WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report ⓘ

Jul 15, 2025 – 10:42 AM JST

PDB ID	:	8K0D / pdb_00008k0d
EMDB ID	:	EMD-36761
Title	:	Cryo-EM structure of conformation 2 of complex of Nipah virus attachment G with 1E5 neutralizing antibody
Authors	:	Sun, M.
Deposited on	:	2023-07-08
Resolution	:	2.94 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp
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:
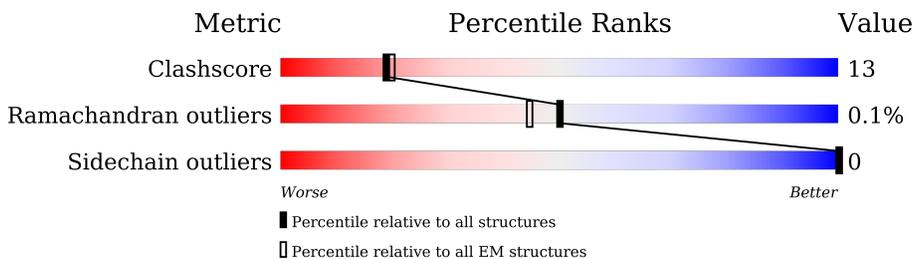
EMDB validation analysis	:	FAILED
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 2.94 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	Percentile Ranks	Value
Clashscore		13
Ramachandran outliers		0.1%
Sidechain outliers		0

Worse   *Better*

▌Percentile relative to all structures
▯Percentile relative to all EM structures

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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%

Mol	Chain	Length	Quality of chain
1	C	242	74% 26%
1	E	242	76% 24%
2	D	213	71% 29%
2	F	213	65% 35%
3	A	402	71% 29%
3	B	402	71% 29%

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 13282 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 The heavy chain of 1E5.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	E	242	Total 1842	C 1167	N 310	O 359	S 6	0	0
1	C	242	Total 1842	C 1167	N 310	O 359	S 6	0	0

- Molecule 2 is a protein called The light chain of 1E5.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	F	213	Total 1620	C 1012	N 267	O 335	S 6	0	0
2	D	213	Total 1620	C 1012	N 267	O 335	S 6	0	0

- Molecule 3 is a protein called Glycoprotein G.

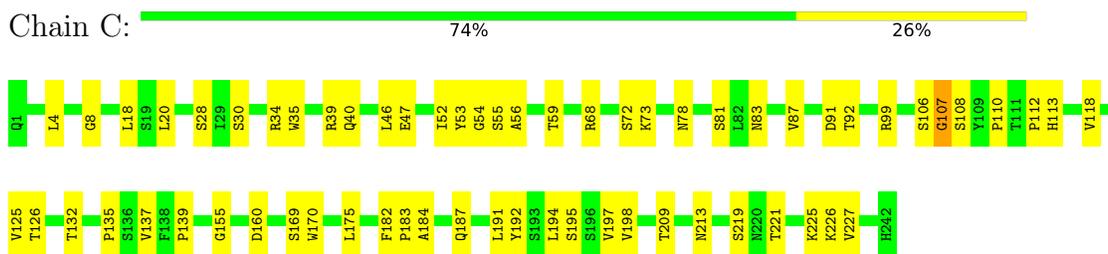| Mol	Chain	Residues	Atoms					AltConf	Trace
3	A	402	Total 3179	C 2028	N 534	O 597	S 20	0	0
3	B	402	Total 3179	C 2028	N 534	O 597	S 20	0	0

3 Residue-property plots ⓘ

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. 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. 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.
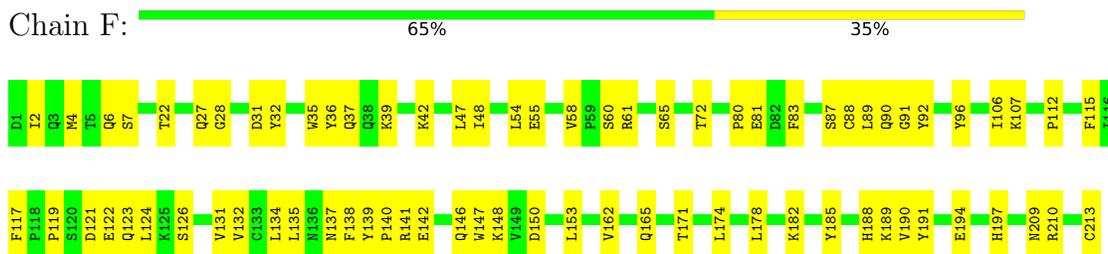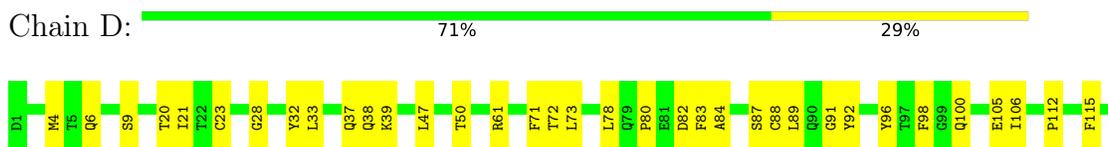
- Molecule 1: The heavy chain of 1E5

