Full wwPDB X-ray Structure Validation Report (i)

Feb 1, 2016 – 02:45 PM GMT

PDB ID	:	4ADQ
Title	:	CRYSTAL STRUCTURE OF THE MOUSE COLONY-STIMULATING FACTOR 1 (MCSF-1) CYTOKINE IN COMPLEX WITH THE VIRAL RECEPTOR BARF1
Authors	:	Elegheert, J.; Bracke, N.; Savvides, S.N.
Deposited on	:	2012-01-02
Resolution	:	4.50 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
http://wwpdb.org/validation/2016/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

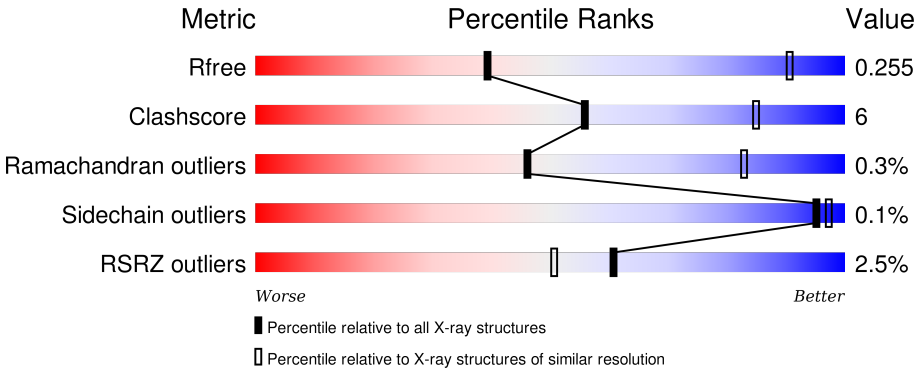
MolProbity	:	4.02b-467
Mogul	:	1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20026688
Percentile statistics	:	20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)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

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 4.50 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))
R_{free}	91344	1071 (5.40-3.60)
Clashscore	102246	1003 (5.30-3.62)
Ramachandran outliers	100387	1117 (5.40-3.60)
Sidechain outliers	100360	1099 (5.40-3.60)
RSRZ outliers	91569	1075 (5.40-3.60)

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 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 <=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	208	2% 78% 11% 11%
1	B	208	% 74% 15% 11%
1	C	208	4% 73% 16% 11%
1	D	208	76% 13% 11%
2	E	153	5% 85% 9% 6%

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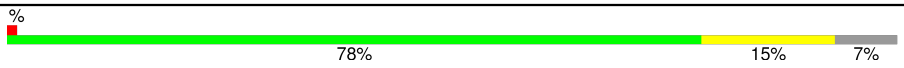
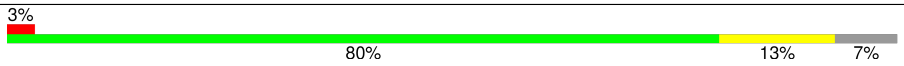
Mol	Chain	Length	Quality of chain
2	F	153	
2	G	153	
2	H	153	

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
4	NAG	B	300	-	-	-	X

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 10758 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 SECRETED PROTEIN BARF1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	185	Total	C	N	O	S	0	0	0
			1477	955	251	264	7			
1	B	185	Total	C	N	O	S	0	0	0
			1477	955	251	264	7			
1	C	186	Total	C	N	O	S	0	0	0
			1483	958	252	266	7			
1	D	186	Total	C	N	O	S	0	0	0
			1483	958	252	266	7			

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	222	LYS	-	EXPRESSION TAG	UNP P0CW72
A	223	HIS	-	EXPRESSION TAG	UNP P0CW72
A	224	HIS	-	EXPRESSION TAG	UNP P0CW72
A	225	HIS	-	EXPRESSION TAG	UNP P0CW72
A	226	HIS	-	EXPRESSION TAG	UNP P0CW72
A	227	HIS	-	EXPRESSION TAG	UNP P0CW72
A	228	HIS	-	EXPRESSION TAG	UNP P0CW72
A	169	SER	THR	ENGINEERED MUTATION	UNP P0CW72
B	222	LYS	-	EXPRESSION TAG	UNP P0CW72
B	223	HIS	-	EXPRESSION TAG	UNP P0CW72
B	224	HIS	-	EXPRESSION TAG	UNP P0CW72
B	225	HIS	-	EXPRESSION TAG	UNP P0CW72
B	226	HIS	-	EXPRESSION TAG	UNP P0CW72
B	227	HIS	-	EXPRESSION TAG	UNP P0CW72
B	228	HIS	-	EXPRESSION TAG	UNP P0CW72
B	169	SER	THR	ENGINEERED MUTATION	UNP P0CW72
C	222	LYS	-	EXPRESSION TAG	UNP P0CW72
C	223	HIS	-	EXPRESSION TAG	UNP P0CW72
C	224	HIS	-	EXPRESSION TAG	UNP P0CW72
C	225	HIS	-	EXPRESSION TAG	UNP P0CW72
C	226	HIS	-	EXPRESSION TAG	UNP P0CW72

