	UNP P23367
C	276	TYR	CYS	engineered mutation	UNP P23367
D	-19	MET	-	expression tag	UNP P23367
D	-18	GLY	-	expression tag	UNP P23367
D	-17	SER	-	expression tag	UNP P23367
D	-16	SER	-	expression tag	UNP P23367
D	-15	HIS	-	expression tag	UNP P23367
D	-14	HIS	-	expression tag	UNP P23367
D	-13	HIS	-	expression tag	UNP P23367
D	-12	HIS	-	expression tag	UNP P23367

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
D	-11	HIS	-	expression tag	UNP P23367
D	-10	HIS	-	expression tag	UNP P23367
D	-9	SER	-	expression tag	UNP P23367
D	-8	SER	-	expression tag	UNP P23367
D	-7	GLY	-	expression tag	UNP P23367
D	-6	LEU	-	expression tag	UNP P23367
D	-5	VAL	-	expression tag	UNP P23367
D	-4	PRO	-	expression tag	UNP P23367
D	-3	ARG	-	expression tag	UNP P23367
D	-2	GLY	-	expression tag	UNP P23367
D	-1	SER	-	expression tag	UNP P23367
D	0	HIS	-	expression tag	UNP P23367
D	61	SER	CYS	engineered mutation	UNP P23367
D	131	CYS	ASN	engineered mutation	UNP P23367
D	216	LEU	CYS	engineered mutation	UNP P23367
D	256	PHE	CYS	engineered mutation	UNP P23367
D	276	TYR	CYS	engineered mutation	UNP P23367
F	-19	MET	-	expression tag	UNP P23367
F	-18	GLY	-	expression tag	UNP P23367
F	-17	SER	-	expression tag	UNP P23367
F	-16	SER	-	expression tag	UNP P23367
F	-15	HIS	-	expression tag	UNP P23367
F	-14	HIS	-	expression tag	UNP P23367
F	-13	HIS	-	expression tag	UNP P23367
F	-12	HIS	-	expression tag	UNP P23367
F	-11	HIS	-	expression tag	UNP P23367
F	-10	HIS	-	expression tag	UNP P23367
F	-9	SER	-	expression tag	UNP P23367
F	-8	SER	-	expression tag	UNP P23367
F	-7	GLY	-	expression tag	UNP P23367
F	-6	LEU	-	expression tag	UNP P23367
F	-5	VAL	-	expression tag	UNP P23367
F	-4	PRO	-	expression tag	UNP P23367
F	-3	ARG	-	expression tag	UNP P23367
F	-2	GLY	-	expression tag	UNP P23367
F	-1	SER	-	expression tag	UNP P23367
F	0	HIS	-	expression tag	UNP P23367
F	61	SER	CYS	engineered mutation	UNP P23367
F	131	CYS	ASN	engineered mutation	UNP P23367
F	216	LEU	CYS	engineered mutation	UNP P23367
F	256	PHE	CYS	engineered mutation	UNP P23367
F	276	TYR	CYS	engineered mutation	UNP P23367

- Molecule 3 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (three-letter code: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$).
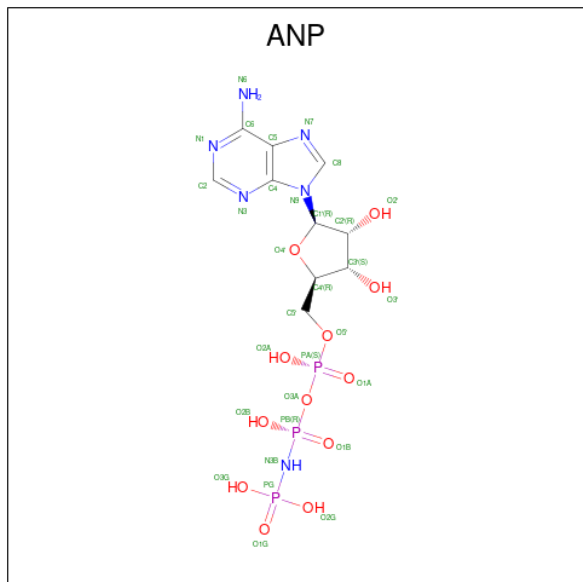
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
3	B	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
3	E	1	Total	C	N	O	P	0	0
			31	10	6	12	3		

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: DNA MISMATCH REPAIR PROTEIN MUTS

• Molecule 1: DNA MISMATCH REPAIR PROTEIN MUTS

T327 Q332 G346 E349 A388 P389 V390 R420 R437 A438 D441 L460 D461 F467 H471 G472 Y473 Y474 I475 Q481 N488 R492 Q493 R500 Y501 I502 L506 Y509 K512 Q526 L527 L531 E540 Q544 R561 T564 L565

S569 F572 K575 P576 I580 R584 V588 E589 Q590 V591 L592 N593 E594 P595 F596 L601 N602 L603 M609 L610 I611 I612 T613 G614 P615 N616 M617 S621 T622 Y623 M624 T627 I630 Y639 V640 P641 R652 I653 F654 T655 R656 V657 G658 A659 ALA ASP ASP

LEU ALA SER ARG SER THR F670 M671 V672 E673 M674 T677 A678 L681 H682 I695 G696 R697 G698 T699 S700 D703 A708 W709 A710 A721 L722 T723 L724 F725 A726 T727 H728 L735 P736 V742 A743 L747 D748 A749 Q763 D764 A767 Y771 G772 L773 A774

V775 A776 G780 V781 P782 K783 K787 L793 S800

• Molecule 1: DNA MISMATCH REPAIR PROTEIN MUTS

Chain E:
2%
48%   24%   •   26%

MET SER ALA ILE GLU ASN PHE ASP ALA HIS THR PRO MET MET GLN GLN TYR LEU ARG LEU LYS ALA GLN HIS PRO GLU ILE LEU LEU PHE TYR ARG MET GLY ASP PHE TYR GLU LEU PHE TYR ASP ASP ALA LYS ARG ALA SER GLN LEU LEU ASP ILE SER LEU THR LYS ARG GLY ALA

SER ALA GLY PRO ILE PRO MET ALA GLY ILE PRO TYR HIS ALA VAL GLU ASN TYR LEU ALA LYS LEU VAL ASN GLN GLY GLU SER VAL ALA ILE ALA GLU GLN ILE GLY ASP PRO ALA THR SER LYS GLY PRO VAL GLU ARG LYS VAL VAL ARG ILE VAL THR PRO GLY THR ILE SER

ASP GLU ALA LEU LEU GLN GLU R128 L132 L133 A134 A135 I136 W137 Q138 D139 L148 G153 R154 F155 R156 L157 T165 T173 N174 L178 L179 Y180 A181 E182 R198 R199 P200 L201 W202 D207 V223 G226 N229 G233 A237 G238 Q242 K245

Q248 R249 L252 I255 R256 S257 I258 T259 M260 E261 R262 E263 Q264 D265 S266 I267 I268 M269 A272 T273 R274 R275 N276 L277 E278 I279 T290 L291 V294 L295 T300 P301 M302 L311 P314 V315 R316 R319 V320 L321 T327 I328 G329 A330 L331 Q332 D333 F334 L338

V341 L342 R343 D347 R361 P362 F372 P376 Q381 L382 D386 S387 A388 P389 V390 L393 M397 G398 E399 F400 L403 R404 D405 A410 I411 I412 D413 T414 P415 P416 V417 L418 V419 R420 V424 I425 L433 W436 D441 GLY ALA THR ASP TYR LEU

GLU ARG LEU GLU VAL ARG GLU ARG GLU ARG THR GLY LEU ASP THR LEU LYS VAL GLY PHE ASN ALA VAL GLY TYR TYR ILE GLN ILE SER ARG GLY GLN SER HIS LEU ALA PRO ILE ALA ASN TYR MET ARG ARG GLN GLN THR LEU LYS ASN ALA GLU ARG TYR ILE ILE PRO GLU GLU LEU LYS

GLU TYR GLU ASP LYS VAL LEU THR SER K517 G518 K519 A520 E524 Y528 F532 F537 L535 L536 P537 A541 A548 L549 L552 D553 V554 L555 V556 N557 L558 A559 Y563 N566 F572 I573 D574 K575 P576 G577 I578 R579 I580 R584 H585 P586 V587 N593 N599

P600 L601 P605 Q606 M609 L610 I611 I612 T613 G614 P615 N616 M617 G618 G619 Y623 M624 L632 Y635 S638 I647 G648 P649 I650 D651 R652 I653 F654 T655 R656 A659 ALA ASP ASP LEU ALA SER GLY ARG SER THR F670 E673 N679 I680 N683 L689 V690

L691 M692 D693 E694 I695 G696 R697 G698 T699 S700 D703 S706 W709 N717 K718 I719 K720 A721 L722 T723 L724 F725 A726 T727 H728 Y729 F730 E731 L732 T733 Q734 L735 K738 M739 V742 H746 L747 E751 H752 G753 D754 T755 F758 S761 V762 G765 A766 A767 S768

K769 S770 Y771 A774 V775 L778 V781 P782 K783 E784 V785 I786 K787 S800

• Molecule 2: DNA MISMATCH REPAIR PROTEIN MUTL

Chain C: 54% 21% • 23%

• Molecule 2: DNA MISMATCH REPAIR PROTEIN MUTL

Chain D: 5% 58% 18% • 23%

• Molecule 2: DNA MISMATCH REPAIR PROTEIN MUTL

Chain F: 5% 55% 21% • 23%

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	165.93Å 188.54Å 200.43Å 90.00° 94.77° 90.00°	Depositor
Resolution (Å)	199.73 – 4.71 80.35 – 4.71	Depositor EDS
% Data completeness (in resolution range)	97.2 (199.73-4.71) 97.3 (80.35-4.71)	Depositor EDS
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.32 (at 4.65Å)	Xtriage
Refinement program	REFMAC 5.8.0107	Depositor
R, R_{free}	0.319 , 0.349 0.337 , 0.364	Depositor DCC
R_{free} test set	1499 reflections (4.83%)	wwPDB-VP
Wilson B-factor (Å^2)	172.9	Xtriage
Anisotropy	0.346	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.26 , 190.8	EDS
L-test for twinning[2]	$< |L| > = 0.37, < L^2 > = 0.20$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.86	EDS
Total number of atoms	21906	wwPDB-VP
Average B, all atoms (Å^2)	234.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.35% 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: ANP

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	0.53	0/5311	0.73	6/7186 (0.1%)
1	B	0.50	0/5311	0.67	3/7186 (0.0%)
1	E	0.56	0/4678	0.75	0/6331
2	C	0.63	1/2288 (0.0%)	0.81	3/3096 (0.1%)
2	D	0.53	0/2288	0.75	1/3096 (0.0%)
2	F	0.52	0/2288	0.73	1/3096 (0.0%)
All	All	0.54	1/22164 (0.0%)	0.73	14/29991 (0.0%)

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
1	A	0	3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	21	GLU	CG-CD	5.39	1.60	1.51

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	707	LEU	CB-CG-CD2	-7.33	98.53	111.00
1	A	652	ARG	NE-CZ-NH2	-6.98	116.81	120.30
2	C	148	LEU	CB-CG-CD1	-6.59	99.79	111.00
1	A	283	LEU	CB-CG-CD2	-6.46	100.01	111.00
1	A	283	LEU	CA-CB-CG	6.14	129.42	115.30
1	A	262	ARG	NE-CZ-NH2	-5.82	117.39	120.30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	237	ARG	NE-CZ-NH2	-5.77	117.41	120.30
1	B	609	MET	CB-CG-SD	5.73	129.59	112.40
2	D	118	GLN	N-CA-C	5.70	126.39	111.00
1	A	367	ARG	NE-CZ-NH2	-5.50	117.55	120.30
2	F	256	PHE	CB-CA-C	-5.47	99.45	110.40
2	C	152	TYR	CA-CB-CG	5.44	123.74	113.40
1	B	764	ASP	CB-CG-OD1	5.21	122.99	118.30
1	B	672	VAL	CG1-CB-CG2	5.10	119.06	110.90

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	265	ASP	Peptide
1	A	266	SER	Peptide
1	A	267	ILE	Peptide

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	5226	0	5283	120	0
1	B	5226	0	5283	123	0
1	E	4605	0	4660	167	1
2	C	2252	0	2272	60	0
2	D	2252	0	2272	43	0
2	F	2252	0	2272	77	0
3	A	31	0	13	3	0
3	B	31	0	13	7	0
3	E	31	0	13	0	0
All	All	21906	0	22081	555	1

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 13.

