Full wwPDB X-ray Structure Validation Report ⓘ

Jan 7, 2024 – 11:58 pm GMT

PDB ID	:	6G5M
Title	:	The structure of thiocyanate dehydrogenase from Thioalkalivibrio paradoxus complex with CU(I) ions.
Authors	:	Polyakov, K.M.; Tsallagov, S.I.; Tikhkonova, T.V.; Popov, V.O.
Deposited on	:	2018-03-29
Resolution	:	2.31 Å(reported)

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

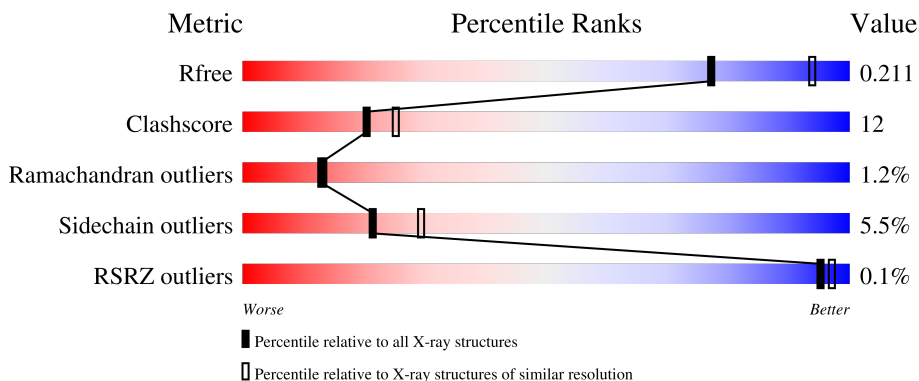|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	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 2.31 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		0.211
Clashscore		12
Ramachandran outliers		1.2%
Sidechain outliers		5.5%
RSRZ outliers		0.1%

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	5974 (2.34-2.30)
Clashscore	141614	6604 (2.34-2.30)
Ramachandran outliers	138981	6523 (2.34-2.30)
Sidechain outliers	138945	6523 (2.34-2.30)
RSRZ outliers	127900	5855 (2.34-2.30)

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	467	70%　　　25%　　· ·
1	B	467	70%　　　27%　　·
1	C	467	73%　　　24%　　·
1	D	467	72%　　　26%　　·

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
1	CSD	B	131[B]	-	-	X	-

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 15507 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	464	Total 3626	C 2316	N 602	O 689	S 19	0	5	0
1	B	466	Total 3639	C 2321	N 606	O 690	S 22	0	7	0
1	C	467	Total 3653	C 2331	N 608	O 692	S 22	0	6	0
1	D	466	Total 3648	C 2326	N 606	O 696	S 20	0	8	0

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	7	Total 7	Cu 7	0	0
2	B	6	Total 6	Cu 6	0	0
2	C	8	Total 8	Cu 8	0	0
2	D	8	Total 8	Cu 8	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	234	Total 234	O 234	0	0
3	B	217	Total 217	O 217	0	0
3	C	222	Total 222	O 222	0	0
3	D	239	Total 239	O 239	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry 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

Chain A:

• Molecule 1: thiocyanate dehydrogenase

Chain B:

• Molecule 1: thiocyanate dehydrogenase

Chain C:

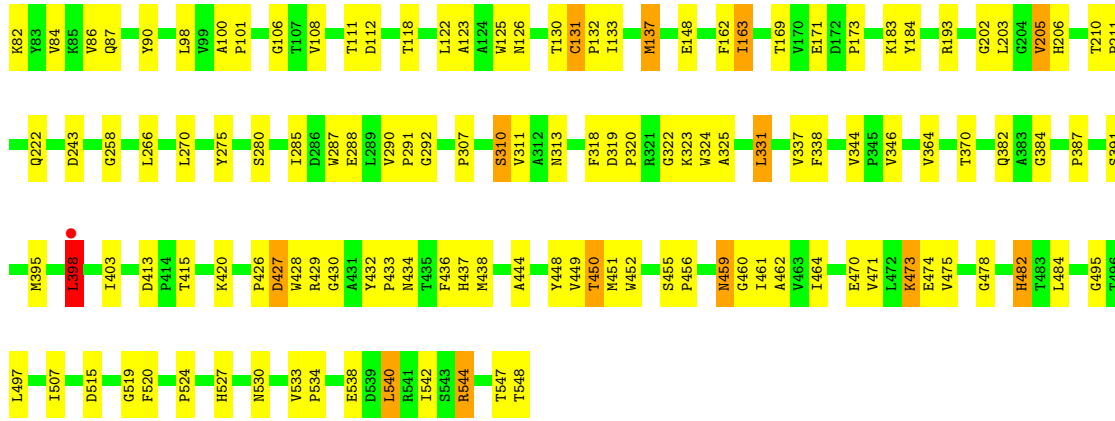K82 Y83 V84 K85 V86 Q87 Y90 L98 V99 A100 P101 G106 T107 V108 T111 D112 T118 L122 A123 A124 W125 N126 T130 C131 P132 I133 M137 E148 F162 I163 T169 V170 E171 D172 P173 K183 Y184 R193 G202 L203 G204 V205 H206 T210 P211

Q222 D243 G258 L266 L270 Y275 S280 I285 D286 W287 E288 L289 V290 P291 G292 P307 S310 V311 A312 N313 F318 D319 P320 R321 G322 K323 W324 A325 L331 V337 F338 V344 P345 V346 V364 T370 Q382 A383 G384 P387 S391

M395 L398 I403 D413 P414 T415 K420 P426 D427 W428 R429 G430 A431 Y432 P433 N434 T435 F436 H437 M438 A444 Y448 V449 T450 M451 W452 S455 P456 N459 G460 I461 A462 V463 I464 E470 V471 L472 K473 E474 V475 G478 H482 T483 L484 G495 T496

L497 I507 D515 G519 F520 P524 H527 N530 V533 P534 E538 D539 L540 R541 I542 S543 R544 T547 T548

• Molecule 1: thiocyanate dehydrogenase

Chain D:

72% 26% •

K82 Q92 L93 L98 P101 G102 S105 G106 T107 A110 L113 M119 A120 W121 L122 A123 A124 W125 N126 T130 C131 P132 H136 M137 A138 E150 F151 V152 G157 N160 L161 F162 I163 V168 D172 P173 K183 L191 V205 H206 I209 T210

