



wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 15, 2017 – 04:11 am GMT

PDB ID : 3ECS
Title : Crystal structure of human eIF2B alpha
Authors : Hiyama, T.B.; Ito, T.; Yokoyama, S.; RIKEN Structural Genomics/Proteomics Initiative (RSGI)
Deposited on : 2008-09-01
Resolution : 2.65 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix) : 1.9-1692
EDS : trunk28620
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
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) : recalc28949

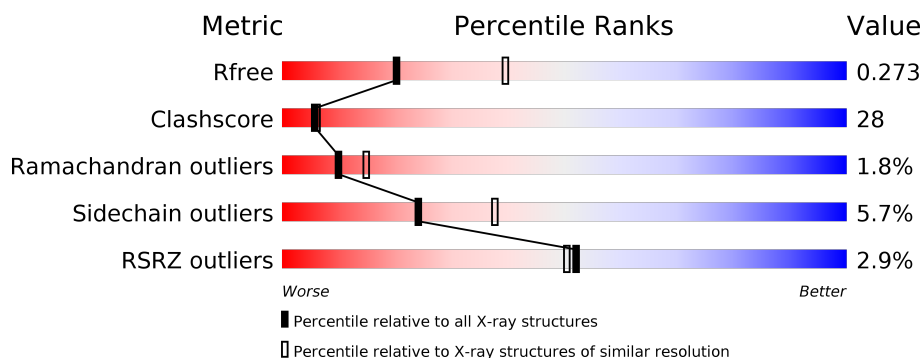
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.65 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}	100719	3491 (2.70-2.62)
Clashscore	112137	1026 (2.68-2.64)
Ramachandran outliers	110173	1010 (2.68-2.64)
Sidechain outliers	110143	1010 (2.68-2.64)
RSRZ outliers	101464	3511 (2.70-2.62)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	315	<div> <div>4%</div> <div> <div></div> <div>55%</div> <div>31%</div> <div>•</div> <div>11%</div> </div> </div>
1	B	315	<div> <div>5%</div> <div> <div></div> <div>50%</div> <div>36%</div> <div>•</div> <div>11%</div> </div> </div>
1	C	315	<div> <div>3%</div> <div> <div></div> <div>54%</div> <div>36%</div> <div>•</div> <div>7%</div> </div> </div>
1	D	315	<div> <div>2%</div> <div> <div></div> <div>57%</div> <div>31%</div> <div>5%</div> <div>8%</div> </div> </div>
1	E	315	<div> <div>2%</div> <div> <div></div> <div>51%</div> <div>35%</div> <div>5%</div> <div>10%</div> </div> </div>
1	F	315	<div> <div>•</div> <div> <div></div> <div>54%</div> <div>32%</div> <div>• •</div> <div>9%</div> </div> </div>

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	G	315	
1	H	315	

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	SO4	A	501	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 17958 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 Translation initiation factor eIF-2B subunit alpha.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	279	Total	C	N	O	S	Se	0	0	0
			2165	1392	362	399	5	7			
1	B	281	Total	C	N	O	S	Se	0	0	0
			2180	1401	365	402	5	7			
1	C	294	Total	C	N	O	S	Se	0	0	0
			2282	1465	380	425	5	7			
1	D	291	Total	C	N	O	S	Se	0	0	0
			2255	1448	377	418	5	7			
1	E	285	Total	C	N	O	S	Se	0	0	0
			2211	1420	368	411	5	7			
1	F	287	Total	C	N	O	S	Se	0	0	0
			2221	1427	372	410	5	7			
1	G	284	Total	C	N	O	S	Se	0	0	0
			2200	1414	368	406	5	7			
1	H	285	Total	C	N	O	S	Se	0	0	0
			2208	1418	369	409	5	7			

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	306	ALA	-	EXPRESSION TAG	UNP Q14232
A	307	ALA	-	EXPRESSION TAG	UNP Q14232
A	308	ALA	-	EXPRESSION TAG	UNP Q14232
A	309	GLU	-	EXPRESSION TAG	UNP Q14232
A	310	HIS	-	EXPRESSION TAG	UNP Q14232
A	311	HIS	-	EXPRESSION TAG	UNP Q14232
A	312	HIS	-	EXPRESSION TAG	UNP Q14232
A	313	HIS	-	EXPRESSION TAG	UNP Q14232
A	314	HIS	-	EXPRESSION TAG	UNP Q14232
A	315	HIS	-	EXPRESSION TAG	UNP Q14232
B	306	ALA	-	EXPRESSION TAG	UNP Q14232
B	307	ALA	-	EXPRESSION TAG	UNP Q14232
B	308	ALA	-	EXPRESSION TAG	UNP Q14232

Continued on next page...

