



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 1, 2026 – 05:42 AM UTC

PDB ID : 1UKI / pdb_00001uki
Title : Structural basis for the selective inhibition of JNK1 by the scaffolding protein JIP1 and SP600125
Authors : Heo, Y.-S.; Kim, Y.K.; Sung, B.-J.; Lee, H.S.; Lee, J.I.; Seo, C.I.; Park, S.-Y.; Kim, J.H.; Hyun, Y.-L.; Jeon, Y.H.; Ro, S.; Lee, T.G.; Cho, J.M.; Hwang, K.Y.; Yang, C.-H.
Deposited on : 2003-08-23
Resolution : 2.70 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
Mogul	:	2022.3.0, CSD as543be (2022)
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

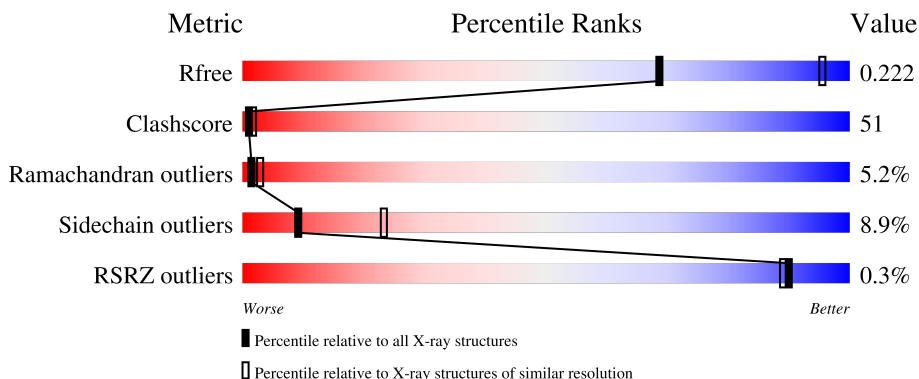
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

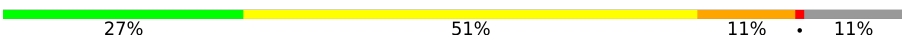
The reported resolution of this entry is 2.70 Å.

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	3538 (2.70-2.70)
Clashscore	190562	3843 (2.70-2.70)
Ramachandran outliers	187476	3778 (2.70-2.70)
Sidechain outliers	187428	3778 (2.70-2.70)
RSRZ outliers	180081	3538 (2.70-2.70)

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	369	
2	B	11	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 2763 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 mitogen-activated protein kinase 8 isoform 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	328	Total	C	N	O	S	0	0	0
			2647	1705	446	477	19			

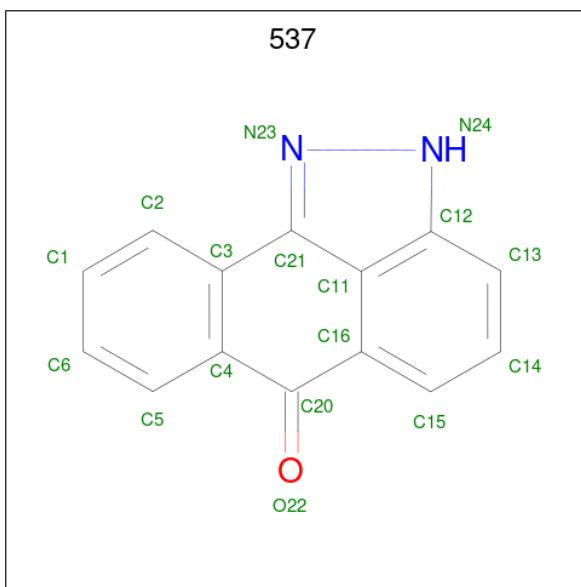
There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	364	HIS	-	expression tag	UNP P45983
A	365	HIS	-	expression tag	UNP P45983
A	366	HIS	-	expression tag	UNP P45983
A	367	HIS	-	expression tag	UNP P45983
A	368	HIS	-	expression tag	UNP P45983
A	369	HIS	-	expression tag	UNP P45983

- Molecule 2 is a protein called 11-mer peptide from C-jun-amino-terminal kinase interacting protein 1.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	B	10	Total	C	N	O	0	0	0
			84	55	15	14			

- Molecule 3 is 2,6-DIHYDROANTHRA/1,9-CD/PYRAZOL-6-ONE (CCD ID: 537) (formula: C₁₄H₈N₂O).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			17	14	2	1		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	15	Total	O	0	0
			15	15		

