Full wwPDB X-ray Structure Validation Report (i)

Sep 2, 2023 – 05:55 PM EDT

PDB ID	:	3RCD
Title	:	HER2 Kinase Domain Complexed with TAK-285
Authors	:	Aertgeerts, K.; Skene, R.; Sogabe, S.
Deposited on	:	2011-03-30
Resolution	:	3.21 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
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)	:	2.35
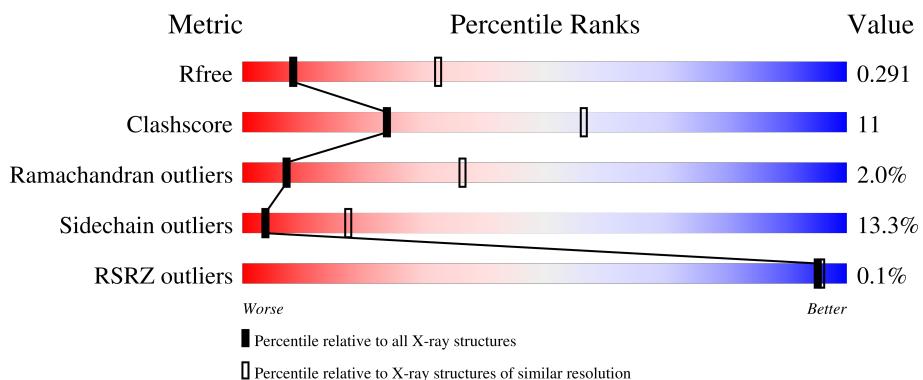
1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION
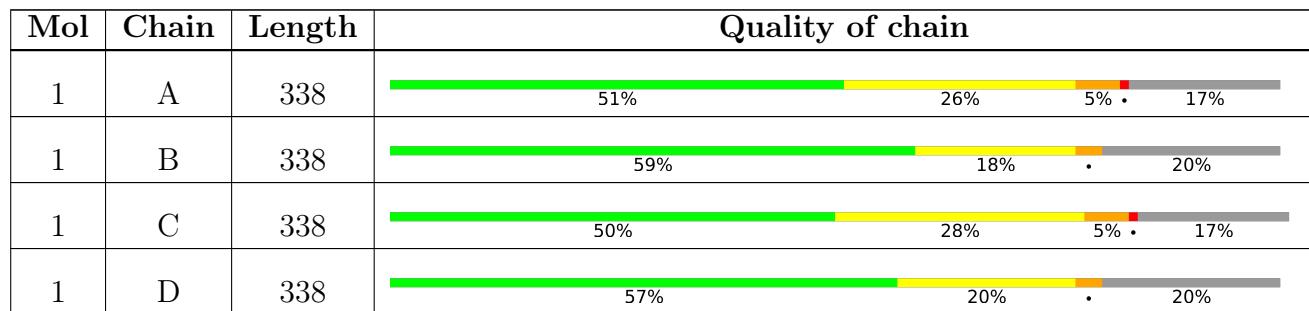
The reported resolution of this entry is 3.21 Å.

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	Percentile Ranks	Value
Rfree		0.291
Clashscore		11
Ramachandran outliers		2.0%
Sidechain outliers		13.3%
RSRZ outliers		0.1%

Worse   *Better*

▌ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1335 (3.24-3.20)
Clashscore	141614	1460 (3.24-3.20)
Ramachandran outliers	138981	1437 (3.24-3.20)
Sidechain outliers	138945	1436 (3.24-3.20)
RSRZ outliers	127900	1291 (3.24-3.20)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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	338	51% 26% 5% • 17%
1	B	338	59% 18% • 20%
1	C	338	50% 28% 5% • 17%
1	D	338	57% 20% • 20%

2　Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 8970 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 Receptor tyrosine-protein kinase erbB-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	281	Total	C	N	O	S	0	0	0
			2254	1444	391	403	16			
1	B	271	Total	C	N	O	S	0	0	0
			2176	1398	381	381	16			
1	C	281	Total	C	N	O	S	0	0	0
			2254	1444	391	403	16			
1	D	271	Total	C	N	O	S	0	0	0
			2176	1398	381	381	16			

There are 88 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	702	MET	-	expression tag	UNP P04626
A	703	SER	-	expression tag	UNP P04626
A	704	GLY	-	expression tag	UNP P04626
A	705	ALA	-	expression tag	UNP P04626
A	706	ALA	-	expression tag	UNP P04626
A	707	PRO	-	expression tag	UNP P04626
A	708	ASN	-	expression tag	UNP P04626
A	709	GLN	-	expression tag	UNP P04626
A	710	ALA	-	expression tag	UNP P04626
A	711	LEU	-	expression tag	UNP P04626
A	712	LEU	-	expression tag	UNP P04626
A	1029	GLY	-	expression tag	UNP P04626
A	1030	ALA	-	expression tag	UNP P04626
A	1031	ALA	-	expression tag	UNP P04626
A	1032	ALA	-	expression tag	UNP P04626
A	1033	SER	-	expression tag	UNP P04626
A	1034	HIS	-	expression tag	UNP P04626
A	1035	HIS	-	expression tag	UNP P04626
A	1036	HIS	-	expression tag	UNP P04626
A	1037	HIS	-	expression tag	UNP P04626
A	1038	HIS	-	expression tag	UNP P04626

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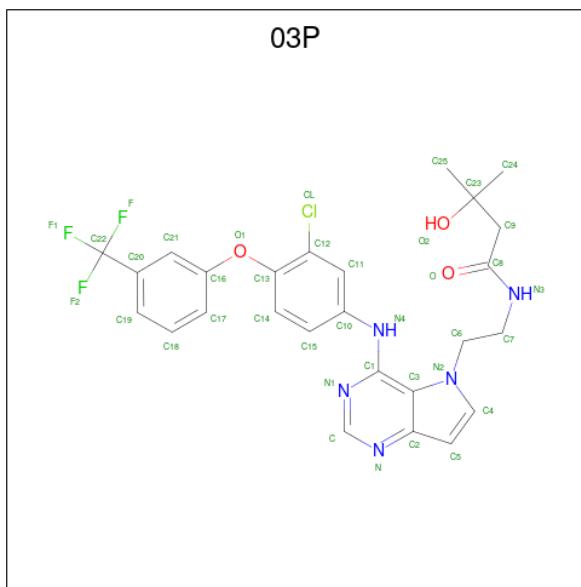
Chain	Residue	Modelled	Actual	Comment	Reference
A	1039	HIS	-	expression tag	UNP P04626
B	702	MET	-	expression tag	UNP P04626
B	703	SER	-	expression tag	UNP P04626
B	704	GLY	-	expression tag	UNP P04626
B	705	ALA	-	expression tag	UNP P04626
B	706	ALA	-	expression tag	UNP P04626
B	707	PRO	-	expression tag	UNP P04626
B	708	ASN	-	expression tag	UNP P04626
B	709	GLN	-	expression tag	UNP P04626
B	710	ALA	-	expression tag	UNP P04626
B	711	LEU	-	expression tag	UNP P04626
B	712	LEU	-	expression tag	UNP P04626
B	1029	GLY	-	expression tag	UNP P04626
B	1030	ALA	-	expression tag	UNP P04626
B	1031	ALA	-	expression tag	UNP P04626
B	1032	ALA	-	expression tag	UNP P04626
B	1033	SER	-	expression tag	UNP P04626
B	1034	HIS	-	expression tag	UNP P04626
B	1035	HIS	-	expression tag	UNP P04626
B	1036	HIS	-	expression tag	UNP P04626
B	1037	HIS	-	expression tag	UNP P04626
B	1038	HIS	-	expression tag	UNP P04626
B	1039	HIS	-	expression tag	UNP P04626
C	702	MET	-	expression tag	UNP P04626
C	703	SER	-	expression tag	UNP P04626
C	704	GLY	-	expression tag	UNP P04626
C	705	ALA	-	expression tag	UNP P04626
C	706	ALA	-	expression tag	UNP P04626
C	707	PRO	-	expression tag	UNP P04626
C	708	ASN	-	expression tag	UNP P04626
C	709	GLN	-	expression tag	UNP P04626
C	710	ALA	-	expression tag	UNP P04626
C	711	LEU	-	expression tag	UNP P04626
C	712	LEU	-	expression tag	UNP P04626
C	1029	GLY	-	expression tag	UNP P04626
C	1030	ALA	-	expression tag	UNP P04626
C	1031	ALA	-	expression tag	UNP P04626
C	1032	ALA	-	expression tag	UNP P04626
C	1033	SER	-	expression tag	UNP P04626
C	1034	HIS	-	expression tag	UNP P04626
C	1035	HIS	-	expression tag	UNP P04626
C	1036	HIS	-	expression tag	UNP P04626

