Full wwPDB X-ray Structure Validation Report ⓘ

Nov 23, 2023 – 04:02 PM EST

PDB ID	:	8HM4
Title	:	Crystal structure of PPIase
Authors	:	Xu, J.H.; Chen, Z.; Gao, X.
Deposited on	:	2022-12-02
Resolution	:	3.79 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:

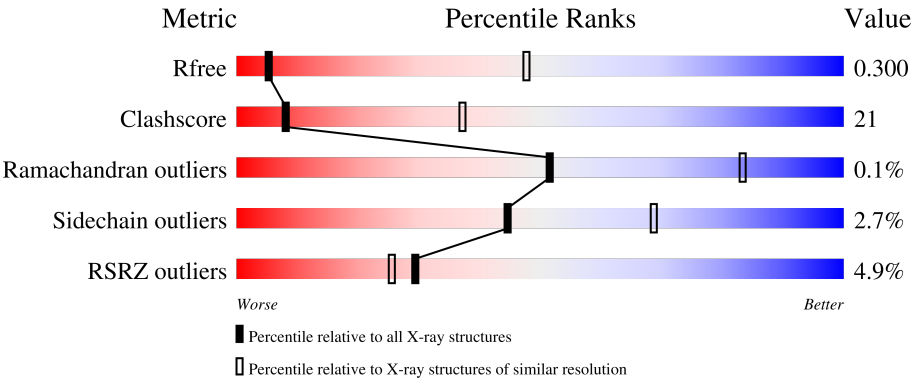
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.79 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 of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	427	2% 63% 34% .
1	B	427	8% 53% 42% . .

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 6807 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 Peptidylprolyl isomerase.

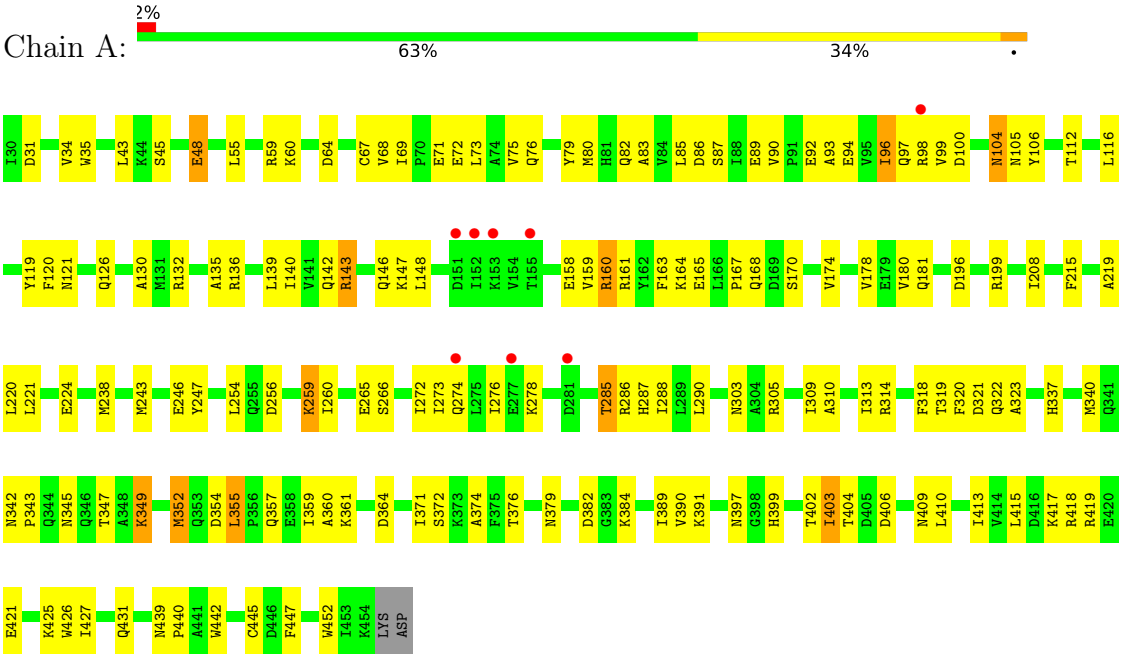
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	425	Total	C	N	O	S	0	0	0
			3442	2165	604	660	13			
1	B	415	Total	C	N	O	S	0	0	0
			3365	2116	592	644	13			

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.

