



Full wwPDB X-ray Structure Validation Report ⓘ

May 22, 2020 – 02:04 am BST

PDB ID : 5YB2
Title : Crystal structure of LP-11/N44
Authors : Zhang, X.; Wang, X.; He, Y.
Deposited on : 2017-09-03
Resolution : 3.80 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 ⓘ symbol.

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

MolProbity : 4.02b-467
Xtrriage (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

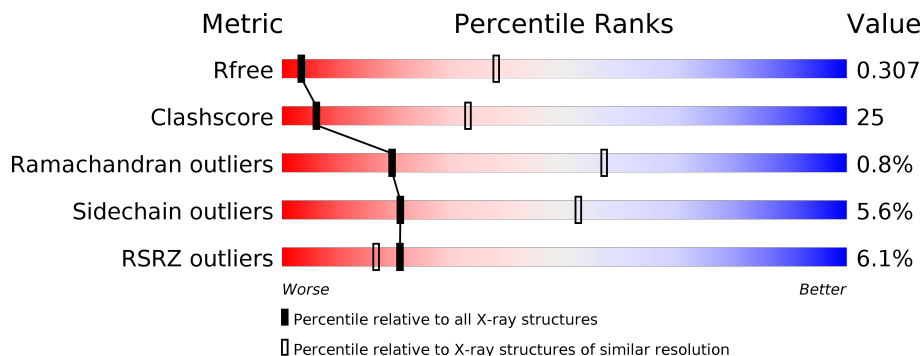
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.80 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	1212 (4.00-3.60)
Clashscore	141614	1288 (4.00-3.60)
Ramachandran outliers	138981	1243 (4.00-3.60)
Sidechain outliers	138945	1237 (4.00-3.60)
RSRZ outliers	127900	1121 (4.00-3.60)

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	A	67	
1	B	67	
1	D	67	
1	E	67	
1	M	67	
2	C	44	

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Mol	Chain	Length	Quality of chain
2	F	44	<p>9% 48% 32% 20%</p>
3	G	23	<p>57% 43%</p>
3	H	23	<p>9% 52% 48%</p>
3	I	23	<p>43% 52% .</p>
3	J	23	<p>9% 61% 39%</p>
3	K	23	<p>9% 65% 26% 9%</p>
3	L	23	<p>4% 70% 26% .</p>
3	P	23	<p>9% 57% 30% .</p>

2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 3495 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 Envelope glycoprotein.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
1	E	36	290	184	56	50	0	0	0
1	D	36	290	184	56	50	0	0	0
1	B	36	290	184	56	50	0	0	0
1	A	36	290	184	56	50	0	0	0
1	M	36	290	184	56	50	0	0	0

There are 115 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	37	GLU	-	expression tag	UNP Q1HMR5
E	38	LEU	-	expression tag	UNP Q1HMR5
E	39	THR	-	expression tag	UNP Q1HMR5
E	40	TRP	-	expression tag	UNP Q1HMR5
E	41	GLU	-	expression tag	UNP Q1HMR5
E	42	GLU	-	expression tag	UNP Q1HMR5
E	43	TRP	-	expression tag	UNP Q1HMR5
E	44	GLU	-	expression tag	UNP Q1HMR5
E	45	LYS	-	expression tag	UNP Q1HMR5
E	46	LYS	-	expression tag	UNP Q1HMR5
E	47	ILE	-	expression tag	UNP Q1HMR5
E	48	GLU	-	expression tag	UNP Q1HMR5
E	49	GLU	-	expression tag	UNP Q1HMR5
E	50	TYR	-	expression tag	UNP Q1HMR5
E	51	THR	-	expression tag	UNP Q1HMR5
E	52	LYS	-	expression tag	UNP Q1HMR5
E	53	LYS	-	expression tag	UNP Q1HMR5
E	54	ILE	-	expression tag	UNP Q1HMR5
E	55	GLU	-	expression tag	UNP Q1HMR5

