Full wwPDB X-ray Structure Validation Report (i)

Feb 1, 2016 – 11:55 AM GMT

PDB ID	:	3QG1
Title	:	Crystal structure of P-loop G239A mutant of subunit A of the A1AO ATP synthase
Authors	:	Ragunathan, P.; Manimekalai, M.S.S.; Kumar, A.; Jeyakanthan, J.; Gruber, G.
Deposited on	:	2011-01-24
Resolution	:	2.95 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:

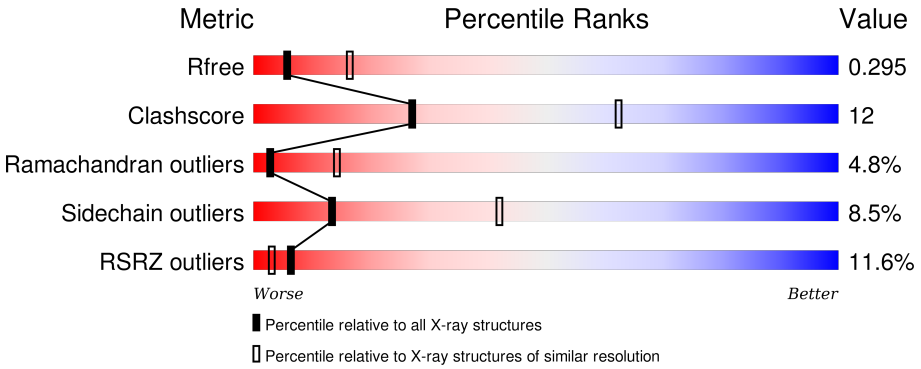
MolProbity	:	4.02b-467
Mogul	:	1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20026688
Percentile statistics	:	20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	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 2.95 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	2184 (3.00-2.92)
Clashscore	102246	2552 (3.00-2.92)
Ramachandran outliers	100387	2468 (3.00-2.92)
Sidechain outliers	100360	2471 (3.00-2.92)
RSRZ outliers	91569	2201 (3.00-2.92)

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	588	11% 69% 21% • • 5%

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
3	MPD	A	590	-	-	X	X

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	MPD	A	592	-	-	-	X

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 4503 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.

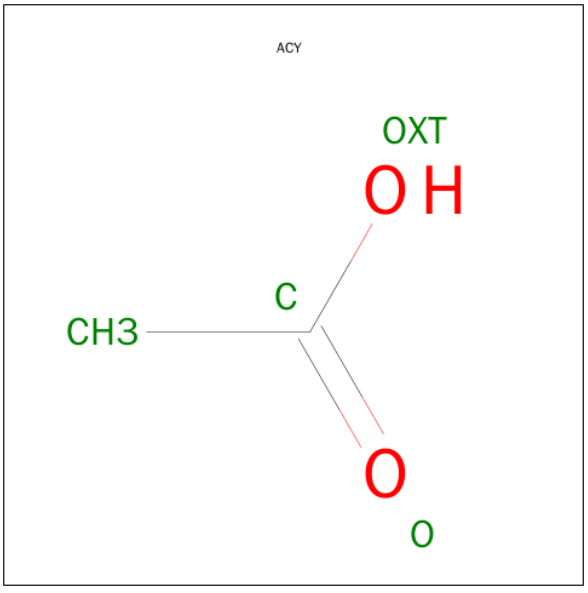
- Molecule 1 is a protein called V-type ATP synthase alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	561	Total	C	N	O	S	0	0	0
			4422	2827	754	823	18			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	79	ARG	GLY	ENGINEERED MUTATION	UNP O57728
A	239	ALA	GLY	ENGINEERED MUTATION	UNP O57728

- Molecule 2 is ACETIC ACID (three-letter code: ACY) (formula: $C_2H_4O_2$).



