



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 22, 2024 – 05:28 AM EDT

PDB ID : 4KKC
Title : Structure of the E148A mutant of CLC-ec1 deltaNC construct in 20mM Bromide
Authors : Lim, H.-H.; Miller, C.
Deposited on : 2013-05-05
Resolution : 3.18 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

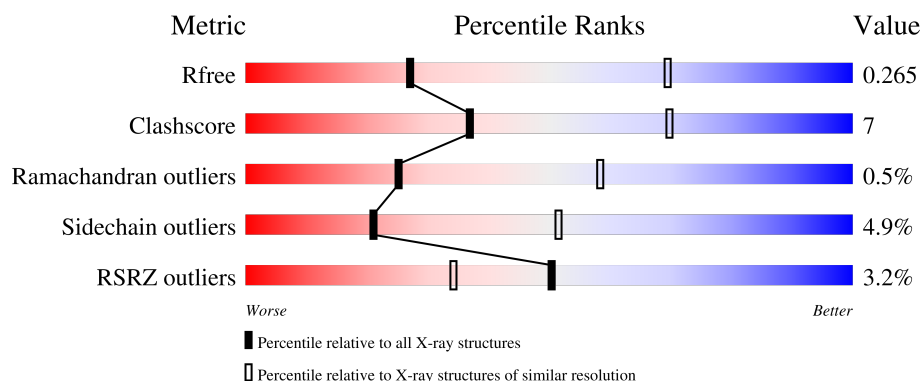
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.18 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}	164625	1851 (3.20-3.16)
Clashscore	180529	1999 (3.20-3.16)
Ramachandran outliers	177936	1961 (3.20-3.16)
Sidechain outliers	177891	1960 (3.20-3.16)
RSRZ outliers	164620	1852 (3.20-3.16)

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 $\leq 5\%$. 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	446	<div> <div>4%</div> <div>77%</div> <div>20%</div> <div>.</div> </div>
1	B	446	<div> <div>4%</div> <div>74%</div> <div>24%</div> <div>..</div> </div>
2	C	222	<div> <div>3%</div> <div>85%</div> <div>13%</div> <div>.</div> </div>
2	E	222	<div> <div>2%</div> <div>83%</div> <div>14%</div> <div>.</div> </div>
3	D	211	<div> <div>3%</div> <div>81%</div> <div>17%</div> <div>.</div> </div>

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Mol	Chain	Length	Quality of chain
3	F	211	<div><div><div>%</div><div><div></div></div><div>82%</div><div>16%</div><div></div></div></div>

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 13215 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 H(+)/Cl(-) exchange transporter ClcA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	444	Total	C	N	O	S	0	0	0
			3329	2188	560	561	20			
1	B	441	Total	C	N	O	S	0	0	0
			3300	2172	553	555	20			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	16	MET	-	expression tag	UNP P37019
A	148	ALA	GLU	engineered mutation	UNP P37019
A	461	LYS	-	expression tag	UNP P37019
B	16	MET	-	expression tag	UNP P37019
B	148	ALA	GLU	engineered mutation	UNP P37019
B	461	LYS	-	expression tag	UNP P37019

- Molecule 2 is a protein called Fab, heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	221	Total	C	N	O	S	0	0	0
			1672	1077	274	315	6			
2	E	221	Total	C	N	O	S	0	0	0
			1672	1077	274	315	6			

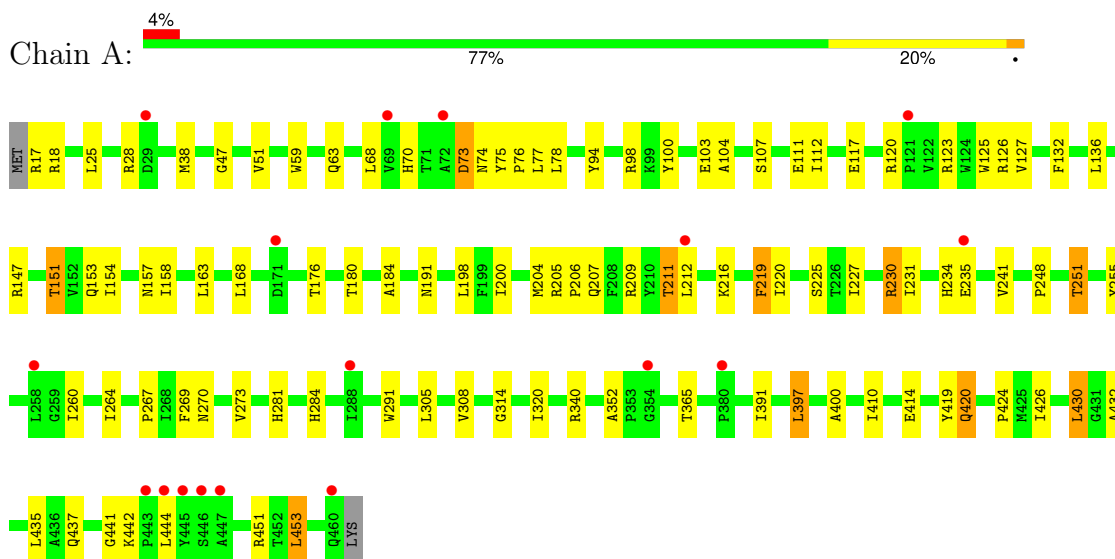
- Molecule 3 is a protein called Fab, light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	211	Total	C	N	O	S	0	0	0
			1621	1008	271	334	8			
3	F	211	Total	C	N	O	S	0	0	0
			1621	1008	271	334	8			

