



# Full wwPDB X-ray Structure Validation Report ⓘ

Jul 12, 2022 – 01:12 pm BST

PDB ID : 7QG6  
Title : Co-crystal structure of UPF3A-RRM-NOPS-L with UPF2-MIF4GIII  
Authors : Powers, K.T.; Bufton, J.C.; Szeto, J.A.; Schaffitzel, C.  
Deposited on : 2021-12-07  
Resolution : 2.95 Å(reported)

This is a Full wwPDB X-ray Structure Validation 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

<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>.

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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 : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.29  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0267  
CCP4 : 7.1.010 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.29

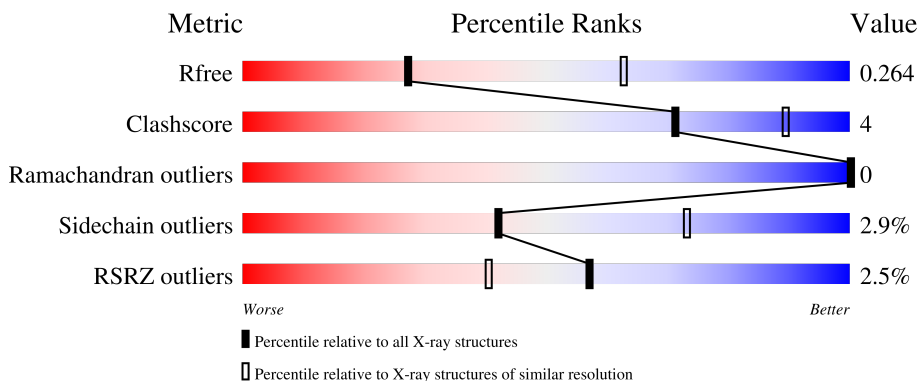
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.95 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	3104 (3.00-2.92)
Clashscore	141614	3462 (3.00-2.92)
Ramachandran outliers	138981	3340 (3.00-2.92)
Sidechain outliers	138945	3343 (3.00-2.92)
RSRZ outliers	127900	2986 (3.00-2.92)

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  $\geq 3$ , 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	176	 2% 60% 10% 30%
1	C	176	 63% 34%
1	E	176	 5% 57% 11% 32%
1	G	176	 3% 61% 5% 34%
2	B	321	 68% 10% 23%

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Mol	Chain	Length	Quality of chain
2	D	321	 64% 11% 24%
2	F	321	 % 71% 6% 23%
2	H	321	 3% 70% 6% 24%

## 2 Entry composition i

There are 5 unique types of molecules in this entry. The entry contains 11757 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 Regulator of nonsense transcripts 3A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	C	117	928	610	148	169	1	0	0	0
1	A	123	965	632	154	178	1	0	0	0
1	E	119	904	593	142	168	1	0	0	0
1	G	116	901	595	140	165	1	0	0	0

There are 108 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	31	MET	-	initiating methionine	UNP Q9H1J1
C	32	SER	-	expression tag	UNP Q9H1J1
C	33	TYR	-	expression tag	UNP Q9H1J1
C	34	TYR	-	expression tag	UNP Q9H1J1
C	35	HIS	-	expression tag	UNP Q9H1J1
C	36	HIS	-	expression tag	UNP Q9H1J1
C	37	HIS	-	expression tag	UNP Q9H1J1
C	38	HIS	-	expression tag	UNP Q9H1J1
C	39	HIS	-	expression tag	UNP Q9H1J1
C	40	HIS	-	expression tag	UNP Q9H1J1
C	41	ASP	-	expression tag	UNP Q9H1J1
C	42	TYR	-	expression tag	UNP Q9H1J1
C	43	ASP	-	expression tag	UNP Q9H1J1
C	44	ILE	-	expression tag	UNP Q9H1J1
C	45	PRO	-	expression tag	UNP Q9H1J1
C	46	THR	-	expression tag	UNP Q9H1J1
C	47	THR	-	expression tag	UNP Q9H1J1
C	48	GLU	-	expression tag	UNP Q9H1J1
C	49	ASN	-	expression tag	UNP Q9H1J1
C	50	LEU	-	expression tag	UNP Q9H1J1
C	51	TYR	-	expression tag	UNP Q9H1J1