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| Chain	Residue	Modelled	Actual	Comment	Reference
C	1037	HIS	-	expression tag	UNP P04626
C	1038	HIS	-	expression tag	UNP P04626
C	1039	HIS	-	expression tag	UNP P04626
D	702	MET	-	expression tag	UNP P04626
D	703	SER	-	expression tag	UNP P04626
D	704	GLY	-	expression tag	UNP P04626
D	705	ALA	-	expression tag	UNP P04626
D	706	ALA	-	expression tag	UNP P04626
D	707	PRO	-	expression tag	UNP P04626
D	708	ASN	-	expression tag	UNP P04626
D	709	GLN	-	expression tag	UNP P04626
D	710	ALA	-	expression tag	UNP P04626
D	711	LEU	-	expression tag	UNP P04626
D	712	LEU	-	expression tag	UNP P04626
D	1029	GLY	-	expression tag	UNP P04626
D	1030	ALA	-	expression tag	UNP P04626
D	1031	ALA	-	expression tag	UNP P04626
D	1032	ALA	-	expression tag	UNP P04626
D	1033	SER	-	expression tag	UNP P04626
D	1034	HIS	-	expression tag	UNP P04626
D	1035	HIS	-	expression tag	UNP P04626
D	1036	HIS	-	expression tag	UNP P04626
D	1037	HIS	-	expression tag	UNP P04626
D	1038	HIS	-	expression tag	UNP P04626
D	1039	HIS	-	expression tag	UNP P04626

- Molecule 2 is N-{2-[4-({3-chloro-4-[3-(trifluoromethyl)phenoxy]phenyl}amino)-5H-pyrrolo[3, 2-d]pyrimidin-5-yl]ethyl}-3-hydroxy-3-methylbutanamide (three-letter code: 03P) (formula: $C_{26}H_{25}ClF_3N_5O_3$).

03P

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total 38	C 26	Cl 1	F 3	N 5	O 3	0	0
2	C	1	Total 38	C 26	Cl 1	F 3	N 5	O 3	0	0
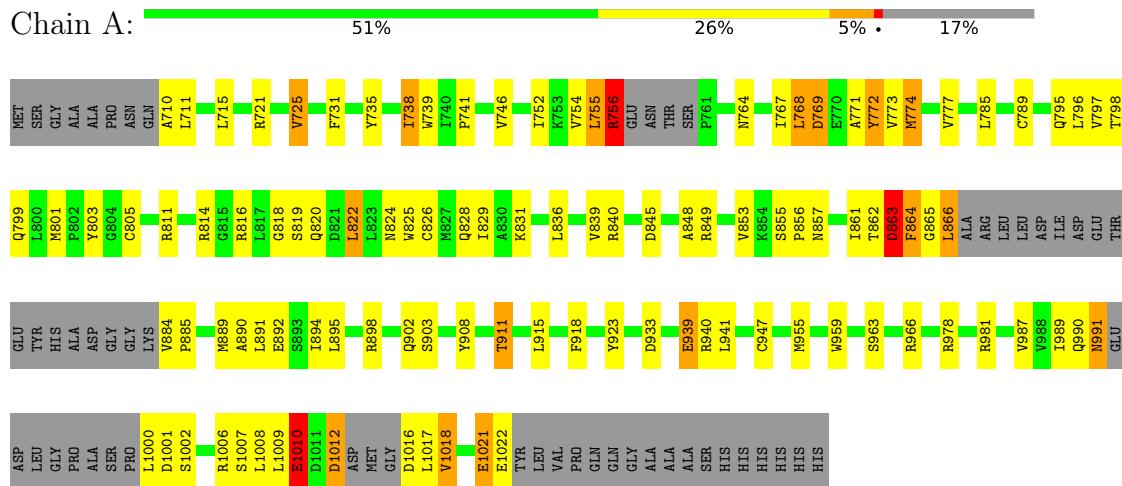
• Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	10	Total 10	O 10	0	0
3	B	9	Total 9	O 9	0	0
3	C	5	Total 5	O 5	0	0
3	D	10	Total 10	O 10	0	0
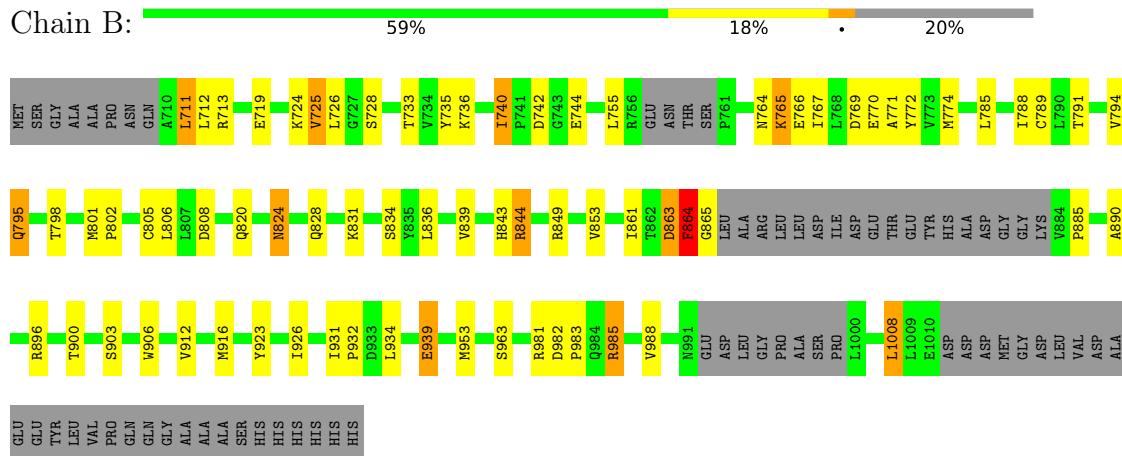
3 Residue-property plots ⓘ

