



# wwPDB X-ray Structure Validation Summary Report

Feb 27, 2014 – 01:07 AM GMT

PDB ID : 3W3A  
Title : Crystal structure of V1-ATPase at 3.9 angstrom resolution  
Authors : Nagamatsu, Y.; Takeda, K.; Kuranaga, T.; Numoto, N.; Miki, K.  
Deposited on : 2012-12-14  
Resolution : 3.90 Å(reported)

This is a wwPDB validation summary report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

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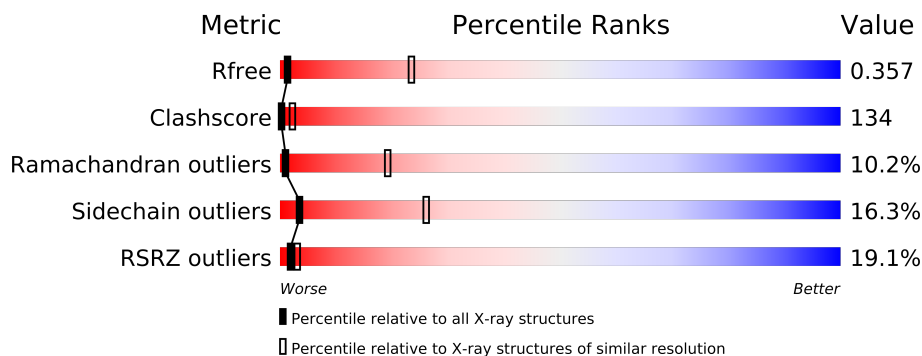
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.15 2013
Xtriage (Phenix)	:	dev-1323
EDS	:	stable22639
Percentile statistics	:	21963
Refmac	:	5.8.0049
CCP4	:	6.3.0 (Settle)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP)	:	stable22683

# 1 Overall quality at a glance

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.



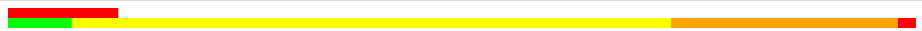
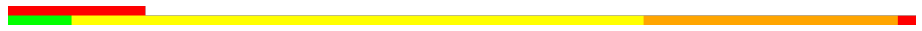
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	66092	1022 (4.38-3.42)
Clashscore	79885	1173 (4.30-3.50)
Ramachandran outliers	78287	1118 (4.30-3.50)
Sidechain outliers	78261	1107 (4.30-3.50)
RSRZ outliers	66119	1000 (4.36-3.44)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	577	
1	B	577	
1	C	577	
1	I	577	
1	J	577	
1	K	577	
2	D	457	
2	E	457	
2	F	457	
2	L	457	
2	M	457	
2	N	457	
3	G	210	
3	O	210	

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Mol	Chain	Length	Quality of chain
4	H	100	
4	P	100	

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 53224 atoms, of which 0 are hydrogen and 0 are deuterium.

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	577	Total	C	N	O	S	0	0	0
			4473	2854	762	835	22			
1	B	577	Total	C	N	O	S	0	0	0
			4473	2854	762	835	22			
1	C	577	Total	C	N	O	S	0	0	0
			4473	2854	762	835	22			
1	I	577	Total	C	N	O	S	0	0	0
			4473	2854	762	835	22			
1	J	577	Total	C	N	O	S	0	0	0
			4473	2854	762	835	22			
1	K	577	Total	C	N	O	S	0	0	0
			4473	2854	762	835	22			

- Molecule 2 is a protein called V-type ATP synthase beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	457	Total	C	N	O	S	0	0	0
			3579	2266	618	685	10			
2	E	457	Total	C	N	O	S	0	0	0
			3579	2266	618	685	10			
2	F	457	Total	C	N	O	S	0	0	0
			3579	2266	618	685	10			
2	L	457	Total	C	N	O	S	0	0	0
			3579	2266	618	685	10			
2	M	457	Total	C	N	O	S	0	0	0
			3579	2266	618	685	10			
2	N	457	Total	C	N	O	S	0	0	0
			3579	2266	618	685	10			

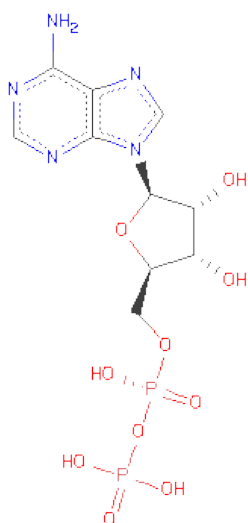
- Molecule 3 is a protein called V-type ATP synthase subunit D.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	G	210	Total	C	N	O	S	0	0	0
			1643	1033	307	301	2			
3	O	210	Total	C	N	O	S	0	0	0
			1643	1033	307	301	2			

- Molecule 4 is a protein called V-type ATP synthase subunit F.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	H	100	Total	C	N	O	S	0	0	0
			759	479	131	146	3			
4	P	100	Total	C	N	O	S	0	0	0
			759	479	131	146	3			

- Molecule 5 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula:  $C_{10}H_{15}N_5O_{10}P_2$ ).



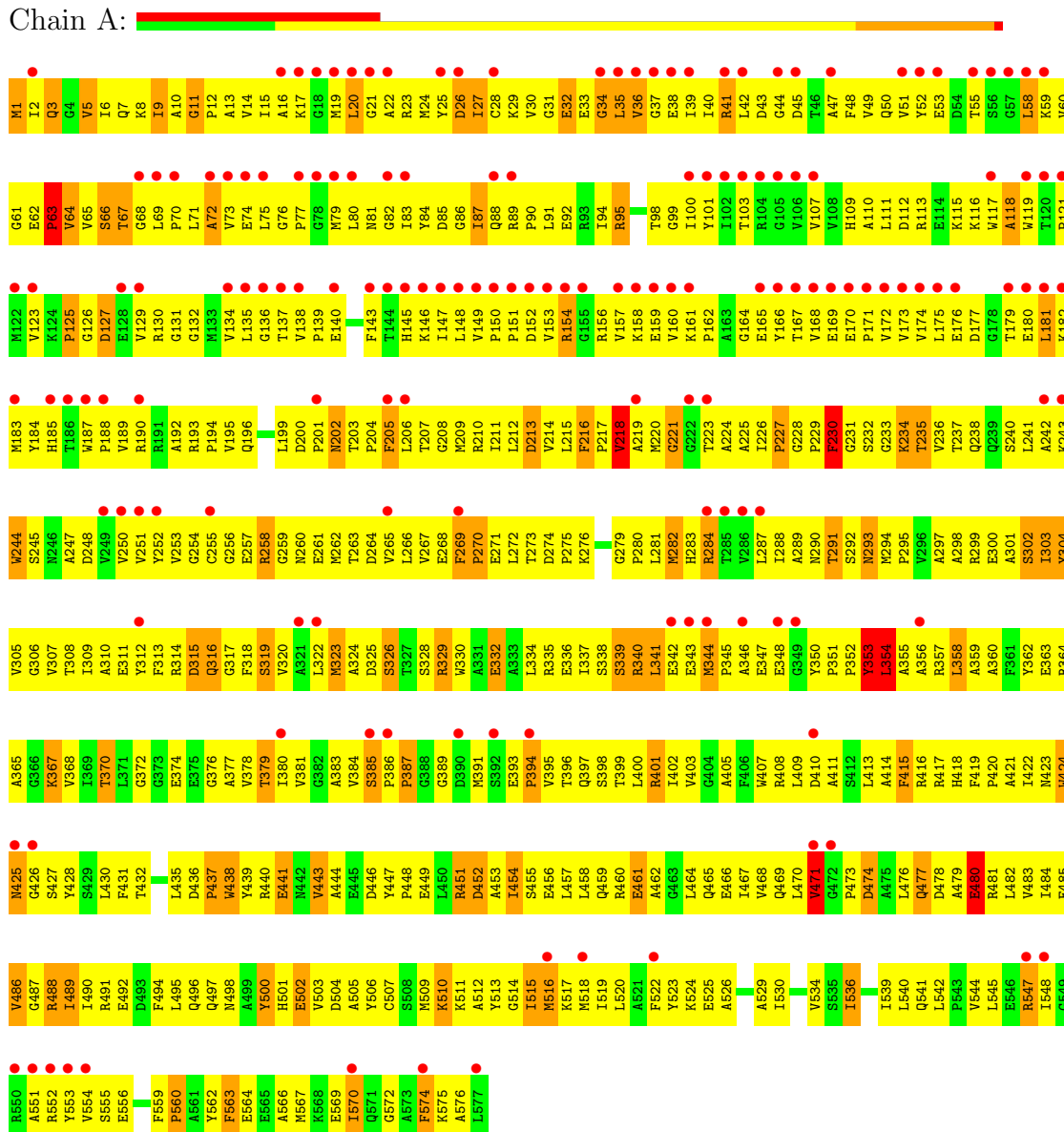
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
5	C	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
5	I	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
5	K	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

