



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 09:50 AM GMT

PDB ID : 3JUT
Title : Acidic Fibroblast Growth Factor (FGF-1) complexed with gentisic acid
Authors : Fernandez, I.S.; Gimenez-Gallego, G.; Romero, A.
Deposited on : 2009-09-15
Resolution : 2.25 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

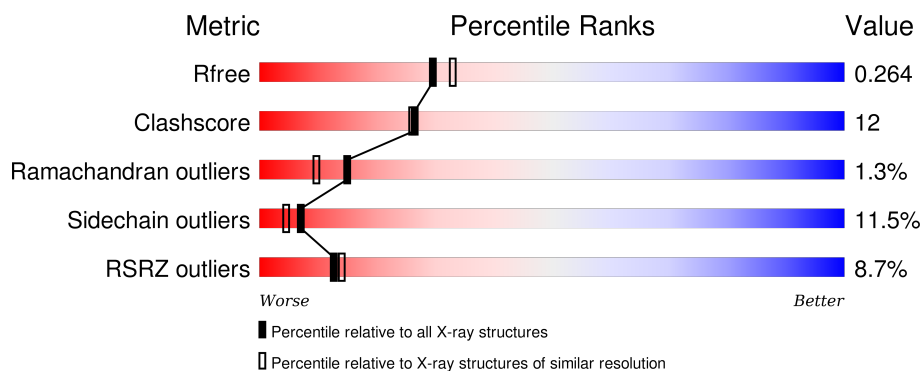
1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.25 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}	91344	1640 (2.28-2.24)
Clashscore	102246	1095 (2.26-2.26)
Ramachandran outliers	100387	1063 (2.26-2.26)
Sidechain outliers	100360	1063 (2.26-2.26)
RSRZ outliers	91569	1647 (2.28-2.24)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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 $\leq 5\%$. 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	130	<div> <div>10%</div> <div>69%</div> <div>23%</div> <div>6%</div> </div>
1	B	130	<div> <div>8%</div> <div>75%</div> <div>20%</div> <div>5%</div> </div>
1	C	130	<div> <div>5%</div> <div>75%</div> <div>21%</div> </div>
1	D	130	<div> <div>5%</div> <div>76%</div> <div>19%</div> </div>
1	E	130	<div> <div>11%</div> <div>68%</div> <div>25%</div> <div>6%</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	130	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	GTQ	B	131	-	-	-	X

2 Entry composition [i](#)

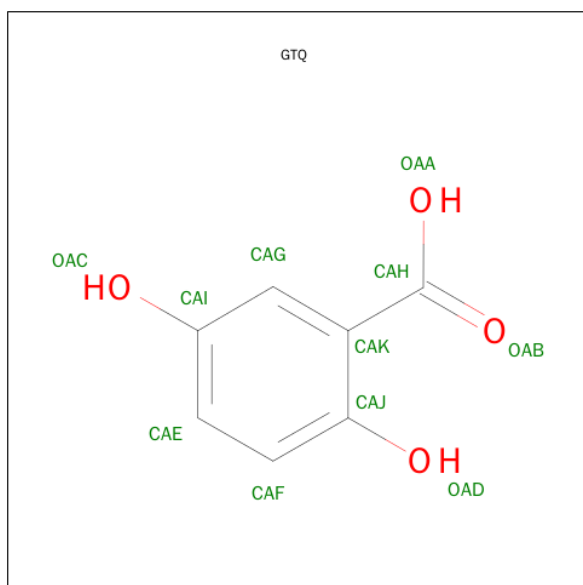
There are 3 unique types of molecules in this entry. The entry contains 6272 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Heparin-binding growth factor 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	130	Total	C	N	O	S	0	0	0
			1038	655	182	197	4			
1	B	130	Total	C	N	O	S	0	0	0
			1037	655	182	196	4			
1	C	130	Total	C	N	O	S	0	0	0
			1038	655	182	197	4			
1	D	130	Total	C	N	O	S	0	0	0
			1038	655	182	197	4			
1	E	130	Total	C	N	O	S	0	0	0
			1038	655	182	197	4			
1	F	130	Total	C	N	O	S	0	0	0
			1038	655	182	197	4			