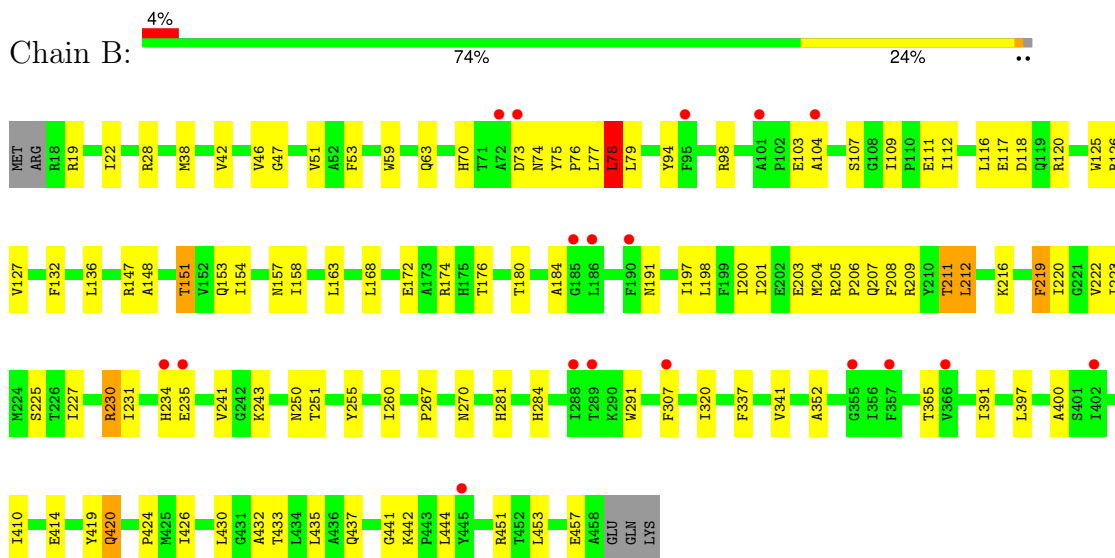
3 Residue-property plots [i](#)

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.

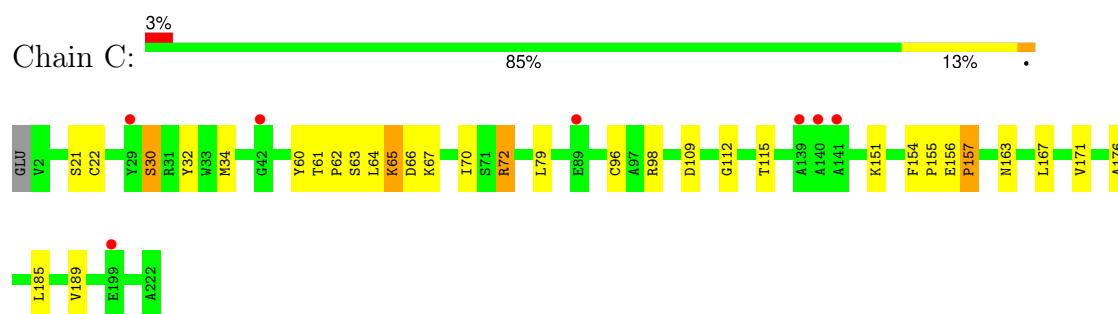
- Molecule 1: H(+)/Cl(-) exchange transporter ClcA