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Chain	Residue	Modelled	Actual	Comment	Reference
C	227	HIS	-	EXPRESSION TAG	UNP P0CW72
C	228	HIS	-	EXPRESSION TAG	UNP P0CW72
C	169	SER	THR	ENGINEERED MUTATION	UNP P0CW72
D	222	LYS	-	EXPRESSION TAG	UNP P0CW72
D	223	HIS	-	EXPRESSION TAG	UNP P0CW72
D	224	HIS	-	EXPRESSION TAG	UNP P0CW72
D	225	HIS	-	EXPRESSION TAG	UNP P0CW72
D	226	HIS	-	EXPRESSION TAG	UNP P0CW72
D	227	HIS	-	EXPRESSION TAG	UNP P0CW72
D	228	HIS	-	EXPRESSION TAG	UNP P0CW72
D	169	SER	THR	ENGINEERED MUTATION	UNP P0CW72

- Molecule 2 is a protein called MACROPHAGE COLONY-STIMULATING FACTOR 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	144	Total	C	N	O	S	0	0	0
			1174	734	198	232	10			
2	F	142	Total	C	N	O	S	0	0	0
			1159	725	197	227	10			
2	G	143	Total	C	N	O	S	0	0	0
			1172	734	198	230	10			
2	H	142	Total	C	N	O	S	0	0	0
			1166	731	197	228	10			

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	-3	GLY	-	EXPRESSION TAG	UNP P07141
E	-2	SER	-	EXPRESSION TAG	UNP P07141
E	-1	HIS	-	EXPRESSION TAG	UNP P07141
E	0	MET	-	EXPRESSION TAG	UNP P07141
F	-3	GLY	-	EXPRESSION TAG	UNP P07141
F	-2	SER	-	EXPRESSION TAG	UNP P07141
F	-1	HIS	-	EXPRESSION TAG	UNP P07141
F	0	MET	-	EXPRESSION TAG	UNP P07141
G	-3	GLY	-	EXPRESSION TAG	UNP P07141
G	-2	SER	-	EXPRESSION TAG	UNP P07141
G	-1	HIS	-	EXPRESSION TAG	UNP P07141
G	0	MET	-	EXPRESSION TAG	UNP P07141
H	-3	GLY	-	EXPRESSION TAG	UNP P07141
H	-2	SER	-	EXPRESSION TAG	UNP P07141
H	-1	HIS	-	EXPRESSION TAG	UNP P07141

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Chain	Residue	Modelled	Actual	Comment	Reference
H	0	MET	-	EXPRESSION TAG	UNP P07141

- Molecule 3 is a polymer of unknown type called SUGAR (3-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	3	Total	C	N	O	0	0
			39	22	2	15		
3	C	3	Total	C	N	O	0	0
			39	22	2	15		
3	D	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 4 is a polymer of unknown type called SUGAR (4-MER).

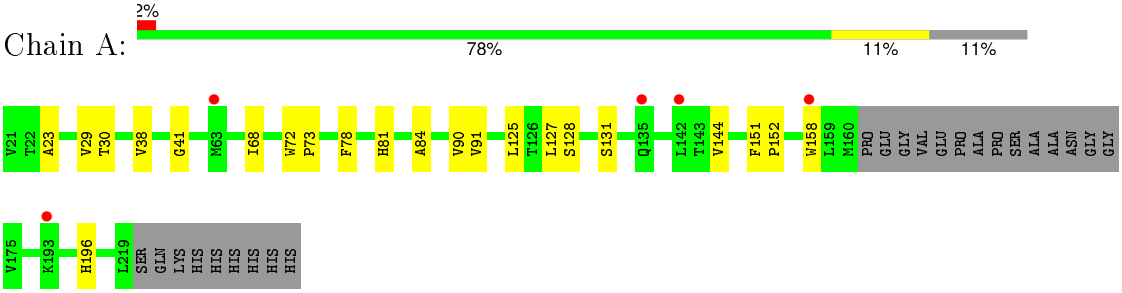
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	B	4	Total	C	N	O	0	0
			50	28	2	20		

