Full wwPDB X-ray Structure Validation Report ⓘ

Oct 24, 2024 – 12:10 AM EDT

PDB ID	:	2GSL
Title	:	X-Ray Crystal Structure of Protein FN1578 from Fusobacterium nucleatum. Northeast Structural Genomics Consortium Target NR1.
Authors	:	Forouhar, F.; Su, M.; Jayaraman, S.; Conover, K.; Janjua, H.; Xiao, R.; Acton, T.B.; Montelione, G.T.; Tong, L.; Hunt, J.F.; Northeast Structural Genomics Consortium (NESG)
Deposited on	:	2006-04-26
Resolution	:	2.60 Å(reported)

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

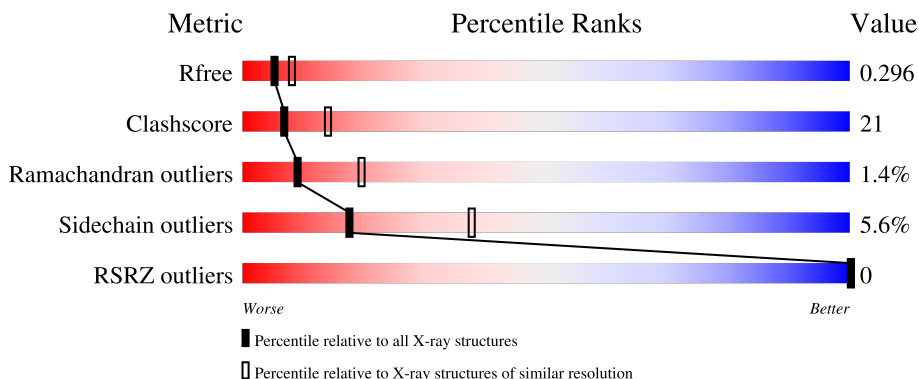|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 2.60 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		0.296
Clashscore		21
Ramachandran outliers		1.4%
Sidechain outliers		5.6%
RSRZ outliers		0

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$_{free}$	164625	3775 (2.60-2.60)
Clashscore	180529	4181 (2.60-2.60)
Ramachandran outliers	177936	4129 (2.60-2.60)
Sidechain outliers	177891	4129 (2.60-2.60)
RSRZ outliers	164620	3775 (2.60-2.60)

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	137	56% / 31% / • / 9%
1	B	137	35% / 48% / • / 13%
1	C	137	55% / 31% / • / 11%
1	D	137	50% / 36% / • / 12%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	E	137	45% 42% 12%
1	F	137	51% 38% 7%

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 6213 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 Hypothetical protein.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	124	Total	C	N	O	S	Se	0	0	0
			1021	670	163	185	1	2			
1	B	119	Total	C	N	O	S	Se	0	0	0
			977	639	157	178	1	2			
1	C	122	Total	C	N	O	S	Se	0	0	0
			1002	657	161	181	1	2			
1	D	121	Total	C	N	O	S	Se	0	0	0
			992	649	161	179	1	2			
1	E	121	Total	C	N	O	S	Se	0	0	0
			991	647	161	180	1	2			
1	F	127	Total	C	N	O	S	Se	0	0	0
			1048	681	174	190	1	2			

There are 66 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MSE	MET	modified residue	GB 19712792
A	94	MSE	MET	modified residue	GB 19712792
A	109	MSE	MET	modified residue	GB 19712792
A	130	LEU	-	cloning artifact	GB 19712792
A	131	GLU	-	cloning artifact	GB 19712792
A	132	HIS	-	expression tag	GB 19712792
A	133	HIS	-	expression tag	GB 19712792
A	134	HIS	-	expression tag	GB 19712792
A	135	HIS	-	expression tag	GB 19712792
A	136	HIS	-	expression tag	GB 19712792
A	137	HIS	-	expression tag	GB 19712792
B	1	MSE	MET	modified residue	GB 19712792
B	94	MSE	MET	modified residue	GB 19712792
B	109	MSE	MET	modified residue	GB 19712792
B	130	LEU	-	cloning artifact	GB 19712792
B	131	GLU	-	cloning artifact	GB 19712792
B	132	HIS	-	expression tag	GB 19712792

