



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 1, 2014 – 02:06 AM GMT

PDB ID : 2V8V
Title : CRYSTAL STRUCTURE OF MUTANT R322A OF BETA-ALANINE SYNTHASE FROM SACCHAROMYCES KLUYVERI
Authors : Lundgren, S.; Andersen, B.; Piskur, J.; Dobritzsch, D.
Deposited on : 2007-08-15
Resolution : 2.90 Å(reported)

This is a full wwPDB validation report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

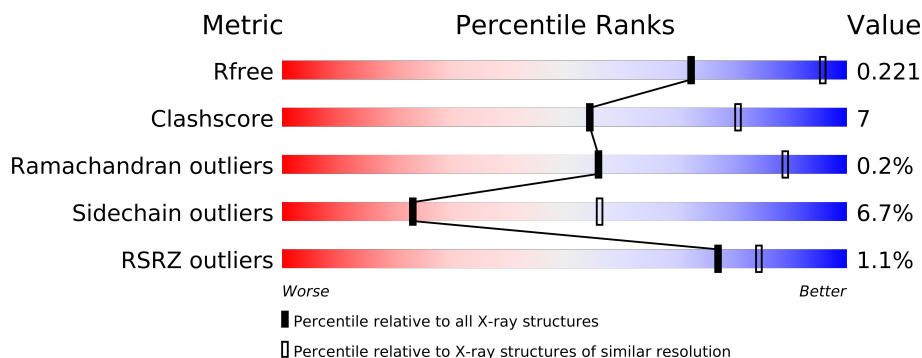
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.15 2013
Xtriage (Phenix) : dev-1323
EDS : stable22639
Percentile statistics : 21963
Refmac : 5.8.0049
CCP4 : 6.3.0 (Settle)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP) : stable22683

1 Overall quality at a glance

The reported resolution of this entry is 2.90 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}	66092	1053 (2.90-2.90)
Clashscore	79885	1326 (2.90-2.90)
Ramachandran outliers	78287	1290 (2.90-2.90)
Sidechain outliers	78261	1292 (2.90-2.90)
RSRZ outliers	66119	1054 (2.90-2.90)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	474	
1	B	474	
1	C	474	
1	D	474	

The following table lists non-polymeric compounds that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Geometry	Electron density
3	URP	C	1457	-	X
3	URP	D	1456	-	X

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 13410 atoms, of which 0 are hydrogen and 0 are deuterium.

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 BETA-ALANINE SYNTHASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	435	Total	C	N	O	S	0	1	0
			3360	2120	575	649	16			
1	B	431	Total	C	N	O	S	0	0	0
			3324	2097	567	644	16			
1	C	431	Total	C	N	O	S	0	0	0
			3324	2097	567	644	16			
1	D	435	Total	C	N	O	S	0	0	0
			3355	2117	572	650	16			

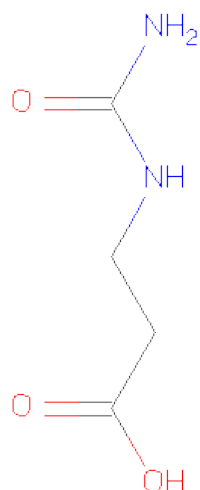
There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	322	ALA	ARG	ENGINEERED MUTATION	UNP Q96W94
B	322	ALA	ARG	ENGINEERED MUTATION	UNP Q96W94
C	322	ALA	ARG	ENGINEERED MUTATION	UNP Q96W94
D	322	ALA	ARG	ENGINEERED MUTATION	UNP Q96W94

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

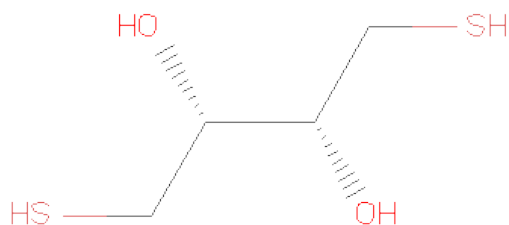
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	2	Total	Zn	0	0
			2	2		
2	A	2	Total	Zn	0	0
			2	2		
2	D	2	Total	Zn	0	0
			2	2		
2	C	2	Total	Zn	0	0
			2	2		

