



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 01:19 PM UTC

PDB ID : 1XCG / pdb_00001xcg
Title : Crystal Structure of Human RhoA in complex with DH/PH fragment of PDZRHOGF
Authors : Derewenda, U.; Oleksy, A.; Stevenson, A.S.; Korczynska, J.; Dauter, Z.; Somlyo, A.P.; Otlewski, J.; Somlyo, A.V.; Derewenda, Z.S.
Deposited on : 2004-09-01
Resolution : 2.50 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4-5-2 with Phenix2.0
Xtriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

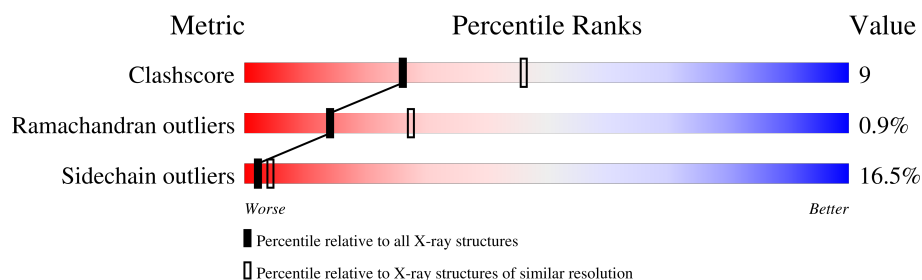
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)

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

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	368	
1	E	368	
2	B	178	
2	F	178	

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 8750 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 Rho guanine nucleotide exchange factor 11.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	355	Total	C	N	O	S	0	0	0
			2906	1837	519	535	15			
1	E	358	Total	C	N	O	S	0	0	0
			2931	1852	525	539	15			

- Molecule 2 is a protein called Transforming protein RhoA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	178	Total	C	N	O	S	0	0	0
			1411	889	240	272	10			
2	F	178	Total	C	N	O	S	0	0	0
			1411	889	240	272	10			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	25	ASN	PHE	engineered mutation	UNP P61586
F	25	ASN	PHE	engineered mutation	UNP P61586

- Molecule 3 is water.

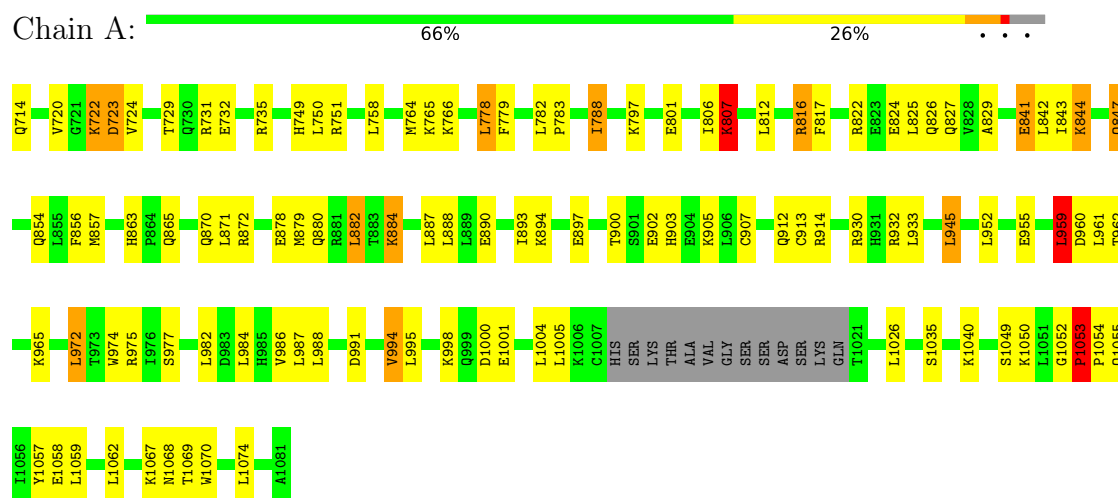
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	30	Total	O	0	0
			30	30		
3	B	17	Total	O	0	0
			17	17		
3	E	30	Total	O	0	0
			30	30		
3	F	14	Total	O	0	0
			14	14		