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Chain	Residue	Modelled	Actual	Comment	Reference
E	56	GLU	-	expression tag	UNP Q1HMR5
E	57	ILE	-	expression tag	UNP Q1HMR5
E	58	LEU	-	expression tag	UNP Q1HMR5
E	59	LYS	-	expression tag	UNP Q1HMR5
D	37	GLU	-	expression tag	UNP Q1HMR5
D	38	LEU	-	expression tag	UNP Q1HMR5
D	39	THR	-	expression tag	UNP Q1HMR5
D	40	TRP	-	expression tag	UNP Q1HMR5
D	41	GLU	-	expression tag	UNP Q1HMR5
D	42	GLU	-	expression tag	UNP Q1HMR5
D	43	TRP	-	expression tag	UNP Q1HMR5
D	44	GLU	-	expression tag	UNP Q1HMR5
D	45	LYS	-	expression tag	UNP Q1HMR5
D	46	LYS	-	expression tag	UNP Q1HMR5
D	47	ILE	-	expression tag	UNP Q1HMR5
D	48	GLU	-	expression tag	UNP Q1HMR5
D	49	GLU	-	expression tag	UNP Q1HMR5
D	50	TYR	-	expression tag	UNP Q1HMR5
D	51	THR	-	expression tag	UNP Q1HMR5
D	52	LYS	-	expression tag	UNP Q1HMR5
D	53	LYS	-	expression tag	UNP Q1HMR5
D	54	ILE	-	expression tag	UNP Q1HMR5
D	55	GLU	-	expression tag	UNP Q1HMR5
D	56	GLU	-	expression tag	UNP Q1HMR5
D	57	ILE	-	expression tag	UNP Q1HMR5
D	58	LEU	-	expression tag	UNP Q1HMR5
D	59	LYS	-	expression tag	UNP Q1HMR5
B	37	GLU	-	expression tag	UNP Q1HMR5
B	38	LEU	-	expression tag	UNP Q1HMR5
B	39	THR	-	expression tag	UNP Q1HMR5
B	40	TRP	-	expression tag	UNP Q1HMR5
B	41	GLU	-	expression tag	UNP Q1HMR5
B	42	GLU	-	expression tag	UNP Q1HMR5
B	43	TRP	-	expression tag	UNP Q1HMR5
B	44	GLU	-	expression tag	UNP Q1HMR5
B	45	LYS	-	expression tag	UNP Q1HMR5
B	46	LYS	-	expression tag	UNP Q1HMR5
B	47	ILE	-	expression tag	UNP Q1HMR5
B	48	GLU	-	expression tag	UNP Q1HMR5
B	49	GLU	-	expression tag	UNP Q1HMR5
B	50	TYR	-	expression tag	UNP Q1HMR5
B	51	THR	-	expression tag	UNP Q1HMR5

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Chain	Residue	Modelled	Actual	Comment	Reference
B	52	LYS	-	expression tag	UNP Q1HMR5
B	53	LYS	-	expression tag	UNP Q1HMR5
B	54	ILE	-	expression tag	UNP Q1HMR5
B	55	GLU	-	expression tag	UNP Q1HMR5
B	56	GLU	-	expression tag	UNP Q1HMR5
B	57	ILE	-	expression tag	UNP Q1HMR5
B	58	LEU	-	expression tag	UNP Q1HMR5
B	59	LYS	-	expression tag	UNP Q1HMR5
A	37	GLU	-	expression tag	UNP Q1HMR5
A	38	LEU	-	expression tag	UNP Q1HMR5
A	39	THR	-	expression tag	UNP Q1HMR5
A	40	TRP	-	expression tag	UNP Q1HMR5
A	41	GLU	-	expression tag	UNP Q1HMR5
A	42	GLU	-	expression tag	UNP Q1HMR5
A	43	TRP	-	expression tag	UNP Q1HMR5
A	44	GLU	-	expression tag	UNP Q1HMR5
A	45	LYS	-	expression tag	UNP Q1HMR5
A	46	LYS	-	expression tag	UNP Q1HMR5
A	47	ILE	-	expression tag	UNP Q1HMR5
A	48	GLU	-	expression tag	UNP Q1HMR5
A	49	GLU	-	expression tag	UNP Q1HMR5
A	50	TYR	-	expression tag	UNP Q1HMR5
A	51	THR	-	expression tag	UNP Q1HMR5
A	52	LYS	-	expression tag	UNP Q1HMR5
A	53	LYS	-	expression tag	UNP Q1HMR5
A	54	ILE	-	expression tag	UNP Q1HMR5
A	55	GLU	-	expression tag	UNP Q1HMR5
A	56	GLU	-	expression tag	UNP Q1HMR5
A	57	ILE	-	expression tag	UNP Q1HMR5
A	58	LEU	-	expression tag	UNP Q1HMR5
A	59	LYS	-	expression tag	UNP Q1HMR5
M	37	GLU	-	expression tag	UNP Q1HMR5
M	38	LEU	-	expression tag	UNP Q1HMR5
M	39	THR	-	expression tag	UNP Q1HMR5
M	40	TRP	-	expression tag	UNP Q1HMR5
M	41	GLU	-	expression tag	UNP Q1HMR5
M	42	GLU	-	expression tag	UNP Q1HMR5
M	43	TRP	-	expression tag	UNP Q1HMR5
M	44	GLU	-	expression tag	UNP Q1HMR5
M	45	LYS	-	expression tag	UNP Q1HMR5
M	46	LYS	-	expression tag	UNP Q1HMR5
M	47	ILE	-	expression tag	UNP Q1HMR5

