



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 07:30 PM UTC

PDB ID : 4XD7 / pdb_00004xd7
Title : Structure of thermophilic F1-ATPase inhibited by epsilon subunit
Authors : SHIRAKIHARA, Y.; SHIRATORI, A.; TANIKAWA, H.; NAKASAKO, M.;
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Deposited on : 2014-12-19
Resolution : 3.90 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

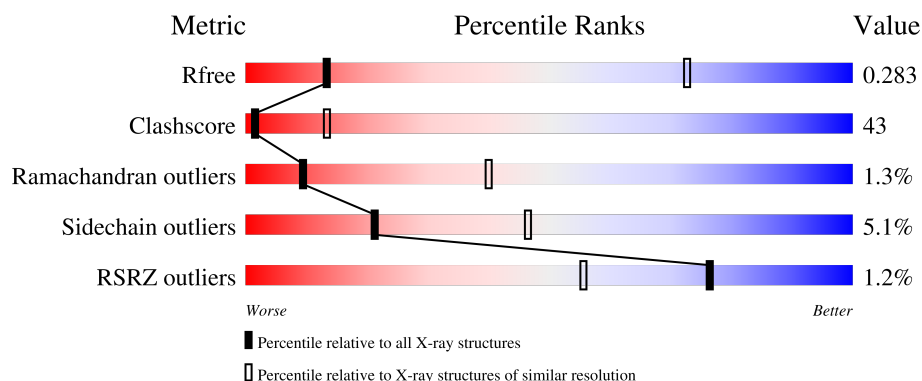
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.90 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}	180053	1270 (4.10-3.70)
Clashscore	190562	1034 (4.08-3.72)
Ramachandran outliers	187476	1251 (4.10-3.70)
Sidechain outliers	187428	1243 (4.10-3.70)
RSRZ outliers	180081	1269 (4.10-3.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	502	% 35% 55% 5%
1	B	502	2% 40% 42% 16%
1	C	502	41% 48% 5% 5%
2	D	483	% 46% 49% 5% 5%
2	E	483	% 42% 51% 5% 5%

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Mol	Chain	Length	Quality of chain
2	F	483	% 51% 42% • •
3	G	285	2% 34% 46% 8% • 11%
4	H	133	5% 41% 47% 8% •

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
5	SO4	A	700	-	-	X	-

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 22656 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 ATP synthase subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	477	Total	C	N	O	Se	0	0	0
			3462	2189	606	658	9			
1	B	423	Total	C	N	O	Se	0	0	0
			2833	1786	484	554	9			
1	C	475	Total	C	N	O	Se	1	0	0
			3329	2109	577	634	9			

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	193	SER	CYS	conflict	UNP Q5KUJ1
A	254	LYS	GLN	conflict	UNP Q5KUJ1
A	463	PHE	TRP	conflict	UNP Q5KUJ1
B	193	SER	CYS	conflict	UNP Q5KUJ1
B	254	LYS	GLN	conflict	UNP Q5KUJ1
B	463	PHE	TRP	conflict	UNP Q5KUJ1
C	193	SER	CYS	conflict	UNP Q5KUJ1
C	254	LYS	GLN	conflict	UNP Q5KUJ1
C	463	PHE	TRP	conflict	UNP Q5KUJ1

- Molecule 2 is a protein called ATP synthase subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	470	Total	C	N	O	Se	1	0	0
			3480	2199	599	669	13			
2	E	469	Total	C	N	O	Se	0	0	0
			3484	2198	598	676	12			
2	F	464	Total	C	N	O	Se	4	0	0
			3334	2097	580	644	13			

There are 33 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	-9	MSE	-	initiating methionine	UNP Q5KUJ3
D	-8	HIS	-	expression tag	UNP Q5KUJ3
D	-7	HIS	-	expression tag	UNP Q5KUJ3
D	-6	HIS	-	expression tag	UNP Q5KUJ3
D	-5	HIS	-	expression tag	UNP Q5KUJ3
D	-4	HIS	-	expression tag	UNP Q5KUJ3
D	-3	HIS	-	expression tag	UNP Q5KUJ3
D	-2	HIS	-	expression tag	UNP Q5KUJ3
D	-1	HIS	-	expression tag	UNP Q5KUJ3
D	0	HIS	-	expression tag	UNP Q5KUJ3
D	1	HIS	-	expression tag	UNP Q5KUJ3
E	-9	MSE	-	initiating methionine	UNP Q5KUJ3
E	-8	HIS	-	expression tag	UNP Q5KUJ3
E	-7	HIS	-	expression tag	UNP Q5KUJ3
E	-6	HIS	-	expression tag	UNP Q5KUJ3
E	-5	HIS	-	expression tag	UNP Q5KUJ3
E	-4	HIS	-	expression tag	UNP Q5KUJ3
E	-3	HIS	-	expression tag	UNP Q5KUJ3
E	-2	HIS	-	expression tag	UNP Q5KUJ3
E	-1	HIS	-	expression tag	UNP Q5KUJ3
E	0	HIS	-	expression tag	UNP Q5KUJ3
E	1	HIS	-	expression tag	UNP Q5KUJ3
F	-9	MSE	-	initiating methionine	UNP Q5KUJ3
F	-8	HIS	-	expression tag	UNP Q5KUJ3
F	-7	HIS	-	expression tag	UNP Q5KUJ3
F	-6	HIS	-	expression tag	UNP Q5KUJ3
F	-5	HIS	-	expression tag	UNP Q5KUJ3
F	-4	HIS	-	expression tag	UNP Q5KUJ3
F	-3	HIS	-	expression tag	UNP Q5KUJ3
F	-2	HIS	-	expression tag	UNP Q5KUJ3
F	-1	HIS	-	expression tag	UNP Q5KUJ3
F	0	HIS	-	expression tag	UNP Q5KUJ3
F	1	HIS	-	expression tag	UNP Q5KUJ3