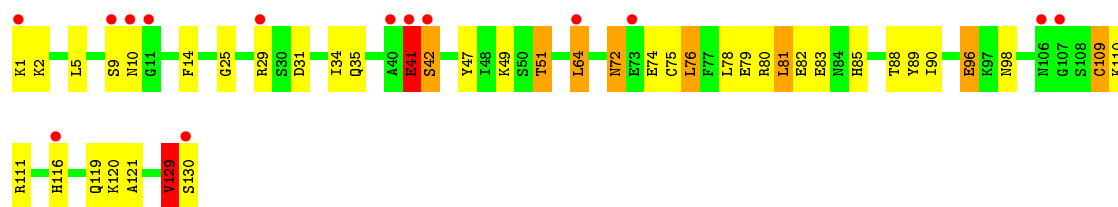
- Molecule 2 is 2,5-DIHYDROXYBENZOIC ACID (three-letter code: GTQ) (formula: C₇H₆O₄).



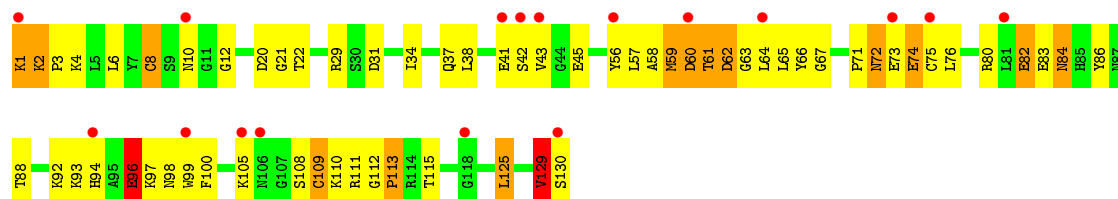
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			11	7	4		
2	B	1	Total	C	O	0	0
			11	7	4		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	6	Total	O	0	0
			6	6		
3	B	5	Total	O	0	0
			5	5		
3	C	4	Total	O	0	0
			4	4		
3	D	6	Total	O	0	0
			6	6		
3	E	2	Total	O	0	0
			2	2		



- Molecule 1: Heparin-binding growth factor 1



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	97.66 Å 47.69 Å 98.41 Å 90.00° 106.45° 90.00°	Depositor
Resolution (Å)	37.01 – 2.25 37.01 – 2.25	Depositor EDS
% Data completeness (in resolution range)	96.2 (37.01-2.25) 96.2 (37.01-2.25)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.12 (at 2.24 Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.216 , 0.274 0.212 , 0.264	Depositor DCC
R_{free} test set	2034 reflections (5.32%)	DCC
Wilson B-factor (Å ²)	39.1	Xtriage
Anisotropy	0.087	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 63.1	EDS
Estimated twinning fraction	0.014 for l,-k,h	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	0 of 40233 reflections	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	6272	wwPDB-VP
Average B, all atoms (Å ²)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 56.30 % of the origin peak, indicating pseudo translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo translational symmetry is equal to 2.7915e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹ Intensities estimated from amplitudes.

² Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 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: GTQ

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	1.99	19/1061 (1.8%)	1.17	8/1429 (0.6%)
1	B	1.05	0/1060	0.96	1/1429 (0.1%)
1	C	0.92	0/1061	0.97	2/1429 (0.1%)
1	D	1.02	0/1061	0.94	2/1429 (0.1%)
1	E	0.97	1/1061 (0.1%)	0.94	0/1429
1	F	1.61	23/1061 (2.2%)	1.15	5/1429 (0.3%)
All	All	1.32	43/6365 (0.7%)	1.03	18/8574 (0.2%)