Chain E:

- Molecule 1: The heavy chain of 1E5

Chain C:

- Molecule 2: The light chain of 1E5

Chain F:

- Molecule 2: The light chain of 1E5

Chain D:

D121 E122 Q123 L124 L134 L135 N136 N137 F138 Y139 P140 K144 V145 Q146 Q159 T163 E164 Q165 D166 S167 K168 T171 Y172 S173 L174 S175 K182 Y185 Y191 E194 V195 T196 H197 C213

• Molecule 3: Glycoprotein G

Chain A: 71% 29%

P200 K201 L202 I203 S204 Y205 T206 L207 I217 L222 A223 M224 Y228 F229 A230 Y231 S232 H233 S241 I249 G253 E254 R258 G259 D260 P263 S264 L265 F266 M267 T288 N269 V270 W271 T272 P273 V279 Y280 H281 A284 V285 Y286 Y291 Y292 V293 L294 S298

D302 P303 I304 W310 M315 R318 Q332 H333 L337 D346 K347 V348 M349 P350 L362 A366 R372 S398 M399 G400 I401 R402 P403 N404 Y407 I408 L409 R410 L414 V426 V427 F428 I431 L436 S437 I438 G439 S440 K443 I444 Y445 D446 S447

V452 F453 Y454 Q455 A456 S459 K465 F466 G467 D468 V469 R480 P488 G489 Q490 C493 N497 I502 C503 W504 Y508 N509 D510 R516 I520 L526 D542 L546 Q550 L551 A552 N557 A558 Q559 K560 T561 I562 T563 F566 L567 L568 I575 S576

L577 V578 D582 R589 P590 K591 L592 F593 A594 V595 C601

• Molecule 3: Glycoprotein G

Chain B: 71% 29%

P200 S204 Y205 T206 L207 I217 A223 M224 F229 A230 H233 L234 S245 R248 V252 V255 L256 D257 R258 G259 D260 E261 V262 P263 S264 L265 F266 M267 H281 A284 V285 Y286 Y291 Y292 V293 L294 D302 P303 T308 Y309 W310 T317 R318 L319

G329 Q334 L337 R344 Y345 D346 K347 V348 M349 P350 L362 A366 V367 L370 V371 R372 T373 E374 S398 M399 Y407 I408 L409 R410 L414 N417 L418 P424 K425 V426 V427 F428 I431 I438 G439 S440 K443 S447 Q455 A456 S457 M463 I464

K465 D468 T471 P474 R480 T483 R487 P488 G489 Q490 S491 Q492 C493 P494 R495 F496 N497 I502 C503 W504 E505 Y508 A511 D515 R516 I520 F525 L526 D527 S528 T531 V536 D542 R548 S553 T556 N557 A558 Q559 K560 T561 I562

T563 F566 L567 L568 K569 I575 V578 P590 K591 L592 V595 C601

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	134340	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/Å^2)$	51	Depositor
Minimum defocus (nm)	1600	Depositor
Maximum defocus (nm)	3200	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	C	0.15	0/1900	0.35	0/2601
1	E	0.17	0/1900	0.38	0/2601
2	D	0.15	0/1653	0.32	0/2245
2	F	0.16	0/1653	0.36	0/2245
3	A	0.21	0/3259	0.40	1/4432 (0.0%)
3	B	0.20	0/3259	0.36	0/4432
All	All	0.18	0/13624	0.37	1/18556 (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})
3	A	402	ARG	N-CA-C	-7.46	99.73	110.40

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	C	1842	0	1767	45	0
1	E	1842	0	1767	42	0
2	D	1620	0	1576	41	0
2	F	1620	0	1576	48	0
3	A	3179	0	3117	96	0
3	B	3179	0	3117	82	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	13282	0	12920	330	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 13.

