

Full wwPDB X-ray Structure Validation Report (i)

Nov 21, 2023 – 06:29 PM JST

PDB ID	:	7F90
Title	:	Crystal structure of SARS auxiliary protein in complex with human nuclear
		protein
Authors	:	Gao, X.; Cui, S.
Deposited on	:	2021-07-03
Resolution	:	2.39 Å(reported)
Authors Deposited on Resolution	: : :	Gao, X.; Cui, S. 2021-07-03 2.39 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 A user guide is available at https://www.wwpdb.org/validation/2017/XrayValidationReportHelp with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (1)) were used in the production of this report:

MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
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)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure: $X\text{-}RAY\;DIFFRACTION$

The reported resolution of this entry is 2.39 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	$egin{array}{c} { m Whole \ archive} \ (\#{ m Entries}) \end{array}$	${f Similar\ resolution}\ (\#{ m Entries,\ resolution\ range}({ m \AA}))$
R_{free}	130704	$3907 \ (2.40-2.40)$
Clashscore	141614	4398(2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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 >=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	Е	63	3% 11% 5%	84%		
1	F	63	10% 11% 8%	81%		
2	А	368	4%	73%	15%	• 11%
2	С	368	2%	73%	16%	11%
3	В	1817	.% •	98%		
3	D	1817	••	97%		



2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 12124 atoms, of which 5832 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 ORF6 protein.

Mol	Chain	Residues		I	Aton	ns			ZeroOcc	AltConf	Trace
1	F	10	Total	С	Η	Ν	0	S	0	0	0
		10	151	52	65	10	23	1	0	0	0
1	1 F	19	Total	С	Η	Ν	0	S	0	0	0
1	Г	12	162	63	61	12	25	1	0	0	0

• Molecule 2 is a protein called mRNA export factor.

Mol	Chain	Residues			Atom	IS			ZeroOcc	AltConf	Trace
2	А	328	Total 5096	C 1645	Н 2499	N 452	0 483	S 17	0	0	0
2	С	327	Total 5086	C 1643	Н 2494	N 449	0 483	S 17	0	1	0

• Molecule 3 is a protein called Nuclear pore complex protein Nup98-Nup96.

Mol	Chain	Residues		A	Atom	s			ZeroOcc	AltConf	Trace
3	В	45	Total 713	C 221	Н 353	N 62	O 75	$\begin{array}{c} \mathrm{S} \\ \mathrm{2} \end{array}$	0	0	0
3	D	46	Total 727	C 225	Н 360	N 63	0 77	$\begin{array}{c} \mathrm{S} \\ \mathrm{2} \end{array}$	0	0	0

• Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	Е	2	Total O 2 2	0	0
4	F	1	Total O 1 1	0	0
4	А	83	Total O 83 83	0	0
4	С	90	Total O 90 90	0	0



Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	В	5	Total O 5 5	0	0
4	D	8	Total O 8 8	0	0



3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide 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: ORF6 protein