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Chain	Residue	Modelled	Actual	Comment	Reference
M	48	GLU	-	expression tag	UNP Q1HMR5
M	49	GLU	-	expression tag	UNP Q1HMR5
M	50	TYR	-	expression tag	UNP Q1HMR5
M	51	THR	-	expression tag	UNP Q1HMR5
M	52	LYS	-	expression tag	UNP Q1HMR5
M	53	LYS	-	expression tag	UNP Q1HMR5
M	54	ILE	-	expression tag	UNP Q1HMR5
M	55	GLU	-	expression tag	UNP Q1HMR5
M	56	GLU	-	expression tag	UNP Q1HMR5
M	57	ILE	-	expression tag	UNP Q1HMR5
M	58	LEU	-	expression tag	UNP Q1HMR5
M	59	LYS	-	expression tag	UNP Q1HMR5

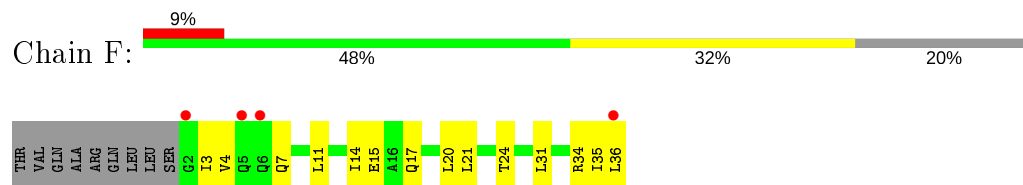
- Molecule 2 is a protein called Envelope glycoprotein.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	F	35	Total	C	N	O	0	0	0
			284	181	55	48			
2	C	35	Total	C	N	O	0	0	0
			284	181	55	48			

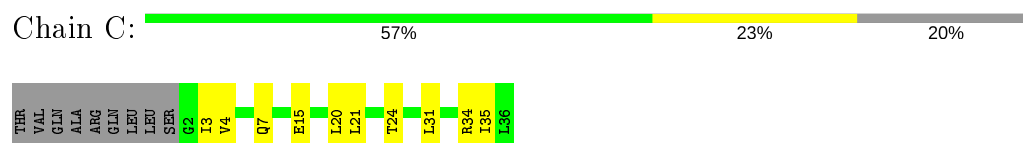
- Molecule 3 is a protein called LP-11.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	H	23	Total	C	N	O	0	0	0
			211	139	30	42			
3	G	23	Total	C	N	O	0	0	0
			211	139	30	42			
3	I	23	Total	C	N	O	0	0	0
			211	139	30	42			
3	K	23	Total	C	N	O	0	0	0
			211	139	30	42			
3	J	23	Total	C	N	O	0	0	0
			211	139	30	42			
3	L	23	Total	C	N	O	0	0	0
			211	139	30	42			
3	P	23	Total	C	N	O	0	0	0
			211	139	30	42			

- Molecule 2: Envelope glycoprotein



- Molecule 2: Envelope glycoprotein



- Molecule 3: LP-11



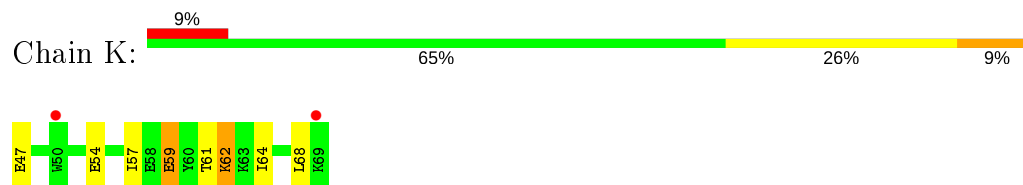
- Molecule 3: LP-11



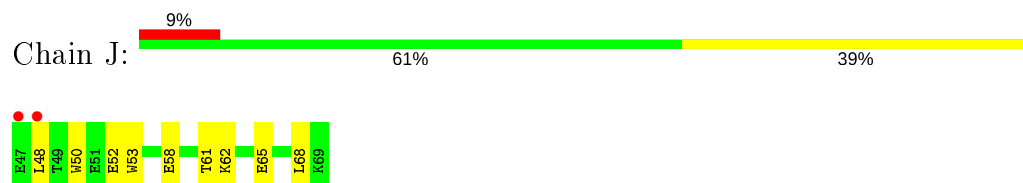
- Molecule 3: LP-11



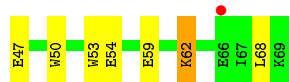
- Molecule 3: LP-11



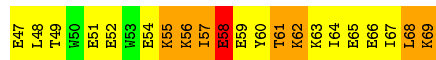
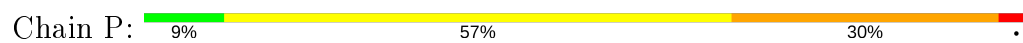
- Molecule 3: LP-11



● Molecule 3: LP-11



● Molecule 3: LP-11



4 Data and refinement statistics

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α , β , γ	110.88Å 110.88Å 125.38Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	27.72 – 3.80 29.80 – 3.51	Depositor EDS
% Data completeness (in resolution range)	100.0 (27.72-3.80) 99.6 (29.80-3.51)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.38 (at 3.56Å)	Xtrriage
Refinement program	PHENIX 1.10.1-2155-000	Depositor
R, R_{free}	0.283 , 0.307 0.283 , 0.307	Depositor DCC
R_{free} test set	330 reflections (4.63%)	wwPDB-VP
Wilson B-factor (Å ²)	130.7	Xtrriage
Anisotropy	0.074	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 69.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.053 for h,-h-k,-l	Xtrriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	3495	wwPDB-VP
Average B, all atoms (Å ²)	134.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.69% of the height of the origin peak. No significant pseudotranslation is detected.*

¹ Intensities estimated from amplitudes.

