



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 12:55 PM UTC

PDB ID : 1VYT / pdb_00001vyt
Title : beta3 subunit complexed with aid
Authors : Chen, Y.-H.; Li, M.-H.; Zhang, Y.; He, L.-L.; Yamada, Y.; Fitzmaurice, A.;
Yang, S.; Zhang, H.; Tong, L.; Yang, J.
Deposited on : 2004-05-07
Resolution : 2.60 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	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

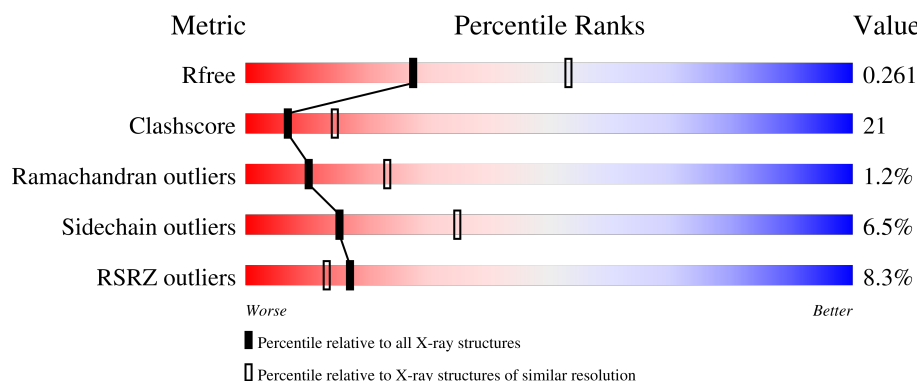
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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}	180053	4008 (2.60-2.60)
Clashscore	190562	4347 (2.60-2.60)
Ramachandran outliers	187476	4277 (2.60-2.60)
Sidechain outliers	187428	4277 (2.60-2.60)
RSRZ outliers	180081	4008 (2.60-2.60)

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 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	351	
1	B	351	
2	E	25	
2	F	25	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 4962 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 CALCIUM CHANNEL BETA-3 SUBUNIT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	274	Total	C	N	O	S	0	0	1
			2184	1386	384	404	10			
1	B	295	Total	C	N	O	S	0	0	1
			2348	1484	420	434	10			

- Molecule 2 is a protein called VOLTAGE-DEPENDENT L-TYPE CALCIUM CHANNEL ALPHA-1C SUBUNIT.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	E	25	Total	C	N	O	0	0	0
			217	135	36	46			
2	F	17	Total	C	N	O	0	0	1
			136	87	20	29			

- Molecule 3 is water.

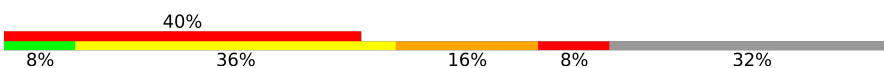
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	45	Total	O	0	0
			45	45		
3	B	26	Total	O	0	0
			26	26		
3	E	6	Total	O	0	0
			6	6		

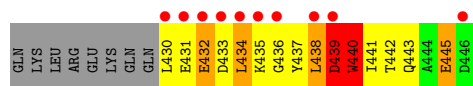
- Molecule 2: VOLTAGE-DEPENDENT L-TYPE CALCIUM CHANNEL ALPHA-1C SUB-UNIT

Chain E: 



- Molecule 2: VOLTAGE-DEPENDENT L-TYPE CALCIUM CHANNEL ALPHA-1C SUB-UNIT

Chain F: 



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	252.30Å 69.00Å 60.70Å 90.00° 96.70° 90.00°	Depositor
Resolution (Å)	30.00 – 2.60 30.00 – 2.61	Depositor EDS
% Data completeness (in resolution range)	96.0 (30.00-2.60) 95.8 (30.00-2.61)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.27 (at 2.61Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.231 , 0.272 0.222 , 0.261	Depositor DCC
R_{free} test set	3157 reflections (10.02%)	wwPDB-VP
Wilson B-factor (Å ²)	45.8	Xtriage
Anisotropy	0.394	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 42.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	4962	wwPDB-VP
Average B, all atoms (Å ²)	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.37% 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	0.54	1/2226 (0.0%)	1.02	11/3009 (0.4%)
1	B	0.46	1/2393 (0.0%)	1.02	10/3234 (0.3%)
2	E	0.52	0/219	0.90	1/291 (0.3%)
2	F	0.66	1/138 (0.7%)	1.49	4/187 (2.1%)
All	All	0.51	3/4976 (0.1%)	1.03	26/6721 (0.4%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	445	GLU	C-N	-5.78	1.25	1.33
1	B	362	HIS	C-N	-5.75	1.25	1.34
1	A	361	HIS	C-N	-5.63	1.25	1.33