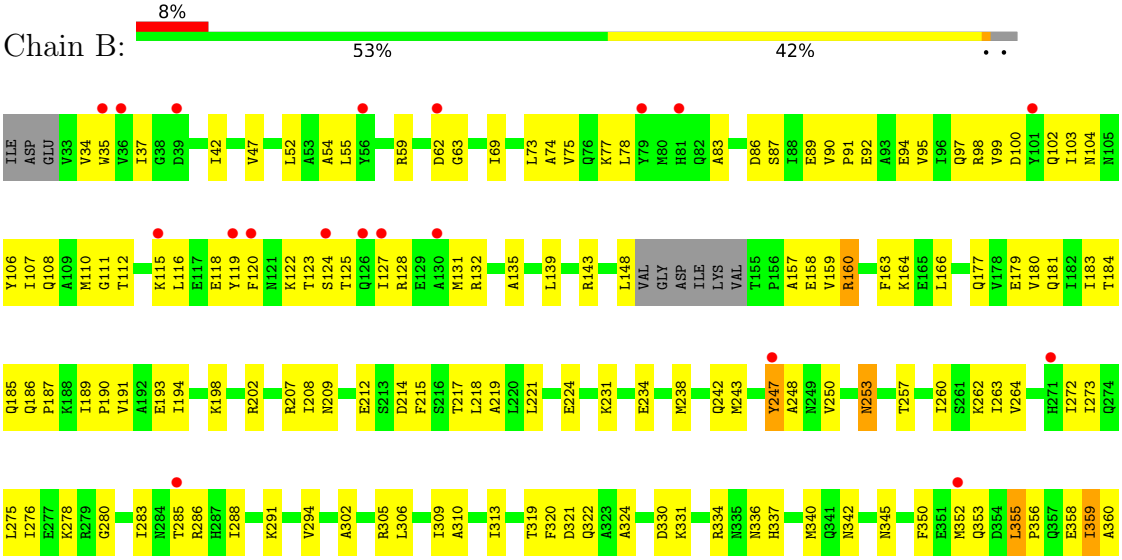
• Molecule 1: Peptidylprolyl isomerase

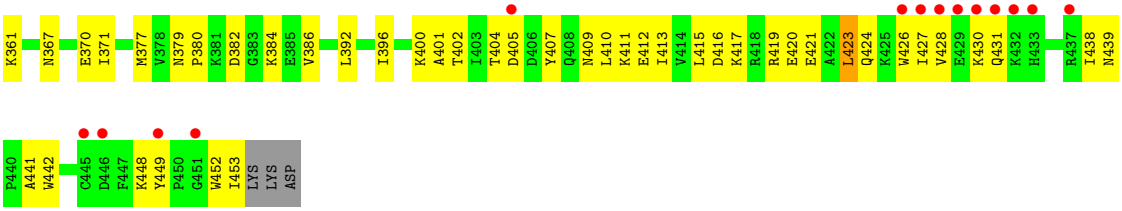
Chain A:



• Molecule 1: Peptidylprolyl isomerase

Chain B:




K361
N367
E370
I371
M377
V378
N379
P380
K381
D382
G383
K384
E385
V386
L392
I396
K400
A401
T402
I403
T404
D405
D406
Y407
Q408
N409
L410
K411
E412
I413
V414
L415
D416
K417
R418
R419
E420
E421
A422
L423
Q424
K425
W426
I427
V428
E429
K430
Q431
K432
H433
R437
I438
N439
P440
A441
W442
C445
D446
F447
K448
Y449
P450
G451
W452
I453
LYS
LYS
ASP

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	82.42Å 126.09Å 130.72Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	37.44 – 3.79 37.44 – 3.79	Depositor EDS
% Data completeness (in resolution range)	99.5 (37.44-3.79) 99.5 (37.44-3.79)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.48 (at 3.76Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.284 , 0.302 0.286 , 0.300	Depositor DCC
R_{free} test set	1395 reflections (10.01%)	wwPDB-VP
Wilson B-factor (Å^2)	159.1	Xtriage
Anisotropy	0.394	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 155.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.45$, $< L^2 > = 0.28$	Xtriage
Estimated twinning fraction	0.037 for -h,l,k	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	6807	wwPDB-VP
Average B, all atoms (Å^2)	206.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.43% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

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	A	0.65	0/3498	0.79	0/4714
1	B	0.54	0/3420	0.71	0/4608
All	All	0.60	0/6918	0.75	0/9322

There are no bond length outliers.

There are no bond angle outliers.