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Chain	Residue	Modelled	Actual	Comment	Reference
C	52	PHE	-	expression tag	UNP Q9H1J1
C	53	GLN	-	expression tag	UNP Q9H1J1
C	54	GLY	-	expression tag	UNP Q9H1J1
C	55	ALA	-	expression tag	UNP Q9H1J1
C	56	MET	-	expression tag	UNP Q9H1J1
C	57	ASP	-	expression tag	UNP Q9H1J1
A	31	MET	-	initiating methionine	UNP Q9H1J1
A	32	SER	-	expression tag	UNP Q9H1J1
A	33	TYR	-	expression tag	UNP Q9H1J1
A	34	TYR	-	expression tag	UNP Q9H1J1
A	35	HIS	-	expression tag	UNP Q9H1J1
A	36	HIS	-	expression tag	UNP Q9H1J1
A	37	HIS	-	expression tag	UNP Q9H1J1
A	38	HIS	-	expression tag	UNP Q9H1J1
A	39	HIS	-	expression tag	UNP Q9H1J1
A	40	HIS	-	expression tag	UNP Q9H1J1
A	41	ASP	-	expression tag	UNP Q9H1J1
A	42	TYR	-	expression tag	UNP Q9H1J1
A	43	ASP	-	expression tag	UNP Q9H1J1
A	44	ILE	-	expression tag	UNP Q9H1J1
A	45	PRO	-	expression tag	UNP Q9H1J1
A	46	THR	-	expression tag	UNP Q9H1J1
A	47	THR	-	expression tag	UNP Q9H1J1
A	48	GLU	-	expression tag	UNP Q9H1J1
A	49	ASN	-	expression tag	UNP Q9H1J1
A	50	LEU	-	expression tag	UNP Q9H1J1
A	51	TYR	-	expression tag	UNP Q9H1J1
A	52	PHE	-	expression tag	UNP Q9H1J1
A	53	GLN	-	expression tag	UNP Q9H1J1
A	54	GLY	-	expression tag	UNP Q9H1J1
A	55	ALA	-	expression tag	UNP Q9H1J1
A	56	MET	-	expression tag	UNP Q9H1J1
A	57	ASP	-	expression tag	UNP Q9H1J1
E	31	MET	-	initiating methionine	UNP Q9H1J1
E	32	SER	-	expression tag	UNP Q9H1J1
E	33	TYR	-	expression tag	UNP Q9H1J1
E	34	TYR	-	expression tag	UNP Q9H1J1
E	35	HIS	-	expression tag	UNP Q9H1J1
E	36	HIS	-	expression tag	UNP Q9H1J1
E	37	HIS	-	expression tag	UNP Q9H1J1
E	38	HIS	-	expression tag	UNP Q9H1J1
E	39	HIS	-	expression tag	UNP Q9H1J1

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Chain	Residue	Modelled	Actual	Comment	Reference
E	40	HIS	-	expression tag	UNP Q9H1J1
E	41	ASP	-	expression tag	UNP Q9H1J1
E	42	TYR	-	expression tag	UNP Q9H1J1
E	43	ASP	-	expression tag	UNP Q9H1J1
E	44	ILE	-	expression tag	UNP Q9H1J1
E	45	PRO	-	expression tag	UNP Q9H1J1
E	46	THR	-	expression tag	UNP Q9H1J1
E	47	THR	-	expression tag	UNP Q9H1J1
E	48	GLU	-	expression tag	UNP Q9H1J1
E	49	ASN	-	expression tag	UNP Q9H1J1
E	50	LEU	-	expression tag	UNP Q9H1J1
E	51	TYR	-	expression tag	UNP Q9H1J1
E	52	PHE	-	expression tag	UNP Q9H1J1
E	53	GLN	-	expression tag	UNP Q9H1J1
E	54	GLY	-	expression tag	UNP Q9H1J1
E	55	ALA	-	expression tag	UNP Q9H1J1
E	56	MET	-	expression tag	UNP Q9H1J1
E	57	ASP	-	expression tag	UNP Q9H1J1
G	31	MET	-	initiating methionine	UNP Q9H1J1
G	32	SER	-	expression tag	UNP Q9H1J1
G	33	TYR	-	expression tag	UNP Q9H1J1
G	34	TYR	-	expression tag	UNP Q9H1J1
G	35	HIS	-	expression tag	UNP Q9H1J1
G	36	HIS	-	expression tag	UNP Q9H1J1
G	37	HIS	-	expression tag	UNP Q9H1J1
G	38	HIS	-	expression tag	UNP Q9H1J1
G	39	HIS	-	expression tag	UNP Q9H1J1
G	40	HIS	-	expression tag	UNP Q9H1J1
G	41	ASP	-	expression tag	UNP Q9H1J1
G	42	TYR	-	expression tag	UNP Q9H1J1
G	43	ASP	-	expression tag	UNP Q9H1J1
G	44	ILE	-	expression tag	UNP Q9H1J1
G	45	PRO	-	expression tag	UNP Q9H1J1
G	46	THR	-	expression tag	UNP Q9H1J1
G	47	THR	-	expression tag	UNP Q9H1J1
G	48	GLU	-	expression tag	UNP Q9H1J1
G	49	ASN	-	expression tag	UNP Q9H1J1
G	50	LEU	-	expression tag	UNP Q9H1J1
G	51	TYR	-	expression tag	UNP Q9H1J1
G	52	PHE	-	expression tag	UNP Q9H1J1
G	53	GLN	-	expression tag	UNP Q9H1J1
G	54	GLY	-	expression tag	UNP Q9H1J1