All (330) 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:137:VAL:HG12	1:E:225:LYS:HZ1	1.33	0.92
3:B:292:TYR:HD2	3:B:362:LEU:HD11	1.37	0.89
2:F:146:GLN:HE21	2:F:153:LEU:HD11	1.48	0.78
2:F:61:ARG:NH2	2:F:81:GLU:OE2	2.15	0.78
2:D:112:PRO:HB3	2:D:138:PHE:HB3	1.66	0.77
3:A:559:GLN:HG3	3:A:560:LYS:H	1.49	0.77
1:E:52:ILE:HG12	1:E:73:LYS:HD3	1.67	0.76
3:A:318:ARG:HD3	3:A:333:HIS:HB3	1.66	0.76
3:A:292:TYR:HD2	3:A:362:LEU:HD11	1.50	0.76
2:D:144:LYS:HB3	2:D:196:THR:HB	1.69	0.74
1:C:68:ARG:NH2	1:C:91:ASP:OD2	2.21	0.72
2:F:188:HIS:O	2:F:210:ARG:NH1	2.22	0.72
1:E:40:GLN:HB2	1:E:46:LEU:HD23	1.70	0.71
1:E:18:LEU:HD13	1:E:87:VAL:HG11	1.73	0.71
2:F:6:GLN:HE22	2:F:87:SER:HA	1.56	0.71
3:B:528:SER:OG	3:B:531:THR:O	2.06	0.71
2:D:6:GLN:HE22	2:D:87:SER:HA	1.56	0.71
2:F:4:MET:HE3	2:F:90:GLN:HB3	1.73	0.70
3:A:284:ALA:HB1	3:A:291:TYR:HE2	1.57	0.69
2:F:124:LEU:O	2:F:182:LYS:NZ	2.25	0.69
1:E:20:LEU:HD12	1:E:82:LEU:HD23	1.74	0.69
2:D:135:LEU:HB2	2:D:174:LEU:HB3	1.74	0.69
3:A:304:ILE:HG12	3:A:349:MET:HE1	1.75	0.68
2:F:22:THR:HG22	2:F:72:THR:HG22	1.75	0.67
1:C:40:GLN:HB2	1:C:46:LEU:HD23	1.77	0.67
1:E:52:ILE:HD13	1:E:59:THR:HG22	1.76	0.66
3:A:202:LEU:O	3:B:258:ARG:NH2	2.18	0.66
2:F:2:ILE:HG12	2:F:27:GLN:HB3	1.77	0.66
3:B:568:LEU:HD23	3:B:569:LYS:HG2	1.77	0.66
2:F:112:PRO:HB3	2:F:138:PHE:HB3	1.78	0.66
1:C:28:SER:HA	1:C:78:ASN:HD21	1.60	0.66
2:F:91:GLY:O	3:A:490:GLN:NE2	2.29	0.65
3:A:493:CYS:HA	3:A:497:ASN:HD22	1.61	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:115:PHE:HB2	2:F:134:LEU:HB3	1.76	0.65
3:A:443:LYS:NZ	3:A:563:THR:O	2.30	0.65
2:D:9:SER:HA	2:D:100:GLN:HE22	1.62	0.64
3:B:566:PHE:HE1	3:B:575:ILE:HG12	1.61	0.64
3:A:207:LEU:HD22	3:A:267:MET:HE3	1.80	0.62
3:B:294:LEU:HG	3:B:350:PRO:HG3	1.80	0.62
2:D:115:PHE:HB2	2:D:134:LEU:HB3	1.81	0.62
3:A:575:ILE:HG22	3:A:592:LEU:HD12	1.82	0.61
3:A:347:LYS:NZ	3:A:407:TYR:OH	2.32	0.61
3:A:263:PRO:HG2	3:A:575:ILE:HD11	1.83	0.60
3:A:372:ARG:HG3	3:A:408:ILE:HD11	1.81	0.60
3:A:508:TYR:HB3	3:A:560:LYS:HG3	1.82	0.60
3:A:258:ARG:HB3	3:B:205:TYR:HB2	1.83	0.60
3:A:203:ILE:HD12	3:A:264:SER:HA	1.84	0.60
3:B:493:CYS:HA	3:B:497:ASN:HD22	1.67	0.60
2:D:37:GLN:HB2	2:D:47:LEU:HD11	1.84	0.60
2:F:83:PHE:CE2	2:F:106:ILE:HG12	2.37	0.60
1:E:184:ALA:HA	1:E:194:LEU:HB3	1.84	0.60
2:D:20:THR:HG23	2:D:72:THR:HG23	1.82	0.59
1:C:226:LYS:NZ	1:C:227:VAL:O	2.35	0.59
1:E:68:ARG:NH2	1:E:91:ASP:OD2	2.36	0.59
1:E:107:GLY:N	3:A:302:ASP:OD2	2.27	0.59
3:B:206:THR:HG21	3:B:264:SER:OG	2.02	0.59
1:E:137:VAL:HG21	1:E:214:VAL:HG21	1.85	0.58
2:F:135:LEU:HB2	2:F:174:LEU:HB3	1.84	0.58
2:D:83:PHE:CZ	2:D:106:ILE:HG13	2.37	0.58
3:A:233:HIS:CE1	3:A:249:ILE:HD12	2.38	0.58
1:C:107:GLY:N	3:B:302:ASP:OD2	2.24	0.58
3:B:224:MET:HE3	3:B:255:VAL:HG21	1.85	0.58
3:B:284:ALA:HB1	3:B:291:TYR:HE2	1.67	0.58
2:F:37:GLN:HB2	2:F:47:LEU:HD11	1.84	0.58
2:D:105:GLU:OE1	2:D:172:TYR:OH	2.20	0.57
3:B:292:TYR:HE2	3:B:418:LEU:HD11	1.70	0.57