- Molecule 3 is a protein called ATP synthase gamma chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	G	254	Total	C	N	O	S	Se	0	0
			1797	1142	308	339	1	7		0

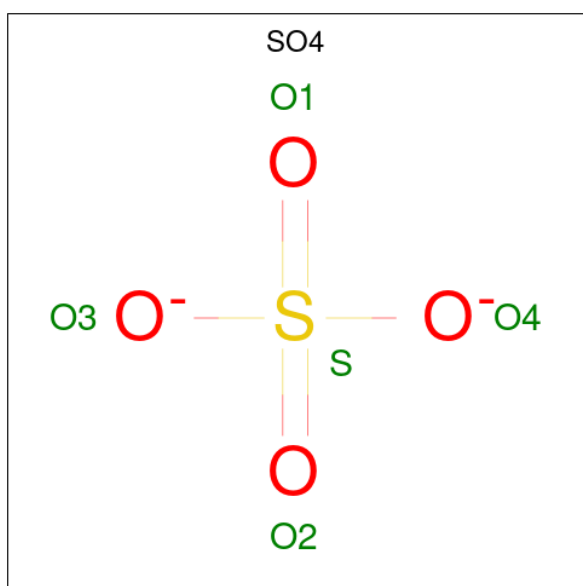
There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	109	CYS	SER	conflict	UNP Q5KUJ2

- Molecule 4 is a protein called ATP synthase epsilon chain.

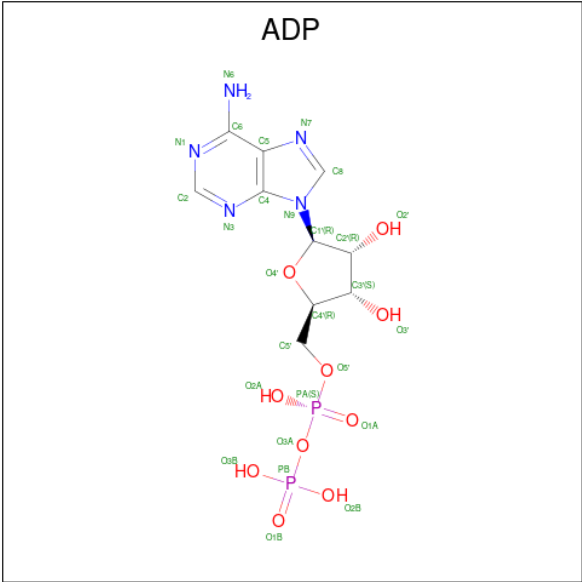
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	H	129	Total	C	N	O	Se	0	0	0
			890	563	148	175	4			

- Molecule 5 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	O	S	0	0
			5	4	1		
5	B	1	Total	O	S	0	0
			5	4	1		
5	D	1	Total	O	S	0	0
			5	4	1		
5	E	1	Total	O	S	0	0
			5	4	1		

- Molecule 6 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂).