3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

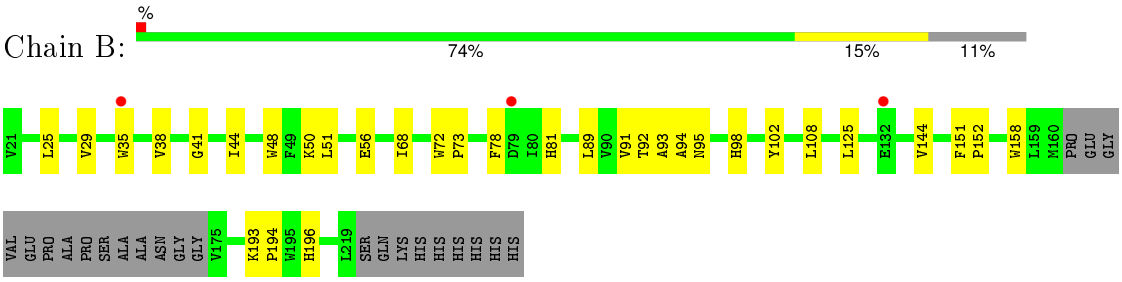
- Molecule 1: SECRETED PROTEIN BARF1

Chain A:



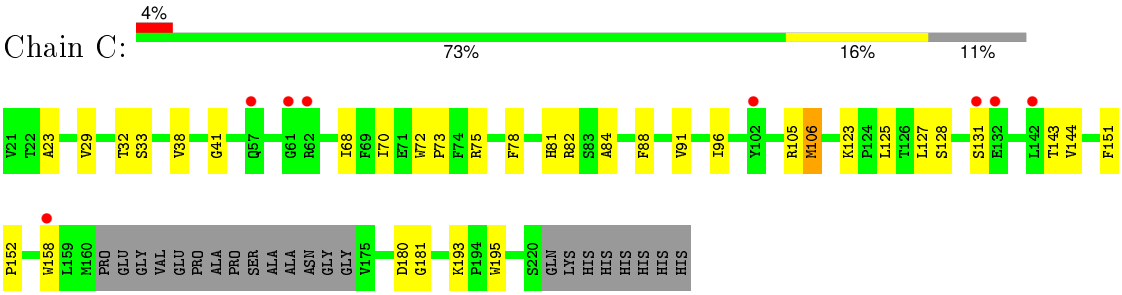
- Molecule 1: SECRETED PROTEIN BARF1

Chain B:



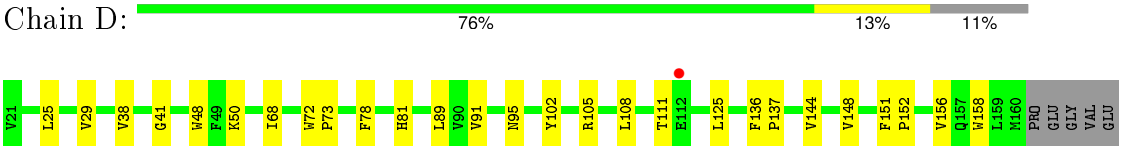
- Molecule 1: SECRETED PROTEIN BARF1

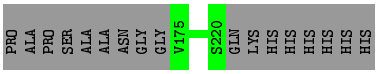
Chain C:



- Molecule 1: SECRETED PROTEIN BARF1

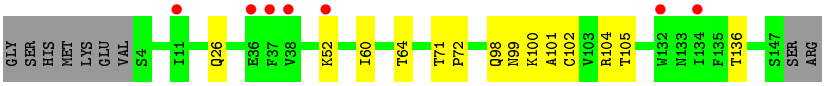
Chain D:





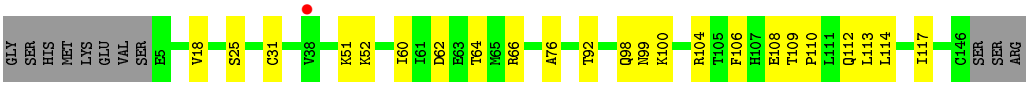
• Molecule 2: MACROPHAGE COLONY-STIMULATING FACTOR 1