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	3442	0	3460	127	0
1	B	3365	0	3376	168	0
All	All	6807	0	6836	291	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 (291) 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:180:VAL:HG21	1:B:359:ILE:HD11	1.39	1.00
1:B:352:MET:HA	1:B:355:LEU:HD11	1.53	0.89

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:355:LEU:HD13	1:B:360:ALA:HB2	1.65	0.77
1:B:99:VAL:HG21	1:B:132:ARG:HG3	1.67	0.77
1:A:256:ASP:HB3	1:A:259:LYS:HG2	1.69	0.73
1:A:345:ASN:HD22	1:A:349:LYS:HE2	1.54	0.73
1:B:159:VAL:HG12	1:B:160:ARG:HG3	1.70	0.73
1:A:148:LEU:HD22	1:A:419:ARG:HD3	1.76	0.67
1:A:71:GLU:HG3	1:A:452:TRP:HH2	1.60	0.67
1:B:238:MET:SD	1:B:242:GLN:NE2	2.68	0.67
1:B:402:THR:HG22	1:B:404:THR:H	1.58	0.67
1:A:71:GLU:HG3	1:A:452:TRP:CH2	2.30	0.66
1:B:356:PRO:HG2	1:B:359:ILE:HG22	1.76	0.65
1:B:352:MET:CA	1:B:355:LEU:HD11	2.25	0.65
1:B:431:GLN:NE2	1:B:453:ILE:O	2.30	0.64
1:B:102:GLN:OE1	1:B:131:MET:HB3	1.98	0.64
1:A:382:ASP:OD2	1:A:384:LYS:NZ	2.29	0.64
1:A:355:LEU:HG	1:A:360:ALA:HB2	1.78	0.63
1:A:160:ARG:HH12	1:A:403:ILE:HG13	1.62	0.63
1:A:93:ALA:O	1:A:97:GLN:HB3	1.98	0.63
1:A:136:ARG:O	1:A:140:ILE:HG12	1.99	0.63
1:B:99:VAL:HG22	1:B:131:MET:HB2	1.81	0.62
1:B:103:ILE:HA	1:B:106:TYR:CD2	2.34	0.62
1:B:177:GLN:HB2	1:B:396:ILE:HG13	1.82	0.62
1:A:445:CYS:HB2	1:A:447:PHE:CZ	2.35	0.62
1:B:358:GLU:HG2	1:B:377:MET:HA	1.82	0.62
1:A:310:ALA:HB1	1:A:371:ILE:HD12	1.81	0.62
1:A:314:ARG:HG3	1:A:371:ILE:HD11	1.81	0.62
1:B:148:LEU:HD22	1:B:419:ARG:HD3	1.83	0.61
1:B:400:LYS:HD2	1:B:401:ALA:N	2.15	0.61
1:A:71:GLU:O	1:A:75:VAL:HG23	1.99	0.61
1:B:104:ASN:O	1:B:108:GLN:HG2	2.01	0.61
1:A:80:MET:HE1	1:A:136:ARG:HG2	1.83	0.60
1:B:342:ASN:HB2	1:B:350:PHE:CD1	2.36	0.60
1:B:416:ASP:HA	1:B:419:ARG:HD2	1.83	0.60
1:A:64:ASP:HB3	1:A:67:CYS:SG	2.41	0.60
1:A:256:ASP:O	1:A:259:LYS:HB2	2.02	0.59
1:B:94:GLU:O	1:B:98:ARG:HG3	2.03	0.59
1:A:447:PHE:HB3	1:A:452:TRP:HZ3	1.68	0.59
1:A:105:ASN:OD1	1:A:106:TYR:N	2.36	0.59
1:B:98:ARG:HD2	1:B:135:ALA:HB1	1.85	0.59
1:A:273:ILE:HG23	1:A:285:THR:OG1	2.03	0.58
1:B:412:GLU:HA	1:B:415:LEU:HD12	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:355:LEU:CD1	1:B:360:ALA:HB2	2.34	0.57
1:A:87:SER:C	1:A:89:GLU:H	2.08	0.56
1:A:83:ALA:HB1	1:A:90:VAL:HG21	1.87	0.56
1:B:257:THR:HA	1:B:275:LEU:HD11	1.87	0.56
1:B:423:LEU:HA	1:B:426:TRP:HB3	1.87	0.56
1:B:420:GLU:O	1:B:424:GLN:N	2.37	0.56
1:B:160:ARG:CZ	1:B:160:ARG:H	2.19	0.56
1:B:355:LEU:HD13	1:B:360:ALA:CB	2.33	0.56
1:B:423:LEU:O	1:B:427:ILE:HG12	2.06	0.56
1:B:423:LEU:O	1:B:427:ILE:N	2.37	0.56
1:A:220:LEU:HD13	1:B:353:GLN:HG2	1.87	0.56