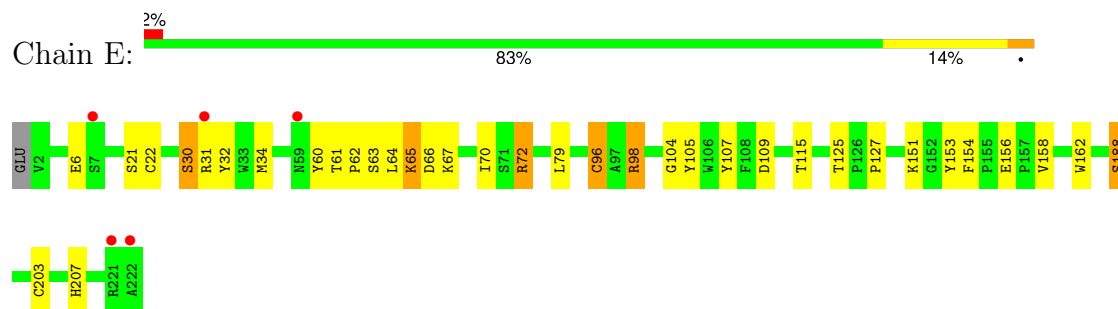
- Molecule 1: H(+)/Cl(-) exchange transporter ClcA



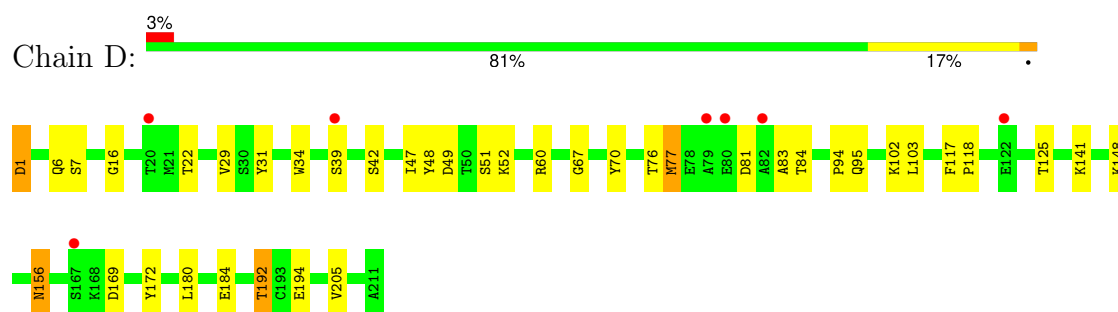
- Molecule 2: Fab, heavy chain



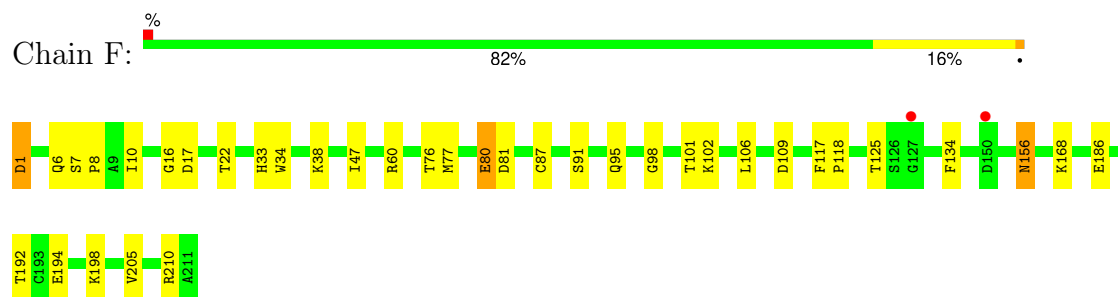
- Molecule 2: Fab, heavy chain



- Molecule 3: Fab, light chain



- Molecule 3: Fab, light chain



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	231.21Å 99.24Å 170.51Å 90.00° 132.00° 90.00°	Depositor
Resolution (Å)	29.53 – 3.18 29.53 – 3.18	Depositor EDS
% Data completeness (in resolution range)	98.3 (29.53-3.18) 98.6 (29.53-3.18)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.96 (at 3.18Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8.1_1168)	Depositor
R, R_{free}	0.231 , 0.264 0.230 , 0.265	Depositor DCC
R_{free} test set	2426 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	95.1	Xtriage
Anisotropy	0.505	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.26 , 10.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.004 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	13215	wwPDB-VP
Average B, all atoms (Å ²)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.47% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.30	0/3401	0.42	0/4616
1	B	0.30	0/3372	0.43	1/4578 (0.0%)
2	C	0.34	0/1721	0.46	0/2355
2	E	0.34	0/1721	0.47	0/2355
3	D	0.29	0/1660	0.47	0/2257
3	F	0.33	0/1660	0.47	0/2257
All	All	0.31	0/13535	0.45	1/18418 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	78	LEU	CA-CB-CG	6.16	129.47	115.30

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	A	3329	0	3483	64	0
1	B	3300	0	3456	70	0
2	C	1672	0	1654	15	0
2	E	1672	0	1654	21	0
3	D	1621	0	1546	21	0
3	F	1621	0	1546	19	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	13215	0	13339	187	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 7.

