



wwPDB X-ray Structure Validation Summary Report ⓘ

May 29, 2020 – 07:08 am BST

PDB ID : 5IFE
Title : Crystal structure of the human SF3b core complex
Authors : Cretu, C.; Dybkov, O.; De Laurentiis, E.; Will, C.L.; Luhrmann, R.; Pena, V.
Deposited on : 2016-02-25
Resolution : 3.10 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.11
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

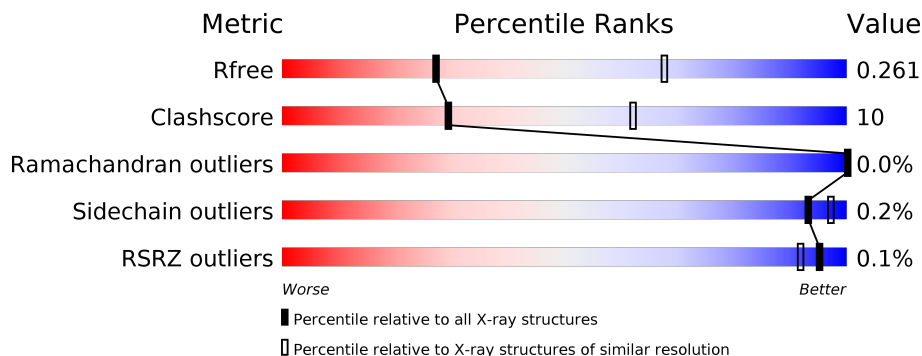
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.10 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}	130704	1094 (3.10-3.10)
Clashscore	141614	1184 (3.10-3.10)
Ramachandran outliers	138981	1141 (3.10-3.10)
Sidechain outliers	138945	1141 (3.10-3.10)
RSRZ outliers	127900	1067 (3.10-3.10)

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 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	B	86	
2	C	1304	
3	D	120	
4	A	1235	

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 17103 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 Splicing factor 3B subunit 5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	B	66	540	343	94	98	5	0	0	0

- Molecule 2 is a protein called Splicing factor 3B subunit 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	829	6602	4242	1132	1189	39	0	0	0

- Molecule 3 is a protein called PHD finger-like domain-containing protein 5A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	D	89	670	410	119	128	13	0	0	0

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	-9	GLY	-	expression tag	UNP Q7RTV0
D	-8	PRO	-	expression tag	UNP Q7RTV0
D	-7	LEU	-	expression tag	UNP Q7RTV0
D	-6	GLY	-	expression tag	UNP Q7RTV0
D	-5	SER	-	expression tag	UNP Q7RTV0
D	-4	PRO	-	expression tag	UNP Q7RTV0
D	-3	GLY	-	expression tag	UNP Q7RTV0
D	-2	SER	-	expression tag	UNP Q7RTV0
D	-1	ARG	-	expression tag	UNP Q7RTV0
D	0	ALA	-	expression tag	UNP Q7RTV0

- Molecule 4 is a protein called Splicing factor 3B subunit 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	A	1184	9287	5894	1576	1772	45	0	0	0

There are 18 discrepancies between the modelled and reference sequences:

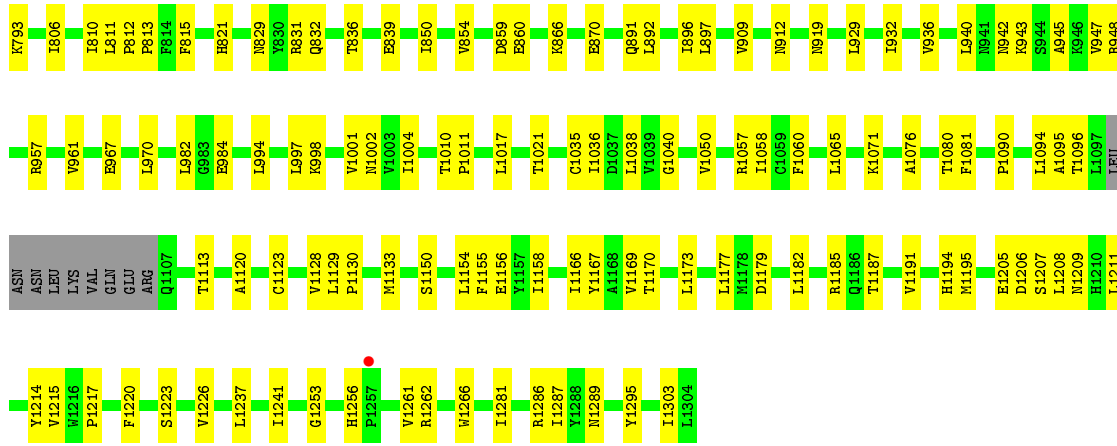
Chain	Residue	Modelled	Actual	Comment	Reference
A	-9	GLY	-	expression tag	UNP Q15393
A	-8	ALA	-	expression tag	UNP Q15393
A	-7	GLU	-	expression tag	UNP Q15393
A	-6	PHE	-	expression tag	UNP Q15393
A	-5	LYS	-	expression tag	UNP Q15393
A	-4	GLY	-	expression tag	UNP Q15393
A	-3	LEU	-	expression tag	UNP Q15393
A	-2	ARG	-	expression tag	UNP Q15393
A	-1	VAL	-	expression tag	UNP Q15393
A	0	ASP	-	expression tag	UNP Q15393
A	1218	ASP	-	expression tag	UNP Q15393
A	1219	TYR	-	expression tag	UNP Q15393
A	1220	LYS	-	expression tag	UNP Q15393
A	1221	ASP	-	expression tag	UNP Q15393
A	1222	ASP	-	expression tag	UNP Q15393
A	1223	ASP	-	expression tag	UNP Q15393
A	1224	ASP	-	expression tag	UNP Q15393
A	1225	LYS	-	expression tag	UNP Q15393