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	61.70Å 79.46Å 82.86Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.96 – 2.70 19.96 – 2.70	Depositor EDS
% Data completeness (in resolution range)	(Not available) (19.96-2.70) 90.1 (19.96-2.70)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.25 (at 2.71Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.216 , 0.241 0.218 , 0.222	Depositor DCC
R_{free} test set	552 reflections (5.23%)	wwPDB-VP
Wilson B-factor (Å ²)	48.0	Xtriage
Anisotropy	0.303	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.27 , 50.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.43$, $\langle L^2 \rangle = 0.26$	Xtriage
Estimated twinning fraction	0.045 for -h,l,k	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	2763	wwPDB-VP
Average B, all atoms (Å ²)	48.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.65% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 537

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	0.55	0/2704	1.01	18/3652 (0.5%)
2	B	0.62	0/86	1.12	0/114
All	All	0.55	0/2790	1.01	18/3766 (0.5%)

There are no bond length outliers.

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	32	ILE	N-CA-C	-9.54	104.65	113.71
1	A	170	PHE	N-CA-C	-8.71	100.46	112.30
1	A	362	ASP	N-CA-C	-6.83	104.82	113.01
1	A	225	PHE	CA-C-N	6.67	128.18	119.84
1	A	225	PHE	C-N-CA	6.67	128.18	119.84
1	A	149	HIS	N-CA-C	6.11	117.81	111.03
1	A	293	GLN	N-CA-C	-5.89	104.94	111.36
1	A	49	GLU	N-CA-C	-5.76	104.17	110.91
1	A	112	ASP	N-CA-C	5.60	117.46	111.36
1	A	334	PRO	CA-C-N	5.58	126.82	119.84
1	A	334	PRO	C-N-CA	5.58	126.82	119.84
1	A	326	ASP	CA-C-N	5.50	125.59	119.32
1	A	326	ASP	C-N-CA	5.50	125.59	119.32
1	A	81	ASN	N-CA-C	5.43	117.06	107.61
1	A	232	ASP	N-CA-C	-5.23	106.00	112.38
1	A	238	ILE	N-CA-C	-5.14	105.59	110.42
1	A	168	LEU	N-CA-C	5.08	117.79	111.24
1	A	292	SER	N-CA-C	-5.06	107.28	113.50

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	2647	0	2683	277	0
2	B	84	0	91	7	0
3	A	17	0	8	1	0
4	A	15	0	0	1	0
All	All	2763	0	2782	280	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 51.