Continued from previous page...

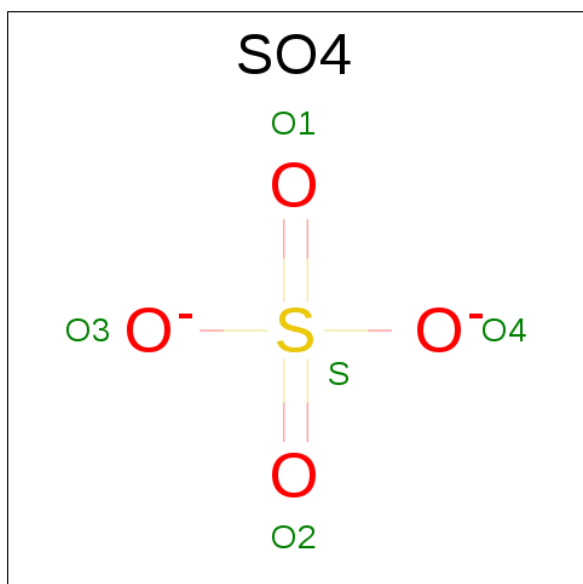
Chain	Residue	Modelled	Actual	Comment	Reference
B	309	GLU	-	EXPRESSION TAG	UNP Q14232
B	310	HIS	-	EXPRESSION TAG	UNP Q14232
B	311	HIS	-	EXPRESSION TAG	UNP Q14232
B	312	HIS	-	EXPRESSION TAG	UNP Q14232
B	313	HIS	-	EXPRESSION TAG	UNP Q14232
B	314	HIS	-	EXPRESSION TAG	UNP Q14232
B	315	HIS	-	EXPRESSION TAG	UNP Q14232
C	306	ALA	-	EXPRESSION TAG	UNP Q14232
C	307	ALA	-	EXPRESSION TAG	UNP Q14232
C	308	ALA	-	EXPRESSION TAG	UNP Q14232
C	309	GLU	-	EXPRESSION TAG	UNP Q14232
C	310	HIS	-	EXPRESSION TAG	UNP Q14232
C	311	HIS	-	EXPRESSION TAG	UNP Q14232
C	312	HIS	-	EXPRESSION TAG	UNP Q14232
C	313	HIS	-	EXPRESSION TAG	UNP Q14232
C	314	HIS	-	EXPRESSION TAG	UNP Q14232
C	315	HIS	-	EXPRESSION TAG	UNP Q14232
D	306	ALA	-	EXPRESSION TAG	UNP Q14232
D	307	ALA	-	EXPRESSION TAG	UNP Q14232
D	308	ALA	-	EXPRESSION TAG	UNP Q14232
D	309	GLU	-	EXPRESSION TAG	UNP Q14232
D	310	HIS	-	EXPRESSION TAG	UNP Q14232
D	311	HIS	-	EXPRESSION TAG	UNP Q14232
D	312	HIS	-	EXPRESSION TAG	UNP Q14232
D	313	HIS	-	EXPRESSION TAG	UNP Q14232
D	314	HIS	-	EXPRESSION TAG	UNP Q14232
D	315	HIS	-	EXPRESSION TAG	UNP Q14232
E	306	ALA	-	EXPRESSION TAG	UNP Q14232
E	307	ALA	-	EXPRESSION TAG	UNP Q14232
E	308	ALA	-	EXPRESSION TAG	UNP Q14232
E	309	GLU	-	EXPRESSION TAG	UNP Q14232
E	310	HIS	-	EXPRESSION TAG	UNP Q14232
E	311	HIS	-	EXPRESSION TAG	UNP Q14232
E	312	HIS	-	EXPRESSION TAG	UNP Q14232
E	313	HIS	-	EXPRESSION TAG	UNP Q14232
E	314	HIS	-	EXPRESSION TAG	UNP Q14232
E	315	HIS	-	EXPRESSION TAG	UNP Q14232
F	306	ALA	-	EXPRESSION TAG	UNP Q14232
F	307	ALA	-	EXPRESSION TAG	UNP Q14232
F	308	ALA	-	EXPRESSION TAG	UNP Q14232
F	309	GLU	-	EXPRESSION TAG	UNP Q14232
F	310	HIS	-	EXPRESSION TAG	UNP Q14232