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	133	HIS	-	expression tag	GB 19712792
B	134	HIS	-	expression tag	GB 19712792
B	135	HIS	-	expression tag	GB 19712792
B	136	HIS	-	expression tag	GB 19712792
B	137	HIS	-	expression tag	GB 19712792
C	1	MSE	MET	modified residue	GB 19712792
C	94	MSE	MET	modified residue	GB 19712792
C	109	MSE	MET	modified residue	GB 19712792
C	130	LEU	-	cloning artifact	GB 19712792
C	131	GLU	-	cloning artifact	GB 19712792
C	132	HIS	-	expression tag	GB 19712792
C	133	HIS	-	expression tag	GB 19712792
C	134	HIS	-	expression tag	GB 19712792
C	135	HIS	-	expression tag	GB 19712792
C	136	HIS	-	expression tag	GB 19712792
C	137	HIS	-	expression tag	GB 19712792
D	1	MSE	MET	modified residue	GB 19712792
D	94	MSE	MET	modified residue	GB 19712792
D	109	MSE	MET	modified residue	GB 19712792
D	130	LEU	-	cloning artifact	GB 19712792
D	131	GLU	-	cloning artifact	GB 19712792
D	132	HIS	-	expression tag	GB 19712792
D	133	HIS	-	expression tag	GB 19712792
D	134	HIS	-	expression tag	GB 19712792
D	135	HIS	-	expression tag	GB 19712792
D	136	HIS	-	expression tag	GB 19712792
D	137	HIS	-	expression tag	GB 19712792
E	1	MSE	MET	modified residue	GB 19712792
E	94	MSE	MET	modified residue	GB 19712792
E	109	MSE	MET	modified residue	GB 19712792
E	130	LEU	-	cloning artifact	GB 19712792
E	131	GLU	-	cloning artifact	GB 19712792
E	132	HIS	-	expression tag	GB 19712792
E	133	HIS	-	expression tag	GB 19712792
E	134	HIS	-	expression tag	GB 19712792
E	135	HIS	-	expression tag	GB 19712792
E	136	HIS	-	expression tag	GB 19712792
E	137	HIS	-	expression tag	GB 19712792
F	1	MSE	MET	modified residue	GB 19712792
F	94	MSE	MET	modified residue	GB 19712792
F	109	MSE	MET	modified residue	GB 19712792
F	130	LEU	-	cloning artifact	GB 19712792

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
F	131	GLU	-	cloning artifact	GB 19712792
F	132	HIS	-	expression tag	GB 19712792
F	133	HIS	-	expression tag	GB 19712792
F	134	HIS	-	expression tag	GB 19712792
F	135	HIS	-	expression tag	GB 19712792
F	136	HIS	-	expression tag	GB 19712792
F	137	HIS	-	expression tag	GB 19712792

- Molecule 2 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 1	Mg 1	0	0
2	B	1	Total 1	Mg 1	0	0
2	C	1	Total 1	Mg 1	0	0
2	D	1	Total 1	Mg 1	0	0
2	E	1	Total 1	Mg 1	0	0
2	F	1	Total 1	Mg 1	0	0

- Molecule 3 is water.

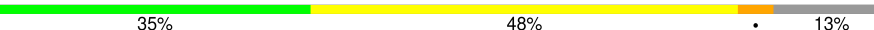| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	35	Total 35	O 35	0	0
3	B	28	Total 28	O 28	0	0
3	C	31	Total 31	O 31	0	0
3	D	20	Total 20	O 20	0	0
3	E	29	Total 29	O 29	0	0
3	F	33	Total 33	O 33	0	0

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.

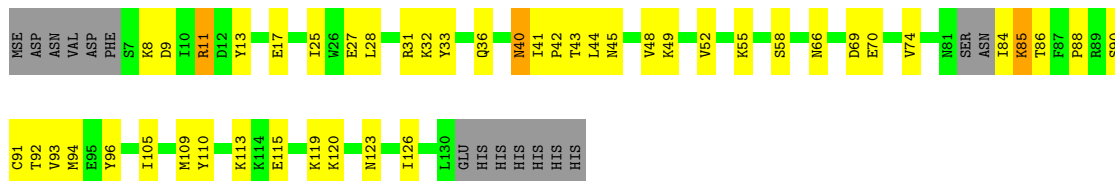- Molecule 1: Hypothetical protein

Chain A:
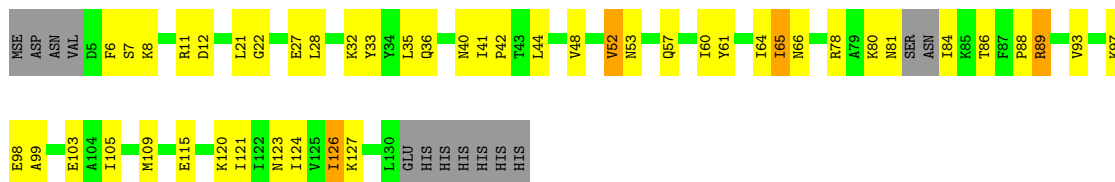
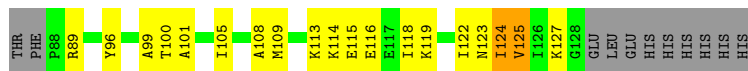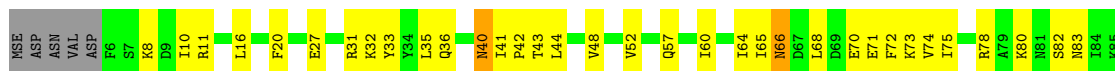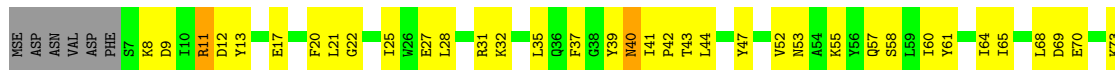- Molecule 1: Hypothetical protein

Chain B:

- Molecule 1: Hypothetical protein

Chain C:

- Molecule 1: Hypothetical protein

Chain D:

MSE ASP ASN VAL ASP F6 S7 K8 D9 I10 R11 L16 F20 E27 R31 K32 Y33 Y34 L35 Q36 N40 I41 P42 T43 L44 V48 V52 Q57 I60 I64 I65 N66 D67 L68 D69 E70 E71 F72 K73 V74 I75 R78 A79 K80 N81 S82 N83 I84 K85

THR PHE P88 R89 Y96 A99 T100 A101 I105 A108 M109 K113 K114 E115 E116 E117 I118 K119 I122 N123 I124 V125 I126 K127 G128 GLU LEU GLU HIS HIS HIS HIS HIS HIS

• Molecule 1: Hypothetical protein

Chain E:

45%   42%   •   12%

MSE ASP ASN VAL ASP PHE S7 K8 D9 I10 R11 D12 Y13 E17 F20 L21 G22 I25 W26 E27 L28 R31 K32 L35 Q36 F37 G38 Y39 N40 I41 P42 T43 L44 Y47 V52 N53 A54 K55 Y56 Q57 S58 L59 I60 Y61 I64 I65 L68 D69 E70 K73

V74 K77 K80 N83 ILE K85 S90 C91 T92 V93 M94 E95 Y96 K97 E98 A101 L102 I105 M109 Y110 E116 I122 N123 I124 V125 I126 K127 G128 GLU LEU GLU HIS HIS HIS HIS HIS HIS

• Molecule 1: Hypothetical protein

Chain F:

51%   38%   •   7%

MSE ASP ASN VAL ASP PHE S7 K8 D9 I10 R11 D12 Y13 F20 I25 W26 E27 R31 K32 L35 N40 I41 P42 T43 V48 K49 V52 N53 A54 K55 Y56 Q57 S58 L59 I60 Y61 I65 N66 D69 K73 G76 K77 K80 N83 ILE LYS T86

F87 P88 R89 S90 C91 T92 V93 K97 E98 A99 T100 A101 L102 I105 I106 G107 A108 M109 Y110 L111 L112 E116 K120 N123 I124 V125 I126 K127 E131 H132 H133 H134 H135 HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	61.30Å 108.75Å 80.50Å 90.00° 108.59° 90.00°	Depositor
Resolution (Å)	29.45 – 2.60	Depositor
	29.45 – 2.60	EDS
% Data completeness	87.8 (29.45-2.60)	Depositor
(in resolution range)	96.0 (29.45-2.60)	EDS
R_{merge}	0.11	Depositor
R_{sym}	0.08	Depositor
$< I/\sigma(I) >$ [1]	3.19 (at 2.61Å)	Xtriage
Refinement program	CNS 1.1, XTALVIEW	Depositor
R, R_{free}	0.230 , 0.292	Depositor
	0.240 , 0.296	DCC
R_{free} test set	2940 reflections (9.94%)	wwPDB-VP
Wilson B-factor (Å^2)	33.7	Xtriage
Anisotropy	0.283	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 29.2	EDS
L-test for twinning[2]	$< |L| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	6213	wwPDB-VP
Average B, all atoms (Å^2)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.60% 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: MG

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	0.42	0/1035	0.53	0/1382
1	B	0.41	0/990	0.53	0/1322
1	C	0.42	0/1015	0.54	0/1355
1	D	0.48	0/1005	0.54	0/1340
1	E	0.43	0/1004	0.57	0/1340
1	F	0.42	0/1065	0.57	1/1424 (0.1%)
All	All	0.43	0/6114	0.55	1/8163 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	132	HIS	CB-CA-C	5.32	121.04	110.40

There are no chirality outliers.

There are no planarity outliers.

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	1021	0	1069	37	0
1	B	977	0	1021	58	0
1	C	1002	0	1056	42	0
1	D	992	0	1044	39	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	991	0	1039	46	0
1	F	1048	0	1077	52	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
3	A	35	0	0	2	0
3	B	28	0	0	3	0
3	C	31	0	0	4	0
3	D	20	0	0	1	0
3	E	29	0	0	5	0
3	F	33	0	0	5	0
All	All	6213	0	6306	258	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 21.

All (258) 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:F:8:LYS:H	1:F:11:ARG:HE	1.16	0.88
1:C:27:GLU:HG2	3:C:212:HOH:O	1.78	0.84
1:F:40:ASN:ND2	1:F:43:THR:H	1.78	0.82
1:B:40:ASN:ND2	1:B:43:THR:H	1.78	0.81
1:B:8:LYS:HB3	1:B:11:ARG:HB2	1.62	0.80
1:E:60:ILE:HD12	1:E:124:ILE:HD11	1.61	0.80
1:F:134:HIS:O	1:F:135:HIS:HB2	1.85	0.76
1:A:8:LYS:HB3	1:A:11:ARG:HB2	1.66	0.76
1:C:66:ASN:HB3	3:C:207:HOH:O	1.86	0.76
1:E:17:GLU:HG3	1:F:35:LEU:HD11	1.69	0.74
1:B:54:ALA:HA	1:B:57:GLN:HE21	1.52	0.74
1:B:40:ASN:C	1:B:40:ASN:HD22	1.91	0.72
1:C:40:ASN:ND2	1:C:42:PRO:HG2	2.05	0.72
1:E:8:LYS:HB3	1:E:11:ARG:HD3	1.71	0.72
1:F:8:LYS:H	1:F:11:ARG:NE	1.88	0.71
1:B:92:THR:HG22	1:B:94:MSE:H	1.56	0.71
1:B:120:LYS:O	1:B:124:ILE:HD13	1.90	0.71
1:F:101:ALA:O	1:F:105:ILE:HG13	1.91	0.71
1:C:84:ILE:HG13	1:C:85:LYS:H	1.57	0.70