All (280) 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:258:THR:HG22	1:A:262:ASN:HD21	1.15	1.06
1:A:190:TYR:HA	1:A:233:GLN:HE22	1.24	0.99
1:A:120:GLN:HB2	1:A:121:MET:HE2	1.44	0.98
1:A:51:ASN:HB3	1:A:110:LEU:HD23	1.48	0.95
1:A:91:VAL:HG22	1:A:360:VAL:HG13	1.49	0.95
1:A:40:VAL:HG22	1:A:55:LYS:HB2	1.53	0.91
1:A:119:ILE:HG23	1:A:218:MET:HA	1.53	0.90
1:A:258:THR:HG22	1:A:262:ASN:ND2	1.87	0.88
1:A:238:ILE:HD12	1:A:244:PRO:HD3	1.56	0.86
1:A:128:MET:HG3	1:A:218:MET:HE3	1.56	0.85
1:A:132:LEU:HD13	1:A:215:MET:HE2	1.58	0.84
1:A:253:GLN:HG2	1:A:254:PRO:HD2	1.58	0.84
1:A:11:TYR:HE2	1:A:13:VAL:HG13	1.43	0.83
1:A:336:LYS:HA	1:A:336:LYS:NZ	1.94	0.81
1:A:234:TRP:CZ2	1:A:238:ILE:HD11	2.16	0.80
1:A:72:ARG:HG2	1:A:76:LEU:HD11	1.62	0.79
1:A:249:MET:HE1	1:A:260:VAL:HG12	1.65	0.79
2:B:162:LEU:H	2:B:162:LEU:HD22	1.47	0.79
1:A:120:GLN:HB2	1:A:121:MET:CE	2.12	0.78
1:A:233:GLN:O	1:A:237:VAL:HG23	1.84	0.78
1:A:351:GLU:O	1:A:355:LEU:HG	1.85	0.77
1:A:86:ILE:HG21	1:A:168:LEU:O	1.86	0.76
1:A:205:ASN:ND2	1:A:309:ARG:HB3	2.01	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:9:ASN:O	1:A:24:LYS:HG3	1.88	0.74
1:A:55:LYS:HE2	1:A:57:LEU:HD21	1.70	0.74
1:A:205:ASN:HD21	1:A:309:ARG:HB3	1.52	0.73
1:A:128:MET:CG	1:A:218:MET:HE3	2.19	0.73
1:A:150:ARG:HH12	1:A:174:ARG:HD2	1.53	0.72
1:A:208:ILE:HG23	1:A:301:MET:HG3	1.69	0.72
1:A:288:LYS:HD2	1:A:288:LYS:N	2.06	0.71
1:A:257:ARG:HG2	1:A:261:GLU:OE2	1.91	0.71
1:A:258:THR:CG2	1:A:262:ASN:HD21	1.97	0.70
1:A:13:VAL:HG21	1:A:29:LEU:HD22	1.74	0.70
1:A:244:PRO:HB3	1:A:248:PHE:HD2	1.56	0.70
1:A:145:ALA:O	1:A:147:ILE:HG13	1.93	0.69
1:A:114:ASN:HB2	1:A:154:PRO:O	1.92	0.69
1:A:128:MET:SD	1:A:218:MET:HE3	2.33	0.68
1:A:310:ILE:HG12	1:A:311:SER:N	2.09	0.68
1:A:127:ARG:NH1	2:B:159:THR:HG23	2.09	0.68
1:A:106:ILE:CG2	1:A:108:MET:HE2	2.24	0.67
1:A:115:LEU:HB3	1:A:119:ILE:HD13	1.75	0.67
1:A:127:ARG:HH12	2:B:159:THR:HG23	1.59	0.67
1:A:259:TYR:CE2	1:A:263:ARG:HD2	2.30	0.67
1:A:89:LEU:HB2	1:A:107:VAL:HG12	1.77	0.66
1:A:150:ARG:HH22	1:A:174:ARG:HG3	1.60	0.66
1:A:55:LYS:HE2	1:A:57:LEU:CD2	2.25	0.65
1:A:61:PHE:CZ	1:A:102:GLN:HA	2.31	0.65
1:A:208:ILE:CG2	1:A:301:MET:HG3	2.25	0.65
1:A:114:ASN:OD1	1:A:116:CYS:HB2	1.97	0.65
1:A:198:LEU:HD22	1:A:256:VAL:HG11	1.78	0.65
2:B:162:LEU:HD22	2:B:162:LEU:N	2.10	0.65
1:A:214:ILE:O	1:A:218:MET:HB2	1.96	0.65
1:A:101:PHE:CE2	1:A:357:TYR:HB2	2.32	0.65
1:A:47:ILE:HG22	1:A:47:ILE:O	1.96	0.65
1:A:213:CYS:HA	1:A:224:LEU:HD12	1.80	0.63