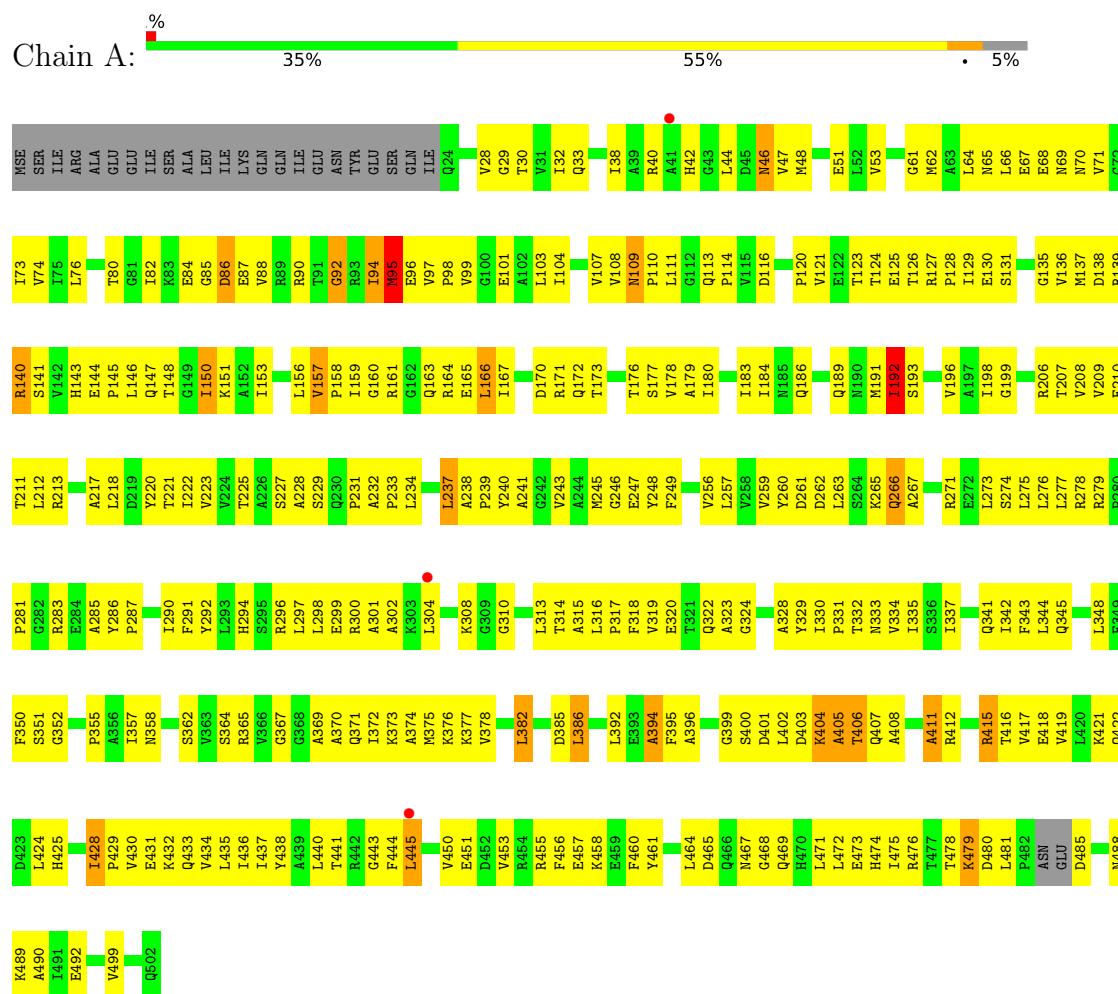


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	F	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

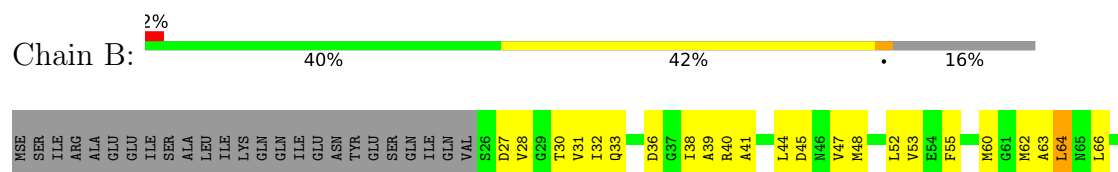
3 Residue-property plots

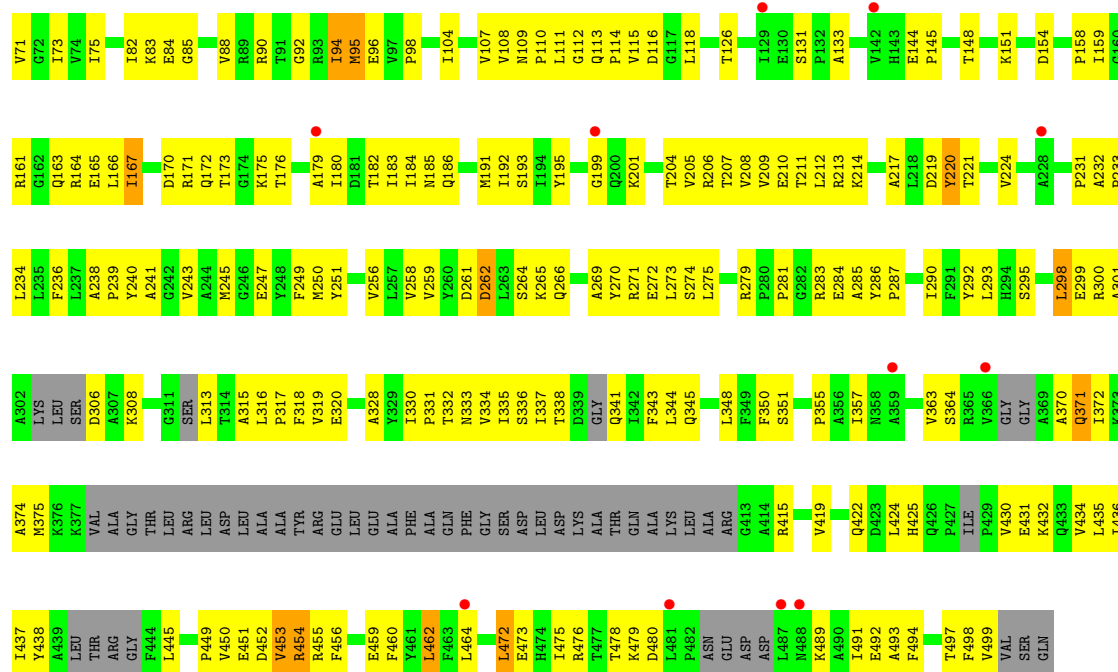
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: ATP synthase subunit alpha