All (187) 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:A:18:ARG:HH11	1:B:457:GLU:HB3	1.46	0.79
1:B:147:ARG:O	1:B:151:THR:OG1	2.04	0.76
1:A:200:ILE:HD12	1:A:204:MET:HG3	1.69	0.74
3:D:1:ASP:OD2	3:D:1:ASP:N	2.21	0.73
1:A:241:VAL:HG11	1:A:391:ILE:HD11	1.70	0.72
2:E:98:ARG:NH1	2:E:109:ASP:OD2	2.23	0.71
1:A:216:LYS:NZ	1:B:437:GLN:OE1	2.23	0.71
1:A:147:ARG:O	1:A:151:THR:OG1	2.06	0.71
3:F:1:ASP:OD2	3:F:1:ASP:N	2.23	0.70
1:B:241:VAL:HG11	1:B:391:ILE:HD11	1.74	0.69
1:A:200:ILE:HA	1:A:204:MET:HB2	1.74	0.68
1:B:200:ILE:HD12	1:B:204:MET:HG3	1.74	0.68
1:B:200:ILE:HA	1:B:204:MET:HB2	1.76	0.68
3:F:60:ARG:NH2	3:F:81:ASP:OD2	2.27	0.67
1:A:437:GLN:OE1	1:B:216:LYS:NZ	2.27	0.66
1:B:75:TYR:HA	1:B:78:LEU:HD12	1.77	0.65
3:D:95:GLN:OE1	3:D:95:GLN:N	2.27	0.65
3:F:95:GLN:OE1	3:F:95:GLN:N	2.29	0.64
1:B:117:GLU:OE1	1:B:209:ARG:NH1	2.31	0.63
3:D:194:GLU:HG2	3:D:205:VAL:HG12	1.80	0.61
2:C:22:CYS:HB3	2:C:79:LEU:HB3	1.82	0.61
1:B:206:PRO:HG2	1:B:211:THR:HG21	1.81	0.61
2:C:32:TYR:O	2:C:72:ARG:NH2	2.34	0.61
2:C:98:ARG:NH1	2:C:109:ASP:OD2	2.34	0.59
2:E:61:THR:O	2:E:63:SER:N	2.35	0.59
1:A:111:GLU:OE2	1:A:120:ARG:NE	2.36	0.58
1:A:73:ASP:OD1	1:A:73:ASP:N	2.36	0.58
1:B:38:MET:HG3	1:B:168:LEU:HD11	1.85	0.58
1:B:111:GLU:OE2	1:B:120:ARG:NE	2.36	0.58
2:E:64:LEU:HB2	2:E:67:LYS:HB2	1.86	0.58
1:A:260:ILE:HG23	1:A:435:LEU:HG	1.86	0.57
2:C:64:LEU:HB2	2:C:67:LYS:HB2	1.87	0.57
1:A:270:ASN:ND2	1:A:442:LYS:O	2.38	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:163:ASN:HD22	2:C:167:LEU:HD13	1.69	0.56
1:B:163:LEU:HD12	1:B:168:LEU:HB2	1.88	0.56
1:B:94:TYR:CZ	1:B:352:ALA:HB2	2.42	0.55
3:F:38:LYS:NZ	3:F:80:GLU:O	2.36	0.55
3:D:60:ARG:NH2	3:D:81:ASP:OD2	2.39	0.55
2:C:61:THR:O	2:C:63:SER:N	2.40	0.54
1:A:117:GLU:OE1	1:A:209:ARG:NH1	2.40	0.54
3:F:16:GLY:HA2	3:F:76:THR:HG23	1.90	0.54
1:B:198:LEU:HG	1:B:410:ILE:HD12	1.89	0.54
1:A:28:ARG:HE	1:B:207:GLN:HG2	1.73	0.53
1:B:74:ASN:HB3	1:B:77:LEU:HB3	1.91	0.53
1:A:112:ILE:HG13	1:A:153:GLN:HA	1.91	0.52
1:B:125:TRP:CD1	1:B:126:ARG:HG3	2.44	0.52
2:E:34:MET:HB3	2:E:79:LEU:HD22	1.92	0.52
1:B:98:ARG:HD2	1:B:291:TRP:CE3	2.45	0.52