1:A:68:VAL:HG13	1:A:69:ILE:HD12	1.88	0.55
1:B:214:ASP:HB3	1:B:217:THR:HG23	1.88	0.55
1:B:54:ALA:HB1	1:B:59:ARG:HD3	1.88	0.55
1:A:43:LEU:HD23	1:A:45:SER:OG	2.07	0.55
1:B:356:PRO:HG2	1:B:359:ILE:CG2	2.37	0.55
1:B:401:ALA:HB1	1:B:405:ASP:OD2	2.06	0.55
1:B:184:THR:HG22	1:B:330:ASP:HB2	1.87	0.55
1:B:278:LYS:NZ	1:B:280:GLY:O	2.22	0.55
1:B:187:PRO:HD3	1:B:386:VAL:HA	1.87	0.54
1:A:136:ARG:O	1:A:139:LEU:HG	2.07	0.54
1:B:179:GLU:O	1:B:392:LEU:HD12	2.07	0.54
1:B:276:ILE:HD11	1:B:286:ARG:HG3	1.89	0.54
1:A:246:GLU:HG3	1:A:265:GLU:O	2.08	0.54
1:A:254:LEU:O	1:A:278:LYS:NZ	2.41	0.54
1:B:302:ALA:HA	1:B:305:ARG:HH11	1.73	0.53
1:B:400:LYS:CE	1:B:401:ALA:H	2.20	0.53
1:B:127:ILE:O	1:B:131:MET:HG2	2.08	0.53
1:B:412:GLU:O	1:B:416:ASP:N	2.32	0.53
1:A:371:ILE:HG22	1:A:391:LYS:HB2	1.90	0.53
1:B:90:VAL:HG12	1:B:139:LEU:HD11	1.91	0.53
1:B:35:TRP:HE1	1:B:37:ILE:HG13	1.73	0.53
1:B:104:ASN:O	1:B:107:ILE:HG12	2.09	0.53
1:A:357:GLN:O	1:A:361:LYS:HG2	2.09	0.52
1:B:125:THR:HA	1:B:128:ARG:HD3	1.92	0.52
1:A:355:LEU:CG	1:A:360:ALA:HB2	2.39	0.52
1:A:219:ALA:HA	1:A:288:ILE:HG12	1.92	0.52
1:B:371:ILE:HD12	1:B:371:ILE:O	2.10	0.52
1:A:402:THR:O	1:A:403:ILE:HG22	2.10	0.52
1:B:208:ILE:CD1	1:B:215:PHE:HD1	2.23	0.51
1:B:313:ILE:HD13	1:B:320:PHE:HD1	1.75	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:161:ARG:HD3	1:A:418:ARG:NH2	2.25	0.51
1:A:347:THR:OG1	1:A:349:LYS:HG3	2.10	0.51
1:B:262:LYS:O	1:B:264:VAL:HG23	2.10	0.51
1:A:87:SER:HB2	1:A:89:GLU:HB3	1.91	0.51
1:A:276:ILE:HD11	1:A:286:ARG:NE	2.26	0.51
1:B:208:ILE:HD13	1:B:215:PHE:CD1	2.46	0.51
1:B:439:ASN:HD22	1:B:441:ALA:H	1.59	0.51
1:A:112:THR:HA	1:A:116:LEU:HD13	1.91	0.51
1:B:340:MET:HB3	1:B:350:PHE:CZ	2.46	0.51
1:A:31:ASP:HB3	1:A:43:LEU:HD11	1.91	0.51
1:A:160:ARG:NH1	1:A:403:ILE:HG13	2.25	0.51
1:B:313:ILE:HG21	1:B:320:PHE:HB2	1.93	0.51
1:A:59:ARG:NH1	1:A:60:LYS:O	2.44	0.51
1:A:427:ILE:O	1:A:431:GLN:HB2	2.11	0.51
1:B:423:LEU:HD13	1:B:426:TRP:HD1	1.76	0.51
1:B:86:ASP:OD1	1:B:87:SER:N	2.42	0.50
1:A:374:ALA:HA	1:A:389:ILE:HG22	1.93	0.50
1:A:309:ILE:O	1:A:313:ILE:HG12	2.12	0.50
1:B:34:VAL:HG23	1:B:35:TRP:H	1.75	0.50
1:B:427:ILE:O	1:B:431:GLN:HB2	2.12	0.50
1:A:100:ASP:O	1:A:104:ASN:HB3	2.12	0.50
1:A:276:ILE:HD11	1:A:286:ARG:HE	1.77	0.50
1:B:110:MET:HB3	1:B:119:TYR:OH	2.12	0.50
1:B:35:TRP:NE1	1:B:37:ILE:HG13	2.27	0.50
1:A:318:PHE:HE2	1:A:323:ALA:HB2	1.76	0.50
1:B:400:LYS:HE2	1:B:401:ALA:H	1.77	0.50
1:A:208:ILE:HD11	1:A:260:ILE:HG21	1.92	0.50
1:B:260:ILE:CG2	1:B:272:ILE:HD12	2.42	0.50
1:A:148:LEU:HD12	1:A:148:LEU:O	2.11	0.49
1:B:89:GLU:O	1:B:143:ARG:NH1	2.46	0.49
1:A:168:GLN:HG3	1:A:170:SER:H	1.78	0.49