- Molecule 3 is N-(AMINOCARBONYL)-BETA-ALANINE (three-letter code: URP) (formula: C₄H₈N₂O₃).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	B	1	Total	C	N	O	0	0
			9	4	2	3		
3	C	1	Total	C	N	O	0	0
			9	4	2	3		
3	D	1	Total	C	N	O	0	0
			9	4	2	3		

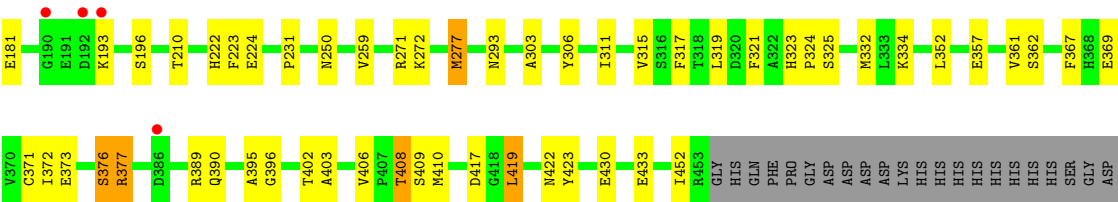
- Molecule 4 is 2,3-DIHYDROXY-1,4-DITHIOBUTANE (three-letter code: DTT) (formula: C₄H₁₀O₂S₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	C	1	Total	C	O	S	0	0
			8	4	2	2		

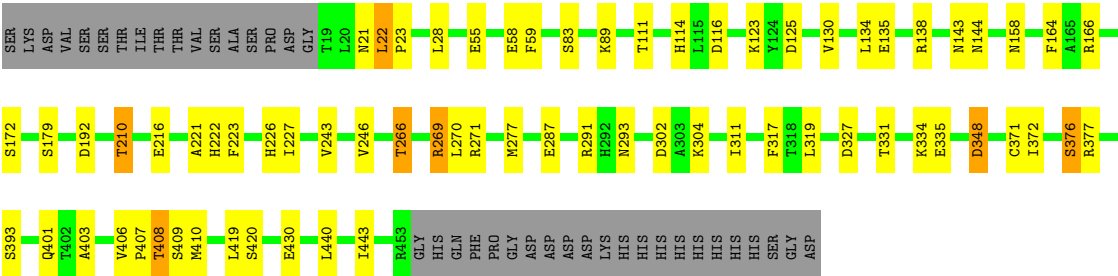
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	O	0	0
			1	1		
5	B	1	Total	O	0	0
			1	1		
5	C	1	Total	O	0	0
			1	1		
5	D	1	Total	O	0	0
			1	1		



● Molecule 1: BETA-ALANINE SYNTHASE

Chain D:



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	77.48Å 84.90Å 104.85Å 67.45° 67.81° 62.75°	Depositor
Resolution (Å)	45.00 – 2.90 43.80 – 2.90	Depositor EDS
% Data completeness (in resolution range)	93.5 (45.00-2.90) 84.6 (43.80-2.90)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.25 (at 2.90Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.194 , 0.246 0.197 , 0.221	Depositor DCC
R_{free} test set	2012 reflections (5.31%)	DCC
Wilson B-factor (Å ²)	33.8	Xtriage
Anisotropy	0.390	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 11.3	EDS
Estimated twinning fraction	0.430 for h,h-k,h-l	Xtriage
L-test for twinning	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	0 of 39859 reflections	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	13410	wwPDB-VP
Average B, all atoms (Å ²)	35.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.54% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, URP, DTT

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	0.59	0/3440	0.69	1/4666 (0.0%)
1	B	0.53	0/3401	0.64	0/4613
1	C	0.54	0/3401	0.66	0/4613
1	D	0.59	0/3432	0.67	1/4657 (0.0%)
All	All	0.56	0/13674	0.67	2/18549 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	125	ASP	CB-CG-OD1	6.58	124.22	118.30
1	D	125	ASP	CB-CG-OD1	5.87	123.58	118.30

There are no chirality outliers.