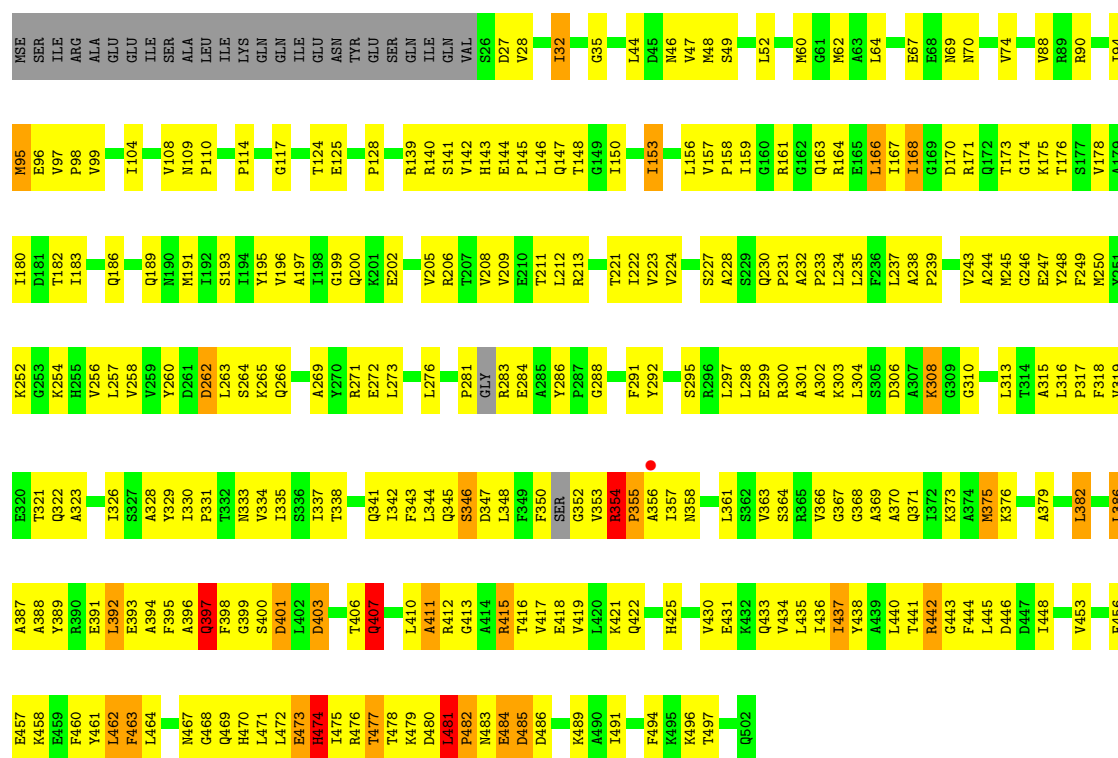
• Molecule 1: ATP synthase subunit alpha





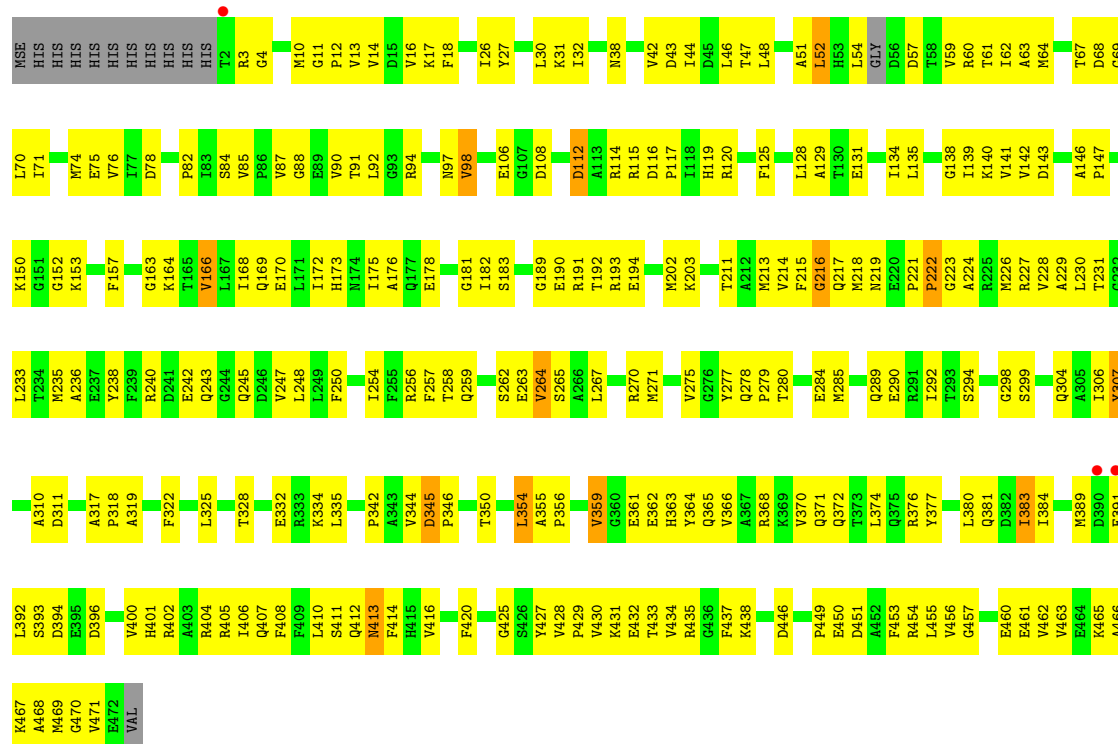
• Molecule 1: ATP synthase subunit alpha