3:B:559:GLN:HG3	3:B:560:LYS:H	1.69	0.57
1:E:39:ARG:NE	1:E:47:GLU:OE2	2.30	0.56
3:A:398:SER:HB3	3:A:502:ILE:HA	1.88	0.56
1:E:230:LYS:NZ	2:F:213:CYS:SG	2.78	0.56
1:E:20:LEU:HB2	1:E:82:LEU:HB3	1.87	0.56
3:A:203:ILE:HD13	3:A:594:ALA:HB2	1.88	0.56
3:A:286:TYR:HB2	3:A:291:TYR:CE1	2.41	0.56
3:B:447:SER:O	3:B:516:ARG:NH2	2.35	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:32:TYR:HB2	2:F:92:TYR:HB2	1.88	0.55
1:C:54:GLY:HA2	1:C:73:LYS:HE3	1.89	0.55
3:B:258:ARG:HG3	3:B:260:ASP:H	1.71	0.55
3:B:292:TYR:CE1	3:B:318:ARG:HG3	2.42	0.55
2:D:91:GLY:O	3:B:490:GLN:NE2	2.39	0.55
1:C:183:PRO:HD3	2:D:163:THR:HG22	1.87	0.55
1:C:184:ALA:HB2	1:C:194:LEU:HD23	1.88	0.55
1:E:116:PHE:O	1:E:119:TRP:NE1	2.37	0.55
2:F:209:ASN:OD1	2:F:210:ARG:N	2.40	0.55
1:C:155:GLY:HA3	1:C:197:VAL:HA	1.89	0.55
1:E:137:VAL:HG12	1:E:225:LYS:NZ	2.16	0.55
3:B:217:ILE:HB	3:B:590:PRO:HD3	1.88	0.54
3:B:348:VAL:HG11	3:B:414:LEU:HD21	1.88	0.54
1:E:98:ALA:HB1	1:E:116:PHE:HB3	1.90	0.54
3:A:292:TYR:CD2	3:A:362:LEU:HD11	2.37	0.54
3:A:204:SER:HB3	3:A:592:LEU:H	1.73	0.54
1:E:137:VAL:HG22	1:E:158:VAL:HA	1.88	0.54
2:F:139:TYR:CD2	2:F:140:PRO:HA	2.43	0.54
3:A:303:PRO:HB3	3:A:310:TRP:CD2	2.43	0.54
3:A:582:ASP:CG	3:A:591:LYS:HZ1	2.15	0.54
1:E:202:SER:HA	1:E:205:LEU:HD13	1.90	0.53
2:D:121:ASP:OD1	2:D:122:GLU:N	2.42	0.53
1:E:15:SER:HA	1:E:86:SER:HA	1.91	0.53
3:A:480:ARG:NH2	3:A:542:ASP:OD1	2.40	0.53
3:B:349:MET:HB3	3:B:367:VAL:HG12	1.90	0.53
3:B:366:ALA:HB2	3:B:414:LEU:HG	1.91	0.53
2:F:182:LYS:O	2:F:185:TYR:N	2.41	0.53
1:C:184:ALA:HA	1:C:194:LEU:HB3	1.91	0.53
3:A:366:ALA:HB2	3:A:414:LEU:HG	1.89	0.53
2:D:115:PHE:HD2	2:D:134:LEU:HD22	1.72	0.53
2:F:141:ARG:HG3	2:F:162:VAL:HG11	1.91	0.53
1:C:170:TRP:CZ3	1:C:198:VAL:HB	2.44	0.53
3:B:292:TYR:CD2	3:B:362:LEU:HD11	2.29	0.53
3:A:233:HIS:HE1	3:A:249:ILE:HD12	1.73	0.53
2:D:136:ASN:OD1	2:D:137:ASN:ND2	2.41	0.53
3:B:252:VAL:HG11	3:B:291:TYR:HB3	1.90	0.53
2:F:7:SER:OG	2:F:22:THR:OG1	2.21	0.52
3:A:455:GLN:OE1	3:A:465:LYS:HE3	2.09	0.52
2:F:138:PHE:HB2	2:F:197:HIS:NE2	2.25	0.52
3:B:372:ARG:HG3	3:B:408:ILE:HD11	1.91	0.52
3:A:217:ILE:HD12	3:A:233:HIS:CD2	2.45	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:224:MET:HE1	3:A:575:ILE:HB	1.91	0.52
3:B:566:PHE:CE1	3:B:575:ILE:HG12	2.44	0.52
3:B:217:ILE:HG23	3:B:233:HIS:CD2	2.45	0.51
3:A:589:ARG:HH11	3:A:591:LYS:HD3	1.74	0.51
3:B:536:VAL:HG11	3:B:548:ARG:HD3	1.91	0.51
3:B:488:PRO:HG3	3:B:526:LEU:HB2	1.92	0.51
3:A:217:ILE:HG23	3:A:233:HIS:CD2	2.45	0.51
3:B:230:ALA:HB2	3:B:291:TYR:CE2	2.45	0.51
1:E:184:ALA:HB2	1:E:194:LEU:HD23	1.91	0.51
3:A:294:LEU:HD23	3:A:350:PRO:HG3	1.92	0.51
3:B:398:SER:HB3	3:B:502:ILE:HA	1.93	0.51
2:F:107:LYS:HD3	2:F:139:TYR:HE1	1.76	0.51
1:C:40:GLN:OE1	2:D:38:GLN:NE2	2.41	0.51
2:D:139:TYR:CD1	2:D:140:PRO:HA	2.46	0.51
3:B:286:TYR:HB2	3:B:291:TYR:CE1	2.45	0.51
3:A:206:THR:HG21	3:A:266:PHE:HE1	1.76	0.50