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: Receptor tyrosine-protein kinase erbB-2

Chain A:

• Molecule 1: Receptor tyrosine-protein kinase erbB-2

Chain B:

• Molecule 1: Receptor tyrosine-protein kinase erbB-2

Chain C:

MET SER GLY ALA PRO ASN GLN A710 L711 L715 R721 K722 V725 Y735 I738 W739 I740 P741 V746 I752 K753 V754 L755 R756 GLU ASN THR SER P761 N764 I767 L768 D769 E770 A771 Y772 V773 M774 V777 V782 L785 C789 Q795 L796 V797

T798 Q799 L800 M801 P802 Y803 G804 C805 R811 E812 N813 R814 G815 R816 L817 G818 S819 Q820 D821 L822 L823 N824 W825 Q828 I829 A830 K831 L836 V839 R840 D845 A848 R849 N850 V851 L852 V853 K854 S855 P856 N857 H858 I861 T862 D863 F864 G865 L866 ALA ARG LEU LEU ASP

ILE ASP GLU THR GLU TYR HIS ALA ASP GLY GLY LYS V884 P885 M889 A890 L891 E892 S893 I894 L895 R898 Q902 S903 T911 L915 F918 Y923 D933 E939 R940 L941 C947 T948 I949 Y952 M953 I954 M955 W959 S963 R978 R981 V987

V988 I989 Q990 N991 GLU ASP LEU GLY PRO ALA SER PRO L1000 D1001 S1002 R1006 S1007 L1008 L1009 E1010 D1011 D1012 ASP MET GLY D1016 L1017 V1018 E1021 E1022 TYR LEU VAL PRO GLN GLN GLY ALA ALA ALA SER HIS HIS HIS HIS HIS HIS

• Molecule 1: Receptor tyrosine-protein kinase erbB-2

Chain D: 57%   20%   •   20%

MET SER GLY ALA ALA PRO ASN GLN A710 L711 L712 E719 V723 K724 V725 L726 G727 S728 T733 V734 Y735 K736 I740 A751 I752 L755 R756 GLU ASN THR SER P761 N764 K765 E766 I767 L768 D769 E770 A771 Y772 V773 M774 A775 G776 L785 I788 C789 L790 T791

V794 Q795 L796 C805 L806 L807 D808 Q820 N824 Q828 K831 S834 Y835 L836 V839 V842 H843 R844 D845 R849 V853 H858 I861 T862 D863 F864 G865 LEU ALA ARG LEU LEU ASP ILE ASP GLU THR GLU TYR HIS ALA ASP GLY GLY LYS V884 P885

A890 R896 T900 H901 W906 V912 M916 Y923 I926 I931 P932 D933 L934 E939 M953 I954 M955 C958 S963 R981 D982 P983 Q984 R985 V988 N991 GLU ASP LEU GLY PRO ALA SER PRO L1000 L1008 L1009 E1010 ASP ASP ASP MET GLY ASP

LEU VAL ASP ALA GLU GLU TYR LEU VAL PRO GLN GLN GLY ALA ALA ALA SER HIS HIS HIS HIS HIS HIS

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	50.54Å 64.94Å 92.36Å 90.42° 89.72° 90.35°	Depositor
Resolution (Å)	40.00 – 3.21 46.18 – 3.21	Depositor EDS
% Data completeness (in resolution range)	76.0 (40.00-3.21) 75.9 (46.18-3.21)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.93 (at 3.19Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.224 , 0.294 0.220 , 0.291	Depositor DCC
R_{free} test set	749 reflections (5.15%)	wwPDB-VP
Wilson B-factor (Å^2)	52.2	Xtriage
Anisotropy	0.519	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 25.0	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.058 for h,-k,-l 0.348 for -h,k,-l 0.056 for -h,-k,l	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	8970	wwPDB-VP
Average B, all atoms (Å^2)	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.42% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: 03P

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	0.45	0/2297	0.71	4/3104 (0.1%)
1	B	0.41	0/2220	0.58	0/3000
1	C	0.44	0/2297	0.74	6/3104 (0.2%)
1	D	0.41	0/2220	0.58	0/3000
All	All	0.43	0/9034	0.66	10/12208 (0.1%)

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	756	ARG	NE-CZ-NH1	-11.85	114.38	120.30
1	C	756	ARG	NE-CZ-NH2	10.29	125.44	120.30
1	A	756	ARG	NE-CZ-NH1	9.81	125.20	120.30
1	C	1006	ARG	NE-CZ-NH1	-7.88	116.36	120.30
1	A	756	ARG	NE-CZ-NH2	-7.71	116.45	120.30
1	C	1006	ARG	NE-CZ-NH2	7.50	124.05	120.30
1	A	1006	ARG	NE-CZ-NH2	-7.12	116.74	120.30
1	A	1006	ARG	NE-CZ-NH1	7.09	123.84	120.30
1	C	756	ARG	CD-NE-CZ	5.26	130.96	123.60
1	C	756	ARG	CG-CD-NE	-5.13	101.02	111.80

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	2254	0	2306	66	0
1	B	2176	0	2243	35	0
1	C	2254	0	2306	67	0
1	D	2176	0	2243	36	0
2	A	38	0	25	2	0
2	C	38	0	25	3	0
3	A	10	0	0	1	0
3	B	9	0	0	1	0
3	C	5	0	0	0	0
3	D	10	0	0	1	0
All	All	8970	0	9148	200	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 11.