### 3 Residue-property plots

These plots are drawn for all protein, RNA 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.

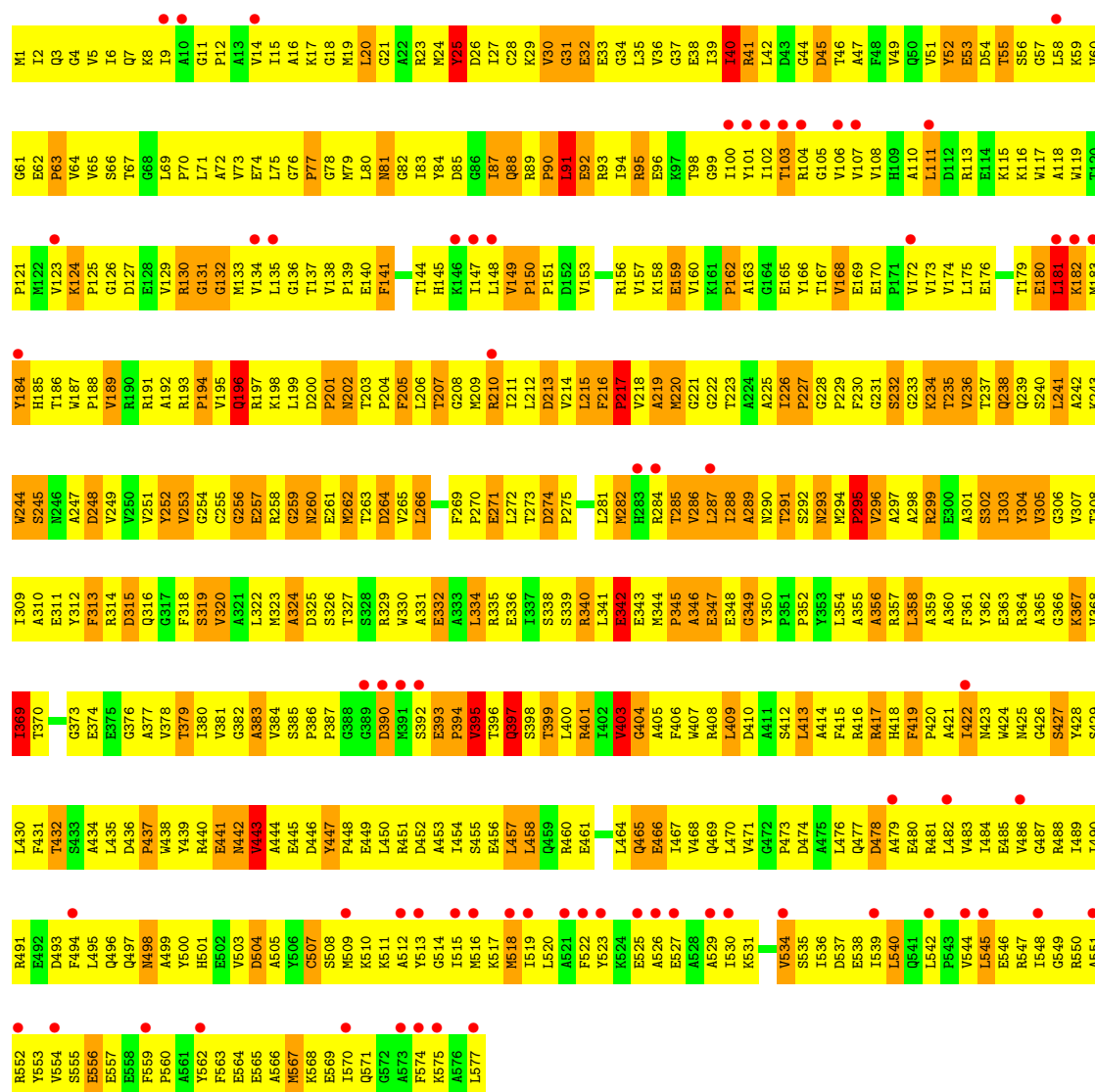
#### • Molecule 1: V-type ATP synthase alpha chain

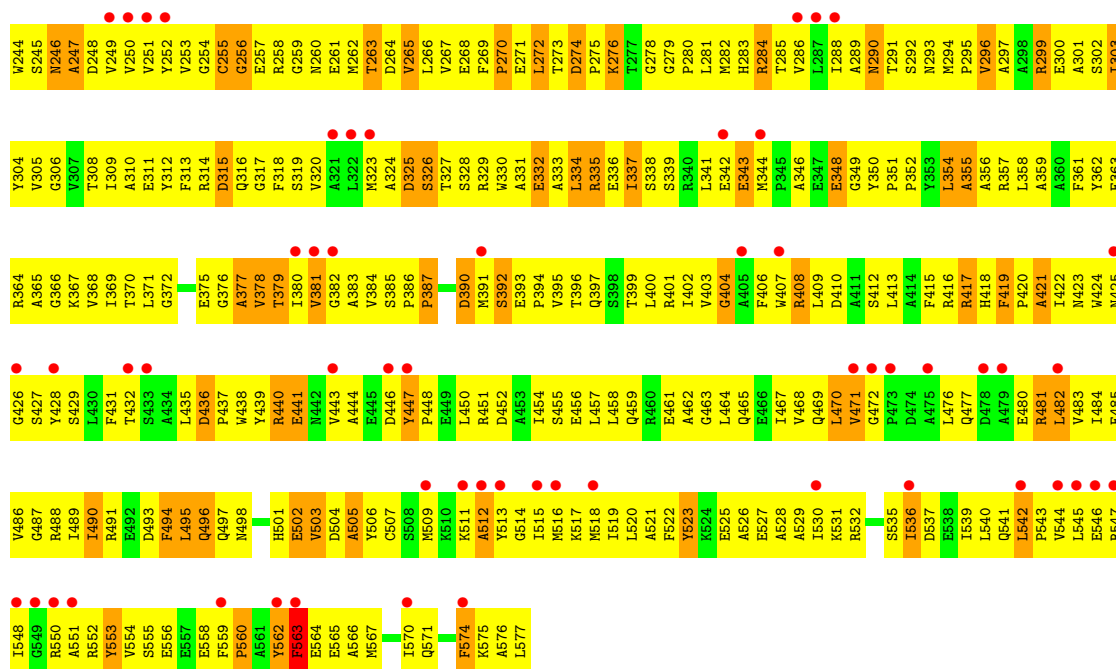
Chain A:



#### • Molecule 1: V-type ATP synthase alpha chain

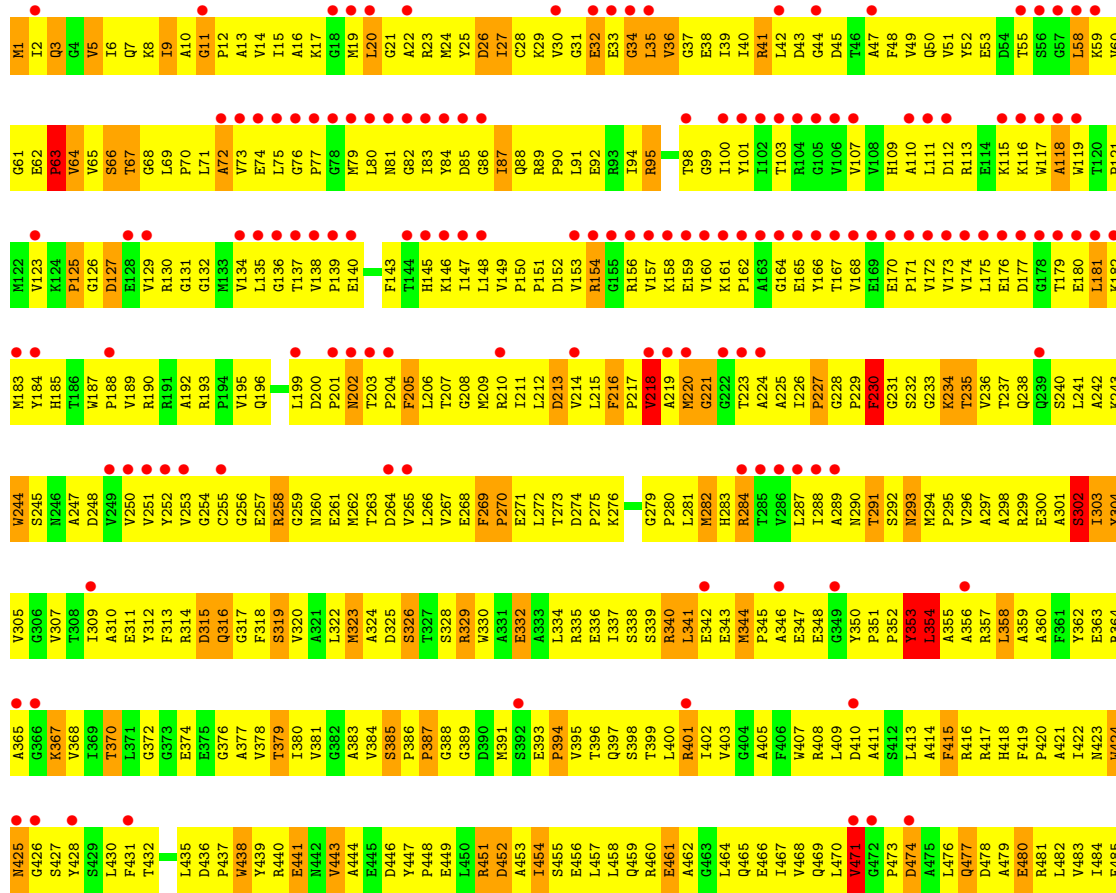
Chain B:



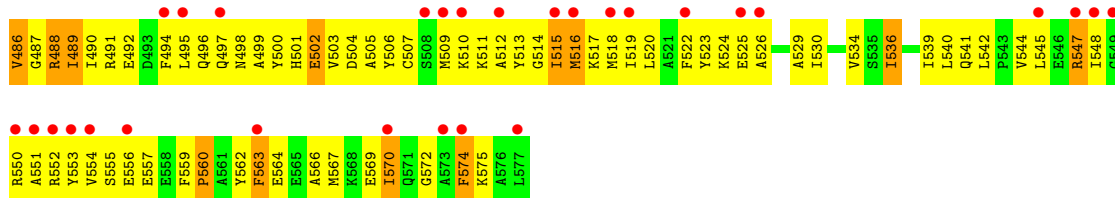


## • Molecule 1: V-type ATP synthase alpha chain

Chain I:

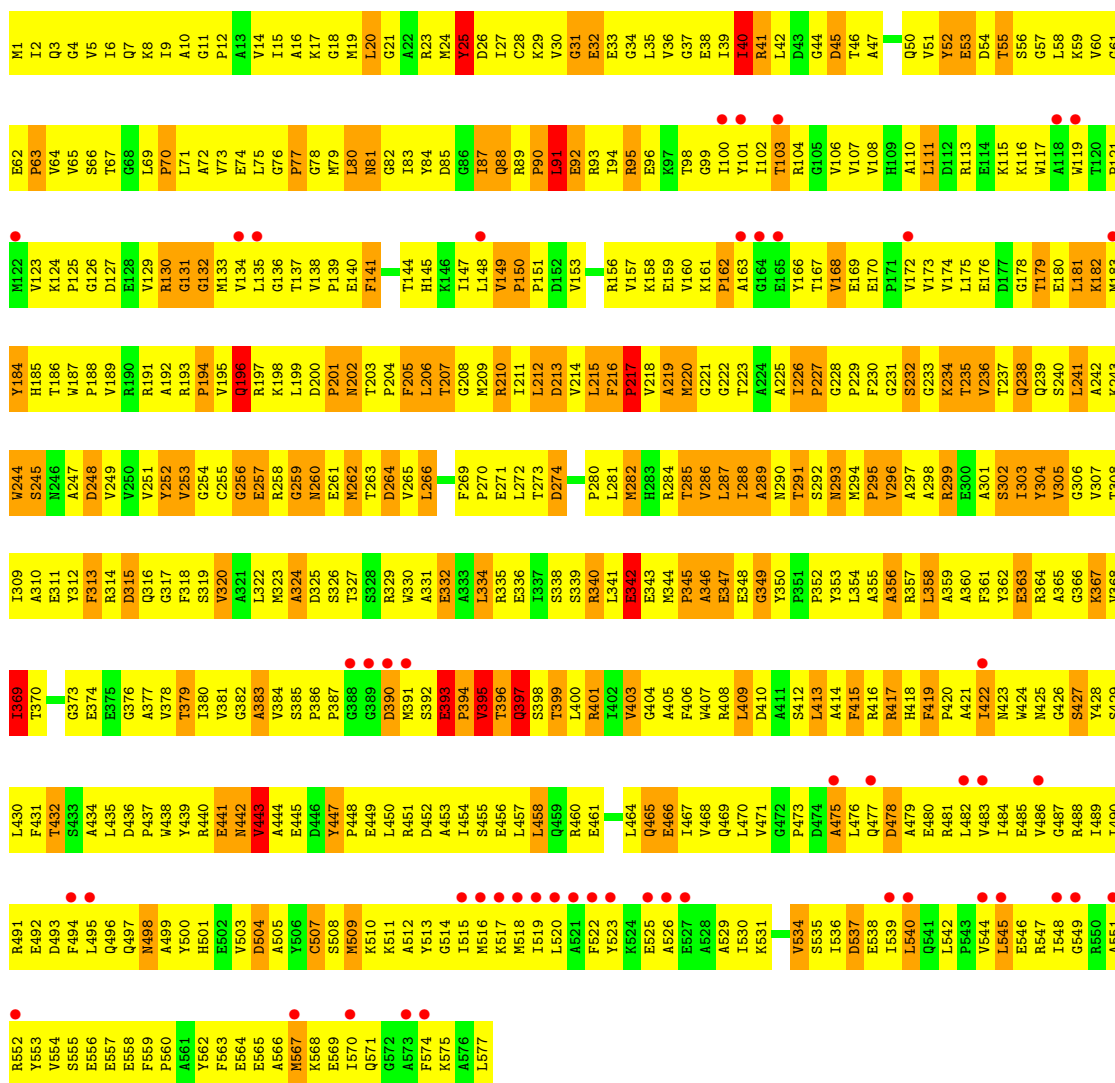






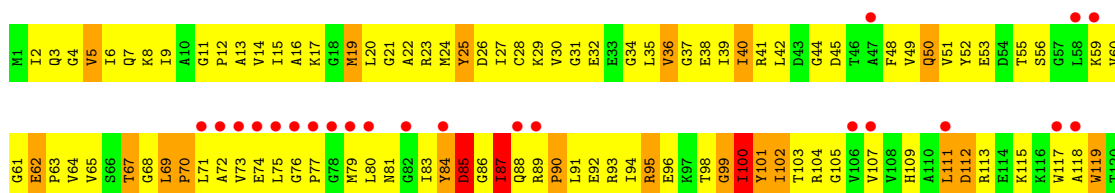
● Molecule 1: V-type ATP synthase alpha chain

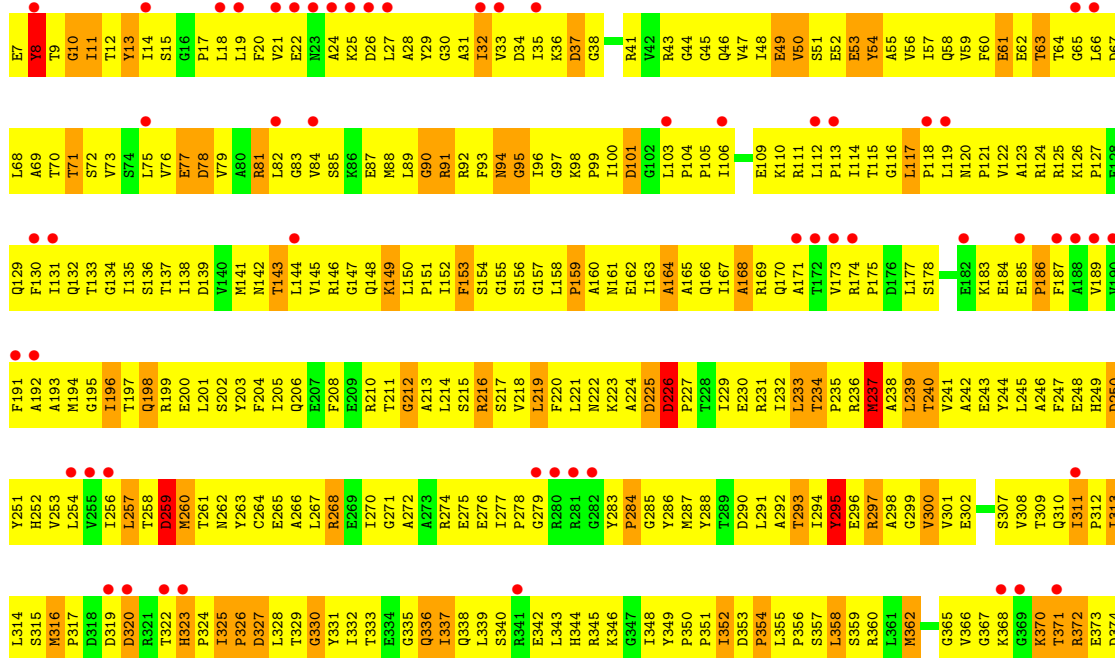
Chain J:

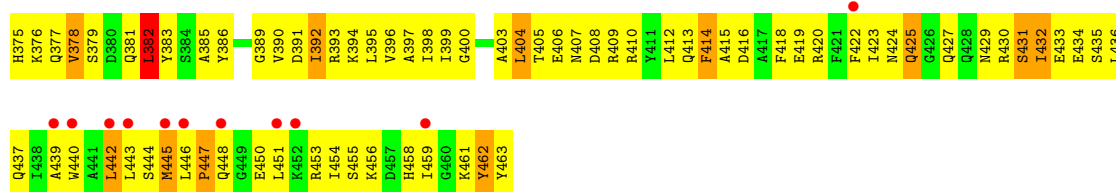


● Molecule 1: V-type ATP synthase alpha chain

Chain K:

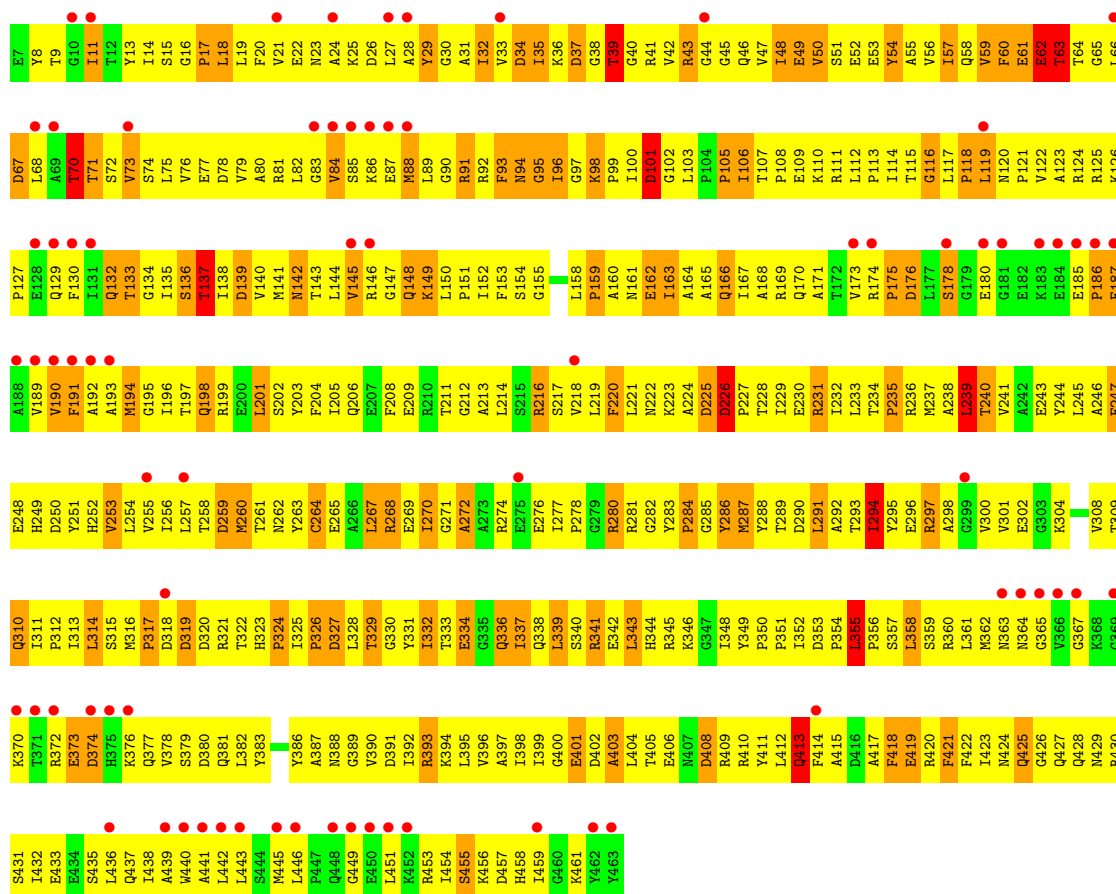






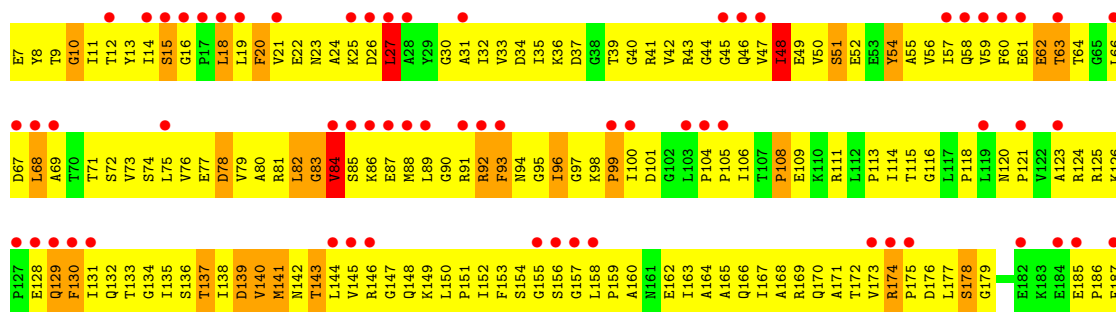
### • Molecule 2: V-type ATP synthase beta chain

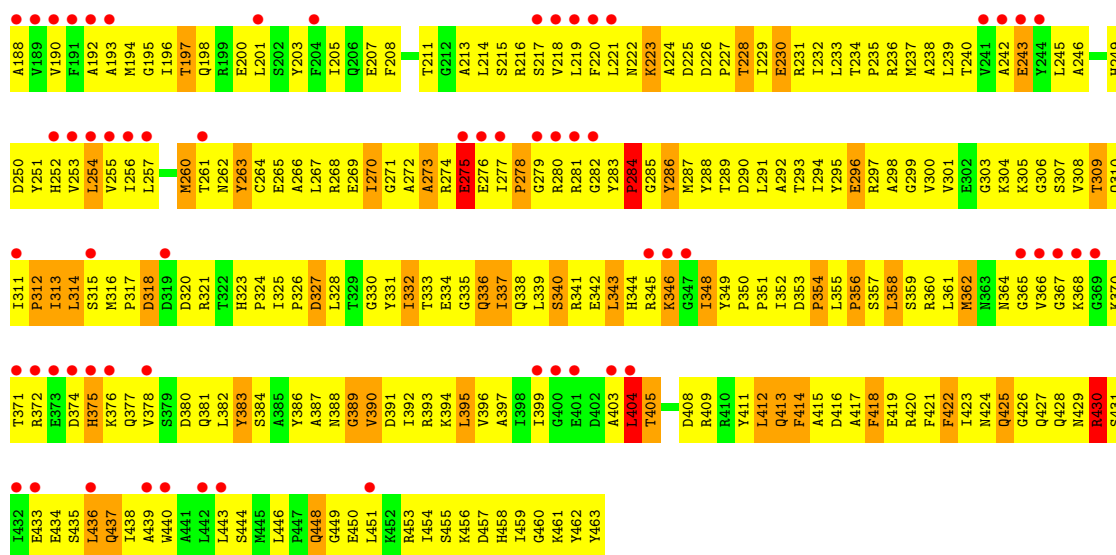
Chain E:



### • Molecule 2: V-type ATP synthase beta chain

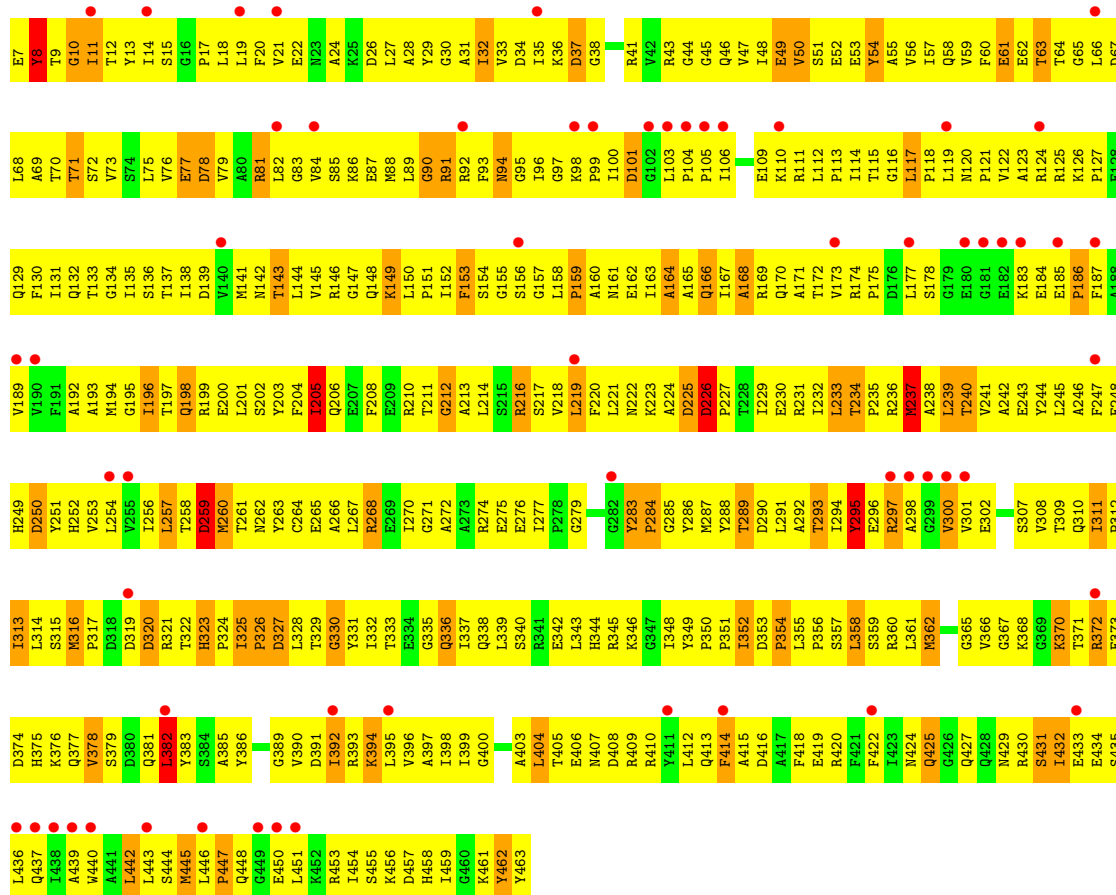
Chain F:





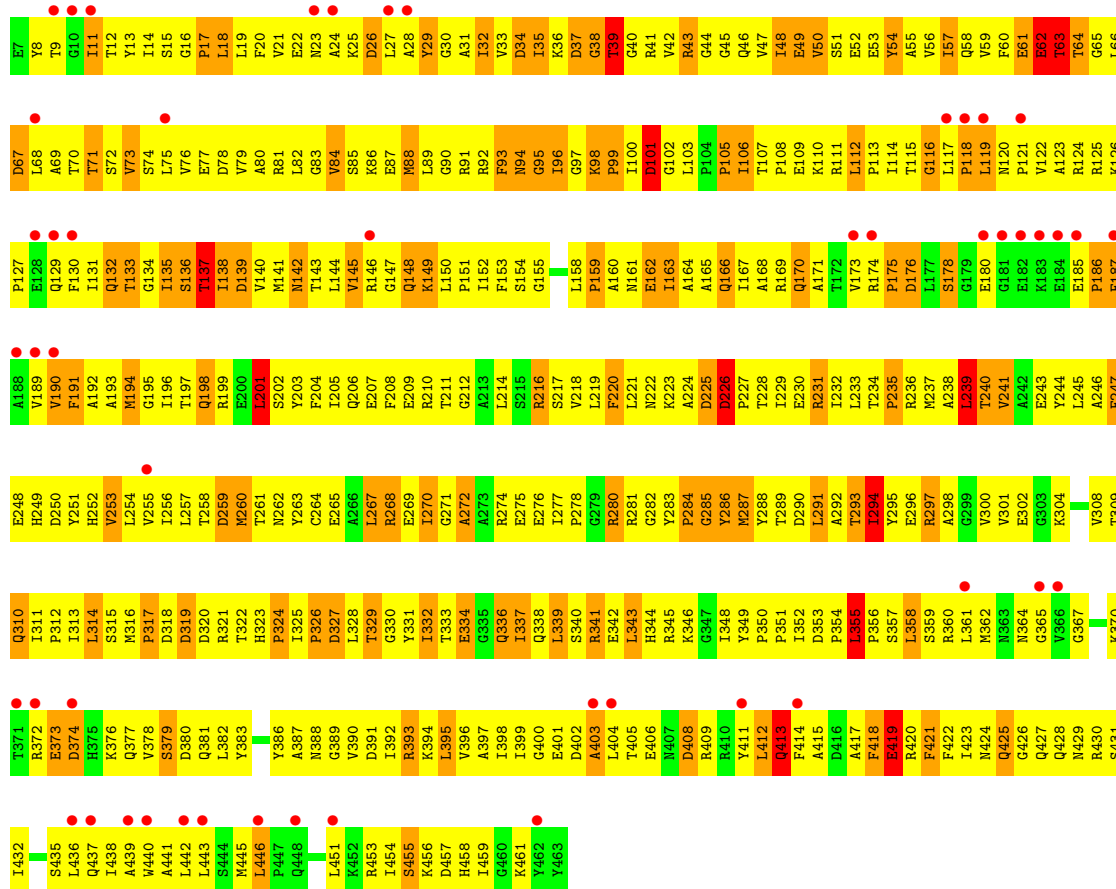
### • Molecule 2: V-type ATP synthase beta chain

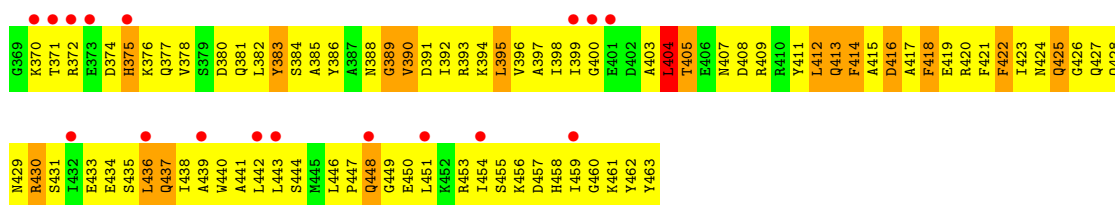
Chain L:



### • Molecule 2: V-type ATP synthase beta chain

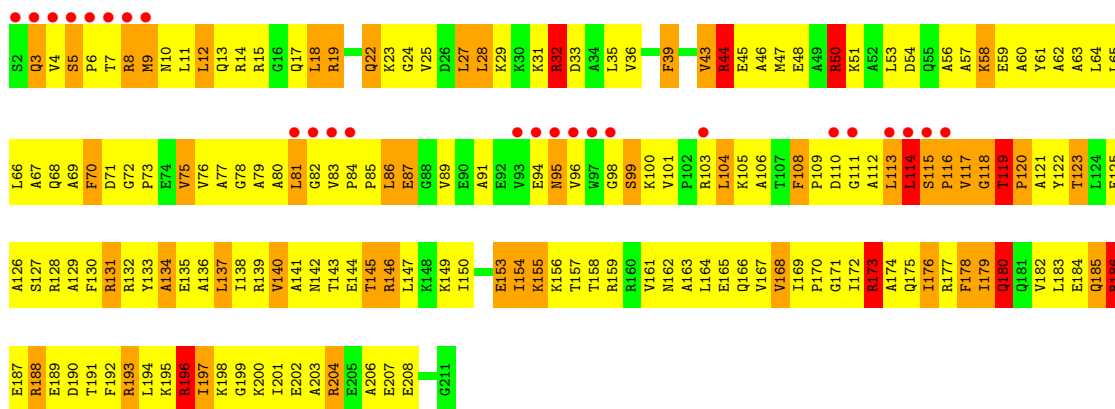
Chain M:





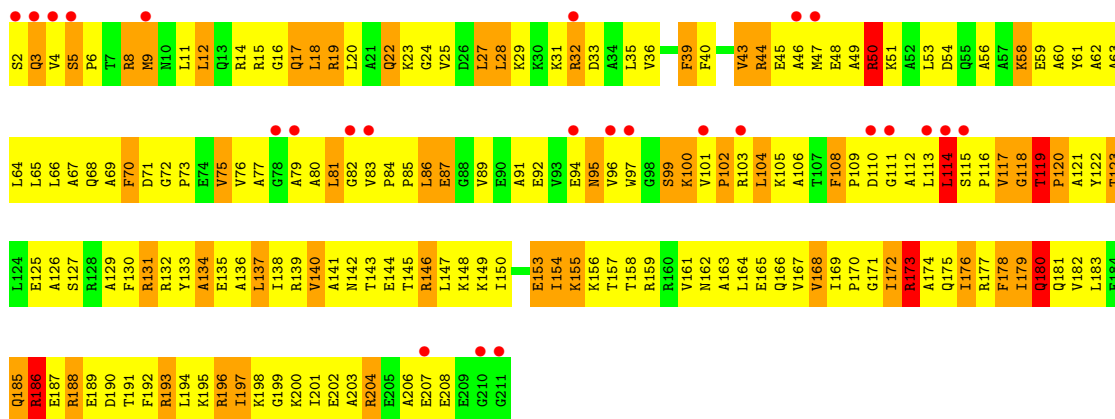
• Molecule 3: V-type ATP synthase subunit D