3 Residue-property plots

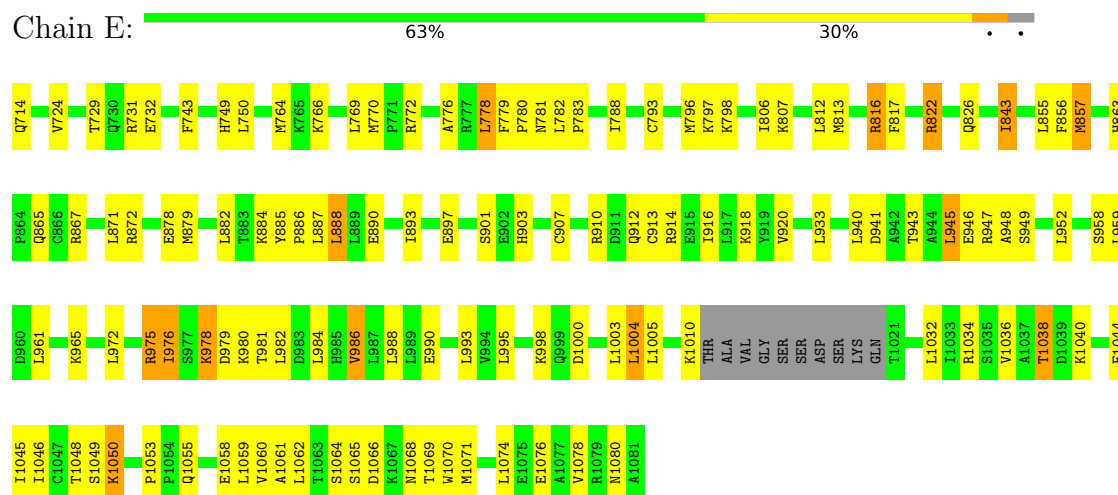
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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. 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.

Note EDS was not executed.

- Molecule 1: Rho guanine nucleotide exchange factor 11

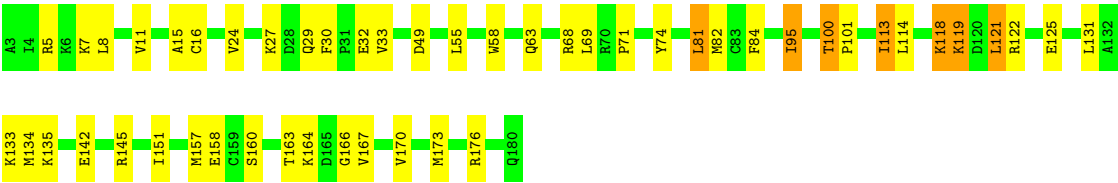


- Molecule 1: Rho guanine nucleotide exchange factor 11

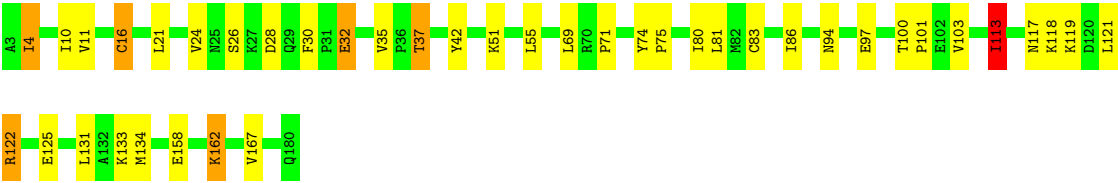


- Molecule 2: Transforming protein RhoA





● Molecule 2: Transforming protein RhoA



4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	89.24Å 118.78Å 90.13Å 90.00° 114.34° 90.00°	Depositor
Resolution (Å)	25.00 – 2.50	Depositor
% Data completeness (in resolution range)	96.8 (25.00-2.50)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.224 , 0.281	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	8750	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.65	0/2950	0.92	1/3970 (0.0%)
1	E	0.66	1/2976 (0.0%)	0.96	4/4004 (0.1%)
2	B	0.74	1/1438 (0.1%)	0.96	0/1944
2	F	0.74	1/1438 (0.1%)	0.97	0/1944
All	All	0.68	3/8802 (0.0%)	0.95	5/11862 (0.0%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	857	MET	SD-CE	-6.34	1.63	1.79
2	B	49	ASP	CA-C	5.35	1.60	1.53
2	F	113	ILE	CA-CB	5.21	1.60	1.54