1:B:103:ILE:O	1:B:107:ILE:HG23	2.13	0.49
1:A:68:VAL:O	1:A:72:GLU:HG3	2.13	0.49
1:B:98:ARG:HD2	1:B:135:ALA:CB	2.42	0.49
1:A:178:VAL:HG12	1:A:180:VAL:HG13	1.94	0.49
1:A:409:ASN:O	1:A:413:ILE:HG12	2.13	0.49
1:B:158:GLU:HB2	1:B:163:PHE:HB2	1.95	0.49
1:A:246:GLU:OE2	1:A:266:SER:HA	2.13	0.48
1:B:52:LEU:HD23	1:B:55:LEU:HD21	1.95	0.48
1:B:319:THR:HG23	1:B:322:GLN:H	1.78	0.48
1:B:400:LYS:CD	1:B:401:ALA:H	2.26	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:196:ASP:OD1	1:A:199:ARG:NH2	2.46	0.48
1:A:364:ASP:OD2	1:B:207:ARG:NH1	2.35	0.48
1:B:190:PRO:HG2	1:B:193:GLU:HB2	1.95	0.48
1:B:342:ASN:HB2	1:B:350:PHE:CE1	2.48	0.48
1:A:148:LEU:HD22	1:A:419:ARG:CD	2.42	0.48
1:A:445:CYS:HB2	1:A:447:PHE:CE1	2.48	0.48
1:A:402:THR:HG23	1:A:404:THR:HG22	1.95	0.48
1:B:321:ASP:HB3	1:B:337:HIS:ND1	2.28	0.48
1:A:87:SER:C	1:A:89:GLU:N	2.67	0.48
1:A:319:THR:HG22	1:A:322:GLN:HG3	1.96	0.48
1:A:132:ARG:O	1:A:136:ARG:HG3	2.14	0.48
1:A:34:VAL:C	1:A:35:TRP:HD1	2.17	0.47
1:A:352:MET:HA	1:A:355:LEU:CD2	2.45	0.47
1:B:231:LYS:HE2	1:B:234:GLU:O	2.14	0.47
1:B:107:ILE:HA	1:B:111:GLY:O	2.14	0.47
1:B:166:LEU:HB2	1:B:411:LYS:HD3	1.97	0.47
1:A:247:TYR:CE1	1:A:273:ILE:HG12	2.49	0.47
1:B:116:LEU:O	1:B:120:PHE:N	2.36	0.47
1:A:221:LEU:HB3	1:B:361:LYS:HE2	1.97	0.47
1:B:185:GLN:HB2	1:B:306:LEU:HD11	1.96	0.47
1:A:399:HIS:NE2	1:A:406:ASP:OD2	2.47	0.47
1:B:257:THR:HA	1:B:275:LEU:CD1	2.45	0.47
1:A:238:MET:HG3	1:A:243:MET:HE3	1.96	0.47
1:B:91:PRO:HD2	1:B:139:LEU:HD13	1.97	0.47
1:A:309:ILE:HD12	1:A:309:ILE:HG23	1.73	0.46
1:B:427:ILE:HD13	1:B:430:LYS:HE2	1.97	0.46
1:B:247:TYR:CZ	1:B:273:ILE:HG12	2.51	0.46
1:B:107:ILE:HG22	1:B:112:THR:C	2.36	0.46
1:B:92:GLU:HA	1:B:95:VAL:HB	1.98	0.46
1:A:256:ASP:HB3	1:A:259:LYS:CG	2.44	0.46
1:A:96:ILE:O	1:A:99:VAL:HG12	2.16	0.45
1:A:439:ASN:OD1	1:A:440:PRO:HD2	2.16	0.45
1:A:120:PHE:O	1:A:121:ASN:HB2	2.16	0.45
1:B:74:ALA:O	1:B:78:LEU:HG	2.15	0.45
1:B:191:VAL:O	1:B:194:ILE:HG13	2.16	0.45
1:A:361:LYS:HD2	1:B:221:LEU:HB3	1.99	0.45
1:B:99:VAL:HG21	1:B:132:ARG:CG	2.43	0.45
1:B:122:LYS:HD3	1:B:123:THR:N	2.32	0.45
1:B:124:SER:O	1:B:127:ILE:HG22	2.16	0.45
1:B:421:GLU:O	1:B:424:GLN:HB2	2.17	0.45
1:B:423:LEU:HA	1:B:423:LEU:HD22	1.79	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:90:VAL:C	1:A:92:GLU:H	2.19	0.45
1:A:55:LEU:HA	1:A:59:ARG:HB3	1.98	0.45
1:A:208:ILE:HD11	1:A:260:ILE:CG2	2.47	0.45
1:B:103:ILE:HD13	1:B:106:TYR:CE2	2.52	0.45
1:B:157:ALA:H	1:B:415:LEU:HD11	1.82	0.45
1:B:219:ALA:HA	1:B:288:ILE:HG22	1.97	0.45
1:B:250:VAL:HG21	1:B:264:VAL:HG21	1.98	0.45
1:B:336:ASN:OD1	1:B:337:HIS:N	2.48	0.45
1:B:62:ASP:OD1	1:B:63:GLY:N	2.50	0.45
