



Full wwPDB X-ray Structure Validation Report

Feb 28, 2014 – 02:38 AM GMT

PDB ID : 3O4J
Title : Structure and Catalysis of Acylaminoacyl Peptidase
Authors : Harmat, V.; Domokos, K.; Menyhard, D.K.; Pallo, A.; Szeltner, Z.; Szamosi, I.; Beke-Somfai, T.; Naray-Szabo, G.; Polgar, L.
Deposited on : 2010-07-27
Resolution : 2.50 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>

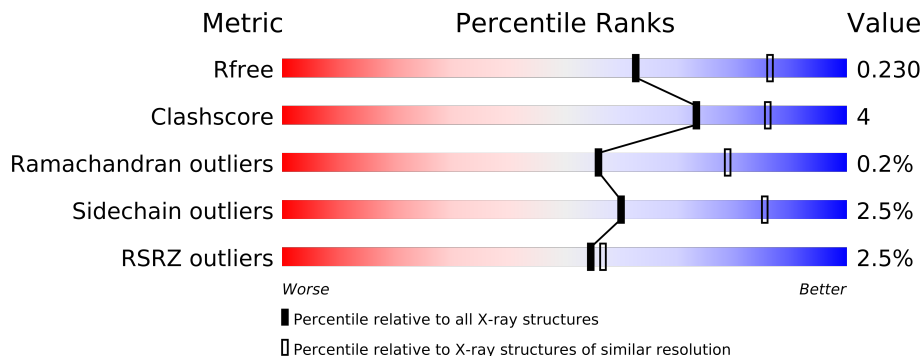
The following versions of software and data (see [references](#)) were used in the production of this report:

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 2.50 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	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	66092	2784 (2.50-2.50)
Clashscore	79885	3562 (2.50-2.50)
Ramachandran outliers	78287	3480 (2.50-2.50)
Sidechain outliers	78261	3482 (2.50-2.50)
RSRZ outliers	66119	2785 (2.50-2.50)

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	582	
1	B	582	
1	C	582	
1	D	582	

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

Mol	Type	Chain	Res	Geometry	Electron density
2	GOL	B	583	-	X
2	GOL	C	583	-	X
2	GOL	D	583	-	X
3	CL	B	584	-	X

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 18121 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 Acylamino-acid-releasingenzyme.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	578	Total	C	N	O	S	0	2	0
			4394	2778	773	831	12			
1	B	574	Total	C	N	O	S	0	2	0
			4357	2758	767	820	12			
1	C	579	Total	C	N	O	S	0	6	0
			4431	2803	779	836	13			
1	D	576	Total	C	N	O	S	0	5	0
			4371	2766	764	829	12			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	524	ASN	ASP	engineered	UNP Q9YBQ2
B	524	ASN	ASP	engineered	UNP Q9YBQ2
C	524	ASN	ASP	engineered	UNP Q9YBQ2
D	524	ASN	ASP	engineered	UNP Q9YBQ2

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	C	O	0	0
			6	3	3		
2	C	1	Total	C	O	0	0
			6	3	3		
2	C	1	Total	C	O	0	0
			6	3	3		
2	D	1	Total	C	O	0	0
			6	3	3		
2	D	1	Total	C	O	0	0
			6	3	3		

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	2	Total	Cl	0	0
			2	2		

- Molecule 4 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	1	Total	Na	0	0
			1	1		

- Molecule 5 is water.

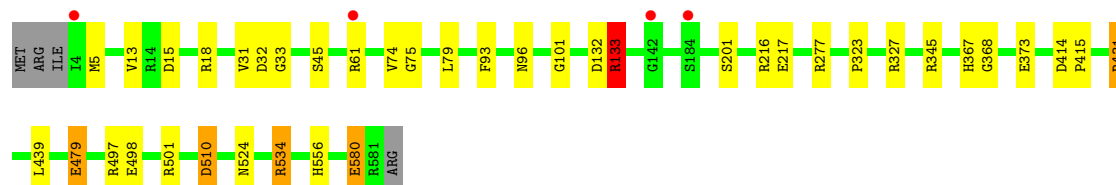
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	82	Total 82	O 82	0	0
5	B	180	Total 180	O 180	0	0
5	C	179	Total 179	O 179	0	0
5	D	94	Total 94	O 94	0	0