Chain E:



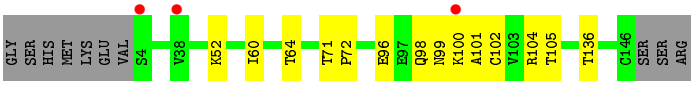
• Molecule 2: MACROPHAGE COLONY-STIMULATING FACTOR 1

Chain F:



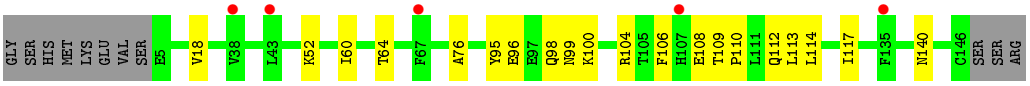
• Molecule 2: MACROPHAGE COLONY-STIMULATING FACTOR 1

Chain G:



• Molecule 2: MACROPHAGE COLONY-STIMULATING FACTOR 1

Chain H:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α, β, γ	234.75Å 234.75Å 96.04Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	117.38 – 4.50 117.38 – 4.50	Depositor EDS
% Data completeness (in resolution range)	94.5 (117.38-4.50) 94.5 (117.38-4.50)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.69 (at 4.47Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.223 , 0.262 0.213 , 0.255	Depositor DCC
R_{free} test set	1111 reflections (10.03%)	DCC
Wilson B-factor (Å^2)	138.7	Xtriage
Anisotropy	0.310	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 166.8	EDS
Estimated twinning fraction	0.052 for h,-h-k,-l	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.42$, $< L^2 > = 0.25$	Xtriage
Outliers	0 of 11082 reflections	Xtriage
F_o,F_c correlation	0.89	EDS
Total number of atoms	10758	wwPDB-VP
Average B, all atoms (Å^2)	187.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.88% 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, 0.375 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: BMA, NAG, MAN

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	0.22	0/1520	0.43	0/2069
1	B	0.23	0/1520	0.42	0/2069
1	C	0.23	0/1526	0.43	0/2077
1	D	0.23	0/1526	0.42	0/2077
2	E	0.22	0/1195	0.37	0/1611
2	F	0.23	0/1179	0.40	0/1588
2	G	0.23	0/1193	0.38	0/1607
2	H	0.23	0/1187	0.38	0/1599
All	All	0.23	0/10846	0.41	0/14697

There are no bond length outliers.

There are no bond angle outliers.

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	1477	0	1445	17	0
1	B	1477	0	1445	24	0
1	C	1483	0	1450	24	0
1	D	1483	0	1450	18	0
2	E	1174	0	1113	11	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	1159	0	1107	18	0
2	G	1172	0	1119	11	0
2	H	1166	0	1114	16	0
3	A	39	0	34	1	0
3	C	39	0	34	1	0
3	D	39	0	34	0	0
4	B	50	0	43	0	0
All	All	10758	0	10388	132	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 6.