1:B:160:ARG:HA	1:B:164:LYS:HB2	1.98	0.45
1:B:180:VAL:HB	1:B:340:MET:SD	2.57	0.45
1:A:147:LYS:HA	1:A:147:LYS:HE2	1.97	0.45
1:A:259:LYS:HD2	1:A:259:LYS:HA	1.49	0.45
1:A:342:ASN:ND2	1:A:354:ASP:OD2	2.50	0.45
1:B:164:LYS:HA	1:B:411:LYS:NZ	2.32	0.45
1:B:305:ARG:O	1:B:309:ILE:HG12	2.17	0.45
1:B:310:ALA:HB1	1:B:371:ILE:HD13	1.99	0.45
1:B:420:GLU:HA	1:B:423:LEU:HB2	1.99	0.45
1:A:79:TYR:HB2	1:A:140:ILE:HD12	1.98	0.45
1:A:160:ARG:HH22	1:A:403:ILE:HG12	1.82	0.45
1:A:34:VAL:HG23	1:A:35:TRP:H	1.82	0.44
1:B:400:LYS:HD2	1:B:401:ALA:H	1.81	0.44
1:B:409:ASN:O	1:B:413:ILE:HG12	2.17	0.44
1:A:303:ASN:HD21	1:A:376:THR:CG2	2.30	0.44
1:B:417:LYS:O	1:B:421:GLU:N	2.38	0.44
1:A:158:GLU:O	1:A:159:VAL:C	2.55	0.44
1:A:174:VAL:HG22	1:A:409:ASN:HD22	1.81	0.44
1:A:181:GLN:HB3	1:A:320:PHE:HE2	1.83	0.44
1:A:318:PHE:CE2	1:A:323:ALA:HB2	2.52	0.44
1:B:253:ASN:OD1	1:B:253:ASN:C	2.55	0.44
1:A:34:VAL:HG23	1:A:35:TRP:N	2.32	0.44
1:A:161:ARG:HG3	1:A:165:GLU:HG2	2.00	0.44
1:A:421:GLU:O	1:A:425:LYS:HG3	2.17	0.44
1:B:148:LEU:HD13	1:B:419:ARG:HD3	2.00	0.44
1:B:190:PRO:HG2	1:B:193:GLU:CB	2.47	0.44
1:B:208:ILE:HD13	1:B:215:PHE:HD1	1.82	0.44
1:A:303:ASN:HD21	1:A:376:THR:HG23	1.83	0.44
1:A:372:SER:N	1:A:390:VAL:O	2.47	0.44
1:B:78:LEU:HB3	1:B:430:LYS:HE3	1.99	0.44
1:B:416:ASP:OD1	1:B:419:ARG:NH1	2.50	0.44
1:B:181:GLN:HB3	1:B:320:PHE:HE2	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:400:LYS:HE2	1:B:400:LYS:HB3	1.79	0.44
1:A:161:ARG:HA	1:A:161:ARG:HD2	1.81	0.44
1:B:157:ALA:HB2	1:B:415:LEU:HD21	2.00	0.44
1:B:278:LYS:HD2	1:B:283:ILE:HG22	1.99	0.44
1:B:448:LYS:HG2	1:B:449:TYR:H	1.82	0.44
1:A:34:VAL:HG12	1:A:442:TRP:CE2	2.53	0.43
1:A:417:LYS:O	1:A:421:GLU:HG3	2.18	0.43
1:A:426:TRP:HE3	1:A:427:ILE:HG13	1.83	0.43
1:B:352:MET:C	1:B:355:LEU:HD11	2.38	0.43
1:A:89:GLU:HG3	1:A:90:VAL:HG23	1.99	0.43
1:A:342:ASN:OD1	1:A:343:PRO:HD2	2.18	0.43
1:A:415:LEU:O	1:A:419:ARG:HG2	2.17	0.43
1:B:331:LYS:HD3	1:B:334:ARG:HD2	1.99	0.43
1:B:439:ASN:HD21	1:B:442:TRP:HE3	1.63	0.43
1:A:73:LEU:O	1:A:76:GLN:HG2	2.18	0.43
1:A:163:PHE:HB3	1:A:403:ILE:HD11	2.00	0.43
1:B:231:LYS:HG3	1:B:234:GLU:HG2	2.01	0.43
1:A:439:ASN:HB3	1:A:442:TRP:CD1	2.53	0.43
1:B:302:ALA:HA	1:B:305:ARG:HD3	2.01	0.43
1:B:120:PHE:CE1	1:B:127:ILE:HD12	2.53	0.43
1:A:174:VAL:HG22	1:A:409:ASN:ND2	2.34	0.43
1:A:359:ILE:HD13	1:A:359:ILE:HG21	1.77	0.43
1:B:34:VAL:HG23	1:B:35:TRP:N	2.33	0.43
1:A:224:GLU:HG2	1:A:290:LEU:HD23	2.00	0.43
1:B:177:GLN:HB2	1:B:396:ILE:CG1	2.48	0.43
1:A:79:TYR:HD1	1:A:143:ARG:HG2	1.84	0.43
1:A:96:ILE:O	1:A:96:ILE:HG13	2.18	0.43
1:B:428:VAL:O	1:B:431:GLN:HB3	2.19	0.43
1:B:243:MET:HB2	1:B:248:ALA:HB2	2.01	0.42