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

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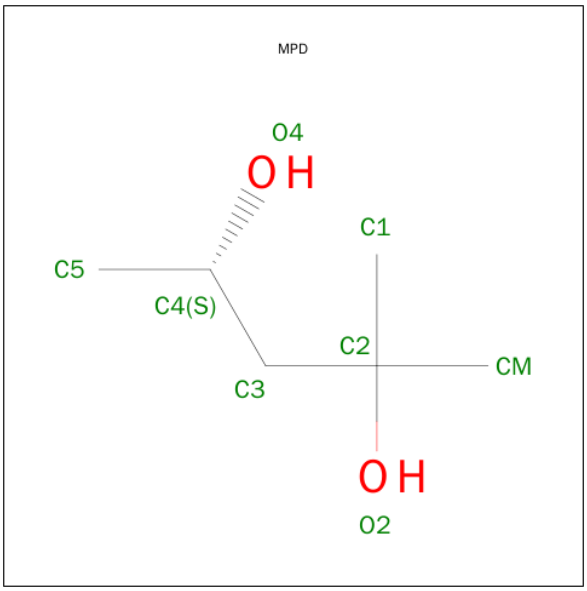
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 4 2 2	0	0
2	A	1	Total C O 4 2 2	0	0
2	A	1	Total C O 4 2 2	0	0
2	A	1	Total C O 4 2 2	0	0

- Molecule 3 is (4S)-2-METHYL-2,4-PENTANEDIOL (three-letter code: MPD) (formula: $C_6H_{14}O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 8 6 2	0	0
3	A	1	Total C O 8 6 2	0	0
3	A	1	Total C O 8 6 2	0	0

- Molecule 4 is water.

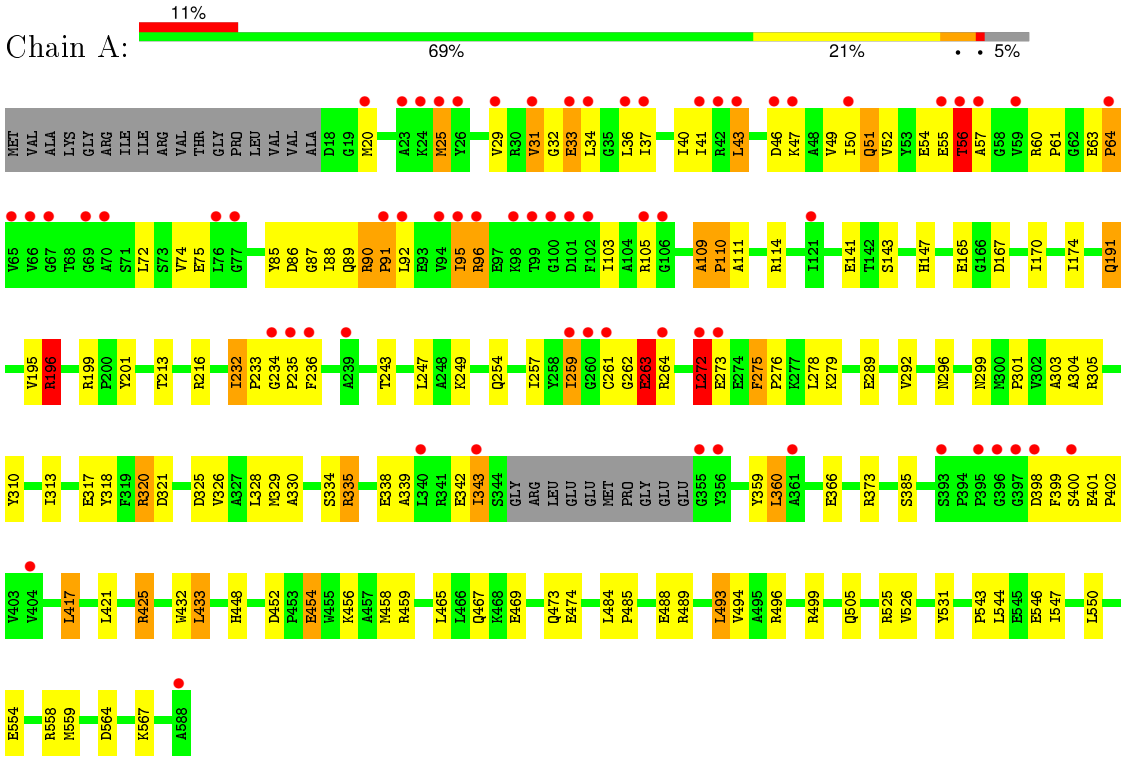
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	33	Total O 33 33	0	0

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: V-type ATP synthase alpha chain