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	E	0	2
1	F	0	1
All	All	0	3

All (43) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	96	GLU	CD-OE2	28.11	1.56	1.25
1	A	83	GLU	CD-OE2	26.08	1.54	1.25
1	A	83	GLU	CD-OE1	21.10	1.48	1.25
1	F	60	ASP	CG-OD2	18.11	1.67	1.25
1	F	74	GLU	CD-OE2	12.33	1.39	1.25
1	A	96	GLU	CG-CD	10.81	1.68	1.51
1	F	21	GLY	C-O	10.42	1.40	1.23
1	F	66	TYR	CE2-CZ	9.61	1.51	1.38
1	A	96	GLU	CD-OE1	9.60	1.36	1.25
1	F	66	TYR	CG-CD1	9.59	1.51	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	73	GLU	CG-CD	9.52	1.66	1.51
1	A	97	LYS	CD-CE	9.29	1.74	1.51
1	A	82	GLU	C-O	8.90	1.40	1.23
1	A	41	GLU	CD-OE2	8.88	1.35	1.25
1	A	2	LYS	CE-NZ	8.74	1.70	1.49
1	A	83	GLU	CG-CD	8.63	1.64	1.51
1	A	41	GLU	CD-OE1	8.48	1.34	1.25
1	A	11	GLY	N-CA	8.15	1.58	1.46
1	F	66	TYR	CE1-CZ	7.92	1.48	1.38
1	F	59	MET	CB-CG	7.72	1.76	1.51
1	F	66	TYR	CG-CD2	7.67	1.49	1.39
1	A	73	GLU	CD-OE2	7.42	1.33	1.25
1	F	96	GLU	C-O	7.24	1.37	1.23
1	F	82	GLU	CG-CD	6.80	1.62	1.51
1	A	1	LYS	CD-CE	6.31	1.67	1.51
1	F	112	GLY	CA-C	6.29	1.61	1.51
1	F	73	GLU	CD-OE1	6.11	1.32	1.25
1	F	96	GLU	CG-CD	6.10	1.61	1.51
1	F	59	MET	C-O	5.99	1.34	1.23
1	F	73	GLU	CD-OE2	5.88	1.32	1.25
1	A	97	LYS	CE-NZ	5.86	1.63	1.49
1	E	75	CYS	CB-SG	-5.70	1.72	1.81
1	F	113	PRO	C-N	5.63	1.47	1.34
1	F	8	CYS	CB-SG	-5.51	1.72	1.81
1	F	92	LYS	CE-NZ	5.42	1.62	1.49
1	F	113	PRO	C-O	5.38	1.34	1.23
1	A	74	GLU	CD-OE2	5.30	1.31	1.25
1	F	62	ASP	CG-OD2	5.30	1.37	1.25
1	A	98	ASN	CB-CG	5.25	1.63	1.51
1	F	93	LYS	CD-CE	5.08	1.64	1.51
1	F	82	GLU	CB-CG	5.08	1.61	1.52
1	F	84	ASN	CB-CG	5.07	1.62	1.51
1	A	94	HIS	C-O	5.05	1.32	1.23

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	62	ASP	CB-CG-OD1	15.70	132.43	118.30
1	A	96	GLU	CG-CD-OE2	-12.45	93.41	118.30
1	A	10	ASN	C-N-CA	-10.16	100.97	122.30
1	A	96	GLU	OE1-CD-OE2	7.99	132.88	123.30
1	F	62	ASP	OD1-CG-OD2	-7.45	109.14	123.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	96	GLU	CG-CD-OE1	7.38	133.06	118.30
1	F	92	LYS	CD-CE-NZ	-7.29	94.92	111.70
1	F	60	ASP	CB-CG-OD2	-6.57	112.39	118.30
1	D	127	LEU	CB-CG-CD1	6.24	121.60	111.00
1	F	61	THR	CA-CB-CG2	-6.04	103.94	112.40
1	C	127	LEU	CA-CB-CG	5.99	129.09	115.30
1	A	11	GLY	N-CA-C	5.90	127.86	113.10
1	A	62	ASP	CB-CG-OD1	5.40	123.16	118.30
1	A	10	ASN	O-C-N	-5.32	114.15	123.20
1	D	29	ARG	NE-CZ-NH2	-5.29	117.66	120.30
1	B	114	ARG	NE-CZ-NH1	5.29	122.94	120.30
1	C	127	LEU	CB-CG-CD1	5.23	119.89	111.00
1	A	29	ARG	CG-CD-NE	5.17	122.66	111.80

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	E	129	VAL	Peptide
1	E	41	GLU	Peptide
1	F	129	VAL	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	1038	0	1028	25	0
1	B	1037	0	1028	25	0
1	C	1038	0	1028	14	0
1	D	1038	0	1028	20	0
1	E	1038	0	1028	28	0
1	F	1038	0	1028	46	0
2	A	11	0	3	3	0
2	B	11	0	3	1	0
3	A	6	0	0	0	0
3	B	5	0	0	0	0
3	C	4	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	6	0	0	0	0
3	E	2	0	0	0	0
All	All	6272	0	6174	151	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 12.