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	1053	PRO	CA-C-N	-8.78	110.69	119.90
1	E	1053	PRO	C-N-CA	-8.78	110.69	119.90
1	E	1053	PRO	O-C-N	8.06	130.97	121.46
1	E	1049	SER	O-C-N	7.15	132.01	122.43
1	A	1053	PRO	N-CA-C	5.81	117.79	110.70

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	2906	0	2997	57	0
1	E	2931	0	3022	65	0
2	B	1411	0	1402	30	0
2	F	1411	0	1402	21	0
3	A	30	0	0	4	0
3	B	17	0	0	0	0
3	E	30	0	0	2	0
3	F	14	0	0	1	0
All	All	8750	0	8823	164	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 9.

All (164) 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:879:MET:HE3	2:B:69:LEU:HB3	1.39	1.03
1:E:822:ARG:HH11	1:E:826:GLN:HE22	1.05	0.93
1:A:879:MET:CE	2:B:69:LEU:HB3	2.03	0.88
1:E:1061:ALA:HB1	1:E:1066:ASP:HB3	1.56	0.86
1:A:822:ARG:HH11	1:A:912:GLN:HE22	1.22	0.86
1:A:959:LEU:HD12	1:A:1005:LEU:HD11	1.58	0.85
2:B:122:ARG:NH2	2:B:158:GLU:OE1	2.14	0.79
2:B:24:VAL:HG12	2:B:30:PHE:HA	1.67	0.77
1:E:863:HIS:HD2	1:E:865:GLN:H	1.32	0.76
1:A:778:LEU:HD13	1:A:779:PHE:CE2	2.20	0.75
1:A:1053:PRO:O	1:A:1055:GLN:N	2.20	0.75
1:A:816:ARG:O	1:A:816:ARG:HD3	1.88	0.73
1:A:788:ILE:HD11	1:A:824:GLU:HG2	1.70	0.72
2:F:117:ASN:ND2	2:F:118:LYS:H	1.88	0.72
2:B:173:MET:HA	2:B:176:ARG:NH1	2.04	0.72
1:E:822:ARG:HE	1:E:912:GLN:NE2	1.87	0.71
2:B:163:THR:O	2:B:164:LYS:HB2	1.91	0.69
1:A:822:ARG:HH11	1:A:912:GLN:NE2	1.91	0.68
1:E:816:ARG:O	1:E:816:ARG:HD3	1.93	0.68
1:A:729:THR:HG23	1:A:732:GLU:H	1.60	0.67
2:B:157:MET:HG2	2:B:170:VAL:HG22	1.76	0.67
1:E:822:ARG:HH11	1:E:826:GLN:NE2	1.86	0.67
2:B:82:MET:SD	2:B:100:THR:HG22	2.34	0.66
1:E:872:ARG:HD3	3:E:37:HOH:O	1.95	0.66
1:E:863:HIS:CD2	1:E:865:GLN:HB2	2.30	0.66
1:A:841:GLU:OE2	1:A:844:LYS:HE3	1.97	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:1040:LYS:HD3	1:E:1064:SER:HB3	1.79	0.64
2:F:81:LEU:HD23	2:F:113:ILE:HG12	1.78	0.64
1:E:893:ILE:HG23	1:E:903:HIS:NE2	2.12	0.64
2:B:122:ARG:HH22	2:B:158:GLU:CD	2.05	0.63
1:A:816:ARG:HD2	1:A:825:LEU:HD22	1.80	0.63
1:E:822:ARG:NH1	1:E:826:GLN:HE22	1.88	0.63
