W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

wwPDB X-ray Structure Validation Summary Report (i)

May 13, 2020 – 04:33 am BST

PDB ID	:	5B04
Title	:	Crystal structure of the eukaryotic translation initiation factor 2B from Schizosaccharomyces pombe
Authors	:	Kashiwagi, K.; Ito, T.; Yokoyama, S.
Deposited on	:	2015-10-27
Resolution	:	2.99 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
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 (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.99 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.
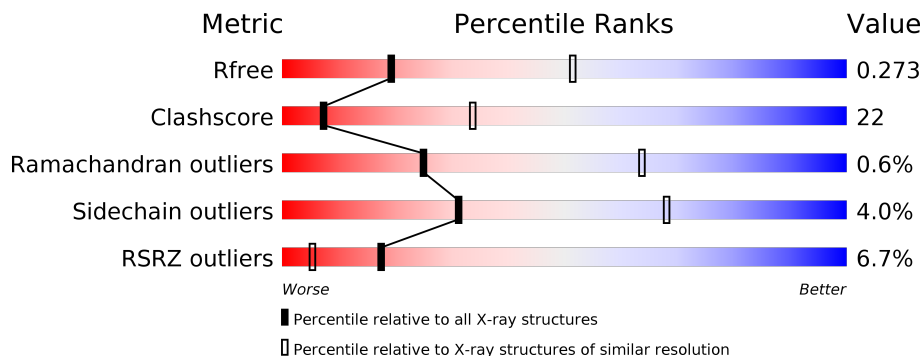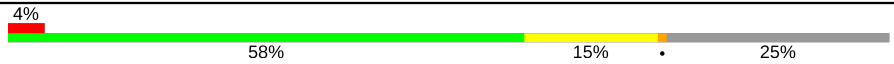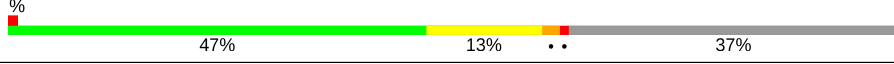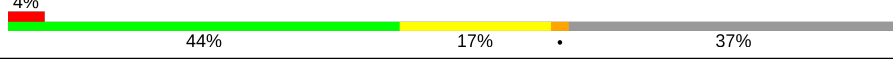

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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 <=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	341	9% / 59% 29% • 7%
1	B	341	5% / 75% 17% • 6%
2	C	399	6% / 66% 19% • 13%
2	D	399	3% / 69% 17% • 13%
3	E	458	9% / 45% 30% 7% • 16%
3	F	458	12% / 38% 36% 9% • 16%

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Mol	Chain	Length	Quality of chain
4	G	467	4% ▬ 58% (green) 15% (yellow) • 25% (grey)
4	H	467	3% ▬ 62% (green) 12% (yellow) • 25% (grey)
5	I	678	% ▬ 47% (green) 13% (yellow) •• 37% (grey)
5	J	678	4% ▬ 44% (green) 17% (yellow) • 37% (grey)

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 28584 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	317	Total 2472	C 1571	N 430	O 458	S 13	0	0	0
1	B	319	Total 2489	C 1582	N 434	O 460	S 13	0	0	0

- Molecule 2 is a protein called Probable translation initiation factor eIF-2B subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	349	Total 2702	C 1714	N 459	O 515	S 14	0	0	0
2	D	346	Total 2674	C 1697	N 453	O 511	S 13	0	0	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-5	GLY	-	expression tag	UNP Q9UT76
C	-4	PRO	-	expression tag	UNP Q9UT76
C	-3	ILE	-	expression tag	UNP Q9UT76
C	-2	SER	-	expression tag	UNP Q9UT76
C	-1	GLU	-	expression tag	UNP Q9UT76
C	0	PHE	-	expression tag	UNP Q9UT76
D	-5	GLY	-	expression tag	UNP Q9UT76
D	-4	PRO	-	expression tag	UNP Q9UT76
D	-3	ILE	-	expression tag	UNP Q9UT76
D	-2	SER	-	expression tag	UNP Q9UT76
D	-1	GLU	-	expression tag	UNP Q9UT76
D	0	PHE	-	expression tag	UNP Q9UT76