All (151) 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:59:MET:CG	1:F:59:MET:CB	1.76	1.61
1:A:97:LYS:CE	1:A:97:LYS:CD	1.74	1.59
1:A:2:LYS:CE	1:A:2:LYS:NZ	1.70	1.49
1:F:60:ASP:CG	1:F:60:ASP:OD2	1.67	1.33
1:B:83:GLU:OE1	1:B:83:GLU:HA	1.64	0.94
1:F:96:GLU:H	1:F:96:GLU:CD	1.74	0.90
1:A:119:GLN:HG2	2:A:131:GTQ:HAF	1.51	0.90
1:F:29:ARG:HE	1:F:130:SER:HB2	1.40	0.86
1:D:90:ILE:HD11	1:D:98:ASN:HA	1.62	0.81
1:B:29:ARG:HH11	1:B:29:ARG:CB	1.95	0.80
1:B:29:ARG:HB2	1:B:29:ARG:HH11	1.47	0.79
1:C:72:ASN:HD22	1:C:74:GLU:H	1.30	0.78
1:A:97:LYS:CE	1:A:97:LYS:CG	2.62	0.77
1:F:8:CYS:O	1:F:12:GLY:HA2	1.85	0.75
1:D:72:ASN:HD22	1:D:74:GLU:H	1.37	0.72
1:B:10:ASN:OD1	2:B:131:GTQ:HAE	1.88	0.72
1:A:90:ILE:HD12	1:A:98:ASN:HA	1.71	0.72
1:F:59:MET:CG	1:F:59:MET:CA	2.66	0.71
1:B:129:VAL:O	1:B:130:SER:HB2	1.91	0.71
1:B:83:GLU:OE1	1:B:83:GLU:CA	2.38	0.70
1:D:3:PRO:HG2	1:D:129:VAL:HG11	1.74	0.70
1:E:29:ARG:HB3	1:E:29:ARG:HH11	1.56	0.70
1:B:79:GLU:O	1:B:80:ARG:NH1	2.27	0.67
1:E:41:GLU:CG	1:E:42:SER:HB2	2.24	0.67
1:F:72:ASN:HD22	1:F:74:GLU:H	1.42	0.66
1:E:81:LEU:HD22	1:E:85:HIS:HA	1.77	0.66
1:C:72:ASN:ND2	1:C:74:GLU:H	1.94	0.65
1:A:97:LYS:NZ	1:A:97:LYS:CD	2.60	0.65
1:D:78:LEU:HB2	1:D:90:ILE:HG22	1.77	0.65
1:F:63:GLY:HA3	1:F:113:PRO:HD3	1.78	0.64
1:B:129:VAL:O	1:B:129:VAL:HG22	1.97	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:72:ASN:ND2	1:F:74:GLU:H	1.96	0.63
1:F:72:ASN:HD22	1:F:72:ASN:C	2.04	0.61
1:F:111:ARG:HB3	1:F:113:PRO:HD2	1.83	0.61
1:F:61:THR:HA	1:F:94:HIS:CE1	2.35	0.61
1:F:29:ARG:NE	1:F:130:SER:HB2	2.14	0.60
1:F:60:ASP:HA	1:F:74:GLU:OE1	2.01	0.60
1:C:45:GLU:OE2	1:C:92:LYS:NZ	2.37	0.58
1:B:29:ARG:CG	1:B:29:ARG:HH11	2.17	0.58
1:A:2:LYS:CD	1:A:2:LYS:NZ	2.63	0.58
1:A:114:ARG:HG2	1:A:114:ARG:HH11	1.68	0.58
1:B:35:GLN:NE2	1:B:35:GLN:H	2.03	0.57
1:F:31:ASP:O	1:F:34:ILE:HG12	2.05	0.57
1:E:41:GLU:CB	1:E:42:SER:HB2	2.35	0.56
1:D:72:ASN:ND2	1:D:74:GLU:H	2.02	0.56
1:F:129:VAL:O	1:F:129:VAL:HG22	2.06	0.56
1:B:72:ASN:C	1:B:72:ASN:HD22	2.11	0.55
1:B:106:ASN:OD1	1:B:108:SER:HB2	2.08	0.54
1:B:129:VAL:CG2	1:B:129:VAL:O	2.56	0.54
1:D:98:ASN:HD21	1:E:85:HIS:CE1	2.26	0.54
1:C:81:LEU:CD2	1:C:85:HIS:HA	2.38	0.54
1:A:19:PRO:HB3	1:B:7:TYR:CE1	2.43	0.54
1:B:84:ASN:O	1:B:85:HIS:HB2	2.08	0.53
1:C:94:HIS:ND1	1:C:97:LYS:NZ	2.57	0.53
1:E:116:HIS:CE1	1:E:119:GLN:HE21	2.27	0.53
1:E:78:LEU:HD12	1:E:90:ILE:HD11	1.89	0.53
1:F:82:GLU:HG3	1:F:88:THR:CG2	2.39	0.53
1:F:96:GLU:N	1:F:96:GLU:CD	2.55	0.53
1:A:119:GLN:CG	2:A:131:GTQ:HAF	2.33	0.53
1:E:2:LYS:NZ	1:F:31:ASP:OD1	2.41	0.53
1:E:96:GLU:H	1:E:96:GLU:CD	2.12	0.52
1:F:86:TYR:CD1	1:F:125:LEU:HD13	2.44	0.52
1:E:29:ARG:HH11	1:E:29:ARG:CB	2.20	0.52
1:C:65:LEU:HD11	1:C:101:VAL:HG13	1.91	0.52
1:A:72:ASN:HD21	1:A:74:GLU:HB2	1.74	0.52
1:F:29:ARG:HE	1:F:130:SER:CB	2.20	0.52
1:E:82:GLU:HG3	1:E:88:THR:CG2	2.40	0.52
1:E:31:ASP:O	1:E:34:ILE:HG12	2.11	0.51
1:B:78:LEU:HB2	1:B:90:ILE:HG23	1.91	0.51
1:E:109:CYS:SG	1:E:110:LYS:O	2.59	0.51
1:F:20:ASP:OD2	1:F:22:THR:OG1	2.24	0.51
1:E:82:GLU:HG3	1:E:88:THR:HG23	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:109:CYS:SG	1:F:110:LYS:O	2.62	0.51
1:F:57:LEU:HD11	1:F:65:LEU:HD22	1.93	0.50
1:F:59:MET:CB	1:F:59:MET:SD	2.96	0.50
1:A:112:GLY:N	1:A:113:PRO:CD	2.74	0.50
1:F:58:ALA:HB2	1:F:75:CYS:SG	2.52	0.50
1:E:5:LEU:HD22	1:E:34:ILE:HD12	1.95	0.49
1:F:10:ASN:OD1	1:F:105:LYS:NZ	2.45	0.49
