W O R L D W I D E
wwPDB
PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Jan 3, 2024 – 05:32 pm GMT

PDB ID	:	5F75
Title	:	Thiocyanate dehydrogenase from Thioalkalivibrio paradoxus
Authors	:	Tsallagov, S.I.; Polyakov, K.M.; Tikhonova, T.V.; Trofimov, A.A.; Shabalin, I.G.; Popov, A.N.; Popov, V.O.
Deposited on	:	2015-12-07
Resolution	:	2.00 Å(reported)

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

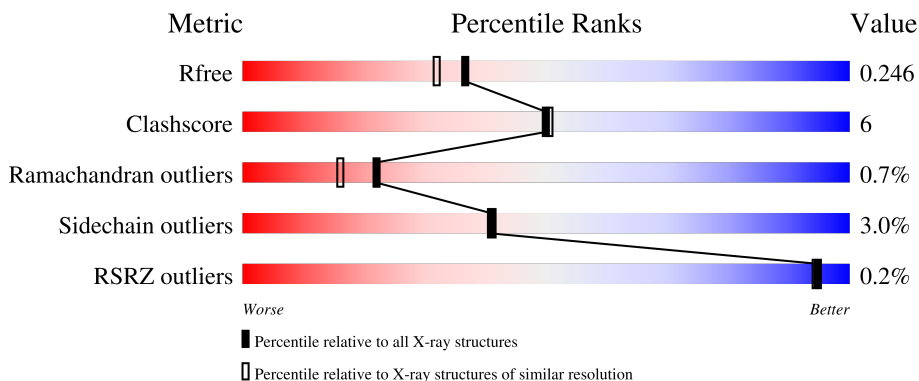|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation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

1   Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.00 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
Rfree		0.246
Clashscore		6
Ramachandran outliers		0.7%
Sidechain outliers		3.0%
RSRZ outliers		0.2%

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))
R_{free}	130704	8085 (2.00-2.00)
Clashscore	141614	9178 (2.00-2.00)
Ramachandran outliers	138981	9054 (2.00-2.00)
Sidechain outliers	138945	9053 (2.00-2.00)
RSRZ outliers	127900	7900 (2.00-2.00)

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	548	72% 14% • 14%
1	B	548	72% 13% 15%
1	C	548	73% 13% • 13%
1	D	548	.% 71% 13% • 15%

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2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 15038 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 Thiocyanate dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	474	Total	C	N	O	S	0	1	0
			3670	2345	614	692	19			
1	B	466	Total	C	N	O	S	0	0	0
			3586	2292	600	676	18			
1	C	475	Total	C	N	O	S	0	3	0
			3673	2346	608	699	20			
1	D	466	Total	C	N	O	S	0	1	0
			3588	2293	594	683	18			

- Molecule 2 is COPPER (II) ION (three-letter code: CU) (formula: Cu).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total	Cu	0	0
			2	2		
2	B	2	Total	Cu	0	0
			2	2		
2	C	2	Total	Cu	0	0
			2	2		
2	D	2	Total	Cu	0	0
			2	2		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	156	Total	O	0	0
			156	156		
3	B	149	Total	O	0	0
			149	149		
3	C	120	Total	O	0	0
			120	120		
3	D	88	Total	O	0	0
			88	88		