2:F:119:PRO:HD3	2:F:131:VAL:HG22	1.94	0.50
3:B:200:PRO:HA	3:B:595:VAL:HG22	1.94	0.50
2:F:123:GLN:O	2:F:126:SER:OG	2.25	0.50
1:C:139:PRO:HA	1:C:225:LYS:HZ1	1.75	0.50
3:B:337:LEU:HD13	3:B:426:VAL:HG21	1.94	0.50
3:B:455:GLN:OE1	3:B:465:LYS:HE3	2.11	0.50
2:D:33:LEU:HD13	2:D:71:PHE:CG	2.47	0.50
2:D:39:LYS:HD2	2:D:84:ALA:HB2	1.92	0.50
3:B:344:ARG:NH2	3:B:374:GLU:O	2.45	0.50
1:E:99:ARG:HB3	1:E:118:VAL:HB	1.92	0.50
3:B:292:TYR:HE1	3:B:318:ARG:HG3	1.76	0.50
3:B:303:PRO:HB3	3:B:310:TRP:CG	2.46	0.49
3:A:202:LEU:HD21	3:A:591:LYS:HB3	1.93	0.49
3:A:566:PHE:CE1	3:A:575:ILE:HG12	2.47	0.49
1:E:70:THR:HB	1:E:83:ASN:HB2	1.94	0.49
1:C:160:ASP:HA	1:C:191:LEU:HB3	1.94	0.49
2:F:142:GLU:O	2:F:142:GLU:HG2	2.13	0.49
2:D:78:LEU:HD21	2:D:83:PHE:CZ	2.48	0.49
1:E:30:SER:O	1:E:55:SER:OG	2.31	0.49
3:A:222:LEU:HD22	3:A:577:LEU:HB2	1.95	0.49
1:E:32:THR:HG21	1:E:99:ARG:HG2	1.95	0.49
3:B:414:LEU:HD22	3:B:426:VAL:HG12	1.93	0.48
3:B:480:ARG:NH2	3:B:542:ASP:OD2	2.42	0.48
3:B:491:SER:OG	3:B:505:GLU:OE2	2.24	0.48
3:B:515:ASP:HB3	3:B:520:ILE:HB	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:347:LYS:NZ	3:B:407:TYR:OH	2.46	0.48
3:A:273:PRO:HG3	3:A:279:VAL:HG21	1.94	0.48
2:F:137:ASN:HA	2:F:171:THR:HB	1.95	0.48
3:A:206:THR:OG1	3:A:265:LEU:O	2.27	0.48
3:A:566:PHE:HE1	3:A:575:ILE:HG12	1.78	0.48
1:C:106:SER:O	1:C:108:SER:N	2.47	0.48
3:B:310:TRP:HE3	3:B:347:LYS:HD3	1.78	0.48
1:E:56:ALA:HB2	3:A:502:ILE:HD12	1.95	0.48
1:C:182:PHE:HD2	1:C:195:SER:HB2	1.79	0.48
2:D:80:PRO:HA	2:D:83:PHE:HE2	1.77	0.48
3:A:401:ILE:HG22	3:A:402:ARG:HE	1.77	0.48
3:A:438:ILE:HG22	3:A:459:SER:HB2	1.95	0.48
3:A:200:PRO:HA	3:A:595:VAL:HG22	1.96	0.48
1:C:30:SER:O	1:C:55:SER:OG	2.31	0.48
3:A:438:ILE:HD13	3:A:504:TRP:CD1	2.49	0.48
2:F:39:LYS:HB2	2:F:42:LYS:HB2	1.95	0.48
3:A:303:PRO:HB2	3:A:349:MET:SD	2.54	0.48
1:C:52:ILE:HD13	1:C:59:THR:HG22	1.95	0.48
3:A:271:TRP:CD1	3:A:332:GLN:HG2	2.49	0.47
3:B:457:SER:HB2	3:B:487:ARG:HD2	1.95	0.47
1:E:117:ASP:OD1	1:E:117:ASP:N	2.47	0.47
3:A:414:LEU:HD22	3:A:426:VAL:HG12	1.96	0.47
1:E:106:SER:O	1:E:108:SER:N	2.47	0.47
2:D:138:PHE:HB2	2:D:197:HIS:NE2	2.29	0.47
3:B:318:ARG:NH2	3:B:329:GLY:O	2.47	0.47
3:B:438:ILE:HD13	3:B:504:TRP:CD1	2.48	0.47
2:F:150:ASP:HA	2:F:190:VAL:HB	1.96	0.47
2:F:189:LYS:HA	2:F:210:ARG:NH1	2.30	0.47
3:A:337:LEU:HD13	3:A:426:VAL:HG21	1.97	0.47
1:C:110:PRO:HB2	3:B:505:GLU:HA	1.97	0.47
3:B:204:SER:HB3	3:B:592:LEU:H	1.80	0.47
3:B:399:MET:HG3	3:B:408:ILE:CG2	2.45	0.47
3:B:410:ARG:NH2	3:B:431:ILE:O	2.44	0.47
3:B:207:LEU:HD22	3:B:267:MET:HE2	1.96	0.47
1:E:113:HIS:HE1	2:F:31:ASP:OD1	1.97	0.47
3:A:520:ILE:HD12	3:A:546:LEU:HD11	1.97	0.47
1:C:110:PRO:O	1:C:112:PRO:HD3	2.15	0.47
3:A:281:HIS:NE2	3:A:302:ASP:OD1	2.47	0.46
3:B:468:ASP:OD1	3:B:516:ARG:NH1	2.47	0.46
2:F:185:TYR:O	2:F:191:TYR:OH	2.31	0.46
3:A:348:VAL:HG11	3:A:414:LEU:HD21	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:508:TYR:HB3	3:B:560:LYS:HG3	1.97	0.46