1:D:98:ASN:HD21	1:E:85:HIS:HE1	1.61	0.49
1:D:116:HIS:HD2	1:D:117:TYR:O	1.95	0.49
1:C:78:LEU:HB2	1:C:90:ILE:HG23	1.94	0.48
1:A:5:LEU:HD22	1:A:34:ILE:HD12	1.93	0.48
1:A:1:LYS:HB2	1:A:37:GLN:HE22	1.78	0.48
1:E:29:ARG:HB3	1:E:29:ARG:NH1	2.23	0.48
1:E:47:TYR:CE1	1:E:76:LEU:HD13	2.48	0.48
1:A:10:ASN:HB2	1:A:121:ALA:HA	1.95	0.48
1:E:64:LEU:HD12	1:E:111:ARG:HD3	1.94	0.48
1:E:116:HIS:CE1	1:E:119:GLN:NE2	2.81	0.48
1:F:97:LYS:O	1:F:99:TRP:CD1	2.67	0.47
1:F:56:TYR:CE1	1:F:71:PRO:HD3	2.48	0.47
1:F:1:LYS:HA	1:F:2:LYS:HB3	1.95	0.47
1:A:114:ARG:HG2	1:A:114:ARG:NH1	2.29	0.47
1:B:90:ILE:CD1	1:B:98:ASN:HA	2.45	0.47
1:D:72:ASN:HD22	1:D:72:ASN:C	2.19	0.47
1:F:82:GLU:HG3	1:F:88:THR:HG23	1.96	0.47
1:D:127:LEU:HG	1:F:20:ASP:HB3	1.96	0.47
1:A:72:ASN:HD22	1:A:74:GLU:N	2.13	0.47
1:C:90:ILE:HD12	1:C:98:ASN:HA	1.96	0.47
1:B:86:TYR:CE1	1:B:125:LEU:HB2	2.50	0.47
1:D:110:LYS:HD3	1:D:115:THR:HG22	1.97	0.47
1:F:72:ASN:HD22	1:F:74:GLU:N	2.11	0.46
1:A:56:TYR:CE1	1:A:71:PRO:HD3	2.50	0.46
1:D:96:GLU:N	1:D:96:GLU:OE1	2.38	0.46
1:C:14:PHE:CE2	1:C:29:ARG:HG3	2.51	0.46
1:A:8:CYS:HB2	1:A:124:PHE:CE2	2.51	0.46
1:F:129:VAL:O	1:F:129:VAL:CG2	2.64	0.45
1:D:129:VAL:O	1:D:129:VAL:HG13	2.15	0.45
1:E:79:GLU:HG3	1:E:89:TYR:CE2	2.51	0.45
1:F:60:ASP:C	1:F:62:ASP:H	2.20	0.45
1:D:8:CYS:HB2	1:D:124:PHE:CE2	2.51	0.45
1:D:29:ARG:HD3	1:F:20:ASP:O	2.17	0.45
1:B:3:PRO:HB3	1:B:51:THR:HG21	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:81:LEU:CD2	1:D:85:HIS:HA	2.47	0.44
1:F:100:PHE:HB2	1:F:115:THR:HB	1.99	0.44
1:C:90:ILE:HD11	1:C:95:ALA:HA	1.98	0.44
1:A:66:TYR:OH	1:A:74:GLU:OE1	2.26	0.44
1:C:90:ILE:CD1	1:C:98:ASN:HA	2.47	0.44
1:B:14:PHE:CE2	1:B:29:ARG:HD2	2.53	0.44
1:B:29:ARG:HB2	1:B:29:ARG:NH1	2.25	0.43
1:B:8:CYS:HB2	1:B:124:PHE:CE2	2.53	0.43
1:E:10:ASN:HB2	1:E:121:ALA:HA	2.00	0.43
1:C:104:LYS:HG2	1:C:110:LYS:HG3	2.01	0.43
1:A:89:TYR:HB2	1:A:101:VAL:CG2	2.49	0.43
1:A:105:LYS:HZ1	2:A:131:GTQ:CAH	2.31	0.43
1:F:1:LYS:HA	1:F:2:LYS:O	2.19	0.43
1:E:41:GLU:HG3	1:E:42:SER:HB2	2.01	0.43
1:E:72:ASN:HD22	1:E:74:GLU:H	1.67	0.43
1:D:115:THR:HA	1:D:119:GLN:OE1	2.19	0.43
1:A:72:ASN:HD22	1:A:74:GLU:H	1.66	0.42
1:F:29:ARG:HH21	1:F:130:SER:CB	2.33	0.42
1:F:125:LEU:HA	1:F:125:LEU:HD12	1.86	0.42
1:F:1:LYS:HA	1:F:2:LYS:CB	2.50	0.42
1:F:4:LYS:HD2	1:F:38:LEU:HD12	2.01	0.42
1:E:129:VAL:O	1:E:130:SER:O	2.36	0.42
1:C:2:LYS:HA	1:C:3:PRO:HD2	1.94	0.42
1:F:6:LEU:HD23	1:F:6:LEU:HA	1.90	0.42
1:B:102:GLY:HA2	1:B:121:ALA:O	2.19	0.42
1:E:129:VAL:O	1:E:130:SER:C	2.58	0.42
1:B:90:ILE:HD12	1:B:98:ASN:HA	2.02	0.41
1:D:29:ARG:NH2	1:F:67:GLY:O	2.47	0.41
1:D:47:TYR:CZ	1:D:76:LEU:HD13	2.55	0.41
1:A:72:ASN:ND2	1:A:74:GLU:HB2	2.35	0.41
1:F:72:ASN:ND2	1:F:72:ASN:C	2.72	0.41
1:A:90:ILE:HG21	1:A:90:ILE:HD13	1.88	0.41
1:F:2:LYS:HA	1:F:3:PRO:HD3	1.76	0.41
1:E:14:PHE:O	1:E:25:GLY:HA2	2.21	0.40
1:C:4:LYS:HD2	1:C:38:LEU:HD13	2.04	0.40
1:E:35:GLN:O	1:E:51:THR:OG1	2.39	0.40
1:B:84:ASN:O	1:B:85:HIS:CB	2.69	0.40
1:D:49:LYS:HD3	1:D:56:TYR:CZ	2.56	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	128/130 (98%)	119 (93%)	8 (6%)	1 (1%)	24	21
1	B	128/130 (98%)	122 (95%)	5 (4%)	1 (1%)	24	21
1	C	128/130 (98%)	123 (96%)	3 (2%)	2 (2%)	12	7
1	D	128/130 (98%)	121 (94%)	5 (4%)	2 (2%)	12	7
1	E	128/130 (98%)	121 (94%)	6 (5%)	1 (1%)	24	21
1	F	128/130 (98%)	120 (94%)	5 (4%)	3 (2%)	8	4
All	All	768/780 (98%)	726 (94%)	32 (4%)	10 (1%)	15	10