Chain G:



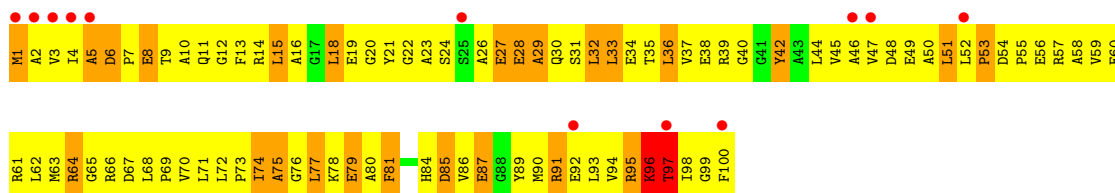
• Molecule 3: V-type ATP synthase subunit D

Chain O:



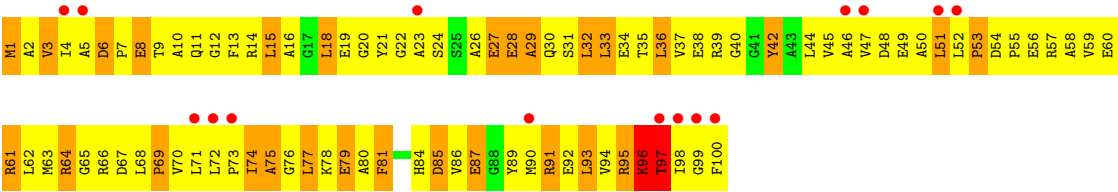
• Molecule 4: V-type ATP synthase subunit F

Chain H:



• Molecule 4: V-type ATP synthase subunit F

Chain P:



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 3 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	382.14Å 382.14Å 148.25Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	49.90 – 3.90 67.65 – 3.90	Depositor EDS
% Data completeness (in resolution range)	90.2 (49.90-3.90) 90.2 (67.65-3.90)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.10	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.99 (at 3.89Å)	Xtriage
Refinement program	CNS 1.3	Depositor
R, $R_{free}$	0.328 , 0.381 0.329 , 0.357	Depositor DCC
$R_{free}$ test set	No test flags present.	DCC
Wilson B-factor (Å <sup>2</sup> )	139.2	Xtriage
Anisotropy	0.123	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 1209.6	EDS
Estimated twinning fraction	0.197 for -h,-k,l	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.32$ , $\langle L^2 \rangle = 0.15$	Xtriage
Outliers	0 of 101559 reflections	Xtriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	53224	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	341.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.19% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.



## 5 Model quality ⓘ

### 5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.51	1/4569 (0.0%)	0.68	1/6198 (0.0%)
1	B	0.62	0/4569	0.86	4/6198 (0.1%)
1	C	0.54	1/4569 (0.0%)	0.72	1/6198 (0.0%)
1	I	0.49	0/4569	0.68	2/6198 (0.0%)
1	J	0.65	2/4569 (0.0%)	0.87	4/6198 (0.1%)
1	K	0.55	1/4569 (0.0%)	0.73	4/6198 (0.1%)
2	D	0.48	0/3646	0.69	1/4938 (0.0%)
2	E	0.54	0/3646	0.76	2/4938 (0.0%)
2	F	0.48	0/3646	0.71	1/4938 (0.0%)
2	L	0.47	0/3646	0.70	1/4938 (0.0%)
2	M	0.58	0/3646	0.78	4/4938 (0.1%)
2	N	0.47	0/3646	0.71	2/4938 (0.0%)
3	G	0.60	0/1663	1.39	24/2235 (1.1%)
3	O	0.55	0/1663	1.42	23/2235 (1.0%)
4	H	0.65	0/770	1.27	6/1040 (0.6%)
4	P	0.58	0/770	1.26	7/1040 (0.7%)
All	All	0.54	5/54156 (0.0%)	0.82	87/73366 (0.1%)

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
2	L	0	1
2	N	0	2
All	All	0	3

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	255	CYS	CB-SG	8.86	1.97	1.82
1	A	576	ALA	CA-CB	-6.14	1.39	1.52
1	K	255	CYS	CB-SG	5.70	1.92	1.82
1	J	393	GLU	CB-CG	5.61	1.62	1.52
1	J	475	ALA	CA-CB	-5.24	1.41	1.52

The worst 5 of 87 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	O	50	ARG	NE-CZ-NH2	-15.90	112.35	120.30
3	O	50	ARG	NE-CZ-NH1	15.14	127.87	120.30
3	O	44	ARG	NE-CZ-NH1	-15.05	112.78	120.30
4	P	91	ARG	NE-CZ-NH2	-14.47	113.07	120.30
3	O	32	ARG	NE-CZ-NH2	-14.40	113.10	120.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	L	283	TYR	Sidechain
2	N	283	TYR	Sidechain
2	N	331	TYR	Sidechain

## 5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4473	0	4491	1133	0
1	B	4473	0	4491	1334	0
1	C	4473	0	4491	1201	0
1	I	4473	0	4491	1159	0
1	J	4473	0	4491	1418	1
1	K	4473	0	4491	1186	0
2	D	3579	0	3598	900	0
2	E	3579	0	3598	1188	0
2	F	3579	0	3598	945	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	L	3579	0	3598	917	0
2	M	3579	0	3598	1207	0
2	N	3579	0	3598	990	0
3	G	1643	0	1718	509	0
3	O	1643	0	1718	512	0
4	H	759	0	764	279	0
4	P	759	0	764	295	0
5	A	27	0	12	32	0
5	C	27	0	12	19	0
5	I	27	0	12	32	0
5	K	27	0	12	23	0
All	All	53224	0	53546	14280	1

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 134.