All (200) 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:989:ILE:HG22	1:A:990:GLN:H	1.28	0.97
1:C:989:ILE:HG22	1:C:990:GLN:H	1.31	0.94
2:A:9001:03P:H6	2:A:9001:03P:HN4	1.45	0.80
1:A:940:ARG:NH1	3:A:2:HOH:O	2.14	0.80
1:D:858:HIS:HB2	3:D:24:HOH:O	1.84	0.77
1:D:755:LEU:HD12	1:D:794:VAL:HB	1.68	0.76
1:D:820:GLN:O	1:D:824:ASN:HB2	1.87	0.75
1:B:764:ASN:HA	1:B:767:ILE:HD12	1.68	0.75
1:D:764:ASN:HA	1:D:767:ILE:HD12	1.69	0.74
1:B:820:GLN:O	1:B:824:ASN:HB2	1.89	0.72
1:B:755:LEU:HD12	1:B:794:VAL:HB	1.71	0.72
1:A:989:ILE:HG22	1:A:990:GLN:N	2.04	0.69
1:A:771:ALA:HA	1:A:774:MET:SD	2.33	0.68
1:C:885:PRO:O	1:C:889:MET:HG3	1.95	0.66
1:C:836:LEU:HA	1:C:839:VAL:HG22	1.78	0.66
1:B:765:LYS:HG3	1:B:766:GLU:N	2.12	0.65
1:B:923:TYR:HB3	1:B:926:ILE:HD12	1.79	0.64
1:D:789:CYS:HB3	1:D:795:GLN:HB2	1.79	0.64
1:C:710:ALA:CB	1:C:772:TYR:HE1	2.11	0.64
1:C:989:ILE:HG22	1:C:990:GLN:N	2.08	0.64
1:A:885:PRO:O	1:A:889:MET:HG3	1.99	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:836:LEU:HA	1:A:839:VAL:HG22	1.80	0.63
1:D:765:LYS:HG3	1:D:766:GLU:N	2.12	0.62
1:C:818:GLY:O	1:C:822:LEU:HD12	2.00	0.62
1:A:939:GLU:HG2	1:B:711:LEU:HD23	1.82	0.61
1:B:789:CYS:HB3	1:B:795:GLN:HB2	1.81	0.61
1:B:981:ARG:O	1:B:983:PRO:HD3	2.01	0.61
1:C:803:TYR:HB2	1:C:853:VAL:HB	1.82	0.61
1:C:771:ALA:HA	1:C:774:MET:SD	2.41	0.60
1:A:769:ASP:O	1:A:773:VAL:HG23	2.01	0.60
1:B:798:THR:HG22	3:B:19:HOH:O	2.02	0.60
1:A:803:TYR:HB2	1:A:853:VAL:HB	1.83	0.60
1:B:724:LYS:H	1:B:736:LYS:HG2	1.67	0.59
1:A:911:THR:O	1:A:915:LEU:HG	2.02	0.59
1:C:769:ASP:O	1:C:773:VAL:HG23	2.04	0.58
1:C:949:ILE:HD13	1:D:768:LEU:HD13	1.86	0.58
1:A:771:ALA:O	1:A:774:MET:HB2	2.03	0.58
1:A:755:LEU:HD12	1:A:755:LEU:H	1.68	0.58
1:C:710:ALA:HB1	1:C:772:TYR:CE1	2.39	0.58
1:C:771:ALA:O	1:C:774:MET:HB2	2.04	0.57
1:A:891:LEU:O	1:A:895:LEU:HG	2.04	0.57
1:C:819:SER:HB2	1:C:987:VAL:HB	1.87	0.57
1:A:710:ALA:CB	1:A:772:TYR:HE1	2.17	0.56
1:D:724:LYS:H	1:D:736:LYS:HG2	1.69	0.56
1:D:934:LEU:O	1:D:939:GLU:HB2	2.06	0.56
1:D:981:ARG:O	1:D:983:PRO:HD3	2.05	0.56
1:A:989:ILE:CG2	1:A:990:GLN:H	2.11	0.56
1:C:710:ALA:HB2	1:C:772:TYR:HE1	1.71	0.56
1:C:911:THR:O	1:C:915:LEU:HG	2.06	0.56
1:C:755:LEU:HD12	1:C:755:LEU:H	1.71	0.55
1:D:923:TYR:HB3	1:D:926:ILE:HD12	1.87	0.55
1:A:818:GLY:O	1:A:822:LEU:HD12	2.05	0.55
1:C:884:VAL:N	1:C:885:PRO:HD3	2.23	0.54
1:A:884:VAL:N	1:A:885:PRO:HD3	2.23	0.54
1:C:891:LEU:O	1:C:895:LEU:HG	2.08	0.54
1:B:934:LEU:O	1:B:939:GLU:HB2	2.09	0.53
1:C:710:ALA:CB	1:C:772:TYR:CE1	2.92	0.53
1:C:852:LEU:HD13	2:C:9001:03P:C	2.38	0.53
1:C:1008:LEU:O	1:C:1010:GLU:N	2.40	0.53
1:C:1016:ASP:O	1:C:1017:LEU:HD23	2.08	0.53
1:A:819:SER:HB2	1:A:987:VAL:HB	1.90	0.53
1:C:814:ARG:HG2	1:C:918:PHE:HB3	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:978:ARG:HA	1:C:981:ARG:CZ	2.39	0.53
1:A:845:ASP:HB2	1:A:866:LEU:HD11	1.90	0.52
1:C:939:GLU:HG2	1:D:711:LEU:HD23	1.91	0.52
1:A:978:ARG:O	1:A:981:ARG:HG2	2.10	0.52
1:A:825:TRP:O	1:A:828:GLN:N	2.43	0.52
1:C:855:SER:O	1:C:857:ASN:N	2.43	0.52
1:A:754:VAL:HG22	1:A:795:GLN:HG2	1.91	0.52
1:A:814:ARG:HG2	1:A:918:PHE:HB3	1.92	0.52
1:A:890:ALA:O	1:A:894:ILE:HG13	2.10	0.51
2:C:9001:03P:HN4	2:C:9001:03P:H6	1.75	0.51
1:A:862:THR:O	1:A:863:ASP:HB2	2.10	0.51
1:C:978:ARG:O	1:C:981:ARG:HG2	2.11	0.51
1:C:829:ILE:HG23	1:C:861:ILE:HD11	1.93	0.51
1:A:848:ALA:N	1:A:911:THR:HG23	2.25	0.51
1:D:843:HIS:O	1:D:844:ARG:HB2	2.11	0.50
1:A:902:GLN:NE2	1:A:963:SER:O	2.45	0.50
1:B:785:LEU:HD21	1:B:788:ILE:HD11	1.93	0.50
1:A:710:ALA:HB1	1:A:772:TYR:CE1	2.47	0.50
1:B:771:ALA:HA	1:B:774:MET:HG2	1.94	0.50
1:A:1021:GLU:O	1:A:1021:GLU:HG2	2.11	0.49
1:D:849:ARG:NH1	1:D:885:PRO:HB3	2.26	0.49
1:A:857:ASN:N	1:A:857:ASN:OD1	2.46	0.49
1:C:801:MET:O	2:C:9001:03P:H5	2.13	0.49
1:A:829:ILE:HG23	1:A:861:ILE:HD11	1.95	0.49
1:A:1016:ASP:O	1:A:1017:LEU:HD23	2.12	0.49
1:C:754:VAL:HG22	1:C:795:GLN:HG2	1.94	0.49
1:C:862:THR:O	1:C:863:ASP:HB2	2.13	0.49
1:C:890:ALA:O	1:C:894:ILE:HG13	2.12	0.49
1:C:848:ALA:N	1:C:911:THR:HG23	2.28	0.48
1:C:739:TRP:CD2	1:C:741:PRO:HD3	2.49	0.48
1:A:978:ARG:HA	1:A:981:ARG:CZ	2.44	0.48
1:C:855:SER:C	1:C:857:ASN:H	2.17	0.48
1:D:931:ILE:HB	1:D:932:PRO:CD	2.44	0.48
1:C:866:LEU:HD12	1:C:866:LEU:N	2.29	0.48
1:A:710:ALA:HB2	1:A:772:TYR:HE1	1.77	0.48
1:A:768:LEU:HD13	1:A:769:ASP:N	2.29	0.48
1:C:836:LEU:HA	1:C:839:VAL:CG2	2.43	0.47
1:C:953:MET:HA	1:D:790:LEU:HD13	1.96	0.47
1:A:739:TRP:CD2	1:A:741:PRO:HD3	2.49	0.47
1:A:801:MET:O	2:A:9001:03P:H5	2.14	0.47
