Full wwPDB X-ray Structure Validation Report (i)

Jul 31, 2023 – 04:25 AM EDT

PDB ID	:	1XGO
Title	:	METHIONINE AMINOPEPTIDASE FROM HYPERTHERMOPHILE PY-ROCOCCUS FURIOSUS
Authors	:	Tahirov, T.H.; Tsukihara, T.
Deposited on	:	1997-11-18
Resolution	:	3.50 Å(reported)

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

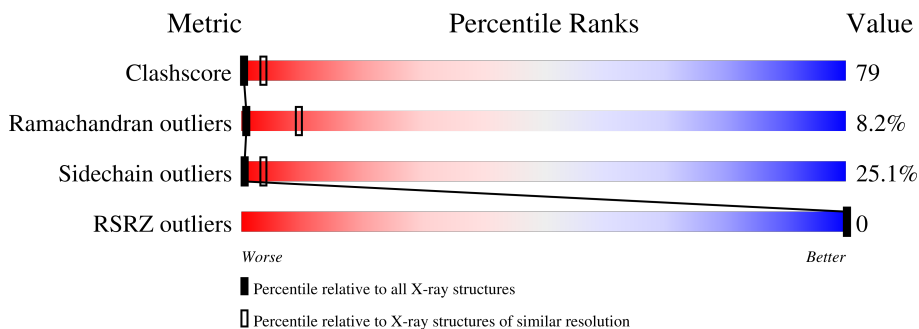|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.34
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.34

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.50 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		79
Ramachandran outliers		8.2%
Sidechain outliers		25.1%
RSRZ outliers		0

Worse   *Better*

▌ Percentile relative to all X-ray structures
⧠ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	1036 (3.58-3.42)
Ramachandran outliers	138981	1005 (3.58-3.42)
Sidechain outliers	138945	1006 (3.58-3.42)
RSRZ outliers	127900	1559 (3.60-3.40)

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	295	15% 60% 22% •

2 Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 2312 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.

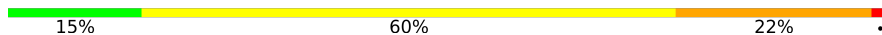- Molecule 1 is a protein called METHIONINE AMINOPEPTIDASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	295	Total	C	N	O	S	0	0	0
			2312	1490	390	423	9			

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 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: METHIONINE AMINOPEPTIDASE

Chain A:

15%   60%   22%   •
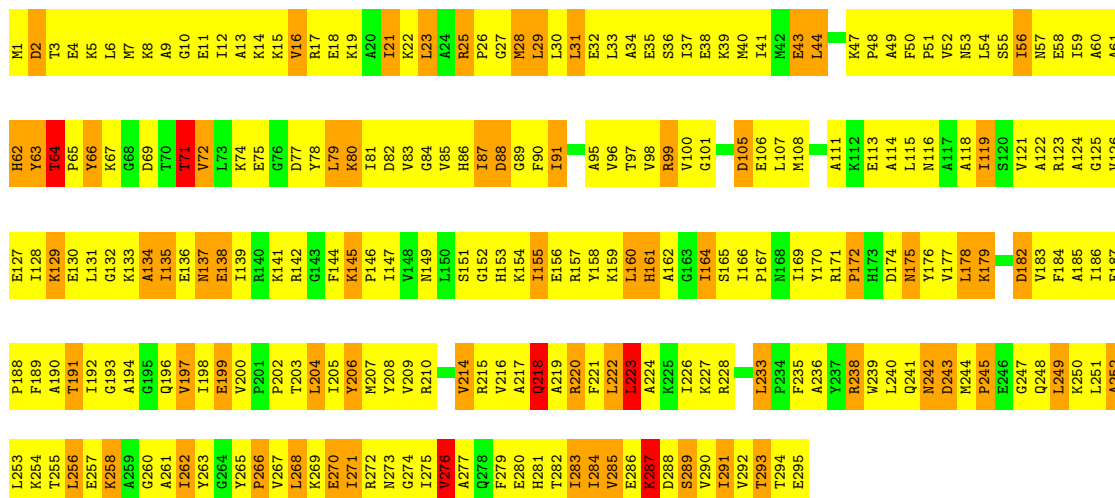
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 62	Depositor
Cell constants a, b, c, α, β, γ	138.92Å 138.92Å 63.91Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	15.00 – 3.50 47.03 – 3.51	Depositor EDS
% Data completeness (in resolution range)	80.3 (15.00-3.50) 84.4 (47.03-3.51)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.41 (at 3.48Å)	Xtriage
Refinement program	X-PLOR 3.1	Depositor
R, R_{free}	0.182 , 0.274 0.195 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å^2)	59.2	Xtriage
Anisotropy	0.396	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.27 , 165.1	EDS
L-test for twinning[2]	$< |L| > = 0.33, < L^2 > = 0.16$	Xtriage
Estimated twinning fraction	0.189 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	2312	wwPDB-VP
Average B, all atoms (Å^2)	31.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.76% 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 (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	0.77	0/2353	1.03	4/3176 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	223	LEU	CA-CB-CG	6.09	129.30	115.30
1	A	99	ARG	N-CA-C	-5.69	95.63	111.00
1	A	64	THR	N-CA-C	-5.27	96.77	111.00
1	A	87	ILE	N-CA-C	-5.16	97.08	111.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	78	TYR	Sidechain

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2312	0	2407	374	0
All	All	2312	0	2407	374	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 79.