All (555) 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:F:82:SER:O	2:F:85:ASP:OD1	1.56	1.21
2:F:267:LEU:HD12	2:F:299:VAL:HG13	1.28	1.13
2:F:83:LEU:HA	2:F:86:LEU:HB3	1.12	1.12
2:C:51:ALA:O	2:C:149:ASP:CG	1.90	1.10
2:F:51:ALA:O	2:F:149:ASP:CG	1.90	1.10
1:B:267:ILE:HD12	1:B:313:MET:HG2	1.32	1.08
1:E:137:TRP:CH2	1:E:139:ASP:HB3	1.87	1.08
2:C:52:LYS:HA	2:C:149:ASP:OD1	1.55	1.06
1:A:656:ARG:NH2	1:A:673:GLU:HA	1.71	1.03
2:F:83:LEU:HA	2:F:86:LEU:CB	1.89	1.02
2:F:83:LEU:CA	2:F:86:LEU:HB3	1.89	1.01
1:B:473:TYR:HB2	1:B:506:LEU:HD21	1.43	0.98
2:F:52:LYS:HA	2:F:149:ASP:OD1	1.64	0.96
1:A:656:ARG:HH21	1:A:673:GLU:HA	1.26	0.92
1:E:266:SER:HA	1:E:651:ASP:HB2	1.50	0.91
2:F:51:ALA:C	2:F:149:ASP:OD2	2.09	0.91
1:A:656:ARG:HH21	1:A:673:GLU:CA	1.85	0.90
1:A:728:HIS:CG	1:B:699:THR:HA	2.07	0.90
2:C:51:ALA:C	2:C:149:ASP:OD2	2.09	0.90
1:B:267:ILE:HD11	1:B:314:PRO:O	1.72	0.89
1:B:267:ILE:HD13	1:B:314:PRO:CD	2.03	0.89
1:E:269:MET:HG2	1:E:653:ILE:HB	1.55	0.88
1:E:267:ILE:HG22	1:E:268:ILE:HG23	1.56	0.87
1:A:699:THR:HA	1:B:728:HIS:CG	2.11	0.85
2:D:86:LEU:HD21	2:D:89:ILE:HB	1.58	0.85
1:E:730:PHE:CD2	1:E:767:ALA:HB3	2.11	0.85
2:D:111:THR:HG22	2:D:122:GLN:HG3	1.57	0.84
1:B:674:MET:O	1:B:677:THR:OG1	1.96	0.84
2:F:70:LEU:CD2	2:F:86:LEU:HD13	2.06	0.83
1:A:563:TYR:O	2:C:200:ARG:NH2	2.12	0.83
1:A:674:MET:O	1:A:677:THR:OG1	1.97	0.83
1:B:565:LEU:O	1:B:584:ARG:NH2	2.13	0.81
2:F:267:LEU:CD1	2:F:299:VAL:HG13	2.09	0.81
1:A:670:PHE:HB3	3:B:1801:ANP:O1G	1.80	0.81
2:F:256:PHE:HE1	2:F:272:ILE:HD12	1.46	0.81
2:C:106:SER:HB3	2:C:150:LEU:HD22	1.63	0.80
2:F:51:ALA:C	2:F:149:ASP:CG	2.40	0.80
1:A:694:GLU:HB2	1:B:697:ARG:HH21	1.47	0.80
1:E:327:THR:HG21	1:E:555:LEU:HD13	1.62	0.80
2:C:51:ALA:C	2:C:149:ASP:CG	2.40	0.79
1:B:267:ILE:HD13	1:B:314:PRO:N	1.95	0.79
1:A:656:ARG:HH21	1:A:673:GLU:CB	1.94	0.79

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:86:LEU:HD21	2:C:89:ILE:HB	1.65	0.79
1:E:291:LEU:HD21	1:E:311:LEU:HD22	1.63	0.79
1:B:473:TYR:CB	1:B:506:LEU:HD21	2.12	0.79
2:F:70:LEU:HD22	2:F:86:LEU:HD13	1.64	0.79
1:A:565:LEU:O	1:A:584:ARG:NH2	2.15	0.78
1:E:157:LEU:HD13	1:E:237:ALA:HB2	1.63	0.78
1:E:727:THR:OG1	1:E:729:TYR:CD2	2.36	0.78
1:E:137:TRP:HH2	1:E:139:ASP:HB3	1.42	0.78
1:E:248:GLN:HG3	1:E:252:LEU:HD21	1.66	0.78
1:A:268:ILE:CG2	1:A:269:MET:H	1.96	0.78
2:F:106:SER:HB3	2:F:150:LEU:HD22	1.66	0.78
2:D:150:LEU:HD12	2:D:151:PHE:CD2	2.19	0.78
2:F:51:ALA:HB1	2:F:149:ASP:OD2	1.83	0.78
2:C:51:ALA:HB1	2:C:149:ASP:OD2	1.83	0.77
1:A:682:HIS:CE1	1:B:780:GLY:O	2.38	0.77
2:C:163:THR:OG1	2:C:166:THR:OG1	2.03	0.76
1:E:576:PRO:O	1:E:605:PRO:HD3	1.87	0.75
2:F:163:THR:OG1	2:F:166:THR:OG1	2.04	0.74
2:D:111:THR:HG22	2:D:122:GLN:CG	2.17	0.73
1:E:295:LEU:CD1	1:E:311:LEU:HD21	2.18	0.73
1:E:755:THR:HG21	2:F:136:PRO:HD2	1.70	0.73
1:E:382:LEU:HD11	1:E:552:LEU:HD11	1.71	0.73
1:A:624:MET:SD	1:A:724:LEU:HB3	2.29	0.72
1:A:773:LEU:HD12	1:A:793:LEU:HD22	1.71	0.72
1:B:267:ILE:HD13	1:B:314:PRO:HD2	1.69	0.72
1:E:580:ILE:HD12	1:E:601:LEU:HD23	1.70	0.72
1:B:656:ARG:HH22	1:B:673:GLU:CD	1.93	0.72
1:B:656:ARG:NH2	1:B:673:GLU:CD	2.43	0.72
1:B:773:LEU:HD12	1:B:793:LEU:HD22	1.72	0.72
2:F:86:LEU:HD21	2:F:90:ILE:HG23	1.72	0.71
2:F:256:PHE:CE1	2:F:272:ILE:HD12	2.26	0.70
1:E:341:VAL:HG21	1:E:381:GLN:HE22	1.56	0.70
1:A:682:HIS:HE1	1:B:780:GLY:O	1.74	0.70
1:B:202:TRP:CZ2	2:C:158:ARG:NH2	2.61	0.69
1:B:267:ILE:CD1	1:B:314:PRO:N	2.55	0.69
1:A:755:THR:HG21	2:C:135:LYS:HB2	1.73	0.69
1:E:632:LEU:O	1:E:632:LEU:HD23	1.93	0.69
2:C:51:ALA:O	2:C:149:ASP:OD1	2.10	0.69
1:A:695:ILE:HD11	1:A:725:PHE:CZ	2.28	0.68
1:B:695:ILE:HD11	1:B:725:PHE:CZ	2.28	0.68
1:E:266:SER:HA	1:E:651:ASP:CB	2.22	0.68

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:615:PRO:HG3	1:A:749:ALA:HB2	1.76	0.68
2:C:102:ILE:HG23	2:C:150:LEU:CD2	2.25	0.67
2:F:267:LEU:HD12	2:F:299:VAL:CG1	2.17	0.67
1:E:264:GLN:O	1:E:266:SER:N	2.28	0.67
2:F:51:ALA:O	2:F:149:ASP:OD1	2.12	0.67
2:C:51:ALA:CA	2:C:149:ASP:OD2	2.43	0.67
1:E:272:ALA:HA	1:E:275:ARG:CZ	2.25	0.66
3:A:1801:ANP:O1G	1:B:670:PHE:HB3	1.96	0.66
1:E:268:ILE:HG22	1:E:314:PRO:HD2	1.76	0.66
2:F:82:SER:C	2:F:85:ASP:OD1	2.33	0.66
1:B:615:PRO:HG3	1:B:749:ALA:HB2	1.76	0.66
1:E:735:LEU:HD22	1:E:739:MET:HG3	1.76	0.66
1:B:267:ILE:CD1	1:B:314:PRO:O	2.43	0.66
2:F:70:LEU:HD21	2:F:86:LEU:HD13	1.77	0.65
2:F:83:LEU:N	2:F:86:LEU:HB3	2.11	0.65
2:F:164:GLU:HG3	2:F:165:LYS:H	1.60	0.65
1:A:267:ILE:CG2	1:A:268:ILE:H	2.10	0.65
1:A:267:ILE:HG22	1:A:268:ILE:H	1.60	0.65
2:C:51:ALA:CB	2:C:149:ASP:OD2	2.45	0.65
1:E:269:MET:CG	1:E:653:ILE:HB	2.24	0.65
2:F:51:ALA:CA	2:F:149:ASP:OD2	2.45	0.65
2:C:72:LEU:HD21	2:C:108:LEU:HD22	1.78	0.65
2:F:102:ILE:HG23	2:F:150:LEU:CD2	2.27	0.65
2:F:80:ILE:HG23	2:F:90:ILE:HD13	1.80	0.64
1:E:295:LEU:HD13	1:E:311:LEU:HD21	1.78	0.64
1:E:295:LEU:HD22	1:E:558:LEU:HD23	1.79	0.64
1:B:678:ALA:HA	1:B:681:LEU:HD12	1.80	0.63
1:E:419:VAL:HG12	1:E:524:GLU:HG2	1.80	0.63
2:F:51:ALA:CB	2:F:149:ASP:OD2	2.46	0.63
2:C:102:ILE:HG23	2:C:150:LEU:HD21	1.79	0.63
1:B:267:ILE:HG22	1:B:268:ILE:N	2.14	0.63
1:A:785:VAL:HG13	1:B:710:ALA:HB1	1.80	0.63
2:D:150:LEU:CD1	2:D:151:PHE:CE2	2.82	0.63
1:A:773:LEU:CD1	1:A:793:LEU:HD22	2.28	0.63
1:E:419:VAL:HA	1:E:424:VAL:HG21	1.81	0.63
1:B:593:ASN:O	1:B:594:GLU:HB3	1.98	0.62
1:E:700:SER:O	1:E:703:ASP:OD1	2.18	0.62
1:B:266:SER:O	1:B:316:ARG:HD3	1.98	0.62
2:F:102:ILE:HG23	2:F:150:LEU:HD21	1.81	0.62
1:B:773:LEU:CD1	1:B:793:LEU:HD22	2.29	0.62
2:C:106:SER:CB	2:C:150:LEU:HD22	2.29	0.62