² 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

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	0.70	0/292	0.75	0/394
1	B	0.76	0/292	0.78	0/394
1	D	1.14	2/292 (0.7%)	1.23	3/394 (0.8%)
1	E	0.78	0/292	0.76	0/394
1	M	1.00	1/292 (0.3%)	0.86	0/394
2	C	0.80	0/286	0.76	0/386
2	F	0.89	1/286 (0.3%)	0.71	0/386
3	G	0.90	0/215	0.86	0/287
3	H	0.96	0/215	0.79	0/287
3	I	1.22	1/215 (0.5%)	1.05	2/287 (0.7%)
3	J	0.94	0/215	0.83	0/287
3	K	1.08	2/215 (0.9%)	0.74	0/287
3	L	1.28	2/215 (0.9%)	1.05	0/287
3	P	1.56	5/215 (2.3%)	1.27	3/287 (1.0%)
All	All	1.01	14/3537 (0.4%)	0.90	8/4751 (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	B	0	1
1	E	0	1
3	I	0	1
All	All	0	3

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	I	47	GLU	CG-CD	-10.53	1.36	1.51
1	M	1	SER	C-N	8.65	1.48	1.33
2	F	15	GLU	CG-CD	7.74	1.63	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	15	GLU	CG-CD	7.03	1.62	1.51
3	P	54	GLU	CB-CG	6.63	1.64	1.52
3	P	54	GLU	CG-CD	6.29	1.61	1.51
3	K	59	GLU	CG-CD	5.62	1.60	1.51
3	L	54	GLU	CG-CD	5.42	1.60	1.51
3	P	58	GLU	CD-OE2	5.30	1.31	1.25
3	K	47	GLU	CB-CG	5.24	1.62	1.52
3	P	55	LYS	CD-CE	5.24	1.64	1.51
3	L	54	GLU	CB-CG	5.22	1.62	1.52
3	P	58	GLU	CB-CG	-5.22	1.42	1.52
1	D	36	LEU	CA-CB	5.05	1.65	1.53

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	36	LEU	CA-CB-CG	8.38	134.56	115.30
3	I	47	GLU	OE1-CD-OE2	7.41	132.19	123.30
1	D	21	LEU	CB-CG-CD1	-7.40	98.42	111.00
3	P	54	GLU	OE1-CD-OE2	-5.77	116.37	123.30
1	D	23	LEU	CB-CG-CD1	-5.45	101.73	111.00
3	I	47	GLU	CA-CB-CG	-5.32	101.69	113.40
3	P	68	LEU	CB-CG-CD1	5.20	119.84	111.00
3	P	68	LEU	CB-CG-CD2	-5.14	102.26	111.00

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	1	SER	Peptide
1	E	1	SER	Peptide
3	I	47	GLU	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	290	0	312	29	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	290	0	312	30	0
1	D	290	0	312	19	0
1	E	290	0	312	51	0
1	M	290	0	312	9	0
2	C	284	0	304	20	0
2	F	284	0	304	30	0
3	G	211	0	210	10	0
3	H	211	0	210	13	0
3	I	211	0	210	10	0
3	J	211	0	210	9	0
3	K	211	0	210	7	0
3	L	211	0	210	5	0
3	P	211	0	210	33	0
All	All	3495	0	3638	176	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 25.