All (374) 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:60:ALA:HB2	1:A:197:VAL:HG21	1.36	1.05
1:A:285:VAL:HA	1:A:290:VAL:HG12	1.37	1.02
1:A:244:MET:HB2	1:A:245:PRO:HD2	1.46	0.98
1:A:34:ALA:HA	1:A:37:ILE:HD12	1.47	0.96
1:A:123:ARG:HH12	1:A:288:ASP:HA	1.36	0.91
1:A:7:MET:HA	1:A:293:THR:HG22	1.52	0.89
1:A:145:LYS:HB3	1:A:191:THR:HG23	1.57	0.87
1:A:60:ALA:HB3	1:A:268:LEU:HB2	1.55	0.87
1:A:203:THR:HG22	1:A:266:PRO:HA	1.58	0.86
1:A:18:GLU:HA	1:A:21:ILE:HD12	1.54	0.85
1:A:198:ILE:O	1:A:268:LEU:HA	1.77	0.84
1:A:199:GLU:HG3	1:A:266:PRO:HG2	1.59	0.83
1:A:27:GLY:H	1:A:72:VAL:HG13	1.39	0.83
1:A:153:HIS:HB3	1:A:161:HIS:NE2	1.93	0.83
1:A:208:TYR:HA	1:A:262:ILE:HG22	1.61	0.82
1:A:115:LEU:HD21	1:A:281:HIS:HD2	1.45	0.80
1:A:30:LEU:HA	1:A:33:LEU:HD13	1.63	0.80
1:A:44:LEU:H	1:A:44:LEU:HD22	1.48	0.79
1:A:196:GLN:HB2	1:A:271:ILE:HD13	1.65	0.79
1:A:55:SER:O	1:A:80:LYS:HB2	1.83	0.78
1:A:123:ARG:NH1	1:A:288:ASP:HA	1.98	0.77
1:A:253:LEU:HA	1:A:256:LEU:HB2	1.66	0.77
1:A:270:GLU:HG3	1:A:274:GLY:O	1.84	0.77
1:A:91:ILE:HD12	1:A:91:ILE:H	1.50	0.77
1:A:33:LEU:HD23	1:A:37:ILE:HD11	1.66	0.76
1:A:80:LYS:HE3	1:A:276:VAL:HB	1.65	0.76
1:A:58:GLU:HB2	1:A:273:ASN:HA	1.65	0.76
1:A:39:LYS:HD2	1:A:39:LYS:N	2.02	0.75
1:A:254:LYS:O	1:A:257:GLU:HB3	1.86	0.75
1:A:153:HIS:HB3	1:A:161:HIS:CE1	2.22	0.75
1:A:95:ALA:HB3	1:A:280:GLU:HB3	1.69	0.75
1:A:50:PHE:CZ	1:A:84:GLY:HA3	2.22	0.75
1:A:56:ILE:HD13	1:A:59:ILE:HD11	1.68	0.75