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.
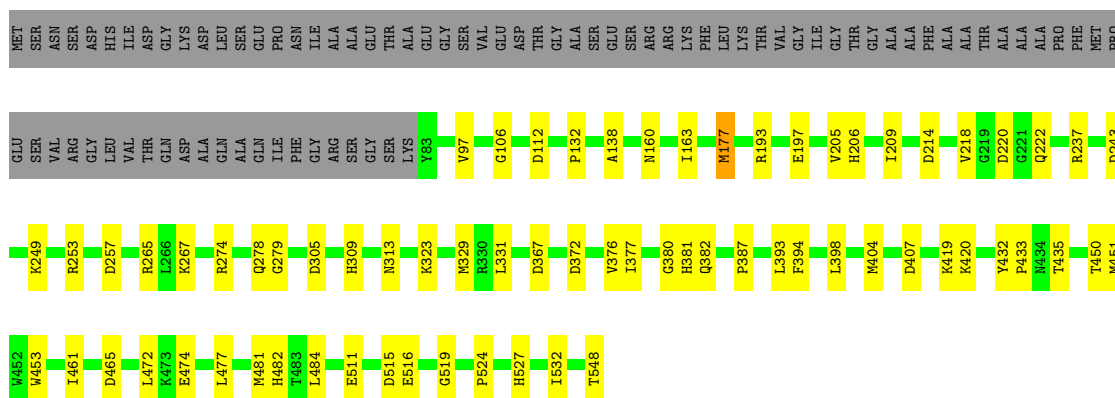
• Molecule 1: Thiocyanate dehydrogenase
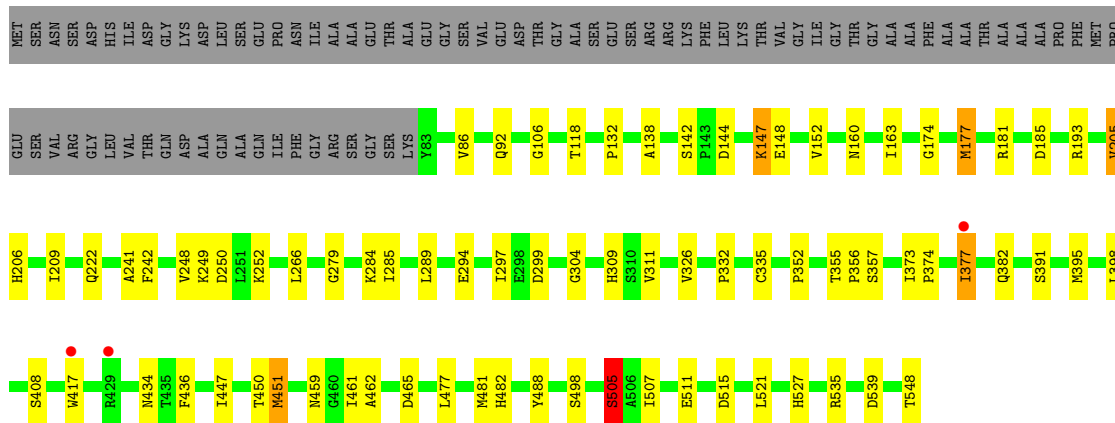

• Molecule 1: Thiocyanate dehydrogenase

• Molecule 1: Thiocyanate dehydrogenase

GLU SER VAL ARG GLY LEU VAL THR GLN ASP ALA GLN ALA Q74 I75 G106 W125 P132 I133 A138 P141 T155 N160 I163 Y164 M177 Y180 L191 V205 I209 D220 G221 Q222 A241 K252 L256 D257 G258 L266 G279

D286 V290 P291 E294 L295 K301 V302 S303 V311 A312 N313 G322 V326 M329 C335 P374 E375 H381 Q382 Q390 M395 N396 S397 L398 I403 S408 S409 N410 H411 W417 V423 T435 F436 H437 M438 Y448 V449 T450 M451 W452 W453

T457 P458 N459 D465 E470 M481 H482 Y488 P522 H527 I532 V533 P534 E538 R541 T547 T548

• Molecule 1: Thiocyanate dehydrogenase

%

Chain D: 71% 13% • 15%

MET SER ASN SER ASP HIS ILE ASP GLY LYS ASP LEU SER GLU PRO ASN ILE ALA ALA GLU THR ALA GLU GLY SER VAL GLU ASP THR GLY ALA SER GLU ARG ARG LYS PHE LEU LYS THR VAL GLY ILE GLY THR ALA ALA PHE ALA ALA THR ALA ALA ALA PRO PHE MET PRO

GLU SER VAL ARG GLY LEU VAL THR GLN ASP ALA GLN ALA GLN ILE ILE PHE GLY ARG SER GLY SER LYS Y83 V86 Q92 G106 T118 P132 A138 S142 P143 D144 K147 E148 V152 N160 I163 G174 M177 R181 D185 R193 V205

H206 I209 Q222 A241 F242 V248 K249 D250 L251 K252 L266 G279 K284 I285 L289 E294 I297 E298 D299 G304 H309 S310 V311 V326 P332 C335 P352 T355 P356 S357 I373 P374 I377 Q382 S391 M395 L398

S408 W417 R429 N434 T435 F436 I447 T450 M451 N459 G460 I461 A462 D465 L477 M481 H482 Y488 S498 S505 A506 I507 E511 D515 L521 H527 R535 D539 T548