2:F:117:ASN:HD22	2:F:118:LYS:H	1.43	0.63
1:A:986:VAL:HG23	1:A:1070:TRP:CH2	2.35	0.62
1:A:749:HIS:HE1	1:A:878:GLU:OE1	1.84	0.61
1:A:972:LEU:HD22	1:A:986:VAL:HG21	1.82	0.61
1:E:976:ILE:HD11	1:E:982:LEU:HG	1.81	0.61
2:B:84:PHE:HB3	2:B:95:ILE:CD1	2.31	0.60
2:F:81:LEU:CD2	2:F:113:ILE:HG12	2.32	0.60
1:E:822:ARG:HD2	1:E:826:GLN:NE2	2.17	0.60
2:B:81:LEU:HD23	2:B:113:ILE:HG12	1.85	0.59
1:E:1045:ILE:HD12	1:E:1059:LEU:HD12	1.85	0.59
2:F:122:ARG:NH2	2:F:158:GLU:OE1	2.37	0.57
1:A:863:HIS:HD2	1:A:865:GLN:H	1.53	0.57
2:B:95:ILE:O	2:B:100:THR:HG23	2.05	0.57
1:E:856:PHE:HE2	1:E:857:MET:HE3	1.70	0.57
1:A:893:ILE:HG23	1:A:903:HIS:NE2	2.21	0.56
1:E:856:PHE:CE2	1:E:857:MET:CE	2.89	0.56
1:E:1070:TRP:O	1:E:1074:LEU:HB2	2.04	0.56
2:F:24:VAL:HG23	2:F:167:VAL:HG11	1.87	0.56
2:B:84:PHE:HB3	2:B:95:ILE:HD13	1.88	0.56
1:E:729:THR:HG23	1:E:732:GLU:H	1.71	0.55
1:E:770:MET:HE1	1:E:843:ILE:HD11	1.88	0.55
1:A:856:PHE:CD1	1:A:857:MET:HE2	2.41	0.55
1:A:1026:LEU:HD21	1:A:1057:TYR:CE1	2.42	0.55
1:E:856:PHE:HE2	1:E:857:MET:CE	2.19	0.55
1:E:856:PHE:CE2	1:E:857:MET:HE3	2.42	0.55
1:E:863:HIS:CD2	1:E:865:GLN:H	2.19	0.55
2:F:10:ILE:HD11	2:F:83:CYS:SG	2.47	0.55
1:E:976:ILE:HD12	1:E:980:LYS:HG2	1.89	0.54
1:E:1045:ILE:HD11	1:E:1074:LEU:HD21	1.89	0.54
1:E:743:PHE:CE1	1:E:796:MET:HG2	2.43	0.54
2:B:81:LEU:CD2	2:B:113:ILE:HG12	2.37	0.53
2:B:71:PRO:HA	2:B:74:TYR:CD2	2.44	0.53
1:A:903:HIS:CE1	1:A:907:CYS:SG	3.02	0.53
1:A:749:HIS:CE1	1:A:878:GLU:OE1	2.62	0.53
1:A:822:ARG:HD3	1:A:912:GLN:NE2	2.25	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:7:LYS:HE3	2:B:58:TRP:CE2	2.44	0.52
2:B:100:THR:HG21	2:B:151:ILE:HG21	1.92	0.52
1:A:722:LYS:HG3	1:A:723:ASP:N	2.23	0.52
1:E:943:THR:HA	1:E:946:GLU:HG3	1.92	0.52
1:E:781:ASN:N	1:E:781:ASN:OD1	2.43	0.51
1:E:822:ARG:HD3	1:E:916:ILE:HG13	1.90	0.51
1:A:879:MET:HE3	2:B:69:LEU:CB	2.28	0.50
2:B:100:THR:N	2:B:101:PRO:HD2	2.26	0.50
1:A:945:LEU:HD22	1:A:1005:LEU:HB3	1.92	0.50
1:E:984:LEU:HD13	1:E:995:LEU:HB3	1.94	0.50
1:A:829:ALA:HB1	1:A:882:LEU:HD21	1.93	0.49