1:A:82:GLN:HA	1:A:85:LEU:HB3	2.01	0.42
1:B:198:LYS:HE2	1:B:202:ARG:HH12	1.84	0.42
1:B:342:ASN:HB3	1:B:345:ASN:OD1	2.19	0.42
1:A:272:ILE:O	1:A:287:HIS:HA	2.18	0.42
1:B:42:ILE:HD11	1:B:77:LYS:HG3	2.00	0.42
1:B:91:PRO:HD3	1:B:143:ARG:NH2	2.34	0.42
1:B:243:MET:CB	1:B:248:ALA:HB2	2.48	0.42
1:B:382:ASP:HB2	1:B:384:LYS:HG2	2.01	0.42
1:A:48:GLU:HG2	1:A:120:PHE:HE1	1.85	0.42
1:A:142:GLN:O	1:A:146:GLN:HG2	2.20	0.42
1:B:47:VAL:HG22	1:B:73:LEU:HD12	2.02	0.42
1:B:160:ARG:H	1:B:160:ARG:NH1	2.18	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:209:ASN:HB3	1:B:260:ILE:HD13	2.01	0.42
1:A:397:ASN:O	1:A:399:HIS:HB2	2.19	0.42
1:B:116:LEU:HD12	1:B:119:TYR:HB3	2.02	0.42
1:B:91:PRO:HD2	1:B:139:LEU:CD1	2.49	0.42
1:B:164:LYS:O	1:B:411:LYS:NZ	2.49	0.42
1:B:438:ILE:HG22	1:B:452:TRP:H	1.85	0.42
1:B:47:VAL:HG13	1:B:69:ILE:HG22	2.02	0.42
1:B:158:GLU:HB2	1:B:163:PHE:CB	2.50	0.42
1:A:126:GLN:NE2	1:A:130:ALA:HB2	2.35	0.41
1:A:305:ARG:O	1:A:309:ILE:HG12	2.20	0.41
1:B:214:ASP:O	1:B:218:LEU:HG	2.19	0.41
1:B:224:GLU:OE1	1:B:291:LYS:N	2.40	0.41
1:B:416:ASP:O	1:B:420:GLU:N	2.31	0.41
1:A:90:VAL:HG12	1:A:92:GLU:H	1.85	0.41
1:B:103:ILE:HA	1:B:106:TYR:HD2	1.83	0.41
1:B:103:ILE:HD13	1:B:106:TYR:HE2	1.85	0.41
1:A:379:ASN:HB3	1:A:382:ASP:OD1	2.20	0.41
1:A:75:VAL:HG12	1:A:79:TYR:CE2	2.56	0.41
1:B:75:VAL:HA	1:B:78:LEU:HD12	2.03	0.41
1:A:160:ARG:NH1	1:A:410:LEU:HD22	2.35	0.41
1:B:367:ASN:HB2	1:B:370:GLU:OE2	2.21	0.41
1:A:340:MET:SD	1:A:359:ILE:HD13	2.60	0.41
1:B:263:ILE:HG13	1:B:263:ILE:O	2.21	0.41
1:B:115:LYS:HD2	1:B:118:GLU:OE1	2.21	0.41
1:B:183:ILE:HG22	1:B:324:ALA:HA	2.03	0.41
1:B:207:ARG:HG2	1:B:212:GLU:OE1	2.20	0.41
1:B:215:PHE:HE2	1:B:286:ARG:CB	2.33	0.41
1:B:407:TYR:O	1:B:410:LEU:HB3	2.21	0.41
1:A:86:ASP:O	1:A:87:SER:OG	2.31	0.41
1:B:83:ALA:O	1:B:87:SER:N	2.53	0.41
1:B:379:ASN:OD1	1:B:380:PRO:HD2	2.21	0.41
1:B:423:LEU:O	1:B:426:TRP:HB3	2.21	0.41
1:A:406:ASP:O	1:A:410:LEU:HD13	2.21	0.40
1:A:93:ALA:HB3	1:A:135:ALA:HB1	2.03	0.40
1:B:97:GLN:O	1:B:100:ASP:HB2	2.21	0.40
1:B:396:ILE:HD12	1:B:396:ILE:O	2.22	0.40
1:A:98:ARG:HG3	1:A:135:ALA:HA	2.04	0.40
1:A:215:PHE:HE2	1:A:286:ARG:HB3	1.86	0.40
1:B:189:ILE:CD1	1:B:294:VAL:HG22	2.51	0.40
1:B:275:LEU:HA	1:B:285:THR:HG22	2.02	0.40
1:A:164:LYS:NZ	1:A:167:PRO:HA	2.36	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:321:ASP:HB3	1:A:337:HIS:ND1	2.37	0.40
1:B:128:ARG:O	1:B:132:ARG:HG3	2.22	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	423/427 (99%)	390 (92%)	32 (8%)	1 (0%)	47 79
1	B	411/427 (96%)	374 (91%)	37 (9%)	0	100 100
All	All	834/854 (98%)	764 (92%)	69 (8%)	1 (0%)	51 83