There are no planarity outliers.

5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3360	0	3252	57	0
1	B	3324	0	3209	50	0
1	C	3324	0	3208	38	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	3355	0	3243	45	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	B	9	0	7	0	0
3	C	9	0	7	2	0
3	D	9	0	7	0	0
4	C	8	0	9	0	0
5	A	1	0	0	0	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
All	All	13410	0	12942	178	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 7.

All (178) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:D:403:ALA:HA	1:D:408:THR:CG2	2.04	0.86
1:A:265:THR:HG21	1:B:229:GLN:O	1.77	0.84
1:A:403:ALA:HA	1:A:408:THR:HG23	1.59	0.83
1:C:57:HIS:O	1:C:123:LYS:NZ	2.12	0.82
1:D:22:LEU:HB2	1:D:23:PRO:HD2	1.64	0.77
1:B:57:HIS:O	1:B:123:LYS:NZ	2.17	0.77
1:D:22:LEU:HD23	1:D:22:LEU:H	1.48	0.76
1:C:403:ALA:HA	1:C:408:THR:CG2	2.16	0.75
1:B:403:ALA:HA	1:B:408:THR:HG23	1.69	0.75
1:D:406:VAL:O	1:D:408:THR:HG22	1.87	0.74
1:A:406:VAL:O	1:A:408:THR:HG22	1.87	0.74
1:C:403:ALA:HA	1:C:408:THR:HG23	1.68	0.74
1:D:291:ARG:NH2	1:D:335:GLU:OE1	2.19	0.74
1:A:309:ASN:HD22	1:A:309:ASN:C	1.91	0.74
1:A:266:THR:HG23	1:B:231:PRO:HG3	1.70	0.74
1:A:403:ALA:HA	1:A:408:THR:CG2	2.17	0.73
1:A:59:PHE:O	1:A:123:LYS:HE2	1.89	0.73
1:D:22:LEU:N	1:D:22:LEU:CD2	2.55	0.70
1:D:22:LEU:H	1:D:22:LEU:CD2	2.03	0.70
1:B:403:ALA:HA	1:B:408:THR:CG2	2.22	0.69
1:B:84:LEU:HD21	1:B:138:ARG:HG3	1.73	0.69
1:C:59:PHE:O	1:C:123:LYS:HE2	1.93	0.68