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:40:ASN:C	1:D:40:ASN:HD22	1.94	0.69
1:F:40:ASN:HD21	1:F:43:THR:H	1.38	0.69
1:E:31:ARG:O	1:E:35:LEU:HB2	1.91	0.69
1:E:40:ASN:C	1:E:40:ASN:HD22	1.96	0.69
1:E:93:VAL:O	1:E:97:LYS:HG3	1.93	0.69
1:B:28:LEU:O	1:B:32:LYS:HG3	1.93	0.68
1:F:8:LYS:N	1:F:11:ARG:HH11	1.92	0.67
1:F:56:TYR:OH	1:F:125:VAL:HG13	1.94	0.66
1:B:71:GLU:HG3	3:B:223:HOH:O	1.94	0.66
1:E:122:ILE:O	1:E:125:VAL:HG22	1.95	0.66
1:B:59:LEU:O	1:B:63:LYS:HB2	1.96	0.65
1:D:8:LYS:HB3	1:D:11:ARG:HB2	1.79	0.65
1:C:40:ASN:ND2	1:C:43:THR:H	1.95	0.65
1:F:40:ASN:HD22	1:F:40:ASN:C	2.00	0.64
1:C:88:PRO:HG3	1:C:93:VAL:HA	1.79	0.64
1:F:69:ASP:O	1:F:73:LYS:HG3	1.97	0.64
1:D:96:TYR:O	1:D:100:THR:HG22	1.98	0.64
1:E:55:LYS:O	1:E:58:SER:HB3	1.99	0.63
1:F:61:TYR:HD1	1:F:98:GLU:HG2	1.64	0.63
1:E:91:CYS:HB2	1:E:95:GLU:HB2	1.81	0.62
1:F:100:THR:HG22	3:F:219:HOH:O	1.98	0.62
1:C:8:LYS:H	1:C:11:ARG:CZ	2.11	0.62
1:F:8:LYS:N	1:F:11:ARG:HE	1.94	0.62
1:E:40:ASN:ND2	1:E:43:THR:H	1.99	0.61
1:D:119:LYS:O	1:D:123:ASN:HB2	2.00	0.61
1:F:27:GLU:HG2	3:F:218:HOH:O	2.01	0.60
1:A:40:ASN:OD1	1:A:42:PRO:HG2	2.02	0.60
1:D:44:LEU:O	1:D:48:VAL:HG23	2.02	0.59
1:A:8:LYS:CB	1:A:11:ARG:HB2	2.33	0.59
1:B:69:ASP:O	1:B:73:LYS:HG3	2.03	0.59
1:C:8:LYS:H	1:C:11:ARG:NH1	2.01	0.59
1:C:88:PRO:HG2	1:F:132:HIS:HE1	1.68	0.58
1:D:41:ILE:HB	1:D:42:PRO:CD	2.33	0.58
1:F:40:ASN:ND2	1:F:42:PRO:HG2	2.18	0.58
1:C:70:GLU:O	1:C:74:VAL:HG23	2.03	0.58
1:D:64:ILE:O	1:D:68:LEU:HD13	2.03	0.58
1:A:123:ASN:O	1:A:127:LYS:HB3	2.03	0.58
1:B:56:TYR:OH	1:B:125:VAL:HG13	2.03	0.58
1:E:68:LEU:O	1:E:73:LYS:HE3	2.03	0.58
1:B:127:LYS:HD2	1:B:127:LYS:O	2.04	0.58
1:E:127:LYS:HB2	1:E:127:LYS:NZ	2.19	0.58