V218 G219 D220 K223 R231 E232 A241 W244 R253 L256 R274 K284 I285 D286 W287 V290 P291 G292 G293 E294 I297 H309 S310 V311 A312 N313 D314 D319 P320 R321 V326 A327 S328 M329 R330 L331 C335 E341 N342 Q343 P356 I373

P374 E375 V376 I377 S378 A379 A383 P387 Q390 S391 F392 L393 F394 M395 S396 S397 L398 R399 Q400 I403 S409 D412 A421 V422 V423 D427 W428 ARG G430 A431 N434 T435 F436 P442 D443 A444 Y448 V449 T450 M451 W452 N459 W469 C478 P479 D480

M481 H482 T483 V493 S498 G499 T503 A504 V508 E513 G519 F520 P524 M525 G526 H527 H528 D529 N530 R535 E538 D539 L540 R541 I542 S543 R544 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	90.64Å 162.37Å 90.71Å 90.00° 119.64° 90.00°	Depositor
Resolution (Å)	45.58 – 2.31 45.58 – 2.31	Depositor EDS
% Data completeness (in resolution range)	95.8 (45.58-2.31) 95.9 (45.58-2.31)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.13 (at 2.32Å)	Xtriage
Refinement program	REFMAC 5.8.0158	Depositor
R, R_{free}	0.132 , 0.206 0.138 , 0.211	Depositor DCC
R_{free} test set	4591 reflections (4.80%)	wwPDB-VP
Wilson B-factor (Å^2)	30.6	Xtriage
Anisotropy	0.389	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 22.6	EDS
L-test for twinning[2]	$< |L| > = 0.43, < L^2 > = 0.25$	Xtriage
Estimated twinning fraction	0.059 for -h-l,k,h 0.059 for l,k,-h-l 0.069 for h,-k,-h-l 0.054 for -h-l,-k,l 0.459 for l,-k,h	Xtriage
Reported twinning fraction	0.474 for H, K, L 0.526 for L, -K, H	Depositor
Outliers	0 of 95620 reflections	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	15507	wwPDB-VP
Average B, all atoms (Å^2)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.55% 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: CSD, 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	0.92	0/3746	1.06	9/5108 (0.2%)
1	B	0.90	0/3767	1.01	5/5140 (0.1%)
1	C	0.90	0/3778	1.04	5/5154 (0.1%)
1	D	0.89	0/3786	1.04	8/5164 (0.2%)
All	All	0.90	0/15077	1.04	27/20566 (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	B	0	1
1	C	0	1
All	All	0	2

There are no bond length outliers.

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	231	ARG	NE-CZ-NH2	-7.78	116.41	120.30
1	A	161	LEU	CB-CG-CD2	-7.28	98.62	111.00
1	D	480	ASP	CB-CG-OD1	7.15	124.74	118.30
1	C	430	GLY	N-CA-C	-7.10	95.34	113.10
1	D	231	ARG	NE-CZ-NH1	7.05	123.82	120.30
1	C	331	LEU	C-N-CD	6.91	142.91	128.40
1	D	314	ASP	CB-CG-OD2	6.70	124.33	118.30
1	D	480	ASP	CB-CG-OD2	-6.63	112.33	118.30
1	D	274	ARG	NE-CZ-NH2	-6.15	117.23	120.30
1	A	161	LEU	CA-CB-CG	6.12	129.38	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	137	MET	CG-SD-CE	-6.00	90.61	100.20
1	B	540	LEU	CB-CG-CD1	-5.97	100.85	111.00
1	C	337	VAL	CB-CA-C	-5.91	100.17	111.40
1	B	388	ASP	CB-CG-OD1	5.89	123.60	118.30
1	A	339	ASP	CB-CG-OD1	5.58	123.32	118.30
1	A	438	MET	CG-SD-CE	5.57	109.11	100.20
1	B	438	MET	CG-SD-CE	5.45	108.93	100.20
1	A	447	ILE	CB-CA-C	-5.41	100.78	111.60
1	B	535	ARG	NE-CZ-NH1	5.38	122.99	120.30
1	B	447	ILE	CB-CA-C	-5.27	101.06	111.60
1	A	193	ARG	NE-CZ-NH1	5.23	122.92	120.30
1	A	119	MET	CG-SD-CE	5.22	108.56	100.20
1	A	289	LEU	CA-CB-CG	5.14	127.12	115.30
1	C	482	HIS	CB-CA-C	5.08	120.56	110.40
1	A	339	ASP	CB-CG-OD2	-5.06	113.75	118.30
1	D	314	ASP	CB-CG-OD1	-5.05	113.76	118.30
1	D	290	VAL	CB-CA-C	5.01	120.92	111.40

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	497	LEU	Peptide
1	C	427	ASP	Peptide

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	3626	0	3506	86	0
1	B	3639	0	3502	107	0
1	C	3653	0	3528	89	0
1	D	3648	0	3500	91	0
2	A	7	0	0	0	0
2	B	6	0	0	0	0
2	C	8	0	0	1	0
2	D	8	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	234	0	0	12	0
3	B	217	0	0	6	0
3	C	222	0	0	6	0
3	D	239	0	0	10	0
All	All	15507	0	14036	357	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 12.