LEU	GLN	ALA	LEU	GLY	LYS	ALA	PRO PRO	PRO	GLN	SER	SER	PRO	GLU VAL	GLU	GLN	GLY	ARG	VAL	GLU	LEU	SER	ASP	MET	ASP	ILE	GLN	GLU	VAL	LEU	THR	MET	GLU	GLU	MET	PRO	GLU ASP	CTN	PRO	VAL	ALA SER
THR	HIS	ALA	SER	TEU	GLY	ASN	PRO HTS	VAL	TEU	GLN	MET	LYS	ALA SER	LEU	LEU	ASP	GLU	GLU	VAL	ASP MFT	ALA	LEU	ASP	ARG	PHE	ARG	LEU	SER	LYS	ALA ASP	THR	GLN	GLU	CYS	SER	PRO ARG	LEU	ILE	SER AI A	SER
SER	SER	THR	ARG	TEU	VAL	GLY	LEU	GLN	SER	LYS	THR	SER	GLY ALA	PHE	LEU	PRO	SER	VAL	VAL	CI II CT N	CYS	ARG	THR	ARG	ALA	ALA SER	LEU	ASN	ILE	PKU SER	THR	SER	TRP	VAL	PRO	PR0 PR0	LEU	SER	VAL	THR
PRO	SER	ALA	PR0 GLU	VAL	PRO LEU	LYS	THR VAL.	GLY	THR	ARG	CLN	LEU	GLY	VAL	PRO	GLU	LYS	SER	THR	TYR CI V	TYS	GLY	LYS	LEU	MET	MET	ALA	DHE	MET	GLY ARG	SER	ARG	VAL	TRP	GLY	PRO ASN	TRP	LEU	ALA	SER GLY
GLU	GLN I FII	ASN	GLY SFR	HIS	GLU	GLU	ASN HTS	GLN	ILE	ALA	SER	MET	GLU	GLY	PHE	PRO	ASN	PRO VAI	ALA	VAL T VS	PRO	LEU	THR	SER	PRO	LYS	VAL	LEU	GLU	LTS	SER	ARG	GLN	LYS	PRO	GLU	ASP	LYS	LEU TVR	GLN THR
PRO	LEU	LEU	LYS	LYS	HIS	THR	VAL HTS	VAL	ASP	GLU LEU	CYS	PRO	TLE	VAL	PRO .	LEU	GLY	VAL	VAL	ILE	ASP	TYR	ALA	TRP	VAL	GLU	ALA	GLY	ASP	PRO	GLU	GLN	ILE	LYS	SIH	TRP SER	LEU	TRP	THR	GLU
ALA	LEU	GLY	HIS	TAS	GLU	ASP	SER. GLN	TEU	ASN	GLU PRO	ARG	GLU	IYK ILE	GLN	ILE	CLU	ARG	ARG	ALA	PHE	ARG	TRP	LEU	CYS	THR	THR	PRO	GLN	GLU	GLU	VAL	LEU	THR	LYS	ASN	PRO	VAL	ALA	VAL	SER TYR
LEU	THR GI V	TAS	ARG	SER	GLU	CYS	SER	ALA	GLN	GLN SER	GLY	ASP	ARG	LEU	ALA	DEU LEU	LEU	SER GI N	PHE	VAL GI V	SER	GLN	SER	ARG	GLU	LEU	THR	GLN	LEU	VAL ASP	TRP	CLN	LEU	ALA	ASP	SER PHE	ILE	ASP	GLU	LEU ARG
ILE	PHE	LEU	L.EU AT.A	GLY	LYS	VAL	TRP GLN	TEU	SER	GLU LYS	LYS	GLN	ASN	VAL	CYS	GLN	LEU	ASP	TAS	ARG	TEU	ALA	ILE	LEU	TRP	LEU	LEU	PRO	THR	ALA SER	ILE	ARG	ALA	SER	MET	TYR GLU	GLU	PHE	GLN	THR
ASP	SER	ARG	TYR ALA	CYS	SER	LEU	PRO SFR	TYR	LEU	GLU GLY	SER	GLY	VAL	ILE	ALA	GLU	GLN	ASN	GLN	THR	LEU	ARG	ASP	CYS	PHE	TEU	LEU	LTS	TYR	ASP	ARG	TYR	ASP	ASN	GLN	LEU	GLU	ARG	SER	THR
ASP	PRO I FII	ASP	TYR	LEU	SER	HIS	LEU TRP	GLU	VAL	LEU ARG	ALA	LEU	TYR	THR	HIS	SER	ALA	GLN	GLU	GLY	LEU	GLN	ALA	TYR	ALA	GLN	LEU	GLU	GLU	GLY	TRP	GLU TRP	ALA	TLE	VAL	LEU	SIH	ASP	ASN	GLY
ARG	CLU GLU	ALA	VAL	CLU	LEU	THR	ARG HTS	CYS	GLN	LEU	CLU	THR	GLU	SER	TRP	ALA LYS	GLU	THR DHF	LEU	THR CI N	LYS	LEU	ARG	VAL PRO	ALA	TRP	ILE	GLU	ALA	ALA	VAL	ALA	SIH	GLU GLU	SER	ASP LYS	SIH	GLU	ALA T FII	CYS
PHE	LYS	GLU	HIS TRP	ASN	ARG	SIH	LYS	ILE	ILE	ARG HTS	LEU	ALA	ASP	ALA	ILE	ASN	GLU	ASN TVR	ASP	T YR I FII	LYS	GLY	PHE	GLU	ASP	ALA	PRO	GLU	ARG	NER SER	LEU	GLN	ASP	GLU	THR	SER GLY	LEU	VAL TYR	LEU	TYR ILE
ARG	VAL	GLU	MET	ARG	HIS	GLN	GLN VAL	ASP	CYS	SER GLY	ASN	ASP	GLU	GLN	LEU	TLE	LYS	VAL	SER	LEU	SER	ARG	ILE	GLU	ILE	CYS	TYR	ALA	LYS	ASP ARG	LEU	GLN	SER	MET	ALA	LYS ARG	VAL	ASN	LEU	ARG
VAL	LEU	LEU	HIS	PRO	PRO ASP	ARG	THR SER	ASP	SER	THR	ASP	PR0	GLN	VAL	PRO	ARG	LEU	LEU AT A	PRO	HIS	GLY	ARG	LEU	MET	PRO	ASP	TYR	MET	ASP	GLU LEU	ARG	LEU	THR	SER	TYR	LEU ARG	GLU	ALA	VAL GI V	SER
•	N	[0	lec	u	le	3:	Ν	u	cle	ea	r	рс	or∈	e c	o	m	əle	ex	р	ro	te	in	ľ	Vu	p(98-	-N	uŗ	<u>9</u>	6										
C	ha	air	ı I):	•••																	97	%																	
MET	PHE	LYS	SER	GLY	THR	PHE	GLY GLY	GLY	THR	GLY	PHE	GLY	THR	SER	THR	GLY	GLN	ASN	GLY	PHE	THR	THR	SER	GLY	ALA	GLY	THR	ALA	PHE	GLY	SER	ASN	THR	GLY	TEU	PHE GLY	ASN	GLN	THR	PRO GLY