- Molecule 3 is a protein called Probable translation initiation factor eIF-2B subunit gamma.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	384	Total 2976	C 1895	N 511	O 553	S 17	0	0	0
3	F	383	Total 2967	C 1890	N 509	O 551	S 17	0	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	157	TYR	ILE	engineered mutation	UNP P56288
E	158	THR	TYR	engineered mutation	UNP P56288
E	159	VAL	GLY	engineered mutation	UNP P56288
F	157	TYR	ILE	engineered mutation	UNP P56288
F	158	THR	TYR	engineered mutation	UNP P56288
F	159	VAL	GLY	engineered mutation	UNP P56288

- Molecule 4 is a protein called Probable translation initiation factor eIF-2B subunit delta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	G	349	Total 2755	C 1763	N 466	O 513	S 13	0	0	0
4	H	349	Total 2755	C 1763	N 466	O 513	S 13	0	0	0

- Molecule 5 is a protein called Probable translation initiation factor eIF-2B subunit epsilon.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	I	428	Total 3377	C 2123	N 592	O 647	S 15	0	0	0
5	J	428	Total 3372	C 2119	N 591	O 647	S 15	0	0	0

- Molecule 6 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).

PO4

O3

O⁻

O2　O⁻ — P = O　O1

P

O⁻

O4
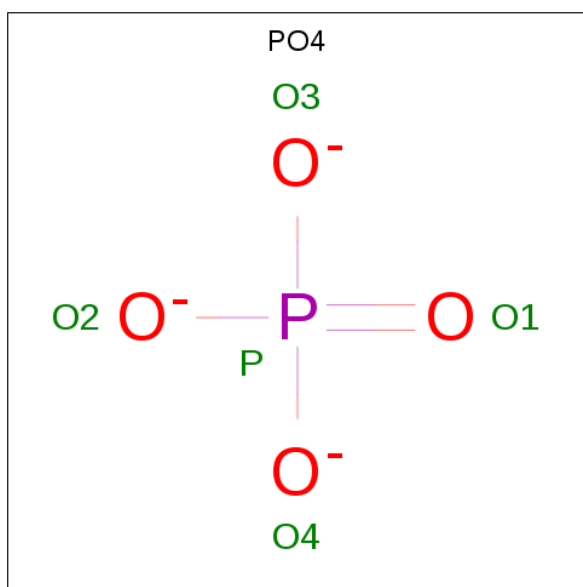
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total 5	O 4	P 1	0	0
6	B	1	Total 5	O 4	P 1	0	0
6	C	1	Total 5	O 4	P 1	0	0
6	D	1	Total 5	O 4	P 1	0	0
6	G	1	Total 5	O 4	P 1	0	0
6	G	1	Total 5	O 4	P 1	0	0
6	H	1	Total 5	O 4	P 1	0	0
6	H	1	Total 5	O 4	P 1	0	0
6	I	1	Total 5	O 4	P 1	0	0

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 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 2: Probable translation initiation factor eIF-2B subunit beta

• Molecule 2: Probable translation initiation factor eIF-2B subunit beta

• Molecule 3: Probable translation initiation factor eIF-2B subunit gamma

V401 V402 E403 D404 G405 V406 I412 V413 A414 A417 Q418 I419 G420 A421 K424 C428 E429 I430 G431 H434 R435 V436 E437 A438 G439 R440 I441 A442 R443 G444 L447 V448 D449 M450 GLU LYS ILE GLU THR ASP MET ASP

• Molecule 3: Probable translation initiation factor eIF-2B subunit gamma

Chain F:

12%				
38%	36%	9%	•	16%

MET SER LEU TYR HIS ALA ALA LEU PRO LEU ALA SER SER PRO SER ILE LEU GLY PRO ILE SER GLY ASN ARG ASN ILE GLN L32 Q33 S34 I35 F44 F47 N49 S50 Y52 P53 L54 T55 G56 S57 D58 P61 K62 A63 L64 I67 G68 N69 K70