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:D:403:ALA:HA	1:D:408:THR:HG21	1.76	0.68
1:B:309:ASN:HD22	1:B:309:ASN:H	1.42	0.67
1:A:28:LEU:HD12	1:A:440:LEU:HD11	1.76	0.67
1:C:317:PHE:HE1	1:C:319:LEU:HD21	1.59	0.67
1:D:55:GLU:HB2	1:D:58:GLU:HG3	1.77	0.66
1:B:262:HIS:HB3	1:B:265:THR:HG22	1.78	0.66
1:A:277:MET:HG3	1:A:352:LEU:HD22	1.77	0.66
1:C:395:ALA:HA	3:C:1457:URP:H51	1.79	0.64
1:C:231:PRO:HG3	1:D:266:THR:HG23	1.79	0.64
1:B:317:PHE:HE1	1:B:319:LEU:HD21	1.63	0.64
1:D:403:ALA:HA	1:D:408:THR:HG23	1.80	0.64
1:A:222:HIS:HB3	1:A:408:THR:HB	1.82	0.61
1:A:302:ASP:OD2	1:B:306:TYR:OH	2.19	0.60
1:A:135:GLU:OE1	1:A:135:GLU:HA	2.00	0.60
1:C:317:PHE:CE1	1:C:319:LEU:HD21	2.37	0.59
1:D:172:SER:HA	1:D:401:GLN:HE21	1.68	0.59
1:A:229:GLN:O	1:B:265:THR:HG21	2.03	0.59
1:A:171:SER:OG	1:A:398:ASP:OD1	2.19	0.58
1:A:371:CYS:HB2	1:A:409:SER:HB2	1.84	0.58
1:A:25:ALA:HB2	1:A:445:ASN:HD21	1.69	0.57
1:C:306:TYR:OH	1:D:302:ASP:OD2	2.21	0.57
1:C:389:ARG:HG2	1:C:390:GLN:O	2.05	0.57
1:D:28:LEU:HD12	1:D:440:LEU:HD11	1.88	0.56
1:C:406:VAL:O	1:C:408:THR:HG22	2.06	0.56
1:A:246:VAL:HG22	1:A:393:SER:HB3	1.88	0.55
1:B:371:CYS:HB3	1:B:409:SER:HB3	1.88	0.55
1:A:271:ARG:HG2	1:A:311:ILE:HD13	1.89	0.55
1:A:371:CYS:CB	1:A:409:SER:HB2	2.37	0.55
1:C:259:VAL:HG23	1:C:272:LYS:HD2	1.89	0.55
1:A:262:HIS:HB3	1:A:265:THR:HG22	1.89	0.54
1:B:252:GLN:HB2	1:B:319:LEU:HB2	1.89	0.53
1:C:373:GLU:O	1:C:377:ARG:HB2	2.08	0.53
1:B:317:PHE:CE1	1:B:319:LEU:HD21	2.43	0.53
1:C:271:ARG:HG2	1:C:311:ILE:HD13	1.91	0.53
1:D:317:PHE:CE1	1:D:319:LEU:HD21	2.44	0.53
1:D:222:HIS:HB3	1:D:408:THR:HB	1.90	0.53
1:B:371:CYS:O	1:B:375:VAL:HG23	2.09	0.52
1:B:90:VAL:O	1:B:210:THR:HG23	2.10	0.52
1:D:403:ALA:CA	1:D:408:THR:HG21	2.39	0.52
1:B:406:VAL:O	1:B:408:THR:HG22	2.10	0.52
1:B:323:HIS:ND1	1:B:324:PRO:HD2	2.24	0.52
1:D:22:LEU:HD23	1:D:22:LEU:N	2.16	0.52