Chain A:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	128.23Å 128.23Å 105.17Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.91 – 2.95 29.91 – 2.95	Depositor EDS
% Data completeness (in resolution range)	100.0 (29.91-2.95) 100.0 (29.91-2.95)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.91 (at 2.95Å)	Xtriage
Refinement program	REFMAC 5.5.0072	Depositor
R, R_{free}	0.262 , 0.319 0.252 , 0.295	Depositor DCC
R_{free} test set	980 reflections (5.44%)	DCC
Wilson B-factor (Å^2)	62.4	Xtriage
Anisotropy	0.059	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.28 , 50.9	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Outliers	2 of 19000 reflections (0.011%)	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	4503	wwPDB-VP
Average B, all atoms (Å^2)	84.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.48% 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: ACY, MPD

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	0.34	0/4514	0.53	0/6112

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	4422	0	4490	104	0
2	A	24	0	18	0	0
3	A	24	0	42	13	0
4	A	33	0	0	0	0
All	All	4503	0	4550	108	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 (108) 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)
3:A:590:MPD:HM1	3:A:590:MPD:O4	1.47	1.14
1:A:95:ILE:HG22	1:A:96:ARG:H	1.19	1.02
1:A:90:ARG:HB3	1:A:91:PRO:HD3	1.35	1.01
3:A:592:MPD:O4	3:A:592:MPD:HM1	1.63	0.96
1:A:90:ARG:CB	1:A:91:PRO:HD3	2.01	0.90
1:A:259:ILE:HG22	1:A:330:ALA:HA	1.53	0.89
1:A:60:ARG:N	1:A:61:PRO:HD2	1.86	0.89
1:A:433:LEU:HD22	3:A:590:MPD:H13	1.55	0.88
1:A:195:VAL:O	1:A:196:ARG:HB2	1.76	0.85
1:A:216:ARG:H	1:A:505:GLN:HE22	1.28	0.81
1:A:109:ALA:HB1	1:A:110:PRO:HD2	1.63	0.80
3:A:592:MPD:O4	3:A:592:MPD:CM	2.30	0.77
1:A:46:ASP:HA	1:A:51:GLN:HB3	1.69	0.75
1:A:90:ARG:HB3	1:A:91:PRO:CD	2.18	0.74
1:A:33:GLU:HG3	1:A:303:ALA:HB3	1.69	0.73
1:A:95:ILE:HG22	1:A:96:ARG:N	2.02	0.72
3:A:590:MPD:CM	3:A:590:MPD:O4	2.30	0.71
1:A:87:GLY:HA3	1:A:304:ALA:O	1.93	0.68
1:A:191:GLN:HE22	1:A:199:ARG:NH2	1.90	0.68
1:A:147:HIS:HE1	1:A:318:TYR:OH	1.76	0.67
1:A:201:TYR:H	3:A:592:MPD:H52	1.59	0.67
1:A:60:ARG:H	1:A:61:PRO:HD2	1.59	0.67
1:A:88:ILE:HD11	1:A:90:ARG:HH11	1.61	0.65
1:A:254:GLN:HE22	1:A:325:ASP:H	1.46	0.63
1:A:90:ARG:CB	1:A:91:PRO:CD	2.77	0.63
1:A:63:GLU:HG3	1:A:64:PRO:HD2	1.81	0.62
1:A:216:ARG:N	1:A:505:GLN:HE22	1.98	0.62
1:A:60:ARG:N	1:A:61:PRO:CD	2.59	0.61
1:A:95:ILE:CG2	1:A:96:ARG:H	2.01	0.61
1:A:296:ASN:O	1:A:335:ARG:NH1	2.35	0.60
1:A:305:ARG:HD3	1:A:335:ARG:HD3	1.83	0.59
1:A:452:ASP:OD2	1:A:525:ARG:NH1	2.36	0.59
1:A:195:VAL:O	1:A:196:ARG:CB	2.52	0.58
1:A:74:VAL:O	1:A:75:GLU:HB3	2.04	0.57
1:A:74:VAL:HG13	1:A:89:GLN:HE22	1.70	0.57
1:A:554:GLU:OE2	1:A:558:ARG:NH2	2.38	0.57
1:A:448:HIS:HE1	1:A:456:LYS:H	1.55	0.55
1:A:432:TRP:CD1	1:A:433:LEU:HD13	2.42	0.55
1:A:458:MET:HE1	1:A:525:ARG:HG2	1.89	0.55
1:A:259:ILE:CG2	1:A:330:ALA:HA	2.30	0.54
1:A:141:GLU:OE1	1:A:147:HIS:HD2	1.89	0.54