K185	H186 Q187	E101	E134	K198	5199 L200	0	K212 K213	GLY	PRO	ASN	GLN	VAL	GLY	GLY	THR	THR	GLY	LEU	PHE GLY	SER	SER	P.KU AT A	THR	SER	SER. AT A	THR	GLY	LEU PHE	SER	SER	THR THR	ASN	SER GLY	PHE	ALA TVR	GLY	GLN	LYS	THR ALA	PHE	GLY THR
SER	THR	GLY	GLY	THR	PRO	GLY	LEU	PHE	GLY	GLN	ASN	GLN	GLN	THR	SER	PHE	SER	LYS	PHU	GLY	GLN G	ALA	THR	THR	4SN	THR	GLY	PHE SER	PHE	GLY	THR	THR	GLY	GLN	PRO	THR	ASN	MET	GLY	PHE	GLY VAL
THR	GLN	SER	PRO	GL Y	GL Y LEU	PHE	GLY	ALA	THR	ASN THR	SER	THR	GLY	ALA	PHE	THR	GLY	THR	GLY	PHE	GLY	GLN	ASN	THR	GLY	GLY	ALA	VAL GLY	SER	THR	PHE	ASN	ASN LYS	LEU	THR	PHE	GLY	SER	THR	SER	ALA PRO
SER	PHE GLY	THR	SER	GLY	LEU	PHE	ASN	LYS	PRO	THR	THR	LEU	GLY	ASN	THR	THR	SER	ASN	AHP GLY	PHE	GLY	ACN	THR	SER	4 SN	SER	ILE	PHE GLY	SER	LYS PRO	ALA	GLY	THR LEU	GLY	THR GI V	TEU	GLY	GLY	PHE	THR	ALA LEU
GLY	ALA GLY	GLN	SER	LEU	GLY	ASN	GLN	PRO	LYS	TTE GLY	GLY	PRO	LEU	THR	GLY	PHE	GLY	ALA	GLY	PHE	ASN	TUD T	THR	ALA	T FTT	GLY	PHE	GLY ALA	PRO	GLN	PRO VAL	ALA	LEU THR	ASP	PRO ASN	ALA	SER	ALA ALA	GLN GLN	ALA	VAL LEU
CLLN	GLN	ILE	SER	LEU	TYR	SER	PHE	GLY	ASP	PRU	TEU	PHE	ARG	PRO	MET	ASP	PRO	LYS	LYS	GLU	GLU	ARG I ETI	LYS	PRO	NHT.	PRO	ALA	ALA GLN	LYS	ALA LEU	THR	PRO	THR HIS	TYR	LYS	THR	PRO	PRO	ALA THR	ARG	VAL ARG
PRO	LYS ALA	LEU	THR	THR	THR	ALA	LIS	HIS	LEU	ASP	GLY	TEU	ASP	ASP	GLU	SER	LEU	ALA	GLY	ALA	PHE	ME.I	LYS	TAS	SER TIF	TAS	LYS	LEU VAL	TEU	ASN	LEU	ASN	SER	LEU	PHE	PRO	VAL	ACN	ASP SER	GLU	ASN
ALA	PRO	SER	TYR	PRO GI II	ASN	GLY GLY	GLU ARG	PHE	SER	TEU	SER	TAS	PRO	ASP	GLU	NCH	GLN	GLN	GLY	ASP	GLU	ASP GED	LEU	VAL	NEK	THE	TYR	ASN	PRO	ALA	LYS	ILE	PR0 GLN	THR	PRO GI II	SER	ALA	ASN	LYS HTS	SER	ASN SER
ASN	VAL	ASP	THR	ILE	V AL ALA	LEU	MET	ARG	ALA	ALA LEU	ARG	ASN	CLY GLY	GLU	GLY	SER	GLU	GLU	SER	PHE	HIS	ASP	SER	LEU	4 SP	ASP	ARG	GLU	ILE	ASN	ASN	TYR	HIS	HIS	PRO ATA	GLY	ILE	TEU	THR LYS	VAL	GLY TYR
TYR	THR	PRO SED	MET	ASP	LEU	ALA	TLE	THR	ASN	GLU	GLY	GLU	CYS	VAL	SER	PHE	THR	ILE	GLY	LYS	GLY	AT L	SER	ILE	TYR PHF	GLU	GLY	ASP VAL	ASN	THR	ASN	ASN	LEU ASP	ASP	TLE	SIH	ILE	ARG	LYS GLU	VAL	VAL VAL