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:77:ASP:O	1:A:100:VAL:HG23	1.87	0.75
1:A:203:THR:HG22	1:A:266:PRO:CA	2.16	0.74
1:A:223:LEU:HB3	1:A:256:LEU:HD21	1.69	0.74
1:A:57:ASN:O	1:A:275:ILE:HA	1.89	0.73
1:A:16:VAL:HG21	1:A:41:ILE:HD11	1.70	0.73
1:A:284:ILE:HD11	1:A:291:ILE:CG1	2.19	0.73
1:A:113:GLU:O	1:A:116:ASN:HB2	1.88	0.72
1:A:63:TYR:HA	1:A:204:LEU:HD21	1.72	0.72
1:A:138:GLU:HA	1:A:141:LYS:HE2	1.71	0.72
1:A:33:LEU:O	1:A:36:SER:HB2	1.90	0.71
1:A:128:ILE:HD11	1:A:176:TYR:HD1	1.55	0.71
1:A:54:LEU:HA	1:A:80:LYS:O	1.92	0.70
1:A:96:VAL:HA	1:A:279:PHE:CE1	2.26	0.70
1:A:166:ILE:HD11	1:A:184:PHE:HB3	1.74	0.69
1:A:177:VAL:HB	1:A:179:LYS:NZ	2.07	0.69
1:A:91:ILE:HD11	1:A:156:GLU:O	1.93	0.69
1:A:177:VAL:HB	1:A:179:LYS:HZ3	1.57	0.69
1:A:86:HIS:HD2	1:A:89:GLY:H	1.38	0.69
1:A:197:VAL:HG13	1:A:268:LEU:HB3	1.75	0.68
1:A:184:PHE:O	1:A:283:ILE:HD13	1.94	0.68
1:A:89:GLY:HA3	1:A:157:ARG:HG2	1.76	0.68
1:A:128:ILE:HB	1:A:174:ASP:HB3	1.76	0.68
1:A:30:LEU:O	1:A:33:LEU:HB3	1.94	0.67
1:A:131:LEU:O	1:A:135:ILE:HG13	1.94	0.67
1:A:96:VAL:HG13	1:A:279:PHE:CE1	2.30	0.66
1:A:29:LEU:H	1:A:29:LEU:HD23	1.60	0.66
1:A:286:GLU:HG3	1:A:289:SER:O	1.96	0.66
1:A:44:LEU:N	1:A:44:LEU:HD13	2.11	0.66
1:A:155:ILE:HD13	1:A:155:ILE:N	2.10	0.66
1:A:209:VAL:HG22	1:A:261:ALA:C	2.16	0.66
1:A:56:ILE:O	1:A:59:ILE:HG12	1.95	0.66
1:A:145:LYS:HD3	1:A:146:PRO:HD2	1.77	0.66
1:A:19:LYS:HD3	1:A:40:MET:SD	2.37	0.65
1:A:191:THR:HA	1:A:275:ILE:O	1.97	0.65
1:A:128:ILE:HD11	1:A:176:TYR:CD1	2.32	0.64
1:A:154:LYS:HA	1:A:184:PHE:CD1	2.31	0.64
1:A:124:ALA:HB2	1:A:285:VAL:HB	1.79	0.64
1:A:60:ALA:HB3	1:A:268:LEU:CB	2.28	0.64
1:A:60:ALA:HB2	1:A:197:VAL:CG2	2.21	0.64
1:A:171:ARG:HB3	1:A:174:ASP:OD2	1.98	0.64
1:A:115:LEU:HD22	1:A:279:PHE:HB3	1.80	0.63

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:115:LEU:HD21	1:A:281:HIS:CD2	2.31	0.63
1:A:199:GLU:CG	1:A:266:PRO:HG2	2.28	0.63
1:A:60:ALA:CB	1:A:197:VAL:HG21	2.21	0.63
1:A:136:GLU:HG3	1:A:169:ILE:HA	1.80	0.63
1:A:292:VAL:HG23	1:A:295:GLU:HA	1.79	0.62
1:A:204:LEU:O	1:A:236:ALA:HA	1.98	0.62
1:A:6:LEU:O	1:A:9:ALA:HB3	1.98	0.62
1:A:13:ALA:O	1:A:16:VAL:HG13	2.00	0.62
1:A:86:HIS:HD2	1:A:89:GLY:N	1.96	0.62
1:A:54:LEU:O	1:A:56:ILE:HG23	1.99	0.62
1:A:284:ILE:HD11	1:A:291:ILE:HG13	1.79	0.62
1:A:247:GLY:O	1:A:251:LEU:HD23	2.00	0.62
1:A:25:ARG:HB2	1:A:25:ARG:NH1	2.15	0.62
1:A:66:TYR:CE2	1:A:69:ASP:HB2	2.35	0.62
1:A:249:LEU:HG	1:A:250:LYS:N	2.15	0.62
1:A:55:SER:HB2	1:A:59:ILE:O	2.00	0.61
1:A:96:VAL:HA	1:A:279:PHE:CD1	2.36	0.61
1:A:128:ILE:HA	1:A:131:LEU:HD23	1.82	0.61
1:A:136:GLU:CG	1:A:169:ILE:HA	2.31	0.61
1:A:56:ILE:HG22	1:A:80:LYS:H	1.65	0.61
1:A:200:VAL:HG21	1:A:269:LYS:HB2	1.82	0.61
1:A:17:ARG:O	1:A:21:ILE:HG13	2.00	0.61
1:A:129:LYS:HG2	1:A:174:ASP:O	2.01	0.61
1:A:183:VAL:HG23	1:A:283:ILE:O	2.00	0.61
1:A:267:VAL:HG12	1:A:268:LEU:O	2.00	0.61
1:A:40:MET:O	1:A:43:GLU:HB2	2.01	0.60
1:A:89:GLY:O	1:A:91:ILE:HG13	2.01	0.60
1:A:151:SER:CB	1:A:167:PRO:HA	2.31	0.60
1:A:145:LYS:O	1:A:191:THR:HG22	2.01	0.60
1:A:255:THR:O	1:A:258:LYS:HG3	2.01	0.60
1:A:145:LYS:HB3	1:A:191:THR:CG2	2.28	0.60
1:A:245:PRO:HG2	1:A:248:GLN:HB2	1.82	0.60
1:A:27:GLY:N	1:A:72:VAL:HG13	2.15	0.60
1:A:286:GLU:HB2	1:A:287:LYS:HD2	1.84	0.60
1:A:2:ASP:HB3	1:A:5:LYS:HD2	1.82	0.60
1:A:119:ILE:N	1:A:119:ILE:HD13	2.17	0.59
1:A:179:LYS:O	1:A:285:VAL:HG23	2.01	0.59
1:A:39:LYS:HD2	1:A:39:LYS:H	1.66	0.59
1:A:66:TYR:HA	1:A:238:ARG:CG	2.32	0.59
1:A:86:HIS:CD2	1:A:89:GLY:H	2.19	0.59
1:A:138:GLU:HG3	1:A:141:LYS:NZ	2.18	0.59