1:A:43:LEU:H	1:A:54:GLU:HG3	1.73	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:342:GLU:O	1:A:343:ILE:HG13	2.08	0.53
1:A:458:MET:CE	1:A:525:ARG:HG2	2.38	0.53
1:A:254:GLN:NE2	1:A:325:ASP:H	2.06	0.52
1:A:496:ARG:HA	1:A:499:ARG:NH1	2.25	0.52
1:A:31:VAL:HG13	1:A:301:PRO:HG3	1.92	0.52
1:A:259:ILE:HG23	1:A:259:ILE:O	2.11	0.51
1:A:114:ARG:HD3	1:A:170:ILE:HD11	1.90	0.51
1:A:526:VAL:HG11	1:A:559:MET:HE2	1.92	0.51
1:A:85:TYR:HB3	1:A:89:GLN:HA	1.92	0.51
1:A:191:GLN:HE22	1:A:199:ARG:HH21	1.56	0.51
1:A:273:GLU:HG3	1:A:276:PRO:HG2	1.92	0.51
1:A:92:LEU:O	1:A:92:LEU:HG	2.12	0.49
1:A:494:VAL:HG11	1:A:531:TYR:HB2	1.94	0.49
1:A:448:HIS:CE1	1:A:456:LYS:H	2.31	0.49
1:A:216:ARG:H	1:A:505:GLN:NE2	2.05	0.49
1:A:232:ILE:HG22	1:A:233:PRO:HD2	1.95	0.48
1:A:201:TYR:CE1	3:A:592:MPD:H32	2.48	0.48
1:A:43:LEU:HG	1:A:54:GLU:OE1	2.13	0.48
1:A:105:ARG:HH21	1:A:299:ASN:HD22	1.61	0.48
1:A:199:ARG:NH1	1:A:321:ASP:OD2	2.47	0.48
1:A:317:GLU:O	1:A:320:ARG:HG3	2.14	0.47
1:A:373:ARG:HG3	1:A:385:SER:HB3	1.96	0.47
1:A:421:LEU:HD13	3:A:590:MPD:H32	1.96	0.47
1:A:262:GLY:O	1:A:263:GLU:C	2.53	0.47
1:A:335:ARG:HA	1:A:335:ARG:HE	1.79	0.47
1:A:275:PHE:HA	1:A:278:LEU:HD13	1.97	0.46
1:A:109:ALA:HB1	1:A:110:PRO:CD	2.39	0.46
1:A:29:VAL:O	1:A:29:VAL:HG12	2.16	0.46
1:A:469:GLU:OE2	1:A:499:ARG:NH1	2.49	0.46
1:A:86:ASP:OD2	1:A:90:ARG:HB2	2.16	0.45
1:A:310:TYR:HA	1:A:313:ILE:HG22	1.98	0.45
1:A:63:GLU:CG	1:A:64:PRO:HD2	2.44	0.45
1:A:275:PHE:N	1:A:276:PRO:CD	2.79	0.45
1:A:433:LEU:HD22	3:A:590:MPD:C1	2.36	0.44
1:A:425:ARG:HA	1:A:425:ARG:HD2	1.88	0.44
1:A:342:GLU:C	1:A:343:ILE:HG13	2.38	0.44
1:A:249:LYS:HE2	3:A:593:MPD:H12	1.98	0.43
1:A:338:GLU:HG3	1:A:339:ALA:N	2.33	0.43
1:A:493:LEU:HD12	1:A:544:LEU:HD11	1.99	0.43
1:A:234:GLY:H	1:A:399:PHE:HE1	1.65	0.43
1:A:257:ILE:HG13	1:A:292:VAL:HB	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:485:PRO:O	1:A:489:ARG:HG3	2.19	0.42
1:A:33:GLU:HG3	1:A:303:ALA:CB	2.44	0.42
1:A:526:VAL:CG1	1:A:559:MET:HE2	2.49	0.42
1:A:484:LEU:HG	1:A:488:GLU:HB3	2.02	0.42
1:A:232:ILE:HG22	1:A:417:LEU:HD22	2.01	0.42
1:A:249:LYS:HE2	3:A:593:MPD:C1	2.49	0.42
1:A:272:LEU:HB3	1:A:273:GLU:H	1.66	0.42
1:A:543:PRO:HG2	1:A:546:GLU:HB2	2.00	0.42
1:A:401:GLU:N	1:A:402:PRO:HA	2.34	0.42
1:A:41:ILE:HG13	1:A:41:ILE:O	2.20	0.42
1:A:213:THR:HG23	1:A:247:LEU:HD23	2.01	0.42
1:A:313:ILE:HD12	1:A:328:LEU:HD22	2.02	0.42
1:A:143:SER:OG	1:A:289:GLU:OE2	2.28	0.41
1:A:85:TYR:CD1	1:A:89:GLN:HG3	2.55	0.41
1:A:275:PHE:O	1:A:278:LEU:HB2	2.20	0.41
1:A:52:VAL:HG22	1:A:56:THR:CG2	2.51	0.41
1:A:432:TRP:CZ2	3:A:590:MPD:H11	2.55	0.41
1:A:526:VAL:CB	1:A:559:MET:HE2	2.51	0.41
1:A:564:ASP:HB3	1:A:567:LYS:HD2	2.02	0.41
1:A:249:LYS:HZ1	3:A:593:MPD:H11	1.86	0.41
1:A:547:ILE:HA	1:A:550:LEU:HD13	2.03	0.41
1:A:110:PRO:HB2	1:A:111:ALA:H	1.65	0.41
1:A:454:GLU:O	1:A:458:MET:HG3	2.21	0.40
1:A:32:GLY:HA2	1:A:301:PRO:HB3	2.03	0.40
1:A:360:LEU:HD22	1:A:360:LEU:H	1.86	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	557/588 (95%)	470 (84%)	60 (11%)	27 (5%)	3 14