TYR	ASP	ASP	GLN	LYS	PRO	VAL	GLU	GLY	LEU	ASN	TYS	ALA	GLU	THR	LEU	GLY	VAL	TRP	THR	ASP	LYS	IHK	ARG	CYS	DEL F	LYS	SER	PRO ASP	ARG	ALA	ASP	ASN	TYR GLU	GLY	ARG I FII	GLU	ALA	VAL	ARG LYS	GLN	GLY ALA
GLN	PHE	GLU	ARG	PRO CI II	THR	GLY	TRP	VAL	PHE	LYS VAL	SER	HIS	PHE	LYS	TYR	LEU	GLN	ASP	ASP	GLU	GLU		GLU	SIH	SFR	LYS	THR	SER THR	LYS	LYS	LYS THR	ALA	PRO LEU	PRO	PRO AT A	SER	GLN	THR	PRO LEU	GLN	MET ALA
LEU	GLY	LYS	ALA	PRO	PRO	GLN	GLN	SER	PRO	GLU VAL	GLU	GLN	LEU	ARG	VAL	GLU	LEU	ASP	ASP	MET	VAL	ASP TIE	THR	GLN	GLU	VAL	LEU	ASP THR	MET	GLU	GLU SER	MET	PRO GLU	ASP	GLN	PRO	VAL	ALA	SER	HIS	ILE ALA
SER	LEU	GLY	ASN	PRO	VAL	LEU	ULE	MET	LYS	ALA SER	LEU	LEU	THR	GLU	GLU	VAL	ASP	MET	ALA LEU	ASP	GLN	AKG	SER	ARG	DEU	SER	LYS	ALA ASP	THR	GLN	GLU	CYS	SER PRO	ARG	LEU PRO	ILE	SER	SER	HIS SFR	SER	LYS THR
ARG	SER	VAL	GLY	LEU	GLN	SER	PHE	THR	SER	GL Y AL.A	PHE	LEU	SER	SER	VAL	VAL	GLN	GLU	CYS	THR	PRO	ARG AT A	ALA	SER	MFT	ASN	ILE	PR0 SER	THR	SER	TRP SFR	VAL	PRO PRO	PRO	LEU THR	SER	VAL	THR	MET	SER	PRO ALA
PRO	GLU	PRO 1 EU	LYS	THR	VAL GLY	THR	ARG	GLN	LEU	GLY	VAL	PRO	ARG	LYS	SER	THR	TYR	GLY	GLY	LYS	LEU	NET	ASP	MET	ALA I FII	PHE	MET	GLY ARG	SER	ARG	VAL	TRP	GLY PRO	ASN	TRP THR	TEU	ALA	SER	GLY GLU	GLN	LEU ASN
GLY	SER	GLU I EII	GLU	ASN	STH	ILE	ALA ASP	SER	MET	GLU	GLY	PHE	LEU	ASN	PRO	ALA	VAL	LYS	LEU	THR	GLU	NEK	PHE	LYS	VAL	TEU	GLU	LYS LEU	SER	ARG	GLN	LYS	ASP	GLU	ASP MFT	TAS	LEU	GLN	THR	LEU	GLU
LYS	LEU	HIS	THR	VAL	VAL	ASP	GLU LEU	CYS	PRO	LEU	VAL	PRO	ASN	GLY	VAL	VAL	ILE	SIH	TYR	ALA	ASP	U AT	LYS	GLU	ALA	GLY	ASP	LEU PRO	GLU	GLN	ILE VAL	LYS	HIS TRP	SER	LEU THR	TRP	THR	CYS	GLU ALA	LEU	TRP GLY
HIS	LEU	GLU	ASP	SER	LEU	ASN	PRO	ARG	GLU	TYR TLE	CLN	ILE	LEU	ARG	ARG	ALA	PHE	SER	TRP	LEU	SER	CIS	ALA	THR	DH(I)	ILE	GLU	GLU	VAL	SER	THR	LYS	ASN SER	PRO	VAL GI II	ALA	VAL	SER	TYR LEU	THR	GLY GLY
ARG	ILE SER	GLU AT A	CYS	SER	ALA	GLN	GLN	GLY	ASP	ARG	TEU	ALA	LEU	LEU	SER	PHE	VAL	GLY	GLN	SER	VAL	ARG CT II	TEU	LEU	THR	GLN	LEU	VAL ASP	TRP	CLN	LEU	ALA	ASP SER	PHE	ILE GI N	ASP	GLU	LEU	ARG TLE	PHE	ALA LEU