1:A:38:MET:HG3	1:A:168:LEU:HD11	1.91	0.52
1:B:281:HIS:HA	1:B:284:HIS:CE1	2.45	0.52
1:A:206:PRO:HG2	1:A:211:THR:HG21	1.91	0.51
1:A:104:ALA:HB2	1:A:127:VAL:HG13	1.91	0.51
1:A:198:LEU:HG	1:A:410:ILE:HD12	1.92	0.51
3:F:194:GLU:HG2	3:F:205:VAL:HG12	1.92	0.51
1:A:414:GLU:OE1	1:B:419:TYR:OH	2.24	0.51
2:C:34:MET:HB3	2:C:79:LEU:HD22	1.91	0.51
1:A:28:ARG:NH2	1:B:203:GLU:OE1	2.30	0.51
1:A:184:ALA:HB1	1:A:225:SER:HB2	1.92	0.51
1:B:270:ASN:ND2	1:B:442:LYS:O	2.44	0.50
1:B:112:ILE:HG13	1:B:153:GLN:HA	1.94	0.49
3:D:31:TYR:HB3	3:D:49:ASP:HA	1.94	0.49
1:A:227:ILE:O	1:A:231:ILE:HG12	2.13	0.49
1:B:227:ILE:O	1:B:231:ILE:HG12	2.13	0.49
2:E:22:CYS:HB3	2:E:79:LEU:HB3	1.93	0.49
1:A:98:ARG:HD2	1:A:291:TRP:CE3	2.47	0.49
1:B:104:ALA:HB2	1:B:127:VAL:HG13	1.93	0.49
1:A:419:TYR:OH	1:B:414:GLU:OE1	2.26	0.48
1:A:430:LEU:HD11	1:B:219:PHE:HB3	1.94	0.48
3:D:156:ASN:N	3:D:156:ASN:OD1	2.46	0.48
2:E:32:TYR:O	2:E:72:ARG:NH2	2.46	0.48
1:A:267:PRO:HG3	1:A:441:GLY:HA3	1.94	0.48
2:E:125:THR:N	2:E:154:PHE:O	2.39	0.48
3:F:156:ASN:OD1	3:F:156:ASN:N	2.45	0.48
1:A:314:GLY:O	1:A:340:ARG:NH2	2.47	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:132:PHE:O	1:A:136:LEU:HB2	2.14	0.48
1:A:176:THR:O	1:A:180:THR:HG23	2.14	0.48
1:A:191:ASN:OD1	1:A:230:ARG:NH1	2.47	0.48
1:A:248:PRO:O	1:A:251:THR:HG22	2.13	0.48
2:C:65:LYS:H	2:C:65:LYS:HG3	1.38	0.47
1:A:281:HIS:HA	1:A:284:HIS:CE1	2.49	0.47
1:B:234:HIS:CD2	1:B:235:GLU:HG2	2.50	0.47
1:A:94:TYR:CZ	1:A:352:ALA:HB2	2.50	0.47
1:B:184:ALA:HB1	1:B:225:SER:HB2	1.95	0.47
1:B:176:THR:O	1:B:180:THR:HG23	2.15	0.47
3:D:29:VAL:O	3:D:70:TYR:OH	2.25	0.47
1:A:400:ALA:HB2	1:A:432:ALA:HB1	1.97	0.46
1:B:73:ASP:N	1:B:73:ASP:OD1	2.48	0.46
1:B:127:VAL:HB	1:B:157:ASN:ND2	2.30	0.46
2:E:127:PRO:HB3	2:E:153:TYR:HB3	1.98	0.46
1:A:216:LYS:O	1:A:220:ILE:HG13	2.16	0.46
1:B:42:VAL:O	1:B:46:VAL:HG23	2.16	0.46
3:D:84:THR:HA	3:D:102:LYS:HA	1.97	0.46
1:B:400:ALA:HB2	1:B:432:ALA:HB1	1.97	0.45
3:D:1:ASP:HB3	3:D:94:PRO:HD2	1.99	0.45
2:E:65:LYS:H	2:E:65:LYS:HG3	1.40	0.45
2:C:60:TYR:HE2	2:C:70:ILE:HG13	1.81	0.45
3:F:34:TRP:HB2	3:F:47:ILE:HB	1.97	0.45