All (27) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	40	ILE
1	A	56	THR
1	A	90	ARG
1	A	91	PRO
1	A	95	ILE
1	A	236	PHE
1	A	263	GLU
1	A	400	SER
1	A	31	VAL
1	A	57	ALA
1	A	64	PRO
1	A	110	PRO
1	A	272	LEU
1	A	25	MET
1	A	43	LEU
1	A	51	GLN
1	A	55	GLU
1	A	72	LEU
1	A	165	GLU
1	A	196	ARG
1	A	264	ARG
1	A	398	ASP
1	A	261	CYS
1	A	334	SER
1	A	343	ILE
1	A	109	ALA
1	A	235	PRO

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	472/493 (96%)	432 (92%)	40 (8%)	13 42

All (40) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	20	MET
1	A	25	MET
1	A	33	GLU
1	A	34	LEU
1	A	36	LEU
1	A	37	ILE
1	A	47	LYS
1	A	49	VAL
1	A	50	ILE
1	A	56	THR
1	A	96	ARG
1	A	103	ILE
1	A	167	ASP
1	A	174	ILE
1	A	191	GLN
1	A	196	ARG
1	A	232	ILE
1	A	243	THR
1	A	259	ILE
1	A	263	GLU
1	A	272	LEU
1	A	275	PHE
1	A	279	LYS
1	A	320	ARG
1	A	326	VAL
1	A	329	MET
1	A	335	ARG
1	A	359	TYR
1	A	360	LEU
1	A	366	GLU
1	A	417	LEU
1	A	425	ARG
1	A	433	LEU
1	A	454	GLU
1	A	459	ARG
1	A	465	LEU
1	A	467	GLN
1	A	473	GLN
1	A	474	GLU
1	A	493	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	89	GLN
1	A	147	HIS
1	A	191	GLN
1	A	254	GLN
1	A	266	ASN
1	A	448	HIS
1	A	505	GLN
1	A	539	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

9 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	ACY	A	589	-	1,3,3	1.23	0	0,3,3	0.00	-
3	MPD	A	590	-	6,7,7	1.44	1 (16%)	7,10,10	1.05	1 (14%)
2	ACY	A	591	-	1,3,3	1.31	0	0,3,3	0.00	-
3	MPD	A	592	-	6,7,7	0.43	0	7,10,10	0.72	0
3	MPD	A	593	-	6,7,7	1.38	1 (16%)	7,10,10	0.47	0
2	ACY	A	594	-	1,3,3	1.31	0	0,3,3	0.00	-

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	ACY	A	595	-	1,3,3	1.23	0	0,3,3	0.00	-
2	ACY	A	596	-	1,3,3	1.15	0	0,3,3	0.00	-
2	ACY	A	597	-	1,3,3	1.24	0	0,3,3	0.00	-