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	98.78Å 95.42Å 107.00Å 90.00° 100.66° 90.00°	Depositor
Resolution (Å)	49.00 – 2.00 48.54 – 2.00	Depositor EDS
% Data completeness (in resolution range)	94.3 (49.00-2.00) 94.3 (48.54-2.00)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.88 (at 2.00Å)	Xtriage
Refinement program	REFMAC 5.8.0073	Depositor
R, R_{free}	0.186 , 0.244 0.188 , 0.246	Depositor DCC
R_{free} test set	6063 reflections (4.88%)	wwPDB-VP
Wilson B-factor (Å^2)	35.7	Xtriage
Anisotropy	0.088	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 46.1	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	15038	wwPDB-VP
Average B, all atoms (Å^2)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.80% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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 ⓘ

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

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	0.81	0/3779	0.91	8/5157 (0.2%)
1	B	0.74	0/3689	0.87	7/5043 (0.1%)
1	C	0.75	0/3792	0.87	2/5177 (0.0%)
1	D	0.69	1/3695 (0.0%)	0.83	1/5052 (0.0%)
All	All	0.75	1/14955 (0.0%)	0.87	18/20429 (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

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	505	SER	CB-OG	-5.12	1.35	1.42

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	306	ARG	NE-CZ-NH1	6.82	123.71	120.30
1	A	367	ASP	CB-CG-OD1	6.49	124.14	118.30
1	A	214	ASP	CB-CG-OD1	6.13	123.82	118.30
1	B	214	ASP	CB-CG-OD1	6.10	123.79	118.30
1	A	330	ARG	NE-CZ-NH1	5.96	123.28	120.30
1	A	193	ARG	NE-CZ-NH1	5.72	123.16	120.30
1	B	274	ARG	NE-CZ-NH1	5.62	123.11	120.30
1	B	112	ASP	CB-CG-OD1	5.51	123.26	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	465	ASP	CB-CG-OD2	-5.34	113.49	118.30
1	B	193	ARG	NE-CZ-NH2	-5.33	117.64	120.30
1	A	112	ASP	CB-CG-OD1	5.33	123.09	118.30
1	B	237	ARG	NE-CZ-NH2	-5.31	117.64	120.30
1	A	431	ALA	N-CA-C	-5.27	96.77	111.00
1	D	465	ASP	CB-CG-OD2	-5.21	113.61	118.30
1	B	274	ARG	NE-CZ-NH2	-5.17	117.71	120.30
1	C	465	ASP	CB-CG-OD1	5.13	122.92	118.30
1	A	193	ARG	NE-CZ-NH2	-5.03	117.79	120.30
1	B	367	ASP	CB-CG-OD1	5.01	122.81	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	430	GLY	Peptide

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	3670	0	3534	57	0
1	B	3586	0	3426	32	0
1	C	3673	0	3514	44	0
1	D	3588	0	3417	39	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
3	A	156	0	0	1	0
3	B	149	0	0	2	0
3	C	120	0	0	1	0
3	D	88	0	0	0	0
All	All	15038	0	13891	166	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 6.