1:B:53:PHE:HE2	1:B:147:ARG:HG2	1.82	0.45
1:B:216:LYS:O	1:B:220:ILE:HG13	2.16	0.45
3:F:109:ASP:OD2	3:F:198:LYS:NZ	2.49	0.45
1:A:68:LEU:HB3	1:A:78:LEU:HD11	1.99	0.45
3:F:7:SER:HB3	3:F:8:PRO:HD3	1.98	0.45
1:B:191:ASN:OD1	1:B:230:ARG:NH1	2.47	0.45
2:E:6:GLU:HA	2:E:22:CYS:HA	1.97	0.45
1:A:184:ALA:HB1	1:A:225:SER:CB	2.47	0.45
2:E:6:GLU:OE2	2:E:96:CYS:N	2.46	0.45
1:B:59:TRP:O	1:B:63:GLN:HG2	2.18	0.44
1:A:25:LEU:HD23	1:B:208:PHE:HE1	1.81	0.44
3:D:141:LYS:HB3	3:D:172:TYR:CZ	2.52	0.44
2:C:156:GLU:HA	2:C:157:PRO:HA	1.79	0.44
2:E:158:VAL:HG12	2:E:207:HIS:HB2	2.00	0.44
1:B:267:PRO:HG3	1:B:441:GLY:HA3	1.99	0.44
1:A:125:TRP:CD1	1:A:126:ARG:HG3	2.53	0.44
1:B:132:PHE:O	1:B:136:LEU:HB2	2.17	0.44
1:A:28:ARG:NE	1:B:207:GLN:HG2	2.33	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:260:ILE:HG23	1:B:435:LEU:HG	1.99	0.43
1:A:397:LEU:HD23	1:A:397:LEU:HA	1.75	0.43
1:B:420:GLN:H	1:B:420:GLN:HG3	1.51	0.43
2:C:30:SER:C	2:C:32:TYR:H	2.21	0.43
3:D:117:PHE:HA	3:D:118:PRO:HD3	1.78	0.43
2:C:171:VAL:HG22	2:C:189:VAL:HG23	2.00	0.43
2:E:162:TRP:CZ3	2:E:203:CYS:HB3	2.54	0.43
1:B:250:ASN:OD1	2:E:104:GLY:HA3	2.19	0.43
3:D:6:GLN:HA	3:D:22:THR:O	2.19	0.43
2:E:30:SER:C	2:E:32:TYR:H	2.22	0.43
1:B:197:ILE:HG12	1:B:222:VAL:HG21	2.01	0.43
1:A:59:TRP:O	1:A:63:GLN:HG2	2.18	0.43
3:D:34:TRP:HB2	3:D:47:ILE:HB	2.01	0.43
3:F:117:PHE:HA	3:F:118:PRO:HD3	1.75	0.43
1:A:163:LEU:HD12	1:A:168:LEU:HB2	2.01	0.43
1:B:78:LEU:HD11	1:B:307:PHE:CE2	2.53	0.43
2:C:154:PHE:HA	2:C:155:PRO:HA	1.85	0.43
3:D:7:SER:HB3	3:D:22:THR:HB	2.00	0.43
3:F:10:ILE:HG12	3:F:102:LYS:HB3	2.01	0.43
3:D:48:TYR:CE1	3:D:52:LYS:HD2	2.54	0.42
2:C:176:ALA:HB2	2:C:185:LEU:HD23	2.00	0.42
3:D:180:LEU:HD22	3:D:184:GLU:HG2	2.00	0.42
1:B:154:ILE:O	1:B:158:ILE:HG12	2.20	0.42
3:F:6:GLN:HA	3:F:22:THR:O	2.19	0.42
1:A:74:ASN:HB3	1:A:77:LEU:HB3	2.01	0.42
1:A:127:VAL:HB	1:A:157:ASN:ND2	2.34	0.42
1:A:255:TYR:CD2	1:A:424:PRO:HB3	2.55	0.42
1:B:320:ILE:HG23	1:B:365:THR:HG21	2.01	0.42
1:B:118:ASP:CG	1:B:174:ARG:HH21	2.22	0.42
1:B:78:LEU:HD13	1:B:79:LEU:HD23	2.01	0.42
1:A:426:ILE:HG22	1:B:223:ILE:HD11	2.02	0.42
1:A:430:LEU:HD22	1:B:223:ILE:CD1	2.50	0.42