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
F	311	HIS	-	EXPRESSION TAG	UNP Q14232
F	312	HIS	-	EXPRESSION TAG	UNP Q14232
F	313	HIS	-	EXPRESSION TAG	UNP Q14232
F	314	HIS	-	EXPRESSION TAG	UNP Q14232
F	315	HIS	-	EXPRESSION TAG	UNP Q14232
G	306	ALA	-	EXPRESSION TAG	UNP Q14232
G	307	ALA	-	EXPRESSION TAG	UNP Q14232
G	308	ALA	-	EXPRESSION TAG	UNP Q14232
G	309	GLU	-	EXPRESSION TAG	UNP Q14232
G	310	HIS	-	EXPRESSION TAG	UNP Q14232
G	311	HIS	-	EXPRESSION TAG	UNP Q14232
G	312	HIS	-	EXPRESSION TAG	UNP Q14232
G	313	HIS	-	EXPRESSION TAG	UNP Q14232
G	314	HIS	-	EXPRESSION TAG	UNP Q14232
G	315	HIS	-	EXPRESSION TAG	UNP Q14232
H	306	ALA	-	EXPRESSION TAG	UNP Q14232
H	307	ALA	-	EXPRESSION TAG	UNP Q14232
H	308	ALA	-	EXPRESSION TAG	UNP Q14232
H	309	GLU	-	EXPRESSION TAG	UNP Q14232
H	310	HIS	-	EXPRESSION TAG	UNP Q14232
H	311	HIS	-	EXPRESSION TAG	UNP Q14232
H	312	HIS	-	EXPRESSION TAG	UNP Q14232
H	313	HIS	-	EXPRESSION TAG	UNP Q14232
H	314	HIS	-	EXPRESSION TAG	UNP Q14232
H	315	HIS	-	EXPRESSION TAG	UNP Q14232

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	G	1	Total O S 5 4 1	0	0
2	H	1	Total O S 5 4 1	0	0

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Cl 1 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	30	Total O 30 30	0	0
4	B	27	Total O 27 27	0	0
4	C	20	Total O 20 20	0	0
4	D	24	Total O 24 24	0	0
4	E	15	Total O 15 15	0	0
4	F	26	Total O 26 26	0	0
4	G	28	Total O 28 28	0	0

Continued on next page...

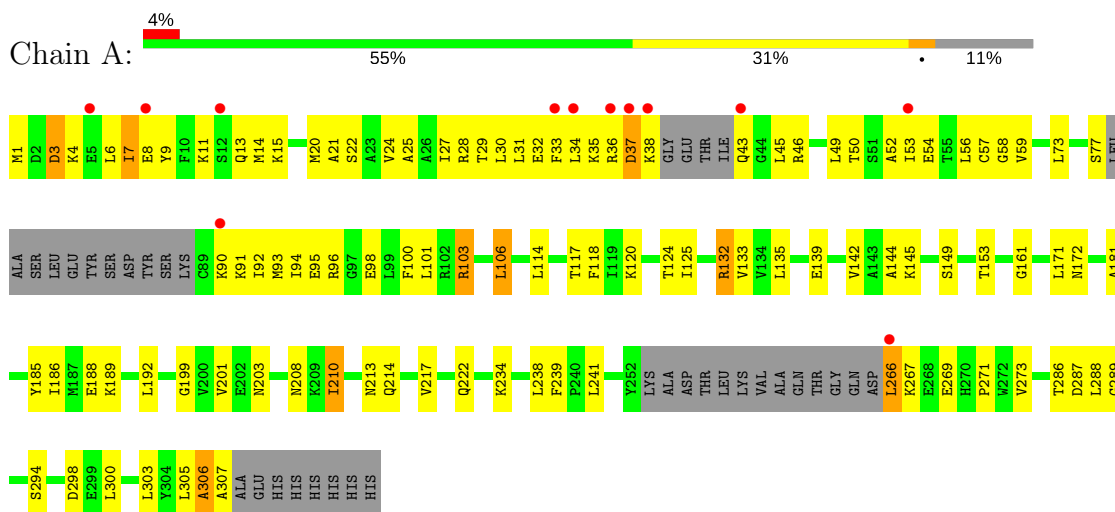
Continued from previous page...