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:250:LYS:O	1:A:253:LEU:HD23	2.02	0.59
1:A:41:ILE:O	1:A:44:LEU:HD22	2.02	0.59
1:A:267:VAL:HG12	1:A:268:LEU:N	2.18	0.59
1:A:80:LYS:HD2	1:A:276:VAL:O	2.02	0.59
1:A:99:ARG:HH11	1:A:105:ASP:HB3	1.67	0.58
1:A:284:ILE:N	1:A:284:ILE:HD13	2.18	0.58
1:A:64:THR:HG21	1:A:236:ALA:HB2	1.85	0.58
1:A:126:VAL:HB	1:A:178:LEU:HD11	1.85	0.58
1:A:154:LYS:HA	1:A:184:PHE:HD1	1.68	0.58
1:A:287:LYS:HG2	1:A:288:ASP:H	1.67	0.58
1:A:287:LYS:HG2	1:A:288:ASP:N	2.18	0.58
1:A:30:LEU:HD13	1:A:71:THR:O	2.03	0.58
1:A:49:ALA:O	1:A:233:LEU:HB3	2.03	0.58
1:A:18:GLU:O	1:A:21:ILE:HB	2.04	0.57
1:A:158:TYR:O	1:A:159:LYS:HD3	2.04	0.57
1:A:51:PRO:HG3	1:A:239:TRP:CZ2	2.39	0.57
1:A:55:SER:C	1:A:80:LYS:HZ3	2.07	0.57
1:A:86:HIS:HA	1:A:90:PHE:O	2.03	0.57
1:A:292:VAL:HG23	1:A:292:VAL:O	2.03	0.57
1:A:146:PRO:C	1:A:147:ILE:HD12	2.25	0.57
1:A:11:GLU:O	1:A:15:LYS:HG3	2.04	0.57
1:A:50:PHE:CE1	1:A:84:GLY:HA3	2.39	0.57
1:A:286:GLU:HB2	1:A:287:LYS:NZ	2.19	0.57
1:A:111:ALA:O	1:A:114:ALA:HB3	2.05	0.56
1:A:284:ILE:HD11	1:A:291:ILE:HG12	1.86	0.56
1:A:96:VAL:HG13	1:A:279:PHE:HE1	1.70	0.56
1:A:33:LEU:CD2	1:A:37:ILE:HD11	2.33	0.56
1:A:53:ASN:HB2	1:A:82:ASP:HB3	1.86	0.56
1:A:256:LEU:CD2	1:A:262:ILE:HD12	2.36	0.56
1:A:183:VAL:HB	1:A:284:ILE:HG22	1.88	0.56
1:A:292:VAL:CG2	1:A:295:GLU:HA	2.35	0.56
1:A:221:PHE:N	1:A:221:PHE:CD2	2.72	0.56
1:A:270:GLU:O	1:A:272:ARG:N	2.39	0.55
1:A:56:ILE:H	1:A:59:ILE:CG1	2.19	0.55
1:A:12:ILE:O	1:A:16:VAL:HG12	2.07	0.55
1:A:188:PRO:HD2	1:A:279:PHE:O	2.06	0.55
1:A:132:GLY:HA2	1:A:135:ILE:HD12	1.89	0.55
1:A:214:VAL:O	1:A:220:ARG:NH1	2.40	0.55
1:A:186:ILE:C	1:A:188:PRO:HD3	2.27	0.55
1:A:128:ILE:CG1	1:A:176:TYR:HB3	2.38	0.54
1:A:214:VAL:HG11	1:A:219:ALA:HB3	1.90	0.54