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	295	SER	N-CA-C	11.81	126.21	111.69
2	F	440	TRP	N-CA-C	-9.69	100.67	111.14
1	B	132	GLU	N-CA-C	-9.66	98.63	113.89
1	A	168	VAL	CA-C-N	9.31	126.46	119.66
1	A	168	VAL	C-N-CA	9.31	126.46	119.66
1	B	133	GLN	N-CA-C	-9.29	100.82	112.72
2	F	432	GLU	N-CA-C	-8.57	101.52	111.03
1	B	293	LYS	N-CA-C	8.54	122.16	108.41
1	B	294	VAL	N-CA-C	-7.78	97.37	108.58
1	A	191	GLU	N-CA-C	7.06	119.88	111.33
1	B	103	TRP	N-CA-C	6.55	120.19	109.06
2	F	436	GLY	N-CA-C	-6.37	104.78	112.49
1	A	65	ARG	N-CA-C	-6.33	98.88	109.07
1	A	103	TRP	N-CA-C	5.98	119.22	109.24
1	A	131	GLN	N-CA-C	-5.92	105.36	113.30
1	B	361	HIS	N-CA-C	5.90	118.83	107.44
1	A	272	ASP	N-CA-C	5.82	118.40	111.71

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	316	THR	N-CA-C	5.57	117.35	111.28
1	A	293	LYS	N-CA-C	5.47	117.55	108.20
1	A	172	ASP	N-CA-C	-5.36	100.16	108.90
1	A	303	LEU	N-CA-C	-5.20	105.69	111.36
1	B	286	ALA	CA-C-N	5.11	125.09	120.03
1	B	286	ALA	C-N-CA	5.11	125.09	120.03
1	B	55	ALA	N-CA-C	-5.08	106.93	113.23
2	F	439	ASP	N-CA-C	-5.08	106.92	113.01
2	E	423	LYS	N-CA-C	-5.00	105.06	110.91

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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	2184	0	2204	80	0
1	B	2348	0	2379	113	0
2	E	217	0	208	5	0
2	F	136	0	124	15	0
3	A	45	0	0	0	0
3	B	26	0	0	0	0
3	E	6	0	0	0	0
All	All	4962	0	4915	207	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 21.

All (207) 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:B:205:LYS:HE2	1:B:214:ILE:HG13	1.37	1.04
1:B:182:LEU:HD23	1:B:290:VAL:HB	1.36	1.02
1:B:185:PRO:HG3	1:B:196:MET:HE3	1.38	1.01
1:A:275:ASN:H	1:A:279:GLN:HE22	1.03	1.01