All (166) 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:D:352:PRO:HB2	1:D:377:ILE:HD12	1.40	1.03
1:A:430:GLY:HA3	1:A:431:ALA:CB	1.92	0.99
1:A:430:GLY:HA3	1:A:431:ALA:HB3	1.49	0.92
1:C:160:ASN:HD21	1:C:222:GLN:HE22	1.18	0.91
1:A:148:GLU:OE1	1:A:183:LYS:NZ	2.07	0.87
1:B:253:ARG:HB3	1:B:257:ASP:OD2	1.75	0.87
1:A:294:GLU:HG3	1:A:398:LEU:HD22	1.63	0.80
1:A:401:ASN:HB2	1:A:430:GLY:O	1.81	0.80
1:C:450:THR:HG21	1:C:482:HIS:O	1.84	0.78
1:C:295:LEU:HG	1:C:398:LEU:HD21	1.71	0.73
1:D:450:THR:HG21	1:D:482:HIS:O	1.88	0.73
1:D:459:ASN:HD22	1:D:481:MET:H	1.35	0.72
1:A:311:VAL:HG23	1:A:329:MET:CE	2.20	0.71
1:D:160:ASN:HD21	1:D:222:GLN:NE2	1.88	0.71
1:A:160:ASN:HD21	1:A:222:GLN:HE22	1.35	0.71
1:D:160:ASN:HD21	1:D:222:GLN:HE22	1.37	0.71
1:A:382:GLN:HE22	1:A:548:THR:H	1.36	0.71
1:A:430:GLY:CA	1:A:431:ALA:CB	2.68	0.70
1:D:382:GLN:HE22	1:D:548:THR:H	1.39	0.69
1:A:430:GLY:HA3	1:A:431:ALA:HB2	1.75	0.68
1:A:404:MET:SD	1:A:419:LYS:HD3	2.34	0.68
1:B:382:GLN:HE22	1:B:548:THR:H	1.40	0.66
1:C:160:ASN:HD21	1:C:222:GLN:NE2	1.90	0.66
1:A:160:ASN:HD21	1:A:222:GLN:NE2	1.93	0.66
1:B:461:ILE:HD12	1:B:477:LEU:HD11	1.78	0.66
1:A:437:HIS:HB2	1:A:450:THR:CG2	2.28	0.64
1:A:450:THR:HG21	1:A:482:HIS:O	1.97	0.64
1:B:450:THR:HG21	1:B:482:HIS:O	1.97	0.64
1:A:311:VAL:CG2	1:A:329:MET:CE	2.77	0.62
1:B:407:ASP:HB2	1:B:420:LYS:HD3	1.82	0.61
1:A:311:VAL:CG2	1:A:329:MET:HE2	2.31	0.61
1:D:252:LYS:NZ	1:D:299:ASP:OD1	2.34	0.61
1:A:357:SER:HA	1:A:419:LYS:HG3	1.82	0.60
1:C:290:VAL:HB	1:C:291:PRO:CD	2.32	0.60
1:B:177:MET:HG3	1:B:279:GLY:O	2.04	0.58
1:B:432:TYR:HB3	1:B:433:PRO:HA	1.86	0.58
1:A:294:GLU:CG	1:A:398:LEU:HD22	2.32	0.57
1:B:519:GLY:HA3	1:D:86:VAL:HG12	1.86	0.57
1:B:160:ASN:HD21	1:B:222:GLN:HE22	1.52	0.57
1:B:380:GLY:O	3:B:701:HOH:O	2.18	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:138:ALA:HB1	1:D:209:ILE:HG12	1.88	0.56
1:A:436:PHE:CE1	1:A:437:HIS:NE2	2.74	0.56
1:A:437:HIS:HB2	1:A:450:THR:HG23	1.88	0.56
1:D:459:ASN:ND2	1:D:481:MET:H	2.03	0.55
1:C:256:LEU:O	1:C:375:GLU:HB2	2.07	0.54
1:B:160:ASN:HD21	1:B:222:GLN:NE2	2.06	0.54
1:A:516:GLU:HG2	1:C:75:ILE:HG12	1.89	0.54
1:D:355:THR:HG23	1:D:377:ILE:HD11	1.90	0.54
1:A:311:VAL:HG21	1:A:329:MET:HE2	1.90	0.54
1:B:331:LEU:O	1:B:376:VAL:HG11	2.08	0.54
1:D:106:GLY:HA2	1:D:132:PRO:O	2.09	0.53
1:D:408:SER:HA	1:D:417:TRP:CD1	2.44	0.53
1:A:256:LEU:O	1:A:375:GLU:HB3	2.09	0.52
1:A:437:HIS:HB2	1:A:450:THR:HG21	1.91	0.52
1:B:435:THR:HA	1:B:450:THR:O	2.09	0.52
1:A:356:PRO:O	1:A:419:LYS:HE3	2.09	0.52
1:B:265:ARG:HD2	1:B:267:LYS:HE3	1.90	0.52