All (357) 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:398:LEU:HB3	3:D:823:HOH:O	1.45	1.15
1:B:131[A]:CSD:SG	1:B:161:LEU:HD22	2.02	1.00
1:B:131[A]:CSD:SG	1:B:161:LEU:CD2	2.54	0.96
1:B:131[B]:CSD:SG	1:B:161:LEU:HD23	2.08	0.93
1:C:451[B]:MET:HE3	1:C:462:ALA:HB2	1.55	0.87
1:B:131[B]:CSD:SG	1:B:161:LEU:CD2	2.64	0.85
1:A:450:THR:HG21	1:A:482:HIS:O	1.77	0.84
1:C:437:HIS:HB2	1:C:450:THR:CG2	2.08	0.83
1:B:439:VAL:HG21	1:B:486:ILE:HG22	1.58	0.83
1:B:382:GLN:NE2	1:B:438:MET:SD	2.52	0.82
1:A:175:GLU:OE1	1:A:280[B]:SER:HB2	1.79	0.82
1:C:451[B]:MET:CE	1:C:462:ALA:HB2	2.10	0.81
1:B:291:PRO:HB3	1:B:436:PHE:CE2	2.18	0.78
1:C:437:HIS:HB2	1:C:450:THR:HG21	1.66	0.76
2:C:605:CU:CU	3:C:835:HOH:O	1.35	0.76
1:C:538:GLU:OE2	3:C:701:HOH:O	2.04	0.74
1:A:161:LEU:HD21	1:A:170:VAL:HG21	1.69	0.74
1:A:348:VAL:HG11	1:A:371:VAL:HG21	1.70	0.73
1:B:291:PRO:HB3	1:B:436:PHE:HE2	1.53	0.73
1:C:205:VAL:HG12	1:C:206:HIS:H	1.53	0.73
1:C:461[A]:ILE:HD12	1:C:484:LEU:HD11	1.71	0.72
1:C:428:TRP:N	1:C:428:TRP:CD1	2.55	0.72
1:D:387:PRO:HD2	1:D:444:ALA:HB2	1.70	0.72
1:C:450:THR:HG21	1:C:482:HIS:O	1.89	0.72
1:A:125:TRP:HZ3	1:D:131:CSD:HD2	1.34	0.71
1:C:451[B]:MET:CE	1:C:462:ALA:CB	2.69	0.71
1:A:395:MET:SD	1:A:403:ILE:HG23	2.30	0.71
1:A:426:PRO:O	1:A:429:ARG:HG3	1.91	0.71
1:B:449:VAL:HG23	1:B:451[A]:MET:HE1	1.72	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:439:VAL:CG2	1:B:486:ILE:HG22	2.22	0.69
1:C:307:PRO:O	1:C:310:SER:HB2	1.91	0.69
1:A:367:ASP:HB3	3:A:770:HOH:O	1.94	0.67
1:C:451[B]:MET:HE3	1:C:462:ALA:CB	2.23	0.67
1:A:125:TRP:CE3	3:D:887:HOH:O	2.49	0.66
1:D:319:ASP:OD2	1:D:321:ARG:NH2	2.26	0.66
1:B:450:THR:HG21	1:B:482:HIS:O	1.97	0.65
1:B:89:PHE:CD1	1:C:86:VAL:HB	2.32	0.65
1:C:428:TRP:N	1:C:428:TRP:HD1	1.93	0.64
1:D:138:ALA:HB1	1:D:209:ILE:HG12	1.79	0.64
1:A:193:ARG:HD2	1:A:234:ASP:OD2	1.98	0.64
1:C:437:HIS:HB2	1:C:450:THR:HG23	1.79	0.63
1:D:106:GLY:HA2	1:D:132:PRO:O	1.99	0.63
1:B:142:SER:O	1:B:535:ARG:HA	1.99	0.62
1:A:365:ASP:HB2	3:A:766:HOH:O	1.99	0.62
1:D:499:GLY:O	1:D:503:THR:HG22	2.00	0.62
1:B:433:PRO:HD3	1:B:453:TRP:CZ2	2.34	0.62
1:B:352:PRO:HB3	1:B:377:ILE:HB	1.80	0.61
1:D:311:VAL:HG21	1:D:329:MET:HE2	1.82	0.61
1:B:131[B]:CSD:SG	1:B:173:PRO:CB	2.89	0.61
1:B:507:ILE:HG13	1:B:523:SER:HB2	1.83	0.60
1:D:435:THR:HG22	1:D:435:THR:O	2.01	0.60
1:D:393:LEU:HD23	1:D:403:ILE:HG21	1.84	0.60
1:D:397:SER:O	1:D:398:LEU:HB2	2.01	0.60
1:C:473:LYS:HE2	1:C:515:ASP:HB2	1.84	0.59
1:B:101:PRO:HA	1:B:108:VAL:HG23	1.83	0.59
1:D:450:THR:HG21	1:D:482:HIS:O	2.02	0.59
1:D:377:ILE:HD11	1:D:400:GLN:NE2	2.17	0.59
1:D:397:SER:O	1:D:398:LEU:CB	2.49	0.59
1:D:292:GLY:HA2	1:D:398:LEU:CD1	2.33	0.59
1:C:428:TRP:HD1	1:C:428:TRP:H	1.50	0.59
1:B:449:VAL:HG23	1:B:451[A]:MET:CE	2.33	0.58
1:A:486:ILE:CG2	1:A:542:ILE:HD12	2.33	0.58
1:A:232:GLU:HB3	3:A:719:HOH:O	2.03	0.58
1:C:222:GLN:HB3	1:C:285:ILE:O	2.04	0.58
1:D:285:ILE:HD12	1:D:287:TRP:O	2.03	0.58
1:A:382:GLN:HE22	1:A:548:THR:H	1.52	0.58
1:B:265:ARG:HD2	1:B:267:LYS:HE3	1.85	0.57
1:B:159:LYS:HB2	1:B:286:ASP:O	2.04	0.57
1:A:395:MET:HG2	1:A:435:THR:HB	1.87	0.57
1:A:140:PHE:CE1	1:A:209:ILE:HD12	2.39	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:313:ASN:HB2	1:D:329:MET:HE1	1.87	0.57
1:A:392:PHE:C	1:A:393:LEU:HD12	2.25	0.56
1:B:290:VAL:HB	1:B:291:PRO:CD	2.36	0.56
1:D:442:PRO:HD2	3:D:878:HOH:O	2.05	0.56
1:A:138:ALA:HB1	1:A:209:ILE:HG12	1.86	0.56
1:B:382:GLN:CD	1:B:383:ALA:H	2.09	0.56
1:D:150:GLU:HG2	1:D:183:LYS:HG3	1.88	0.56
1:A:86:VAL:HG12	1:D:519:GLY:HA3	1.88	0.56
1:B:131[A]:CSD:SG	1:B:161:LEU:HD23	2.43	0.56
1:C:451[B]:MET:HE2	1:C:462:ALA:CB	2.36	0.56
1:A:265:ARG:HD2	1:A:267:LYS:HE2	1.88	0.56
1:C:427:ASP:HA	1:C:428:TRP:C	2.26	0.56
1:A:278:GLN:O	1:A:281:LYS:HG3	2.06	0.55
1:B:132:PRO:HD2	1:C:125:TRP:CZ3	2.42	0.55
1:C:449:VAL:HG22	1:C:462:ALA:HB3	1.87	0.55
1:D:459:ASN:HB2	1:D:478:GLY:O	2.07	0.55
1:B:267:LYS:HD2	1:D:172:ASP:HB2	1.89	0.55
1:B:483:THR:HG21	1:B:529:ASP:HA	1.88	0.55