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	42	SER
1	F	41	GLU
1	B	83	GLU
1	D	43	VAL
1	C	112	GLY
1	F	98	ASN
1	C	41	GLU
1	D	83	GLU
1	F	2	LYS
1	A	43	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	114/114 (100%)	103 (90%)	11 (10%)	10	8
1	B	114/114 (100%)	101 (89%)	13 (11%)	7	5
1	C	114/114 (100%)	102 (90%)	12 (10%)	8	6
1	D	114/114 (100%)	103 (90%)	11 (10%)	10	8
1	E	114/114 (100%)	98 (86%)	16 (14%)	4	2
1	F	114/114 (100%)	98 (86%)	16 (14%)	4	2
All	All	684/684 (100%)	605 (88%)	79 (12%)	7	4

All (79) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	LYS
1	A	2	LYS
1	A	32	GLN
1	A	41	GLU
1	A	72	ASN
1	A	76	LEU
1	A	83	GLU
1	A	84	ASN
1	A	90	ILE
1	A	92	LYS
1	A	127	LEU
1	B	1	LYS
1	B	29	ARG
1	B	35	GLN
1	B	64	LEU
1	B	72	ASN
1	B	76	LEU
1	B	81	LEU
1	B	83	GLU
1	B	91	SER
1	B	108	SER
1	B	114	ARG
1	B	127	LEU
1	B	129	VAL
1	C	1	LYS
1	C	2	LYS
1	C	35	GLN
1	C	43	VAL
1	C	72	ASN
1	C	76	LEU