1:A:120:GLN:HE21	1:A:120:GLN:HA	1.62	0.63
1:A:150:ARG:HH21	1:A:173:ALA:N	1.97	0.63
1:A:11:TYR:CE2	1:A:13:VAL:HG13	2.30	0.63
1:A:140:LYS:HB2	1:A:312:VAL:HG11	1.79	0.63
1:A:57:LEU:HB2	1:A:60:PRO:HG3	1.81	0.63
1:A:336:LYS:HA	1:A:336:LYS:HZ2	1.63	0.63
1:A:111:MET:HE2	1:A:166:LYS:HD2	1.81	0.63
1:A:348:THR:HG22	1:A:351:GLU:HG3	1.80	0.63
1:A:219:ILE:HD13	1:A:280:PHE:CE1	2.34	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:157:ILE:HG22	1:A:165:LEU:HD21	1.81	0.62
1:A:336:LYS:HA	1:A:336:LYS:HZ3	1.62	0.62
1:A:79:CYS:O	1:A:335:PRO:HB3	1.99	0.61
1:A:128:MET:HG3	1:A:218:MET:CE	2.28	0.61
1:A:95:GLN:CB	1:A:101:PHE:HA	2.30	0.61
1:A:91:VAL:CG2	1:A:360:VAL:HG13	2.27	0.61
1:A:78:LYS:NZ	1:A:362:ASP:HB2	2.16	0.61
1:A:199:GLY:C	1:A:200:MET:HG3	2.24	0.61
1:A:190:TYR:HB3	1:A:225:PHE:O	2.00	0.61
1:A:249:MET:O	1:A:252:LEU:HD13	2.01	0.60
1:A:153:LYS:O	1:A:156:ASN:ND2	2.35	0.60
1:A:14:GLU:OE2	1:A:19:THR:HG23	2.01	0.60
1:A:153:LYS:HG3	1:A:155:SER:HB3	1.82	0.60
1:A:159:VAL:CG1	1:A:165:LEU:HD23	2.32	0.59
1:A:135:MET:HG2	1:A:165:LEU:HD11	1.85	0.59
1:A:356:ILE:O	1:A:359:GLU:HB2	2.01	0.59
1:A:318:HIS:CG	1:A:319:PRO:HD2	2.38	0.59
1:A:349:ILE:HD13	1:A:349:ILE:C	2.28	0.58
1:A:289:LEU:HD23	1:A:289:LEU:H	1.68	0.58
1:A:114:ASN:HA	1:A:158:VAL:HA	1.85	0.58
1:A:88:LEU:HD12	1:A:107:VAL:O	2.04	0.58
1:A:143:HIS:HE1	1:A:207:ASP:OD2	1.85	0.58
1:A:336:LYS:HG3	1:A:337:ILE:H	1.69	0.57
1:A:37:GLN:HG3	1:A:69:ARG:HD2	1.87	0.56
1:A:249:MET:HA	1:A:252:LEU:HD13	1.87	0.56
1:A:324:TRP:CE3	2:B:156:ARG:HG2	2.40	0.56
1:A:311:SER:HB2	1:A:314:GLU:OE1	2.04	0.56
1:A:215:MET:O	1:A:218:MET:HB3	2.05	0.56
1:A:117:GLN:O	1:A:121:MET:HE3	2.06	0.56
1:A:247:GLU:HG3	1:A:248:PHE:N	2.21	0.55
1:A:25:ARG:NH2	1:A:47:ILE:HB	2.20	0.55
1:A:215:MET:HA	1:A:218:MET:HE2	1.88	0.55
1:A:11:TYR:HD1	1:A:24:LYS:HA	1.72	0.55
1:A:189:ARG:HE	1:A:192:ARG:HH11	1.54	0.55
2:B:162:LEU:H	2:B:162:LEU:CD2	2.17	0.55
1:A:287:ASN:HD22	1:A:288:LYS:NZ	2.05	0.55
1:A:157:ILE:CG2	1:A:165:LEU:HD21	2.36	0.54
1:A:61:PHE:HZ	1:A:102:GLN:HA	1.70	0.54
1:A:111:MET:O	3:A:0:537:HC2	2.06	0.54
1:A:61:PHE:O	1:A:62:GLN:HB2	2.06	0.54
1:A:216:GLY:C	1:A:218:MET:H	2.15	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:209:TRP:HH2	1:A:241:LEU:CD1	2.21	0.54
1:A:232:ASP:OD2	1:A:236:LYS:HE2	2.07	0.54
1:A:115:LEU:HA	1:A:118:VAL:HG12	1.90	0.54
1:A:244:PRO:HB3	1:A:248:PHE:CD2	2.41	0.54
1:A:86:ILE:HG22	1:A:167:ILE:O	2.08	0.54
1:A:204:GLU:C	1:A:206:VAL:H	2.15	0.54