All (176) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:35:ILE:HA	3:P:62:LYS:HZ1	1.12	1.14
1:A:3:ILE:HG23	2:C:7:GLN:HE22	1.24	1.03
1:B:3:ILE:HG23	1:A:7:GLN:HE22	1.26	0.95
1:B:29:LYS:NZ	3:K:54:GLU:OE2	2.03	0.91
1:E:34:ARG:CZ	1:D:36:LEU:HD21	2.03	0.87
1:E:35:ILE:HA	3:P:62:LYS:NZ	1.90	0.86
1:E:7:GLN:HE22	2:F:3:ILE:HG23	1.40	0.85
1:E:35:ILE:HG23	3:P:62:LYS:HZ2	1.49	0.78
3:P:58:GLU:OE2	3:P:58:GLU:HA	1.81	0.78
1:A:3:ILE:HG23	2:C:7:GLN:NE2	2.00	0.76
1:M:12:ARG:HA	1:M:15:GLU:OE1	1.88	0.74
3:P:49:THR:HB	3:P:51:GLU:OE1	1.86	0.74
1:A:15:GLU:HG2	3:J:68:LEU:HD13	1.71	0.73
1:E:35:ILE:CD1	2:F:35:ILE:HD11	2.20	0.72
1:E:32:GLN:HG3	3:H:50:TRP:CE2	2.25	0.72
3:L:59:GLU:HA	3:L:62:LYS:HE3	1.73	0.70
1:E:3:ILE:HG22	2:F:3:ILE:HD13	1.72	0.70
1:A:3:ILE:HD13	2:C:3:ILE:HG22	1.72	0.70
3:P:55:LYS:O	3:P:58:GLU:HB3	1.91	0.70
1:B:7:GLN:HE22	2:C:3:ILE:HG23	1.57	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:35:ILE:HD11	2:F:35:ILE:HG12	1.75	0.69
1:D:34:ARG:HE	2:F:36:LEU:HD21	1.59	0.68
1:B:36:LEU:HD21	2:C:34:ARG:NE	2.08	0.67
1:E:3:ILE:CG2	2:F:3:ILE:HD13	2.26	0.66
3:P:61:THR:O	3:P:62:LYS:HE2	1.96	0.66
1:E:36:LEU:HD21	2:F:34:ARG:CZ	2.25	0.65
3:I:47:GLU:HG2	3:I:48:LEU:N	2.10	0.65
3:P:61:THR:C	3:P:62:LYS:HE2	2.19	0.63
2:F:20:LEU:HD21	3:H:60:TYR:HB2	1.82	0.62
1:E:35:ILE:O	3:P:62:LYS:CD	2.48	0.62
3:K:57:ILE:O	3:K:61:THR:HG23	2.00	0.61
1:B:36:LEU:HD21	2:C:34:ARG:CZ	2.30	0.61
1:E:35:ILE:HD13	2:F:35:ILE:HD11	1.82	0.61
1:E:6:GLN:OE1	1:D:7:GLN:NE2	2.27	0.60
1:E:20:LEU:O	1:E:24:THR:HG23	2.02	0.60
2:C:20:LEU:O	2:C:24:THR:HG23	2.02	0.60
3:P:55:LYS:O	3:P:59:GLU:HG3	2.02	0.60
2:F:17:GLN:HE21	3:H:64:ILE:HD13	1.66	0.60
1:B:20:LEU:O	1:B:24:THR:HG23	2.02	0.59
1:M:20:LEU:O	1:M:24:THR:HG23	2.02	0.59
1:A:20:LEU:O	1:A:24:THR:HG23	2.02	0.59
2:F:20:LEU:O	2:F:24:THR:HG23	2.02	0.59
1:E:29:LYS:NZ	3:H:54:GLU:OE2	2.24	0.59
1:M:31:LEU:O	1:M:35:ILE:HD12	2.03	0.59
2:F:31:LEU:O	2:F:35:ILE:HD12	2.03	0.59
1:A:31:LEU:O	1:A:35:ILE:HD12	2.03	0.58
1:A:2:GLY:O	1:A:5:GLN:HB2	2.03	0.58
1:B:31:LEU:O	1:B:35:ILE:HD12	2.03	0.58
1:E:31:LEU:O	1:E:35:ILE:HD12	2.03	0.58
1:B:35:ILE:HD11	1:A:35:ILE:CD1	2.33	0.58
3:J:58:GLU:O	3:J:62:LYS:HG2	2.04	0.57
1:E:35:ILE:HG23	3:P:65:GLU:OE1	2.04	0.57
2:C:31:LEU:O	2:C:35:ILE:HD12	2.03	0.57
1:B:35:ILE:HD11	1:A:35:ILE:HD13	1.87	0.57
1:M:11:LEU:HG	1:M:15:GLU:OE2	2.05	0.57
1:E:26:TRP:CE3	3:G:53:TRP:CD1	2.94	0.56
1:E:35:ILE:O	3:P:62:LYS:HD2	2.06	0.56
1:E:7:GLN:NE2	2:F:3:ILE:HG23	2.18	0.56
3:I:47:GLU:OE1	1:A:26:TRP:HB2	2.06	0.55
1:B:36:LEU:HD11	2:C:34:ARG:NH1	2.22	0.55
1:E:3:ILE:HD11	1:D:4:VAL:HG22	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:K:59:GLU:O	3:K:62:LYS:HG3	2.07	0.55
1:A:4:VAL:HG23	1:A:5:GLN:NE2	2.22	0.54