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Chain	Residue	Modelled	Actual	Comment	Reference
G	55	ALA	-	expression tag	UNP Q9H1J1
G	56	MET	-	expression tag	UNP Q9H1J1
G	57	ASP	-	expression tag	UNP Q9H1J1

- Molecule 2 is a protein called Regulator of nonsense transcripts 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	245	Total	C	N	O	S	0	1	0
			2015	1297	343	363	12			
2	B	248	Total	C	N	O	S	0	1	0
			2033	1312	346	363	12			
2	F	246	Total	C	N	O	S	0	0	0
			1987	1282	337	356	12			
2	H	244	Total	C	N	O	S	0	0	0
			1974	1279	335	348	12			

There are 108 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	734	MET	-	initiating methionine	UNP Q9HAU5
D	735	SER	-	expression tag	UNP Q9HAU5
D	736	TYR	-	expression tag	UNP Q9HAU5
D	737	TYR	-	expression tag	UNP Q9HAU5
D	738	HIS	-	expression tag	UNP Q9HAU5
D	739	HIS	-	expression tag	UNP Q9HAU5
D	740	HIS	-	expression tag	UNP Q9HAU5
D	741	HIS	-	expression tag	UNP Q9HAU5
D	742	HIS	-	expression tag	UNP Q9HAU5
D	743	HIS	-	expression tag	UNP Q9HAU5
D	744	ASP	-	expression tag	UNP Q9HAU5
D	745	TYR	-	expression tag	UNP Q9HAU5
D	746	ASP	-	expression tag	UNP Q9HAU5
D	747	ILE	-	expression tag	UNP Q9HAU5
D	748	PRO	-	expression tag	UNP Q9HAU5
D	749	THR	-	expression tag	UNP Q9HAU5
D	750	THR	-	expression tag	UNP Q9HAU5
D	751	GLU	-	expression tag	UNP Q9HAU5
D	752	ASN	-	expression tag	UNP Q9HAU5
D	753	LEU	-	expression tag	UNP Q9HAU5
D	754	TYR	-	expression tag	UNP Q9HAU5
D	755	PHE	-	expression tag	UNP Q9HAU5
D	756	GLN	-	expression tag	UNP Q9HAU5