Chain C: 41% 48% 5% • 5%

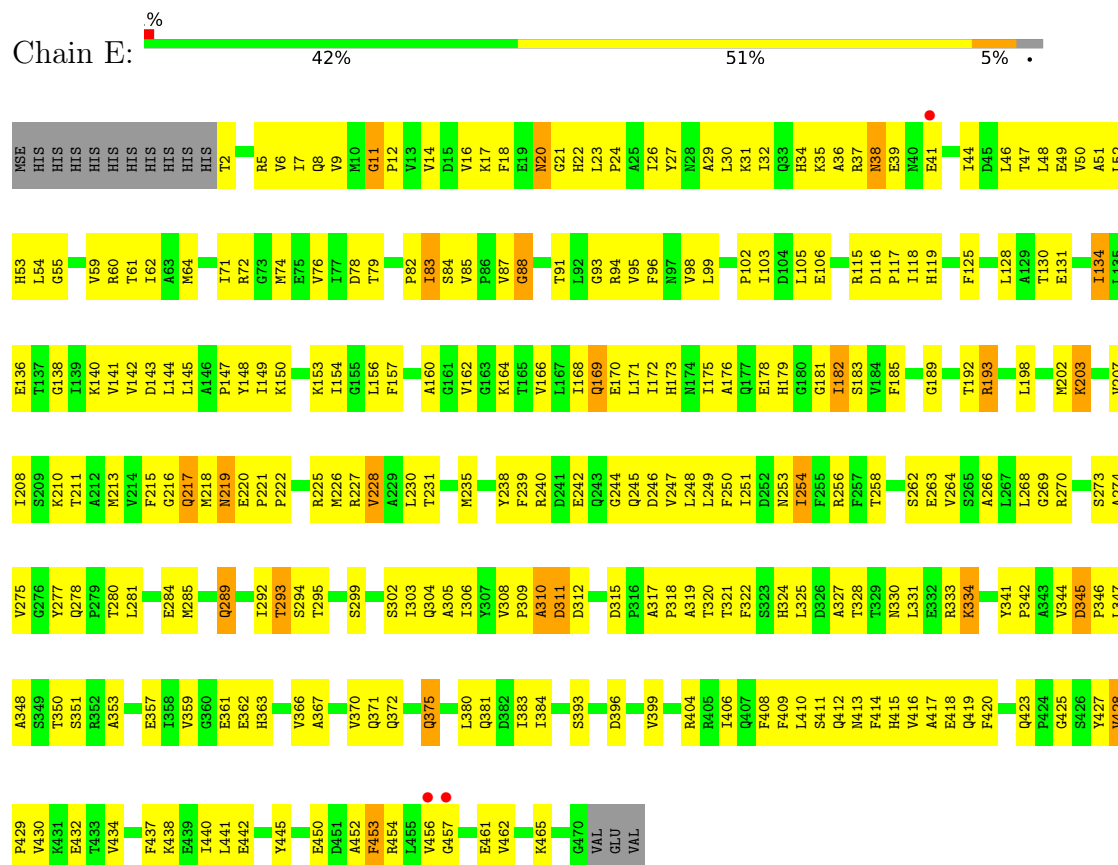


• Molecule 2: ATP synthase subunit beta

Chain D: 46% 49% • •



• Molecule 2: ATP synthase subunit beta



• Molecule 2: ATP synthase subunit beta

4 Data and refinement statistics

Property	Value	Source
Space group	I 41 2 2	Depositor
Cell constants a, b, c, α , β , γ	233.40Å 233.40Å 303.96Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.99 – 3.90 19.99 – 3.90	Depositor EDS
% Data completeness (in resolution range)	99.0 (19.99-3.90) 98.9 (19.99-3.90)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.04 (at 3.71Å)	Xtriage
Refinement program	PHENIX 1.7_650	Depositor
R, R_{free}	0.250 , 0.282 0.252 , 0.283	Depositor DCC
R_{free} test set	2247 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	123.5	Xtriage
Anisotropy	0.167	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.28 , 75.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	22656	wwPDB-VP
Average B, all atoms (Å ²)	122.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.89% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ 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: SO4, ADP