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:88:PRO:HG2	1:F:91:CYS:O	2.04	0.58
1:B:40:ASN:HD21	1:B:43:THR:H	1.47	0.58
1:B:10:ILE:HG22	1:B:78:ARG:HH21	1.68	0.58
1:C:33:TYR:O	1:C:36:GLN:HG2	2.03	0.58
1:F:126:ILE:HG13	1:F:127:LYS:N	2.18	0.58
1:E:94:MSE:O	1:E:98:GLU:HG3	2.04	0.57
1:A:84:ILE:HG23	1:A:86:THR:H	1.69	0.57
1:D:57:GLN:NE2	1:D:99:ALA:HB1	2.19	0.57
1:E:61:TYR:CE2	1:E:65:ILE:HD13	2.40	0.57
1:F:76:GLY:O	1:F:80:LYS:HG3	2.04	0.57
1:A:33:TYR:O	1:A:36:GLN:HG2	2.05	0.57
1:D:72:PHE:HB3	1:D:105:ILE:HD12	1.85	0.57
1:B:22:GLY:HA3	1:B:103:GLU:O	2.05	0.57
1:F:61:TYR:CD1	1:F:98:GLU:HG2	2.40	0.57
1:C:40:ASN:HD22	1:C:43:THR:H	1.50	0.57
1:E:61:TYR:CD1	1:E:98:GLU:HB3	2.40	0.56
1:A:124:ILE:O	1:A:124:ILE:HD12	2.06	0.55
1:E:73:LYS:O	1:E:77:LYS:HB2	2.07	0.55
1:C:41:ILE:HG13	1:D:16:LEU:HD23	1.89	0.55
1:A:7:SER:HB3	1:A:11:ARG:HB3	1.88	0.55
1:E:126:ILE:HD12	1:E:127:LYS:N	2.22	0.54
1:F:116:GLU:HB3	3:F:226:HOH:O	2.07	0.54
1:B:49:LYS:HA	1:B:52:VAL:HG12	1.88	0.54
1:C:88:PRO:HB3	1:C:96:TYR:HB2	1.90	0.54
1:B:51:LYS:HD3	1:B:56:TYR:CZ	2.43	0.53
1:F:8:LYS:HG3	1:F:9:ASP:H	1.72	0.53
1:F:61:TYR:CE2	1:F:65:ILE:HD13	2.42	0.53
1:E:52:VAL:HG13	3:E:231:HOH:O	2.08	0.53
1:C:105:ILE:O	1:C:109:MSE:HG3	2.08	0.53
1:E:21:LEU:HG	1:E:25:ILE:HD11	1.90	0.53
1:A:44:LEU:HD21	1:B:20:PHE:CD2	2.44	0.53
1:A:22:GLY:HA3	1:A:103:GLU:O	2.09	0.53
1:A:93:VAL:HG12	1:A:97:LYS:HD2	1.91	0.53
1:A:88:PRO:HA	1:A:89:ARG:HH11	1.74	0.52
1:C:92:THR:HA	1:F:131:GLU:OE1	2.08	0.52
1:B:99:ALA:O	1:B:103:GLU:HG3	2.10	0.52
1:B:105:ILE:CG2	1:B:109:MSE:HE3	2.40	0.52
1:F:25:ILE:HD13	1:F:110:TYR:HB2	1.91	0.52
1:E:9:ASP:O	1:E:13:TYR:HB2	2.10	0.52
1:B:27:GLU:OE2	1:B:31:ARG:NE	2.43	0.52
1:F:77:LYS:HA	1:F:80:LYS:HD3	1.92	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:122:ILE:HD12	1:D:122:ILE:O	2.09	0.52
1:E:41:ILE:HG12	3:E:212:HOH:O	2.09	0.52
1:B:112:LEU:C	1:B:114:LYS:H	2.14	0.51
1:D:40:ASN:ND2	1:D:43:THR:H	2.08	0.51
1:B:117:GLU:O	1:B:121:ILE:HG13	2.11	0.51
1:B:59:LEU:C	1:B:59:LEU:HD12	2.31	0.51
1:D:60:ILE:CD1	1:D:124:ILE:HD11	2.40	0.50
1:A:53:ASN:O	1:A:57:GLN:HG3	2.12	0.50
1:A:52:VAL:HG22	3:A:215:HOH:O	2.10	0.50
1:F:124:ILE:O	1:F:124:ILE:HD12	2.11	0.50
1:A:121:ILE:O	1:A:124:ILE:HG13	2.11	0.50
1:A:123:ASN:O	1:A:126:ILE:HD13	2.12	0.50
1:D:31:ARG:O	1:D:35:LEU:HB2	2.12	0.50
1:D:57:GLN:HE21	1:D:99:ALA:HB1	1.76	0.50
1:A:88:PRO:HA	1:A:89:ARG:NH1	2.27	0.50
1:E:92:THR:HG22	1:E:93:VAL:H	1.76	0.50
1:E:110:TYR:OH	1:F:32:LYS:HE2	2.12	0.50
1:F:7:SER:C	1:F:11:ARG:HH11	2.14	0.50
1:C:92:THR:HG22	1:C:94:MSE:H	1.77	0.50
1:E:27:GLU:HG2	3:E:217:HOH:O	2.10	0.50
1:B:33:TYR:O	1:B:36:GLN:HG2	2.12	0.49
1:D:122:ILE:O	1:D:125:VAL:HG22	2.11	0.49
1:F:134:HIS:O	1:F:135:HIS:CB	2.57	0.49
1:D:72:PHE:O	1:D:105:ILE:HD11	2.12	0.49
1:C:27:GLU:O	1:C:31:ARG:HG3	2.12	0.49
1:E:39:TYR:CZ	1:E:47:TYR:HE1	2.30	0.49
1:B:52:VAL:HG22	3:B:229:HOH:O	2.13	0.49