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Chain	Residue	Modelled	Actual	Comment	Reference
D	757	GLY	-	expression tag	UNP Q9HAU5
D	758	ALA	-	expression tag	UNP Q9HAU5
D	759	MET	-	expression tag	UNP Q9HAU5
D	760	ASP	-	expression tag	UNP Q9HAU5
B	734	MET	-	initiating methionine	UNP Q9HAU5
B	735	SER	-	expression tag	UNP Q9HAU5
B	736	TYR	-	expression tag	UNP Q9HAU5
B	737	TYR	-	expression tag	UNP Q9HAU5
B	738	HIS	-	expression tag	UNP Q9HAU5
B	739	HIS	-	expression tag	UNP Q9HAU5
B	740	HIS	-	expression tag	UNP Q9HAU5
B	741	HIS	-	expression tag	UNP Q9HAU5
B	742	HIS	-	expression tag	UNP Q9HAU5
B	743	HIS	-	expression tag	UNP Q9HAU5
B	744	ASP	-	expression tag	UNP Q9HAU5
B	745	TYR	-	expression tag	UNP Q9HAU5
B	746	ASP	-	expression tag	UNP Q9HAU5
B	747	ILE	-	expression tag	UNP Q9HAU5
B	748	PRO	-	expression tag	UNP Q9HAU5
B	749	THR	-	expression tag	UNP Q9HAU5
B	750	THR	-	expression tag	UNP Q9HAU5
B	751	GLU	-	expression tag	UNP Q9HAU5
B	752	ASN	-	expression tag	UNP Q9HAU5
B	753	LEU	-	expression tag	UNP Q9HAU5
B	754	TYR	-	expression tag	UNP Q9HAU5
B	755	PHE	-	expression tag	UNP Q9HAU5
B	756	GLN	-	expression tag	UNP Q9HAU5
B	757	GLY	-	expression tag	UNP Q9HAU5
B	758	ALA	-	expression tag	UNP Q9HAU5
B	759	MET	-	expression tag	UNP Q9HAU5
B	760	ASP	-	expression tag	UNP Q9HAU5
F	734	MET	-	initiating methionine	UNP Q9HAU5
F	735	SER	-	expression tag	UNP Q9HAU5
F	736	TYR	-	expression tag	UNP Q9HAU5
F	737	TYR	-	expression tag	UNP Q9HAU5
F	738	HIS	-	expression tag	UNP Q9HAU5
F	739	HIS	-	expression tag	UNP Q9HAU5
F	740	HIS	-	expression tag	UNP Q9HAU5
F	741	HIS	-	expression tag	UNP Q9HAU5
F	742	HIS	-	expression tag	UNP Q9HAU5
F	743	HIS	-	expression tag	UNP Q9HAU5
F	744	ASP	-	expression tag	UNP Q9HAU5

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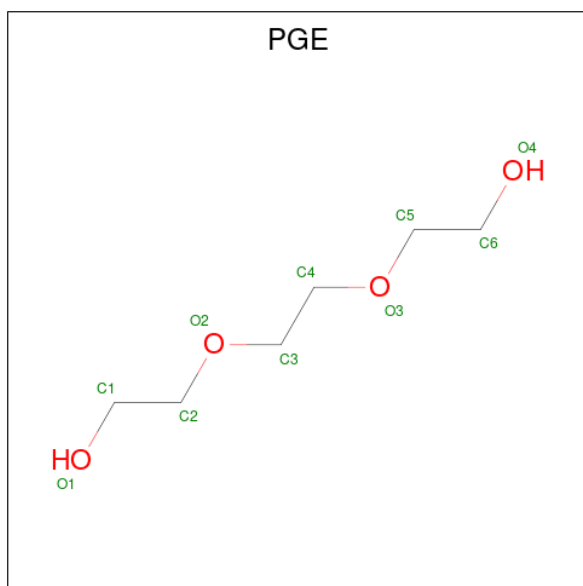
Chain	Residue	Modelled	Actual	Comment	Reference
F	745	TYR	-	expression tag	UNP Q9HAU5
F	746	ASP	-	expression tag	UNP Q9HAU5
F	747	ILE	-	expression tag	UNP Q9HAU5
F	748	PRO	-	expression tag	UNP Q9HAU5
F	749	THR	-	expression tag	UNP Q9HAU5
F	750	THR	-	expression tag	UNP Q9HAU5
F	751	GLU	-	expression tag	UNP Q9HAU5
F	752	ASN	-	expression tag	UNP Q9HAU5
F	753	LEU	-	expression tag	UNP Q9HAU5
F	754	TYR	-	expression tag	UNP Q9HAU5
F	755	PHE	-	expression tag	UNP Q9HAU5
F	756	GLN	-	expression tag	UNP Q9HAU5
F	757	GLY	-	expression tag	UNP Q9HAU5
F	758	ALA	-	expression tag	UNP Q9HAU5
F	759	MET	-	expression tag	UNP Q9HAU5
F	760	ASP	-	expression tag	UNP Q9HAU5
H	734	MET	-	initiating methionine	UNP Q9HAU5
H	735	SER	-	expression tag	UNP Q9HAU5
H	736	TYR	-	expression tag	UNP Q9HAU5
H	737	TYR	-	expression tag	UNP Q9HAU5
H	738	HIS	-	expression tag	UNP Q9HAU5
H	739	HIS	-	expression tag	UNP Q9HAU5
H	740	HIS	-	expression tag	UNP Q9HAU5
H	741	HIS	-	expression tag	UNP Q9HAU5
H	742	HIS	-	expression tag	UNP Q9HAU5
H	743	HIS	-	expression tag	UNP Q9HAU5
H	744	ASP	-	expression tag	UNP Q9HAU5
H	745	TYR	-	expression tag	UNP Q9HAU5
H	746	ASP	-	expression tag	UNP Q9HAU5
H	747	ILE	-	expression tag	UNP Q9HAU5
H	748	PRO	-	expression tag	UNP Q9HAU5
H	749	THR	-	expression tag	UNP Q9HAU5
H	750	THR	-	expression tag	UNP Q9HAU5
H	751	GLU	-	expression tag	UNP Q9HAU5
H	752	ASN	-	expression tag	UNP Q9HAU5
H	753	LEU	-	expression tag	UNP Q9HAU5
H	754	TYR	-	expression tag	UNP Q9HAU5
H	755	PHE	-	expression tag	UNP Q9HAU5
H	756	GLN	-	expression tag	UNP Q9HAU5
H	757	GLY	-	expression tag	UNP Q9HAU5
H	758	ALA	-	expression tag	UNP Q9HAU5
H	759	MET	-	expression tag	UNP Q9HAU5