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	0.71	0/3496	1.15	16/4711 (0.3%)
1	B	0.64	0/2853	1.10	7/3840 (0.2%)
1	C	0.68	0/3367	1.15	22/4526 (0.5%)
2	D	0.69	0/3519	1.07	7/4735 (0.1%)
2	E	0.69	0/3524	1.11	13/4751 (0.3%)
2	F	0.59	0/3362	1.03	12/4504 (0.3%)
3	G	0.82	0/1808	1.28	22/2435 (0.9%)
4	H	0.82	0/895	1.28	9/1202 (0.7%)
All	All	0.69	0/22824	1.12	108/30704 (0.4%)

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	C	0	2
2	D	0	2
2	F	0	1
3	G	0	1
All	All	0	6

There are no bond length outliers.

The worst 5 of 108 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	G	115	ILE	N-CA-C	13.32	125.93	108.35
3	G	189	LEU	CA-C-N	11.65	134.40	119.84
3	G	189	LEU	C-N-CA	11.65	134.40	119.84
3	G	186	ARG	N-CA-C	-10.86	95.89	110.55

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	G	114	ALA	N-CA-C	9.13	121.51	110.19

There are no chirality outliers.

5 of 6 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	354	ARG	Peptide
1	C	401	ASP	Peptide
2	D	216	GLY	Peptide
2	D	391	GLU	Peptide
2	F	215	PHE	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	3462	0	3344	336	0
1	B	2833	0	2533	253	0
1	C	3329	0	3032	297	0
2	D	3480	0	3309	284	0
2	E	3484	0	3345	274	0
2	F	3334	0	3069	213	0
3	G	1797	0	1665	207	0
4	H	890	0	833	90	0
5	A	5	0	0	3	0
5	B	5	0	0	1	0
5	D	5	0	0	0	0
5	E	5	0	0	0	0
6	F	27	0	12	1	0
All	All	22656	0	21142	1873	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 43.

The worst 5 of 1873 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:C:262:ASP:H	1:C:318:PHE:HB2	1.05	1.13
1:A:404:LYS:HG3	1:A:405:ALA:H	1.06	1.11
4:H:129:VAL:HG13	4:H:132:MSE:HA	1.33	1.09
2:F:139:ILE:HA	2:F:412:GLN:NE2	1.69	1.07
1:A:32:ILE:HG22	1:A:33:GLN:HG3	1.40	1.04

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	473/502 (94%)	429 (91%)	42 (9%)	2 (0%)	30	64
1	B	403/502 (80%)	357 (89%)	42 (10%)	4 (1%)	12	45
1	C	469/502 (93%)	411 (88%)	51 (11%)	7 (2%)	8	37
2	D	466/483 (96%)	414 (89%)	50 (11%)	2 (0%)	30	64
2	E	463/483 (96%)	418 (90%)	39 (8%)	6 (1%)	9	40
2	F	456/483 (94%)	406 (89%)	46 (10%)	4 (1%)	14	47
3	G	242/285 (85%)	193 (80%)	38 (16%)	11 (4%)	2	19
4	H	123/133 (92%)	108 (88%)	12 (10%)	3 (2%)	4	29
All	All	3095/3373 (92%)	2736 (88%)	320 (10%)	39 (1%)	9	40

5 of 39 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	371	GLN
1	C	354	ARG
2	D	393	SER
2	E	311	ASP
3	G	143	GLN

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	332/402 (83%)	312 (94%)	20 (6%)	17	44
1	B	242/402 (60%)	233 (96%)	9 (4%)	30	53
1	C	291/402 (72%)	274 (94%)	17 (6%)	18	44
2	D	333/385 (86%)	318 (96%)	15 (4%)	24	49
2	E	349/385 (91%)	330 (95%)	19 (5%)	20	46
2	F	309/385 (80%)	301 (97%)	8 (3%)	40	60
3	G	157/231 (68%)	144 (92%)	13 (8%)	10	34
4	H	78/104 (75%)	72 (92%)	6 (8%)	12	37
All	All	2091/2696 (78%)	1984 (95%)	107 (5%)	21	46

5 of 107 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	D	354	LEU
2	E	254	ILE
3	G	241	MSE
2	D	413	ASN
2	E	182	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 34 such sidechains are listed below:

Mol	Chain	Res	Type
2	F	200	HIS
2	F	324	HIS
3	G	263	ASN
1	C	433	GLN
1	C	407	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