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:373:GLU:O	1:B:377:ARG:HB2	2.10	0.52
1:B:222:HIS:HB3	1:B:408:THR:HB	1.92	0.52
1:A:309:ASN:C	1:A:309:ASN:ND2	2.61	0.51
1:D:403:ALA:N	1:D:408:THR:HG21	2.25	0.51
1:A:51[B]:ARG:NH1	1:A:53:GLY:O	2.35	0.51
1:D:372:ILE:O	1:D:376:SER:HB2	2.10	0.51
1:D:158:ASN:HD21	1:D:164:PHE:HB2	1.75	0.51
1:C:181:GLU:H	1:C:181:GLU:CD	2.14	0.51
1:B:402:THR:OG1	1:B:408:THR:HG21	2.12	0.50
1:A:207:ILE:O	1:A:207:ILE:HG22	2.12	0.49
1:B:277:MET:HG3	1:B:352:LEU:HD22	1.93	0.49
1:D:158:ASN:ND2	1:D:164:PHE:HB2	2.27	0.49
1:B:181:GLU:H	1:B:181:GLU:CD	2.15	0.49
1:C:111:THR:HA	1:C:223:PHE:O	2.13	0.49
1:A:378:SER:OG	1:A:441:GLN:HB3	2.12	0.49
1:D:22:LEU:HB2	1:D:23:PRO:CD	2.37	0.49
1:A:90:VAL:O	1:A:210:THR:HG23	2.13	0.49
1:C:422:ASN:OD1	1:C:423:TYR:N	2.46	0.49
1:A:157:PHE:CE1	1:A:201:LEU:HD21	2.48	0.48
1:D:59:PHE:O	1:D:123:LYS:HE2	2.14	0.48
1:A:247:GLN:HE22	1:A:295:LEU:HD12	1.79	0.47
1:A:329:LEU:O	1:A:332:MET:HB2	2.14	0.47
1:A:193:LYS:HE2	1:D:327:ASP:OD2	2.14	0.47
1:C:222:HIS:HB3	1:C:408:THR:HB	1.96	0.47
1:D:371:CYS:HB3	1:D:409:SER:HB3	1.96	0.47
1:D:111:THR:HA	1:D:223:PHE:O	2.14	0.47
1:A:111:THR:HA	1:A:223:PHE:O	2.15	0.47
1:B:262:HIS:HB3	1:B:265:THR:CG2	2.43	0.47
1:C:127:ILE:CG2	1:C:131:LEU:HD12	2.44	0.46
1:D:348:ASP:OD2	1:D:348:ASP:N	2.49	0.46
1:B:107:LYS:HE3	1:B:220:ASP:OD1	2.14	0.46
1:A:224:GLU:OE2	1:A:399:SER:OG	2.30	0.46
1:C:323:HIS:ND1	1:C:324:PRO:HD2	2.30	0.46
1:A:265:THR:HG23	1:B:230:GLY:HA2	1.97	0.46
1:A:263:ALA:O	1:A:271:ARG:NH2	2.48	0.46
1:C:55:GLU:HB2	1:C:58:GLU:HG3	1.96	0.46
1:C:419:LEU:HD11	1:C:422:ASN:HD22	1.81	0.46
1:D:269:ARG:HG2	1:D:270:LEU:HG	1.97	0.46
1:D:226:HIS:HD1	1:D:227:ILE:N	2.13	0.46
1:C:396:GLY:H	3:C:1457:URP:C4	2.29	0.46
1:B:60:GLY:HA3	1:B:423:TYR:CD2	2.51	0.46
1:C:303:ALA:HA	1:C:315:VAL:HG22	1.97	0.46

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:371:CYS:HB3	1:C:409:SER:HB3	1.98	0.45
1:D:221:ALA:HB1	1:D:407:PRO:O	2.17	0.45
1:B:60:GLY:HA3	1:B:423:TYR:HD2	1.81	0.45
1:B:111:THR:HA	1:B:223:PHE:O	2.17	0.45
1:A:25:ALA:HB2	1:A:445:ASN:ND2	2.32	0.45
1:B:291:ARG:NH2	1:B:335:GLU:OE1	2.49	0.45
1:A:291:ARG:HG3	1:A:291:ARG:HH11	1.81	0.45
1:D:143:ASN:O	1:D:144:ASN:HB2	2.17	0.45
1:A:91:ASP:OD1	1:A:95:ASN:HB2	2.16	0.45
1:B:100:TYR:HA	1:B:101:PRO:HD3	1.89	0.45
1:C:259:VAL:N	1:C:272:LYS:HB2	2.31	0.44
1:C:367:PHE:HB3	1:C:408:THR:O	2.18	0.44
1:B:401:GLN:NE2	1:B:401:GLN:HA	2.31	0.44
1:D:271:ARG:HG2	1:D:311:ILE:HD13	1.99	0.44
1:D:243:VAL:HB	1:D:410:MET:HB2	2.00	0.44
1:A:90:VAL:HG22	1:A:96:MET:HG2	2.00	0.44
1:B:275:LEU:HB2	1:B:312:PRO:HG2	1.99	0.44
1:A:352:LEU:HD12	1:A:352:LEU:N	2.33	0.44
1:D:114:HIS:HB2	1:D:116:ASP:OD1	2.18	0.44
1:C:127:ILE:HG23	1:C:131:LEU:HD12	2.00	0.44
1:D:277:MET:HB3	1:D:277:MET:HE2	1.67	0.44
1:D:419:LEU:HG	1:D:420:SER:N	2.33	0.44
1:C:361:VAL:HG12	1:C:362:SER:N	2.32	0.43
1:B:301:ILE:HG13	1:B:317:PHE:HB3	2.00	0.43
1:B:55:GLU:HB2	1:B:58:GLU:HG3	2.00	0.43
1:A:339:GLU:HA	1:A:339:GLU:OE1	2.17	0.43
1:B:97:PHE:N	1:B:97:PHE:CD1	2.86	0.43
1:C:323:HIS:CG	1:C:324:PRO:HD2	2.53	0.43
1:B:197:VAL:O	1:B:201:LEU:HG	2.19	0.43
1:D:246:VAL:HG22	1:D:393:SER:HB3	2.01	0.43
1:A:262:HIS:HB3	1:A:265:THR:CG2	2.48	0.42
1:A:277:MET:HE2	1:A:277:MET:HB3	1.66	0.42
1:A:198:TYR:CE2	1:D:293:ASN:HB2	2.53	0.42
1:B:134:LEU:HD22	1:B:138:ARG:HD3	2.01	0.42
1:C:259:VAL:H	1:C:272:LYS:HB2	1.84	0.42
1:D:89:LYS:HB3	1:D:210:THR:HG21	2.00	0.42
1:C:403:ALA:N	1:C:408:THR:HG21	2.35	0.42
1:A:51[B]:ARG:HB3	1:A:51[B]:ARG:HH11	1.84	0.42
1:B:193:LYS:HG2	1:B:193:LYS:O	2.19	0.42
1:A:317:PHE:CE1	1:A:319:LEU:HD21	2.54	0.42
1:A:334:LYS:HE2	1:A:334:LYS:HB3	1.79	0.42
1:A:265:THR:CG2	1:B:229:GLN:O	2.60	0.42