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:256:PHE:HE1	2:F:272:ILE:CD1	2.10	0.62
2:F:82:SER:O	2:F:86:LEU:N	2.33	0.62
1:E:650:ILE:HD13	1:E:689:LEU:HD22	1.81	0.62
1:E:165:THR:HG21	1:E:263:GLU:HG2	1.82	0.61
1:E:321:LEU:HD13	1:E:572:PHE:CZ	2.35	0.61
1:B:267:ILE:CD1	1:B:313:MET:C	2.68	0.61
2:F:106:SER:CB	2:F:150:LEU:HD22	2.30	0.61
2:D:241:ALA:HB3	2:D:287:ALA:HB3	1.83	0.61
1:E:382:LEU:HD22	1:E:390:VAL:CG1	2.31	0.61
1:E:332:GLN:HG3	1:E:563:TYR:HB2	1.84	0.60
1:B:278:GLU:OE2	1:B:283:LEU:N	2.30	0.60
1:B:630:ILE:HG23	1:B:640:VAL:HG11	1.84	0.60
2:C:241:ALA:HB3	2:C:287:ALA:HB3	1.83	0.60
1:E:248:GLN:CG	1:E:252:LEU:HD21	2.30	0.60
1:A:268:ILE:HG23	1:A:269:MET:H	1.66	0.60
1:A:782:PRO:HG3	1:B:682:HIS:NE2	2.16	0.60
1:E:566:ASN:O	1:E:584:ARG:NH2	2.35	0.60
1:E:382:LEU:HD22	1:E:390:VAL:HG13	1.82	0.60
1:E:248:GLN:HG3	1:E:252:LEU:HD11	1.83	0.60
1:B:502:ILE:CD1	1:B:506:LEU:HD22	2.32	0.59
1:E:268:ILE:HG22	1:E:314:PRO:HG2	1.82	0.59
2:C:47:GLU:HG3	2:C:53:LEU:HD23	1.83	0.59
2:C:266:ARG:O	2:C:269:ASN:HB2	2.02	0.59
2:F:241:ALA:HB3	2:F:287:ALA:HB3	1.83	0.59
1:E:252:LEU:HD22	1:E:255:ILE:HD12	1.83	0.59
1:A:209:ALA:HB1	1:A:238:GLY:HA3	1.84	0.59
1:E:572:PHE:HA	1:E:647:ILE:O	2.01	0.59
1:A:580:ILE:CD1	1:A:630:ILE:HD13	2.33	0.59
1:E:294:VAL:HG21	1:E:587:VAL:HA	1.85	0.59
2:F:83:LEU:HA	2:F:86:LEU:CA	2.32	0.59
2:D:156:ALA:HB1	2:D:160:PHE:CZ	2.38	0.59
1:E:157:LEU:HD11	1:E:233:GLY:O	2.03	0.59
1:E:403:LEU:HD22	1:E:535:LEU:CD2	2.33	0.59
1:E:332:GLN:OE1	2:F:200:ARG:NH2	2.35	0.58
2:F:164:GLU:HG3	2:F:165:LYS:N	2.19	0.58
2:C:70:LEU:CD2	2:C:86:LEU:HD13	2.34	0.58
1:E:656:ARG:HG2	1:E:695:ILE:HG22	1.84	0.58
1:A:450:LEU:CD2	1:A:506:LEU:HD21	2.34	0.58
2:C:164:GLU:HG3	2:C:165:LYS:H	1.67	0.58
2:C:80:ILE:O	2:C:83:LEU:HG	2.03	0.58
1:A:630:ILE:HG23	1:A:640:VAL:HG11	1.84	0.58