1:A:986:VAL:HG23	1:A:1070:TRP:HH2	1.77	0.49
2:F:4:ILE:O	2:F:4:ILE:HG13	2.11	0.49
1:A:1058:GLU:OE1	1:E:1038:THR:HB	2.12	0.49
1:A:764:MET:CE	1:A:857:MET:HE1	2.43	0.49
1:E:986:VAL:HG22	1:E:1070:TRP:CH2	2.47	0.49
1:E:941:ASP:HB3	1:E:1004:LEU:HB3	1.95	0.49
1:A:816:ARG:HD3	1:A:816:ARG:C	2.32	0.48
1:A:933:LEU:HD22	1:A:961:LEU:HB3	1.95	0.48
1:A:822:ARG:HE	1:A:826:GLN:NE2	2.11	0.48
1:E:1034:ARG:HB2	1:E:1044:PHE:HB2	1.95	0.48
1:A:991:ASP:OD1	1:A:991:ASP:N	2.47	0.48
1:E:888:LEU:HD13	2:F:37:THR:HG21	1.96	0.48
1:E:945:LEU:HA	1:E:948:ALA:HB2	1.96	0.48
1:A:972:LEU:HD23	1:A:1059:LEU:HD13	1.95	0.48
2:B:157:MET:HG2	2:B:170:VAL:CG2	2.42	0.47
1:A:863:HIS:CD2	1:A:865:GLN:H	2.32	0.47
1:E:903:HIS:CE1	1:E:907:CYS:SG	3.07	0.47
1:E:879:MET:HE1	3:F:182:HOH:O	2.14	0.47
2:F:16:CYS:O	2:F:16:CYS:SG	2.72	0.47
2:F:117:ASN:ND2	2:F:118:LYS:N	2.59	0.47
1:A:974:TRP:HB2	1:A:984:LEU:HD11	1.97	0.46
1:E:1074:LEU:O	1:E:1078:VAL:HG12	2.15	0.46
1:A:822:ARG:HD3	1:A:912:GLN:HE21	1.81	0.46
1:E:764:MET:HE3	1:E:857:MET:CE	2.46	0.46
1:E:1040:LYS:O	1:E:1064:SER:HA	2.15	0.46
1:E:910:ARG:HD2	1:E:914:ARG:NH2	2.30	0.46
2:B:166:GLY:O	2:B:170:VAL:HG23	2.16	0.46
1:A:987:LEU:HB2	1:A:994:VAL:HG22	1.98	0.45
2:F:74:TYR:N	2:F:75:PRO:CD	2.79	0.45
1:A:735:ARG:NH2	1:A:807:LYS:O	2.37	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:817:PHE:O	1:A:912:GLN:HB3	2.16	0.45
1:A:880:GLN:NE2	3:A:77:HOH:O	2.50	0.45
1:E:778:LEU:HD13	1:E:779:PHE:CE2	2.51	0.45
1:E:749:HIS:HE1	1:E:878:GLU:OE1	1.98	0.45
1:E:933:LEU:HD22	1:E:961:LEU:HB3	1.98	0.45
1:E:822:ARG:HE	1:E:912:GLN:HE22	1.63	0.45
1:E:976:ILE:H	1:E:976:ILE:HG13	1.34	0.45
1:E:975:ARG:CZ	1:E:1060:VAL:HG21	2.47	0.45
1:A:827:GLN:HG3	3:A:67:HOH:O	2.17	0.44
1:A:974:TRP:HB2	1:A:984:LEU:CD1	2.47	0.44
1:E:978:LYS:O	1:E:979:ASP:HB2	2.17	0.44
1:A:932:ARG:HH12	2:B:68:ARG:NH2	2.15	0.44
1:A:764:MET:HE2	1:A:857:MET:CE	2.48	0.44
1:A:847:GLN:O	1:A:854:GLN:HB2	2.18	0.44
1:A:884:LYS:HA	1:A:884:LYS:HD2	1.73	0.44
2:B:8:LEU:HD11	2:B:81:LEU:HG	2.00	0.44