1:F:93:VAL:HG12	1:F:97:LYS:HE2	1.94	0.49
1:C:25:ILE:HD13	1:C:110:TYR:HB2	1.96	0.48
1:C:31:ARG:HD3	1:D:20:PHE:CE2	2.48	0.48
1:A:99:ALA:O	1:A:103:GLU:HG3	2.13	0.48
1:B:35:LEU:O	1:B:35:LEU:HG	2.13	0.48
1:A:35:LEU:CD2	1:B:21:LEU:HB2	2.44	0.48
1:B:113:LYS:C	1:B:115:GLU:H	2.15	0.48
1:F:55:LYS:O	1:F:58:SER:HB3	2.14	0.48
1:C:45:ASN:HB3	1:C:49:LYS:NZ	2.29	0.48
1:B:8:LYS:HB3	1:B:11:ARG:CB	2.40	0.48
1:B:80:LYS:HD3	1:B:98:GLU:HG2	1.95	0.48
1:D:41:ILE:HB	1:D:42:PRO:HD3	1.95	0.48
1:A:21:LEU:HB2	1:B:35:LEU:HD22	1.96	0.47
1:E:37:PHE:HB2	1:E:39:TYR:CE1	2.50	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:64:ILE:O	1:B:68:LEU:HD13	2.14	0.47
1:A:78:ARG:HD2	3:A:202:HOH:O	2.15	0.47
1:C:41:ILE:N	1:C:42:PRO:HD2	2.30	0.47
1:D:70:GLU:O	1:D:74:VAL:HG23	2.14	0.47
1:E:11:ARG:HB3	1:E:12:ASP:H	1.53	0.47
1:E:57:GLN:NE2	3:E:232:HOH:O	2.47	0.47
1:F:40:ASN:ND2	1:F:40:ASN:C	2.68	0.47
1:E:105:ILE:CG2	1:E:109:MSE:HE3	2.44	0.47
1:A:80:LYS:HE3	1:A:98:GLU:HG3	1.97	0.47
1:D:40:ASN:C	1:D:40:ASN:ND2	2.66	0.47
1:D:122:ILE:HD12	1:D:122:ILE:C	2.36	0.46
1:A:60:ILE:HD12	1:A:124:ILE:HD11	1.97	0.46
1:A:44:LEU:O	1:A:48:VAL:HG23	2.15	0.46
1:C:88:PRO:HG2	1:F:132:HIS:CE1	2.49	0.46
1:C:113:LYS:C	1:C:115:GLU:H	2.19	0.46
1:F:108:ALA:O	1:F:112:LEU:HG	2.15	0.46
1:F:123:ASN:HA	1:F:126:ILE:HG12	1.97	0.46
1:A:33:TYR:CZ	1:A:126:ILE:HB	2.51	0.46
1:C:123:ASN:O	1:C:126:ILE:HG13	2.15	0.46
1:D:105:ILE:O	1:D:109:MSE:HG3	2.15	0.46
1:E:64:ILE:HD11	1:E:102:LEU:HD21	1.98	0.46
1:B:71:GLU:O	1:B:75:ILE:HG12	2.16	0.46
1:C:8:LYS:HB2	1:C:11:ARG:HH11	1.79	0.46
1:F:77:LYS:HA	1:F:80:LYS:CD	2.46	0.46
1:B:51:LYS:HD2	1:B:125:VAL:CG1	2.45	0.46
1:C:40:ASN:HD22	1:C:40:ASN:C	2.18	0.46
1:B:88:PRO:HG2	1:B:91:CYS:O	2.16	0.46
1:C:90:SER:O	1:C:91:CYS:HB3	2.16	0.46
1:D:65:ILE:HG23	1:D:66:ASN:N	2.30	0.46
1:D:68:LEU:O	1:D:73:LYS:HE3	2.16	0.45
1:D:75:ILE:HD13	1:D:108:ALA:CB	2.46	0.45
1:E:101:ALA:O	1:E:105:ILE:HG13	2.16	0.45
1:B:11:ARG:HG2	1:B:12:ASP:OD2	2.17	0.45
1:C:110:TYR:HE2	1:D:32:LYS:HZ3	1.60	0.45
1:C:52:VAL:HG13	3:C:233:HOH:O	2.16	0.45
1:F:120:LYS:O	1:F:124:ILE:HG23	2.17	0.45
1:A:64:ILE:HG13	1:A:65:ILE:N	2.32	0.45
1:B:69:ASP:HB3	3:B:222:HOH:O	2.15	0.45
1:D:114:LYS:C	1:D:116:GLU:H	2.20	0.45
1:F:102:LEU:O	1:F:106:ILE:HG12	2.17	0.45
1:D:80:LYS:HG2	1:D:101:ALA:HB2	1.98	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:41:ILE:N	1:A:42:PRO:HD2	2.32	0.45
1:D:115:GLU:HA	1:D:118:ILE:HD12	1.99	0.45
1:A:120:LYS:O	1:A:124:ILE:HG23	2.16	0.45
1:C:9:ASP:O	1:C:13:TYR:HB2	2.17	0.45
1:E:70:GLU:O	1:E:74:VAL:HG23	2.17	0.45
1:E:44:LEU:HD21	1:F:20:PHE:CD2	2.52	0.44
1:E:55:LYS:HD2	1:E:90:SER:O	2.18	0.44
1:A:105:ILE:CG2	1:A:109:MSE:HE3	2.48	0.44
1:B:65:ILE:HG23	1:B:66:ASN:N	2.32	0.44
1:E:40:ASN:C	1:E:40:ASN:ND2	2.68	0.44
1:C:110:TYR:OH	1:D:32:LYS:NZ	2.51	0.44
1:B:16:LEU:HD12	1:B:16:LEU:N	2.32	0.44
1:B:61:TYR:CE2	1:B:65:ILE:HD13	2.53	0.44
1:C:8:LYS:HB3	1:C:11:ARG:HB2	1.99	0.44