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:56:LYS:HG3	1:B:115:ILE:HG13	1.40	0.99
1:B:230:ASN:HB3	1:B:232:PRO:HD2	1.45	0.98
2:F:439:ASP:HA	2:F:442:THR:HB	1.48	0.95
1:A:38:GLU:HG3	1:A:39:SER:N	1.84	0.89
2:F:432:GLU:HG3	2:F:433:ASP:H	1.41	0.84
1:A:38:GLU:HG3	1:A:39:SER:H	1.41	0.84
1:A:312:MET:HE3	1:A:315:LEU:HD22	1.58	0.82
1:B:298:LYS:HE2	2:F:430:LEU:HD22	1.62	0.81
1:A:275:ASN:N	1:A:279:GLN:HE22	1.79	0.81
1:B:196:MET:HE1	1:B:294:VAL:CG2	2.11	0.81
1:B:342:LEU:HD23	2:F:443:GLN:OE1	1.81	0.79
1:A:38:GLU:CG	1:A:39:SER:N	2.46	0.78
1:A:207:ARG:NH2	1:A:354:GLU:OE1	2.19	0.76
1:A:300:LEU:HG	1:A:319:MET:HE1	1.68	0.75
1:A:316:THR:HG22	1:A:320:MET:HE2	1.69	0.73
1:A:111:GLU:OE1	1:A:355:VAL:HG13	1.88	0.73
1:B:56:LYS:CG	1:B:115:ILE:HG13	2.16	0.73
2:F:439:ASP:HA	2:F:442:THR:CB	2.18	0.73
1:A:107:ARG:NH2	1:A:359:ALA:O	2.22	0.72
1:B:133:GLN:C	1:B:135:ALA:H	1.96	0.72
2:E:423:LYS:HD2	2:E:426:GLU:HG3	1.71	0.72
1:B:291:PHE:HB2	1:B:333:PHE:CD2	2.25	0.71
1:A:276:HIS:H	1:A:279:GLN:NE2	1.88	0.71
1:B:177:MET:H	1:B:261:ALA:HB1	1.56	0.71
1:B:184:GLY:HA3	1:B:193:THR:HG23	1.72	0.70
1:A:93:LEU:CD2	1:A:108:LEU:HD23	2.23	0.68
1:B:196:MET:HE1	1:B:294:VAL:HG23	1.75	0.68
1:A:247:ILE:HG12	1:A:247:ILE:O	1.92	0.68
1:A:275:ASN:H	1:A:279:GLN:NE2	1.85	0.68
1:B:351:GLU:O	1:B:355:VAL:HG23	1.93	0.67
2:F:435:LYS:HA	2:F:438:LEU:HB2	1.77	0.67
1:B:196:MET:HE1	1:B:294:VAL:HG21	1.75	0.67
1:B:129:LEU:C	1:B:131:GLN:H	2.03	0.66
1:A:55:ALA:HA	1:A:58:LYS:HG3	1.77	0.66
1:A:107:ARG:HD2	1:A:113:GLY:O	1.96	0.66
1:B:323:ASP:O	1:B:327:GLN:HG3	1.96	0.66
1:B:51:GLN:NE2	1:B:54:ARG:HH21	1.94	0.65
1:B:339:GLU:HG3	1:B:345:ALA:CA	2.27	0.65
1:B:50:GLN:O	1:B:54:ARG:HG3	1.96	0.65
1:A:38:GLU:O	1:A:41:ARG:HB3	1.97	0.65
1:A:302:ARG:HG3	1:A:302:ARG:HH11	1.62	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:204:LEU:HD11	1:B:349:LEU:HD21	1.79	0.64
1:A:339:GLU:CD	1:A:339:GLU:H	2.05	0.64
1:B:322:TYR:CZ	1:B:326:VAL:HG21	2.34	0.63
1:A:247:ILE:O	1:A:251:GLN:HG3	1.98	0.63
1:B:204:LEU:HD21	1:B:349:LEU:HD23	1.81	0.63
1:B:286:ALA:N	1:B:287:PRO:HD3	2.13	0.62
1:A:187:LEU:HG	1:A:321:ALA:CB	2.29	0.62
1:B:172:ASP:HB3	1:B:226:ARG:NH2	2.15	0.62
1:A:93:LEU:HD23	1:A:108:LEU:HD23	1.82	0.62
1:B:238:ILE:O	1:B:241:SER:HB3	1.99	0.62