3:A:510:ASP:CG	3:A:563:THR:H	2.23	0.46
1:C:139:PRO:HD3	1:C:225:LYS:HD2	1.98	0.46
2:F:121:ASP:OD1	2:F:122:GLU:N	2.49	0.46
1:C:39:ARG:NE	1:C:47:GLU:OE2	2.37	0.46
1:C:137:VAL:HG12	1:C:225:LYS:NZ	2.31	0.46
3:B:317:THR:HA	3:B:334:GLN:HA	1.98	0.46
2:D:4:MET:HE3	2:D:23:CYS:SG	2.56	0.46
2:D:28:GLY:O	3:B:557:ASN:ND2	2.47	0.46
3:A:279:VAL:HG22	3:A:315:MET:HE1	1.97	0.46
3:A:206:THR:HG21	3:A:266:PHE:CE1	2.50	0.46
2:F:54:LEU:HD21	2:F:60:SER:HA	1.97	0.46
2:F:89:LEU:HD11	2:F:96:TYR:HB3	1.97	0.46
3:A:204:SER:HB3	3:A:592:LEU:HB2	1.98	0.45
3:A:437:SER:OG	3:A:465:LYS:NZ	2.38	0.45
3:B:417:ASN:O	3:B:424:PRO:HB3	2.16	0.45
3:B:281:HIS:NE2	3:B:302:ASP:OD1	2.47	0.45
1:C:56:ALA:HB2	3:B:502:ILE:HD12	1.98	0.45
3:B:346:ASP:HB3	3:B:407:TYR:HE1	1.81	0.45
3:B:553:SER:OG	3:B:556:THR:OG1	2.24	0.45
3:A:269:ASN:ND2	3:A:332:GLN:OE1	2.47	0.45
1:E:103:TYR:HE2	3:A:241:SER:HB2	1.80	0.45
3:A:258:ARG:HD3	3:A:264:SER:HB2	1.97	0.45
1:E:31:ASP:HA	3:A:404:ASN:HD21	1.82	0.45
3:A:488:PRO:HG3	3:A:526:LEU:HB2	1.99	0.45
1:C:4:LEU:HD21	1:C:35:TRP:HZ3	1.82	0.45
3:B:561:THR:HG22	3:B:578:VAL:HG13	1.99	0.45
3:A:348:VAL:CG1	3:A:414:LEU:HD21	2.47	0.45
2:D:61:ARG:NE	2:D:82:ASP:OD2	2.49	0.45
2:D:89:LEU:HD11	2:D:96:TYR:HB3	1.98	0.45
2:F:124:LEU:HA	2:F:182:LYS:HE2	1.99	0.44
3:A:224:MET:HE2	3:A:265:LEU:HD21	2.00	0.44
2:D:124:LEU:HB3	2:D:182:LYS:NZ	2.32	0.44
1:E:115:TRP:HB2	2:F:36:TYR:OH	2.18	0.44
2:F:147:TRP:CE2	2:F:178:LEU:HB2	2.52	0.44
2:D:32:TYR:HB2	2:D:92:TYR:HB2	1.99	0.44
2:F:106:ILE:HB	2:F:165:GLN:NE2	2.33	0.44
3:A:231:TYR:HE1	3:A:577:LEU:HD11	1.83	0.44
1:E:65:LEU:O	1:E:69:VAL:HG12	2.18	0.44
3:A:258:ARG:NH2	3:A:260:ASP:OD2	2.50	0.44
1:E:17:THR:HA	1:E:85:ASN:HA	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:18:LEU:O	1:C:83:ASN:HA	2.18	0.44
2:D:21:ILE:HB	2:D:73:LEU:HB3	1.99	0.44
2:D:137:ASN:OD1	2:D:171:THR:OG1	2.30	0.44
3:B:348:VAL:CG1	3:B:414:LEU:HD21	2.47	0.44
2:D:165:GLN:HB2	2:D:172:TYR:CZ	2.53	0.43
2:F:6:GLN:NE2	2:F:88:CYS:H	2.16	0.43
3:A:232:SER:HA	3:A:249:ILE:O	2.18	0.43
3:A:304:ILE:HD12	3:A:409:LEU:HD21	2.00	0.43
3:B:223:ALA:O	3:B:291:TYR:OH	2.23	0.43
1:E:175:LEU:HD21	1:E:198:VAL:HG21	1.99	0.43
2:F:65:SER:OG	2:F:72:THR:OG1	2.36	0.43
1:C:34:ARG:HE	1:C:53:TYR:HE1	1.66	0.43
3:B:308:THR:HA	3:B:407:TYR:HE2	1.83	0.43
3:A:410:ARG:NH2	3:A:431:ILE:O	2.47	0.43
3:A:561:THR:HG22	3:A:578:VAL:HG13	2.01	0.43
3:B:414:LEU:HD23	3:B:428:PHE:HA	2.00	0.43
3:A:589:ARG:HA	3:A:590:PRO:HD3	1.90	0.43
3:B:443:LYS:NZ	3:B:563:THR:O	2.51	0.43
1:E:32:THR:CG2	1:E:99:ARG:HG2	2.48	0.43
1:E:110:PRO:O	1:E:112:PRO:HD3	2.18	0.43
2:F:117:PHE:HB2	2:F:132:VAL:HG23	2.01	0.43
1:C:175:LEU:HD21	1:C:198:VAL:HG21	2.01	0.43
3:B:234:LEU:HB2	3:B:248:ARG:HH11	1.83	0.43
1:E:21:THR:HG23	1:E:79:GLN:OE1	2.18	0.43
3:A:263:PRO:HD3	3:A:568:LEU:HD22	2.00	0.43
3:A:348:VAL:HG11	3:A:428:PHE:HB2	2.00	0.43
3:B:463:MET:HE2	3:B:483:THR:HA	2.01	0.43
3:A:222:LEU:HD12	3:A:222:LEU:HA	1.87	0.43