1:C:8:LYS:HG3	1:C:9:ASP:N	2.33	0.44
1:D:10:ILE:HG22	1:D:78:ARG:NH1	2.31	0.44
1:E:53:ASN:O	1:E:57:GLN:HG3	2.18	0.44
1:A:126:ILE:HD13	1:A:127:LYS:N	2.33	0.43
1:B:39:TYR:CZ	1:B:47:TYR:HE1	2.36	0.43
1:B:40:ASN:ND2	1:B:40:ASN:C	2.63	0.43
1:D:82:SER:OG	1:D:83:ASN:N	2.51	0.43
1:B:60:ILE:HD12	1:B:125:VAL:HG22	2.01	0.43
1:C:44:LEU:O	1:C:48:VAL:HG12	2.18	0.43
1:D:71:GLU:O	1:D:75:ILE:HG13	2.19	0.43
1:A:35:LEU:HD21	1:B:17:GLU:O	2.19	0.43
1:E:20:PHE:CE2	1:F:31:ARG:HG2	2.54	0.43
1:A:65:ILE:HG23	1:A:66:ASN:N	2.34	0.43
1:F:60:ILE:HD12	1:F:125:VAL:HG22	2.01	0.43
1:A:61:TYR:OH	1:A:80:LYS:HD2	2.19	0.42
1:E:28:LEU:O	1:E:32:LYS:HB2	2.18	0.42
1:A:89:ARG:N	1:A:89:ARG:HE	2.18	0.42
1:F:41:ILE:N	1:F:42:PRO:HD2	2.34	0.42
1:C:92:THR:HG22	1:C:94:MSE:N	2.33	0.42
1:B:44:LEU:O	1:B:48:VAL:HG12	2.18	0.42
1:E:41:ILE:N	1:E:42:PRO:HD2	2.35	0.42
1:F:31:ARG:O	1:F:35:LEU:HB2	2.20	0.42
1:B:60:ILE:CD1	1:B:125:VAL:HG22	2.49	0.42
1:F:8:LYS:N	1:F:11:ARG:NH1	2.64	0.42
1:B:40:ASN:ND2	1:B:42:PRO:HG2	2.35	0.42
1:B:40:ASN:ND2	1:B:43:THR:HB	2.35	0.42
1:B:70:GLU:HA	1:B:73:LYS:HD3	2.02	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:105:ILE:CG2	1:D:109:MSE:HE3	2.50	0.42
1:E:22:GLY:HA2	1:E:25:ILE:HD12	2.02	0.42
1:A:86:THR:HG22	1:A:89:ARG:NH1	2.35	0.42
1:C:119:LYS:HE3	3:C:230:HOH:O	2.19	0.42
1:F:66:ASN:ND2	3:F:221:HOH:O	2.52	0.42
1:D:27:GLU:HG2	3:D:208:HOH:O	2.20	0.41
1:C:27:GLU:OE1	1:C:52:VAL:HG11	2.19	0.41
1:B:48:VAL:HG13	1:B:49:LYS:N	2.34	0.41
1:F:7:SER:N	1:F:11:ARG:NH1	2.68	0.41
1:B:51:LYS:HD2	1:B:125:VAL:HG12	2.02	0.41
1:E:64:ILE:HD11	1:E:102:LEU:CD2	2.51	0.41
1:B:98:GLU:O	1:B:101:ALA:HB3	2.20	0.41
1:F:53:ASN:O	1:F:57:GLN:HG3	2.21	0.41
1:C:9:ASP:C	1:C:11:ARG:H	2.23	0.41
1:C:55:LYS:O	1:C:58:SER:HB3	2.21	0.41
1:C:88:PRO:HB3	1:C:96:TYR:CB	2.51	0.41
1:B:112:LEU:C	1:B:114:LYS:N	2.72	0.41
1:E:20:PHE:N	3:E:216:HOH:O	2.54	0.41
1:E:40:ASN:ND2	1:E:43:THR:HB	2.36	0.41
1:E:80:LYS:HG3	1:E:101:ALA:HB2	2.03	0.41
1:B:55:LYS:HG3	1:B:95:GLU:OE2	2.21	0.41
1:F:48:VAL:HG13	1:F:49:LYS:N	2.36	0.41
1:D:113:LYS:C	1:D:115:GLU:H	2.24	0.40
1:F:124:ILE:HD12	1:F:124:ILE:C	2.41	0.40
1:A:28:LEU:O	1:A:32:LYS:HG3	2.22	0.40
1:B:29:GLU:OE1	1:B:32:LYS:HE2	2.21	0.40
1:B:89:ARG:NH2	1:B:89:ARG:HG3	2.36	0.40
1:C:17:GLU:O	1:D:35:LEU:HD21	2.21	0.40
1:E:64:ILE:O	1:E:68:LEU:HD13	2.20	0.40
1:F:32:LYS:HD2	3:F:229:HOH:O	2.21	0.40
1:D:33:TYR:O	1:D:36:GLN:HG2	2.21	0.40
1:A:7:SER:HB3	1:A:11:ARG:HG2	2.03	0.40
1:E:8:LYS:O	1:E:11:ARG:HB2	2.21	0.40
1:B:105:ILE:HG22	1:B:109:MSE:HE3	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	120/137 (88%)	109 (91%)	9 (8%)	2 (2%)	7	16
1	B	115/137 (84%)	99 (86%)	14 (12%)	2 (2%)	7	16
1	C	118/137 (86%)	104 (88%)	11 (9%)	3 (2%)	4	8
1	D	117/137 (85%)	101 (86%)	15 (13%)	1 (1%)	14	31
1	E	117/137 (85%)	105 (90%)	10 (8%)	2 (2%)	7	16
1	F	123/137 (90%)	112 (91%)	11 (9%)	0	100	100
All	All	710/822 (86%)	630 (89%)	70 (10%)	10 (1%)	9	19