- Molecule 5 is ZINC ION (three-letter code: ZN) (formula: Zn).

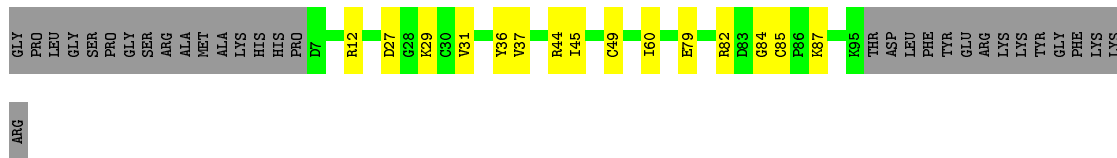
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	D	3	Total	Zn	0	0
			3	3		

- Molecule 6 is POTASSIUM ION (three-letter code: K) (formula: K).

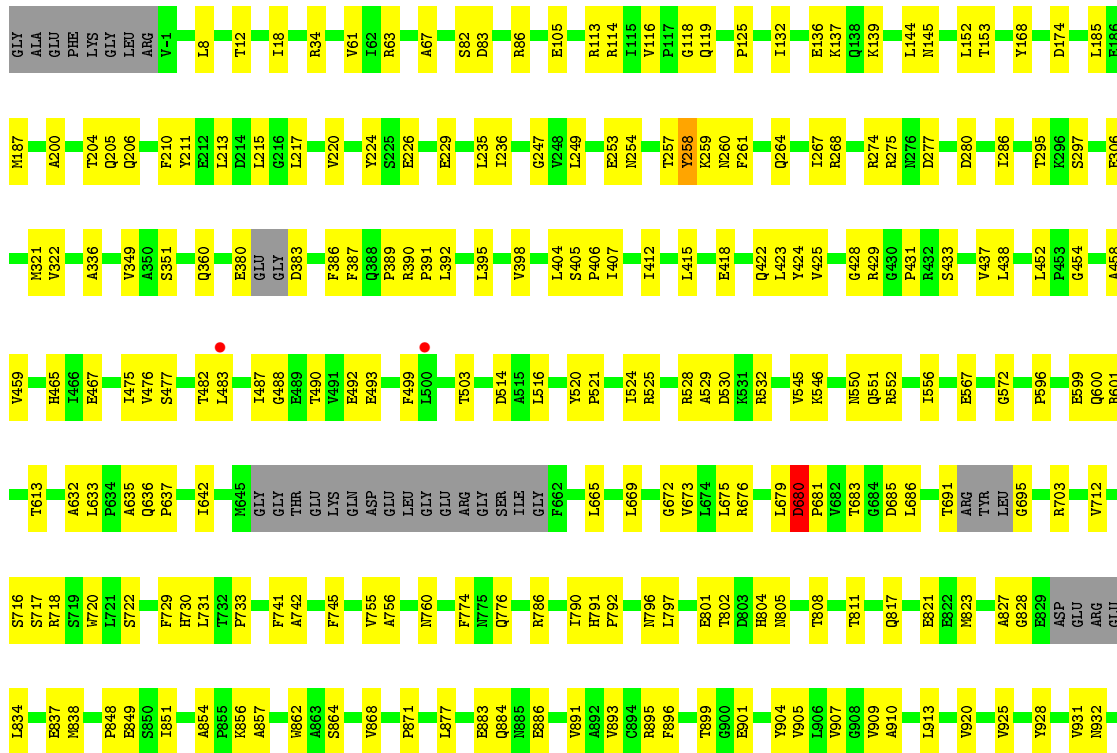
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	K	0	0
			1	1		