1:A:59:ARG:HG3	1:A:102:GLN:O	2.08	0.54
1:A:15:ILE:C	1:A:15:ILE:HD12	2.33	0.53
1:A:227:GLY:HA2	1:A:236:LYS:HE2	1.90	0.53
1:A:310:ILE:HG12	1:A:311:SER:H	1.74	0.53
1:A:357:TYR:O	1:A:361:MET:HG2	2.07	0.53
1:A:150:ARG:NH2	1:A:173:ALA:C	2.67	0.53
1:A:23:LEU:HB3	1:A:25:ARG:HG2	1.91	0.52
1:A:83:LYS:C	1:A:166:LYS:HZ3	2.17	0.52
1:A:215:MET:O	1:A:219:ILE:HG13	2.09	0.52
1:A:348:THR:HG22	1:A:351:GLU:CG	2.40	0.52
1:A:131:LEU:HD23	1:A:134:GLN:NE2	2.24	0.52
1:A:72:ARG:HG2	1:A:76:LEU:CD1	2.34	0.51
1:A:216:GLY:C	1:A:218:MET:N	2.68	0.51
1:A:98:LEU:HD23	1:A:357:TYR:CD1	2.45	0.51
1:A:40:VAL:HG22	1:A:55:LYS:CB	2.32	0.51
1:A:61:PHE:CZ	1:A:353:LYS:HG3	2.46	0.51
1:A:101:PHE:O	1:A:353:LYS:HE3	2.10	0.51
1:A:143:HIS:C	1:A:145:ALA:H	2.18	0.51
1:A:25:ARG:HH21	1:A:47:ILE:HB	1.76	0.51
1:A:106:ILE:HG22	1:A:108:MET:HE2	1.91	0.51
1:A:132:LEU:CD1	1:A:215:MET:HE2	2.35	0.51
1:A:318:HIS:CD2	1:A:320:TYR:H	2.29	0.51
1:A:76:LEU:HD22	1:A:147:ILE:HD11	1.92	0.50
1:A:238:ILE:HG23	1:A:243:THR:HA	1.93	0.50
1:A:86:ILE:HG23	1:A:86:ILE:O	2.12	0.50
1:A:227:GLY:HA2	1:A:232:ASP:OD2	2.11	0.50
1:A:99:GLU:HA	1:A:99:GLU:OE1	2.12	0.50
1:A:112:ASP:O	1:A:113:ALA:HB2	2.11	0.50
1:A:287:ASN:HD22	1:A:288:LYS:HZ1	1.59	0.50
1:A:159:VAL:HG12	1:A:165:LEU:HD23	1.94	0.49
1:A:98:LEU:O	1:A:353:LYS:HE2	2.12	0.49
1:A:348:THR:HG23	1:A:351:GLU:H	1.75	0.49
1:A:58:SER:O	1:A:59:ARG:C	2.56	0.49
1:A:113:ALA:O	1:A:159:VAL:HG22	2.11	0.49
1:A:117:GLN:O	1:A:118:VAL:C	2.55	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:249:MET:SD	1:A:260:VAL:HG11	2.53	0.49
1:A:209:TRP:HZ3	1:A:303:VAL:N	2.10	0.49
1:A:219:ILE:O	1:A:279:LEU:HD22	2.13	0.48
1:A:206:VAL:HG13	1:A:207:ASP:N	2.28	0.48
1:A:318:HIS:HD2	1:A:320:TYR:H	1.59	0.48
1:A:9:ASN:C	1:A:9:ASN:HD22	2.19	0.48
1:A:141:HIS:NE2	1:A:335:PRO:HG3	2.29	0.48
1:A:156:ASN:C	1:A:156:ASN:HD22	2.22	0.48
1:A:216:GLY:HA3	1:A:224:LEU:HD11	1.95	0.48
1:A:234:TRP:CH2	1:A:238:ILE:HD11	2.49	0.48
1:A:120:GLN:HA	1:A:120:GLN:NE2	2.29	0.48
1:A:129:SER:HB3	1:A:320:TYR:CZ	2.49	0.48
1:A:247:GLU:HG3	1:A:248:PHE:H	1.77	0.48
1:A:216:GLY:O	1:A:219:ILE:N	2.45	0.47
1:A:298:LEU:C	1:A:300:LYS:H	2.22	0.47
1:A:361:MET:O	1:A:363:LEU:HD22	2.14	0.47
1:A:11:TYR:CD1	1:A:24:LYS:HA	2.49	0.47
1:A:83:LYS:O	1:A:166:LYS:NZ	2.39	0.47
1:A:136:LEU:HD21	1:A:315:ALA:HB1	1.97	0.47
1:A:150:ARG:HD3	1:A:202:TYR:CE1	2.50	0.47
1:A:217:GLU:HG2	1:A:223:VAL:HA	1.96	0.47
1:A:235:ASN:HD21	1:A:263:ARG:HE	1.62	0.47
1:A:266:TYR:C	1:A:268:GLY:H	2.23	0.47