3:A:230:ALA:HB2	3:A:291:TYR:CE2	2.53	0.43
3:A:298:SER:HB2	3:A:303:PRO:HG3	2.01	0.43
3:A:205:TYR:HB3	3:B:258:ARG:HB3	2.01	0.42
2:D:6:GLN:NE2	2:D:88:CYS:H	2.16	0.42
3:B:345:TYR:CD1	3:B:370:LEU:HB2	2.54	0.42
3:A:445:TYR:CE1	3:A:452:VAL:HB	2.54	0.42
1:C:8:GLY:HA3	1:C:20:LEU:HD23	2.00	0.42
2:D:146:GLN:HB2	2:D:194:GLU:HB2	2.01	0.42
3:A:346:ASP:OD2	3:A:407:TYR:OH	2.22	0.42
1:C:92:THR:HG23	1:C:126:THR:HA	2.01	0.42
1:C:209:THR:HA	1:C:226:LYS:HE2	2.00	0.42
3:B:440:SER:HB3	3:B:456:ALA:HB3	2.01	0.42
3:A:205:TYR:HB2	3:B:256:LEU:HD11	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:18:LEU:HB2	1:C:87:VAL:HG11	2.01	0.42
1:C:135:PRO:HD2	1:C:221:THR:HG21	2.02	0.42
3:B:511:ALA:HB2	3:B:525:PHE:HZ	1.84	0.42
3:A:550:GLN:HG2	3:A:552:ALA:O	2.19	0.42
3:A:468:ASP:OD1	3:A:469:VAL:N	2.52	0.42
2:D:138:PHE:CE1	2:D:174:LEU:HB2	2.55	0.42
3:A:217:ILE:HB	3:A:590:PRO:HD3	2.01	0.42
3:A:284:ALA:HB1	3:A:291:TYR:CE2	2.46	0.42
1:C:99:ARG:HD3	1:C:118:VAL:HB	2.01	0.42
1:C:169:SER:OG	1:C:213:ASN:HB3	2.19	0.42
3:B:291:TYR:N	3:B:319:LEU:O	2.43	0.42
2:F:35:TRP:HB2	2:F:48:ILE:HB	2.01	0.42
3:A:228:TYR:HD1	3:A:254:GLU:HG2	1.85	0.42
3:B:258:ARG:HD3	3:B:262:VAL:HB	2.02	0.42
3:A:253:GLY:HA3	3:A:267:MET:HA	2.01	0.41
3:B:257:ASP:OD1	3:B:258:ARG:N	2.53	0.41
3:A:559:GLN:CG	3:A:560:LYS:H	2.28	0.41
3:B:471:THR:HG23	3:B:474:PRO:O	2.20	0.41
3:A:399:MET:HE1	3:A:436:LEU:HG	2.03	0.41
3:B:229:PHE:HE1	3:B:266:PHE:H	1.67	0.41
1:C:46:LEU:O	2:D:98:PHE:HB2	2.21	0.41
1:C:126:THR:HG21	1:C:192:TYR:OH	2.20	0.41
1:C:113:HIS:CG	2:D:50:THR:HG22	2.56	0.41
1:C:225:LYS:HE2	1:C:225:LYS:HB3	1.80	0.41
2:D:80:PRO:HA	2:D:83:PHE:CE2	2.55	0.41
3:A:249:ILE:HG23	3:A:270:VAL:HG13	2.02	0.41
1:C:187:GLN:HG2	2:D:159:GLN:HE22	1.85	0.41
2:F:6:GLN:HE21	2:F:88:CYS:H	1.68	0.41
2:F:55:GLU:O	2:F:58:VAL:HG12	2.21	0.41
2:F:148:LYS:NZ	2:F:194:GLU:HB3	2.36	0.41
1:E:29:ILE:HG22	1:E:35:TRP:CE2	2.55	0.41
3:A:231:TYR:HB3	3:A:267:MET:HE2	2.02	0.41
3:A:447:SER:O	3:A:516:ARG:NH2	2.40	0.41
1:C:18:LEU:HD11	1:C:125:VAL:HG11	2.03	0.41
1:C:72:SER:OG	1:C:81:SER:HB2	2.21	0.41
2:D:166:ASP:OD2	2:D:168:LYS:HG3	2.21	0.41
2:D:185:TYR:O	2:D:191:TYR:OH	2.30	0.41
3:B:234:LEU:HD11	3:B:245:SER:HB3	2.02	0.41
3:A:440:SER:HB3	3:A:456:ALA:HB3	2.01	0.41
3:A:454:TYR:HD1	3:A:466:PHE:HB3	1.85	0.41
1:C:132:THR:HG22	1:C:219:SER:HB3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:495:ARG:HG2	3:B:496:PHE:CD2	2.56	0.41
3:B:526:LEU:HD22	3:B:558:ALA:HB3	2.03	0.41
1:E:41:PRO:HB2	1:E:44:LYS:HE2	2.04	0.40
2:F:28:GLY:O	3:A:557:ASN:ND2	2.47	0.40
1:C:155:GLY:HA3	1:C:197:VAL:HG12	2.02	0.40
1:E:52:ILE:CG1	1:E:73:LYS:HD3	2.44	0.40
1:E:70:THR:N	1:E:83:ASN:O	2.51	0.40
1:C:182:PHE:CE2	2:D:175:SER:HB2	2.57	0.40
1:E:72:SER:OG	1:E:81:SER:HB2	2.21	0.40
2:F:80:PRO:HA	2:F:83:PHE:CE2	2.56	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 PDB entries followed by that with respect to all EM entries.