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:19:LYS:HB2	1:A:40:MET:HE1	1.90	0.54
1:A:166:ILE:HD13	1:A:186:ILE:HG12	1.91	0.53
1:A:44:LEU:HD22	1:A:44:LEU:N	2.20	0.53
1:A:197:VAL:CG1	1:A:268:LEU:HB3	2.37	0.53
1:A:17:ARG:NH2	1:A:294:THR:O	2.41	0.53
1:A:133:LYS:O	1:A:134:ALA:C	2.46	0.53
1:A:89:GLY:CA	1:A:157:ARG:HG2	2.37	0.53
1:A:16:VAL:HG11	1:A:83:VAL:HG11	1.90	0.53
1:A:80:LYS:HE3	1:A:276:VAL:CB	2.36	0.53
1:A:151:SER:HB2	1:A:166:ILE:O	2.09	0.53
1:A:197:VAL:HG23	1:A:270:GLU:HA	1.91	0.53
1:A:253:LEU:O	1:A:257:GLU:N	2.39	0.53
1:A:130:GLU:OE2	1:A:130:GLU:HA	2.08	0.53
1:A:242:ASN:ND2	1:A:242:ASN:H	2.04	0.53
1:A:66:TYR:HA	1:A:238:ARG:HB2	1.91	0.53
1:A:155:ILE:HG22	1:A:160:LEU:O	2.09	0.52
1:A:56:ILE:CG2	1:A:79:LEU:HA	2.39	0.52
1:A:91:ILE:H	1:A:91:ILE:CD1	2.13	0.52
1:A:269:LYS:HZ2	1:A:273:ASN:H	1.57	0.52
1:A:14:LYS:O	1:A:17:ARG:HB3	2.10	0.52
1:A:159:LYS:HB2	1:A:162:ALA:HB2	1.92	0.52
1:A:178:LEU:HD23	1:A:178:LEU:N	2.25	0.52
1:A:244:MET:HB2	1:A:245:PRO:CD	2.31	0.52
1:A:1:MET:SD	1:A:90:PHE:CE1	3.03	0.52
1:A:129:LYS:HB2	1:A:170:TYR:CD2	2.45	0.51
1:A:206:TYR:CD2	1:A:206:TYR:N	2.78	0.51
1:A:116:ASN:O	1:A:119:ILE:HG12	2.09	0.51
1:A:185:ALA:HA	1:A:282:THR:HA	1.91	0.51
1:A:56:ILE:HG22	1:A:79:LEU:HA	1.91	0.51
1:A:164:ILE:HD13	1:A:164:ILE:N	2.25	0.51
1:A:29:LEU:HG	1:A:32:GLU:HB3	1.91	0.51
1:A:223:LEU:HD12	1:A:224:ALA:N	2.25	0.51
1:A:183:VAL:HG13	1:A:183:VAL:O	2.09	0.51
1:A:222:LEU:HD22	1:A:226:ILE:CD1	2.40	0.51
1:A:66:TYR:HA	1:A:238:ARG:CB	2.40	0.51
1:A:126:VAL:O	1:A:177:VAL:HA	2.10	0.51
1:A:244:MET:SD	1:A:249:LEU:HA	2.51	0.51
1:A:12:ILE:HG23	1:A:44:LEU:HD23	1.92	0.51
1:A:50:PHE:C	1:A:50:PHE:CD2	2.84	0.51
1:A:209:VAL:HG23	1:A:210:ARG:HG2	1.93	0.51
1:A:56:ILE:H	1:A:59:ILE:HD11	1.75	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:257:GLU:HG3	1:A:258:LYS:N	2.24	0.51
1:A:187:GLU:HB3	1:A:189:PHE:CE2	2.45	0.50
1:A:190:ALA:HB3	1:A:277:ALA:HB3	1.92	0.50
1:A:191:THR:OG1	1:A:274:GLY:HA3	2.11	0.50
1:A:126:VAL:HG12	1:A:127:GLU:N	2.26	0.50
1:A:281:HIS:CE1	1:A:294:THR:O	2.65	0.50
1:A:87:ILE:O	1:A:88:ASP:C	2.50	0.50
1:A:1:MET:SD	1:A:90:PHE:CZ	3.04	0.50
1:A:66:TYR:HA	1:A:238:ARG:HG3	1.92	0.50
1:A:166:ILE:HD11	1:A:184:PHE:CB	2.40	0.50
1:A:178:LEU:HB2	1:A:285:VAL:HG11	1.93	0.50
1:A:151:SER:HB2	1:A:167:PRO:HA	1.94	0.49
1:A:177:VAL:CB	1:A:179:LYS:HZ3	2.24	0.49
1:A:118:ALA:O	1:A:122:ALA:HB2	2.12	0.49
1:A:139:ILE:HG23	1:A:144:PHE:HB2	1.94	0.49
1:A:145:LYS:O	1:A:191:THR:N	2.45	0.49
1:A:121:VAL:HG13	1:A:131:LEU:HD13	1.93	0.49
1:A:284:ILE:HG12	1:A:291:ILE:HG23	1.94	0.49
1:A:209:VAL:HG22	1:A:261:ALA:O	2.12	0.49
1:A:220:ARG:O	1:A:223:LEU:HD12	2.12	0.49
1:A:221:PHE:H	1:A:221:PHE:HD2	1.60	0.49
1:A:66:TYR:H	1:A:66:TYR:HD2	1.60	0.49
1:A:155:ILE:CD1	1:A:184:PHE:HA	2.43	0.49
1:A:16:VAL:CG2	1:A:41:ILE:HD11	2.41	0.49
1:A:118:ALA:HA	1:A:121:VAL:CG1	2.43	0.49
1:A:128:ILE:O	1:A:131:LEU:N	2.43	0.48
1:A:30:LEU:HA	1:A:33:LEU:CD1	2.40	0.48
1:A:86:HIS:CB	1:A:91:ILE:HA	2.43	0.48
1:A:251:LEU:O	1:A:254:LYS:HB3	2.13	0.48
1:A:129:LYS:HB2	1:A:170:TYR:CE2	2.49	0.48
1:A:183:VAL:O	1:A:184:PHE:HD1	1.97	0.48
1:A:186:ILE:HG22	1:A:188:PRO:HD3	1.96	0.48
1:A:126:VAL:CG1	1:A:127:GLU:N	2.76	0.47
1:A:223:LEU:O	1:A:227:LYS:HB2	2.14	0.47
1:A:118:ALA:HA	1:A:121:VAL:HG12	1.97	0.47
1:A:125:GLY:N	1:A:178:LEU:O	2.47	0.47
1:A:8:LYS:HG3	1:A:12:ILE:HD11	1.95	0.47
1:A:10:GLY:HA2	1:A:13:ALA:HB3	1.97	0.47
1:A:54:LEU:HD23	1:A:79:LEU:HD11	1.97	0.47
1:A:59:ILE:O	1:A:59:ILE:HG13	2.14	0.47