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Mol	Chain	Res	Type
1	C	81	LEU
1	C	83	GLU
1	C	84	ASN
1	C	90	ILE
1	C	116	HIS
1	C	127	LEU
1	D	1	LYS
1	D	32	GLN
1	D	35	GLN
1	D	49	LYS
1	D	64	LEU
1	D	72	ASN
1	D	81	LEU
1	D	98	ASN
1	D	120	LYS
1	D	127	LEU
1	D	130	SER
1	E	1	LYS
1	E	9	SER
1	E	41	GLU
1	E	49	LYS
1	E	51	THR
1	E	64	LEU
1	E	72	ASN
1	E	76	LEU
1	E	80	ARG
1	E	81	LEU
1	E	83	GLU
1	E	96	GLU
1	E	98	ASN
1	E	109	CYS
1	E	120	LYS
1	E	129	VAL
1	F	1	LYS
1	F	37	GLN
1	F	42	SER
1	F	43	VAL
1	F	45	GLU
1	F	64	LEU
1	F	72	ASN
1	F	76	LEU
1	F	80	ARG

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Mol	Chain	Res	Type
1	F	83	GLU
1	F	84	ASN
1	F	96	GLU
1	F	108	SER
1	F	109	CYS
1	F	125	LEU
1	F	129	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	35	GLN
1	A	37	GLN
1	A	72	ASN
1	A	84	ASN
1	A	94	HIS
1	B	35	GLN
1	B	69	GLN
1	B	72	ASN
1	B	98	ASN
1	C	35	GLN
1	C	69	GLN
1	C	72	ASN
1	D	35	GLN
1	D	69	GLN
1	D	72	ASN
1	D	85	HIS
1	D	98	ASN
1	D	116	HIS
1	E	13	HIS
1	E	32	GLN
1	E	72	ASN
1	E	119	GLN
1	F	72	ASN