3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

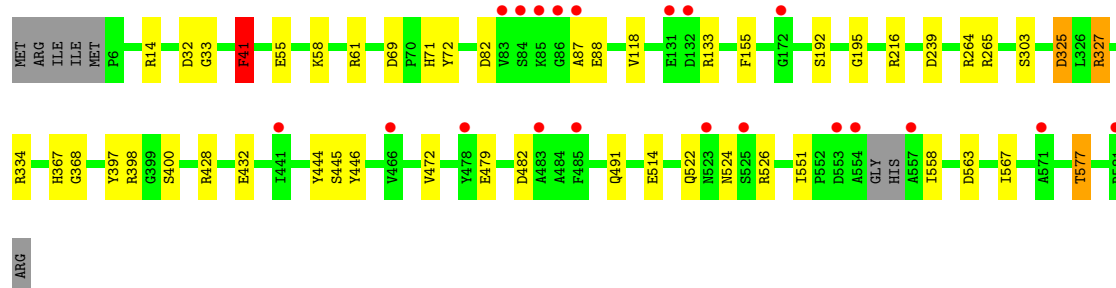
- Molecule 1: Acylamino-acid-releasingenzyme

Chain A: 



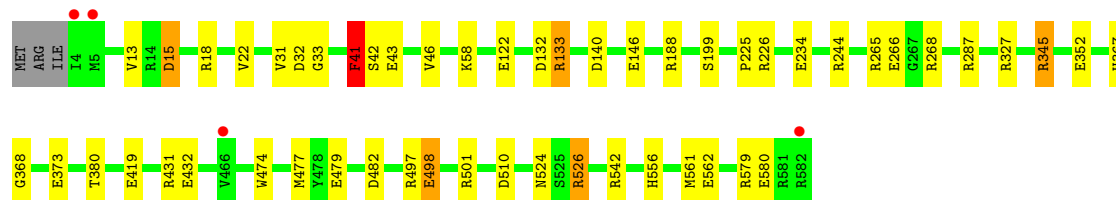
- Molecule 1: Acylamino-acid-releasingenzyme

Chain B: 



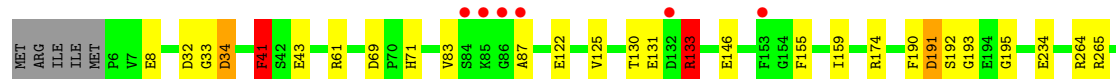
- Molecule 1: Acylamino-acid-releasingenzyme

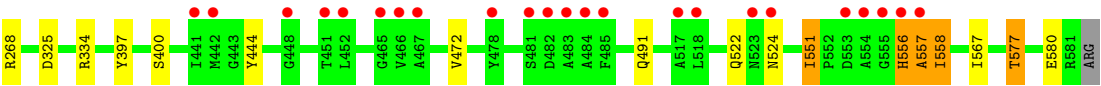
Chain C: 



- Molecule 1: Acylamino-acid-releasingenzyme

Chain D: 





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	184.27Å 227.52Å 110.68Å 90.00° 100.37° 90.00°	Depositor
Resolution (Å)	29.52 – 2.50 29.52 – 2.50	Depositor EDS
% Data completeness (in resolution range)	96.9 (29.52-2.50) 96.9 (29.52-2.50)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.62 (at 2.51Å)	Xtriage
Refinement program	REFMAC 5.5.0102	Depositor
R, R_{free}	0.199 , 0.236 0.197 , 0.230	Depositor DCC
R_{free} test set	7519 reflections (5.30%)	DCC
Wilson B-factor (Å ²)	42.8	Xtriage
Anisotropy	0.123	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 22.7	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 149375 reflections	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	18121	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.09% 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: GOL, CL, NA

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	4/4494 (0.1%)	0.87	6/6096 (0.1%)
1	B	1.22	16/4454 (0.4%)	0.99	17/6039 (0.3%)
1	C	1.16	15/4544 (0.3%)	0.95	13/6161 (0.2%)
1	D	1.10	9/4471 (0.2%)	0.94	19/6066 (0.3%)
All	All	1.11	44/17963 (0.2%)	0.94	55/24362 (0.2%)