1:E:772:ARG:HA	1:E:772:ARG:HD3	1.85	0.44
2:F:119:LYS:C	2:F:121:LEU:H	2.25	0.44
2:F:24:VAL:HG12	2:F:30:PHE:HA	1.99	0.44
2:F:71:PRO:HA	2:F:74:TYR:CD2	2.53	0.44
1:A:879:MET:HE1	2:B:63:GLN:HG2	2.00	0.43
1:E:776:ALA:O	1:E:780:PRO:HA	2.18	0.43
1:A:900:THR:HG22	1:A:902:GLU:H	1.83	0.43
1:E:749:HIS:CE1	1:E:878:GLU:OE1	2.72	0.43
1:E:863:HIS:HD2	1:E:865:GLN:HB2	1.78	0.43
1:A:913:CYS:HB3	3:A:36:HOH:O	2.19	0.43
2:B:119:LYS:C	2:B:121:LEU:H	2.26	0.43
1:E:817:PHE:CD2	1:E:913:CYS:SG	3.12	0.42
1:E:975:ARG:HB2	1:E:1058:GLU:HG2	2.00	0.42
2:F:24:VAL:HG11	2:F:30:PHE:HD1	1.84	0.42
2:F:100:THR:N	2:F:101:PRO:HD2	2.34	0.42
1:E:812:LEU:HD23	1:E:813:MET:CE	2.49	0.42
1:A:890:GLU:OE1	1:A:914:ARG:NH2	2.53	0.42
1:E:843:ILE:HA	1:E:843:ILE:HD12	1.75	0.42
2:F:32:GLU:H	2:F:32:GLU:HG3	1.57	0.42
1:A:782:LEU:N	1:A:783:PRO:CD	2.82	0.42
2:B:95:ILE:HG12	2:B:114:LEU:HD11	2.01	0.42
2:B:118:LYS:HB3	2:B:121:LEU:HD22	2.02	0.42
1:E:1066:ASP:O	1:E:1069:THR:HB	2.20	0.41
1:E:782:LEU:N	1:E:783:PRO:CD	2.84	0.41
1:E:885:TYR:HB2	1:E:886:PRO:HD3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:1076:GLU:HG3	1:E:1080:ASN:HD21	1.85	0.41
1:E:920:VAL:HG12	2:F:69:LEU:HD21	2.01	0.41
1:A:872:ARG:HD3	3:A:26:HOH:O	2.19	0.41
2:B:24:VAL:HG23	2:B:167:VAL:HG11	2.03	0.41
1:A:870:GLN:HG3	2:B:5:ARG:NH1	2.36	0.41
2:F:26:SER:HB3	2:F:42:TYR:CE2	2.54	0.41
1:A:856:PHE:CE1	1:A:857:MET:HE2	2.56	0.41
1:A:986:VAL:CG2	1:A:1070:TRP:CH2	3.03	0.41
1:E:993:LEU:CD2	1:E:1045:ILE:HD13	2.50	0.41
1:A:856:PHE:CE1	1:A:857:MET:CE	3.04	0.40
1:E:867:ARG:NH1	3:E:84:HOH:O	2.41	0.40
1:E:816:ARG:HD3	1:E:816:ARG:C	2.46	0.40
2:F:94:ASN:HA	2:F:97:GLU:HB3	2.03	0.40
1:E:863:HIS:HD2	1:E:865:GLN:N	2.08	0.40
2:B:8:LEU:HD23	2:B:8:LEU:C	2.47	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	351/368 (95%)	333 (95%)	11 (3%)	7 (2%)	6	10
1	E	354/368 (96%)	335 (95%)	18 (5%)	1 (0%)	36	55
2	B	176/178 (99%)	165 (94%)	10 (6%)	1 (1%)	21	38
2	F	176/178 (99%)	169 (96%)	6 (3%)	1 (1%)	21	38
All	All	1057/1092 (97%)	1002 (95%)	45 (4%)	10 (1%)	14	27