1:B:102:GLY:N	1:B:107:THR:O	2.39	0.55
1:A:165:GLY:HA3	1:A:502:ASN:ND2	2.22	0.55
1:B:422:VAL:HG13	1:B:422:VAL:O	2.06	0.55
1:C:460:GLY:HA3	1:C:475:VAL:O	2.07	0.55
1:D:403:ILE:HB	1:D:423:VAL:HB	1.88	0.54
1:B:182:ILE:HG23	1:B:190:ASN:O	2.07	0.54
1:A:223:LYS:NZ	1:A:279:GLY:O	2.38	0.54
1:A:511:GLU:O	1:A:515:ASP:HA	2.07	0.54
1:B:202:GLY:O	1:B:223:LYS:HE3	2.08	0.54
1:C:126:ASN:ND2	3:C:708:HOH:O	2.34	0.54
1:B:332:PRO:HA	1:B:376:VAL:HG21	1.90	0.54
1:D:431:ALA:O	1:D:434:ASN:ND2	2.41	0.53
1:B:292:GLY:C	1:B:294:GLU:N	2.61	0.53
1:C:464:ILE:CD1	1:C:471:VAL:HG22	2.39	0.53
1:D:294:GLU:HG2	1:D:379:ALA:HB2	1.89	0.53
1:D:450:THR:CG2	1:D:482:HIS:O	2.56	0.53
1:B:292:GLY:C	1:B:294:GLU:H	2.10	0.53
1:D:232[B]:GLU:HG3	3:D:769:HOH:O	2.09	0.53
1:B:117:TRP:HH2	1:C:497:LEU:HD22	1.74	0.53
1:B:511:GLU:O	1:B:515:ASP:HA	2.09	0.52
1:A:141:PRO:HA	1:A:534:PRO:O	2.09	0.52
1:B:131[B]:CSD:SG	1:B:173:PRO:HB3	2.49	0.52
1:A:161:LEU:HD21	1:A:170:VAL:CG2	2.40	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:451[B]:MET:HE2	1:C:462:ALA:HB2	1.92	0.52
1:A:125:TRP:HE3	3:D:887:HOH:O	1.90	0.51
1:B:206:HIS:CE1	3:B:760:HOH:O	2.63	0.51
1:B:538:GLU:O	1:B:541:ARG:HG3	2.10	0.51
1:C:428:TRP:HA	1:C:433:PRO:HD2	1.91	0.51
1:A:194:ASP:O	1:A:197:GLU:HB2	2.11	0.51
1:A:244:TRP:HB2	1:A:311:VAL:HG12	1.93	0.51
1:A:289:LEU:HD11	1:A:331:LEU:HD21	1.93	0.51
1:A:243:ASP:O	1:A:261:MET:HA	2.10	0.51
1:D:482:HIS:CE1	1:D:528:HIS:CD2	2.99	0.51
1:A:98:LEU:O	1:A:110:ALA:HA	2.11	0.51
1:B:131[B]:CSD:SG	1:B:173:PRO:HB2	2.51	0.51
1:B:516:GLU:HA	3:B:748:HOH:O	2.11	0.51
1:D:535:ARG:N	1:D:539:ASP:OD2	2.42	0.51
1:C:111:THR:HG22	1:C:112:ASP:N	2.26	0.50
1:C:291:PRO:HB2	1:C:452:TRP:CZ3	2.46	0.50
1:B:161:LEU:HD23	1:B:173:PRO:HB3	1.93	0.50
1:B:435:THR:HG23	1:B:449:VAL:HG21	1.92	0.50
1:D:232[A]:GLU:HG2	3:D:769:HOH:O	2.11	0.50
1:D:292:GLY:HA2	1:D:398:LEU:HD13	1.92	0.50
1:B:89:PHE:CE1	1:C:86:VAL:HB	2.45	0.50
1:B:281:LYS:NZ	3:B:724:HOH:O	2.44	0.50
1:D:137:MET:HA	1:D:152:VAL:O	2.11	0.50
1:A:98:LEU:HD22	1:A:494:VAL:HG11	1.94	0.50
1:A:396:ASN:HB2	1:A:402:ASN:OD1	2.11	0.50
1:C:364:VAL:HG21	1:C:370:THR:HG23	1.93	0.50
1:B:101:PRO:CA	1:B:108:VAL:HG23	2.42	0.50
1:B:180:TYR:CD1	1:B:191:LEU:HD11	2.47	0.50
1:B:407:ASP:HB2	1:B:420:LYS:HD3	1.94	0.50
1:D:253:ARG:NH1	3:D:709:HOH:O	2.38	0.50
1:D:459:ASN:N	1:D:459:ASN:HD22	2.09	0.50
1:B:123:ALA:HB1	1:B:125:TRP:CD1	2.46	0.49
1:B:126:ASN:ND2	3:B:725:HOH:O	2.45	0.49
1:B:459:ASN:HB2	1:B:478:GLY:O	2.12	0.49
1:A:245:ASP:OD2	3:A:701:HOH:O	2.20	0.49
1:B:439:VAL:HG21	1:B:486:ILE:CG2	2.37	0.49
1:B:449:VAL:CG2	1:B:451[A]:MET:CE	2.89	0.49
1:D:93:LEU:HD12	1:D:113:LEU:O	2.11	0.49
1:B:439:VAL:CG2	1:B:486:ILE:CG2	2.91	0.49
1:A:449:VAL:O	1:A:449:VAL:HG23	2.12	0.49
1:B:242:PHE:HA	1:B:262:THR:O	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:176:GLY:HA2	3:A:761:HOH:O	2.12	0.48
1:C:413:ASP:OD1	1:C:415:THR:OG1	2.29	0.48
1:B:291:PRO:HB3	1:B:436:PHE:CZ	2.47	0.48
1:C:507:ILE:O	1:C:520:PHE:HA	2.14	0.48
1:B:125:TRP:CH2	1:C:132:PRO:HD2	2.48	0.48
1:C:451[A]:MET:SD	1:C:474:GLU:HG2	2.53	0.48
1:A:447:ILE:HG13	1:A:464:ILE:HB	1.96	0.48
1:B:132:PRO:HD2	1:C:125:TRP:CH2	2.47	0.48
1:B:336:VAL:HG22	1:B:348:VAL:HG22	1.96	0.48
1:C:311:VAL:O	1:C:331:LEU:HB2	2.13	0.48
1:B:382:GLN:HG2	1:B:548:THR:OG1	2.14	0.48
1:D:102:GLY:HA3	1:D:105:SER:OG	2.14	0.48
1:A:383:ALA:HA	1:A:393:LEU:O	2.14	0.47
1:A:179:ILE:HD13	1:A:218:VAL:HG21	1.96	0.47
3:A:727:HOH:O	1:D:120:ALA:HB1	2.14	0.47
1:B:293:GLY:HA3	3:B:826:HOH:O	2.13	0.47
1:B:480:ASP:HB2	1:B:500:TYR:CE1	2.49	0.47
1:C:205:VAL:HG12	1:C:206:HIS:N	2.26	0.47
1:C:384:GLY:HA3	1:C:438:MET:CE	2.44	0.47
1:D:101:PRO:HD3	1:D:137:MET:HG2	1.95	0.47
1:A:372:ASP:C	1:A:373:ILE:HG13	2.34	0.47
1:D:191:LEU:HD12	1:D:191:LEU:HA	1.65	0.47
1:A:104:PHE:CZ	1:A:161:LEU:HA	2.50	0.47
1:D:209:ILE:HG22	1:D:210:THR:O	2.15	0.47
1:C:395:MET:SD	1:C:403:ILE:HG23	2.55	0.47
1:D:161:LEU:HD23	1:D:173:PRO:HG3	1.97	0.47
1:A:131:CSD:SG	1:A:161:LEU:HD22	2.55	0.47