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:402:THR:OG1	1:A:408:THR:HG21	2.20	0.42
1:A:127:ILE:O	1:A:131:LEU:HB2	2.20	0.41
1:B:371:CYS:HB3	1:B:409:SER:CB	2.49	0.41
1:A:89:LYS:HB3	1:A:210:THR:HG21	2.02	0.41
1:B:193:LYS:O	1:B:193:LYS:CG	2.68	0.41
1:B:180:LEU:HD11	1:B:184:TYR:CE1	2.56	0.41
1:A:367:PHE:HB3	1:A:408:THR:O	2.20	0.41
1:D:172:SER:HA	1:D:401:GLN:NE2	2.33	0.41
1:C:133:GLY:O	1:C:136:VAL:HB	2.21	0.41
1:C:321:PHE:HD2	1:C:332:MET:HE3	1.86	0.41
1:B:128:LEU:HD22	1:B:413:ILE:HD11	2.02	0.41
1:A:420:SER:HA	1:A:425:GLU:HG3	2.02	0.41
1:A:265:THR:HG23	1:B:230:GLY:CA	2.51	0.41
1:D:22:LEU:N	1:D:22:LEU:HD22	2.32	0.41
1:A:131:LEU:HA	1:A:131:LEU:HD23	1.88	0.41
1:A:134:LEU:HD22	1:A:138:ARG:HG3	2.03	0.41
1:D:135:GLU:HA	1:D:138:ARG:HB2	2.03	0.41
1:B:118:GLN:HB2	1:B:121:ALA:HB2	2.03	0.41
1:B:137:LEU:HD11	1:B:153:VAL:HG23	2.03	0.41
1:C:224:GLU:HB3	1:C:410:MET:HG2	2.02	0.40
1:B:192:ASP:O	1:B:194:PRO:HD3	2.20	0.40
1:A:114:HIS:CE1	1:A:126:GLY:HA3	2.56	0.40
1:D:111:THR:HB	1:D:443:ILE:HD11	2.03	0.40
1:A:172:SER:HA	1:A:401:GLN:HE21	1.86	0.40
1:C:372:ILE:O	1:C:376:SER:HB3	2.21	0.40
1:C:402:THR:OG1	1:C:408:THR:HG21	2.21	0.40
1:B:294:GLY:CA	1:B:323:HIS:HD2	2.34	0.40
1:C:277:MET:HG3	1:C:352:LEU:HD22	2.04	0.40
1:B:306:TYR:HE2	1:D:21:ASN:HD21	1.69	0.40
1:A:157:PHE:CD1	1:A:201:LEU:HD21	2.56	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	434/474 (92%)	423 (98%)	11 (2%)	0	100	100
1	B	429/474 (90%)	412 (96%)	15 (4%)	2 (0%)	38	79
1	C	429/474 (90%)	412 (96%)	16 (4%)	1 (0%)	56	89
1	D	433/474 (91%)	420 (97%)	13 (3%)	0	100	100
All	All	1725/1896 (91%)	1667 (97%)	55 (3%)	3 (0%)	56	89