4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants	189.33Å 86.79Å 47.91Å	Deperitor
a, b, c, α , β , γ	90.00° 92.09° 90.00°	Depositor
$\mathbf{P}_{\text{ascolution}}(\hat{\mathbf{A}})$	47.87 - 2.39	Depositor
Resolution (A)	47.87 - 2.39	EDS
% Data completeness	99.7 (47.87-2.39)	Depositor
(in resolution range)	99.9(47.87-2.39)	EDS
R _{merge}	0.13	Depositor
R _{sym}	(Not available)	Depositor
$< I/\sigma(I) > 1$	$2.80 (at 2.39 \text{\AA})$	Xtriage
Refinement program	PHENIX 1.18.2_3874	Depositor
D D.	0.220 , 0.258	Depositor
$\mathbf{n}, \mathbf{n}_{free}$	0.222 , 0.256	DCC
R_{free} test set	1603 reflections (5.22%)	wwPDB-VP
Wilson B-factor $(Å^2)$	31.2	Xtriage
Anisotropy	1.016	Xtriage
Bulk solvent $k_{sol}(e/Å^3), B_{sol}(Å^2)$	0.38 , 37.8	EDS
L-test for twinning ²	$< L > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.086 for -h,-k,l	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	12124	wwPDB-VP
Average B, all atoms $(Å^2)$	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: The largest off-origin peak in the Patterson function is 5.00% of the height of the origin peak. No significant pseudotranslation is detected.