1:D:343:GLN:HA	3:D:804:HOH:O	2.15	0.47
1:A:488:TYR:HE2	1:A:532[A]:ILE:HG22	1.79	0.46
1:C:131[B]:CSD:SG	1:C:173:PRO:HB3	2.55	0.46
1:D:162:PHE:HD1	1:D:168[A]:VAL:CG2	2.29	0.46
1:A:178:LYS:NZ	3:A:708:HOH:O	2.37	0.46
1:A:226:CYS:HG	1:A:242:PHE:HZ	1.64	0.46
1:B:223:LYS:NZ	1:B:277:LEU:O	2.49	0.46
1:B:267:LYS:HB3	1:B:268:PRO:HD2	1.97	0.46
1:C:270:LEU:HD12	1:C:275:TYR:O	2.16	0.46
1:D:205:VAL:HG23	1:D:220:ASP:HA	1.97	0.46
1:A:210:THR:HG22	1:A:318:PHE:CZ	2.51	0.46
1:B:103:LYS:HG3	1:B:133:ILE:HG23	1.97	0.46
1:A:277:LEU:HA	1:A:281:LYS:HB2	1.97	0.46
1:B:196:ALA:O	1:B:200:GLY:N	2.47	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:294:GLU:HG2	1:D:379:ALA:CB	2.46	0.46
1:A:414:PRO:HA	1:A:417:TRP:CD1	2.50	0.46
1:C:325:ALA:O	1:C:338:PHE:N	2.39	0.46
1:B:224:ASP:HB2	1:B:284:LYS:HE3	1.98	0.45
1:D:241:ALA:HB1	3:D:852:HOH:O	2.16	0.45
1:D:435:THR:HA	1:D:450:THR:O	2.15	0.45
1:B:403:ILE:HB	1:B:423:VAL:HB	1.98	0.45
1:B:446:LYS:NZ	1:B:512:THR:O	2.47	0.45
1:C:183:LYS:NZ	3:C:731:HOH:O	2.48	0.45
1:C:210:THR:HB	1:C:211:PRO:HD2	1.97	0.45
1:D:206:HIS:O	1:D:218:VAL:HA	2.16	0.45
1:A:326:VAL:CG1	1:A:335:CYS:HB3	2.47	0.45
1:B:141:PRO:HA	1:B:534:PRO:O	2.16	0.45
1:B:102:GLY:HA2	1:B:525:MET:HB3	1.98	0.45
1:C:322:GLY:HA2	3:C:709:HOH:O	2.16	0.45
1:C:387:PRO:HD2	1:C:444:ALA:HB2	1.99	0.45
1:C:106:GLY:HA2	1:C:132:PRO:O	2.17	0.45
1:C:148:GLU:HA	1:C:184:TYR:O	2.17	0.45
1:C:163:ILE:O	1:C:163:ILE:CG2	2.64	0.45
1:C:163:ILE:HD11	1:C:287:TRP:CD1	2.52	0.45
1:A:246:PRO:HD2	1:A:249:LYS:HZ1	1.80	0.45
1:A:258:GLY:HA3	1:A:374:PRO:O	2.17	0.45
1:A:326:VAL:HG12	1:A:335:CYS:HB3	1.99	0.45
1:B:161:LEU:HD12	1:B:168:VAL:HG11	1.98	0.45
1:D:331:LEU:O	1:D:376:VAL:HG11	2.17	0.45
1:A:158:GLY:HA2	3:A:914:HOH:O	2.17	0.44
1:A:278:GLN:NE2	3:A:717:HOH:O	2.44	0.44
1:C:108:VAL:O	1:C:108:VAL:CG1	2.65	0.44
1:A:205:VAL:HG12	1:A:206:HIS:H	1.82	0.44
1:C:461[A]:ILE:HD11	1:C:484:LEU:HD21	1.98	0.44
1:D:161:LEU:HG	1:D:168[B]:VAL:HG11	1.98	0.44
1:D:383:ALA:HB2	1:D:394:PHE:CD1	2.53	0.44
1:D:390:GLN:OE1	1:D:409:SER:HB3	2.18	0.44
1:D:290:VAL:HG22	1:D:291:PRO:HD2	1.99	0.44
1:B:435:THR:HG23	1:B:449:VAL:CG2	2.47	0.44
1:C:98:LEU:HD11	1:C:530:ASN:HB2	1.99	0.44
1:D:124:ALA:HB3	1:D:132:PRO:HB3	2.00	0.44
1:B:365:ASP:O	1:B:367:ASP:N	2.51	0.44
1:B:265:ARG:NE	1:B:367:ASP:OD1	2.44	0.44
1:C:100:ALA:HA	1:C:101:PRO:HD3	1.74	0.44
1:C:292:GLY:HA3	1:C:398:LEU:HD13	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:136:HIS:HB2	1:D:205:VAL:O	2.18	0.44
1:B:86:VAL:HG12	1:C:519:GLY:HA3	1.99	0.44
1:B:382:GLN:HB2	1:B:436:PHE:O	2.17	0.44
1:B:422:VAL:O	1:B:422:VAL:CG1	2.65	0.44
1:A:393:LEU:HA	1:A:404:MET:O	2.18	0.44
1:B:325:ALA:HB2	1:B:340:ARG:HD2	1.99	0.44
1:A:449:VAL:CG2	1:A:462:ALA:HB3	2.48	0.43
1:C:382:GLN:NE2	1:C:548:THR:OG1	2.47	0.43
1:C:460:GLY:O	1:C:461[A]:ILE:HD13	2.17	0.43
1:D:327:ALA:O	1:D:335:CYS:HA	2.18	0.43
1:A:251:LEU:O	1:A:298:GLU:HA	2.18	0.43
1:B:238:TYR:CD1	1:B:238:TYR:C	2.91	0.43
1:C:87:GLN:HA	1:C:90:TYR:HD2	1.82	0.43
1:D:498:SER:HB3	1:D:526:GLY:HA2	2.00	0.43
1:B:98:LEU:HB3	1:B:111:THR:HB	2.00	0.43
1:B:118:THR:HG21	1:C:524:PRO:HA	2.00	0.43
1:B:127:TYR:HA	1:C:169:THR:OG1	2.19	0.43
1:B:159:LYS:HG3	1:B:286:ASP:HB3	2.00	0.43
1:C:211:PRO:HD3	1:C:318:PHE:CB	2.47	0.43
1:D:102:GLY:HA2	1:D:525:MET:HB3	1.99	0.43
1:D:122:LEU:HD11	1:D:191:LEU:HD13	2.00	0.43
1:A:82:LYS:HE3	1:D:513:GLU:OE1	2.17	0.43
1:B:387:PRO:HG2	1:B:444:ALA:HB2	2.00	0.43
1:B:524:PRO:C	1:B:525:MET:HG3	2.39	0.43
1:C:538:GLU:CD	1:C:538:GLU:H	2.21	0.43
1:C:162:PHE:HZ	1:C:171:GLU:O	2.02	0.43
1:D:110:ALA:O	1:D:119:MET:N	2.47	0.43
1:C:387:PRO:HG3	1:C:542:ILE:HG22	2.01	0.43
1:D:291:PRO:HB2	1:D:452:TRP:CZ3	2.54	0.43
1:D:387:PRO:HG3	1:D:542:ILE:CG2	2.49	0.43
1:A:166:VAL:HG11	1:D:126:ASN:HD22	1.84	0.43
1:A:438:MET:HE2	1:A:547:THR:CG2	2.49	0.43
1:C:455:SER:HA	1:C:456:PRO:HA	1.81	0.43
1:B:106:GLY:HA2	1:B:132:PRO:O	2.19	0.43
1:B:378:SER:HB2	1:B:400:GLN:HG3	2.01	0.43
1:C:459:ASN:HB2	1:C:478:GLY:O	2.18	0.43