3:L:59:GLU:CA	3:L:62:LYS:HE3	2.38	0.54
3:P:60:TYR:O	3:P:64:ILE:HG13	2.08	0.54
3:K:59:GLU:HA	3:K:62:LYS:HE3	1.89	0.54
1:E:34:ARG:HA	3:P:58:GLU:OE2	2.08	0.53
1:E:35:ILE:O	3:P:62:LYS:CG	2.57	0.53
1:M:11:LEU:HD11	3:P:68:LEU:CD2	2.40	0.52
1:E:36:LEU:HD21	2:F:34:ARG:NE	2.24	0.52
1:B:36:LEU:HD21	2:C:34:ARG:CD	2.39	0.52
1:D:20:LEU:CD1	2:F:21:LEU:HD13	2.40	0.52
3:P:62:LYS:NZ	3:P:65:GLU:CD	2.64	0.51
1:E:34:ARG:NH2	1:D:36:LEU:HD21	2.25	0.51
3:K:64:ILE:O	3:K:68:LEU:HG	2.11	0.51
1:D:34:ARG:NE	2:F:36:LEU:HD21	2.25	0.50
1:E:31:LEU:HB2	2:F:31:LEU:HD13	1.91	0.50
1:B:34:ARG:CZ	1:A:36:LEU:HD21	2.40	0.50
1:E:32:GLN:HA	2:F:31:LEU:HD21	1.93	0.50
1:B:32:GLN:HB2	2:C:31:LEU:HD21	1.94	0.50
1:E:11:LEU:HD11	3:H:68:LEU:HD22	1.94	0.50
1:E:17:GLN:HG3	1:D:21:LEU:HD11	1.94	0.49
3:P:62:LYS:O	3:P:63:LYS:C	2.51	0.49
1:D:15:GLU:HG2	3:G:68:LEU:HD13	1.95	0.49
3:P:63:LYS:HG2	3:P:67:ILE:HD11	1.95	0.48
3:P:68:LEU:O	3:P:69:LYS:HB2	2.12	0.48
1:B:3:ILE:HG23	1:A:7:GLN:NE2	2.10	0.48
1:B:31:LEU:HD21	1:A:32:GLN:HA	1.94	0.48
3:I:49:THR:HG22	1:A:26:TRP:HE1	1.78	0.48
1:E:36:LEU:HD11	2:F:34:ARG:NH1	2.29	0.48
1:D:26:TRP:CZ2	3:I:48:LEU:HB2	2.49	0.47
3:I:50:TRP:CD1	3:L:47:GLU:HB2	2.49	0.47
1:E:31:LEU:CB	2:F:31:LEU:HD13	2.44	0.47
1:E:25:VAL:HG11	3:H:57:ILE:HG21	1.97	0.47
3:I:61:THR:O	3:I:65:GLU:HB2	2.16	0.46
3:G:61:THR:O	3:G:65:GLU:HB2	2.15	0.46
3:P:62:LYS:HD3	3:P:65:GLU:HB2	1.98	0.46
3:H:61:THR:O	3:H:65:GLU:HB2	2.15	0.46
3:J:61:THR:O	3:J:65:GLU:HB2	2.15	0.46
3:P:56:LYS:O	3:P:57:ILE:C	2.54	0.46
1:E:11:LEU:CD1	3:H:68:LEU:HD22	2.45	0.46
3:L:50:TRP:O	3:L:53:TRP:HB3	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:32:GLN:CA	2:F:31:LEU:HD21	2.47	0.45
1:B:26:TRP:CE3	3:J:53:TRP:CD1	3.05	0.45
3:J:58:GLU:OE1	3:J:62:LYS:HE3	2.16	0.45
3:P:60:TYR:C	3:P:62:LYS:N	2.66	0.45
1:B:35:ILE:HD13	2:C:35:ILE:HD11	1.99	0.45
1:E:19:HIS:CD2	3:G:60:TYR:CE1	3.05	0.45
1:B:3:ILE:HG22	2:C:3:ILE:HD13	1.98	0.45
1:E:34:ARG:NH2	1:M:29:LYS:NZ	2.65	0.44
1:E:3:ILE:HD13	1:D:3:ILE:HG22	1.99	0.44
3:G:69:LYS:HD2	3:G:69:LYS:N	2.32	0.44
1:A:32:GLN:HG3	3:J:50:TRP:CE2	2.53	0.44
1:A:32:GLN:HG3	3:J:50:TRP:CZ2	2.52	0.44
1:B:31:LEU:HD21	1:A:32:GLN:CB	2.46	0.44
1:D:20:LEU:HD23	1:D:20:LEU:HA	1.63	0.44
1:M:4:VAL:HG23	1:M:5:GLN:OE1	2.18	0.44
3:P:62:LYS:HA	3:P:62:LYS:HD3	1.11	0.44
1:E:35:ILE:HG23	3:P:62:LYS:NZ	2.28	0.43
1:E:32:GLN:HB2	2:F:31:LEU:HD21	2.00	0.43
3:J:48:LEU:HA	3:J:48:LEU:HD23	1.80	0.43
1:B:17:GLN:NE2	1:A:18:GLN:OE1	2.52	0.43
3:P:60:TYR:C	3:P:62:LYS:H	2.22	0.43
2:C:15:GLU:HG2	3:L:68:LEU:HD22	1.99	0.43
1:E:23:LEU:HB3	3:G:57:ILE:HD11	2.00	0.43
1:E:31:LEU:HA	1:E:31:LEU:HD23	1.77	0.43
1:E:28:ILE:HG13	1:D:28:ILE:HD11	2.00	0.43
3:P:66:GLU:HG2	3:P:66:GLU:O	2.17	0.43