1:A:154:ILE:O	1:A:158:ILE:HG12	2.20	0.41
1:A:219:PHE:CE2	1:B:426:ILE:HG23	2.55	0.41
1:A:410:ILE:O	1:A:414:GLU:HG3	2.20	0.41
3:F:186:GLU:HG2	3:F:210:ARG:NH1	2.34	0.41
2:E:107:TYR:HB3	3:F:33:HIS:CD2	2.55	0.41
1:A:47:GLY:O	1:A:51:VAL:HG23	2.19	0.41
1:A:234:HIS:CD2	1:A:235:GLU:HG2	2.54	0.41
1:A:420:GLN:H	1:A:420:GLN:HG3	1.57	0.41
1:B:116:LEU:HB3	1:B:206:PRO:HD3	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:87:CYS:O	3:F:98:GLY:N	2.52	0.41
1:B:47:GLY:O	1:B:51:VAL:HG23	2.19	0.41
2:E:60:TYR:HE2	2:E:70:ILE:HG13	1.86	0.41
1:A:216:LYS:HE2	1:B:433:THR:HG22	2.03	0.41
1:B:243:LYS:HB3	2:E:31:ARG:HH21	1.85	0.41
3:D:148:LYS:HB2	3:D:192:THR:OG1	2.20	0.41
1:A:305:LEU:HA	1:A:308:VAL:HG22	2.02	0.41
1:A:430:LEU:HD22	1:B:223:ILE:HD12	2.02	0.41
1:B:337:PHE:O	1:B:341:VAL:HG23	2.20	0.41
2:C:112:GLY:O	3:D:42:SER:OG	2.33	0.41
2:E:188:SER:HB2	3:F:134:PHE:CD2	2.56	0.41
1:A:100:TYR:O	1:A:126:ARG:NH1	2.52	0.41
1:A:207:GLN:HG2	1:B:28:ARG:HE	1.86	0.41
3:F:8:PRO:O	3:F:101:THR:HG23	2.21	0.41
1:A:75:TYR:HB3	1:A:76:PRO:HD3	2.02	0.41
1:A:320:ILE:HG23	1:A:365:THR:HG21	2.02	0.41
1:B:19:ARG:HA	1:B:19:ARG:HD2	1.94	0.41
1:B:75:TYR:HB3	1:B:76:PRO:HD3	2.03	0.41
3:D:16:GLY:N	3:D:77:MET:O	2.50	0.41
3:D:49:ASP:O	3:D:51:SER:N	2.46	0.41
2:E:105:TYR:CD2	3:F:91:SER:HA	2.56	0.41
1:B:109:ILE:HG23	1:B:204:MET:SD	2.61	0.41
1:B:198:LEU:HD13	1:B:201:ILE:HD11	2.03	0.41
1:B:410:ILE:O	1:B:414:GLU:HG3	2.21	0.41
1:A:269:PHE:O	1:A:273:VAL:HG12	2.21	0.40
1:B:172:GLU:HG3	1:B:212:LEU:O	2.21	0.40
1:A:123:ARG:HE	1:A:126:ARG:HD2	1.87	0.40
3:D:83:ALA:O	3:D:103:LEU:N	2.52	0.40
2:E:162:TRP:CH2	2:E:203:CYS:HB3	2.56	0.40
1:B:255:TYR:CE2	1:B:424:PRO:HB3	2.57	0.40
1:A:453:LEU:HB3	1:B:22:ILE:HG12	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	442/446 (99%)	423 (96%)	18 (4%)	1 (0%)	44	73
1	B	439/446 (98%)	419 (95%)	18 (4%)	2 (0%)	25	58
2	C	219/222 (99%)	200 (91%)	17 (8%)	2 (1%)	14	47
2	E	219/222 (99%)	203 (93%)	15 (7%)	1 (0%)	25	58
3	D	209/211 (99%)	190 (91%)	16 (8%)	3 (1%)	9	38
3	F	209/211 (99%)	192 (92%)	17 (8%)	0	100	100
All	All	1737/1758 (99%)	1627 (94%)	101 (6%)	9 (0%)	25	58