P71 I91 C92 M93 E94 H99 I100 N101 A102 W103 L104 R105 Y108 M112 R113 A118 P119 T120 I121 L122 D123 D124 S125 K126 S127 S128 A129 D130 A131 L132 V144 C145 L146 S147 C148 D149 L154 P155 P156 Y157 T158 D161 K162 F163 R164 S169 A172 L178 K179

Y180 E181 H182 I183 THR SER GLN SER LYS GLU ILE D191 A192 K193 Q194 L195 I196 E199 E200 K201 T202 S203 R204 L205 L206 Y207 A208 K209 S210 S211 A212 D213 V214 G215 S216 D217 F218 T219 F220 L224 P229 T235 N236 L237 S238 H241 I242 F243 V244 H247 I250 D251 L252

I253 R254 E255 I259 S260 S261 I262 R263 G264 D265 L266 I267 P268 V269 L270 V271 K272 C273 Q274 Y275 Q276 K277 S278 F279 T280 V281 ARG GLU ASN ILE GLN ARG PHE LEU SER SER PRO ASN ASN ILE ASP ASN TYR ASP GLY LEU SER SER GLN ILE LYS ILE ASN A311 L312 I313 A314

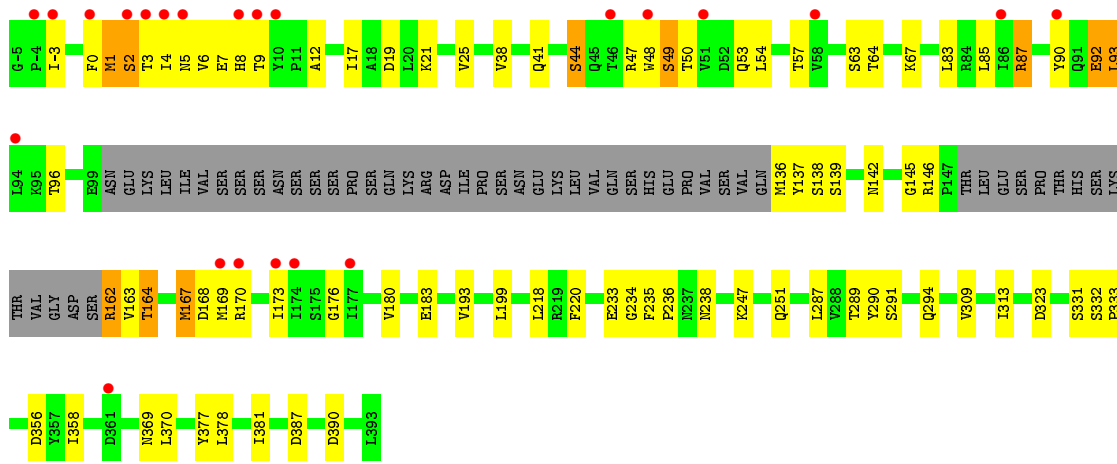K315 D316 G317 I318 I319 C320 S321 L326 P327 N328 Y329 F330 E331 L332 N333 I334 C335 I336 A337 K338 L339 T340 P341 E342 Q343 R344 L345 V346 D347 V348 T349 S350 R351 R352 R353 A354 L355 A358 D359 C360 M361 V362 N363 E364 G365 T366 T367 I368 K369 D370 N371 S372 N373 I378 I379 G380 K381

N382 C383 V384 I385 G386 K387 G388 S389 V390 V391 I395 L396 M397 D398 N399 V400 V401 V402 E403 D404 G405 V406 R407 L408 I412 V413 A414 S415 G416 A417 Q418 I419 G420 A421 K422 S423 R424 L425 R426 E427 C428 E429 I430 G431 V432 D433 H434 R435 V436 E437 A438 G439 R440 I441 A442 R443 G444 E445

R446 L447 V448 D449 M450 GLU LYS ILE GLU THR ASP MET ASP

• Molecule 4: Probable translation initiation factor eIF-2B subunit delta

Chain G:

4%				
58%	15%	•	25%	

MET GLY PHE SER ALA GLU GLN ALA LYS LYS ASP GLY LYS ASP GLN PRO VAL GLU SER GLU VAL SER SER SER VAL GLY GLY THR SER PRO ALA THR ALA SER SER VAL VAL SER PRO ASN GLU PRO LYS SER GLY GLU ALA LYS LEU ALA LEU LYS LYS ALA ARG LYS ALA GLN SER ARG

ARG ALA LYS ALA GLU ALA ALA ALA ASN ASN PRO GLY PRO VAL SER GLU GLU LYS LYS VAL ALA ILE PRO ASN LYS ASN SER ASN SER GLN GLN LYS ALA SER LYS ASN PRO GLN ASN SER PRO GLU THR ASP ALA ASN LEU GLN GLU LYS LYS I114 F115 E116 S121 I122 F123

S124 T134 E135 N136 I137 P138 K139 H142 I157 S160 I175 Y178 Q179 T180 P181 Y182 G183 T184 T185 L186 H189 L190 T191 N195 I198 S208 I209 S210 L218 K219 I222 S223 V224 L225 D226 I227 D228 L229 T230 D231 D232 E233 G234 K235 E236 L237 L238 L239

E240 K241 S244 Y245 I257 V258 K264 L272 T273 Y274 L275 S278 V283 H286 A287 K288 N289 V290 R302 P303 R308 M325 S330 V336 H344 S348 S354 R355 A356 K380 F381 T382 M403 M404 G405 V406 D407 D408 F409 E410 E411 K412 P413

L416 W419 K420 L427 L449 D433 P436 P437 V444 L449 F462 LYS GLN VAL TYR ALA

• Molecule 4: Probable translation initiation factor eIF-2B subunit delta

Chain H:

3%

62%   12%   •   25%

MET GLY PHE SER ALA GLU GLN GLN ALA LYS LYS ASP GLY LYS ASP GLN SER PRO VAL SER GLU SER SER VAL GLY GLY THR SER PRO ALA THR ALA SER SER VAL VAL SER PRO ASN GLU PRO LYS LEU SER GLY LYS GLU ALA LYS ALA LEU GLN LYS LYS ALA ARG LYS GLN ALA SER ARG

ARG ALA LYS GLU ALA ALA ALA ASN PRO PRO GLY VAL SER GLU GLU LYS LYS VAL ALA ILE PRO LYS ASN ASN SER GLN GLN LYS LYS SER ALA SER LYS GLN ASN PRO GLN ASN PRO GLU THR ASP ALA ALA LEU GLN LYS LYS I114 F115 E116 E117 K118 Q119 V120

S121 I122 F123 D140 P143 K156 I157 F158 L168 T184 V202 I207 S208 N213 A214 I215 R216 L220 E221 V224 L225 D226 I227 K241 V258 I271 S277 V283 L284 D300 S301 R302 K312 E316 I329 I332 G342 G343 H344

L347 S348 R355 S359 L360 I361 E383 Q386 V402 N403 M404 G405 V406 D407 D408 F409 E410 E411 K412 L416 A417 N418 V422 K423 N424 L425 D433 V444 L449 N460 E461 F462 LYS GLN VAL TYR ALA

• Molecule 5: Probable translation initiation factor eIF-2B subunit epsilon

Chain I:

%

47%   13%   ••   37%

MET PRO PRO SER LYS GLY LEU ASN GLY LYS LEU GLU LYS PRO K15 H16 A17 L18 Q19 S24 D25 S26 Y27 N28 Y29 R30 F31 R32 P33 L34 T35 K38 L50 Y53 F57 G62 V63 Q64 P89 S90 F93 G107 L110 T120 V130 V131 S132

L140 R144 D149 I154 R160 P164 V178 C186 V187 H188 Y198 M201 D202 P203 E204 I205 F206 H209 E210 E211 L212 E213 V214 I219 C226 V230 P231 F238 D242 D246 L257 G258 K259 K260 I261 E268 R273 V274 R290