1:B:214:ILE:CG2	1:B:268:VAL:HB	2.30	0.62
1:B:214:ILE:HD13	1:B:214:ILE:N	2.15	0.61
1:B:180:VAL:HB	1:B:268:VAL:HA	1.81	0.61
1:A:127:ILE:O	1:A:131:GLN:HG3	2.01	0.61
1:B:185:PRO:HD2	1:B:193:THR:HG23	1.83	0.61
1:B:231:ASN:N	1:B:232:PRO:HD2	2.15	0.61
2:F:431:GLU:HA	2:F:434:LEU:HB2	1.83	0.60
1:B:184:GLY:CA	1:B:197:GLN:HE21	2.14	0.60
1:A:50:GLN:O	1:A:54:ARG:HD3	2.02	0.60
2:E:442:THR:HA	2:E:445:GLU:HG3	1.83	0.60
1:B:339:GLU:HG3	1:B:345:ALA:HA	1.83	0.59
1:B:296:SER:HB3	1:B:298:LYS:HG2	1.84	0.59
1:B:51:GLN:NE2	1:B:54:ARG:NH2	2.51	0.58
1:A:191:GLU:O	1:A:195:MET:HG3	2.04	0.58
1:B:214:ILE:HG22	1:B:268:VAL:HB	1.86	0.58
1:B:173:VAL:O	1:B:226:ARG:NH2	2.36	0.58
1:A:187:LEU:HG	1:A:321:ALA:HB2	1.85	0.57
1:A:255:GLU:CD	1:B:235:ARG:HH22	2.13	0.57
1:B:205:LYS:HE2	1:B:214:ILE:CG1	2.26	0.57
1:A:340:ASN:C	1:A:340:ASN:HD22	2.14	0.56
1:B:133:GLN:HG2	1:B:134:LYS:N	2.19	0.56
1:B:182:LEU:HD12	1:B:201:PHE:CE2	2.40	0.56
1:B:203:PHE:CE1	1:B:346:CYS:HB3	2.41	0.56
1:B:203:PHE:CZ	1:B:346:CYS:HB3	2.41	0.56
1:B:305:ARG:HG3	1:B:312:MET:HE2	1.88	0.55
1:B:49:GLN:O	1:B:53:GLU:HG2	2.06	0.55
1:A:182:LEU:HD23	1:A:290:VAL:HB	1.89	0.55
1:B:183:VAL:HG23	1:B:183:VAL:O	2.07	0.54
1:A:128:ARG:NH1	1:A:129:LEU:HD11	2.23	0.54
1:B:231:ASN:H	1:B:232:PRO:HD2	1.72	0.54
1:A:93:LEU:HD21	1:A:108:LEU:HD23	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:182:LEU:HD23	1:B:290:VAL:CB	2.23	0.54
1:B:53:GLU:HA	1:B:56:LYS:HD3	1.90	0.54
1:B:184:GLY:H	1:B:197:GLN:NE2	2.06	0.54
1:A:71:CYS:SG	1:A:73:VAL:HG12	2.48	0.54
1:B:307:ARG:HB3	1:B:311:GLN:HG3	1.90	0.53
1:A:302:ARG:HG3	1:A:302:ARG:NH1	2.23	0.53
1:B:83:SER:O	1:B:116:ALA:HB1	2.08	0.53
1:A:55:ALA:O	1:A:96:LYS:HE3	2.08	0.53
1:B:109:VAL:CG1	1:B:360:THR:HG22	2.38	0.53
1:B:230:ASN:HB3	1:B:232:PRO:CD	2.31	0.53
1:B:277:PRO:HB3	1:B:289:ILE:HD13	1.92	0.52
1:B:239:GLU:C	1:B:241:SER:H	2.18	0.51
1:B:56:LYS:HG3	1:B:115:ILE:CG1	2.28	0.51
1:B:357:TRP:O	1:B:361:HIS:HB2	2.09	0.51
1:B:183:VAL:O	1:B:184:GLY:O	2.29	0.51
1:B:133:GLN:C	1:B:135:ALA:N	2.65	0.51
1:B:43:GLU:HA	1:B:43:GLU:OE1	2.11	0.51
1:B:201:PHE:HE1	1:B:270:ASP:OD1	1.94	0.51
1:A:173:VAL:HG11	1:B:235:ARG:HG2	1.93	0.50
1:B:184:GLY:N	1:B:197:GLN:NE2	2.59	0.50
1:A:224:ALA:HB2	1:A:254:ILE:HD11	1.92	0.50
1:B:263:SER:O	1:B:264:LEU:HB2	2.10	0.50