1:C:381:HIS:HB3	3:C:796:HOH:O	2.09	0.52
1:A:459:ASN:HD22	1:A:481:MET:H	1.58	0.51
1:D:311:VAL:HG12	1:D:332:PRO:HG3	1.91	0.51
1:B:404:MET:SD	1:B:419:LYS:HD3	2.51	0.51
1:A:332:PRO:HA	1:A:376:VAL:HG21	1.93	0.51
1:C:294:GLU:HG2	1:C:398:LEU:HD22	1.92	0.51
1:D:451:MET:SD	1:D:462:ALA:HB2	2.51	0.51
1:B:380:GLY:HA3	1:B:394:PHE:CZ	2.47	0.50
1:C:241:ALA:HB2	1:C:266:LEU:HD13	1.92	0.50
1:D:285:ILE:HA	1:D:304:GLY:HA3	1.93	0.50
1:C:488:TYR:CE2	1:C:532:ILE:HG22	2.47	0.49
1:B:481:MET:HE1	1:B:484:LEU:HD21	1.94	0.49
1:C:538:GLU:HG3	1:C:541:ARG:NH1	2.27	0.49
1:D:498:SER:HA	1:D:505:SER:HB3	1.93	0.49
1:B:197:GLU:HG2	1:B:278:GLN:HE22	1.78	0.49
1:C:177[A]:MET:HG3	1:C:279:GLY:O	2.12	0.49
1:C:258:GLY:HA3	1:C:374:PRO:O	2.13	0.49
1:A:403:ILE:HB	1:A:423:VAL:HB	1.93	0.49
1:D:242:PHE:HB2	1:D:311:VAL:HG21	1.94	0.49
1:B:106:GLY:HA2	1:B:132:PRO:O	2.13	0.49
1:A:106:GLY:HA2	1:A:132:PRO:O	2.12	0.48
1:C:403:ILE:HB	1:C:423:VAL:HB	1.94	0.48
1:A:197:GLU:HG2	1:A:278:GLN:HE22	1.78	0.48
1:C:397:SER:O	1:C:398:LEU:CB	2.59	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:436:PHE:CE1	1:A:437:HIS:CD2	3.01	0.48
1:C:408:SER:HA	1:C:417:TRP:CD1	2.49	0.48
1:D:284:LYS:NZ	1:D:309:HIS:O	2.42	0.48
1:B:329:MET:HA	1:B:329:MET:HE3	1.96	0.48
1:A:132:PRO:HD2	1:C:125:TRP:CH2	2.49	0.48
1:A:522:PRO:HD2	1:C:522:PRO:HD2	1.96	0.48
1:A:314:ASP:HB3	1:A:328:SER:OG	2.14	0.48
1:D:461:ILE:HD12	1:D:477:LEU:HD11	1.96	0.48
1:A:436:PHE:CD1	1:A:437:HIS:CD2	3.02	0.47
1:C:141:PRO:HA	1:C:534:PRO:O	2.13	0.47
1:A:161:LEU:HG	1:A:168:VAL:HG21	1.97	0.47
1:C:397:SER:O	1:C:398:LEU:HB3	2.15	0.47
1:B:387:PRO:HD3	3:B:784:HOH:O	2.14	0.47
1:D:144:ASP:OD2	1:D:147:LYS:HD3	2.14	0.47
1:C:163:ILE:HG22	1:C:164:TYR:CE1	2.49	0.47
1:D:160:ASN:ND2	1:D:222:GLN:HE22	2.11	0.47
1:C:459:ASN:HD22	1:C:481:MET:H	1.64	0.46
1:A:132:PRO:HD2	1:C:125:TRP:CZ3	2.51	0.46
1:C:322:GLY:O	1:C:411:HIS:HE1	1.99	0.46
1:C:438:MET:HE2	1:C:547:THR:HB	1.97	0.46
1:D:488:TYR:HB3	1:D:539:ASP:OD1	2.16	0.46
1:C:326:VAL:CG1	1:C:335:CYS:HB3	2.46	0.45
1:A:511:GLU:OE2	1:A:516:GLU:HB2	2.17	0.45
1:C:390:GLN:NE2	1:C:409:SER:HB3	2.31	0.45
1:A:457:THR:HG22	3:A:720:HOH:O	2.15	0.45
1:D:205:VAL:HG12	1:D:206:HIS:N	2.31	0.45
1:D:511:GLU:O	1:D:515:ASP:HA	2.17	0.45
1:A:177[A]:MET:HG3	1:A:279:GLY:O	2.17	0.45
1:B:433:PRO:HB3	1:B:453:TRP:NE1	2.32	0.45
1:A:250:ASP:OD2	1:A:252:LYS:HB2	2.17	0.45
1:A:430:GLY:CA	1:A:431:ALA:HB2	2.43	0.44
1:A:477:LEU:HD21	1:A:517:VAL:HG21	1.99	0.44
1:C:220:ASP:H	1:C:313:ASN:HD22	1.65	0.44
1:B:243:ASP:OD1	1:B:309:HIS:HB3	2.17	0.44