All (44) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	444	TYR	CE1-CZ	-16.49	1.17	1.38
1	D	444	TYR	CG-CD2	-13.41	1.21	1.39
1	B	444	TYR	CE2-CZ	-13.22	1.21	1.38
1	B	444	TYR	CE1-CZ	-13.09	1.21	1.38
1	D	444	TYR	CG-CD1	-12.27	1.23	1.39
1	B	444	TYR	CG-CD1	-11.95	1.23	1.39
1	D	444	TYR	CE2-CZ	-11.77	1.23	1.38
1	B	444	TYR	CG-CD2	-11.25	1.24	1.39
1	A	510	ASP	CB-CG	-8.21	1.34	1.51
1	D	234	GLU	CG-CD	8.17	1.64	1.51
1	C	498	GLU	CG-CD	8.06	1.64	1.51
1	B	432	GLU	CG-CD	7.95	1.63	1.51
1	B	428	ARG	CB-CG	7.90	1.73	1.52
1	B	514	GLU	CD-OE1	6.84	1.33	1.25
1	C	432	GLU	CG-CD	6.83	1.62	1.51
1	C	510	ASP	CB-CG	-6.80	1.37	1.51
1	C	13	VAL	CB-CG1	-6.66	1.38	1.52
1	D	580	GLU	CG-CD	6.50	1.61	1.51
1	A	373	GLU	CD-OE1	-6.42	1.18	1.25
1	C	373	GLU	CD-OE2	-6.37	1.18	1.25
1	B	82	ASP	CB-CG	6.04	1.64	1.51
1	D	8	GLU	CD-OE2	-5.97	1.19	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	287	ARG	CG-CD	5.85	1.66	1.51
1	B	88	GLU	CB-CG	5.84	1.63	1.52
1	C	432	GLU	CD-OE1	5.83	1.32	1.25
1	C	122	GLU	CD-OE1	5.80	1.32	1.25
1	C	580	GLU	CG-CD	5.76	1.60	1.51
1	C	46	VAL	CB-CG2	5.52	1.64	1.52
1	B	118	VAL	CB-CG2	-5.46	1.41	1.52
1	D	122	GLU	CG-CD	5.44	1.60	1.51
1	C	234	GLU	CG-CD	5.41	1.60	1.51
1	C	345	ARG	CG-CD	5.39	1.65	1.51
1	B	72	TYR	CE2-CZ	5.32	1.45	1.38
1	B	325	ASP	CB-CG	-5.32	1.40	1.51
1	B	55[A]	GLU	CB-CG	5.29	1.62	1.52
1	B	55[B]	GLU	CB-CG	5.29	1.62	1.52
1	B	303	SER	CB-OG	-5.25	1.35	1.42
1	C	266	GLU	CD-OE1	5.16	1.31	1.25
1	B	41	PHE	CB-CG	-5.14	1.42	1.51
1	D	41	PHE	CB-CG	-5.09	1.42	1.51
1	C	562	GLU	CG-CD	-5.05	1.44	1.51
1	A	345	ARG	CG-CD	5.04	1.64	1.51
1	A	13	VAL	CB-CG1	-5.01	1.42	1.52
1	C	41	PHE	CE2-CZ	-5.01	1.27	1.37