1:A:15:ILE:HD11	1:A:39:ILE:HG21	1.96	0.47
1:A:149:HIS:O	1:A:150:ARG:HB2	2.14	0.47
1:A:160:LYS:HB3	1:A:162:ASP:OD1	2.14	0.47
1:A:165:LEU:HD13	1:A:166:LYS:N	2.30	0.47
1:A:232:ASP:O	1:A:236:LYS:HG3	2.14	0.47
1:A:101:PHE:CD2	1:A:357:TYR:HB2	2.50	0.47
1:A:239:GLU:O	1:A:268:GLY:HA2	2.14	0.47
1:A:143:HIS:CE1	1:A:207:ASP:OD2	2.67	0.47
1:A:275:PHE:CE2	1:A:298:LEU:HD13	2.50	0.47
1:A:121:MET:HB2	4:A:384:HOH:O	2.15	0.46
1:A:152:LEU:HD12	1:A:207:ASP:HB3	1.97	0.46
1:A:193:ALA:HB2	1:A:209:TRP:HB3	1.98	0.46
1:A:356:ILE:N	1:A:356:ILE:HD13	2.29	0.46
1:A:57:LEU:CB	1:A:60:PRO:HG3	2.45	0.46
1:A:97:SER:O	1:A:101:PHE:HB2	2.16	0.46
1:A:301:MET:HE3	1:A:301:MET:HB2	1.86	0.46
1:A:45:ASP:HB2	1:A:52:VAL:HG11	1.98	0.46
1:A:48:LEU:HB3	1:A:50:ARG:HG2	1.96	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:58:SER:HA	1:A:103:ASP:OD2	2.16	0.46
1:A:131:LEU:HD23	1:A:131:LEU:HA	1.76	0.46
1:A:143:HIS:C	1:A:145:ALA:N	2.73	0.46
1:A:11:TYR:HE1	1:A:26:TYR:O	1.99	0.45
1:A:82:HIS:CD2	1:A:84:ASN:H	2.34	0.45
1:A:95:GLN:HG2	1:A:101:PHE:HA	1.98	0.45
1:A:290:LYS:HD3	1:A:293:GLN:OE1	2.16	0.45
1:A:303:VAL:HG11	1:A:308:LYS:HB2	1.97	0.45
1:A:170:PHE:N	1:A:170:PHE:CD1	2.84	0.45
1:A:160:LYS:HB3	1:A:164:THR:OG1	2.15	0.45
1:A:352:TRP:O	1:A:353:LYS:C	2.60	0.45
1:A:263:ARG:HG2	1:A:263:ARG:HH11	1.82	0.45
1:A:326:ASP:HB3	1:A:329:GLU:OE1	2.15	0.45
1:A:259:TYR:O	1:A:263:ARG:HG3	2.16	0.45
1:A:326:ASP:HA	1:A:327:PRO:HD2	1.79	0.45
1:A:129:SER:HA	1:A:132:LEU:HD12	1.98	0.45
1:A:352:TRP:O	1:A:355:LEU:N	2.50	0.45
1:A:231:ILE:C	1:A:233:GLN:N	2.74	0.45
1:A:271:PHE:CZ	1:A:299:SER:HA	2.52	0.45
1:A:324:TRP:CZ3	2:B:156:ARG:HG2	2.52	0.45
1:A:82:HIS:HD2	1:A:84:ASN:HB2	1.82	0.44
1:A:209:TRP:HZ3	1:A:303:VAL:C	2.25	0.44
1:A:337:ILE:HG23	1:A:337:ILE:O	2.17	0.44
1:A:54:ILE:HG12	1:A:107:VAL:HG22	1.99	0.44
1:A:89:LEU:O	1:A:90:ASN:HB2	2.17	0.44
1:A:95:GLN:HB3	1:A:101:PHE:HA	1.98	0.44
1:A:119:ILE:HG13	1:A:218:MET:HG3	1.99	0.44
1:A:71:TYR:HB2	1:A:356:ILE:HD11	2.00	0.44
1:A:361:MET:C	1:A:363:LEU:N	2.76	0.44
1:A:133:TYR:CE1	1:A:325:TYR:HA	2.52	0.44
1:A:48:LEU:CB	1:A:50:ARG:HG2	2.48	0.44
1:A:125:HIS:CD2	1:A:290:LYS:HB3	2.53	0.44
1:A:190:TYR:HA	1:A:233:GLN:NE2	2.09	0.44
1:A:280:PHE:HB3	1:A:281:PRO:HD2	2.00	0.44
1:A:106:ILE:HG21	1:A:108:MET:HE2	1.97	0.43
1:A:141:HIS:HE2	1:A:335:PRO:HG3	1.83	0.43
1:A:246:PRO:O	1:A:247:GLU:C	2.58	0.43
1:A:211:VAL:O	1:A:212:GLY:C	2.58	0.43
1:A:219:ILE:HD13	1:A:280:PHE:HE1	1.80	0.43
1:A:301:MET:HA	1:A:310:ILE:HG22	2.00	0.43