All (132) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:52:LYS:NZ	2:G:98:GLN:O	2.24	0.71
2:E:52:LYS:NZ	2:E:98:GLN:O	2.24	0.70
1:B:193:LYS:HG3	1:B:194:PRO:HA	1.78	0.63
1:D:50:LYS:HD3	1:D:102:TYR:CE2	2.33	0.63
1:C:105:ARG:NH1	1:D:105:ARG:NH2	2.47	0.62
1:C:82:ARG:NH1	1:C:84:ALA:O	2.32	0.61
1:A:196:HIS:ND1	1:A:196:HIS:O	2.36	0.58
2:F:52:LYS:NZ	2:F:98:GLN:O	2.35	0.58
1:B:196:HIS:ND1	1:B:196:HIS:O	2.37	0.58
1:A:23:ALA:CB	1:A:29:VAL:HG21	2.35	0.57
2:E:71:THR:HG23	2:E:72:PRO:HD2	1.86	0.57
1:B:50:LYS:HD3	1:B:102:TYR:CE2	2.39	0.56
1:B:44:ILE:CD1	1:B:108:LEU:HD11	2.36	0.56
1:C:23:ALA:CB	1:C:29:VAL:HG21	2.35	0.55
1:A:151:PHE:CG	1:A:152:PRO:HA	2.41	0.55
2:G:71:THR:HG23	2:G:72:PRO:HD2	1.87	0.55
1:A:30:THR:HG22	1:A:90:VAL:HG22	1.89	0.55
2:H:109:THR:HG22	2:H:110:PRO:HD2	1.89	0.55
1:C:91:VAL:HG23	1:C:91:VAL:O	2.08	0.54
1:B:38:VAL:HG21	2:G:64:THR:HG23	1.89	0.54
2:F:110:PRO:O	2:F:114:LEU:HD13	2.08	0.54
3:C:300:NAG:O3	3:C:301:NAG:O5	2.21	0.54
1:D:68:ILE:HD12	1:D:68:ILE:N	2.22	0.54
2:F:109:THR:HG22	2:F:110:PRO:HD2	1.89	0.53
1:B:151:PHE:CG	1:B:152:PRO:HA	2.43	0.53
1:C:144:VAL:HG23	1:C:158:TRP:CZ2	2.44	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:71:THR:CG2	2:E:72:PRO:HD2	2.39	0.53
2:H:110:PRO:O	2:H:114:LEU:HD13	2.09	0.53
1:C:123:LYS:NZ	1:C:180:ASP:OD2	2.37	0.53
2:G:71:THR:CG2	2:G:72:PRO:HD2	2.38	0.53
2:H:52:LYS:NZ	2:H:98:GLN:O	2.40	0.53
1:D:151:PHE:CG	1:D:152:PRO:HA	2.44	0.53
1:B:29:VAL:HG12	1:B:91:VAL:HB	1.91	0.53
1:B:68:ILE:N	1:B:68:ILE:HD12	2.25	0.52
1:A:68:ILE:HD12	1:A:68:ILE:N	2.25	0.52
1:C:68:ILE:HD12	1:C:68:ILE:N	2.25	0.52
3:A:301:NAG:H61	3:A:302:BMA:H2	1.92	0.52
1:C:151:PHE:CG	1:C:152:PRO:HA	2.45	0.52
1:A:38:VAL:HG21	2:E:64:THR:HG23	1.92	0.51
1:C:78:PHE:CE2	1:C:91:VAL:HG12	2.46	0.51
1:B:78:PHE:CE2	1:B:91:VAL:HG22	2.45	0.51
2:F:104:ARG:CG	2:F:106:PHE:CE1	2.94	0.51
2:H:18:VAL:CG1	2:H:76:ALA:HB1	2.41	0.51
1:B:44:ILE:CD1	1:B:108:LEU:CD1	2.89	0.51
2:E:104:ARG:CG	2:E:105:THR:N	2.74	0.50
1:D:108:LEU:O	1:D:111:THR:HG22	2.11	0.50
2:H:104:ARG:CG	2:H:106:PHE:CE1	2.94	0.50
2:F:99:ASN:O	2:F:100:LYS:HB2	2.11	0.50
2:H:99:ASN:O	2:H:100:LYS:HB2	2.12	0.49
1:D:78:PHE:CE2	1:D:91:VAL:HG22	2.47	0.49
2:G:104:ARG:CG	2:G:105:THR:N	2.75	0.49
1:D:38:VAL:HG21	2:F:64:THR:HG23	1.95	0.49
1:A:23:ALA:HB3	1:A:29:VAL:HG21	1.94	0.49
2:G:99:ASN:O	2:G:100:LYS:HB2	2.13	0.49
2:E:99:ASN:O	2:E:100:LYS:HB2	2.13	0.49
1:C:38:VAL:HG21	2:H:64:THR:HG23	1.95	0.48
1:B:92:THR:HG23	1:B:93:ALA:N	2.28	0.48
2:G:104:ARG:HG2	2:G:105:THR:N	2.28	0.48
2:F:18:VAL:CG1	2:F:76:ALA:HB1	2.43	0.48
1:A:127:LEU:HD23	1:A:128:SER:N	2.28	0.48
1:A:144:VAL:HG23	1:A:158:TRP:CZ2	2.49	0.48
1:D:29:VAL:HG12	1:D:91:VAL:HB	1.96	0.48
2:F:60:ILE:O	2:F:64:THR:HB	2.14	0.48
2:F:104:ARG:HD3	2:F:106:PHE:CZ	2.49	0.47
1:B:81:HIS:HB2	1:C:81:HIS:CE1	2.49	0.47
1:A:23:ALA:CB	1:A:29:VAL:CG2	2.92	0.47