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	H	15	Total	O	0	0
			15	15		

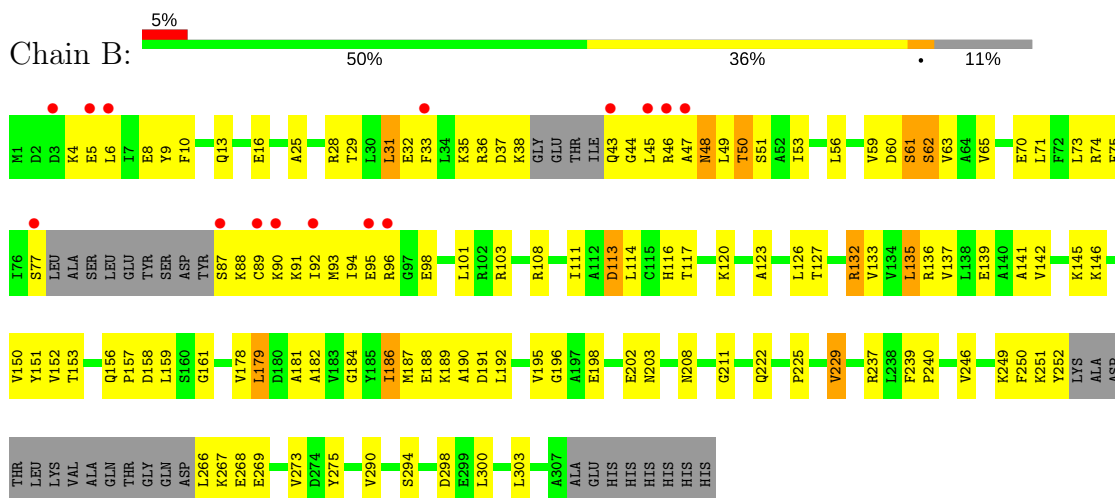
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of 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: Translation initiation factor eIF-2B subunit alpha