1:A:297:LEU:HG	1:A:301:MET:HE3	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:234:TRP:HE1	1:A:260:VAL:HG22	1.82	0.43
1:A:270:SER:OG	1:A:273:LYS:HG3	2.18	0.43
1:A:300:LYS:O	1:A:310:ILE:HG22	2.19	0.43
1:A:219:ILE:HD13	1:A:280:PHE:CZ	2.54	0.43
1:A:219:ILE:HG22	1:A:279:LEU:HB3	2.00	0.43
1:A:128:MET:O	1:A:129:SER:C	2.61	0.43
1:A:238:ILE:O	1:A:239:GLU:C	2.61	0.43
1:A:15:ILE:HG13	1:A:15:ILE:O	2.18	0.43
1:A:143:HIS:HA	1:A:147:ILE:O	2.18	0.42
1:A:222:GLY:O	1:A:223:VAL:C	2.62	0.42
1:A:250:LYS:C	1:A:252:LEU:N	2.77	0.42
1:A:361:MET:C	1:A:363:LEU:H	2.26	0.42
1:A:213:CYS:O	1:A:214:ILE:C	2.62	0.42
1:A:145:ALA:HB2	1:A:335:PRO:HD2	2.00	0.42
1:A:9:ASN:C	1:A:9:ASN:ND2	2.78	0.42
1:A:47:ILE:O	1:A:48:LEU:HG	2.20	0.42
1:A:119:ILE:HG21	1:A:217:GLU:OE1	2.19	0.42
1:A:162:ASP:OD1	1:A:164:THR:OG1	2.32	0.42
1:A:336:LYS:HG3	1:A:337:ILE:N	2.32	0.42
1:A:349:ILE:HG23	1:A:350:GLU:N	2.34	0.42
1:A:90:ASN:O	1:A:107:VAL:N	2.40	0.42
1:A:115:LEU:HB3	1:A:119:ILE:CD1	2.46	0.42
1:A:253:GLN:CG	1:A:254:PRO:HD2	2.41	0.42
1:A:29:LEU:HD12	1:A:29:LEU:N	2.35	0.41
1:A:130:TYR:O	1:A:131:LEU:C	2.63	0.41
1:A:131:LEU:O	1:A:135:MET:HG3	2.19	0.41
1:A:71:TYR:HD1	1:A:356:ILE:HD13	1.85	0.41
1:A:335:PRO:O	1:A:336:LYS:HB2	2.20	0.41
1:A:117:GLN:O	1:A:119:ILE:N	2.52	0.41
1:A:97:SER:HA	1:A:357:TYR:OH	2.20	0.41
1:A:271:PHE:O	1:A:295:ARG:HD2	2.20	0.41
1:A:48:LEU:HD13	1:A:50:ARG:HD3	2.02	0.41
1:A:310:ILE:CG1	1:A:311:SER:N	2.83	0.41
1:A:348:THR:CG2	1:A:351:GLU:HG3	2.49	0.41
1:A:97:SER:O	1:A:101:PHE:N	2.52	0.41
1:A:136:LEU:O	1:A:140:LYS:HB2	2.20	0.41
1:A:263:ARG:HG2	1:A:263:ARG:NH1	2.35	0.41
1:A:63:ASN:O	1:A:64:GLN:C	2.62	0.41
1:A:209:TRP:CZ3	1:A:303:VAL:N	2.89	0.41
1:A:72:ARG:O	1:A:76:LEU:HG	2.19	0.41
1:A:84:ASN:HD22	1:A:137:CYS:HB3	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:117:GLN:O	1:A:120:GLN:N	2.53	0.41
1:A:275:PHE:CD2	1:A:298:LEU:HD13	2.55	0.41
1:A:188:THR:O	1:A:189:ARG:HB2	2.21	0.41
1:A:15:ILE:O	1:A:15:ILE:CG1	2.69	0.40
1:A:133:TYR:HB2	1:A:321:ILE:HG23	2.03	0.40
1:A:318:HIS:O	1:A:322:ASN:HB2	2.20	0.40
1:A:61:PHE:CE2	1:A:353:LYS:HG3	2.56	0.40
1:A:243:THR:HG23	1:A:266:TYR:O	2.21	0.40
1:A:30:LYS:HD2	1:A:30:LYS:C	2.47	0.40
1:A:318:HIS:HD2	1:A:320:TYR:HB3	1.87	0.40
1:A:348:THR:HG22	1:A:351:GLU:OE2	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	320/369 (87%)	245 (77%)	58 (18%)	17 (5%)	1	3
2	B	8/11 (73%)	8 (100%)	0	0	100	100
All	All	328/380 (86%)	253 (77%)	58 (18%)	17 (5%)	1	3