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1054	PRO
1	A	1000	ASP
1	A	1052	GLY
1	A	807	LYS
1	A	959	LEU
1	A	1053	PRO
1	A	960	ASP
2	B	15	ALA
1	E	1050	LYS
2	F	162	LYS

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	323/334 (97%)	265 (82%)	58 (18%)	2	3
1	E	326/334 (98%)	267 (82%)	59 (18%)	2	3
2	B	156/156 (100%)	134 (86%)	22 (14%)	3	7
2	F	156/156 (100%)	136 (87%)	20 (13%)	4	9
All	All	961/980 (98%)	802 (84%)	159 (16%)	2	4

All (159) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	714	GLN
1	A	720	VAL
1	A	722	LYS
1	A	723	ASP
1	A	724	VAL
1	A	731	ARG
1	A	750	LEU
1	A	751	ARG
1	A	758	LEU
1	A	765	LYS
1	A	766	LYS
1	A	778	LEU

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Mol	Chain	Res	Type
1	A	788	ILE
1	A	797	LYS
1	A	801	GLU
1	A	806	ILE
1	A	807	LYS
1	A	812	LEU
1	A	816	ARG
1	A	841	GLU
1	A	842	LEU
1	A	843	ILE
1	A	844	LYS
1	A	847	GLN
1	A	871	LEU
1	A	882	LEU
1	A	884	LYS
1	A	887	LEU
1	A	888	LEU
1	A	894	LYS
1	A	897	GLU
1	A	905	LYS
1	A	930	ARG
1	A	945	LEU
1	A	952	LEU
1	A	955	GLU
1	A	959	LEU
1	A	962	THR
1	A	965	LYS
1	A	972	LEU
1	A	975	ARG
1	A	977	SER
1	A	982	LEU
1	A	988	LEU
1	A	994	VAL
1	A	995	LEU
1	A	998	LYS
1	A	1001	GLU
1	A	1004	LEU
1	A	1035	SER
1	A	1040	LYS
1	A	1049	SER
1	A	1050	LYS
1	A	1062	LEU

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Mol	Chain	Res	Type
1	A	1067	LYS
1	A	1068	ASN
1	A	1069	THR
1	A	1074	LEU
2	B	11	VAL
2	B	16	CYS
2	B	27	LYS
2	B	29	GLN
2	B	32	GLU
2	B	33	VAL
2	B	55	LEU
2	B	81	LEU
2	B	95	ILE
2	B	100	THR
2	B	113	ILE
2	B	118	LYS
2	B	119	LYS
2	B	121	LEU
2	B	125	GLU
2	B	131	LEU
2	B	133	LYS
2	B	134	MET
2	B	135	LYS
2	B	142	GLU
2	B	145	ARG
2	B	160	SER
1	E	714	GLN
1	E	724	VAL
1	E	731	ARG
1	E	750	LEU
1	E	766	LYS
1	E	769	LEU
1	E	778	LEU
1	E	788	ILE
1	E	793	CYS
1	E	797	LYS
1	E	798	LYS
1	E	806	ILE
1	E	807	LYS
1	E	816	ARG
1	E	822	ARG
1	E	843	ILE

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Mol	Chain	Res	Type
1	E	855	LEU
1	E	871	LEU
1	E	882	LEU
1	E	884	LYS
1	E	887	LEU
1	E	888	LEU
1	E	890	GLU
1	E	897	GLU
1	E	901	SER
1	E	918	LYS
1	E	940	LEU
1	E	945	LEU
1	E	947	ARG
1	E	949	SER
1	E	952	LEU
1	E	958	SER
1	E	959	LEU
1	E	965	LYS
1	E	972	LEU
1	E	975	ARG
1	E	976	ILE
1	E	978	LYS
1	E	981	THR
1	E	986	VAL
1	E	988	LEU
1	E	990	GLU
1	E	998	LYS
1	E	1000	ASP
1	E	1003	LEU
1	E	1004	LEU
1	E	1005	LEU
1	E	1010	LYS
1	E	1032	LEU
1	E	1036	VAL
1	E	1038	THR
1	E	1046	ILE
1	E	1048	THR
1	E	1050	LYS
1	E	1055	GLN
1	E	1062	LEU
1	E	1065	SER
1	E	1068	ASN

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Mol	Chain	Res	Type
1	E	1071	MET
2	F	4	ILE
2	F	11	VAL
2	F	16	CYS
2	F	21	LEU
2	F	28	ASP
2	F	32	GLU
2	F	35	VAL
2	F	37	THR
2	F	51	LYS
2	F	55	LEU
2	F	80	ILE
2	F	86	ILE
2	F	103	VAL
2	F	113	ILE
2	F	122	ARG
2	F	125	GLU
2	F	131	LEU
2	F	133	LYS
2	F	134	MET
2	F	162	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	718	HIS
1	A	730	GLN
1	A	749	HIS
1	A	826	GLN
1	A	880	GLN
1	A	912	GLN
2	B	29	GLN
2	B	41	ASN
2	B	52	GLN
1	E	714	GLN
1	E	715	ASN
1	E	749	HIS
1	E	826	GLN
1	E	858	GLN
1	E	863	HIS
1	E	880	GLN
1	E	895	HIS

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Mol	Chain	Res	Type
1	E	912	GLN
1	E	985	HIS
1	E	1008	HIS
1	E	1080	ASN
2	F	41	ASN
2	F	117	ASN
2	F	180	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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

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

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.