1:A:89:GLY:HA2	1:A:158:TYR:CD1	2.50	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:283:ILE:HD13	1:A:283:ILE:H	1.78	0.47
1:A:48:PRO:HA	1:A:85:VAL:HG12	1.95	0.47
1:A:218:GLN:HA	1:A:221:PHE:HB2	1.96	0.47
1:A:283:ILE:HG12	1:A:284:ILE:N	2.29	0.47
1:A:16:VAL:O	1:A:17:ARG:C	2.53	0.47
1:A:139:ILE:N	1:A:139:ILE:HD12	2.30	0.46
1:A:8:LYS:HG3	1:A:12:ILE:CD1	2.45	0.46
1:A:257:GLU:HA	1:A:262:ILE:CD1	2.46	0.46
1:A:153:HIS:CB	1:A:161:HIS:NE2	2.73	0.46
1:A:19:LYS:HB2	1:A:40:MET:CE	2.44	0.46
1:A:126:VAL:H	1:A:178:LEU:HG	1.79	0.46
1:A:205:ILE:HA	1:A:235:PHE:O	2.16	0.46
1:A:258:LYS:HE3	1:A:258:LYS:HB2	1.68	0.46
1:A:142:ARG:HB3	1:A:144:PHE:CD1	2.51	0.46
1:A:256:LEU:HD23	1:A:262:ILE:HD12	1.97	0.46
1:A:267:VAL:HG12	1:A:268:LEU:H	1.79	0.46
1:A:169:ILE:CG2	1:A:170:TYR:N	2.79	0.46
1:A:206:TYR:HA	1:A:263:TYR:O	2.15	0.46
1:A:106:GLU:CD	1:A:106:GLU:N	2.69	0.46
1:A:121:VAL:O	1:A:123:ARG:HG2	2.15	0.46
1:A:164:ILE:HD13	1:A:164:ILE:H	1.81	0.46
1:A:25:ARG:O	1:A:28:MET:HB2	2.16	0.45
1:A:59:ILE:HA	1:A:269:LYS:HA	1.98	0.45
1:A:189:PHE:N	1:A:189:PHE:CD2	2.85	0.45
1:A:203:THR:CG2	1:A:266:PRO:HA	2.39	0.45
1:A:86:HIS:CA	1:A:90:PHE:O	2.64	0.45
1:A:194:ALA:HB3	1:A:271:ILE:HD11	1.97	0.45
1:A:61:ALA:O	1:A:62:HIS:HB2	2.16	0.45
1:A:107:LEU:HD22	1:A:277:ALA:HB2	1.98	0.45
1:A:183:VAL:O	1:A:184:PHE:CD1	2.70	0.45
1:A:267:VAL:C	1:A:268:LEU:HD22	2.37	0.45
1:A:194:ALA:HB2	1:A:272:ARG:HH21	1.81	0.45
1:A:222:LEU:HD23	1:A:222:LEU:HA	1.60	0.45
1:A:25:ARG:HB2	1:A:25:ARG:CZ	2.47	0.45
1:A:60:ALA:HA	1:A:276:VAL:HG11	1.99	0.45
1:A:244:MET:CB	1:A:245:PRO:HD2	2.24	0.45
1:A:257:GLU:O	1:A:260:GLY:N	2.49	0.45
1:A:151:SER:HB3	1:A:167:PRO:HA	1.99	0.45
1:A:146:PRO:O	1:A:147:ILE:HD12	2.17	0.45
1:A:129:LYS:HD3	1:A:172:PRO:HA	1.99	0.44
1:A:129:LYS:HE2	1:A:175:ASN:N	2.32	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:179:LYS:O	1:A:182:ASP:HB2	2.16	0.44
1:A:216:VAL:O	1:A:219:ALA:HB3	2.18	0.44
1:A:235:PHE:N	1:A:235:PHE:CD2	2.85	0.44
1:A:270:GLU:HG3	1:A:274:GLY:C	2.37	0.44
1:A:16:VAL:HG13	1:A:17:ARG:H	1.81	0.44
1:A:123:ARG:HG3	1:A:126:VAL:CG2	2.47	0.44
1:A:50:PHE:HD2	1:A:51:PRO:O	2.00	0.44
1:A:58:GLU:HB2	1:A:273:ASN:CA	2.43	0.44
1:A:127:GLU:OE2	1:A:129:LYS:HE3	2.18	0.44
1:A:3:THR:O	1:A:6:LEU:HB3	2.17	0.44
1:A:154:LYS:HG2	1:A:155:ILE:N	2.32	0.44
1:A:31:LEU:HD23	1:A:65:PRO:HB2	1.99	0.44
1:A:106:GLU:CD	1:A:106:GLU:H	2.21	0.44
1:A:167:PRO:C	1:A:169:ILE:H	2.21	0.44
1:A:265:TYR:H	1:A:265:TYR:HD2	1.64	0.44
1:A:38:GLU:HB3	1:A:39:LYS:HD2	1.99	0.44
1:A:47:LYS:HB3	1:A:86:HIS:CE1	2.53	0.44
1:A:58:GLU:CB	1:A:273:ASN:HA	2.41	0.44
1:A:207:MET:O	1:A:262:ILE:HB	2.18	0.44
1:A:35:GLU:O	1:A:36:SER:C	2.56	0.44
1:A:35:GLU:HA	1:A:39:LYS:HZ2	1.83	0.44
1:A:74:LYS:O	1:A:77:ASP:HB2	2.18	0.44
1:A:250:LYS:O	1:A:251:LEU:C	2.56	0.44
1:A:10:GLY:O	1:A:14:LYS:N	2.51	0.43
1:A:22:LYS:O	1:A:23:LEU:HB2	2.19	0.43
1:A:66:TYR:CD2	1:A:66:TYR:N	2.84	0.43
1:A:249:LEU:O	1:A:252:ALA:HB3	2.18	0.43
1:A:55:SER:OG	1:A:61:ALA:HA	2.18	0.43
1:A:56:ILE:H	1:A:59:ILE:CD1	2.31	0.43
1:A:152:GLY:O	1:A:165:SER:HA	2.18	0.43
1:A:153:HIS:CB	1:A:161:HIS:CD2	3.01	0.43
1:A:25:ARG:HH21	1:A:28:MET:HE2	1.84	0.43
1:A:256:LEU:HD22	1:A:262:ILE:HD12	1.99	0.43
1:A:80:LYS:HE3	1:A:276:VAL:O	2.19	0.43
1:A:37:ILE:O	1:A:40:MET:N	2.50	0.43
1:A:123:ARG:HG3	1:A:126:VAL:HG23	2.00	0.43
1:A:158:TYR:C	1:A:159:LYS:HD3	2.39	0.43
1:A:56:ILE:HD13	1:A:56:ILE:H	1.83	0.43
1:A:128:ILE:HD13	1:A:178:LEU:CD2	2.49	0.43
1:A:283:ILE:HA	1:A:291:ILE:O	2.18	0.43
1:A:27:GLY:H	1:A:72:VAL:CG1	2.21	0.42