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Chain	Residue	Modelled	Actual	Comment	Reference
H	760	ASP	-	expression tag	UNP Q9HAU5

- Molecule 3 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: C<sub>6</sub>H<sub>14</sub>O<sub>4</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
3	D	1	10	6	4	0	0
3	B	1	10	6	4	0	0
3	F	1	10	6	4	0	0

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Cl		
4	F	1	1	1	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
5	C	1	1	1	0	0
5	D	9	9	9	0	0

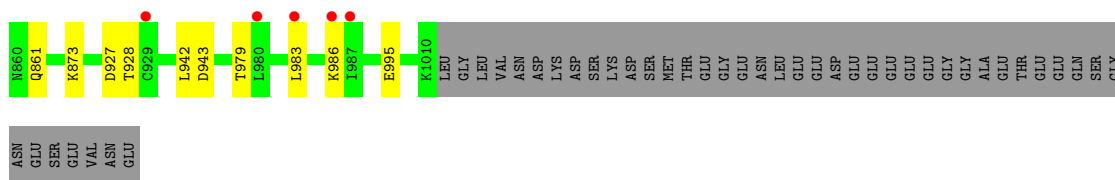
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total O 1 1	0	0
5	B	2	Total O 2 2	0	0
5	F	1	Total O 1 1	0	0
5	G	2	Total O 2 2	0	0
5	H	3	Total O 3 3	0	0







## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	77.68Å 108.58Å 119.94Å 90.00° 90.10° 90.00°	Depositor
Resolution (Å)	65.25 – 2.95 65.25 – 2.95	Depositor EDS
% Data completeness (in resolution range)	99.1 (65.25-2.95) 98.6 (65.25-2.95)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.17 (at 2.96Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, $R_{free}$	0.207 , 0.263 0.214 , 0.264	Depositor DCC
$R_{free}$ test set	2080 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	66.7	Xtrriage
Anisotropy	0.048	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	(Not available) , (Not available)	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	0.178 for h,-k,-l	Xtrriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	11757	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	66.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.76% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical 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: CL, PGE

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	0.26	0/992	0.48	0/1351
1	C	0.26	0/955	0.46	0/1300
1	E	0.27	0/930	0.45	0/1269
1	G	0.27	0/927	0.47	0/1265
2	B	0.25	0/2080	0.46	0/2821
2	D	0.25	0/2061	0.46	0/2795
2	F	0.25	0/2033	0.45	0/2760
2	H	0.25	0/2021	0.44	0/2742
All	All	0.25	0/11999	0.46	0/16303

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	A	965	0	882	12	0
1	C	928	0	865	3	0
1	E	904	0	806	12	0
1	G	901	0	823	5	0
2	B	2033	0	2022	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	2015	0	1997	20	0
2	F	1987	0	1964	10	0
2	H	1974	0	1955	9	0
3	B	10	0	14	0	0
3	D	10	0	14	0	0
3	F	10	0	14	0	0
4	F	1	0	0	0	0
5	A	1	0	0	0	0
5	B	2	0	0	1	0
5	C	1	0	0	0	0
5	D	9	0	0	0	0
5	F	1	0	0	0	0
5	G	2	0	0	0	0
5	H	3	0	0	0	0
All	All	11757	0	11356	81	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 4.