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.



¹Intensities estimated from amplitudes.

5 Model quality (i)

5.1 Standard geometry (i)

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	
	Ullaili	RMSZ	# Z > 5	RMSZ	# Z > 5
1	Е	0.31	0/87	0.54	0/117
1	F	0.50	0/103	0.68	0/140
2	А	0.34	0/2672	0.57	1/3631~(0.0%)
2	С	0.32	0/2670	0.54	0/3629
3	В	0.26	0/364	0.47	0/487
3	D	0.27	0/371	0.51	0/497
All	All	0.32	0/6267	0.55	1/8501~(0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$Observed(^{o})$	$Ideal(^{o})$
2	A	190	ARG	NE-CZ-NH1	5.28	122.94	120.30

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	Е	86	65	65	8	0
1	F	101	61	83	1	0
2	А	2597	2499	2499	39	0
2	С	2592	2494	2494	42	0
3	В	360	353	352	3	0
3	D	367	360	359	15	0



Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	А	83	0	0	14	0
4	В	5	0	0	2	0
4	С	90	0	0	12	1
4	D	8	0	0	6	0
4	Ε	2	0	0	1	0
4	F	1	0	0	0	0
All	All	6292	5832	5852	95	1

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 8.

All (95) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom 1	Atom 2	Interatomic	Clash
Atom-1	Atom-2	distance (Å)	overlap (Å)
2:A:246:ASN:OD1	4:A:401:HOH:O	1.83	0.95
2:C:76:GLN:OE1	4:C:401:HOH:O	1.85	0.95
2:C:220:ILE:O	4:C:402:HOH:O	1.88	0.91
1:E:61:ASP:OD1	2:A:239:ARG:NH1	2.05	0.89
2:A:150:ASP:OD1	2:A:152:THR:OG1	1.91	0.88
2:A:357:ASN:ND2	4:A:403:HOH:O	1.96	0.87
2:A:76:GLN:NE2	4:A:406:HOH:O	2.12	0.82
3:D:161:THR:OG1	4:D:1901:HOH:O	1.98	0.80
3:D:158:THR:O	4:D:1901:HOH:O	1.99	0.79
3:D:187:GLN:O	4:D:1902:HOH:O	2.02	0.78
2:A:91:ASP:HB3	2:A:133:ILE:HG22	1.68	0.74
3:D:200:LEU:H	3:D:200:LEU:HD12	1.56	0.69
2:C:84:MET:O	4:C:403:HOH:O	2.09	0.69
2:C:161:SER:OG	4:C:404:HOH:O	2.10	0.69
3:D:158:THR:HA	4:D:1903:HOH:O	1.92	0.68
2:C:222:LYS:O	4:C:406:HOH:O	2.13	0.67
2:A:326:ASN:ND2	4:A:405:HOH:O	2.05	0.66
2:C:211:LEU:HD13	2:C:235:SER:HB3	1.79	0.65
2:C:246:ASN:OD1	4:C:407:HOH:O	2.15	0.65
2:C:310:THR:HG21	4:C:412:HOH:O	1.95	0.64
2:A:179:ILE:HG22	2:A:228:PRO:HG3	1.82	0.61
1:F:61:ASP:OD1	2:C:239:ARG:NH1	2.32	0.61
2:C:310:THR:CB	4:C:412:HOH:O	2.49	0.61
2:A:223:ASP:OD2	4:A:407:HOH:O	2.16	0.61
3:B:204:ARG:NH1	4:B:1902:HOH:O	2.32	0.60
2:A:252:LYS:NZ	4:A:414:HOH:O	2.32	0.60
2:C:356:ARG:HG2	2:C:358:ALA:HB2	1.84	0.60



	A second se	Interatomic	Clash
Atom-1	Atom-2	distance (Å)	overlap (Å)
2:A:203:GLU:OE1	4:A:408:HOH:O	2.17	0.59
2:A:225:GLN:NE2	4:A:407:HOH:O	2.36	0.58
2:A:73:ASP:OD1	4:A:409:HOH:O	2.17	0.58
2:A:140:ASN:HB2	4:A:426:HOH:O	2.06	0.56
3:D:194:GLU:OE2	3:D:194:GLU:N	2.33	0.56
2:C:316:GLN:HB2	2:C:317:PRO:HD2	1.89	0.55
3:D:212:ARG:NH2	4:D:1901:HOH:O	2.41	0.52
2:C:299:PHE:CG	2:C:362:LEU:HD21	2.45	0.52
2:A:157:ASP:O	2:A:158:THR:OG1	2.22	0.51
2:C:174:TYR:CZ	3:D:199:SER:HB3	2.46	0.51
2:C:110:ALA:HB3	2:C:124:ALA:HB3	1.93	0.51
2:C:138:ALA:HB1	2:C:139:PRO:HD2	1.94	0.50
2:A:211:LEU:HD13	2:A:235:SER:HB3	1.94	0.49
1:E:61:ASP:OD2	2:A:256:THR:OG1	2.24	0.49
2:A:316:GLN:HB3	2:A:317:PRO:HD2	1.93	0.49
2:C:32:ILE:H	2:C:32:ILE:HD12	1.78	0.49
2:C:38:PRO:HD2	2:C:42:ILE:HD11	1.94	0.48
1:E:61:ASP:O	4:E:101:HOH:O	2.19	0.48
2:C:274:TYR:CD1	2:C:294:ASP:HB3	2.49	0.48
2:C:119:GLN:NE2	4:C:410:HOH:O	2.22	0.48
1:E:60:LEU:HD23	2:A:257:PHE:HB3	1.96	0.48
1:E:61:ASP:CG	2:A:239:ARG:HH11	2.18	0.47
2:C:216:ARG:NH1	3:D:200:LEU:HD13	2.29	0.47
2:C:224:LYS:N	2:C:224:LYS:HD3	2.30	0.47
2:C:274:TYR:HB3	2:C:293:SER:HB2	1.96	0.47
2:C:40:ASP:HB2	2:C:63:ALA:HB2	1.96	0.47
2:A:48:SER:HB2	2:A:52:LEU:HD12	1.97	0.46
2:A:211:LEU:HD13	2:A:235:SER:CB	2.45	0.46
2:C:50:PRO:HG3	2:C:325:HIS:HB2	1.98	0.46
2:C:310:THR:CG2	4:C:412:HOH:O	2.58	0.46
2:A:106:CYS:HA	2:A:129:PRO:HB3	1.96	0.46
2:A:274:TYR:CD2	2:A:294:ASP:HB3	2.51	0.45
2:C:271:GLN:HB3	3:D:184:THR:HG22	1.98	0.45
2:A:103:THR:O	2:A:110:ALA:HA	2.17	0.45
2:C:91:ASP:HB3	2:C:133:ILE:HG22	1.98	0.45
2:C:65:ASP:OD2	2:C:67:ARG:NE	2.48	0.44
2:C:189:GLU:OE2	4:C:409:HOH:O	2.21	0.44
2:A:165:MET:HE3	2:A:167:LEU:HG	1.98	0.44
2:A:128:ALA:HB1	2:A:129:PRO:HD2	1.99	0.44
2:C:232:ALA:HA	2:C:241:ALA:O	2.18	0.44
2:A:137:LYS:O	4:A:410:HOH:O	2.21	0.44