1:A:199:ALA:HB2	2:E:444:ALA:HB2	1.94	0.49
1:B:204:LEU:HD21	1:B:349:LEU:CD2	2.42	0.49
1:B:231:ASN:N	1:B:232:PRO:CD	2.75	0.49
2:F:432:GLU:HG3	2:F:433:ASP:N	2.17	0.49
1:B:206:HIS:HA	1:B:209:ASP:HB2	1.94	0.49
1:A:87:PHE:HB3	1:A:108:LEU:HD21	1.95	0.49
1:B:288:ILE:HA	1:B:334:ASP:OD2	2.13	0.49
1:B:73:VAL:HG23	1:B:86:ASN:HD21	1.78	0.48
1:A:276:HIS:ND1	1:A:277:PRO:HD2	2.28	0.48
1:B:107:ARG:HD2	1:B:113:GLY:O	2.14	0.48
1:B:172:ASP:HB3	1:B:226:ARG:CZ	2.43	0.48
2:F:440:TRP:CD1	2:F:440:TRP:C	2.91	0.48
1:B:131:GLN:HA	1:B:134:LYS:HB2	1.95	0.48
2:E:444:ALA:C	2:E:446:ASP:H	2.20	0.48
1:A:341:GLN:HB2	1:A:344:ASP:OD2	2.14	0.48
2:F:437:TYR:O	2:F:441:ILE:HG13	2.13	0.48
1:A:49:GLN:O	1:A:53:GLU:HG3	2.13	0.47
2:F:439:ASP:CA	2:F:442:THR:HB	2.33	0.47
1:A:276:HIS:N	1:A:279:GLN:NE2	2.59	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:38:GLU:HG2	1:A:40:ALA:H	1.80	0.47
1:A:257:ILE:HD13	1:A:269:LEU:HD11	1.96	0.47
1:B:214:ILE:HG23	1:B:268:VAL:HB	1.96	0.47
1:B:203:PHE:CE1	1:B:350:ALA:HB2	2.50	0.47
1:A:247:ILE:O	1:A:247:ILE:CG1	2.61	0.47
1:A:304:ILE:HD12	1:A:319:MET:HE3	1.97	0.47
1:A:43:GLU:OE2	1:A:47:GLN:HG3	2.15	0.47
1:A:220:ASP:OD1	1:A:223:LEU:HG	2.15	0.47
1:B:275:ASN:O	1:B:325:LEU:HD21	2.14	0.46
1:A:38:GLU:N	1:A:41:ARG:HD3	2.30	0.46
1:B:184:GLY:CA	1:B:197:GLN:NE2	2.79	0.46
1:B:214:ILE:HD13	1:B:214:ILE:H	1.79	0.46
1:A:203:PHE:CE2	1:A:207:ARG:HG3	2.51	0.46
1:A:85:VAL:HG22	1:A:86:ASN:N	2.31	0.46
1:A:186:SER:OG	1:A:187:LEU:N	2.49	0.46
1:A:128:ARG:HH12	1:A:129:LEU:HD11	1.81	0.46
1:A:79:PRO:HD3	1:A:103:TRP:CE2	2.51	0.46
1:A:193:THR:O	1:A:197:GLN:HG3	2.16	0.45
1:B:169:PRO:HA	1:B:170:PRO:HD3	1.85	0.45
1:A:185:PRO:HB3	1:A:294:VAL:HG23	1.99	0.45
1:B:177:MET:HE2	1:B:264:LEU:O	2.16	0.45
1:A:123:ARG:O	1:A:123:ARG:HG3	2.15	0.45
2:F:438:LEU:O	2:F:442:THR:N	2.46	0.45
1:A:128:ARG:NH1	1:A:129:LEU:CD1	2.80	0.45
1:B:184:GLY:H	1:B:197:GLN:HE22	1.63	0.45
1:B:129:LEU:O	1:B:131:GLN:N	2.50	0.44
2:E:441:ILE:O	2:E:445:GLU:HG3	2.17	0.44
1:A:89:ALA:O	1:A:90:LYS:HB2	2.16	0.44
1:A:211:ARG:HB2	1:A:357:TRP:CH2	2.52	0.44
1:B:175:PRO:HG3	1:B:258:PHE:CE1	2.52	0.44
1:A:325:LEU:O	1:A:328:CYS:HB2	2.16	0.44
1:A:83:SER:O	1:A:116:ALA:HB1	2.18	0.43
1:B:186:SER:HB3	1:B:193:THR:OG1	2.18	0.43
1:B:276:HIS:ND1	1:B:277:PRO:HD2	2.32	0.43