All (81) 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:H:873:LYS:HD2	2:H:928:THR:HG21	1.71	0.70
2:D:920[B]:ARG:NH1	2:D:972:ILE:HD11	2.09	0.68
2:D:927:ASP:OD1	2:D:979:THR:HG22	1.96	0.65
2:D:942:LEU:HD21	2:D:983:LEU:HD23	1.79	0.65
2:B:776:ARG:NH1	5:B:1201:HOH:O	2.30	0.65
2:D:799:PRO:HG2	2:D:805:VAL:HG11	1.78	0.64
1:E:72:ILE:HD13	1:E:148:VAL:HG22	1.81	0.63
2:H:859:VAL:HG12	2:H:861:GLN:HG3	1.81	0.63
1:C:105:SER:OG	2:D:867:ARG:NH2	2.34	0.60
2:D:782:ASP:O	2:D:786:VAL:HG22	2.01	0.60
2:D:810:ILE:HG23	2:D:845:VAL:HG12	1.84	0.60
2:D:947:VAL:HG11	2:D:1003:LEU:HD13	1.82	0.60
1:A:124:ILE:H	1:A:124:ILE:HD12	1.69	0.58
2:D:960:GLU:N	2:D:960:GLU:OE1	2.37	0.57
2:D:946:LEU:O	2:D:950:GLN:HG3	2.05	0.57
1:A:121:PRO:HA	1:A:124:ILE:HD11	1.87	0.56
2:B:960:GLU:N	2:B:960:GLU:OE1	2.39	0.56
1:E:75:LEU:HB3	1:E:76:PRO:CD	2.38	0.54
1:G:165:ASP:OD1	1:G:167:LYS:N	2.41	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:93:ALA:HB1	1:A:119:ARG:HD2	1.90	0.53
1:G:104:LEU:HA	1:G:110:LEU:HD21	1.91	0.53
2:B:1008:LEU:HB2	2:B:1014:VAL:HG22	1.91	0.53
2:B:927:ASP:OD1	2:B:979:THR:HG22	2.09	0.52
1:A:160:LYS:O	1:A:162:ARG:N	2.42	0.52
1:A:74:ARG:NH1	2:B:858:GLU:OE1	2.42	0.52
1:A:103:ASP:O	1:A:104:LEU:HB2	2.10	0.52
2:D:841:VAL:O	2:D:845:VAL:HG13	2.09	0.52
2:F:994:GLU:N	2:F:994:GLU:OE1	2.41	0.52
2:H:787:THR:O	2:H:791:VAL:HG23	2.10	0.52
2:D:852:ASP:OD2	2:D:867:ARG:NH1	2.43	0.51
1:E:124:ILE:H	1:E:124:ILE:HD12	1.76	0.50
2:B:1005:ARG:O	2:B:1009:ILE:HG13	2.12	0.50
1:A:177:TYR:O	1:A:181:LEU:HD12	2.12	0.49
2:B:838:GLN:O	2:B:841:VAL:HG12	2.12	0.49
2:D:815:ASN:OD1	2:D:867:ARG:NH2	2.46	0.49
1:A:107:TYR:O	1:A:110:LEU:HD21	2.13	0.49
1:A:186:VAL:O	1:A:186:VAL:HG23	2.12	0.49
2:D:924:THR:O	2:D:928:THR:HG23	2.13	0.49
2:H:873:LYS:CD	2:H:928:THR:HG21	2.42	0.48
2:F:926:LEU:HB3	2:F:983:LEU:HD11	1.96	0.48
2:F:984:ARG:O	2:F:987:ILE:HG22	2.13	0.48
1:E:72:ILE:CG2	1:E:75:LEU:HD11	2.44	0.48
2:D:961:VAL:HG13	2:B:862:PRO:HB3	1.96	0.47
2:F:960:GLU:OE1	2:F:960:GLU:N	2.43	0.47
1:E:72:ILE:HG22	1:E:75:LEU:HD11	1.96	0.47
2:F:816:ILE:HD11	2:F:827:VAL:HG21	1.97	0.47
2:D:810:ILE:HG12	2:D:841:VAL:HG13	1.96	0.46
2:F:989:LEU:HD22	2:F:989:LEU:H	1.80	0.46
1:C:138:ASP:OD1	1:C:142:LEU:N	2.46	0.46
2:F:859:VAL:HG12	2:F:861:GLN:HG3	1.98	0.46
2:H:979:THR:O	2:H:983:LEU:HD12	2.16	0.46
1:C:72:ILE:HD11	1:C:127:PHE:CZ	2.51	0.46
1:E:104:LEU:HD22	1:E:104:LEU:H	1.81	0.45
2:D:873:LYS:HG2	2:D:928:THR:HG21	1.99	0.45
2:F:982:LEU:HD23	2:F:982:LEU:O	2.17	0.45
2:B:795:MET:HA	2:B:798:LEU:HD23	1.99	0.45
2:H:786:VAL:HG22	2:H:786:VAL:O	2.17	0.45
1:G:102:ALA:HB1	1:G:110:LEU:HD22	1.99	0.45
2:D:944:CYS:O	2:D:947:VAL:HG12	2.16	0.45
1:E:181:LEU:O	1:E:185:CYS:N	2.45	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:819:VAL:HG12	2:H:820:LYS:O	2.18	0.44
1:A:177:TYR:CE2	1:A:181:LEU:HD11	2.54	0.43
1:A:95:ASP:N	1:A:95:ASP:OD1	2.48	0.43
2:H:942:LEU:HD21	2:H:983:LEU:HD23	2.02	0.42
2:D:835:VAL:HG11	2:D:842:GLY:HA3	2.01	0.42
2:B:1004:GLU:O	2:B:1007:PHE:HB2	2.20	0.42
1:E:88:LEU:HB3	1:E:91:LEU:HD13	2.02	0.42
2:B:824:ILE:O	2:B:827:VAL:HG22	2.20	0.42
2:F:927:ASP:OD1	2:F:979:THR:HG22	2.19	0.42
2:B:816:ILE:HD12	2:B:827:VAL:HG21	2.02	0.41
1:E:153:PHE:HB3	2:F:847:ASP:OD1	2.20	0.41
1:E:120:ASN:ND2	1:E:123:ASP:OD1	2.52	0.41
1:A:186:VAL:O	1:A:186:VAL:CG2	2.68	0.41
2:B:912:PRO:HG2	2:B:915:HIS:HB2	2.02	0.41
1:E:105:SER:OG	1:E:106:LEU:N	2.54	0.41
1:E:91:LEU:HD23	1:E:94:HIS:CE1	2.55	0.41
2:D:1004:GLU:O	2:D:1008:LEU:HD12	2.20	0.41
2:B:810:ILE:HD13	2:B:844:HIS:HB2	2.03	0.41
1:G:103:ASP:O	1:G:104:LEU:HD12	2.21	0.40
2:B:803:GLN:O	2:B:807:ASP:OD1	2.40	0.40
1:G:171:ILE:CD1	2:H:794:GLN:OE1	2.69	0.40