1:B:311:VAL:HG12	1:B:332:PRO:HG3	2.01	0.43
1:D:421:ALA:HB2	3:D:731:HOH:O	2.18	0.43
1:B:434:ASN:HB3	1:B:436:PHE:CE1	2.54	0.42
1:C:202:GLY:O	1:C:203:LEU:HD23	2.19	0.42
1:C:451[B]:MET:HE2	1:C:462:ALA:HB3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:136:HIS:O	1:B:153:VAL:HG23	2.18	0.42
1:C:533:VAL:HA	1:C:534:PRO:HD3	1.84	0.42
1:B:206:HIS:O	1:B:218:VAL:HA	2.19	0.42
1:D:377:ILE:HD11	1:D:400:GLN:HE22	1.83	0.42
1:B:404:MET:SD	1:B:419:LYS:HG2	2.60	0.42
1:D:284:LYS:NZ	1:D:309:HIS:O	2.48	0.42
1:D:448:TYR:CG	1:D:493:VAL:HG21	2.54	0.42
1:A:232:GLU:HG2	3:A:859:HOH:O	2.19	0.42
1:B:211:PRO:O	1:B:537:LEU:HD22	2.20	0.42
1:C:438:MET:HA	1:C:448:TYR:O	2.20	0.42
1:C:478:GLY:HA2	3:C:902:HOH:O	2.19	0.42
1:D:524:PRO:C	1:D:525:MET:HG3	2.39	0.42
1:D:292:GLY:HA2	1:D:398:LEU:HD11	2.01	0.42
1:D:313:ASN:HB2	1:D:329:MET:CE	2.49	0.42
1:A:177:MET:HE2	3:A:835:HOH:O	2.19	0.42
1:A:536:THR:O	1:A:539:ASP:HB2	2.18	0.42
1:B:295:LEU:HD23	1:B:398:LEU:HD23	2.01	0.42
1:B:453:TRP:HB3	1:B:457:THR:HB	2.02	0.42
1:C:484:LEU:HD23	1:C:495:GLY:HA3	2.01	0.42
1:C:544:ARG:HD3	1:C:548:THR:HA	2.02	0.42
1:D:321:ARG:HE	1:D:321:ARG:HB2	1.71	0.42
1:D:326:VAL:CG1	1:D:335:CYS:HB3	2.50	0.42
1:A:287:TRP:CZ2	1:A:302:VAL:HA	2.55	0.42
1:C:432:TYR:HB3	1:C:433:PRO:HA	2.02	0.42
1:D:244:TRP:HZ3	1:D:373:ILE:HD12	1.85	0.42
1:A:488:TYR:CE2	1:A:532[A]:ILE:HG22	2.54	0.42
1:C:461[A]:ILE:CD1	1:C:484:LEU:HD21	2.50	0.42
1:A:393:LEU:HD12	1:A:393:LEU:N	2.35	0.41
1:A:159:LYS:HA	1:A:162:PHE:CE2	2.55	0.41
1:B:92:GLN:OE1	1:C:84:VAL:HG23	2.20	0.41
1:D:256:LEU:O	1:D:375:GLU:HB2	2.20	0.41
1:D:161:LEU:CG	1:D:168[B]:VAL:HG11	2.50	0.41
1:A:435:THR:HG23	1:A:451:MET:CE	2.50	0.41
1:B:292:GLY:O	1:B:295:LEU:HB2	2.20	0.41
1:B:376:VAL:HA	3:B:750:HOH:O	2.21	0.41
1:B:512:THR:HA	1:B:515:ASP:OD1	2.20	0.41
1:D:157:GLY:O	1:D:160:ASN:HB2	2.20	0.41
1:D:290:VAL:HG22	1:D:291:PRO:CD	2.50	0.41
1:D:387:PRO:O	1:D:541:ARG:HD3	2.20	0.41
1:B:124:ALA:HB3	1:B:132:PRO:HB3	2.03	0.41
1:B:437:HIS:O	1:B:449:VAL:HB	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:287:TRP:HD1	1:C:288:GLU:O	2.03	0.41
1:D:508:VAL:HG23	1:D:520:PHE:CE1	2.56	0.41
1:A:118:THR:O	1:D:504:ALA:HA	2.20	0.41
1:C:324:TRP:CZ3	1:C:346:VAL:HG21	2.56	0.41
1:C:437:HIS:ND1	1:C:548:THR:O	2.48	0.41
1:C:540:LEU:HD23	1:C:540:LEU:HA	1.91	0.41
1:A:210:THR:HB	1:A:211:PRO:CD	2.51	0.41
1:A:435:THR:HG23	1:A:451:MET:HE2	2.02	0.41
1:A:535:ARG:HG3	3:A:847:HOH:O	2.21	0.41
1:D:163:ILE:HD11	1:D:287:TRP:CG	2.56	0.41
1:D:392:PHE:C	1:D:393:LEU:HD12	2.41	0.41
1:A:137:MET:HA	1:A:152:VAL:O	2.21	0.41
1:A:150:GLU:OE1	1:A:231:ARG:NH2	2.42	0.41
1:A:264:LYS:HD2	1:A:368:THR:HG23	2.02	0.41
1:A:436:PHE:N	1:A:436:PHE:CD2	2.87	0.41
1:B:317:VAL:O	1:B:325:ALA:HA	2.21	0.41
1:D:341:GLU:HG3	1:D:342:ASN:N	2.36	0.41
1:A:349:LEU:HD23	1:A:358:GLN:HG2	2.03	0.41
1:B:449:VAL:CG2	1:B:451[A]:MET:HE1	2.45	0.41
1:A:435:THR:HA	1:A:450:THR:O	2.21	0.40
1:B:291:PRO:CB	1:B:436:PHE:HE2	2.28	0.40
1:B:504:ALA:HA	1:C:118:THR:O	2.20	0.40
1:C:319:ASP:HA	1:C:320:PRO:HD3	1.94	0.40
1:D:448:TYR:CD1	1:D:493:VAL:HG21	2.55	0.40
1:D:544:ARG:HD3	1:D:544:ARG:HA	1.82	0.40
1:C:122:LEU:HD23	1:C:123:ALA:N	2.36	0.40
1:C:148:GLU:OE2	1:C:183:LYS:HE2	2.21	0.40
1:D:98:LEU:CD1	1:D:530:ASN:HD22	2.34	0.40
1:D:105:SER:O	1:D:107:THR:HG23	2.20	0.40
1:A:138:ALA:O	1:A:151:PHE:HB2	2.22	0.40
1:D:162:PHE:HD1	1:D:168[A]:VAL:HG21	1.85	0.40
1:D:311:VAL:CG2	1:D:329:MET:HE2	2.50	0.40
1:A:323:LYS:HD3	1:A:324:TRP:CZ2	2.57	0.40
1:C:111:THR:HG22	1:C:112:ASP:H	1.85	0.40
1:A:217:ALA:HA	1:A:227:ALA:O	2.21	0.40
1:B:101:PRO:HD2	1:B:529:ASP:O	2.21	0.40
1:D:387:PRO:HG3	1:D:542:ILE:HG22	2.03	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	464/467 (99%)	416 (90%)	43 (9%)	5 (1%)	14	15
1	B	467/467 (100%)	427 (91%)	36 (8%)	4 (1%)	17	19
1	C	469/467 (100%)	419 (89%)	41 (9%)	9 (2%)	8	6
1	D	469/467 (100%)	434 (92%)	31 (7%)	4 (1%)	17	19
All	All	1869/1868 (100%)	1696 (91%)	151 (8%)	22 (1%)	13	13