1:B:912:VAL:O	1:B:916:MET:HG2	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:725:VAL:HG13	1:A:735:TYR:CE2	2.48	0.47
1:C:857:ASN:N	1:C:857:ASN:OD1	2.46	0.47
1:C:1021:GLU:HG2	1:C:1021:GLU:O	2.15	0.47
1:D:771:ALA:HA	1:D:774:MET:HG2	1.96	0.47
1:A:1008:LEU:O	1:A:1010:GLU:N	2.47	0.47
1:B:1008:LEU:HD23	1:B:1008:LEU:O	2.15	0.47
1:D:890:ALA:HA	1:D:906:TRP:CD2	2.50	0.47
1:A:814:ARG:HB3	1:A:814:ARG:NH1	2.30	0.47
1:A:863:ASP:O	1:A:864:PHE:C	2.53	0.47
1:B:931:ILE:HB	1:B:932:PRO:CD	2.44	0.47
1:C:825:TRP:O	1:C:828:GLN:N	2.47	0.47
1:A:731:PHE:HZ	1:A:866:LEU:HG	1.79	0.46
1:C:777:VAL:HG13	1:C:777:VAL:O	2.15	0.46
1:D:1008:LEU:HD23	1:D:1008:LEU:O	2.16	0.46
1:C:884:VAL:N	1:C:885:PRO:CD	2.79	0.46
1:B:982:ASP:OD1	1:B:985:ARG:HD3	2.15	0.46
1:C:902:GLN:NE2	1:C:963:SER:O	2.48	0.46
1:D:785:LEU:HD21	1:D:788:ILE:HD11	1.97	0.46
1:C:814:ARG:HB3	1:C:814:ARG:NH1	2.30	0.46
1:D:719:GLU:O	1:D:740:ILE:HD12	2.15	0.46
1:C:752:ILE:HG12	1:C:797:VAL:HG22	1.98	0.45
1:D:849:ARG:HH12	1:D:885:PRO:HB3	1.81	0.45
1:B:849:ARG:NH1	1:B:885:PRO:HB3	2.32	0.45
1:C:989:ILE:CG2	1:C:990:GLN:H	2.14	0.45
1:B:828:GLN:O	1:B:831:LYS:HB2	2.17	0.45
1:D:788:ILE:CD1	1:D:796:LEU:HD23	2.47	0.45
1:A:710:ALA:CB	1:A:772:TYR:CE1	2.97	0.45
1:B:843:HIS:O	1:B:844:ARG:HB2	2.17	0.45
1:A:836:LEU:HA	1:A:839:VAL:CG2	2.47	0.45
1:A:777:VAL:O	1:A:777:VAL:HG13	2.16	0.45
1:C:756:ARG:HE	1:C:756:ARG:HB2	1.19	0.44
1:C:813:ASN:HB3	1:C:817:LEU:HG	1.99	0.44
1:D:843:HIS:CE1	1:D:845:ASP:O	2.71	0.44
1:A:855:SER:O	1:A:857:ASN:N	2.50	0.44
1:B:863:ASP:O	1:B:865:GLY:N	2.51	0.44
1:C:738:ILE:CD1	1:C:1012:ASP:HB2	2.46	0.44
1:A:884:VAL:N	1:A:885:PRO:CD	2.80	0.44
1:A:892:GLU:OE1	1:A:903:SER:HB3	2.17	0.44
1:C:715:LEU:O	1:C:789:CYS:HA	2.17	0.44
1:A:819:SER:CB	1:A:987:VAL:HB	2.47	0.44
1:A:923:TYR:CE1	1:A:941:LEU:HG	2.52	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:912:VAL:O	1:D:916:MET:HG2	2.18	0.43
1:A:774:MET:SD	1:A:774:MET:N	2.91	0.43
1:A:955:MET:HB3	1:A:959:TRP:CH2	2.53	0.43
1:D:726:LEU:H	1:D:735:TYR:HA	1.82	0.43
1:A:715:LEU:O	1:A:789:CYS:HA	2.19	0.43
1:C:955:MET:HB3	1:C:959:TRP:CH2	2.54	0.43
1:D:982:ASP:OD1	1:D:985:ARG:HD3	2.18	0.43
1:B:900:THR:O	1:B:903:SER:OG	2.26	0.43
1:A:731:PHE:CZ	1:A:866:LEU:HG	2.54	0.43
1:B:849:ARG:HH12	1:B:885:PRO:HB3	1.84	0.43
1:C:767:ILE:HG22	1:C:767:ILE:O	2.19	0.43
1:D:863:ASP:O	1:D:865:GLY:N	2.51	0.43
1:B:801:MET:HA	1:B:802:PRO:HD3	1.88	0.43
1:B:890:ALA:HA	1:B:906:TRP:CD2	2.53	0.43
1:A:767:ILE:HG22	1:A:767:ILE:O	2.17	0.43
1:A:855:SER:C	1:A:857:ASN:H	2.22	0.43
1:C:941:LEU:O	1:C:952:TYR:OH	2.27	0.43
1:A:939:GLU:OE1	1:B:713:ARG:HB2	2.19	0.42
1:B:719:GLU:O	1:B:740:ILE:HD12	2.19	0.42
1:C:845:ASP:HB2	1:C:866:LEU:HD11	1.99	0.42
1:C:725:VAL:HG13	1:C:735:TYR:CE2	2.55	0.42
1:D:751:ALA:C	1:D:752:ILE:HG13	2.39	0.42
1:D:955:MET:O	1:D:958:CYS:HB2	2.19	0.42
1:D:836:LEU:HA	1:D:839:VAL:HG22	2.00	0.42
1:D:849:ARG:HH12	1:D:885:PRO:CB	2.32	0.42
1:A:990:GLN:HB3	1:A:991:ASN:H	1.60	0.42
1:B:726:LEU:H	1:B:735:TYR:HA	1.84	0.42
1:C:819:SER:CB	1:C:987:VAL:HB	2.49	0.42
1:C:923:TYR:CE1	1:C:941:LEU:HG	2.55	0.42
1:A:738:ILE:CD1	1:A:1012:ASP:HB2	2.49	0.42
1:C:855:SER:OG	1:C:858:HIS:HB3	2.20	0.42
1:D:806:LEU:HD13	1:D:853:VAL:HG22	2.01	0.42
1:D:766:GLU:O	1:D:770:GLU:HG2	2.20	0.41
1:C:774:MET:SD	1:C:774:MET:N	2.93	0.41
1:A:756:ARG:HB2	1:A:756:ARG:HH11	1.85	0.41
1:B:806:LEU:HD13	1:B:853:VAL:HG22	2.02	0.41
1:D:828:GLN:O	1:D:831:LYS:HB2	2.20	0.41
1:A:752:ILE:HG12	1:A:797:VAL:HG22	2.03	0.41
1:A:939:GLU:HG2	1:B:711:LEU:CD2	2.50	0.41
1:B:824:ASN:O	1:B:828:GLN:HG3	2.20	0.41
1:A:866:LEU:HD12	1:A:866:LEU:N	2.35	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:836:LEU:HA	1:B:839:VAL:HG22	2.01	0.41
1:B:843:HIS:CE1	1:B:864:PHE:HA	2.56	0.41
1:C:863:ASP:O	1:C:864:PHE:C	2.59	0.41
1:D:842:VAL:HG22	1:D:901:HIS:CE1	2.56	0.41
1:C:824:ASN:HD22	1:C:824:ASN:HA	1.63	0.41
1:B:742:ASP:C	1:B:744:GLU:H	2.24	0.40
1:A:785:LEU:HD11	1:A:796:LEU:HB3	2.03	0.40
1:B:719:GLU:HB3	1:B:740:ILE:O	2.21	0.40
1:C:768:LEU:HD13	1:C:769:ASP:N	2.36	0.40
1:C:782:VAL:HG11	1:C:836:LEU:HD21	2.03	0.40
1:C:892:GLU:OE1	1:C:903:SER:HB3	2.21	0.40
1:C:978:ARG:HA	1:C:981:ARG:NH1	2.36	0.40
1:A:826:CYS:O	1:A:908:TYR:OH	2.36	0.40
1:A:963:SER:HA	1:A:966:ARG:NE	2.37	0.40
1:C:785:LEU:HD11	1:C:796:LEU:HB3	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	271/338 (80%)	245 (90%)	19 (7%)	7 (3%)	5	30
1	B	263/338 (78%)	236 (90%)	24 (9%)	3 (1%)	14	50
1	C	271/338 (80%)	244 (90%)	19 (7%)	8 (3%)	4	27
1	D	263/338 (78%)	235 (89%)	25 (10%)	3 (1%)	14	50
All	All	1068/1352 (79%)	960 (90%)	87 (8%)	21 (2%)	7	36