2:E:104:ARG:HG2	2:E:105:THR:N	2.28	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:33:SER:OG	1:C:106:MET:CE	2.62	0.47
1:A:78:PHE:CE2	1:A:91:VAL:HG22	2.48	0.47
1:C:91:VAL:O	1:C:91:VAL:CG2	2.61	0.47
2:H:18:VAL:CG1	2:H:76:ALA:CB	2.92	0.47
2:H:60:ILE:O	2:H:64:THR:HB	2.15	0.47
1:A:131:SER:HB3	1:A:144:VAL:HG12	1.96	0.47
1:B:196:HIS:CG	1:B:196:HIS:O	2.67	0.47
1:B:94:ALA:HA	1:B:98:HIS:HD1	1.80	0.47
2:G:101:ALA:O	2:G:102:CYS:HB2	2.14	0.46
2:E:101:ALA:O	2:E:102:CYS:HB2	2.16	0.46
1:D:48:TRP:CE3	1:D:89:LEU:HD22	2.50	0.46
2:H:104:ARG:HD3	2:H:106:PHE:CZ	2.50	0.46
1:D:144:VAL:HG23	1:D:158:TRP:CZ2	2.50	0.46
1:A:72:TRP:N	1:A:73:PRO:CD	2.80	0.45
1:A:196:HIS:CG	1:A:196:HIS:O	2.66	0.45
1:D:125:LEU:HD12	1:D:125:LEU:C	2.36	0.45
1:C:143:THR:HG23	1:C:143:THR:O	2.16	0.45
1:C:72:TRP:N	1:C:73:PRO:CD	2.80	0.45
2:F:18:VAL:CG1	2:F:76:ALA:CB	2.95	0.45
1:C:125:LEU:HD12	1:C:125:LEU:C	2.38	0.45
1:B:72:TRP:N	1:B:73:PRO:CD	2.80	0.44
1:C:193:LYS:HE2	1:C:195:TRP:CZ2	2.53	0.44
1:A:84:ALA:HB2	2:F:31:CYS:HB3	1.99	0.44
1:C:131:SER:HB3	1:C:144:VAL:HG12	1.99	0.44
1:B:25:LEU:HD12	1:B:94:ALA:O	2.18	0.44
1:B:125:LEU:C	1:B:125:LEU:HD12	2.37	0.44
1:B:25:LEU:CD1	1:B:95:ASN:HA	2.47	0.44
1:D:72:TRP:N	1:D:73:PRO:CD	2.81	0.44
2:H:109:THR:CG2	2:H:110:PRO:HD2	2.48	0.43
1:C:193:LYS:HE2	1:C:195:TRP:CE2	2.52	0.43
1:C:33:SER:OG	1:C:106:MET:HE1	2.17	0.43
1:B:144:VAL:HG23	1:B:158:TRP:CZ2	2.53	0.43
1:D:105:ARG:HB2	1:D:105:ARG:CZ	2.49	0.43
2:E:60:ILE:O	2:E:64:THR:HB	2.19	0.43
1:C:96:ILE:HD12	1:C:181:GLY:C	2.39	0.43
1:D:108:LEU:HD23	1:D:108:LEU:C	2.39	0.43
2:E:26:GLN:NE2	2:F:25:SER:O	2.52	0.43
1:B:51:LEU:HA	1:B:56:GLU:O	2.19	0.43
2:H:18:VAL:HG12	2:H:76:ALA:HB1	2.00	0.42
2:F:109:THR:CG2	2:F:110:PRO:HD2	2.50	0.42
1:D:136:PHE:CG	1:D:137:PRO:HA	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:62:ASP:O	2:F:66:ARG:NH1	2.50	0.42
2:G:136:THR:HG22	2:G:136:THR:O	2.19	0.42
1:B:35:TRP:CZ2	1:B:108:LEU:HD12	2.54	0.42
2:G:60:ILE:O	2:G:64:THR:HB	2.20	0.42
2:H:95:TYR:CE2	2:H:140:ASN:ND2	2.88	0.42
2:H:113:LEU:O	2:H:117:ILE:HD13	2.21	0.41
1:A:81:HIS:HB2	1:D:81:HIS:CE1	2.55	0.41
2:F:108:GLU:HB3	2:F:112:GLN:OE1	2.19	0.41
1:A:125:LEU:C	1:A:125:LEU:HD12	2.40	0.41
1:B:44:ILE:HD11	1:B:108:LEU:HD11	2.01	0.41
1:D:148:VAL:CG2	1:D:156:VAL:HG22	2.51	0.41
1:C:70:ILE:HB	1:C:75:ARG:HD3	2.03	0.41
1:D:25:LEU:CD1	1:D:95:ASN:HA	2.51	0.41
1:B:48:TRP:CE3	1:B:89:LEU:HD22	2.56	0.41
1:C:127:LEU:HD23	1:C:128:SER:N	2.35	0.41
1:C:32:THR:HG22	1:C:88:PHE:CD2	2.56	0.41
2:F:113:LEU:O	2:F:117:ILE:HD13	2.21	0.41
2:H:108:GLU:HB3	2:H:112:GLN:OE1	2.22	0.40
2:F:51:LYS:NZ	2:F:92:THR:O	2.52	0.40
2:G:96:GLU:N	2:G:96:GLU:OE1	2.55	0.40
2:E:136:THR:O	2:E:136:THR:HG22	2.20	0.40
2:H:96:GLU:OE1	2:H:96:GLU:N	2.54	0.40
1:B:92:THR:CG2	1:B:93:ALA:N	2.84	0.40
2:F:18:VAL:HG12	2:F:76:ALA:HB1	2.04	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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	181/208 (87%)	177 (98%)	3 (2%)	1 (1%)	30 74