Y293 P294 D298 L301 A322 R323 S324 C325 I326 I327 L332 T337 V345 T348 I349 C354 G357 I362 A365 G374 I379 G380 K381 I396 I401 V402 A403 V407 I408 G409 K416 N417 K418 R419 L420 T421 T422 Q428 G429 T430 L431 N432

D433 P434 S435 L436 V437 G438 G440 I439 G441 R442 GLY GLN GLU TYR HIS ALA GLU GLU ASP SER ASP ASP GLY GLU PHE MET GLU ALA SER GLY LEU ILE GLU SER THR ASN GLU LEU HIS LEU SER ASP SER GLU SER GLU THR SER SER SER GLU GLU ASP MET GLU PHE ILE

PRO PHE SER ALA ARG ASP SER ALA ASN THR ILE ASN SER GLU ASP VAL SER PRO LYS GLU ASP ASN LYS GLU ALA GLN GLU SER LEU GLU ARG ALA PHE GLU ASN HIS GLN ILE ILE ASP ALA ALA LEU GLU LEU ASN THR LEU ARG MET ALA MET ASN ALA ASN TYR HIS GLU

VAL ARG SER ALA ILE VAL LEU GLN LEU LEU GLY TYR PHE TYR GLN LEU GLU ILE ALA GLU ASN VAL SER PRO LYS GLU ALA LEU ALA GLN LEU MET THR ARG TRP GLY PRO LEU LEU ALA LYS TYR MET GLU ASP VAL SER GLY GLY LEU LYS GLN PHE VAL ASP LEU ASN TYR CYS VAL ARG LEU SER

MET THR ARG HIS PHE LEU GLN LEU LEU GLY TYR PHE TYR GLN LEU GLU ILE ALA GLU ASN VAL GLN GLU ASN ALA ILE ALA LEU LEU ARG ASP ALA GLY LYS GLN LEU PHE VAL ASP LEU ASN TYR THR ALA GLU SER GLU GLU

SER GLU GLU GLY SER GLU

• Molecule 5: Probable translation initiation factor eIF-2B subunit epsilon

Chain J:

4%

44%   17%   •   37%

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	144.50Å 209.23Å 223.53Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.29 – 2.99 49.29 – 2.99	Depositor EDS
% Data completeness (in resolution range)	99.6 (49.29-2.99) 99.6 (49.29-2.99)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.40 (at 3.01Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.9_1692)	Depositor
R, R_{free}	0.222 , 0.271 0.227 , 0.273	Depositor DCC
R_{free} test set	6815 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	80.9	Xtriage
Anisotropy	0.445	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 63.0	EDS
L-test for twinning[2]	$<|L|> = 0.48, <L^2> = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	28584	wwPDB-VP
Average B, all atoms (Å^2)	86.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.99% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1] Intensities estimated from amplitudes.
[2] Theoretical values of $<|L|>$, $<L^2>$ 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: PO4

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	0.32	0/2519	0.63	5/3409 (0.1%)
1	B	0.29	0/2537	0.48	2/3434 (0.1%)
2	C	0.31	0/2747	0.49	1/3726 (0.0%)
2	D	0.26	0/2719	0.46	2/3690 (0.1%)
3	E	0.57	2/3029 (0.1%)	0.91	21/4100 (0.5%)
3	F	0.51	3/3020 (0.1%)	1.08	30/4088 (0.7%)
4	G	0.38	1/2802 (0.0%)	0.58	3/3797 (0.1%)
4	H	0.27	0/2802	0.43	0/3797
5	I	0.46	1/3437 (0.0%)	0.77	14/4658 (0.3%)
5	J	0.45	2/3432 (0.1%)	0.63	5/4652 (0.1%)
All	All	0.40	9/29044 (0.0%)	0.69	83/39351 (0.2%)

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	A	0	2
3	E	0	5
3	F	0	6
4	H	0	1
5	I	0	1
5	J	0	1
All	All	0	16