The worst 5 of 14280 close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:J:475:ALA:CB	4:P:98:ILE:HB	1.37	1.50
1:J:475:ALA:HB2	4:P:98:ILE:CB	1.42	1.47
2:L:322:THR:HG21	3:O:15:ARG:NH1	1.51	1.25
2:E:94:ASN:HD22	2:E:95:GLY:N	1.34	1.24
2:M:94:ASN:HD22	2:M:95:GLY:N	1.36	1.24

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:J:156:ARG:NH1	1:J:156:ARG:NH1[5_555]	1.86	0.34

## 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	575/577 (100%)	431 (75%)	96 (17%)	48 (8%)	1 27

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	575/577 (100%)	370 (64%)	134 (23%)	71 (12%)	1	14
1	C	575/577 (100%)	423 (74%)	98 (17%)	54 (9%)	1	23
1	I	575/577 (100%)	426 (74%)	103 (18%)	46 (8%)	1	28
1	J	575/577 (100%)	367 (64%)	137 (24%)	71 (12%)	1	14
1	K	575/577 (100%)	423 (74%)	104 (18%)	48 (8%)	1	27
2	D	455/457 (100%)	305 (67%)	108 (24%)	42 (9%)	1	24
2	E	455/457 (100%)	302 (66%)	98 (22%)	55 (12%)	1	14
2	F	455/457 (100%)	315 (69%)	98 (22%)	42 (9%)	1	24
2	L	455/457 (100%)	306 (67%)	109 (24%)	40 (9%)	1	25
2	M	455/457 (100%)	298 (66%)	95 (21%)	62 (14%)	0	11
2	N	455/457 (100%)	318 (70%)	94 (21%)	43 (10%)	1	22
3	G	208/210 (99%)	147 (71%)	38 (18%)	23 (11%)	1	16
3	O	208/210 (99%)	145 (70%)	40 (19%)	23 (11%)	1	16
4	H	98/100 (98%)	66 (67%)	20 (20%)	12 (12%)	1	14
4	P	98/100 (98%)	63 (64%)	24 (24%)	11 (11%)	1	16
All	All	6792/6824 (100%)	4705 (69%)	1396 (21%)	691 (10%)	1	19

5 of 691 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	11	GLY
1	A	36	VAL
1	A	63	PRO
1	A	227	PRO
1	A	230	PHE

### 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	468/468 (100%)	400 (86%)	68 (14%)	5	32
1	B	468/468 (100%)	377 (81%)	91 (19%)	2	16

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	468/468 (100%)	403 (86%)	65 (14%)	5	35
1	I	468/468 (100%)	401 (86%)	67 (14%)	5	33
1	J	468/468 (100%)	380 (81%)	88 (19%)	2	17
1	K	468/468 (100%)	409 (87%)	59 (13%)	7	39
2	D	384/384 (100%)	331 (86%)	53 (14%)	5	35
2	E	384/384 (100%)	309 (80%)	75 (20%)	2	16
2	F	384/384 (100%)	330 (86%)	54 (14%)	5	34
2	L	384/384 (100%)	330 (86%)	54 (14%)	5	34
2	M	384/384 (100%)	310 (81%)	74 (19%)	2	16
2	N	384/384 (100%)	330 (86%)	54 (14%)	5	34
3	G	166/166 (100%)	127 (76%)	39 (24%)	1	9
3	O	166/166 (100%)	131 (79%)	35 (21%)	1	12
4	H	76/76 (100%)	59 (78%)	17 (22%)	1	11
4	P	76/76 (100%)	56 (74%)	20 (26%)	1	7
All	All	5596/5596 (100%)	4683 (84%)	913 (16%)	3	26

5 of 913 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	G	22	GLN
1	I	425	ASN
2	N	376	LYS
3	G	100	LYS
1	I	3	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 164 such sidechains are listed below:

Mol	Chain	Res	Type
2	F	413	GLN
1	I	397	GLN
2	N	310	GLN
2	F	427	GLN
3	G	166	GLN

### 5.3.3 RNA ⓘ

There are no RNA chains 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 ⓘ

4 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	ADP	A	600	-	29,29,29	1.54	6 (20%)	45,45,45	2.31	9 (20%)
5	ADP	C	600	-	29,29,29	1.57	6 (20%)	45,45,45	2.24	7 (15%)
5	ADP	I	600	-	29,29,29	1.60	5 (17%)	45,45,45	2.42	9 (20%)
5	ADP	K	600	-	29,29,29	1.57	5 (17%)	45,45,45	2.30	7 (15%)

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
5	ADP	A	600	-	-	0/16/32/32	0/1/3/3
5	ADP	C	600	-	-	1/16/32/32	0/1/3/3
5	ADP	I	600	-	-	0/16/32/32	0/1/3/3
5	ADP	K	600	-	-	1/16/32/32	0/1/3/3

The worst 5 of 22 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	600	ADP	C2-N3	4.25	1.40	1.32
5	A	600	ADP	C2-N3	4.20	1.40	1.32
5	K	600	ADP	C2-N3	4.17	1.40	1.32
5	I	600	ADP	C2-N3	3.97	1.40	1.32
5	I	600	ADP	C2-N1	3.38	1.40	1.33

The worst 5 of 32 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	K	600	ADP	N3-C2-N1	-12.81	118.00	128.71
5	C	600	ADP	N3-C2-N1	-12.41	118.34	128.71
5	I	600	ADP	N3-C2-N1	-12.15	118.55	128.71
5	A	600	ADP	N3-C2-N1	-11.76	118.88	128.71
5	I	600	ADP	O4'-C1'-N9	5.14	113.22	108.44

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	K	600	ADP	C2'-C1'-N9-C8
5	C	600	ADP	C2'-C1'-N9-C8

There are no ring outliers.

## 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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	577/577 (100%)	1.56	160 (27%) 1 2	115, 374, 620, 740	0
1	B	577/577 (100%)	0.42	67 (11%) 5 7	83, 244, 430, 549	0
1	C	577/577 (100%)	1.44	153 (26%) 1 2	108, 349, 549, 646	0
1	I	577/577 (100%)	1.93	173 (29%) 1 2	116, 375, 619, 740	0
1	J	577/577 (100%)	0.30	50 (8%) 10 12	77, 243, 428, 549	0
1	K	577/577 (100%)	1.31	138 (23%) 1 3	110, 349, 549, 646	0
2	D	457/457 (100%)	0.78	67 (14%) 3 4	96, 320, 526, 650	0
2	E	457/457 (100%)	0.81	76 (16%) 2 4	110, 287, 495, 630	0
2	F	457/457 (100%)	1.59	125 (27%) 1 2	140, 348, 547, 662	0
2	L	457/457 (100%)	0.61	60 (13%) 4 5	97, 320, 525, 649	0
2	M	457/457 (100%)	0.50	50 (10%) 6 8	112, 286, 495, 630	0
2	N	457/457 (100%)	1.36	106 (23%) 1 3	141, 348, 548, 662	0
3	G	210/210 (100%)	0.59	25 (11%) 5 7	114, 342, 586, 705	0
3	O	210/210 (100%)	0.43	25 (11%) 5 7	114, 340, 586, 705	0
4	H	100/100 (100%)	0.40	12 (12%) 5 7	48, 337, 574, 695	0
4	P	100/100 (100%)	0.60	15 (15%) 3 4	50, 336, 575, 695	0
All	All	6824/6824 (100%)	1.01	1302 (19%) 2 3	48, 324, 549, 740	0

The worst 5 of 1302 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	77	PRO	19.6
1	I	181	LEU	18.8
1	A	159	GLU	18.1
1	A	171	PRO	18.0
2	E	185	GLU	16.9



## 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

There are no carbohydrates in this entry.

## 6.4 Ligands

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<sup>th</sup> 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	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
5	ADP	A	600	27/27	0.43	0.10	10,308,489,668	0
5	ADP	I	600	27/27	0.42	-0.05	10,309,489,667	0
5	ADP	C	600	27/27	0.26	-0.37	10,228,551,718	0
5	ADP	K	600	27/27	0.29	-0.49	10,225,552,718	0

## 6.5 Other polymers

There are no such residues in this entry.