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:734:GLN:O	1:A:737:GLU:HG2	2.04	0.57
2:C:105:VAL:HG13	2:C:153:ASN:OD1	2.04	0.57
1:E:268:ILE:HD12	1:E:269:MET:O	2.04	0.57
1:E:269:MET:HG2	1:E:653:ILE:CB	2.29	0.57
1:E:652:ARG:NH1	1:E:683:ASN:O	2.37	0.57
1:A:179:LEU:HD23	1:A:197:ARG:HB2	1.86	0.57
1:A:670:PHE:N	3:B:1801:ANP:O2G	2.38	0.57
1:E:165:THR:HG21	1:E:263:GLU:CG	2.35	0.57
2:D:73:ALA:O	2:D:80:ILE:HG23	2.03	0.57
1:E:267:ILE:HG22	1:E:268:ILE:CG2	2.32	0.57
1:E:613:THR:O	1:E:746:HIS:HB2	2.05	0.57
2:F:256:PHE:CE1	2:F:288:PHE:CE1	2.92	0.57
1:A:575:LYS:HB3	1:A:576:PRO:HD2	1.86	0.56
1:E:268:ILE:HG22	1:E:314:PRO:CD	2.34	0.56
2:D:70:LEU:CD2	2:D:86:LEU:HD13	2.34	0.56
1:E:264:GLN:HB2	1:E:267:ILE:HG12	1.88	0.56
1:E:735:LEU:HD22	1:E:739:MET:CG	2.35	0.56
1:E:226:GLY:HA3	1:E:683:ASN:HD21	1.71	0.56
2:F:52:LYS:CA	2:F:149:ASP:OD1	2.48	0.56
1:A:268:ILE:CG2	1:A:269:MET:N	2.63	0.56
1:B:576:PRO:HB2	1:B:722:LEU:HD11	1.87	0.56
1:A:678:ALA:HA	1:A:681:LEU:HD12	1.88	0.55
2:D:64:LYS:HG3	2:D:114:THR:HG21	1.87	0.55
1:E:719:ILE:HG22	1:E:721:ALA:HB2	1.88	0.55
1:B:276:ASN:HB2	1:B:657:VAL:HG21	1.89	0.55
2:C:51:ALA:O	2:C:149:ASP:OD2	2.18	0.55
1:E:771:TYR:O	1:E:774:ALA:HB3	2.06	0.55
1:A:624:MET:SD	1:A:724:LEU:CB	2.95	0.55
2:D:150:LEU:HD11	2:D:151:PHE:CE2	2.41	0.55
1:E:268:ILE:HG22	1:E:314:PRO:CG	2.36	0.55
1:A:420:ARG:HG3	1:B:420:ARG:NH1	2.22	0.55
1:A:760:HIS:HB3	3:A:1801:ANP:C6	2.36	0.55
1:E:135:ALA:HA	1:E:179:LEU:O	2.07	0.55
2:F:47:GLU:HG3	2:F:53:LEU:HD23	1.89	0.55
1:B:575:LYS:HB3	1:B:576:PRO:HD2	1.87	0.55
2:D:263:MET:SD	2:D:264:ARG:N	2.77	0.55
1:A:268:ILE:HG22	1:A:269:MET:H	1.69	0.54
1:B:771:TYR:O	1:B:775:VAL:HG23	2.06	0.54
2:F:70:LEU:HD21	2:F:86:LEU:CD1	2.36	0.54
1:A:738:LYS:HG3	1:E:717:ASN:HD21	1.72	0.54
1:B:580:ILE:HD12	1:B:601:LEU:HB3	1.89	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:82:SER:O	2:F:86:LEU:CB	2.56	0.54
2:D:80:ILE:O	2:D:83:LEU:HG	2.08	0.54
1:B:266:SER:C	1:B:267:ILE:HG13	2.28	0.54
1:A:580:ILE:HD12	1:A:601:LEU:HB3	1.90	0.54
2:C:64:LYS:HG3	2:C:114:THR:HG21	1.89	0.54
1:A:576:PRO:HB2	1:A:722:LEU:HD11	1.89	0.54
1:E:419:VAL:HG21	1:E:528:TYR:CG	2.43	0.53
1:E:599:ASN:HD21	1:E:761:SER:HA	1.73	0.53
2:D:47:GLU:HG3	2:D:53:LEU:HD23	1.89	0.53
2:C:120:ALA:HB3	2:C:137:ALA:O	2.09	0.53
1:E:273:THR:O	1:E:277:LEU:HG	2.07	0.53
1:A:564:THR:HA	2:C:198:GLN:HE22	1.74	0.53
2:C:157:ARG:O	2:C:161:LEU:HG	2.08	0.53
2:F:66:ASP:OD1	2:F:67:GLU:N	2.41	0.53
1:B:267:ILE:HD11	1:B:314:PRO:C	2.29	0.53
1:E:656:ARG:NH2	1:E:673:GLU:CG	2.72	0.53
1:B:473:TYR:HB2	1:B:506:LEU:CD2	2.30	0.52
2:C:80:ILE:O	2:C:80:ILE:HG22	2.08	0.52
1:E:403:LEU:HD22	1:E:535:LEU:HD23	1.91	0.52
1:A:708:ALA:O	1:A:709:TRP:C	2.47	0.52
2:C:52:LYS:CA	2:C:149:ASP:OD1	2.45	0.52
1:E:563:TYR:CE1	2:F:200:ARG:HD2	2.44	0.52
2:F:65:LYS:HA	2:F:68:LEU:HD12	1.92	0.52
1:A:615:PRO:HB3	1:A:771:TYR:CD1	2.44	0.52
2:F:83:LEU:O	2:F:87:GLU:N	2.33	0.52
2:F:120:ALA:HB3	2:F:137:ALA:O	2.09	0.52
1:B:179:LEU:HD23	1:B:197:ARG:HB2	1.90	0.52
1:B:209:ALA:HB1	1:B:238:GLY:HA3	1.90	0.52
1:B:615:PRO:HB3	1:B:771:TYR:CD1	2.45	0.52
2:D:65:LYS:HA	2:D:68:LEU:HD12	1.91	0.52
1:E:302:MET:HE3	1:E:549:LEU:HB3	1.92	0.52
2:F:105:VAL:HG13	2:F:153:ASN:OD1	2.09	0.52
2:F:157:ARG:O	2:F:161:LEU:HG	2.09	0.52
1:B:700:SER:O	1:B:703:ASP:OD1	2.28	0.52
2:C:185:VAL:O	2:C:211:ARG:NH2	2.43	0.52
2:D:120:ALA:HB3	2:D:137:ALA:O	2.09	0.52
1:E:259:THR:HG22	1:E:260:MET:N	2.25	0.52
1:E:733:THR:HG21	1:E:767:ALA:HB2	1.92	0.52
1:A:728:HIS:CD2	1:B:699:THR:HA	2.43	0.52
1:A:771:TYR:O	1:A:775:VAL:HG23	2.10	0.52
2:C:72:LEU:CD2	2:C:108:LEU:HD22	2.40	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:164:GLU:HG3	2:C:165:LYS:N	2.25	0.52
2:D:116:GLU:HG3	2:D:117:GLN:HG3	1.91	0.52
1:E:341:VAL:HG21	1:E:381:GLN:NE2	2.23	0.52
1:A:268:ILE:HG22	1:A:269:MET:N	2.25	0.51
1:A:700:SER:O	1:A:703:ASP:OD1	2.29	0.51
1:B:580:ILE:CD1	1:B:630:ILE:HD13	2.41	0.51
1:A:592:LEU:HD12	1:A:593:ASN:N	2.25	0.51
2:D:70:LEU:HD21	2:D:86:LEU:HD13	1.91	0.51
1:E:656:ARG:NH2	1:E:673:GLU:HG2	2.26	0.51
2:F:185:VAL:O	2:F:211:ARG:NH2	2.43	0.51
1:B:588:VAL:HA	1:B:591:VAL:HG12	1.93	0.51
1:E:327:THR:HG23	1:E:390:VAL:HG23	1.92	0.51
1:A:611:ILE:HD11	1:A:735:LEU:HB2	1.92	0.51
2:C:87:GLU:O	2:C:87:GLU:HG2	2.11	0.51
2:D:113:ARG:HB2	2:D:120:ALA:HB2	1.93	0.51
1:E:264:GLN:O	1:E:267:ILE:HG12	2.11	0.51
2:C:70:LEU:HD21	2:C:86:LEU:HD13	1.92	0.51
2:D:80:ILE:O	2:D:80:ILE:HG22	2.11	0.51
1:E:613:THR:HG21	1:E:767:ALA:HA	1.93	0.51
2:D:87:GLU:HG2	2:D:87:GLU:O	2.11	0.51
1:A:264:GLN:HB2	1:A:268:ILE:HD11	1.92	0.51
1:E:259:THR:HG22	1:E:260:MET:H	1.76	0.51
1:E:691:LEU:CD2	1:E:724:LEU:HD12	2.41	0.51
1:A:267:ILE:CG2	1:A:268:ILE:N	2.72	0.50
1:A:267:ILE:HG22	1:A:268:ILE:N	2.24	0.50
1:E:291:LEU:CD2	1:E:311:LEU:HD22	2.39	0.50
1:E:223:VAL:O	1:E:679:ASN:HB2	2.12	0.50
1:A:467:PHE:HB2	1:A:473:TYR:CE1	2.47	0.50
1:A:584:ARG:HD2	1:A:589:GLU:OE1	2.12	0.50
2:D:151:PHE:CZ	2:D:157:ARG:HB3	2.47	0.50
2:F:51:ALA:O	2:F:149:ASP:OD2	2.18	0.50
2:D:47:GLU:HG2	2:D:192:ASN:HA	1.94	0.50
1:E:376:PRO:HG3	1:E:399:GLU:CD	2.31	0.50
1:A:694:GLU:CB	1:B:697:ARG:HH21	2.21	0.50
2:D:111:THR:CG2	2:D:122:GLN:HG3	2.37	0.50
1:E:709:TRP:HA	1:E:732:LEU:HD21	1.94	0.50
1:B:708:ALA:O	1:B:709:TRP:C	2.50	0.50
1:B:327:THR:HG23	1:B:390:VAL:HG22	1.93	0.50
2:D:185:VAL:O	2:D:211:ARG:NH2	2.45	0.50
1:E:783:LYS:O	1:E:787:LYS:HB2	2.12	0.50
1:A:656:ARG:NH1	1:A:657:VAL:O	2.43	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:611:ILE:HD11	1:B:735:LEU:HB2	1.94	0.49
1:A:227:VAL:HG12	1:A:260:MET:HB2	1.95	0.49
1:E:133:LEU:HD23	1:E:148:LEU:HB3	1.94	0.49
2:F:113:ARG:HB2	2:F:120:ALA:HB2	1.95	0.49
1:A:624:MET:CE	1:A:724:LEU:HB2	2.43	0.49
1:A:327:THR:HG23	1:A:390:VAL:HG22	1.94	0.49
2:C:151:PHE:O	2:C:158:ARG:NH1	2.44	0.49
2:F:66:ASP:OD1	2:F:67:GLU:HG3	2.12	0.49
1:A:278:GLU:HA	1:A:281:GLN:O	2.13	0.49
3:A:1801:ANP:PG	1:B:670:PHE:HB3	2.53	0.49
1:B:300:THR:OG1	1:B:346:GLY:O	2.29	0.49
1:A:617:MET:SD	1:B:671:MET:CE	3.01	0.49
2:C:105:VAL:O	2:C:150:LEU:O	2.31	0.49
1:B:467:PHE:HB2	1:B:473:TYR:CE1	2.47	0.49
1:A:673:GLU:HG2	1:A:674:MET:CE	2.43	0.49
2:C:65:LYS:HA	2:C:68:LEU:HD12	1.93	0.49
2:F:151:PHE:O	2:F:158:ARG:NH1	2.46	0.49
1:A:300:THR:OG1	1:A:346:GLY:O	2.30	0.49
1:E:415:PRO:HB2	1:E:424:VAL:HG22	1.95	0.49
1:E:433:LEU:HD12	1:E:520:ALA:HB1	1.95	0.49
1:E:617:MET:O	1:E:758:PHE:CE2	2.65	0.49
1:E:635:TYR:OH	1:E:648:GLY:O	2.27	0.48
1:B:621:SER:OG	3:B:1801:ANP:O2B	2.31	0.48
1:A:267:ILE:CG2	1:A:652:ARG:HG2	2.43	0.48
1:B:267:ILE:HG21	1:B:314:PRO:HD2	1.95	0.48
1:B:502:ILE:HD12	1:B:506:LEU:HD22	1.95	0.48
1:E:155:PHE:O	1:E:258:ILE:HA	2.14	0.48
2:F:82:SER:C	2:F:86:LEU:HB3	2.33	0.48
2:C:47:GLU:HG2	2:C:192:ASN:HA	1.94	0.48
1:E:179:LEU:HD22	1:E:199:ARG:HD3	1.95	0.48
1:A:209:ALA:CB	1:A:238:GLY:HA3	2.42	0.48
1:B:527:LEU:O	1:B:531:LEU:HD13	2.13	0.48
1:B:266:SER:O	1:B:316:ARG:CD	2.60	0.48
1:E:412:ILE:HG22	1:E:413:ASP:N	2.28	0.48
1:B:584:ARG:HD2	1:B:589:GLU:OE1	2.13	0.48
1:B:622:THR:N	3:B:1801:ANP:O1A	2.38	0.48
1:E:362:PRO:HG3	1:E:419:VAL:HG22	1.96	0.48
1:A:780:GLY:O	1:B:682:HIS:HE1	1.96	0.48
1:B:564:THR:HG23	2:D:195:ILE:CD1	2.43	0.48
1:A:243:TYR:O	1:A:247:THR:N	2.47	0.48
1:A:603:LEU:HD11	1:A:724:LEU:HD21	1.94	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:615:PRO:HB3	1:A:771:TYR:CG	2.48	0.47
1:E:730:PHE:HA	1:E:767:ALA:CB	2.43	0.47
2:F:234:LEU:HD22	2:F:294:ILE:CG2	2.44	0.47
1:A:780:GLY:O	1:B:682:HIS:CE1	2.67	0.47
1:B:279:ILE:CG2	1:B:311:LEU:HD13	2.44	0.47
2:D:67:GLU:HG2	2:D:89:ILE:HG22	1.96	0.47
1:A:278:GLU:OE2	1:A:283:LEU:N	2.37	0.47
1:A:527:LEU:O	1:A:531:LEU:HD13	2.14	0.47
1:B:540:GLU:O	1:B:544:GLN:HG2	2.14	0.47
1:B:596:PHE:CZ	3:B:1801:ANP:N6	2.82	0.47
1:E:200:PRO:HB2	1:E:202:TRP:NE1	2.29	0.47
2:F:82:SER:O	2:F:86:LEU:HB3	2.15	0.47
1:E:755:THR:HG21	2:F:135:LYS:HB2	1.96	0.47
2:F:47:GLU:HG2	2:F:192:ASN:HA	1.95	0.47
1:B:267:ILE:CG1	1:B:314:PRO:O	2.63	0.47
1:E:624:MET:SD	1:E:726:ALA:HB2	2.54	0.47
1:B:603:LEU:HD11	1:B:724:LEU:HD21	1.95	0.47
1:E:400:PHE:HZ	1:E:541:ALA:HB1	1.80	0.47
1:E:632:LEU:HD23	1:E:632:LEU:C	2.34	0.47
1:A:279:ILE:CG2	1:A:311:LEU:HD13	2.45	0.47
1:B:251:THR:O	1:B:252:LEU:HD23	2.15	0.47
2:F:64:LYS:HG3	2:F:114:THR:HG21	1.97	0.47
1:E:393:LEU:HD22	1:E:548:ALA:HA	1.97	0.47
1:E:623:TYR:HB2	1:E:747:LEU:HD21	1.97	0.47
1:B:243:TYR:CE2	1:B:247:THR:HG21	2.50	0.47
1:E:137:TRP:HD1	1:E:181:ALA:CB	2.28	0.47
1:E:311:LEU:O	1:E:632:LEU:HD11	2.15	0.47
1:E:388:ALA:HB3	1:E:389:PRO:HD3	1.96	0.47
1:B:615:PRO:HB3	1:B:771:TYR:CG	2.50	0.46
2:C:234:LEU:HD22	2:C:294:ILE:CG2	2.44	0.46
2:D:234:LEU:HD22	2:D:294:ILE:CG2	2.44	0.46
1:B:267:ILE:HD13	1:B:313:MET:C	2.33	0.46