The worst 5 of 9 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	268	PRO	N-CD	-13.76	1.28	1.47
5	J	434	PRO	N-CD	-9.39	1.34	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	J	33	PRO	N-CD	8.86	1.60	1.47
5	I	434	PRO	N-CD	7.20	1.57	1.47
3	E	257	GLU	CG-CD	-6.17	1.42	1.51

The worst 5 of 83 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	I	429	GLY	N-CA-C	16.66	154.74	113.10
3	F	370	ASP	N-CA-C	16.40	155.28	111.00
3	F	370	ASP	CB-CA-C	-15.86	78.69	110.40
5	I	432	ASN	CB-CA-C	-14.98	80.44	110.40
3	F	212	ALA	CB-CA-C	13.37	130.15	110.10

There are no chirality outliers.

5 of 16 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	329	LYS	Peptide
1	A	60	ASP	Peptide
3	E	257	GLU	Peptide
3	E	260	SER	Peptide
3	E	269	TYR	Peptide

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	A	2472	0	2492	150	0
1	B	2489	0	2512	52	0
2	C	2702	0	2744	95	0
2	D	2674	0	2714	52	1
3	E	2976	0	3032	265	0
3	F	2967	0	3022	325	7
4	G	2755	0	2841	91	0
4	H	2755	0	2841	45	0
5	I	3377	0	3361	140	1
5	J	3372	0	3351	134	7

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	A	5	0	0	0	0
6	B	5	0	0	0	0
6	C	5	0	0	0	0
6	D	5	0	0	1	0
6	G	10	0	0	1	0
6	H	10	0	0	0	0
6	I	5	0	0	1	0
All	All	28584	0	28910	1287	8

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 22.

The worst 5 of 1287 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:F:218:PHE:CE2	5:I:203:PRO:HB3	1.37	1.58
3:F:368:ILE:HA	3:F:385:ILE:O	1.17	1.24
3:E:355:LEU:HD21	3:E:369:LYS:O	1.05	1.23
3:F:218:PHE:HE2	5:I:203:PRO:CB	1.54	1.21
3:F:265:ASP:O	3:F:268:PRO:HD2	1.35	1.21

The worst 5 of 8 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	Interatomic distance (Å)	Clash overlap (Å)
3:F:113:ARG:NH2	5:J:443:GLY:C[2_555]	0.64	1.56
3:F:113:ARG:CZ	5:J:443:GLY:O[2_555]	0.66	1.54
3:F:113:ARG:NH2	5:J:443:GLY:O[2_555]	0.96	1.24
3:F:113:ARG:NH1	5:J:443:GLY:O[2_555]	1.51	0.69
3:F:113:ARG:CZ	5:J:443:GLY:C[2_555]	1.76	0.44

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	313/341 (92%)	293 (94%)	17 (5%)	3 (1%)	15	53
1	B	315/341 (92%)	302 (96%)	12 (4%)	1 (0%)	41	76
2	C	343/399 (86%)	330 (96%)	13 (4%)	0	100	100
2	D	340/399 (85%)	327 (96%)	13 (4%)	0	100	100
3	E	378/458 (82%)	334 (88%)	36 (10%)	8 (2%)	7	33
3	F	377/458 (82%)	334 (89%)	40 (11%)	3 (1%)	19	57
4	G	347/467 (74%)	331 (95%)	15 (4%)	1 (0%)	41	76
4	H	347/467 (74%)	339 (98%)	8 (2%)	0	100	100
5	I	426/678 (63%)	400 (94%)	24 (6%)	2 (0%)	29	68
5	J	426/678 (63%)	385 (90%)	37 (9%)	4 (1%)	17	55
All	All	3612/4686 (77%)	3375 (93%)	215 (6%)	22 (1%)	25	64

5 of 22 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	E	262	ILE
3	E	442	ALA
3	E	270	LEU
3	E	277	LYS
5	J	432	ASN

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	276/298 (93%)	264 (96%)	12 (4%)	29	66
1	B	278/298 (93%)	274 (99%)	4 (1%)	67	88
2	C	301/350 (86%)	290 (96%)	11 (4%)	34	70
2	D	298/350 (85%)	295 (99%)	3 (1%)	76	91
3	E	330/395 (84%)	299 (91%)	31 (9%)	8	32