5 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	$\# Z > 2$
5	SO4	D	700	-	4,4,4	0.26	0	6,6,6	0.20	0
5	SO4	B	700	-	4,4,4	0.28	0	6,6,6	0.23	0
5	SO4	E	700	-	4,4,4	0.28	0	6,6,6	0.21	0
5	SO4	A	700	-	4,4,4	0.27	0	6,6,6	0.34	0
6	ADP	F	600	-	28,29,29	1.50	5 (17%)	43,45,45	1.84	8 (18%)

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
6	ADP	F	600	-	-	8/16/32/32	0/3/3/3

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	F	600	ADP	C5-C4	4.93	1.47	1.39
6	F	600	ADP	PA-O3A	2.65	1.62	1.59
6	F	600	ADP	C5-C6	2.65	1.48	1.41
6	F	600	ADP	C8-N7	2.40	1.36	1.31

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	F	600	ADP	C5-N7	-2.18	1.35	1.39

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	F	600	ADP	C5-C4-N3	-6.00	118.46	126.72
6	F	600	ADP	N3-C4-N9	4.94	135.57	127.17
6	F	600	ADP	C2-N3-C4	3.75	120.98	111.83
6	F	600	ADP	N3-C2-N1	-3.21	123.72	128.58
6	F	600	ADP	C4-C5-N7	-2.92	107.24	110.58

There are no chirality outliers.

5 of 8 torsion outliers are listed below:

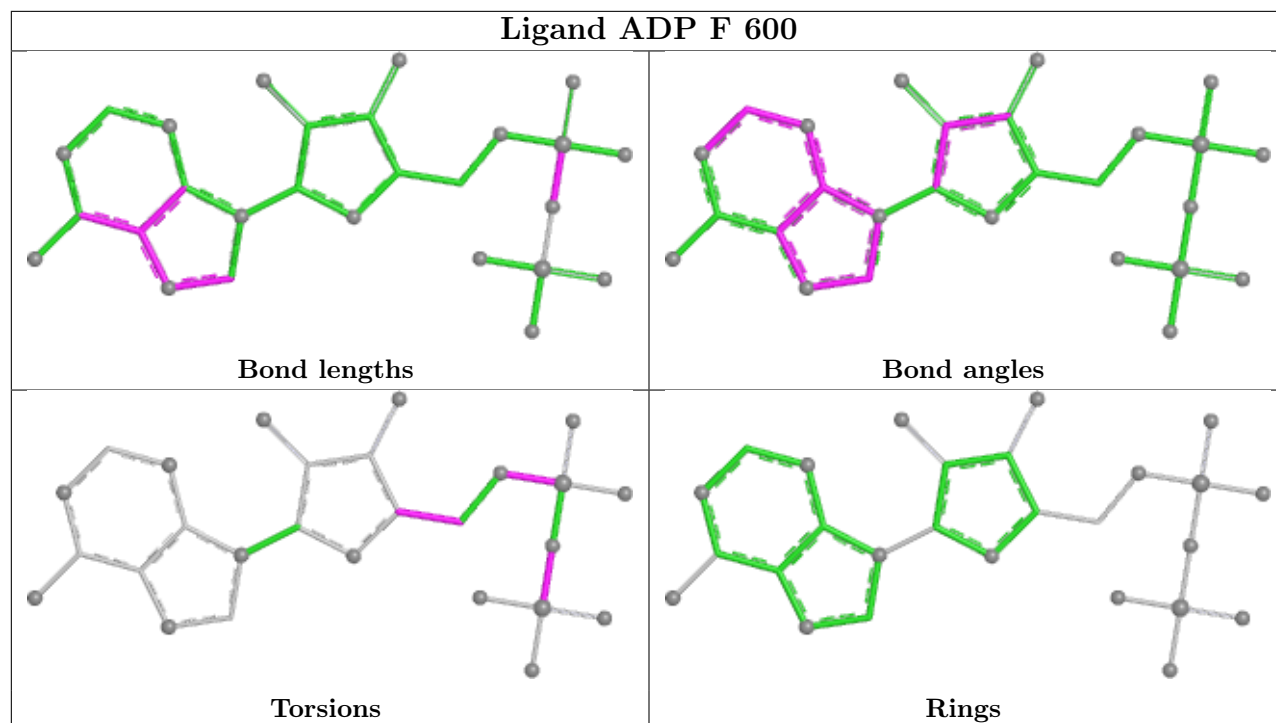
Mol	Chain	Res	Type	Atoms
6	F	600	ADP	PA-O3A-PB-O2B
6	F	600	ADP	PA-O3A-PB-O3B
6	F	600	ADP	C5'-O5'-PA-O2A
6	F	600	ADP	C5'-O5'-PA-O3A
6	F	600	ADP	O4'-C4'-C5'-O5'

There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	700	SO4	1	0
5	A	700	SO4	3	0
6	F	600	ADP	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