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	62	GLN
1	A	121	MET
1	A	189	ARG
1	A	226	PRO
1	A	173	ALA
1	A	335	PRO
1	A	48	LEU

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Mol	Chain	Res	Type
1	A	246	PRO
1	A	65	THR
1	A	86	ILE
1	A	99	GLU
1	A	102	GLN
1	A	205	ASN
1	A	223	VAL
1	A	325	TYR
1	A	330	ALA
1	A	118	VAL

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	293/331 (88%)	269 (92%)	24 (8%)	10	27
2	B	10/11 (91%)	7 (70%)	3 (30%)	0	1
All	All	303/342 (89%)	276 (91%)	27 (9%)	9	23

All (27) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	13	VAL
1	A	15	ILE
1	A	19	THR
1	A	24	LYS
1	A	30	LYS
1	A	68	LYS
1	A	91	VAL
1	A	98	LEU
1	A	100	GLU
1	A	120	GLN
1	A	121	MET
1	A	156	ASN
1	A	195	GLU

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Mol	Chain	Res	Type
1	A	204	GLU
1	A	235	ASN
1	A	246	PRO
1	A	247	GLU
1	A	250	LYS
1	A	272	GLU
1	A	288	LYS
1	A	331	GLU
1	A	336	LYS
1	A	349	ILE
1	A	363	LEU
2	B	158	THR
2	B	159	THR
2	B	162	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	9	ASN
1	A	27	GLN
1	A	28	ASN
1	A	51	ASN
1	A	62	GLN
1	A	82	HIS
1	A	84	ASN
1	A	90	ASN
1	A	120	GLN
1	A	125	HIS
1	A	143	HIS
1	A	156	ASN
1	A	233	GLN
1	A	235	ASN
1	A	262	ASN
1	A	287	ASN
1	A	318	HIS
1	A	322	ASN
2	B	161	ASN

5.3.3 RNA ⓘ

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](#)

1 ligand is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
3	537	A	0	-	20,20,20	2.90	15 (75%)	27,30,30	1.34	4 (14%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	537	A	0	-	-	-	0/4/4/4

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	0	537	C21-N23	4.38	1.37	1.33
3	A	0	537	O22-C20	4.23	1.30	1.22
3	A	0	537	C14-C15	4.16	1.46	1.38
3	A	0	537	C14-C13	4.14	1.46	1.38
3	A	0	537	C11-C12	-4.11	1.35	1.41
3	A	0	537	C4-C3	4.04	1.47	1.40
3	A	0	537	C11-C21	-2.99	1.36	1.44
3	A	0	537	C15-C16	2.96	1.44	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	0	537	C5-C4	2.85	1.44	1.39
3	A	0	537	C1-C2	2.85	1.43	1.38
3	A	0	537	C6-C5	2.65	1.43	1.38
3	A	0	537	C16-C20	-2.35	1.43	1.48
3	A	0	537	C3-C21	-2.24	1.42	1.47
3	A	0	537	C6-C1	2.19	1.43	1.38
3	A	0	537	C13-C12	2.11	1.43	1.39

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	0	537	C15-C16-C20	4.26	125.91	119.26
3	A	0	537	C11-C16-C20	-2.83	117.05	120.69
3	A	0	537	C15-C16-C11	-2.21	117.04	120.16
3	A	0	537	C12-N24-N23	-2.19	110.28	111.90

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	0	537	1	0

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	328/369 (88%)	-0.17	1 (0%) 90 89	26, 47, 71, 83	0
2	B	10/11 (90%)	-0.22	0 100 100	42, 47, 55, 57	0
All	All	338/380 (88%)	-0.17	1 (0%) 90 89	26, 47, 71, 83	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	337	ILE	2.2

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](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	537	A	0	17/17	0.92	0.08	37,41,43,44	0

6.5 Other polymers [i](#)

There are no such residues in this entry.