Atom 1	Atom 2	Interatomic	Clash
Atom-1	Atom-2	distance (Å)	overlap (Å)
1:E:60:LEU:HD22	2:A:255:PHE:CD2	2.53	0.43
2:A:357:ASN:ND2	4:A:417:HOH:O	2.36	0.43
2:A:58:ILE:HD13	2:A:68:CYS:HB2	2.00	0.43
2:A:216:ARG:CZ	3:B:200:LEU:HD12	2.48	0.43
2:A:325:HIS:CE1	4:A:405:HOH:O	2.71	0.43
2:C:155:PHE:O	2:C:164:MET:HG2	2.18	0.43
2:C:165:MET:CE	2:C:167:LEU:HD21	2.48	0.43
2:A:116:SER:OG	2:A:117:SER:N	2.52	0.43
2:C:343:GLU:OE2	3:D:163:LYS:HG3	2.19	0.43
2:C:198:GLU:O	2:C:200:GLN:N	2.51	0.43
3:D:171:ASP:OD1	3:D:172:THR:N	2.51	0.43
2:C:299:PHE:CG	2:C:362:LEU:CD2	3.02	0.42
2:C:251:ALA:HB3	4:C:432:HOH:O	2.18	0.42
2:A:48:SER:HB2	2:A:49:PRO:HD2	2.01	0.42
2:C:293:SER:HA	2:C:317:PRO:HB3	2.02	0.42
2:A:140:ASN:ND2	4:A:426:HOH:O	2.52	0.42
3:D:168:THR:HG22	3:D:185:LYS:HE2	2.02	0.42
1:E:61:ASP:CG	2:A:239:ARG:NH1	2.73	0.42
2:C:104:ALA:HB1	2:C:130:VAL:HG12	2.01	0.41
3:D:170:THR:HG22	3:D:171:ASP:N	2.35	0.41
3:D:198:LYS:NZ	4:D:1903:HOH:O	2.53	0.41
2:C:285:HIS:CD2	2:C:363:LYS:HG3	2.55	0.41
2:C:314:LEU:HD12	2:C:314:LEU:N	2.35	0.41
3:B:206:GLU:OE2	4:B:1901:HOH:O	2.22	0.41
1:E:60:LEU:HD22	2:A:255:PHE:HD2	1.86	0.41
2:A:287:THR:HB	2:A:300:TRP:O	2.21	0.41
2:C:106:CYS:HA	2:C:129:PRO:HB3	2.03	0.41

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:C:411:HOH:O	4:C:437:HOH:O[2_556]	2.07	0.13