1:D:18:GLN:O	1:D:18:GLN:HG3	2.19	0.43
1:E:32:GLN:CB	2:F:31:LEU:HD21	2.48	0.43
3:I:48:LEU:HD22	3:I:52:GLU:HB2	2.01	0.43
3:P:48:LEU:HA	3:P:52:GLU:OE1	2.19	0.43
3:P:62:LYS:HA	3:P:62:LYS:HE2	2.00	0.43
1:B:34:ARG:NE	1:A:36:LEU:HD21	2.34	0.43
1:D:20:LEU:HD12	2:F:21:LEU:HD13	2.00	0.43
2:F:11:LEU:HD11	3:I:68:LEU:HD22	2.00	0.43
3:H:48:LEU:HA	3:H:48:LEU:HD23	1.80	0.43
1:A:31:LEU:HD23	1:A:31:LEU:HA	1.77	0.42
1:A:4:VAL:HG23	1:A:5:GLN:HE21	1.84	0.42
1:B:31:LEU:HD21	1:A:32:GLN:HB2	2.01	0.42
3:I:51:GLU:C	3:I:55:LYS:HZ3	2.21	0.42
3:P:62:LYS:HZ3	3:P:65:GLU:CD	2.23	0.42
1:B:31:LEU:HA	1:B:31:LEU:HD23	1.77	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:32:GLN:HA	2:F:31:LEU:CD2	2.50	0.42
1:B:31:LEU:HD21	1:A:32:GLN:CA	2.50	0.42
1:D:14:ILE:HG13	2:F:14:ILE:HD11	2.02	0.42
3:H:48:LEU:HD22	3:H:52:GLU:HB2	2.01	0.42
2:F:20:LEU:CD2	3:H:60:TYR:HB2	2.47	0.42
1:M:31:LEU:HA	1:M:31:LEU:HD23	1.77	0.42
3:P:62:LYS:HA	3:P:62:LYS:CE	2.27	0.42
1:A:20:LEU:CD1	2:C:21:LEU:HD13	2.50	0.41
1:A:3:ILE:HD13	2:C:3:ILE:CG2	2.45	0.41
3:J:48:LEU:HD22	3:J:52:GLU:HB2	2.01	0.41
3:P:68:LEU:HA	3:P:68:LEU:HD23	1.71	0.41
1:B:18:GLN:HE22	3:K:61:THR:HG22	1.84	0.41
1:E:32:GLN:HG3	3:H:50:TRP:CZ2	2.54	0.41
1:B:3:ILE:CG2	2:C:3:ILE:HD13	2.50	0.41
3:G:47:GLU:HB2	3:G:48:LEU:H	1.66	0.41
3:G:48:LEU:HD22	3:G:52:GLU:HB2	2.01	0.41
1:A:11:LEU:O	1:A:15:GLU:HG3	2.20	0.41
1:B:3:ILE:O	1:B:7:GLN:HB2	2.21	0.41
1:B:11:LEU:HD11	3:K:68:LEU:HD22	2.02	0.41
2:C:31:LEU:HA	2:C:31:LEU:HD23	1.77	0.41
2:F:3:ILE:O	2:F:7:GLN:HB2	2.21	0.41
1:E:23:LEU:HD13	3:G:57:ILE:HD13	2.02	0.41
1:E:29:LYS:HE2	3:H:54:GLU:HG3	2.03	0.41
1:B:31:LEU:CD2	1:A:32:GLN:HA	2.50	0.40
2:C:3:ILE:O	2:C:7:GLN:HB2	2.21	0.40
3:I:51:GLU:HB3	3:I:55:LYS:HZ1	1.86	0.40
1:M:3:ILE:O	1:M:7:GLN:HB2	2.21	0.40
1:E:19:HIS:CD2	3:G:60:TYR:HE1	2.39	0.40
1:E:33:ALA:O	3:P:58:GLU:HG2	2.21	0.40
1:E:3:ILE:HG22	2:F:3:ILE:CD1	2.47	0.40
1:B:36:LEU:HD21	2:C:34:ARG:HD2	2.02	0.40
1:D:19:HIS:O	1:D:23:LEU:HG	2.22	0.40
1:E:3:ILE:HD11	1:D:4:VAL:CG2	2.50	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	34/67 (51%)	33 (97%)	1 (3%)	0	100	100
1	B	34/67 (51%)	34 (100%)	0	0	100	100
1	D	34/67 (51%)	30 (88%)	3 (9%)	1 (3%)	4	34
1	E	34/67 (51%)	33 (97%)	1 (3%)	0	100	100
1	M	34/67 (51%)	32 (94%)	2 (6%)	0	100	100
2	C	33/44 (75%)	33 (100%)	0	0	100	100
2	F	33/44 (75%)	33 (100%)	0	0	100	100
3	G	21/23 (91%)	20 (95%)	1 (5%)	0	100	100
3	H	21/23 (91%)	21 (100%)	0	0	100	100
3	I	21/23 (91%)	21 (100%)	0	0	100	100
3	J	21/23 (91%)	21 (100%)	0	0	100	100
3	K	21/23 (91%)	20 (95%)	1 (5%)	0	100	100
3	L	21/23 (91%)	21 (100%)	0	0	100	100
3	P	21/23 (91%)	16 (76%)	3 (14%)	2 (10%)	0	11
All	All	383/584 (66%)	368 (96%)	12 (3%)	3 (1%)	19	57