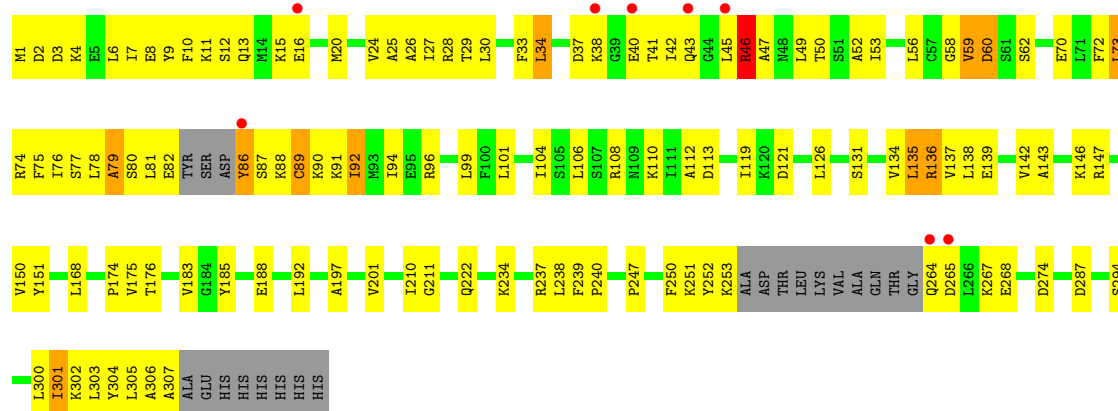


- Molecule 1: Translation initiation factor eIF-2B subunit alpha

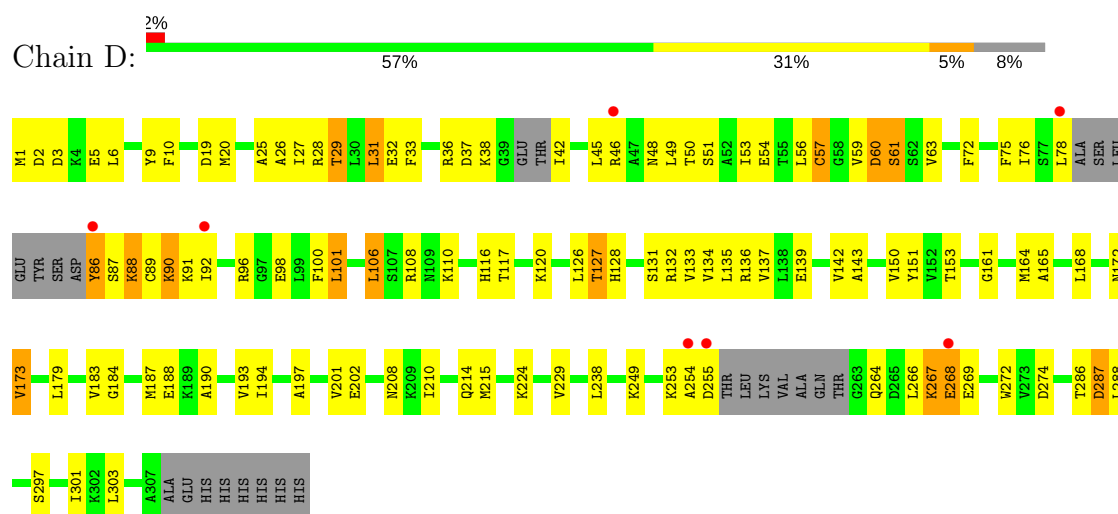


- Molecule 1: Translation initiation factor eIF-2B subunit alpha

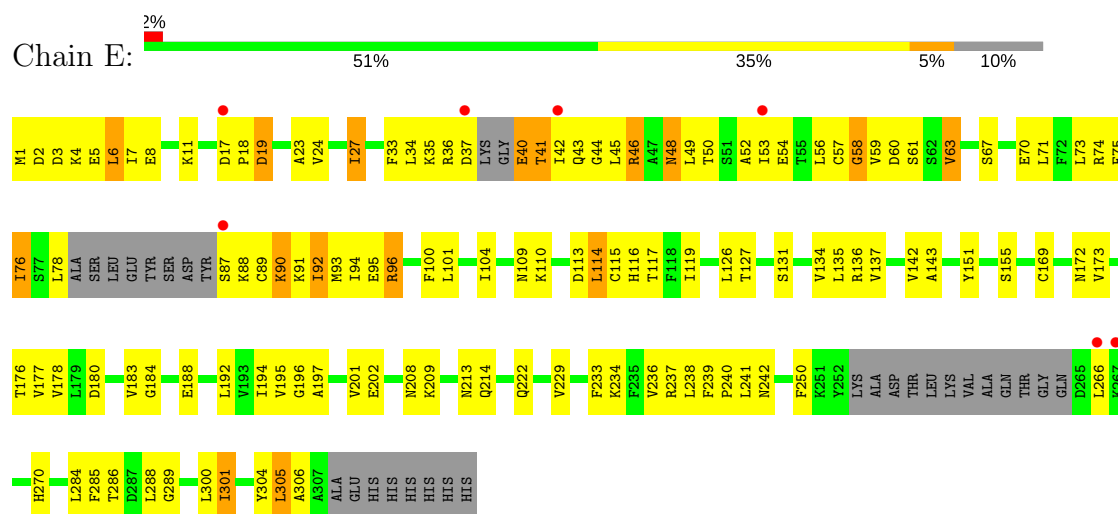




• Molecule 1: Translation initiation factor eIF-2B subunit alpha

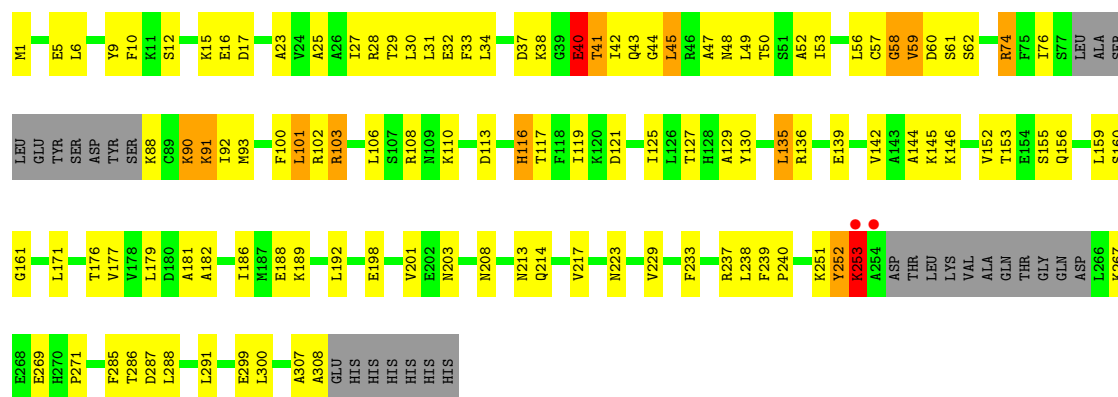


• Molecule 1: Translation initiation factor eIF-2B subunit alpha



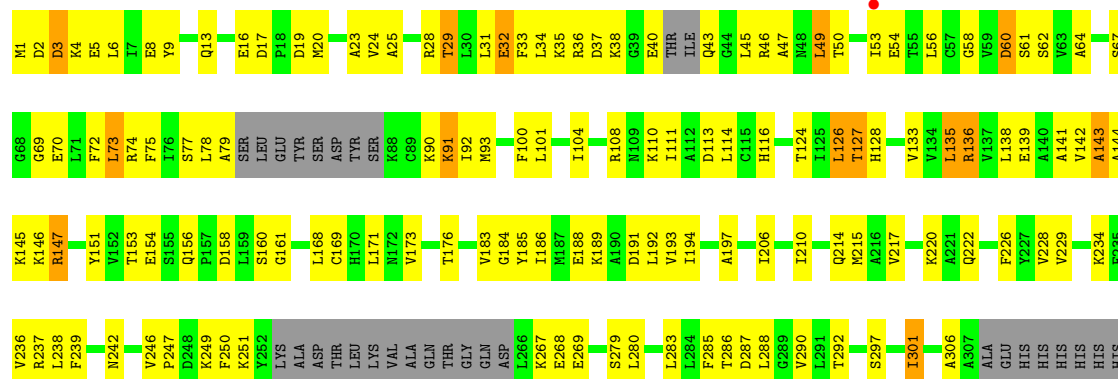
• Molecule 1: Translation initiation factor eIF-2B subunit alpha





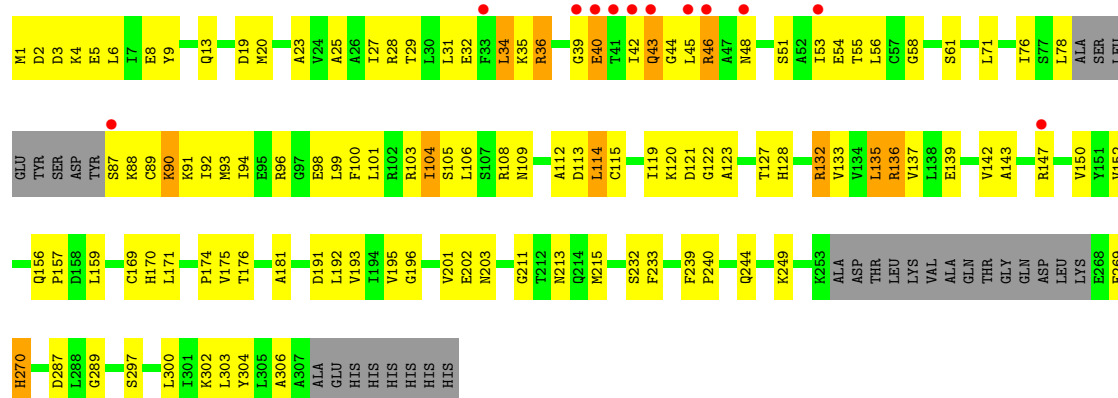
• Molecule 1: Translation initiation factor eIF-2B subunit alpha

Chain G: 46% 40% 10%



• Molecule 1: Translation initiation factor eIF-2B subunit alpha

Chain H: 4% 53% 33% 10%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	70.89Å 156.39Å 138.44Å 90.00° 104.20° 90.00°	Depositor
Resolution (Å)	50.00 – 2.65 48.59 – 2.65	Depositor EDS
% Data completeness (in resolution range)	99.2 (50.00-2.65) 99.2 (48.59-2.65)	Depositor EDS
R_{merge}	0.18	Depositor
R_{sym}	0.18	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.39 (at 2.65Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.214 , 0.273 0.214 , 0.273	Depositor DCC
R_{free} test set	4200 reflections (4.99%)	DCC
Wilson B-factor (Å ²)	41.6	Xtriage
Anisotropy	0.380	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 55.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.019 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	17958	wwPDB-VP
Average B, all atoms (Å ²)	48.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.00% 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, CL