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:34:ALA:O	1:A:35:GLU:C	2.57	0.42
1:A:186:ILE:O	1:A:188:PRO:HD3	2.19	0.42
1:A:233:LEU:H	1:A:233:LEU:HG	1.62	0.42
1:A:26:PRO:HD3	1:A:100:VAL:HG12	2.01	0.42
1:A:114:ALA:O	1:A:115:LEU:C	2.57	0.42
1:A:6:LEU:HD22	1:A:293:THR:HG21	2.02	0.42
1:A:66:TYR:CD2	1:A:69:ASP:HB2	2.54	0.42
1:A:154:LYS:HB2	1:A:184:PHE:CE1	2.54	0.42
1:A:155:ILE:HD11	1:A:184:PHE:HA	2.01	0.42
1:A:43:GLU:C	1:A:44:LEU:HD13	2.39	0.42
1:A:18:GLU:HA	1:A:21:ILE:CD1	2.38	0.42
1:A:89:GLY:C	1:A:157:ARG:HG2	2.40	0.42
1:A:157:ARG:O	1:A:158:TYR:HB2	2.18	0.42
1:A:188:PRO:C	1:A:189:PHE:HD2	2.23	0.42
1:A:191:THR:HG1	1:A:192:ILE:H	1.66	0.42
1:A:244:MET:SD	1:A:249:LEU:CA	3.08	0.42
1:A:50:PHE:CZ	1:A:84:GLY:CA	2.98	0.42
1:A:204:LEU:HD22	1:A:204:LEU:H	1.84	0.42
1:A:268:LEU:N	1:A:268:LEU:HD22	2.35	0.42
1:A:58:GLU:OE1	1:A:58:GLU:N	2.53	0.42
1:A:137:ASN:OD1	1:A:137:ASN:N	2.53	0.42
1:A:123:ARG:HG3	1:A:123:ARG:O	2.20	0.41
1:A:209:VAL:CG2	1:A:260:GLY:O	2.68	0.41
1:A:79:LEU:N	1:A:98:VAL:O	2.52	0.41
1:A:37:ILE:HG22	1:A:41:ILE:HD11	2.02	0.41
1:A:67:LYS:HB2	1:A:67:LYS:HE3	1.80	0.41
1:A:80:LYS:HB2	1:A:80:LYS:HZ3	1.85	0.41
1:A:265:TYR:HA	1:A:266:PRO:HD3	1.78	0.41
1:A:29:LEU:O	1:A:30:LEU:C	2.59	0.41
1:A:243:ASP:O	1:A:244:MET:HB3	2.21	0.41
1:A:247:GLY:O	1:A:248:GLN:C	2.56	0.41
1:A:123:ARG:NH2	1:A:288:ASP:O	2.53	0.41
1:A:192:ILE:HG13	1:A:193:GLY:N	2.34	0.41
1:A:286:GLU:HB2	1:A:287:LYS:HZ2	1.83	0.41
1:A:34:ALA:CA	1:A:37:ILE:HD12	2.35	0.41
1:A:80:LYS:HE3	1:A:276:VAL:CG2	2.50	0.41
1:A:222:LEU:HD22	1:A:226:ILE:HD11	2.03	0.41
1:A:2:ASP:HA	1:A:4:GLU:CD	2.41	0.41
1:A:87:ILE:HD13	1:A:87:ILE:HA	1.76	0.41
1:A:99:ARG:HB2	1:A:108:MET:SD	2.61	0.41
1:A:269:LYS:NZ	1:A:273:ASN:H	2.17	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:56:ILE:HD13	1:A:56:ILE:N	2.35	0.41
1:A:287:LYS:HD2	1:A:287:LYS:N	2.36	0.41
1:A:220:ARG:HE	1:A:220:ARG:HB2	1.54	0.41
1:A:239:TRP:N	1:A:239:TRP:CD1	2.88	0.41
1:A:240:LEU:O	1:A:242:ASN:N	2.53	0.41
1:A:249:LEU:CG	1:A:250:LYS:N	2.83	0.41
1:A:37:ILE:O	1:A:41:ILE:HD12	2.22	0.40
1:A:249:LEU:O	1:A:250:LYS:C	2.59	0.40
1:A:270:GLU:O	1:A:271:ILE:C	2.60	0.40
1:A:25:ARG:HB2	1:A:25:ARG:HH11	1.85	0.40
1:A:25:ARG:HH21	1:A:28:MET:HG2	1.86	0.40
1:A:244:MET:CB	1:A:245:PRO:CD	2.98	0.40
1:A:38:GLU:O	1:A:41:ILE:HB	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	293/295 (99%)	204 (70%)	65 (22%)	24 (8%)	1 9