2:D:247:THR:HB	2:D:248:PRO:HD2	1.96	0.46
1:E:412:ILE:HG22	1:E:413:ASP:H	1.80	0.46
1:E:242:GLN:HA	1:E:245:LYS:HD3	1.97	0.46
1:E:694:GLU:HG2	1:E:727:THR:HA	1.97	0.46
1:B:735:LEU:N	1:B:736:PRO:CD	2.79	0.46
1:E:619:GLY:O	1:E:747:LEU:HG	2.15	0.46
1:B:267:ILE:CG2	1:B:268:ILE:N	2.78	0.46
2:C:71:ALA:C	2:C:72:LEU:HD12	2.36	0.46
2:C:113:ARG:HB2	2:C:120:ALA:HB2	1.96	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:640:VAL:HG13	1:A:641:PRO:HD2	1.98	0.46
1:B:695:ILE:HD11	1:B:725:PHE:CE2	2.51	0.46
2:F:105:VAL:O	2:F:150:LEU:O	2.34	0.46
1:A:656:ARG:CZ	1:A:673:GLU:HA	2.41	0.46
1:B:243:TYR:O	1:B:247:THR:N	2.49	0.46
1:E:410:ALA:O	1:E:425:ILE:HA	2.15	0.46
1:A:276:ASN:HB2	1:A:657:VAL:HG21	1.96	0.46
1:A:509:TYR:O	1:A:512:LYS:HG2	2.16	0.46
1:A:617:MET:SD	1:B:671:MET:HE2	2.56	0.46
1:E:728:HIS:O	1:E:729:TYR:C	2.54	0.46
1:A:695:ILE:HD11	1:A:725:PHE:CE2	2.51	0.46
1:E:278:GLU:O	1:E:290:THR:HB	2.16	0.46
1:E:397:MET:CE	1:E:552:LEU:HD12	2.45	0.46
1:E:611:ILE:HD11	1:E:735:LEU:HD12	1.98	0.46
1:E:656:ARG:NH2	1:E:673:GLU:HG3	2.31	0.45
2:C:102:ILE:CG2	2:C:150:LEU:HD21	2.46	0.45
1:B:776:ALA:O	1:B:781:VAL:HG23	2.16	0.45
1:E:362:PRO:HG3	1:E:419:VAL:CG2	2.47	0.45
1:E:693:ASP:HA	1:E:726:ALA:HB3	1.98	0.45
2:F:80:ILE:CG2	2:F:90:ILE:HD13	2.46	0.45
1:E:301:PRO:HG2	1:E:347:ASP:HB2	1.99	0.45
2:C:162:ARG:O	2:C:163:THR:O	2.35	0.45
1:A:627:THR:HA	1:A:630:ILE:HD12	1.99	0.45
1:A:673:GLU:HG2	1:A:674:MET:HE3	1.98	0.45
1:B:624:MET:SD	1:B:726:ALA:HB2	2.57	0.45
1:B:471:HIS:HB3	1:B:492:ARG:HD3	1.97	0.45
1:B:614:GLY:N	1:B:767:ALA:HB2	2.31	0.45
1:E:654:PHE:CB	1:E:680:ILE:HG23	2.47	0.45
1:A:244:ALA:HA	1:A:247:THR:OG1	2.17	0.45
1:A:776:ALA:O	1:A:781:VAL:HG23	2.17	0.45
1:B:209:ALA:CB	1:B:238:GLY:HA3	2.46	0.45
2:C:247:THR:HB	2:C:248:PRO:HD2	1.98	0.45
1:E:277:LEU:HD12	1:E:279:ILE:HD11	1.99	0.45
1:A:735:LEU:N	1:A:736:PRO:CD	2.80	0.44
1:B:227:VAL:HG12	1:B:260:MET:HB2	1.98	0.44
1:E:137:TRP:CZ3	1:E:139:ASP:HB3	2.47	0.44
1:E:300:THR:OG1	1:E:553:ASP:OD2	2.29	0.44
2:F:162:ARG:O	2:F:163:THR:O	2.34	0.44
1:A:728:HIS:ND1	1:B:698:GLY:O	2.51	0.44
2:D:139:HIS:CG	2:D:140:PRO:HD2	2.53	0.44
1:B:244:ALA:HA	1:B:247:THR:OG1	2.18	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:30:LEU:HD22	2:C:145:LEU:HD22	1.99	0.44
1:A:202:TRP:CD1	2:D:158:ARG:CZ	3.01	0.44
1:B:509:TYR:O	1:B:512:LYS:HG2	2.18	0.44
2:C:164:GLU:CG	2:C:165:LYS:H	2.30	0.44
1:E:134:ALA:HB3	1:E:178:LEU:HD23	2.00	0.44
1:E:248:GLN:HG3	1:E:252:LEU:CD2	2.44	0.44
1:A:580:ILE:HD13	1:A:630:ILE:HD13	1.99	0.44
1:A:624:MET:HE1	1:A:724:LEU:O	2.18	0.44
1:E:400:PHE:CZ	1:E:541:ALA:HB1	2.53	0.44
1:E:585:HIS:CG	1:E:586:PRO:HD2	2.53	0.44
1:E:732:LEU:C	1:E:734:GLN:N	2.70	0.44
1:B:493:GLN:HB3	1:B:500:ARG:HB2	2.00	0.43
1:A:347:ASP:OD2	1:A:350:ARG:CZ	2.67	0.43
1:B:640:VAL:HG13	1:B:641:PRO:HD2	2.00	0.43
1:E:269:MET:HG2	1:E:653:ILE:CG2	2.48	0.43
1:E:436:TRP:CZ2	1:E:519:LYS:HD3	2.53	0.43
1:B:437:ARG:O	1:B:441:ASP:HB2	2.18	0.43
1:B:695:ILE:HD11	1:B:725:PHE:HZ	1.80	0.43
2:C:251:ALA:HB1	2:C:285:GLN:HB2	1.99	0.43
2:D:160:PHE:N	2:D:160:PHE:CD1	2.84	0.43
1:A:243:TYR:CE2	1:A:247:THR:HG21	2.54	0.43
2:D:297:HIS:ND1	2:D:315:SER:N	2.66	0.43
1:E:182:GLU:HB2	1:E:198:ARG:NH2	2.33	0.43
1:E:578:ILE:HG12	1:E:650:ILE:HD11	2.00	0.43
1:E:746:HIS:HE1	1:E:765:GLY:HA3	1.84	0.43
1:B:297:SER:OG	1:B:561:ARG:HD3	2.18	0.43
1:B:564:THR:HG23	2:D:195:ILE:HD12	2.01	0.43
2:C:295:ASP:CG	2:C:296:PRO:HD2	2.39	0.43
1:E:238:GLY:O	1:E:242:GLN:NE2	2.48	0.43
1:E:411:ILE:HG22	1:E:412:ILE:N	2.33	0.43
2:F:30:LEU:HD22	2:F:145:LEU:HD22	2.00	0.43
2:F:251:ALA:HB1	2:F:285:GLN:HB2	1.99	0.43
1:B:438:ALA:HA	1:B:441:ASP:HB2	1.99	0.43
1:E:302:MET:HE3	1:E:549:LEU:HD13	2.01	0.43
1:E:652:ARG:O	1:E:653:ILE:HG13	2.19	0.43
2:F:108:LEU:HD12	2:F:147:VAL:HG22	2.00	0.43
2:D:30:LEU:HD22	2:D:145:LEU:HD22	2.01	0.43
1:B:267:ILE:HD13	1:B:313:MET:HA	2.00	0.43
1:B:652:ARG:HB3	1:B:654:PHE:CE2	2.54	0.43
2:C:162:ARG:O	2:C:163:THR:C	2.57	0.43
1:E:436:TRP:HB3	1:E:517:LYS:N	2.34	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:112:SER:HB2	2:F:143:THR:HG23	2.01	0.43
2:D:80:ILE:CG2	2:D:83:LEU:HD21	2.49	0.42
2:D:251:ALA:HB1	2:D:285:GLN:HB2	2.01	0.42
1:E:132:LEU:HD12	1:E:173:THR:O	2.19	0.42
1:E:342:LEU:O	1:E:343:ARG:C	2.57	0.42
2:F:83:LEU:HD12	2:F:84:ASP:N	2.34	0.42
2:F:71:ALA:C	2:F:72:LEU:HD12	2.40	0.42
1:A:617:MET:SD	1:B:671:MET:HE3	2.60	0.42
1:A:657:VAL:O	1:A:658:GLY:C	2.58	0.42
2:D:112:SER:HB2	2:D:143:THR:HG23	2.01	0.42
1:E:157:LEU:CD1	1:E:237:ALA:HB2	2.42	0.42
1:E:334:PHE:HB3	1:E:338:LEU:HD12	2.01	0.42
2:F:102:ILE:CG2	2:F:150:LEU:HD21	2.49	0.42
1:A:493:GLN:HB3	1:A:500:ARG:HB2	2.01	0.42
1:A:267:ILE:HG21	1:A:652:ARG:HG2	2.00	0.42
1:A:738:LYS:HA	1:E:717:ASN:ND2	2.35	0.42
1:B:656:ARG:NH2	1:B:673:GLU:HB3	2.35	0.42
2:C:121:TRP:HA	2:C:136:PRO:HA	2.01	0.42
1:E:532:PHE:O	1:E:536:LEU:HD13	2.20	0.42
1:E:654:PHE:HB3	1:E:680:ILE:HG23	2.02	0.42
1:A:614:GLY:N	1:A:767:ALA:HB2	2.34	0.42
1:B:269:MET:HG2	1:B:653:ILE:HD13	2.02	0.42
1:E:556:VAL:O	1:E:559:ALA:HB3	2.20	0.42
1:A:321:LEU:HD13	1:A:572:PHE:CZ	2.55	0.42
1:A:603:LEU:HD21	1:A:610:LEU:HG	2.00	0.42
1:A:611:ILE:CD1	1:A:735:LEU:HB2	2.50	0.42
1:B:267:ILE:HD11	1:B:314:PRO:N	2.35	0.42
2:D:227:ILE:HB	2:D:329:VAL:HG21	2.01	0.42
1:E:327:THR:CG2	1:E:555:LEU:HD13	2.42	0.42
1:E:411:ILE:HG21	1:E:415:PRO:HG3	2.02	0.42
2:F:207:GLN:HG2	2:F:210:ARG:HH12	1.84	0.42
1:A:682:HIS:NE2	1:B:782:PRO:HG3	2.35	0.42
1:E:730:PHE:HA	1:E:767:ALA:HB1	2.02	0.42
1:A:748:ASP:HB2	1:A:763:GLN:HG3	2.01	0.41
1:E:573:ILE:O	1:E:648:GLY:HA2	2.20	0.41
2:F:227:ILE:HB	2:F:329:VAL:HG21	2.02	0.41
1:A:652:ARG:HB3	1:A:654:PHE:CE2	2.55	0.41
1:A:728:HIS:ND1	1:B:699:THR:HA	2.34	0.41
1:E:153:GLY:HA2	1:E:255:ILE:HG12	2.02	0.41
1:E:599:ASN:ND2	1:E:761:SER:HA	2.35	0.41
1:E:659:ALA:HB2	1:E:697:ARG:HD3	2.01	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:56:ILE:O	2:C:144:THR:HA	2.20	0.41
2:C:80:ILE:CG2	2:C:83:LEU:HD21	2.50	0.41
1:E:174:ASN:O	1:E:174:ASN:CG	2.56	0.41
1:A:299:VAL:HG21	1:A:342:LEU:HB2	2.03	0.41
2:D:56:ILE:O	2:D:144:THR:HA	2.21	0.41
1:E:267:ILE:HG22	1:E:268:ILE:CG1	2.50	0.41
1:E:327:THR:HG23	1:E:390:VAL:CG2	2.50	0.41
1:E:732:LEU:C	1:E:734:GLN:H	2.22	0.41
2:C:67:GLU:HG2	2:C:89:ILE:HG22	2.02	0.41
2:D:44:ILE:HG23	2:D:189:LEU:HA	2.03	0.41
1:E:155:PHE:HB3	1:E:257:SER:O	2.21	0.41
1:E:609:MET:HB3	1:E:742:VAL:HG22	2.01	0.41
1:E:730:PHE:CD2	1:E:767:ALA:CB	2.94	0.41
2:F:83:LEU:O	2:F:84:ASP:C	2.59	0.41
2:F:162:ARG:O	2:F:163:THR:C	2.58	0.41
2:D:108:LEU:HD12	2:D:147:VAL:HG22	2.03	0.41
1:E:575:LYS:HE2	1:E:606:GLN:HE22	1.85	0.41
1:E:615:PRO:HA	1:E:771:TYR:HB2	2.03	0.41
1:E:623:TYR:CZ	1:E:762:VAL:HG21	2.55	0.41
2:F:44:ILE:HG23	2:F:189:LEU:HA	2.02	0.41
2:F:67:GLU:HG2	2:F:89:ILE:HG22	2.02	0.41
1:B:580:ILE:HD13	1:B:630:ILE:HD13	2.02	0.41
2:D:162:ARG:HB3	2:D:167:GLU:HG2	2.03	0.41
1:E:781:VAL:HG11	1:E:786:ILE:HG12	2.01	0.41
1:A:265:ASP:OD1	1:A:267:ILE:HG12	2.20	0.41
1:A:282:ASN:OD1	1:A:284:ALA:N	2.54	0.41
1:A:592:LEU:HD12	1:A:593:ASN:H	1.85	0.41
1:A:723:THR:HG22	1:A:724:LEU:N	2.35	0.41
1:A:699:THR:HA	1:B:728:HIS:CD2	2.54	0.41
1:B:278:GLU:HA	1:B:281:GLN:O	2.21	0.41
1:B:603:LEU:HD21	1:B:610:LEU:HG	2.01	0.41
1:B:617:MET:HA	3:B:1801:ANP:C5'	2.51	0.41
1:B:783:LYS:NZ	1:B:787:LYS:HE3	2.36	0.41
1:E:691:LEU:HD21	1:E:724:LEU:HD12	2.03	0.41
1:B:569:SER:HB3	1:B:639:TYR:CZ	2.56	0.41
1:E:264:GLN:O	1:E:267:ILE:CG1	2.68	0.41
1:A:656:ARG:HE	1:A:673:GLU:HG3	1.84	0.40
1:A:697:ARG:HD3	1:B:697:ARG:HD2	2.03	0.40
1:B:460:LEU:HD22	1:B:481:GLN:HB3	2.03	0.40
1:B:611:ILE:CD1	1:B:735:LEU:HB2	2.51	0.40
1:E:650:ILE:HD13	1:E:689:LEU:CD2	2.48	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:460:LEU:HD22	1:A:481:GLN:HB3	2.03	0.40
1:A:710:ALA:O	1:A:711:VAL:C	2.58	0.40
2:C:109:THR:HA	2:C:123:ALA:O	2.21	0.40
1:E:575:LYS:CE	1:E:606:GLN:HE22	2.34	0.40
1:A:624:MET:HE1	1:A:724:LEU:HB2	2.02	0.40
1:A:773:LEU:HD13	1:A:790:ARG:HG2	2.03	0.40
1:B:388:ALA:N	1:B:389:PRO:CD	2.84	0.40
1:B:627:THR:HA	1:B:630:ILE:HD12	2.03	0.40
2:C:51:ALA:C	2:C:149:ASP:OD1	2.57	0.40
2:C:112:SER:HB2	2:C:143:THR:HG23	2.03	0.40
1:A:788:ARG:HA	1:A:788:ARG:HD2	1.89	0.40
1:B:207:ASP:OD2	2:C:48:ARG:NH2	2.48	0.40
1:A:670:PHE:CG	1:B:616:ASN:ND2	2.89	0.40
1:A:696:GLY:O	1:A:729:TYR:OH	2.29	0.40
1:B:615:PRO:HD2	1:B:747:LEU:O	2.21	0.40
1:B:622:THR:HG21	3:B:1801:ANP:N7	2.37	0.40
1:B:748:ASP:HB2	1:B:763:GLN:HG3	2.03	0.40
1:E:264:GLN:O	1:E:265:ASP:C	2.60	0.40
1:E:361:ARG:HB3	1:E:417:VAL:O	2.21	0.40
1:E:609:MET:HA	1:E:723:THR:O	2.22	0.40
2:F:56:ILE:O	2:F:144:THR:HA	2.21	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:418:LEU:O	1:E:420:ARG:NH1[2_858]	2.10	0.10