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	0.44	0/2191	0.67	0/2945
1	B	0.43	0/2206	0.67	0/2964
1	C	0.43	0/2310	0.70	1/3106 (0.0%)
1	D	0.43	0/2282	0.68	2/3066 (0.1%)
1	E	0.42	0/2237	0.68	1/3008 (0.0%)
1	F	0.44	0/2248	0.67	0/3022
1	G	0.42	0/2226	0.66	0/2991
1	H	0.40	0/2235	0.67	0/3005
All	All	0.43	0/17935	0.68	4/24107 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	92	ILE	N-CA-C	-6.03	94.73	111.00
1	D	60	ASP	N-CA-C	-5.91	95.05	111.00
1	E	58	GLY	N-CA-C	-5.67	98.93	113.10
1	D	267	LYS	N-CA-C	-5.46	96.26	111.00

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	2165	0	2247	122	0
1	B	2180	0	2265	112	0
1	C	2282	0	2365	142	0
1	D	2255	0	2336	143	0
1	E	2211	0	2291	149	0
1	F	2221	0	2311	123	0
1	G	2200	0	2285	141	0
1	H	2208	0	2293	155	0
2	A	10	0	0	4	0
2	B	5	0	0	1	0
2	C	5	0	0	0	0
2	D	5	0	0	0	0
2	E	5	0	0	0	0
2	F	10	0	0	0	0
2	G	5	0	0	0	0
2	H	5	0	0	1	0
3	A	1	0	0	0	0
4	A	30	0	0	1	0
4	B	27	0	0	0	0
4	C	20	0	0	3	0
4	D	24	0	0	0	0
4	E	15	0	0	2	0
4	F	26	0	0	1	0
4	G	28	0	0	3	0
4	H	15	0	0	1	0
All	All	17958	0	18393	1011	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 28.

The worst 5 of 1011 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:53:ILE:HA	1:F:56:LEU:HD12	1.30	1.12
1:H:42:ILE:HA	1:H:45:LEU:HB3	1.32	1.09
1:A:92:ILE:H	1:A:92:ILE:HD12	1.20	1.06
1:E:6:LEU:HD11	1:E:53:ILE:HB	1.41	1.03
1:E:286:THR:HG23	1:E:288:LEU:H	1.21	1.02

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	271/315 (86%)	251 (93%)	16 (6%)	4 (2%)	12	18
1	B	273/315 (87%)	252 (92%)	18 (7%)	3 (1%)	17	26
1	C	288/315 (91%)	264 (92%)	19 (7%)	5 (2%)	11	16
1	D	283/315 (90%)	258 (91%)	19 (7%)	6 (2%)	8	12
1	E	277/315 (88%)	254 (92%)	19 (7%)	4 (1%)	13	20
1	F	281/315 (89%)	257 (92%)	16 (6%)	8 (3%)	6	8
1	G	276/315 (88%)	254 (92%)	19 (7%)	3 (1%)	17	26
1	H	279/315 (89%)	253 (91%)	19 (7%)	7 (2%)	6	9
All	All	2228/2520 (88%)	2043 (92%)	145 (6%)	40 (2%)	10	15

5 of 40 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	61	SER
1	C	46	ARG
1	C	265	ASP
1	D	61	SER
1	D	88	LYS

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	237/260 (91%)	228 (96%)	9 (4%)	38	57

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	239/260 (92%)	224 (94%)	15 (6%)	21	34
1	C	250/260 (96%)	238 (95%)	12 (5%)	30	46
1	D	246/260 (95%)	229 (93%)	17 (7%)	18	29
1	E	243/260 (94%)	229 (94%)	14 (6%)	23	37
1	F	242/260 (93%)	228 (94%)	14 (6%)	23	37
1	G	240/260 (92%)	225 (94%)	15 (6%)	21	34
1	H	242/260 (93%)	228 (94%)	14 (6%)	23	37
All	All	1939/2080 (93%)	1829 (94%)	110 (6%)	24	38

5 of 110 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	173	VAL
1	E	96	ARG
1	H	114	LEU
1	D	287	ASP
1	E	27	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 40 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	208	ASN
1	E	244	GLN
1	H	208	ASN
1	E	214	GLN
1	F	48	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 [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 11 ligands modelled in this entry, 1 is monoatomic - leaving 10 for Mogul analysis.