1:B:291:PHE:CD1	1:B:291:PHE:C	2.94	0.43
1:B:236:THR:O	1:B:240:ARG:HG2	2.18	0.43
1:B:347:GLU:O	1:B:351:GLU:HB3	2.18	0.43
1:A:205:LYS:HE3	1:A:205:LYS:HB2	1.74	0.43
1:B:331:GLU:O	1:B:333:PHE:N	2.51	0.43
1:A:347:GLU:O	1:A:351:GLU:HG3	2.19	0.43
1:A:56:LYS:HA	1:A:115:ILE:HD12	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:191:GLU:HG3	1:A:311:GLN:CD	2.43	0.43
1:B:40:ALA:O	1:B:43:GLU:HB3	2.18	0.43
1:B:182:LEU:CD1	1:B:197:GLN:HG2	2.47	0.43
1:A:214:ILE:HG12	1:A:268:VAL:HB	2.00	0.43
1:B:191:GLU:HG3	1:B:311:GLN:NE2	2.34	0.43
1:B:305:ARG:C	1:B:307:ARG:N	2.76	0.43
1:B:317:VAL:HA	1:B:320:MET:CE	2.49	0.43
1:B:70:TYR:HB3	1:B:87:PHE:CZ	2.54	0.43
1:A:168:VAL:HA	1:A:169:PRO:HD3	1.80	0.42
1:A:340:ASN:HD22	1:A:341:GLN:N	2.17	0.42
1:B:240:ARG:HE	1:B:240:ARG:HB3	1.61	0.42
1:A:107:ARG:HB3	1:A:115:ILE:HA	2.01	0.42
1:A:304:ILE:HD12	1:A:319:MET:CE	2.49	0.42
1:A:174:VAL:HB	1:A:175:PRO:CD	2.49	0.42
1:B:51:GLN:HE21	1:B:54:ARG:NH2	2.17	0.42
1:B:233:GLY:O	1:B:237:ILE:HG13	2.20	0.42
1:A:275:ASN:N	1:A:279:GLN:NE2	2.57	0.41
1:B:211:ARG:HB2	1:B:357:TRP:CH2	2.55	0.41
1:B:203:PHE:CE2	1:B:346:CYS:HB3	2.56	0.41
1:B:244:ARG:HD2	1:B:244:ARG:HA	1.81	0.41
1:B:295:SER:O	1:B:322:TYR:OH	2.36	0.41
1:A:78:CYS:HA	1:A:103:TRP:CZ2	2.55	0.41
1:A:174:VAL:HG12	1:A:284:SER:O	2.19	0.41
1:B:262:LYS:HE2	1:B:262:LYS:HB3	1.82	0.41
1:B:294:VAL:HG22	2:F:437:TYR:CE2	2.56	0.41
1:A:125:GLU:OE2	1:A:128:ARG:NH1	2.53	0.41
1:B:38:GLU:O	1:B:38:GLU:HG3	2.18	0.41
1:B:203:PHE:CD1	1:B:346:CYS:HB3	2.56	0.41
1:B:214:ILE:HA	1:B:268:VAL:O	2.20	0.41
1:B:127:ILE:HG22	1:B:128:ARG:N	2.35	0.41
1:B:129:LEU:C	1:B:131:GLN:N	2.71	0.41
1:B:193:THR:O	1:B:197:GLN:HB2	2.20	0.41
1:B:201:PHE:HE1	1:B:270:ASP:CG	2.29	0.41
2:F:430:LEU:N	2:F:432:GLU:HG2	2.36	0.41
1:A:203:PHE:CZ	1:A:207:ARG:HG3	2.56	0.41
1:A:253:GLU:HA	1:A:253:GLU:OE1	2.21	0.40
1:B:339:GLU:CD	1:B:339:GLU:H	2.28	0.40
2:F:432:GLU:O	2:F:433:ASP:C	2.62	0.40
1:A:250:VAL:O	1:A:254:ILE:HG12	2.21	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	268/351 (76%)	255 (95%)	13 (5%)	0	100	100
1	B	291/351 (83%)	265 (91%)	20 (7%)	6 (2%)	5	11
2	E	23/25 (92%)	21 (91%)	2 (9%)	0	100	100
2	F	15/25 (60%)	12 (80%)	2 (13%)	1 (7%)	1	1
All	All	597/752 (79%)	553 (93%)	37 (6%)	7 (1%)	10	23