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	B	181/208 (87%)	177 (98%)	3 (2%)	1 (1%)	30 74
1	C	182/208 (88%)	178 (98%)	3 (2%)	1 (0%)	34 77
1	D	182/208 (88%)	177 (97%)	4 (2%)	1 (0%)	34 77
2	E	142/153 (93%)	139 (98%)	3 (2%)	0	100 100
2	F	140/153 (92%)	138 (99%)	2 (1%)	0	100 100
2	G	141/153 (92%)	138 (98%)	3 (2%)	0	100 100
2	H	140/153 (92%)	138 (99%)	2 (1%)	0	100 100
All	All	1289/1444 (89%)	1262 (98%)	23 (2%)	4 (0%)	46 83

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	41	GLY
1	B	41	GLY
1	C	41	GLY
1	D	41	GLY

5.3.2 Protein sidechains (i)

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	165/183 (90%)	165 (100%)	0	100 100
1	B	165/183 (90%)	165 (100%)	0	100 100
1	C	166/183 (91%)	165 (99%)	1 (1%)	90 95
1	D	166/183 (91%)	166 (100%)	0	100 100
2	E	135/144 (94%)	135 (100%)	0	100 100
2	F	133/144 (92%)	133 (100%)	0	100 100
2	G	135/144 (94%)	135 (100%)	0	100 100
2	H	134/144 (93%)	134 (100%)	0	100 100
All	All	1199/1308 (92%)	1198 (100%)	1 (0%)	95 97

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	106	MET

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	149	ASN
1	B	118	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

13 carbohydrates are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	NAG	A	300	1,3	14,14,15	0.49	0	15,19,21	0.65	0
3	NAG	A	301	3	14,14,15	0.52	0	15,19,21	0.54	0
3	BMA	A	302	3	11,11,12	0.56	0	14,15,17	0.71	0
4	NAG	B	300	1,4	14,14,15	0.52	0	15,19,21	0.77	0
4	NAG	B	301	4	14,14,15	0.47	0	15,19,21	0.75	0
4	BMA	B	302	4	11,11,12	0.60	0	14,15,17	1.02	1 (7%)
4	MAN	B	303	4	11,11,12	0.53	0	14,15,17	0.96	1 (7%)
3	NAG	C	300	1,3	14,14,15	0.45	0	15,19,21	0.75	0
3	NAG	C	301	3	14,14,15	0.50	0	15,19,21	0.70	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
3	BMA	C	302	3	11,11,12	0.60	0	14,15,17	0.67	0
3	NAG	D	300	1,3	14,14,15	0.51	0	15,19,21	0.71	0
3	NAG	D	301	3	14,14,15	0.50	0	15,19,21	0.82	0
3	BMA	D	302	3	11,11,12	0.57	0	14,15,17	1.07	1 (7%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	A	300	1,3	-	0/6/23/26	0/1/1/1
3	NAG	A	301	3	-	0/6/23/26	0/1/1/1
3	BMA	A	302	3	-	0/2/19/22	0/1/1/1
4	NAG	B	300	1,4	-	0/6/23/26	0/1/1/1
4	NAG	B	301	4	-	0/6/23/26	0/1/1/1
4	BMA	B	302	4	-	0/2/19/22	0/1/1/1
4	MAN	B	303	4	-	0/2/19/22	0/1/1/1
3	NAG	C	300	1,3	-	0/6/23/26	0/1/1/1
3	NAG	C	301	3	-	0/6/23/26	0/1/1/1
3	BMA	C	302	3	-	0/2/19/22	0/1/1/1
3	NAG	D	300	1,3	-	0/6/23/26	0/1/1/1
3	NAG	D	301	3	-	0/6/23/26	0/1/1/1
3	BMA	D	302	3	-	0/2/19/22	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	303	MAN	C1-O5-C5	2.01	114.80	112.25
4	B	302	BMA	C1-C2-C3	2.63	112.66	109.54
3	D	302	BMA	C1-C2-C3	3.26	113.39	109.54