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 [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	468/502 (93%)	-0.25	3 (0%) 85 69	63, 97, 156, 240	0
1	B	414/502 (82%)	0.12	11 (2%) 56 39	92, 129, 236, 263	0
1	C	466/502 (92%)	-0.02	1 (0%) 91 81	86, 124, 177, 215	0
2	D	457/483 (94%)	-0.23	3 (0%) 84 67	70, 107, 165, 212	0
2	E	456/483 (94%)	-0.20	3 (0%) 84 67	71, 103, 155, 210	0
2	F	451/483 (93%)	0.00	3 (0%) 84 67	95, 137, 164, 211	0
3	G	247/285 (86%)	0.33	7 (2%) 55 38	80, 134, 182, 199	0
4	H	125/133 (93%)	0.36	6 (4%) 35 27	114, 143, 168, 191	0
All	All	3084/3373 (91%)	-0.05	37 (1%) 76 55	63, 119, 180, 263	0

The worst 5 of 37 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	142	VAL	4.6
4	H	89	ASP	3.6
2	F	420	PHE	3.5
1	B	464	LEU	3.5
3	G	52	VAL	3.4

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](#)

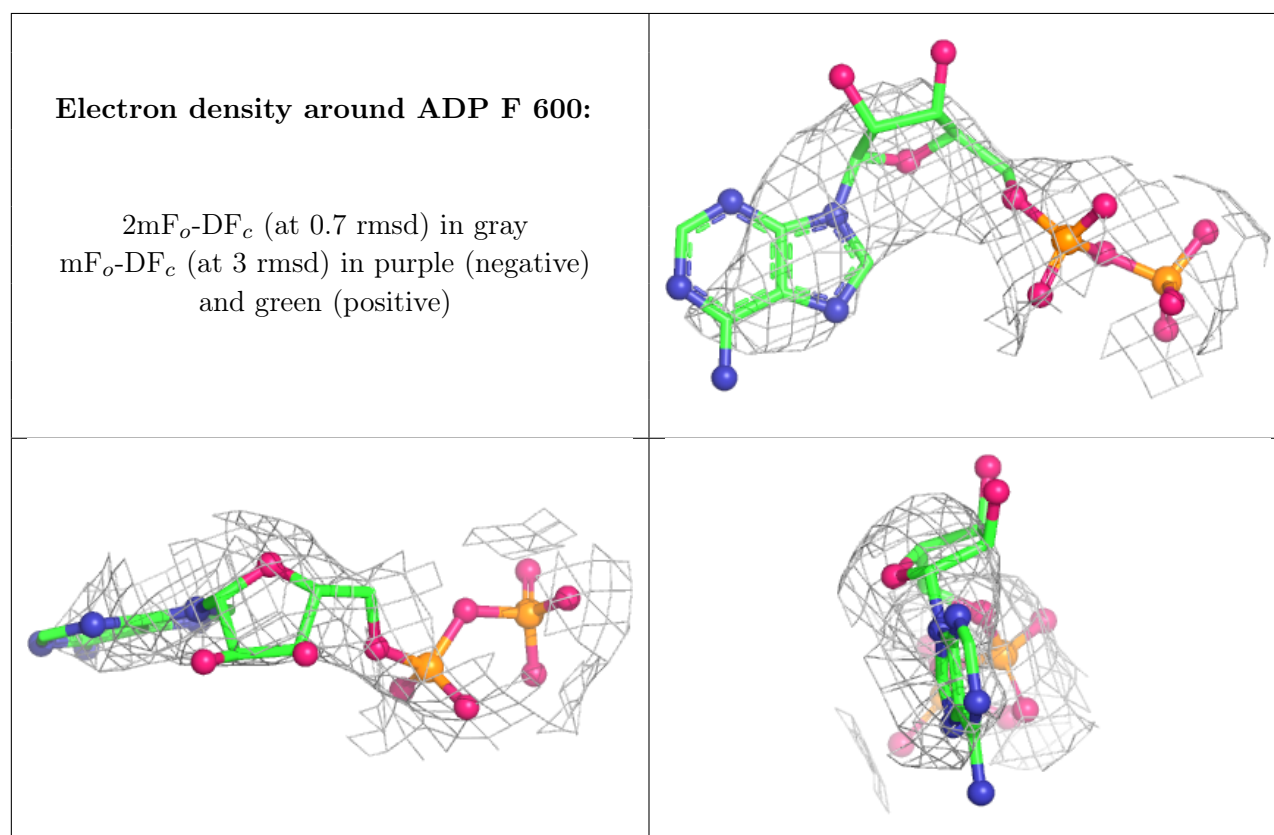
There are no oligosaccharides in this entry.

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
5	SO4	E	700	5/5	0.38	0.21	185,189,190,191	0
5	SO4	D	700	5/5	0.63	0.07	190,192,193,194	0
5	SO4	B	700	5/5	0.63	0.14	187,190,191,194	0
5	SO4	A	700	5/5	0.85	0.18	184,186,190,192	0
6	ADP	F	600	27/27	0.89	0.13	173,198,203,203	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



6.5 Other polymers [i](#)

There are no such residues in this entry.