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	P	58	GLU
3	P	61	THR
1	D	35	ILE

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	31/61 (51%)	29 (94%)	2 (6%)	17	48
1	B	31/61 (51%)	30 (97%)	1 (3%)	39	65
1	D	31/61 (51%)	30 (97%)	1 (3%)	39	65
1	E	31/61 (51%)	30 (97%)	1 (3%)	39	65
1	M	31/61 (51%)	29 (94%)	2 (6%)	17	48
2	C	30/38 (79%)	29 (97%)	1 (3%)	38	65
2	F	30/38 (79%)	29 (97%)	1 (3%)	38	65
3	G	23/23 (100%)	23 (100%)	0	100	100
3	H	23/23 (100%)	22 (96%)	1 (4%)	29	58
3	I	23/23 (100%)	20 (87%)	3 (13%)	4	23
3	J	23/23 (100%)	23 (100%)	0	100	100
3	K	23/23 (100%)	22 (96%)	1 (4%)	29	58
3	L	23/23 (100%)	22 (96%)	1 (4%)	29	58
3	P	23/23 (100%)	17 (74%)	6 (26%)	0	4
All	All	376/542 (69%)	355 (94%)	21 (6%)	21	52

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	4	VAL
1	D	5	GLN
2	F	4	VAL
3	H	62	LYS
3	I	62	LYS
3	I	66	GLU
3	I	69	LYS
1	B	4	VAL
1	A	4	VAL
1	A	5	GLN
2	C	4	VAL
3	K	62	LYS
3	L	62	LYS
1	M	1	SER
1	M	4	VAL
3	P	47	GLU

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Mol	Chain	Res	Type
3	P	56	LYS
3	P	57	ILE
3	P	58	GLU
3	P	62	LYS
3	P	69	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	E	7	GLN
1	E	19	HIS
2	F	17	GLN
1	B	18	GLN
1	A	5	GLN
1	A	7	GLN
1	A	19	HIS
2	C	5	GLN
2	C	6	GLN
2	C	7	GLN
2	C	17	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](#)

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

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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	36/67 (53%)	0.27	3 (8%) 11 9	117, 139, 169, 185	0
1	B	36/67 (53%)	0.53	2 (5%) 24 20	131, 144, 161, 173	0
1	D	36/67 (53%)	0.21	1 (2%) 53 43	99, 115, 164, 191	0
1	E	36/67 (53%)	0.19	3 (8%) 11 9	104, 126, 173, 178	0
1	M	36/67 (53%)	0.65	5 (13%) 2 3	102, 124, 162, 174	0
2	C	35/44 (79%)	0.11	0 100 100	128, 140, 161, 166	0
2	F	35/44 (79%)	0.23	4 (11%) 5 5	105, 127, 166, 172	0
3	G	23/23 (100%)	0.07	0 100 100	116, 130, 142, 147	0
3	H	23/23 (100%)	0.32	2 (8%) 10 8	121, 137, 153, 159	0
3	I	23/23 (100%)	0.02	0 100 100	105, 119, 141, 155	0
3	J	23/23 (100%)	0.38	2 (8%) 10 8	139, 145, 155, 166	0
3	K	23/23 (100%)	0.45	2 (8%) 10 8	144, 153, 162, 166	0
3	L	23/23 (100%)	0.64	1 (4%) 35 30	121, 130, 152, 159	0
3	P	23/23 (100%)	-0.44	0 100 100	103, 111, 121, 121	0
All	All	411/584 (70%)	0.27	25 (6%) 21 17	99, 136, 166, 191	0

All (25) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	1	SER	11.6
1	D	1	SER	10.3
3	H	69	LYS	5.9
3	L	66	GLU	4.8
1	M	1	SER	4.3
1	A	3	ILE	4.1
3	K	69	LYS	3.3
1	E	1	SER	3.1

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Mol	Chain	Res	Type	RSRZ
1	M	36	LEU	2.9
1	M	3	ILE	2.9
3	J	48	LEU	2.8
2	F	2	GLY	2.8
3	K	50	TRP	2.7
1	M	2	GLY	2.6
3	J	47	GLU	2.6
2	F	6	GLN	2.5
1	B	2	GLY	2.4
2	F	36	LEU	2.4
3	H	47	GLU	2.4
2	F	5	GLN	2.4
1	A	1	SER	2.4
1	E	36	LEU	2.4
1	M	7	GLN	2.2
1	E	22	GLN	2.0
1	A	12	ARG	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 carbohydrates 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.