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	301	NAG	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	302	BMA	1	0
3	C	300	NAG	1	0
3	C	301	NAG	1	0

5.6 Ligand geometry (i)

There are no ligands in this entry.

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, 95^{th} 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	185/208 (88%)	0.45	5 (2%)	58	48	122, 162, 201, 219	0
1	B	185/208 (88%)	0.32	3 (1%)	74	65	121, 162, 196, 219	0
1	C	186/208 (89%)	0.56	8 (4%)	39	30	129, 162, 201, 228	0
1	D	186/208 (89%)	0.34	1 (0%)	91	88	122, 162, 199, 234	0
2	E	144/153 (94%)	0.35	7 (4%)	33	26	142, 217, 254, 277	0
2	F	142/153 (92%)	0.26	1 (0%)	89	84	141, 216, 254, 279	0
2	G	143/153 (93%)	0.27	3 (2%)	67	57	139, 216, 251, 275	0
2	H	142/153 (92%)	0.46	5 (3%)	48	38	142, 218, 256, 280	0
All	All	1313/1444 (90%)	0.38	33 (2%)	61	51	121, 179, 248, 280	0

All (33) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	135	PHE	3.7
2	G	4	SER	3.4
1	C	61	GLY	3.0
2	H	38	VAL	3.0
1	A	135	GLN	3.0
1	C	57	GLN	2.9
2	E	38	VAL	2.8
2	H	107	HIS	2.7
2	G	100	LYS	2.7
1	B	79	ASP	2.7
2	E	134	ILE	2.6
1	C	131	SER	2.6
2	F	38	VAL	2.6
1	C	102	TYR	2.6
1	B	132	GLU	2.5
2	H	67	PHE	2.5

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Mol	Chain	Res	Type	RSRZ
2	E	37	PHE	2.5
1	A	158	TRP	2.5
2	E	52	LYS	2.4
1	C	142	LEU	2.4
1	A	63	MET	2.4
1	C	62	ARG	2.3
1	D	112	GLU	2.3
2	E	132	TRP	2.3
1	C	158	TRP	2.2
2	E	36	GLU	2.2
1	A	193	LYS	2.2
2	G	38	VAL	2.2
1	C	132	GLU	2.1
2	H	43	LEU	2.1
1	B	35	TRP	2.1
1	A	142	LEU	2.1
2	E	11	ILE	2.0

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

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

6.3 Carbohydrates

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, 95^{th} 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
4	NAG	B	300	14/15	0.85	0.46	0.32	135,163,189,212	0
3	NAG	D	300	14/15	0.88	0.35	-0.23	123,162,214,226	0
3	NAG	A	300	14/15	0.87	0.29	-0.45	145,179,206,212	0
3	NAG	C	300	14/15	0.89	0.30	-0.57	124,172,199,213	0
3	NAG	C	301	14/15	0.88	0.21	-	144,161,169,179	0
3	NAG	D	301	14/15	0.88	0.27	-	155,163,188,204	0
4	NAG	B	301	14/15	0.84	0.34	-	114,153,183,184	0
3	BMA	C	302	11/12	0.81	0.28	-	134,183,206,212	0
4	BMA	B	302	11/12	0.87	0.18	-	152,186,205,211	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(Å^2)	Q<0.9
3	BMA	A	302	11/12	0.77	0.32	-	128,168,198,201	0
3	NAG	A	301	14/15	0.71	0.39	-	177,203,208,214	0
3	BMA	D	302	11/12	0.79	0.24	-	114,166,179,183	0
4	MAN	B	303	11/12	0.73	0.37	-	205,232,270,272	0

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.