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	403	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	376/378 (100%)	363 (96%)	13 (4%)	36 64
1	B	367/378 (97%)	360 (98%)	7 (2%)	57 76
All	All	743/756 (98%)	723 (97%)	20 (3%)	44 69

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	48	GLU
1	A	94	GLU
1	A	96	ILE
1	A	104	ASN
1	A	119	TYR
1	A	143	ARG
1	A	160	ARG
1	A	259	LYS
1	A	274	GLN
1	A	285	THR
1	A	349	LYS
1	A	352	MET
1	A	355	LEU
1	B	160	ARG
1	B	186	GLN
1	B	247	TYR
1	B	253	ASN
1	B	355	LEU
1	B	359	ILE
1	B	423	LEU

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	126	GLN
1	A	345	ASN
1	B	104	ASN
1	B	186	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 monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	425/427 (99%)	-0.01	8 (1%)	66	59	112, 170, 233, 264	0
1	B	415/427 (97%)	0.24	33 (7%)	12	10	124, 213, 388, 448	0
All	All	840/854 (98%)	0.12	41 (4%)	29	25	112, 182, 354, 448	0

All (41) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	433	HIS	6.4
1	A	152	ILE	5.6
1	B	431	GLN	5.1
1	B	445	CYS	4.6
1	B	127	ILE	4.6
1	B	124	SER	4.1
1	B	119	TYR	4.0
1	A	153	LYS	3.9
1	B	115	LYS	3.9
1	B	449	TYR	3.7
1	B	352	MET	3.4
1	B	451	GLY	3.4
1	B	446	ASP	3.3
1	B	429	GLU	3.2
1	A	98	ARG	3.0
1	B	35	TRP	2.9
1	B	62	ASP	2.9
1	B	79	TYR	2.9
1	B	437	ARG	2.8
1	B	126	GLN	2.8
1	B	247	TYR	2.7
1	B	426	TRP	2.7
1	A	155	THR	2.6
1	B	271	HIS	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	151	ASP	2.6
1	B	101	TYR	2.5
1	B	36	VAL	2.5
1	B	130	ALA	2.5
1	A	274	GLN	2.5
1	B	405	ASP	2.4
1	B	430	LYS	2.4
1	B	285	THR	2.4
1	B	427	ILE	2.4
1	B	56	TYR	2.3
1	B	120	PHE	2.3
1	B	428	VAL	2.2
1	B	39	ASP	2.2
1	B	432	LYS	2.2
1	B	81	HIS	2.2
1	A	281	ASP	2.0
1	A	277	GLU	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 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.