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	362	HIS
1	B	184	GLY
1	B	332	SER
1	B	130	LYS
1	B	191	GLU
1	B	134	LYS
2	F	445	GLU

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	242/310 (78%)	236 (98%)	6 (2%)	42	69
1	B	261/310 (84%)	240 (92%)	21 (8%)	11	25
2	E	23/23 (100%)	19 (83%)	4 (17%)	2	3

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	F	14/23 (61%)	10 (71%)	4 (29%)	0	1
All	All	540/666 (81%)	505 (94%)	35 (6%)	15	35

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	79	PRO
1	A	133	GLN
1	A	207	ARG
1	A	284	SER
1	A	339	GLU
1	A	340	ASN
1	B	52	LEU
1	B	108	LEU
1	B	133	GLN
1	B	187	LEU
1	B	196	MET
1	B	197	GLN
1	B	206	HIS
1	B	214	ILE
1	B	226	ARG
1	B	228	VAL
1	B	240	ARG
1	B	241	SER
1	B	242	SER
1	B	244	ARG
1	B	246	SER
1	B	294	VAL
1	B	296	SER
1	B	306	SER
1	B	339	GLU
1	B	351	GLU
1	B	362	HIS
2	E	423	LYS
2	E	425	ARG
2	E	442	THR
2	E	443	GLN
2	F	434	LEU
2	F	438	LEU
2	F	439	ASP
2	F	440	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	81	GLN
1	A	101	ASN
1	A	167	HIS
1	A	279	GLN
1	A	301	GLN
1	A	327	GLN
1	A	340	ASN
1	A	341	GLN
1	A	361	HIS
1	B	50	GLN
1	B	51	GLN
1	B	57	HIS
1	B	122	GLN
1	B	197	GLN
1	B	206	HIS
1	B	231	ASN
1	B	265	GLN
1	B	311	GLN
2	E	429	GLN
2	E	443	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

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	274/351 (78%)	0.04	17 (6%) 26 21	20, 38, 89, 122	0
1	B	295/351 (84%)	0.56	21 (7%) 22 17	32, 55, 90, 119	0
2	E	25/25 (100%)	0.29	3 (12%) 9 7	21, 40, 76, 84	0
2	F	17/25 (68%)	2.07	10 (58%) 0 0	57, 82, 121, 121	0
All	All	611/752 (81%)	0.36	51 (8%) 17 13	20, 47, 90, 122	0

All (51) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	F	430	LEU	4.3
1	A	43	GLU	3.7
1	B	135	ALA	3.7
1	B	113	GLY	3.7
1	B	363	PRO	3.6
2	F	439	ASP	3.5
1	A	246	SER	3.4
2	E	423	LYS	3.3
1	A	38	GLU	3.2
1	A	136	ARG	3.2
2	F	433	ASP	3.2
1	B	358	ARG	3.2
1	B	111	GLU	3.0
1	B	110	LYS	3.0
1	A	167	HIS	2.9
1	A	39	SER	2.9
2	F	431	GLU	2.9
1	B	298	LYS	2.9
1	B	362	HIS	2.8
1	A	134	LYS	2.8
1	B	133	GLN	2.7

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Mol	Chain	Res	Type	RSRZ
2	F	446	ASP	2.7
1	B	206	HIS	2.7
2	F	432	GLU	2.6
1	A	133	GLN	2.6
2	E	422	GLN	2.6
1	A	135	ALA	2.5
1	B	230	ASN	2.5
2	F	434	LEU	2.4
1	B	344	ASP	2.4
2	F	435	LYS	2.4
1	A	50	GLN	2.4
1	A	53	GLU	2.3
1	B	168	VAL	2.3
1	A	57	HIS	2.3
1	A	41	ARG	2.2
1	A	40	ALA	2.2
2	E	445	GLU	2.2
1	B	167	HIS	2.2
2	F	436	GLY	2.2
1	A	168	VAL	2.2
1	B	115	ILE	2.1
1	B	299	VAL	2.1
1	B	184	GLY	2.1
1	A	338	ASP	2.0
1	B	114	ASP	2.0
1	B	295	SER	2.0
1	B	296	SER	2.0
1	A	76	GLU	2.0
2	F	438	LEU	2.0
1	B	356	TYR	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 oligosaccharides 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.