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	659/800 (82%)	623 (94%)	34 (5%)	2 (0%)	41	76
1	B	659/800 (82%)	623 (94%)	33 (5%)	3 (0%)	29	68
1	E	582/800 (73%)	522 (90%)	52 (9%)	8 (1%)	11	47
2	C	277/369 (75%)	252 (91%)	21 (8%)	4 (1%)	11	47
2	D	277/369 (75%)	252 (91%)	23 (8%)	2 (1%)	22	62
2	F	277/369 (75%)	249 (90%)	23 (8%)	5 (2%)	8	41
All	All	2731/3507 (78%)	2521 (92%)	186 (7%)	24 (1%)	17	56

All (24) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	163	THR
2	D	117	GLN
1	E	265	ASP
1	E	420	ARG
1	E	753	GLY
1	E	755	THR
2	F	163	THR
2	F	266	ARG
1	B	594	GLU
1	B	658	GLY
1	A	283	LEU
1	A	658	GLY
1	E	593	ASN
1	E	769	LYS
2	F	267	LEU
1	B	268	ILE
1	E	778	LEU
2	C	296	PRO
2	C	117	GLN
2	D	93	GLY
2	F	93	GLY
2	F	117	GLN
2	C	93	GLY
1	E	267	ILE

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.

WORLDWIDE
wwPDB
PROTEIN DATA BANK

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	550/662 (83%)	540 (98%)	10 (2%)	59	77
1	B	550/662 (83%)	541 (98%)	9 (2%)	62	79
1	E	484/662 (73%)	464 (96%)	20 (4%)	30	56
2	C	235/308 (76%)	219 (93%)	16 (7%)	16	42
2	D	235/308 (76%)	224 (95%)	11 (5%)	26	52
2	F	235/308 (76%)	224 (95%)	11 (5%)	26	52
All	All	2289/2910 (79%)	2212 (97%)	77 (3%)	37	61

All (77) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	256	ARG
1	A	300	THR
1	A	319	ARG
1	A	333	ASP
1	A	349	GLU
1	A	413	ASP
1	A	461	ASP
1	A	493	GLN
1	A	526	GLN
1	A	773	LEU
1	B	256	ARG
1	B	332	GLN
1	B	349	GLU
1	B	461	ASP
1	B	488	ASN
1	B	493	GLN
1	B	526	GLN
1	B	671	MET
1	B	773	LEU
2	C	41	ARG
2	C	83	LEU
2	C	90	ILE
2	C	94	PHE
2	C	132	VAL
2	C	148	LEU
2	C	149	ASP
2	C	154	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	C	159	LYS
2	C	171	ILE
2	C	177	ARG
2	C	210	ARG
2	C	252	GLU
2	C	263	MET
2	C	284	GLN
2	C	293	GLU
2	D	30	LEU
2	D	83	LEU
2	D	94	PHE
2	D	97	GLU
2	D	148	LEU
2	D	154	THR
2	D	177	ARG
2	D	233	ASP
2	D	252	GLU
2	D	265	ASP
2	D	266	ARG
1	E	128	ARG
1	E	207	ASP
1	E	229	ASN
1	E	242	GLN
1	E	249	ARG
1	E	261	GLU
1	E	263	GLU
1	E	319	ARG
1	E	386	ASP
1	E	405	ASP
1	E	517	LYS
1	E	536	LEU
1	E	579	ARG
1	E	652	ARG
1	E	689	LEU
1	E	699	THR
1	E	706	SER
1	E	738	LYS
1	E	775	VAL
1	E	784	GLU
2	F	94	PHE
2	F	97	GLU
2	F	111	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	F	149	ASP
2	F	154	THR
2	F	159	LYS
2	F	177	ARG
2	F	210	ARG
2	F	233	ASP
2	F	252	GLU
2	F	266	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	276	ASN
1	A	325	GLN
1	A	717	ASN
1	B	276	ASN
1	B	325	GLN
1	B	602	ASN
2	C	118	GLN
2	C	198	GLN
2	C	231	HIS
2	C	274	GLN
2	D	117	GLN
2	D	118	GLN
2	D	122	GLN
2	D	188	ASN
2	D	274	GLN
1	E	214	ASN
1	E	599	ASN
1	E	683	ASN
1	E	744	ASN
1	E	746	HIS
2	F	33	ASN
2	F	118	GLN

5.3.3 RNA (i)

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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

3 ligands are 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	#$|Z| > 2$
3	ANP	E	1801	-	29,33,33	2.15	9 (31%)	31,52,52	2.02	10 (32%)
3	ANP	A	1801	-	29,33,33	1.85	9 (31%)	31,52,52	2.09	10 (32%)
3	ANP	B	1801	-	29,33,33	1.82	9 (31%)	31,52,52	1.87	8 (25%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ANP	E	1801	-	-	1/14/38/38	0/3/3/3
3	ANP	A	1801	-	-	3/14/38/38	0/3/3/3
3	ANP	B	1801	-	-	8/14/38/38	0/3/3/3

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	1801	ANP	PG-N3B	5.54	1.77	1.63
3	E	1801	ANP	PB-N3B	5.23	1.77	1.63
3	A	1801	ANP	PB-N3B	4.72	1.75	1.63

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1801	ANP	PG-N3B	4.31	1.74	1.63
3	B	1801	ANP	PB-N3B	4.09	1.74	1.63
3	A	1801	ANP	PG-N3B	4.07	1.74	1.63
3	E	1801	ANP	PB-O3A	3.59	1.63	1.59
3	E	1801	ANP	PG-O1G	3.27	1.51	1.46
3	B	1801	ANP	PG-O2G	-3.03	1.48	1.56
3	E	1801	ANP	C5-C4	3.01	1.48	1.40
3	E	1801	ANP	PB-O1B	2.87	1.50	1.46
3	A	1801	ANP	PB-O1B	2.79	1.50	1.46
3	B	1801	ANP	PB-O2B	-2.65	1.49	1.56
3	B	1801	ANP	C5-C4	2.62	1.47	1.40
3	E	1801	ANP	C2-N3	2.62	1.36	1.32
3	A	1801	ANP	PG-O1G	2.60	1.50	1.46
3	A	1801	ANP	C2-N3	2.56	1.36	1.32
3	A	1801	ANP	PB-O3A	2.43	1.62	1.59
3	B	1801	ANP	PB-O1B	2.42	1.50	1.46
3	A	1801	ANP	C5-C4	2.41	1.47	1.40
3	B	1801	ANP	PG-O3G	-2.38	1.50	1.56
3	E	1801	ANP	PG-O2G	-2.33	1.50	1.56
3	B	1801	ANP	C2-N3	2.31	1.35	1.32
3	A	1801	ANP	PG-O3G	-2.25	1.50	1.56
3	E	1801	ANP	PG-O3G	-2.23	1.50	1.56
3	B	1801	ANP	O4'-C1'	2.12	1.44	1.41
3	A	1801	ANP	O4'-C1'	2.06	1.44	1.41

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	E	1801	ANP	O1G-PG-N3B	-4.67	104.90	111.77
3	A	1801	ANP	O1G-PG-N3B	-4.56	105.05	111.77
3	B	1801	ANP	O1G-PG-N3B	-4.45	105.21	111.77
3	E	1801	ANP	O1B-PB-N3B	-4.18	105.62	111.77
3	A	1801	ANP	O1B-PB-N3B	-4.13	105.69	111.77
3	E	1801	ANP	C3'-C2'-C1'	4.03	107.05	100.98
3	B	1801	ANP	O2B-PB-O1B	3.95	118.20	109.92
3	A	1801	ANP	C3'-C2'-C1'	3.92	106.87	100.98
3	A	1801	ANP	O2G-PG-O3G	3.91	118.06	107.64
3	E	1801	ANP	O2B-PB-O1B	3.77	117.83	109.92
3	B	1801	ANP	N3-C2-N1	-3.64	123.00	128.68
3	A	1801	ANP	C4-C5-N7	-3.58	105.67	109.40
3	E	1801	ANP	N3-C2-N1	-3.50	123.22	128.68
3	B	1801	ANP	O1B-PB-N3B	-3.44	106.70	111.77

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	1801	ANP	O2B-PB-O1B	3.21	116.65	109.92
3	B	1801	ANP	O5'-C5'-C4'	3.10	119.65	108.99
3	B	1801	ANP	PB-O3A-PA	-3.03	121.96	132.62
3	B	1801	ANP	C4-C5-N7	-2.88	106.40	109.40
3	A	1801	ANP	N3-C2-N1	-2.70	124.45	128.68
3	E	1801	ANP	PB-O3A-PA	-2.69	123.14	132.62
3	A	1801	ANP	PB-O3A-PA	-2.44	124.02	132.62
3	E	1801	ANP	O3A-PB-N3B	2.37	113.17	106.59
3	E	1801	ANP	C2-N1-C6	2.36	122.80	118.75
3	A	1801	ANP	C1'-N9-C4	2.31	130.70	126.64
3	E	1801	ANP	N6-C6-N1	2.28	123.31	118.57
3	E	1801	ANP	O5'-C5'-C4'	2.21	116.58	108.99
3	A	1801	ANP	O5'-C5'-C4'	2.07	116.12	108.99
3	B	1801	ANP	O2G-PG-O3G	2.03	113.03	107.64

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1801	ANP	PB-N3B-PG-O1G
3	A	1801	ANP	PA-O3A-PB-O1B
3	A	1801	ANP	PA-O3A-PB-O2B
3	B	1801	ANP	PB-N3B-PG-O1G
3	B	1801	ANP	PA-O3A-PB-O1B
3	B	1801	ANP	PA-O3A-PB-O2B
3	B	1801	ANP	C5'-O5'-PA-O1A
3	B	1801	ANP	C5'-O5'-PA-O2A
3	B	1801	ANP	C5'-O5'-PA-O3A
3	E	1801	ANP	PB-N3B-PG-O1G
3	B	1801	ANP	O4'-C4'-C5'-O5'
3	B	1801	ANP	C3'-C4'-C5'-O5'

There are no ring outliers.