• Molecule 3: PHD finger-like domain-containing protein 5A



• Molecule 4: Splicing factor 3B subunit 3



E935	R936	L937	T1028	T1120	T1121	L1122	S1123	G1124	G1125	I1128	L1129	H1147	G1157	R1186	D1199	S1162	S1165	Y1166	Y1167	V1170	V1173	N1188	N1192	E1196	R1214	Y1215	D1221	D1222	ASP	ASP	LYS	T1028	W1032	V1033	T1034	L1039	D1040	Y1041	D1042	T1043	D1048	K1049	F1050	G1051	N1052	I1053	C1054	V1055	V1056	R1057	L1058	E1065	V1066	D1067	GLU	ASP	PRO	THR	GLY	ASN	LYS	ALA	LEU	TRP	ASP	ARG	GLY	LEU	LEU	M1083	V1091	I1092	M1093	N1094	Y1095	E1099	T1100	V1101	L1102	S1103	L1104	L1117	V1118	Y1119	E946	E947	Y948	F949	A950	A951	R958	Y959	L960	I961	G962	R965	R968	Y969	L977	C981	E982	N983	I986	A987	N988	I993	I994	T995	I996	V1000	D1004	V1005	W1011	V1012	R1013	Y1014	M1017	E1018	L1021	I1022	I1023	F1024	A1025	D1026	D1027
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4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	105.06Å 154.44Å 210.42Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.04 – 3.10 47.04 – 3.10	Depositor EDS
% Data completeness (in resolution range)	99.8 (47.04-3.10) 99.9 (47.04-3.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.70 (at 3.12Å)	Xtrriage
Refinement program	PHENIX 1.10.1-2155	Depositor
R, R_{free}	0.231 , 0.260 0.229 , 0.261	Depositor DCC
R_{free} test set	3108 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å ²)	79.9	Xtrriage
Anisotropy	0.313	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 39.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	17103	wwPDB-VP
Average B, all atoms (Å ²)	77.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.62% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, K

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	B	0.24	0/556	0.42	0/751
2	C	0.24	0/6727	0.40	0/9106
3	D	0.25	0/678	0.43	0/909
4	A	0.25	0/9476	0.46	0/12858
All	All	0.25	0/17437	0.43	0/23624

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 [i](#)

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	B	540	0	509	9	0
2	C	6602	0	6800	126	0
3	D	670	0	653	9	0
4	A	9287	0	9201	197	0
5	D	3	0	0	0	0
6	A	1	0	0	0	0
All	All	17103	0	17163	327	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 10.

The worst 5 of 327 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:1173:LEU:O	2:C:1177:LEU:HB2	1.64	0.98
2:C:1289:ASN:HB3	2:C:1295:TYR:H	1.39	0.85
2:C:665:ILE:HG23	2:C:690:ILE:HD11	1.63	0.80
2:C:672:ALA:HA	2:C:679:ILE:HD11	1.63	0.80
4:A:1103:SER:OG	4:A:1120:THR:HG22	1.86	0.76

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	B	64/86 (74%)	59 (92%)	5 (8%)	0	100	100
2	C	823/1304 (63%)	806 (98%)	17 (2%)	0	100	100
3	D	87/120 (72%)	79 (91%)	8 (9%)	0	100	100
4	A	1172/1235 (95%)	1104 (94%)	67 (6%)	1 (0%)	51	83
All	All	2146/2745 (78%)	2048 (95%)	97 (4%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	A	680	ASP

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	B	57/77 (74%)	57 (100%)	0	100	100
2	C	715/1104 (65%)	714 (100%)	1 (0%)	93	98
3	D	76/101 (75%)	76 (100%)	0	100	100
4	A	1027/1066 (96%)	1024 (100%)	3 (0%)	92	96
All	All	1875/2348 (80%)	1871 (100%)	4 (0%)	93	97

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	C	1081	PHE
4	A	258	TYR
4	A	680	ASP
4	A	1166	TYR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
4	A	760	ASN

5.3.3 RNA [i](#)

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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

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.

No monomer is involved in short contacts.

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 [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	B	66/86 (76%)	-0.02	0 100 100	50, 69, 92, 106	0
2	C	829/1304 (63%)	-0.25	1 (0%) 95 92	51, 79, 110, 135	0
3	D	89/120 (74%)	-0.36	0 100 100	45, 61, 88, 106	0
4	A	1184/1235 (95%)	-0.18	2 (0%) 95 90	36, 74, 114, 149	0
All	All	2168/2745 (78%)	-0.21	3 (0%) 95 92	36, 75, 112, 149	0

All (3) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	A	500	LEU	2.7
2	C	1257	PRO	2.6
4	A	483	LEU	2.4

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 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. 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(\AA^2)	Q<0.9
6	K	A	1301	1/1	0.85	0.18	109,109,109,109	0
5	ZN	D	202	1/1	0.98	0.15	52,52,52,52	0
5	ZN	D	201	1/1	0.98	0.13	68,68,68,68	0
5	ZN	D	203	1/1	1.00	0.14	59,59,59,59	0

6.5 Other polymers [i](#)

There are no such residues in this entry.