1:A:432:TYR:HA	1:A:433:PRO:C	2.37	0.44
1:A:459:ASN:ND2	1:A:481:MET:H	2.16	0.44
1:B:511:GLU:O	1:B:515:ASP:HA	2.17	0.44
1:A:180:TYR:CD1	1:A:191:LEU:HD11	2.53	0.44
1:A:211:PRO:HD3	1:A:318:PHE:CB	2.47	0.44
1:D:241:ALA:HB2	1:D:266:LEU:HD13	1.99	0.44
1:B:465:ASP:HB2	1:B:472:LEU:HD21	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:311:VAL:HG21	1:C:329:MET:CE	2.48	0.44
1:C:435:THR:HG22	1:C:451[A]:MET:SD	2.57	0.43
1:D:142:SER:O	1:D:535:ARG:HA	2.17	0.43
1:B:220:ASP:H	1:B:313:ASN:HD22	1.66	0.43
1:A:163:ILE:HD12	1:A:163:ILE:HA	1.83	0.43
1:C:311:VAL:CG2	1:C:329:MET:CE	2.96	0.43
1:B:138:ALA:HB1	1:B:209:ILE:HG12	2.00	0.43
1:D:242:PHE:CD1	1:D:242:PHE:N	2.87	0.43
1:C:106:GLY:HA2	1:C:132:PRO:O	2.19	0.43
1:D:373:ILE:HA	1:D:374:PRO:HD2	1.93	0.42
1:D:185:ASP:C	1:D:185:ASP:OD1	2.58	0.42
1:C:382:GLN:HE22	1:C:548:THR:H	1.66	0.42
1:D:152:VAL:HG22	1:D:181:ARG:HD2	2.00	0.42
1:A:380:GLY:HA3	1:A:394:PHE:CZ	2.55	0.42
1:A:413:ASP:OD1	1:A:415:THR:OG1	2.31	0.42
1:D:177:MET:HG3	1:D:279:GLY:O	2.19	0.42
1:D:248:VAL:HG12	1:D:250:ASP:HB3	2.02	0.42
1:C:488:TYR:HE2	1:C:532:ILE:HG22	1.84	0.41
1:D:250:ASP:OD1	1:D:250:ASP:C	2.58	0.41
1:A:163:ILE:HG22	1:A:164:TYR:CE1	2.55	0.41
1:B:481:MET:CE	1:B:484:LEU:HD21	2.49	0.41
1:D:289:LEU:HD21	1:D:297:ILE:HB	2.02	0.41
1:A:253:ARG:HB3	1:A:257:ASP:OD2	2.21	0.41
1:C:438:MET:HA	1:C:448:TYR:O	2.19	0.41
1:A:226:CYS:HB3	1:A:313:ASN:HD21	1.86	0.41
1:C:138:ALA:HB1	1:C:209:ILE:HG12	2.03	0.41
1:A:350:ALA:O	1:A:406:TRP:HZ2	2.03	0.41
1:A:436:PHE:HE1	1:A:437:HIS:NE2	2.19	0.41
1:B:97:VAL:O	1:B:532:ILE:HA	2.21	0.41
1:C:163:ILE:HD12	1:C:163:ILE:HA	1.49	0.41
1:C:286:ASP:OD2	1:C:303:SER:OG	2.33	0.41
1:C:453:TRP:CD2	1:C:457:THR:HG21	2.55	0.41
1:B:451:MET:HE2	1:B:474:GLU:OE1	2.21	0.41
1:C:290:VAL:HB	1:C:291:PRO:HD2	2.02	0.41
1:C:133:ILE:O	1:C:155:THR:HA	2.21	0.40
1:D:326:VAL:HG12	1:D:335:CYS:HB3	2.03	0.40
1:D:377:ILE:H	1:D:377:ILE:HG13	1.69	0.40
1:B:524:PRO:HA	1:D:118:THR:HG21	2.02	0.40
1:D:507:ILE:HB	1:D:521:LEU:HB2	2.04	0.40
1:B:206:HIS:O	1:B:218:VAL:HA	2.21	0.40
1:C:180:TYR:CD1	1:C:191:LEU:HD11	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:350:ALA:O	1:A:419:LYS:HE2	2.21	0.40
1:A:433:PRO:HB3	1:A:453:TRP:NE1	2.36	0.40
1:C:294:GLU:CG	1:C:398:LEU:HD22	2.52	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	473/548 (86%)	443 (94%)	27 (6%)	3 (1%)	25	19
1	B	464/548 (85%)	425 (92%)	35 (8%)	4 (1%)	17	11
1	C	476/548 (87%)	452 (95%)	22 (5%)	2 (0%)	34	30
1	D	465/548 (85%)	435 (94%)	26 (6%)	4 (1%)	17	11
All	All	1878/2192 (86%)	1755 (94%)	110 (6%)	13 (1%)	22	16