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 carbohydrates 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	GTQ	A	131	-	8,11,11	0.50	0	11,15,15	0.83	0
2	GTQ	B	131	-	8,11,11	0.97	0	11,15,15	1.33	1 (9%)

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	GTQ	A	131	-	-	0/0/4/4	0/1/1/1
2	GTQ	B	131	-	-	0/0/4/4	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	131	GTQ	CAJ-CAK-CAH	2.94	124.61	121.60

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	131	GTQ	3	0
2	B	131	GTQ	1	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	130/130 (100%)	0.88	13 (10%) 9 10	31, 38, 48, 54	0
1	B	130/130 (100%)	0.56	10 (7%) 16 18	28, 37, 46, 100	0
1	C	130/130 (100%)	0.48	7 (5%) 29 33	29, 37, 47, 54	0
1	D	130/130 (100%)	0.47	7 (5%) 29 33	28, 37, 48, 55	0
1	E	130/130 (100%)	0.56	14 (10%) 8 7	29, 37, 47, 57	0
1	F	130/130 (100%)	0.98	17 (13%) 5 4	30, 39, 48, 52	0
All	All	780/780 (100%)	0.66	68 (8%) 13 14	28, 38, 48, 100	0

All (68) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1	LYS	7.6
1	B	130	SER	7.1
1	F	41	GLU	6.9
1	D	130	SER	6.9
1	E	41	GLU	6.4
1	D	1	LYS	6.2
1	A	130	SER	5.9
1	F	1	LYS	5.7
1	C	130	SER	5.6
1	C	1	LYS	5.4
1	F	42	SER	5.4
1	F	60	ASP	5.1
1	A	42	SER	5.1
1	A	2	LYS	5.0
1	E	1	LYS	4.6
1	A	61	THR	4.6
1	C	2	LYS	4.4
1	D	129	VAL	4.3
1	B	43	VAL	4.2

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Mol	Chain	Res	Type	RSRZ
1	C	41	GLU	3.9
1	F	64	LEU	3.8
1	F	105	LYS	3.7
1	F	43	VAL	3.5
1	F	73	GLU	3.5
1	B	129	VAL	3.5
1	B	1	LYS	3.4
1	E	9	SER	3.3
1	C	129	VAL	3.2
1	C	43	VAL	3.2
1	A	43	VAL	3.2
1	A	40	ALA	3.1
1	F	56	TYR	3.1
1	F	130	SER	3.1
1	D	2	LYS	3.0
1	B	2	LYS	3.0
1	E	116	HIS	3.0
1	B	83	GLU	2.9
1	E	107	GLY	2.9
1	F	118	GLY	2.8
1	E	73	GLU	2.7
1	E	40	ALA	2.7
1	E	42	SER	2.6
1	D	41	GLU	2.5
1	D	3	PRO	2.5
1	F	106	ASN	2.5
1	E	29	ARG	2.5
1	F	99	TRP	2.5
1	B	61	THR	2.5
1	A	63	GLY	2.4
1	C	105	LYS	2.4
1	E	106	ASN	2.4
1	A	41	GLU	2.4
1	A	72	ASN	2.4
1	E	10	ASN	2.3
1	E	64	LEU	2.3
1	D	84	ASN	2.3
1	E	130	SER	2.3
1	F	81	LEU	2.2
1	E	11	GLY	2.2
1	A	3	PRO	2.2
1	F	10	ASN	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	41	GLU	2.1
1	A	129	VAL	2.1
1	B	111	ARG	2.1
1	B	64	LEU	2.0
1	F	94	HIS	2.0
1	A	94	HIS	2.0
1	F	75	CYS	2.0

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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
2	GTQ	B	131	11/11	0.78	0.24	3.04	60,62,63,64	3
2	GTQ	A	131	11/11	0.87	0.18	0.27	55,57,59,59	3

6.5 Other polymers [i](#)

There are no such residues in this entry.