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	25	ALA
1	C	25	ALA
1	B	158	ASN

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	358/392 (91%)	331 (92%)	27 (8%)	19	49
1	B	354/392 (90%)	330 (93%)	24 (7%)	22	55
1	C	354/392 (90%)	329 (93%)	25 (7%)	21	52
1	D	358/392 (91%)	338 (94%)	20 (6%)	30	66
All	All	1424/1568 (91%)	1328 (93%)	96 (7%)	23	56

All (96) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	SER
1	A	45	GLN
1	A	51[A]	ARG
1	A	51[B]	ARG
1	A	107	LYS
1	A	113	SER
1	A	130	VAL
1	A	134	LEU
1	A	166	ARG

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Mol	Chain	Res	Type
1	A	188	SER
1	A	192	ASP
1	A	207	ILE
1	A	210	THR
1	A	265	THR
1	A	266	THR
1	A	287	GLU
1	A	304	LYS
1	A	307	SER
1	A	309	ASN
1	A	331	THR
1	A	334	LYS
1	A	348	ASP
1	A	356	SER
1	A	361	VAL
1	A	377	ARG
1	A	408	THR
1	A	430	GLU
1	B	54	GLN
1	B	113	SER
1	B	130	VAL
1	B	134	LEU
1	B	166	ARG
1	B	167	SER
1	B	179	SER
1	B	181	GLU
1	B	193	LYS
1	B	210	THR
1	B	228	GLU
1	B	250	ASN
1	B	265	THR
1	B	286	SER
1	B	309	ASN
1	B	334	LYS
1	B	357	GLU
1	B	376	SER
1	B	377	ARG
1	B	390	GLN
1	B	408	THR
1	B	417	ASP
1	B	419	LEU
1	B	430	GLU

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Mol	Chain	Res	Type
1	C	29	SER
1	C	54	GLN
1	C	90	VAL
1	C	113	SER
1	C	130	VAL
1	C	134	LEU
1	C	166	ARG
1	C	193	LYS
1	C	196	SER
1	C	210	THR
1	C	250	ASN
1	C	277	MET
1	C	293	ASN
1	C	325	SER
1	C	334	LYS
1	C	357	GLU
1	C	369	GLU
1	C	376	SER
1	C	377	ARG
1	C	408	THR
1	C	417	ASP
1	C	419	LEU
1	C	430	GLU
1	C	433	GLU
1	C	452	ILE
1	D	22	LEU
1	D	83	SER
1	D	130	VAL
1	D	134	LEU
1	D	166	ARG
1	D	179	SER
1	D	192	ASP
1	D	210	THR
1	D	216	GLU
1	D	266	THR
1	D	269	ARG
1	D	287	GLU
1	D	304	LYS
1	D	331	THR
1	D	334	LYS
1	D	348	ASP
1	D	376	SER

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Mol	Chain	Res	Type
1	D	377	ARG
1	D	408	THR
1	D	430	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (29) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	21	ASN
1	A	54	GLN
1	A	57	HIS
1	A	143	ASN
1	A	158	ASN
1	A	247	GLN
1	A	309	ASN
1	A	390	GLN
1	A	401	GLN
1	A	445	ASN
1	B	54	GLN
1	B	203	ASN
1	B	250	ASN
1	B	309	ASN
1	B	401	GLN
1	C	54	GLN
1	C	203	ASN
1	C	250	ASN
1	C	366	ASN
1	C	405	HIS
1	C	445	ASN
1	D	57	HIS
1	D	158	ASN
1	D	217	ASN
1	D	250	ASN
1	D	397	HIS
1	D	401	GLN
1	D	405	HIS
1	D	445	ASN

5.3.3 RNA ⓘ

There are no RNA chains 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 carbohydrates in this entry.