All (24) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	23	LEU
1	A	164	ILE
1	A	217	ALA
1	A	252	ALA
1	A	271	ILE
1	A	71	THR
1	A	160	LEU
1	A	241	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	266	PRO
1	A	287	LYS
1	A	21	ILE
1	A	101	GLY
1	A	228	ARG
1	A	31	LEU
1	A	62	HIS
1	A	88	ASP
1	A	134	ALA
1	A	191	THR
1	A	172	PRO
1	A	218	GLN
1	A	245	PRO
1	A	129	LYS
1	A	270	GLU
1	A	276	VAL

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	243/243 (100%)	182 (75%)	61 (25%)	0	3

All (61) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	ASP
1	A	16	VAL
1	A	25	ARG
1	A	28	MET
1	A	29	LEU
1	A	43	GLU
1	A	44	LEU
1	A	52	VAL
1	A	56	ILE
1	A	63	TYR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	64	THR
1	A	66	TYR
1	A	71	THR
1	A	72	VAL
1	A	75	GLU
1	A	79	LEU
1	A	80	LYS
1	A	81	ILE
1	A	91	ILE
1	A	97	THR
1	A	105	ASP
1	A	119	ILE
1	A	135	ILE
1	A	137	ASN
1	A	138	GLU
1	A	145	LYS
1	A	149	ASN
1	A	155	ILE
1	A	161	HIS
1	A	175	ASN
1	A	178	LEU
1	A	179	LYS
1	A	182	ASP
1	A	197	VAL
1	A	199	GLU
1	A	202	PRO
1	A	204	LEU
1	A	206	TYR
1	A	214	VAL
1	A	215	ARG
1	A	218	GLN
1	A	220	ARG
1	A	222	LEU
1	A	223	LEU
1	A	233	LEU
1	A	238	ARG
1	A	242	ASN
1	A	243	ASP
1	A	249	LEU
1	A	256	LEU
1	A	258	LYS
1	A	262	ILE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	268	LEU
1	A	276	VAL
1	A	283	ILE
1	A	284	ILE
1	A	285	VAL
1	A	287	LYS
1	A	289	SER
1	A	291	ILE
1	A	293	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	86	HIS
1	A	175	ASN
1	A	242	ASN

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 monosaccharides 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.

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	295/295 (100%)	-0.91	0	100	100	4, 28, 60, 85	0

There are no RSRZ outliers to report.

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

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.