All (22) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	398	LEU
1	A	312	ALA
1	A	398	LEU
1	B	366	ASP
1	C	429	ARG
1	D	205	VAL
1	C	193	ARG
1	C	323	LYS
1	C	398	LEU
1	A	205	VAL
1	B	205	VAL
1	D	469	TRP
1	A	291	PRO
1	B	249	LYS
1	C	133	ILE
1	C	540	LEU
1	B	291	PRO
1	D	356	PRO
1	A	356	PRO
1	C	426	PRO
1	C	205	VAL
1	C	258	GLY

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	392/391 (100%)	369 (94%)	23 (6%)	19	26
1	B	393/391 (100%)	370 (94%)	23 (6%)	19	26
1	C	396/391 (101%)	373 (94%)	23 (6%)	20	27
1	D	396/391 (101%)	377 (95%)	19 (5%)	25	35
All	All	1577/1564 (101%)	1489 (94%)	88 (6%)	21	29

All (88) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	105	SER
1	A	142	SER
1	A	188	ARG
1	A	218	VAL
1	A	243	ASP
1	A	249	LYS
1	A	303	SER
1	A	357	SER
1	A	360	GLN
1	A	366	ASP
1	A	368	THR
1	A	372	ASP
1	A	395	MET
1	A	412	ASP
1	A	426	PRO
1	A	429	ARG
1	A	435	THR
1	A	436	PHE
1	A	447	ILE
1	A	450	THR
1	A	453	TRP
1	A	523	SER
1	A	527	HIS
1	B	84	VAL