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	F	329/395 (83%)	306 (93%)	23 (7%)	15	47
4	G	314/408 (77%)	307 (98%)	7 (2%)	52	81
4	H	314/408 (77%)	307 (98%)	7 (2%)	52	81
5	I	379/596 (64%)	363 (96%)	16 (4%)	30	66
5	J	378/596 (63%)	365 (97%)	13 (3%)	37	72
All	All	3197/4094 (78%)	3070 (96%)	127 (4%)	31	68

5 of 127 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	E	370	ASP
3	F	315	LYS
5	J	398	ASP
3	E	424	LYS
3	F	200	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 20 such sidechains are listed below:

Mol	Chain	Res	Type
4	G	403	ASN
4	G	460	ASN
5	J	386	ASN
3	F	325	ASN
3	F	343	GLN

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)

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	$\#|Z| > 2$
6	PO4	I	701	-	4,4,4	0.90	0	6,6,6	0.42	0
6	PO4	H	501	-	4,4,4	0.91	0	6,6,6	0.45	0
6	PO4	H	502	-	4,4,4	0.93	0	6,6,6	0.46	0
6	PO4	G	502	-	4,4,4	0.91	0	6,6,6	0.42	0
6	PO4	G	501	-	4,4,4	0.91	0	6,6,6	0.43	0
6	PO4	B	401	-	4,4,4	0.94	0	6,6,6	0.45	0
6	PO4	A	401	-	4,4,4	0.93	0	6,6,6	0.43	0
6	PO4	D	401	-	4,4,4	0.92	0	6,6,6	0.43	0
6	PO4	C	401	-	4,4,4	0.90	0	6,6,6	0.42	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 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	I	701	PO4	1	0
6	G	501	PO4	1	0
6	D	401	PO4	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(Å²)	Q<0.9
1	A	317/341 (92%)	0.60	30 (9%)	8	3	55, 86, 150, 173	0
1	B	319/341 (93%)	0.49	18 (5%)	24	8	49, 80, 123, 180	0
2	C	349/399 (87%)	0.46	23 (6%)	18	5	42, 68, 138, 165	0
2	D	346/399 (86%)	0.19	10 (2%)	51	23	41, 66, 111, 161	0
3	E	384/458 (83%)	0.67	42 (10%)	5	2	61, 99, 142, 163	0
3	F	383/458 (83%)	0.79	56 (14%)	2	1	66, 108, 153, 168	0
4	G	349/467 (74%)	0.45	20 (5%)	23	8	44, 75, 136, 167	0
4	H	349/467 (74%)	0.19	12 (3%)	45	19	44, 65, 116, 153	0
5	I	428/678 (63%)	0.23	10 (2%)	60	31	42, 73, 115, 148	0
5	J	428/678 (63%)	0.39	25 (5%)	23	7	50, 87, 122, 153	0
All	All	3652/4686 (77%)	0.44	246 (6%)	17	5	41, 80, 137, 180	0

The worst 5 of 246 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	F	423	SER	7.7
2	C	8	HIS	7.5
3	E	450	MET	6.5
4	G	226	ASP	6.0
2	C	4	ILE	5.7

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(Å^2)	Q<0.9
6	PO4	G	501	5/5	0.88	0.17	91,94,118,136	0
6	PO4	G	502	5/5	0.89	0.18	62,67,102,104	0
6	PO4	H	501	5/5	0.89	0.17	81,85,101,134	0
6	PO4	I	701	5/5	0.90	0.15	101,102,127,141	0
6	PO4	H	502	5/5	0.95	0.20	71,82,90,98	0
6	PO4	D	401	5/5	0.97	0.22	50,53,72,73	0
6	PO4	A	401	5/5	0.98	0.16	70,71,84,89	0
6	PO4	B	401	5/5	0.98	0.19	63,67,86,93	0
6	PO4	C	401	5/5	0.99	0.18	51,53,68,70	0

6.5 Other polymers (i)

There are no such residues in this entry.