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.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	Е	8/63~(13%)	8 (100%)	0	0	100 100
1	F	10/63~(16%)	10 (100%)	0	0	100 100
2	А	324/368~(88%)	305 (94%)	19 (6%)	0	100 100
2	С	324/368~(88%)	311 (96%)	13~(4%)	0	100 100
3	В	41/1817 (2%)	41 (100%)	0	0	100 100
3	D	42/1817~(2%)	42 (100%)	0	0	100 100
All	All	749/4496~(17%)	717 (96%)	32 (4%)	0	100 100

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

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	Е	10/61~(16%)	9~(90%)	1 (10%)	7 11
1	F	12/61~(20%)	8~(67%)	4 (33%)	0 0
2	А	285/317~(90%)	271~(95%)	14 (5%)	25 40
2	С	285/317~(90%)	281~(99%)	4 (1%)	67 82
3	В	41/1543~(3%)	41 (100%)	0	100 100
3	D	42/1543~(3%)	42 (100%)	0	100 100
All	All	675/3842~(18%)	652 (97%)	23 (3%)	37 56

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	Ε	53	ASP
1	F	53	ASP
1	F	54	ASP



Mol	Chain	Res	Type
1	F	59	GLU
1	F	60	LEU
2	А	36	SER
2	А	61	SER
2	А	105	SER
2	А	140	ASN
2	A	159	ARG
2	А	171	GLU
2	А	200	GLN
2	А	225	GLN
2	А	229	THR
2	А	235	SER
2	А	237	GLU
2	A	249	ASN
2	А	302	LYS
2	A	338	TRP
2	С	72	GLN
2	С	224	LYS
2	С	302	LYS
2	С	338	TRP

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

Mol	Chain	Res	Type
2	С	246	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 monosaccharides in this entry.



5.6 Ligand geometry (i)

There are no ligands in this entry.

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, 95^{th} 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	$\langle RSRZ \rangle$	#RSRZ>2	$\mathbf{OWAB}(\mathrm{\AA}^2)$	Q < 0.9
1	Ε	10/63~(15%)	1.57	2(20%) 1 0	48, 57, 89, 92	0
1	F	12/63~(19%)	2.70	6 (50%) 0 0	44, 74, 100, 114	0
2	А	328/368~(89%)	0.69	13 (3%) 38 37	24, 36, 59, 89	0
2	С	327/368~(88%)	0.62	6 (1%) 68 66	22, 33, 53, 69	0
3	В	45/1817~(2%)	1.51	12 (26%) 0 0	35, 59, 77, 87	0
3	D	46/1817~(2%)	1.00	7(15%) 2 1	31, 48, 67, 76	0
All	All	768/4496~(17%)	0.77	46 (5%) 21 20	22, 36, 65, 114	0

All (46) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	63	PRO	9.4
1	Е	62	TYR	7.1
3	В	163	LYS	5.7
1	F	62	TYR	4.7
2	А	262	SER	4.7
1	F	52	LEU	4.5
2	С	348	GLN	4.2
2	А	348	GLN	3.8
2	С	212	LYS	3.8
2	А	364	PRO	3.8
2	А	365	ARG	3.7
2	С	262	SER	3.7
2	А	258	LYS	3.6
3	В	210	ALA	3.5
3	В	212	ARG	3.2
2	А	212	LYS	3.1
3	D	171	ASP	3.1
2	С	357	ASN	3.1
2	А	357	ASN	3.0



Mol	Chain	Res	Type	RSRZ
3	В	186	HIS	2.8
3	D	163	LYS	2.8
3	D	172	THR	2.7
3	D	168	THR	2.6
3	D	212	ARG	2.6
2	А	270	PRO	2.6
1	F	60	LEU	2.5
3	В	162	ILE	2.5
3	В	158	THR	2.5
3	D	185	LYS	2.5
3	В	171	ASP	2.4
2	А	351	ASN	2.4
3	В	165	ASN	2.3
3	В	184	THR	2.3
3	D	183	SER	2.3
2	А	343	GLU	2.3
2	С	364	PRO	2.2
2	А	359	ALA	2.2
3	В	189	ILE	2.2
3	В	195	TYR	2.2
2	С	156	TRP	2.2
1	F	59	GLU	2.2
1	Е	59	GLU	2.2
2	А	345	TYR	2.2
2	А	116	SER	2.1
1	F	61	ASP	2.1
3	В	170	THR	2.1

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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)

There are no ligands in this entry.



6.5 Other polymers (i)

There are no such residues in this entry.