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	119/176 (68%)	109 (92%)	10 (8%)	0	100	100
1	C	113/176 (64%)	106 (94%)	7 (6%)	0	100	100
1	E	115/176 (65%)	102 (89%)	13 (11%)	0	100	100
1	G	110/176 (62%)	101 (92%)	9 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	B	247/321 (77%)	234 (95%)	13 (5%)	0	100	100
2	D	244/321 (76%)	233 (96%)	11 (4%)	0	100	100
2	F	244/321 (76%)	234 (96%)	10 (4%)	0	100	100
2	H	242/321 (75%)	228 (94%)	14 (6%)	0	100	100
All	All	1434/1988 (72%)	1347 (94%)	87 (6%)	0	100	100

There are no Ramachandran outliers to report.

### 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	94/158 (60%)	92 (98%)	2 (2%)	53	80
1	C	93/158 (59%)	92 (99%)	1 (1%)	73	89
1	E	86/158 (54%)	83 (96%)	3 (4%)	36	68
1	G	88/158 (56%)	85 (97%)	3 (3%)	37	69
2	B	226/300 (75%)	220 (97%)	6 (3%)	44	74
2	D	224/300 (75%)	214 (96%)	10 (4%)	27	61
2	F	219/300 (73%)	215 (98%)	4 (2%)	59	82
2	H	216/300 (72%)	209 (97%)	7 (3%)	39	71
All	All	1246/1832 (68%)	1210 (97%)	36 (3%)	42	73

All (36) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	186	VAL
2	D	777	LYS
2	D	789	GLU
2	D	793	ARG
2	D	852	ASP
2	D	882	ARG