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	9	ASP
1	E	11	ARG
1	A	12	ASP
1	A	65	ILE
1	D	89	ARG
1	C	11	ARG
1	B	114	LYS
1	C	85	LYS
1	C	86	THR
1	E	116	GLU

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	109/119 (92%)	102 (94%)	7 (6%)	14	32
1	B	104/119 (87%)	98 (94%)	6 (6%)	17	36
1	C	107/119 (90%)	102 (95%)	5 (5%)	22	45
1	D	106/119 (89%)	100 (94%)	6 (6%)	17	37
1	E	106/119 (89%)	101 (95%)	5 (5%)	22	45
1	F	112/119 (94%)	105 (94%)	7 (6%)	15	32
All	All	644/714 (90%)	608 (94%)	36 (6%)	17	38

All (36) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	PHE
1	A	27	GLU
1	A	52	VAL
1	A	81	ASN
1	A	89	ARG
1	A	115	GLU
1	A	126	ILE
1	B	23	ASP
1	B	27	GLU
1	B	40	ASN
1	B	70	GLU
1	B	127	LYS
1	B	129	GLU
1	C	28	LEU
1	C	32	LYS
1	C	40	ASN
1	C	69	ASP
1	C	120	LYS
1	D	40	ASN
1	D	52	VAL
1	D	66	ASN
1	D	124	ILE
1	D	125	VAL
1	D	127	LYS
1	E	40	ASN
1	E	69	ASP
1	E	85	LYS
1	E	123	ASN
1	E	127	LYS
1	F	9	ASP

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	F	13	TYR
1	F	40	ASN
1	F	49	LYS
1	F	52	VAL
1	F	89	ARG
1	F	124	ILE

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	123	ASN
1	B	36	GLN
1	B	40	ASN
1	B	57	GLN
1	C	40	ASN
1	D	40	ASN
1	D	57	GLN
1	D	66	ASN
1	E	40	ASN
1	E	57	GLN
1	F	40	ASN
1	F	57	GLN
1	F	66	ASN
1	F	81	ASN
1	F	135	HIS

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 ⓘ

Of 6 ligands modelled in this entry, 6 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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 (i)

6.1 Protein, DNA and RNA chains (i)

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	122/137 (89%)	-1.62	0	100	100	14, 35, 78, 91	0
1	B	117/137 (85%)	-1.65	0	100	100	17, 42, 73, 88	0
1	C	120/137 (87%)	-1.73	0	100	100	13, 32, 75, 83	0
1	D	119/137 (86%)	-1.69	0	100	100	14, 32, 73, 85	0
1	E	119/137 (86%)	-1.70	0	100	100	16, 36, 69, 90	0
1	F	125/137 (91%)	-1.59	0	100	100	11, 38, 85, 96	0
All	All	722/822 (87%)	-1.66	0	100	100	11, 35, 77, 96	0

There are no RSRZ outliers to report.

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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	MG	A	201	1/1	0.99	0.02	19,19,19,19	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	MG	F	206	1/1	0.99	0.01	17,17,17,17	0
2	MG	C	203	1/1	1.00	0.03	17,17,17,17	0
2	MG	D	204	1/1	1.00	0.02	12,12,12,12	0
2	MG	E	205	1/1	1.00	0.01	22,22,22,22	0
2	MG	B	202	1/1	1.00	0.01	14,14,14,14	0

6.5 Other polymers (i)

There are no such residues in this entry.