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	ACY	A	589	-	-	0/0/0/0	0/0/0/0
3	MPD	A	590	-	-	0/5/5/5	0/0/0/0
2	ACY	A	591	-	-	0/0/0/0	0/0/0/0
3	MPD	A	592	-	-	0/5/5/5	0/0/0/0
3	MPD	A	593	-	-	0/5/5/5	0/0/0/0
2	ACY	A	594	-	-	0/0/0/0	0/0/0/0
2	ACY	A	595	-	-	0/0/0/0	0/0/0/0
2	ACY	A	596	-	-	0/0/0/0	0/0/0/0
2	ACY	A	597	-	-	0/0/0/0	0/0/0/0

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	590	MPD	C5-C4	-2.79	1.39	1.51
3	A	593	MPD	C5-C4	-2.63	1.40	1.51

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	590	MPD	C2-C3-C4	-2.53	104.68	116.66

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	590	MPD	6	0
3	A	592	MPD	4	0
3	A	593	MPD	3	0

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	561/588 (95%)	0.45	65 (11%) 6 3	33, 70, 189, 223	1 (0%)

All (65) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	99	THR	7.9
1	A	95	ILE	6.7
1	A	356	TYR	6.1
1	A	94	VAL	5.9
1	A	41	ILE	5.3
1	A	37	ILE	4.9
1	A	56	THR	4.9
1	A	29	VAL	4.7
1	A	66	VAL	4.5
1	A	100	GLY	4.4
1	A	50	ILE	4.4
1	A	273	GLU	4.4
1	A	404	VAL	4.4
1	A	36	LEU	4.3
1	A	34	LEU	4.3
1	A	67	GLY	4.0
1	A	397	GLY	3.9
1	A	59	VAL	3.9
1	A	42	ARG	3.9
1	A	343	ILE	3.7
1	A	96	ARG	3.6
1	A	105	ARG	3.5
1	A	25	MET	3.4
1	A	46	ASP	3.4
1	A	31	VAL	3.4
1	A	23	ALA	3.3
1	A	64	PRO	3.3

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Mol	Chain	Res	Type	RSRZ
1	A	69	GLY	3.2
1	A	98	LYS	3.2
1	A	33	GLU	3.1
1	A	43	LEU	3.1
1	A	47	LYS	3.1
1	A	102	PHE	3.1
1	A	65	VAL	3.0
1	A	70	ALA	3.0
1	A	361	ALA	2.9
1	A	234	GLY	2.8
1	A	400	SER	2.8
1	A	588	ALA	2.8
1	A	235	PRO	2.8
1	A	101	ASP	2.7
1	A	259	ILE	2.7
1	A	121	ILE	2.7
1	A	395	PRO	2.6
1	A	393	SER	2.6
1	A	260	GLY	2.6
1	A	261	CYS	2.6
1	A	91	PRO	2.6
1	A	236	PHE	2.6
1	A	20	MET	2.5
1	A	77	GLY	2.5
1	A	396	GLY	2.5
1	A	340	LEU	2.4
1	A	26	TYR	2.4
1	A	239	ALA	2.3
1	A	355	GLY	2.3
1	A	24	LYS	2.3
1	A	398	ASP	2.3
1	A	106	GLY	2.3
1	A	55	GLU	2.3
1	A	76	LEU	2.3
1	A	272	LEU	2.2
1	A	57	ALA	2.2
1	A	92	LEU	2.2
1	A	264	ARG	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, 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
3	MPD	A	592	8/8	0.90	0.56	9.18	80,80,80,80	0
3	MPD	A	590	8/8	0.93	0.30	3.41	80,80,81,81	0
3	MPD	A	593	8/8	0.90	0.28	1.45	55,56,56,56	0
2	ACY	A	589	4/4	0.90	0.14	-0.47	77,77,77,77	0
2	ACY	A	596	4/4	0.95	0.36	-	77,77,77,77	0
2	ACY	A	597	4/4	0.82	0.32	-	60,60,60,60	0
2	ACY	A	591	4/4	0.77	0.31	-	67,67,67,68	0
2	ACY	A	594	4/4	0.87	0.26	-	84,84,84,84	0
2	ACY	A	595	4/4	0.82	0.23	-	79,80,80,80	0

6.5 Other polymers (i)

There are no such residues in this entry.