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Mol	Chain	Res	Type
2	D	937	SER
2	D	966	HIS
2	D	973	ASP
2	D	1002	ASP
2	D	1003	LEU
1	A	82	GLU
1	A	106	LEU
2	B	767	LYS
2	B	804	GLU
2	B	885	GLU
2	B	939	LYS
2	B	965	ASP
2	B	986	LYS
1	E	80	THR
1	E	179	LYS
1	E	183	THR
2	F	844	HIS
2	F	852	ASP
2	F	965	ASP
2	F	1000	VAL
1	G	97	PHE
1	G	106	LEU
1	G	165	ASP
2	H	806	LYS
2	H	837	TYR
2	H	855	LEU
2	H	927	ASP
2	H	943	ASP
2	H	986	LYS
2	H	995	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 4 ligands modelled in this entry, 1 is monoatomic - leaving 3 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
3	PGE	D	1101	-	9,9,9	0.51	0	8,8,8	0.21	0
3	PGE	B	1101	-	9,9,9	0.52	0	8,8,8	0.25	0
3	PGE	F	1101	-	9,9,9	0.50	0	8,8,8	0.36	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
3	PGE	D	1101	-	-	3/7/7/7	-
3	PGE	B	1101	-	-	2/7/7/7	-
3	PGE	F	1101	-	-	7/7/7/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	F	1101	PGE	O2-C3-C4-O3
3	F	1101	PGE	O3-C5-C6-O4
3	F	1101	PGE	C4-C3-O2-C2
3	B	1101	PGE	O3-C5-C6-O4

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Mol	Chain	Res	Type	Atoms
3	D	1101	PGE	O1-C1-C2-O2
3	F	1101	PGE	O1-C1-C2-O2
3	D	1101	PGE	C3-C4-O3-C5
3	F	1101	PGE	C1-C2-O2-C3
3	D	1101	PGE	C1-C2-O2-C3
3	F	1101	PGE	C3-C4-O3-C5
3	B	1101	PGE	C3-C4-O3-C5
3	F	1101	PGE	C6-C5-O3-C4

There are no ring outliers.

No monomer is involved in short contacts.

## 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

### 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	123/176 (69%)	-0.13	3 (2%) 59 42	43, 72, 96, 101	0
1	C	117/176 (66%)	-0.30	0 100 100	45, 79, 101, 117	0
1	E	119/176 (67%)	0.25	8 (6%) 17 10	57, 86, 103, 116	0
1	G	116/176 (65%)	-0.02	6 (5%) 27 17	52, 85, 102, 111	0
2	B	248/321 (77%)	-0.06	4 (1%) 72 55	28, 53, 80, 94	0
2	D	245/321 (76%)	-0.11	0 100 100	33, 57, 84, 100	0
2	F	246/321 (76%)	-0.12	4 (1%) 72 55	31, 60, 86, 101	0
2	H	244/321 (76%)	0.14	11 (4%) 33 21	47, 71, 91, 106	0
All	All	1458/1988 (73%)	-0.04	36 (2%) 57 40	28, 68, 95, 117	0

All (36) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	929	CYS	4.9
1	G	66	ALA	4.8
2	H	987	ILE	3.8
1	E	155	LYS	3.6
2	H	983	LEU	3.5
1	G	157	ALA	3.5
1	E	88	LEU	3.5
2	H	837	TYR	3.5
1	E	134	TYR	3.4
2	F	1008	LEU	3.0
2	H	980	LEU	2.9
2	F	847	ASP	2.7
1	E	115	TYR	2.7
2	H	986	LYS	2.7
2	H	836	LEU	2.7
1	G	141	GLY	2.6

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Mol	Chain	Res	Type	RSRZ
2	H	800	TRP	2.6
2	F	889	ILE	2.5
2	H	834	LEU	2.5
1	A	184	TYR	2.5
1	E	173	ASP	2.4
2	B	986	LYS	2.4
2	F	884	VAL	2.2
1	G	67	LEU	2.2
2	B	1013	LEU	2.2
1	A	103	ASP	2.2
1	E	171	ILE	2.2
2	B	1010	LYS	2.2
1	G	88	LEU	2.2
1	A	118	PHE	2.2
1	E	131	PHE	2.1
1	E	72	ILE	2.1
2	B	987	ILE	2.1
2	H	843	ILE	2.1
1	G	165	ASP	2.0
2	H	795	MET	2.0

## 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 monosaccharides 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, 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	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	PGE	B	1101	10/10	0.89	0.31	51,72,87,88	0
3	PGE	D	1101	10/10	0.91	0.19	59,67,74,78	0
3	PGE	F	1101	10/10	0.93	0.15	52,66,77,87	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	CL	F	1102	1/1	0.99	0.20	42,42,42,42	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.