5.6 Ligand geometry ⓘ

Of 12 ligands modelled in this entry, 8 are monoatomic - leaving 4 for Mogul analysis.

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	URP	B	1456	-	8,8,8	0.86	0	9,9,9	1.10	1 (11%)
4	DTT	C	1456	1	7,7,7	0.54	0	8,8,8	1.73	1 (12%)
3	URP	C	1457	-	8,8,8	1.13	1 (12%)	9,9,9	1.36	1 (11%)
3	URP	D	1456	-	8,8,8	0.95	0	9,9,9	1.35	1 (11%)

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	URP	B	1456	-	-	0/6/6/6	0/0/0/0
4	DTT	C	1456	1	-	0/8/8/8	0/0/0/0
3	URP	C	1457	-	-	0/6/6/6	0/0/0/0
3	URP	D	1456	-	-	0/6/6/6	0/0/0/0

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1457	URP	C5-C4	2.45	1.56	1.50

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	1456	DTT	C2-C1-S1	-3.53	109.09	114.66
3	D	1456	URP	N3-C2-N1	2.36	119.01	116.46
3	C	1457	URP	N3-C2-N1	2.17	118.79	116.46
3	B	1456	URP	O41-C4-C5	-2.10	115.80	123.03

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

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	435/474 (91%)	-0.13	1 (0%) 93 96	30, 36, 39, 42	0
1	B	431/474 (90%)	-0.06	7 (1%) 68 78	30, 36, 38, 42	0
1	C	431/474 (90%)	-0.06	11 (2%) 53 63	30, 36, 39, 41	0
1	D	435/474 (91%)	-0.11	0 100 100	30, 36, 39, 43	0
All	All	1732/1896 (91%)	-0.09	19 (1%) 77 84	30, 36, 39, 43	0

All (19) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	190	GLY	4.6
1	C	24	ALA	3.7
1	C	105	GLY	3.6
1	C	23	PRO	3.4
1	A	105	GLY	3.3
1	C	50	ALA	3.2
1	C	192	ASP	3.0
1	C	190	GLY	3.0
1	C	54	GLN	2.8
1	B	192	ASP	2.7
1	C	56	SER	2.7
1	B	50	ALA	2.7
1	C	52	TRP	2.6
1	B	52	TRP	2.2
1	C	193	LYS	2.2
1	B	56	SER	2.1
1	B	451	VAL	2.1
1	C	386	ASP	2.0
1	B	181	GLU	2.0

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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	RSR	LLDF	B-factors(Å ²)	Q<0.9
3	URP	C	1457	9/9	0.28	4.18	52,56,63,64	0
3	URP	D	1456	9/9	0.30	2.73	75,76,77,78	0
3	URP	B	1456	9/9	0.20	0.44	46,49,50,51	0
4	DTT	C	1456	8/8	0.16	-0.35	54,62,64,67	0
2	ZN	D	1454	1/1	0.14	-1.22	29,29,29,29	0
2	ZN	B	1454	1/1	0.12	-1.42	36,36,36,36	0
2	ZN	A	1455	1/1	0.12	-1.67	29,29,29,29	0
2	ZN	C	1454	1/1	0.11	-2.10	34,34,34,34	0
2	ZN	B	1455	1/1	0.08	-2.38	38,38,38,38	0
2	ZN	D	1455	1/1	0.10	-3.15	33,33,33,33	0
2	ZN	A	1456	1/1	0.06	-3.56	35,35,35,35	0
2	ZN	C	1455	1/1	0.08	-3.94	36,36,36,36	0

6.5 Other polymers ⓘ

There are no such residues in this entry.