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	C	240/242 (99%)	227 (95%)	12 (5%)	1 (0%)	30	55
1	E	240/242 (99%)	227 (95%)	12 (5%)	1 (0%)	30	55
2	D	211/213 (99%)	205 (97%)	6 (3%)	0	100	100
2	F	211/213 (99%)	205 (97%)	6 (3%)	0	100	100
3	A	400/402 (100%)	376 (94%)	24 (6%)	0	100	100
3	B	400/402 (100%)	382 (96%)	18 (4%)	0	100	100
All	All	1702/1714 (99%)	1622 (95%)	78 (5%)	2 (0%)	50	72

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	107	GLY
1	E	107	GLY

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 PDB entries followed by that with respect to all EM entries.

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	C	210/210 (100%)	210 (100%)	0	100	100
1	E	210/210 (100%)	210 (100%)	0	100	100
2	D	187/187 (100%)	187 (100%)	0	100	100
2	F	187/187 (100%)	187 (100%)	0	100	100
3	A	359/359 (100%)	359 (100%)	0	100	100
3	B	359/359 (100%)	359 (100%)	0	100	100
All	All	1512/1512 (100%)	1512 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	E	5	GLN
1	E	113	HIS
1	E	114	ASN
1	E	213	ASN
1	E	241	HIS
2	F	27	GLN
2	F	79	GLN
3	A	233	HIS
1	C	242	HIS
2	D	100	GLN
2	D	159	GLN
3	B	586	ASN
3	B	600	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 ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.