All (21) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1018	VAL
1	B	864	PHE
1	C	1018	VAL
1	D	864	PHE
1	A	863	ASP
1	A	864	PHE
1	C	863	ASP
1	C	864	PHE
1	C	1009	LEU
1	A	1009	LEU
1	A	1010	GLU
1	C	1010	GLU
1	D	844	ARG
1	C	722	LYS
1	C	856	PRO
1	A	856	PRO
1	B	844	ARG
1	A	865	GLY
1	C	865	GLY
1	B	725	VAL
1	D	723	VAL

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	250/293 (85%)	210 (84%)	40 (16%)	2	11
1	B	241/293 (82%)	215 (89%)	26 (11%)	6	26
1	C	250/293 (85%)	211 (84%)	39 (16%)	2	11
1	D	241/293 (82%)	215 (89%)	26 (11%)	6	26
All	All	982/1172 (84%)	851 (87%)	131 (13%)	4	17

All (131) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	711	LEU

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WORLDWIDE
wwPDB
PROTEIN DATA BANK

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Mol	Chain	Res	Type
1	A	721	ARG
1	A	725	VAL
1	A	738	ILE
1	A	746	VAL
1	A	755	LEU
1	A	756	ARG
1	A	764	ASN
1	A	768	LEU
1	A	769	ASP
1	A	772	TYR
1	A	774	MET
1	A	798	THR
1	A	799	GLN
1	A	805	CYS
1	A	811	ARG
1	A	816	ARG
1	A	820	GLN
1	A	822	LEU
1	A	824	ASN
1	A	831	LYS
1	A	840	ARG
1	A	849	ARG
1	A	863	ASP
1	A	866	LEU
1	A	898	ARG
1	A	911	THR
1	A	933	ASP
1	A	939	GLU
1	A	947	CYS
1	A	991	ASN
1	A	1000	LEU
1	A	1001	ASP
1	A	1002	SER
1	A	1007	SER
1	A	1010	GLU
1	A	1012	ASP
1	A	1018	VAL
1	A	1021	GLU
1	A	1022	GLU
1	B	711	LEU
1	B	712	LEU
1	B	725	VAL

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Mol	Chain	Res	Type
1	B	728	SER
1	B	733	THR
1	B	740	ILE
1	B	765	LYS
1	B	769	ASP
1	B	770	GLU
1	B	772	TYR
1	B	791	THR
1	B	795	GLN
1	B	805	CYS
1	B	808	ASP
1	B	824	ASN
1	B	834	SER
1	B	861	ILE
1	B	863	ASP
1	B	864	PHE
1	B	896	ARG
1	B	939	GLU
1	B	953	MET
1	B	963	SER
1	B	985	ARG
1	B	988	VAL
1	B	1008	LEU
1	C	711	LEU
1	C	721	ARG
1	C	725	VAL
1	C	738	ILE
1	C	746	VAL
1	C	755	LEU
1	C	756	ARG
1	C	764	ASN
1	C	768	LEU
1	C	769	ASP
1	C	772	TYR
1	C	774	MET
1	C	798	THR
1	C	799	GLN
1	C	805	CYS
1	C	811	ARG
1	C	816	ARG
1	C	820	GLN
1	C	822	LEU

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Mol	Chain	Res	Type
1	C	824	ASN
1	C	831	LYS
1	C	840	ARG
1	C	849	ARG
1	C	851	VAL
1	C	863	ASP
1	C	866	LEU
1	C	895	LEU
1	C	898	ARG
1	C	933	ASP
1	C	939	GLU
1	C	947	CYS
1	C	991	ASN
1	C	1000	LEU
1	C	1001	ASP
1	C	1002	SER
1	C	1007	SER
1	C	1012	ASP
1	C	1021	GLU
1	C	1022	GLU
1	D	711	LEU
1	D	712	LEU
1	D	725	VAL
1	D	728	SER
1	D	733	THR
1	D	740	ILE
1	D	769	ASP
1	D	770	GLU
1	D	772	TYR
1	D	791	THR
1	D	795	GLN
1	D	805	CYS
1	D	808	ASP
1	D	824	ASN
1	D	834	SER
1	D	861	ILE
1	D	863	ASP
1	D	864	PHE
1	D	896	ARG
1	D	900	THR
1	D	939	GLU
1	D	953	MET

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Mol	Chain	Res	Type
1	D	963	SER
1	D	985	ARG
1	D	988	VAL
1	D	1008	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	745	ASN
1	A	820	GLN
1	A	824	ASN
1	B	809	HIS
1	B	824	ASN
1	B	901	HIS
1	B	902	GLN
1	C	745	ASN
1	C	820	GLN
1	C	824	ASN
1	D	745	ASN
1	D	809	HIS
1	D	824	ASN
1	D	901	HIS
1	D	902	GLN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5   Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6   Ligand geometry ⓘ

2 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	#$\|Z\| > 2$
2	03P	A	9001	-	38,41,41	0.96	2 (5%)	50,60,60	1.31	4 (8%)
2	03P	C	9001	-	38,41,41	0.92	3 (7%)	50,60,60	1.43	4 (8%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	03P	A	9001	-	-	3/25/25/25	0/4/4/4
2	03P	C	9001	-	-	6/25/25/25	0/4/4/4