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	E	62	PRO
2	C	62	PRO
3	D	76	THR
1	A	107	SER
1	B	107	SER
1	B	148	ALA
3	D	169	ASP
3	D	67	GLY
2	C	157	PRO

5.3.2 Protein sidechains ⓘ

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	334/336 (99%)	316 (95%)	18 (5%)	18	48
1	B	331/336 (98%)	315 (95%)	16 (5%)	21	52
2	C	181/182 (100%)	173 (96%)	8 (4%)	24	54
2	E	181/182 (100%)	170 (94%)	11 (6%)	15	44
3	D	185/185 (100%)	179 (97%)	6 (3%)	34	63

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	F	185/185 (100%)	176 (95%)	9 (5%)	21	51
All	All	1397/1406 (99%)	1329 (95%)	68 (5%)	21	51

All (68) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	17	ARG
1	A	70	HIS
1	A	73	ASP
1	A	103	GLU
1	A	151	THR
1	A	205	ARG
1	A	211	THR
1	A	212	LEU
1	A	219	PHE
1	A	230	ARG
1	A	251	THR
1	A	264	ILE
1	A	397	LEU
1	A	420	GLN
1	A	430	LEU
1	A	444	LEU
1	A	451	ARG
1	A	453	LEU
1	B	70	HIS
1	B	78	LEU
1	B	103	GLU
1	B	151	THR
1	B	205	ARG
1	B	211	THR
1	B	212	LEU
1	B	219	PHE
1	B	230	ARG
1	B	251	THR
1	B	397	LEU
1	B	420	GLN
1	B	430	LEU
1	B	444	LEU
1	B	451	ARG
1	B	453	LEU
2	C	21	SER
2	C	30	SER

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Mol	Chain	Res	Type
2	C	65	LYS
2	C	66	ASP
2	C	72	ARG
2	C	96	CYS
2	C	115	THR
2	C	151	LYS
3	D	1	ASP
3	D	39	SER
3	D	77	MET
3	D	125	THR
3	D	156	ASN
3	D	192	THR
2	E	21	SER
2	E	30	SER
2	E	65	LYS
2	E	66	ASP
2	E	72	ARG
2	E	96	CYS
2	E	98	ARG
2	E	115	THR
2	E	151	LYS
2	E	156	GLU
2	E	188	SER
3	F	1	ASP
3	F	17	ASP
3	F	77	MET
3	F	80	GLU
3	F	106	LEU
3	F	125	THR
3	F	156	ASN
3	F	168	LYS
3	F	192	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	284	HIS
1	B	284	HIS
2	C	163	ASN
3	F	37	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 oligosaccharides 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(Å²)	Q<0.9
1	A	444/446 (99%)	-0.07	17 (3%)	44	29	37, 57, 85, 128	0
1	B	441/446 (98%)	0.02	18 (4%)	42	27	37, 61, 96, 128	0
2	C	221/222 (99%)	-0.17	7 (3%)	50	34	29, 56, 95, 126	0
2	E	221/222 (99%)	-0.12	5 (2%)	61	44	29, 54, 89, 133	0
3	D	211/211 (100%)	0.16	7 (3%)	49	34	37, 66, 97, 120	0
3	F	211/211 (100%)	-0.15	2 (0%)	81	67	31, 50, 99, 120	0
All	All	1749/1758 (99%)	-0.05	56 (3%)	50	34	29, 58, 95, 133	0

All (56) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	D	79	ALA	8.3
1	A	445	TYR	5.9
3	D	167	SER	5.5
1	A	235	GLU	4.7
1	B	104	ALA	4.7
1	A	447	ALA	4.4
1	B	288	ILE	4.3
1	A	444	LEU	4.3
1	A	460	GLN	3.9
3	D	20	THR	3.8
3	D	82	ALA	3.8
1	A	354	GLY	3.6
1	A	171	ASP	3.6
1	B	95	PHE	3.6
2	E	59	ASN	3.3
1	B	72	ALA	3.1
2	E	31	ARG	3.1
2	E	7	SER	3.0
2	C	199	GLU	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	366	VAL	2.9
1	B	307	PHE	2.9
1	B	357	PHE	2.9
3	F	150	ASP	2.8
1	A	69	VAL	2.8
1	A	72	ALA	2.8
1	B	73	ASP	2.8
3	F	127	GLY	2.7
1	B	186	LEU	2.7
2	C	141	ALA	2.7
2	E	222	ALA	2.7
3	D	80	GLU	2.7
1	B	190	PHE	2.6
1	A	258	LEU	2.5
1	B	234	HIS	2.5
2	C	139	ALA	2.4
1	B	402	ILE	2.4
1	B	355	GLY	2.3
1	B	101	ALA	2.3
2	C	42	GLY	2.3
1	A	443	PRO	2.3
1	B	445	TYR	2.2
3	D	122	GLU	2.2
2	E	221	ARG	2.2
1	A	288	ILE	2.2
3	D	39	SER	2.2
1	A	121	PRO	2.2
1	A	212	LEU	2.2
1	A	380	PRO	2.1
1	B	235	GLU	2.1
1	B	289	THR	2.1
2	C	89	GLU	2.1
2	C	140	ALA	2.1
1	A	29	ASP	2.1
1	B	185	GLY	2.0
2	C	29	TYR	2.0
1	A	446	SER	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

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.