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	SO4	A	501	-	4,4,4	0.35	0	6,6,6	0.20	0
2	SO4	A	509	-	4,4,4	0.32	0	6,6,6	0.10	0
2	SO4	B	502	-	4,4,4	0.31	0	6,6,6	0.14	0
2	SO4	C	503	-	4,4,4	0.34	0	6,6,6	0.11	0
2	SO4	D	504	-	4,4,4	0.29	0	6,6,6	0.15	0
2	SO4	E	505	-	4,4,4	0.32	0	6,6,6	0.13	0
2	SO4	F	506	-	4,4,4	0.33	0	6,6,6	0.21	0
2	SO4	F	510	-	4,4,4	0.37	0	6,6,6	0.11	0
2	SO4	G	507	-	4,4,4	0.35	0	6,6,6	0.13	0
2	SO4	H	508	-	4,4,4	0.35	0	6,6,6	0.16	0

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	SO4	A	501	-	-	0/0/0/0	0/0/0/0
2	SO4	A	509	-	-	0/0/0/0	0/0/0/0
2	SO4	B	502	-	-	0/0/0/0	0/0/0/0
2	SO4	C	503	-	-	0/0/0/0	0/0/0/0
2	SO4	D	504	-	-	0/0/0/0	0/0/0/0
2	SO4	E	505	-	-	0/0/0/0	0/0/0/0
2	SO4	F	506	-	-	0/0/0/0	0/0/0/0
2	SO4	F	510	-	-	0/0/0/0	0/0/0/0
2	SO4	G	507	-	-	0/0/0/0	0/0/0/0
2	SO4	H	508	-	-	0/0/0/0	0/0/0/0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	501	SO4	4	0
2	B	502	SO4	1	0
2	H	508	SO4	1	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [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	272/315 (86%)	-0.19	12 (4%) 35 32	12, 34, 93, 112	0
1	B	274/315 (86%)	-0.09	15 (5%) 26 24	17, 40, 103, 118	0
1	C	287/315 (91%)	-0.24	8 (2%) 53 52	20, 41, 85, 107	0
1	D	284/315 (90%)	-0.19	7 (2%) 58 56	19, 41, 83, 117	0
1	E	278/315 (88%)	-0.11	7 (2%) 58 56	20, 46, 88, 113	0
1	F	280/315 (88%)	-0.31	2 (0%) 87 88	18, 36, 82, 97	0
1	G	277/315 (87%)	-0.12	1 (0%) 92 93	23, 46, 88, 97	0
1	H	278/315 (88%)	-0.08	12 (4%) 36 33	21, 49, 95, 120	0
All	All	2230/2520 (88%)	-0.17	64 (2%) 52 50	12, 41, 89, 120	0

The worst 5 of 64 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	45	LEU	6.4
1	D	86	TYR	6.0
1	A	266	LEU	5.4
1	H	41	THR	5.1
1	C	45	LEU	4.3

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

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

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(Å ²)	Q<0.9
2	SO4	G	507	5/5	0.97	0.20	0.87	51,55,57,59	0
2	SO4	A	501	5/5	0.97	0.16	0.41	44,47,49,51	0
2	SO4	H	508	5/5	0.98	0.13	0.39	67,68,72,73	0
2	SO4	D	504	5/5	0.98	0.15	0.17	53,54,56,57	0
2	SO4	B	502	5/5	0.98	0.14	0.02	45,45,47,52	0
2	SO4	A	509	5/5	0.96	0.14	-0.60	76,80,80,81	0
2	SO4	C	503	5/5	0.98	0.12	-1.00	56,59,60,60	0
2	SO4	F	506	5/5	0.98	0.12	-1.10	52,53,55,56	0
2	SO4	F	510	5/5	0.97	0.10	-1.92	72,74,75,77	0
2	SO4	E	505	5/5	0.99	0.12	-3.08	58,58,62,64	0
3	CL	A	601	1/1	0.95	0.31	-	54,54,54,54	0

6.5 Other polymers [i](#)

There are no such residues in this entry.