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	9001	03P	C1-N4	2.75	1.40	1.36
2	A	9001	03P	C1-N4	2.68	1.40	1.36
2	A	9001	03P	C8-N3	2.28	1.38	1.33
2	C	9001	03P	C8-N3	2.04	1.38	1.33
2	C	9001	03P	C2-N	-2.02	1.33	1.37

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	9001	03P	C9-C8-N3	-4.90	110.55	115.57
2	A	9001	03P	C13-C12-CL	4.46	124.67	119.43
2	C	9001	03P	C13-C12-CL	4.44	124.65	119.43
2	A	9001	03P	N4-C1-N1	3.56	123.49	118.72
2	C	9001	03P	C7-C6-N2	3.44	116.49	110.90
2	A	9001	03P	C9-C8-N3	-3.27	112.21	115.57
2	A	9001	03P	C-N-C2	-2.37	112.14	115.40
2	C	9001	03P	C10-N4-C1	-2.11	122.76	128.26

There are no chirality outliers.

All (9) torsion outliers are listed below:
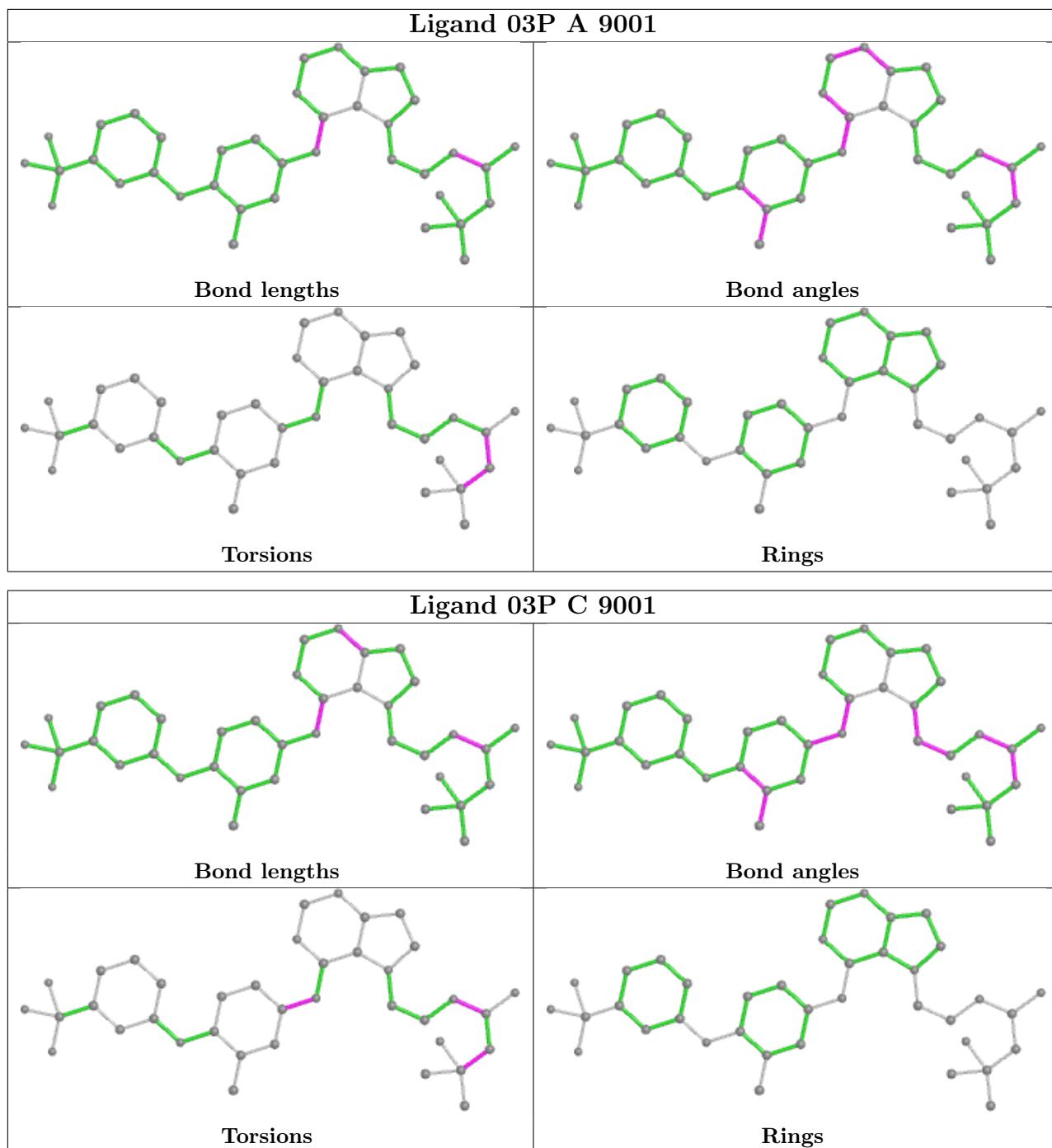
Mol	Chain	Res	Type	Atoms
2	C	9001	03P	O-C8-N3-C7
2	C	9001	03P	C9-C8-N3-C7
2	A	9001	03P	O-C8-C9-C23
2	C	9001	03P	C15-C10-N4-C1
2	A	9001	03P	C24-C23-C9-C8
2	C	9001	03P	C25-C23-C9-C8
2	C	9001	03P	C11-C10-N4-C1
2	A	9001	03P	O2-C23-C9-C8
2	C	9001	03P	O2-C23-C9-C8

There are no ring outliers.

2 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	9001	03P	2	0
2	C	9001	03P	3	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 03P A 9001

Bond lengths

Bond angles

Torsions

Rings

Ligand 03P C 9001

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	281/338 (83%)	-0.45	0	100	100	28, 42, 77, 97	3 (1%)
1	B	271/338 (80%)	-0.26	0	100	100	35, 56, 86, 107	5 (1%)
1	C	281/338 (83%)	-0.43	0	100	100	28, 43, 81, 99	5 (1%)
1	D	271/338 (80%)	-0.23	1 (0%)	92	89	36, 55, 84, 108	5 (1%)
All	All	1104/1352 (81%)	-0.34	1 (0%)	95	96	28, 49, 84, 108	18 (1%)