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Mol	Chain	Res	Type
1	B	92	GLN
1	B	161	LEU
1	B	163	ILE
1	B	193	ARG
1	B	243	ASP
1	B	250	ASP
1	B	295	LEU
1	B	305	ASP
1	B	332	PRO
1	B	341	GLU
1	B	375	GLU
1	B	382	GLN
1	B	395	MET
1	B	408	SER
1	B	447	ILE
1	B	449	VAL
1	B	455[A]	SER
1	B	455[B]	SER
1	B	497	LEU
1	B	505[A]	SER
1	B	505[B]	SER
1	B	527	HIS
1	C	82	LYS
1	C	130	THR
1	C	137	MET
1	C	163	ILE
1	C	243	ASP
1	C	266	LEU
1	C	280	SER
1	C	290	VAL
1	C	310	SER
1	C	313	ASN
1	C	344	VAL
1	C	391	SER
1	C	398	LEU
1	C	420	LYS
1	C	434	ASN
1	C	436	PHE
1	C	450	THR
1	C	459	ASN
1	C	470	GLU
1	C	473	LYS

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Mol	Chain	Res	Type
1	C	527	HIS
1	C	544	ARG
1	C	547	THR
1	D	92	GLN
1	D	130	THR
1	D	205	VAL
1	D	223	LYS
1	D	290	VAL
1	D	297	ILE
1	D	341	GLU
1	D	356	PRO
1	D	377	ILE
1	D	395	MET
1	D	412	ASP
1	D	422	VAL
1	D	427	ASP
1	D	434	ASN
1	D	436	PHE
1	D	459	ASN
1	D	483	THR
1	D	527	HIS
1	D	538	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	222	GLN
1	A	382	GLN
1	B	126	ASN
1	B	502	ASN
1	C	278	GLN
1	C	390	GLN
1	C	401	ASN
1	D	126	ASN
1	D	192	GLN
1	D	342	ASN
1	D	360	GLN
1	D	530	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

6 non-standard protein/DNA/RNA residues are 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	#$|Z| > 2$
1	CSD	A	131	1	3,7,8	1.07	0	1,8,10	2.01	1 (100%)
1	CSD	C	131[B]	-	4,5,8	1.49	1 (25%)	1,5,10	2.06	1 (100%)
1	CSD	C	131[A]	-	4,5,8	1.54	1 (25%)	1,5,10	1.51	0
1	CSD	D	131	1	3,6,8	1.18	0	0,6,10	-	-
1	CSD	B	131[B]	-	4,5,8	1.02	0	1,5,10	1.26	0
1	CSD	B	131[A]	-	4,5,8	0.69	0	1,5,10	0.32	0

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
1	CSD	A	131	1	-	2/2/6/8	-
1	CSD	C	131[B]	-	-	1/1/4/8	-
1	CSD	C	131[A]	-	-	1/1/4/8	-
1	CSD	D	131	1	-	1/1/5/8	-
1	CSD	B	131[B]	-	-	1/1/4/8	-
1	CSD	B	131[A]	-	-	1/1/4/8	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	131[A]	CSD	CB-CA	2.44	1.55	1.53
1	C	131[B]	CSD	CB-CA	2.44	1.55	1.53

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	131[B]	CSD	CA-CB-SG	-2.06	110.00	114.44
1	A	131	CSD	OD1-SG-CB	-2.01	101.70	105.54

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	131	CSD	N-CA-CB-SG
1	A	131	CSD	CA-CB-SG-OD1
1	B	131[A]	CSD	N-CA-CB-SG
1	B	131[B]	CSD	N-CA-CB-SG
1	C	131[A]	CSD	N-CA-CB-SG
1	C	131[B]	CSD	N-CA-CB-SG
1	D	131	CSD	N-CA-CB-SG

There are no ring outliers.

5 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	131	CSD	1	0
1	C	131[B]	CSD	1	0
1	D	131	CSD	1	0
1	B	131[B]	CSD	5	0
1	B	131[A]	CSD	3	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 29 ligands modelled in this entry, 29 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 (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, 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	463/467 (99%)	-0.73	0	100	100	23, 36, 55, 88	0
1	B	465/467 (99%)	-0.73	0	100	100	21, 36, 58, 83	0
1	C	466/467 (99%)	-0.76	1 (0%)	95	97	23, 36, 51, 81	0
1	D	465/467 (99%)	-0.79	0	100	100	24, 36, 50, 82	0
All	All	1859/1868 (99%)	-0.75	1 (0%)	95	97	21, 36, 53, 88	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	398	LEU	2.5

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

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
1	CSD	B	131[A]	6/9	0.94	0.12	27,31,34,37	2
1	CSD	B	131[B]	6/9	0.94	0.12	27,34,39,50	2
1	CSD	C	131[A]	6/9	0.95	0.09	38,40,43,44	1
1	CSD	C	131[B]	6/9	0.95	0.09	38,40,43,44	1
1	CSD	A	131	8/9	0.96	0.11	25,35,39,44	0
1	CSD	D	131	7/9	0.96	0.08	36,41,46,55	0

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(Å^2)	Q<0.9
2	CU	A	606	1/1	0.91	0.13	60,60,60,60	1
2	CU	D	606	1/1	0.94	0.13	31,31,31,31	1
2	CU	C	608	1/1	0.97	0.12	36,36,36,36	1
2	CU	A	603	1/1	0.98	0.10	29,29,29,29	1
2	CU	D	603	1/1	0.98	0.12	23,23,23,23	1
2	CU	A	607	1/1	0.98	0.12	41,41,41,41	1
2	CU	D	607	1/1	0.98	0.17	43,43,43,43	1
2	CU	C	603	1/1	0.99	0.08	30,30,30,30	1
2	CU	C	606	1/1	0.99	0.09	25,25,25,25	1
2	CU	C	607	1/1	0.99	0.17	35,35,35,35	1
2	CU	A	605	1/1	0.99	0.17	19,19,19,19	1
2	CU	B	603	1/1	0.99	0.11	26,26,26,26	1
2	CU	B	605	1/1	0.99	0.15	16,16,16,16	1
2	CU	B	606	1/1	0.99	0.14	32,32,32,32	1
2	CU	D	608	1/1	0.99	0.12	26,26,26,26	1
2	CU	B	601	1/1	1.00	0.10	36,36,36,36	0
2	CU	C	604	1/1	1.00	0.13	29,29,29,29	1
2	CU	C	605	1/1	1.00	0.21	18,18,18,18	1
2	CU	B	602	1/1	1.00	0.17	22,22,22,22	1
2	CU	A	602	1/1	1.00	0.15	26,26,26,26	1
2	CU	B	604	1/1	1.00	0.15	35,35,35,35	1
2	CU	D	601	1/1	1.00	0.07	41,41,41,41	0
2	CU	D	602	1/1	1.00	0.15	35,35,35,35	1
2	CU	A	601	1/1	1.00	0.10	41,41,41,41	0
2	CU	D	604	1/1	1.00	0.11	39,39,39,39	1
2	CU	D	605	1/1	1.00	0.13	31,31,31,31	1
2	CU	A	604	1/1	1.00	0.14	40,40,40,40	1
2	CU	C	601	1/1	1.00	0.08	36,36,36,36	0
2	CU	C	602	1/1	1.00	0.15	35,35,35,35	1

6.5 Other polymers ⓘ

There are no such residues in this entry.