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	431	ALA
1	D	356	PRO
1	D	174	GLY
1	D	205	VAL
1	B	205	VAL
1	B	249	LYS
1	B	381	HIS
1	C	205	VAL
1	C	398	LEU
1	D	398	LEU
1	A	205	VAL
1	A	527	HIS

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Mol	Chain	Res	Type
1	B	398	LEU

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	391/451 (87%)	381 (97%)	10 (3%)	46	48
1	B	378/451 (84%)	369 (98%)	9 (2%)	49	51
1	C	390/451 (86%)	381 (98%)	9 (2%)	50	53
1	D	380/451 (84%)	361 (95%)	19 (5%)	24	20
All	All	1539/1804 (85%)	1492 (97%)	47 (3%)	41	40

All (47) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	163	ILE
1	A	265	ARG
1	A	391	SER
1	A	395	MET
1	A	424	GLU
1	A	427	ASP
1	A	450	THR
1	A	483	THR
1	A	516	GLU
1	A	527	HIS
1	B	163	ILE
1	B	177	MET
1	B	305	ASP
1	B	323	LYS
1	B	372	ASP
1	B	377	ILE
1	B	393	LEU
1	B	516	GLU
1	B	527	HIS
1	C	163	ILE

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Mol	Chain	Res	Type
1	C	252	LYS
1	C	290	VAL
1	C	294	GLU
1	C	301	LYS
1	C	395	MET
1	C	436	PHE
1	C	470	GLU
1	C	527	HIS
1	D	92	GLN
1	D	147	LYS
1	D	148	GLU
1	D	163	ILE
1	D	177	MET
1	D	193	ARG
1	D	249	LYS
1	D	294	GLU
1	D	357	SER
1	D	377	ILE
1	D	391	SER
1	D	395	MET
1	D	434[A]	ASN
1	D	434[B]	ASN
1	D	436	PHE
1	D	447	ILE
1	D	451	MET
1	D	505	SER
1	D	527	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (25) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	222	GLN
1	A	278	GLN
1	A	313	ASN
1	A	382	GLN
1	A	390	GLN
1	A	459	ASN
1	B	126	ASN
1	B	222	GLN
1	B	278	GLN
1	B	313	ASN
1	B	382	GLN

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Mol	Chain	Res	Type
1	B	390	GLN
1	B	411	HIS
1	B	459	ASN
1	C	222	GLN
1	C	278	GLN
1	C	313	ASN
1	C	382	GLN
1	C	390	GLN
1	C	411	HIS
1	C	459	ASN
1	D	222	GLN
1	D	313	ASN
1	D	382	GLN
1	D	459	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 ⓘ

Of 8 ligands modelled in this entry, 8 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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(Å²)	Q<0.9
1	A	474/548 (86%)	-0.44	1 (0%)	95	94	22, 35, 50, 61	0
1	B	466/548 (85%)	-0.38	0	100	100	23, 38, 61, 77	0
1	C	475/548 (86%)	-0.40	0	100	100	23, 37, 53, 66	0
1	D	466/548 (85%)	-0.22	3 (0%)	89	88	26, 44, 62, 74	0
All	All	1881/2192 (85%)	-0.36	4 (0%)	95	94	22, 38, 59, 77	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	377	ILE	2.7
1	A	430	GLY	2.3
1	D	429	ARG	2.3
1	D	417	TRP	2.1

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 ⓘ

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(Å²)	Q<0.9
2	CU	A	601	1/1	0.99	0.09	33,33,33,33	0
2	CU	A	602	1/1	0.99	0.09	32,32,32,32	1
2	CU	B	601	1/1	0.99	0.09	37,37,37,37	0
2	CU	B	602	1/1	0.99	0.10	34,34,34,34	1
2	CU	D	602	1/1	0.99	0.10	44,44,44,44	1
2	CU	C	602	1/1	1.00	0.10	35,35,35,35	1
2	CU	D	601	1/1	1.00	0.11	42,42,42,42	0
2	CU	C	601	1/1	1.00	0.11	32,32,32,32	0

6.5 Other polymers ⓘ

There are no such residues in this entry.