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	776	GLY	2.2

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.
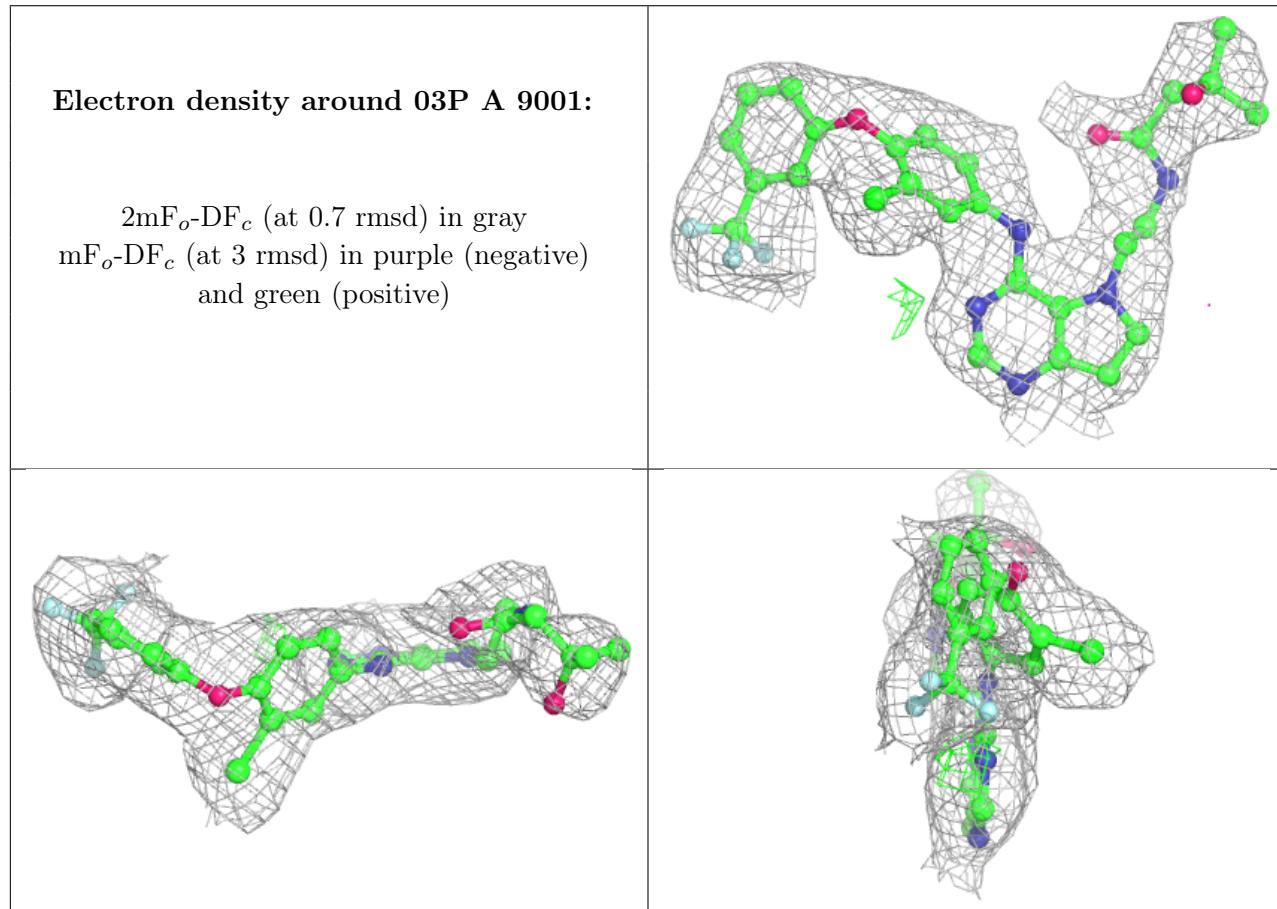
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	03P	A	9001	38/38	0.96	0.19	31,34,42,43	0

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WORLDWIDE
wwPDB
PROTEIN DATA BANK
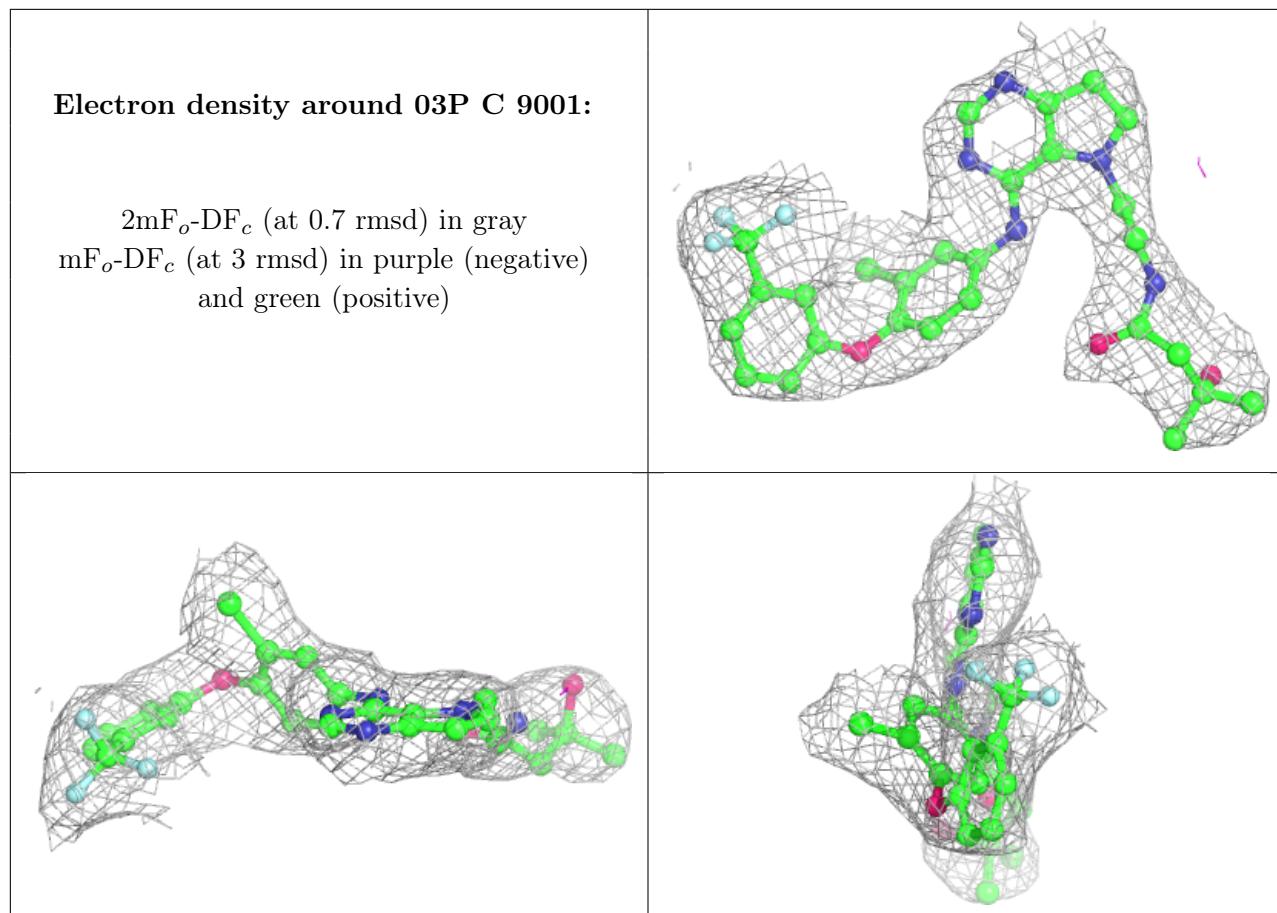
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	03P	C	9001	38/38	0.96	0.17	45,46,47,48	0

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 03P A 9001:

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

Electron density around 03P C 9001:

$2mF_o$-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.