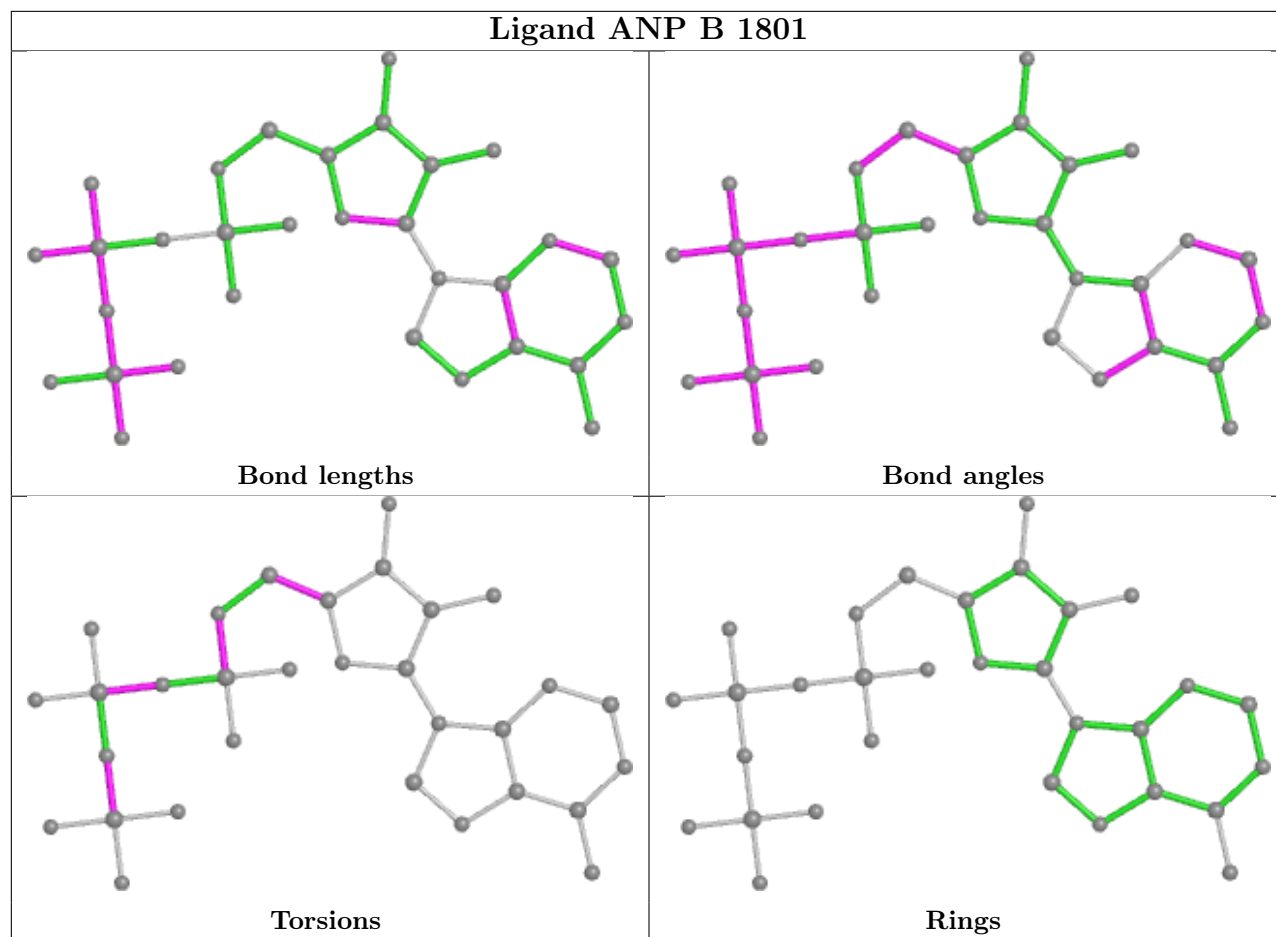2 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1801	ANP	3	0
3	B	1801	ANP	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 ANP E 1801

Bond lengths

Bond angles

Torsions

Rings

Ligand ANP A 1801

Bond lengths

Bond angles

Torsions

Rings

Ligand ANP B 1801

Bond lengths

Bond angles

Torsions

Rings
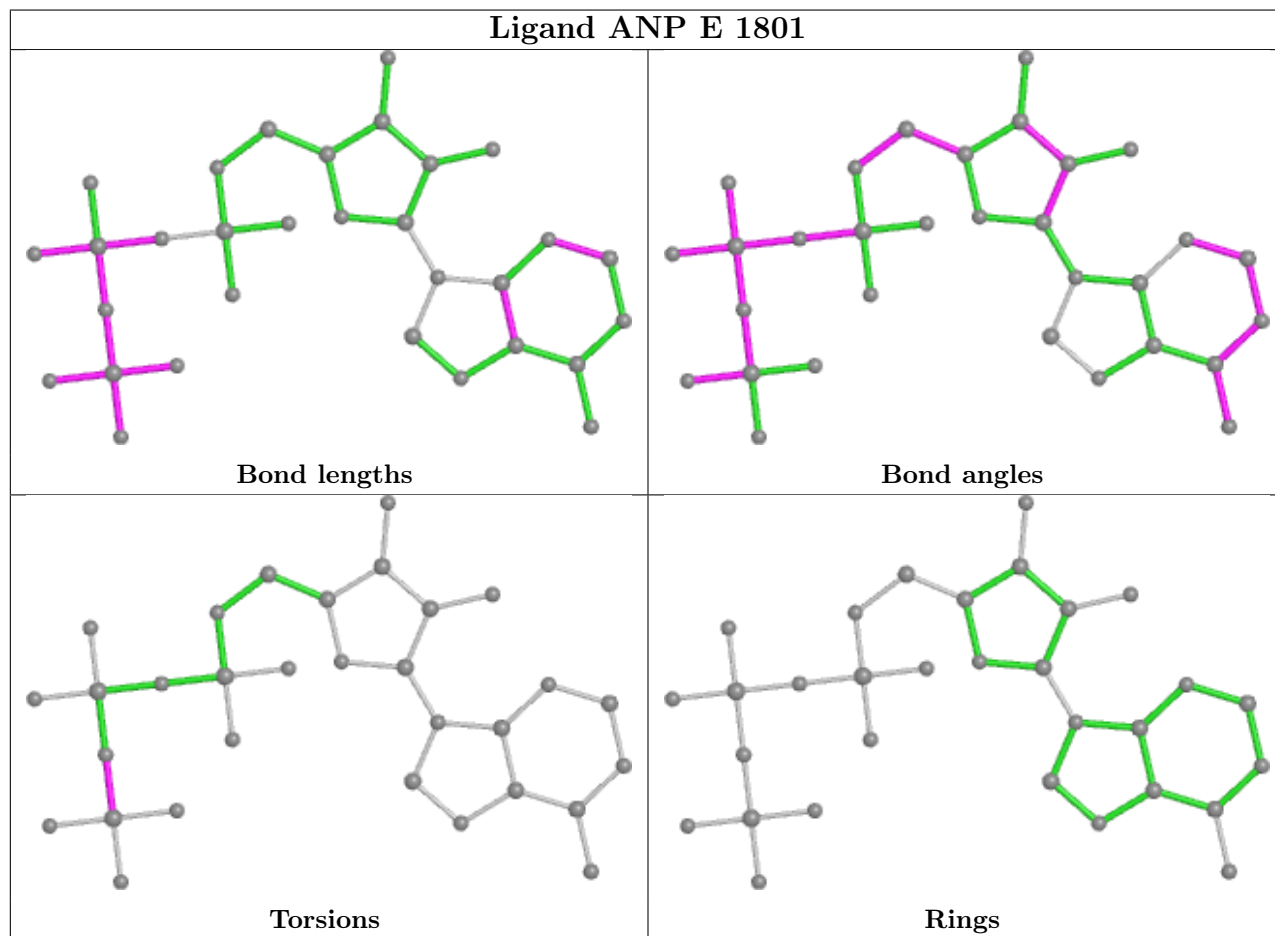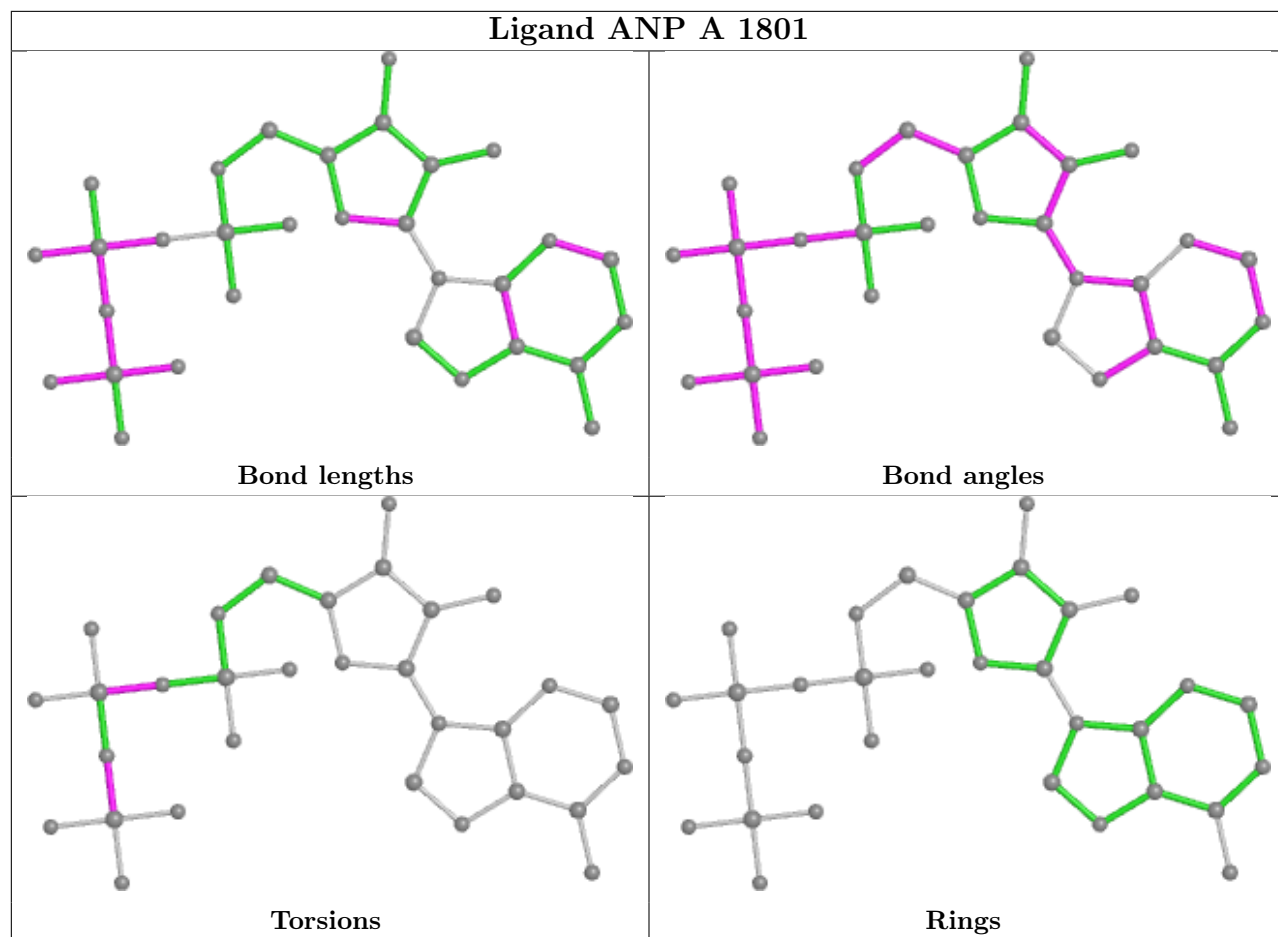
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	663/800 (82%)	-0.10	7 (1%)	80	73	139, 203, 285, 347	0
1	B	663/800 (82%)	-0.15	8 (1%)	79	70	162, 230, 292, 329	0
1	E	588/800 (73%)	-0.01	12 (2%)	65	56	176, 236, 298, 405	0
2	C	285/369 (77%)	0.03	1 (0%)	92	87	150, 186, 253, 315	0
2	D	285/369 (77%)	0.36	17 (5%)	21	18	202, 277, 357, 420	0
2	F	285/369 (77%)	0.33	20 (7%)	16	14	200, 280, 355, 460	0
All	All	2769/3507 (78%)	0.01	65 (2%)	60	52	139, 230, 316, 460	0

All (65) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	330	ALA	5.3
1	E	614	GLY	5.2
2	D	279	LYS	5.2
1	E	315	VAL	4.6
1	E	331	LEU	4.1
2	D	81	ALA	3.8
2	F	289	VAL	3.6
1	E	800	SER	3.4
1	E	329	GLY	3.4
1	A	577	GLY	3.4
1	A	154	ARG	3.2
2	D	243	PRO	3.2
2	D	181	ALA	3.2
2	F	329	VAL	3.2
2	F	295	ASP	3.1
1	E	372	PHE	3.1
2	F	70	LEU	3.1
2	F	250	LEU	3.1
2	D	198	GLN	3.0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	F	330	LEU	3.0
1	B	743	ALA	3.0
1	B	614	GLY	3.0
2	F	247	THR	2.9
1	E	316	ARG	2.9
2	F	246	THR	2.9
1	B	613	THR	2.9
2	D	220	PHE	2.9
2	F	326	VAL	2.9
2	F	197	ARG	2.8
1	A	749	ALA	2.8
2	F	141	VAL	2.6
1	E	638	SER	2.6
2	F	208	LYS	2.6
2	F	280	LEU	2.6
1	B	721	ALA	2.5
2	F	69	ALA	2.5
1	A	427	SER	2.5
2	F	202	VAL	2.5
1	B	742	VAL	2.5
2	D	180	LEU	2.5
2	D	22	ARG	2.5
1	A	742	VAL	2.4
2	D	182	ARG	2.3
2	C	279	LYS	2.3
2	D	49	GLY	2.3
2	D	239	TRP	2.3
1	E	537	PRO	2.3
1	E	328	ILE	2.3
2	D	256	PHE	2.3
1	B	475	ILE	2.3
2	D	80	ILE	2.3
2	F	81	ALA	2.2
1	B	572	PHE	2.2
2	F	118	GLN	2.2
2	D	278	ASP	2.2
2	D	326	VAL	2.2
1	A	148	LEU	2.1
1	B	609	MET	2.1
2	F	279	LYS	2.1
2	F	34	SER	2.1
2	F	80	ILE	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	D	23	PRO	2.0
1	E	751	GLU	2.0
1	A	136	ILE	2.0
2	D	197	ARG	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 monosaccharides 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. 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.

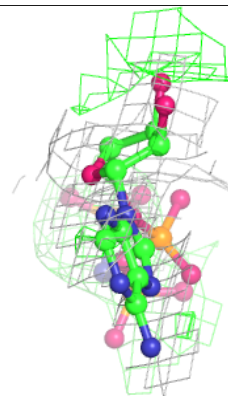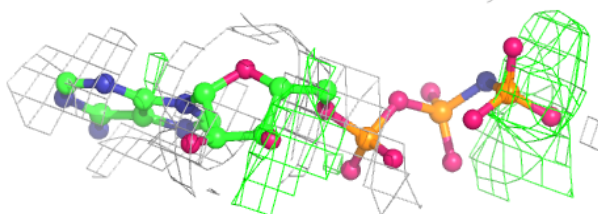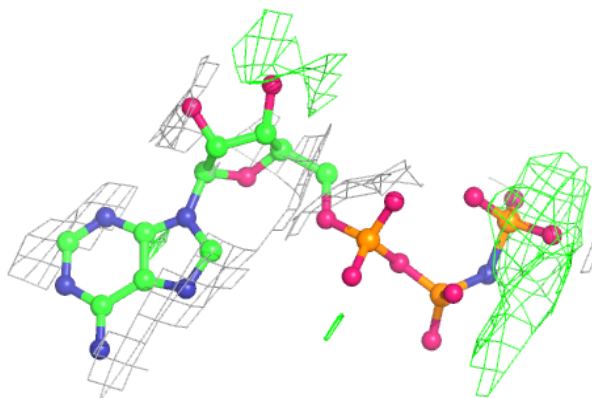| Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	ANP	E	1801	31/31	0.84	0.24	232,262,291,292	0
3	ANP	A	1801	31/31	0.89	0.26	160,165,174,175	0
3	ANP	B	1801	31/31	0.95	0.21	185,196,210,211	0

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.
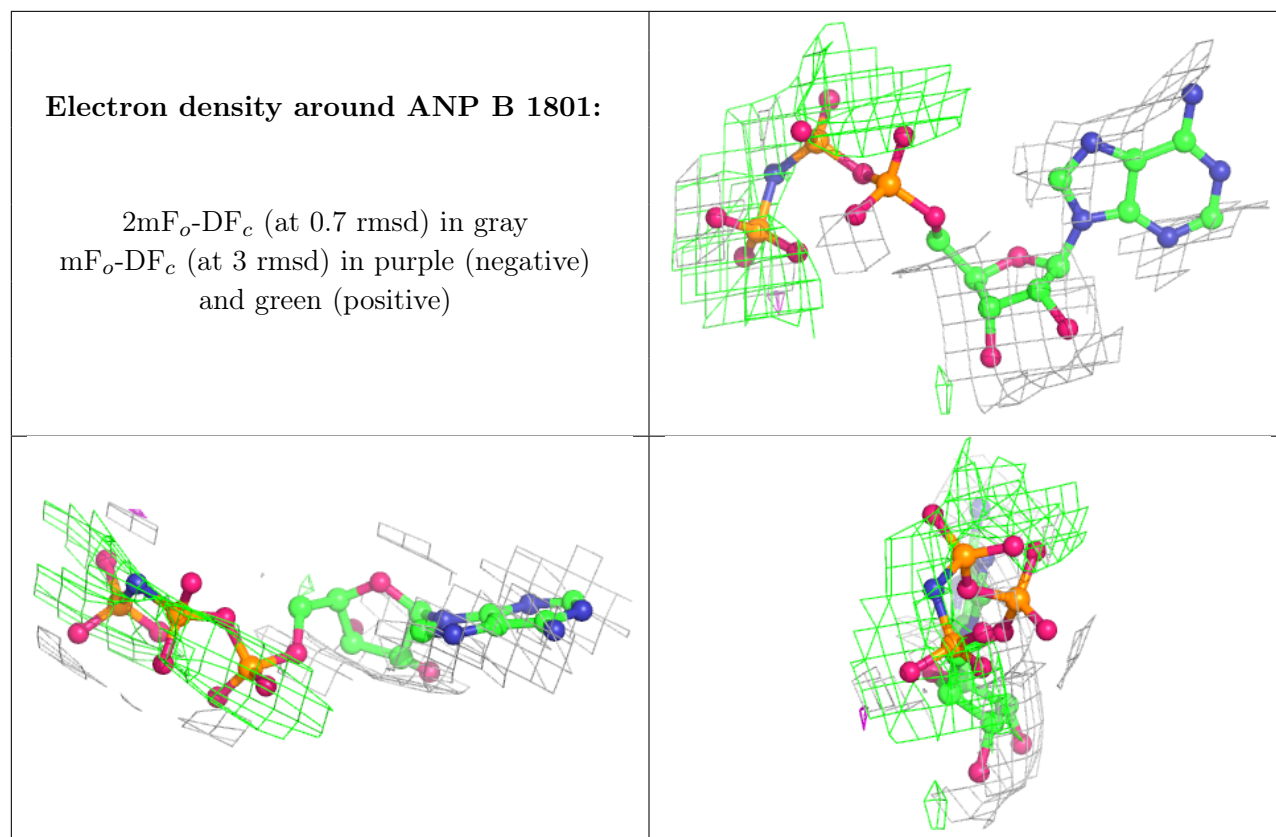
Electron density around ANP E 1801:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
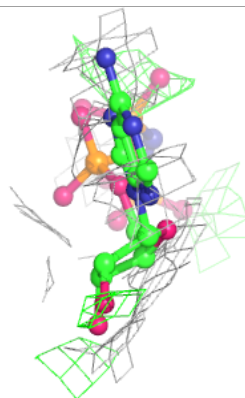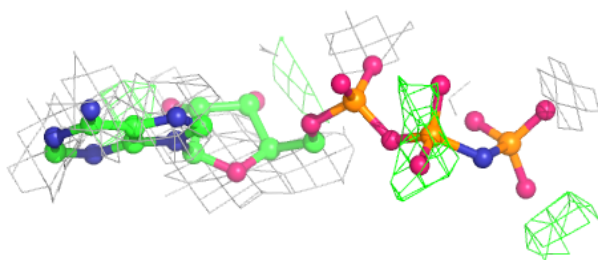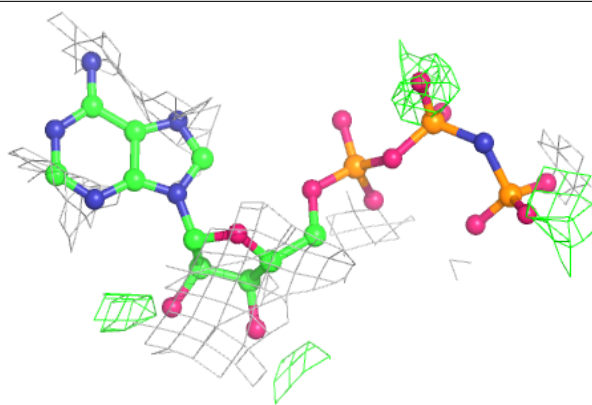
Electron density around ANP A 1801:

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

Electron density around ANP B 1801:

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

6.5   Other polymers   ⓘ

There are no such residues in this entry.