All (55) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	41	PHE	CB-CG-CD1	-12.58	111.99	120.80
1	C	510	ASP	CB-CG-OD1	-12.15	107.37	118.30
1	B	41	PHE	CB-CG-CD2	10.69	128.28	120.80
1	D	325	ASP	CB-CG-OD1	-9.40	109.84	118.30
1	D	69	ASP	CB-CG-OD2	-8.68	110.49	118.30
1	B	325	ASP	CB-CG-OD1	-8.57	110.59	118.30
1	A	133	ARG	NE-CZ-NH1	8.46	124.53	120.30
1	A	510	ASP	CB-CG-OD1	-8.28	110.85	118.30
1	D	325	ASP	CB-CG-OD2	8.21	125.69	118.30
1	D	191	ASP	CB-CG-OD2	7.91	125.42	118.30
1	D	41	PHE	CB-CG-CD1	-7.78	115.35	120.80
1	B	265	ARG	NE-CZ-NH1	7.45	124.02	120.30
1	C	580	GLU	OE1-CD-OE2	-7.29	114.56	123.30
1	B	82	ASP	CB-CG-OD1	7.18	124.76	118.30
1	A	580	GLU	OE1-CD-OE2	-6.85	115.08	123.30
1	D	325	ASP	N-CA-CB	-6.76	98.43	110.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	268	ARG	NE-CZ-NH1	6.70	123.65	120.30
1	D	8	GLU	CG-CD-OE1	6.69	131.69	118.30
1	A	373	GLU	OE1-CD-OE2	-6.67	115.30	123.30
1	C	373	GLU	OE1-CD-OE2	-6.43	115.58	123.30
1	D	444	TYR	CB-CG-CD2	6.04	124.62	121.00
1	D	334	ARG	NE-CZ-NH1	5.99	123.29	120.30
1	B	14	ARG	NE-CZ-NH1	5.97	123.28	120.30
1	D	69	ASP	CB-CG-OD1	5.96	123.67	118.30
1	B	334	ARG	NE-CZ-NH1	5.94	123.27	120.30
1	C	15	ASP	CB-CG-OD1	5.92	123.63	118.30
1	A	534	ARG	NE-CZ-NH1	5.88	123.24	120.30
1	C	561	MET	CG-SD-CE	-5.88	90.79	100.20
1	D	265	ARG	NE-CZ-NH1	5.85	123.22	120.30
1	B	563	ASP	CB-CG-OD1	5.84	123.56	118.30
1	B	444	TYR	CB-CG-CD1	5.78	124.47	121.00
1	D	133	ARG	CG-CD-NE	5.78	123.93	111.80
1	D	41	PHE	CB-CA-C	-5.75	98.90	110.40
1	C	542	ARG	NE-CZ-NH1	5.75	123.17	120.30
1	B	239	ASP	CB-CG-OD1	5.74	123.47	118.30
1	B	216	ARG	NE-CZ-NH2	-5.72	117.44	120.30
1	B	133	ARG	CG-CD-NE	5.71	123.79	111.80
1	B	69	ASP	CB-CG-OD2	-5.60	113.26	118.30
1	D	133	ARG	NE-CZ-NH1	5.57	123.08	120.30
1	C	265	ARG	NE-CZ-NH1	5.51	123.05	120.30
1	D	41	PHE	CB-CG-CD2	5.50	124.65	120.80
1	B	133	ARG	NE-CZ-NH1	5.49	123.05	120.30
1	A	277	ARG	NE-CZ-NH1	5.46	123.03	120.30
1	C	526	ARG	NE-CZ-NH2	-5.44	117.58	120.30
1	C	140	ASP	CB-CG-OD1	5.43	123.19	118.30
1	D	444	TYR	CZ-CE2-CD2	5.30	124.57	119.80
1	D	34	ASP	CB-CG-OD1	5.29	123.06	118.30
1	C	542	ARG	NE-CZ-NH2	-5.25	117.68	120.30
1	C	133	ARG	NE-CZ-NH2	-5.20	117.70	120.30
1	D	8	GLU	CG-CD-OE2	-5.15	108.00	118.30
1	B	327[A]	ARG	NE-CZ-NH2	-5.14	117.73	120.30
1	B	327[B]	ARG	NE-CZ-NH2	-5.14	117.73	120.30
1	D	268	ARG	NE-CZ-NH2	-5.11	117.74	120.30
1	C	579	ARG	NE-CZ-NH2	-5.11	117.75	120.30
1	B	398	ARG	NE-CZ-NH2	-5.06	117.77	120.30

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	4394	0	0	21	0
1	B	4357	0	0	12	0
1	C	4431	0	0	23	0
1	D	4371	0	0	18	0
2	B	6	0	8	0	0
2	C	12	0	16	0	0
2	D	12	0	16	0	0
3	B	2	0	0	0	0
4	B	1	0	0	0	0
5	A	82	0	0	6	0
5	B	180	0	0	2	0
5	C	179	0	0	7	0
5	D	94	0	0	2	0
All	All	18121	0	40	74	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 4.

All (74) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:32:ASP:OD1	1:C:33:GLY:N	1.91	1.03
1:D:556[B]:HIS:O	1:D:558:ILE:CG2	2.14	0.96
1:C:498:GLU:OE1	1:C:501[A]:ARG:NH2	2.09	0.86
1:C:43[A]:GLU:OE1	5:C:756:HOH:O	1.97	0.81
1:B:482:ASP:OD2	1:B:526:ARG:NH1	2.19	0.76
1:B:41:PHE:N	1:B:41:PHE:CD2	2.55	0.75
1:C:188:ARG:NH1	1:C:225:PRO:O	2.21	0.73
1:A:15:ASP:OD1	1:A:18:ARG:NH2	2.22	0.72
1:A:534:ARG:NH2	5:A:653:HOH:O	2.24	0.69
1:C:15:ASP:OD1	1:C:18:ARG:NH2	2.26	0.69
1:A:217:GLU:OE2	1:A:217:GLU:N	2.27	0.67
1:C:226:ARG:CD	5:C:770:HOH:O	2.45	0.65
1:B:32:ASP:CG	1:B:33:GLY:N	2.49	0.64
1:A:498:GLU:OE1	1:A:501:ARG:NH1	2.30	0.64

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:D:125:VAL:CG2	1:D:159:ILE:CD1	2.80	0.60
1:A:327:ARG:NH2	5:A:598:HOH:O	2.35	0.59
1:D:32:ASP:CG	1:D:33:GLY:N	2.56	0.58
1:A:216:ARG:N	1:A:217:GLU:OE2	2.36	0.58
1:A:524:ASN:ND2	1:A:556[B]:HIS:ND1	2.52	0.57
1:C:43[B]:GLU:OE2	1:C:58:LYS:NZ	2.38	0.56
1:A:32:ASP:CG	1:A:33:GLY:N	2.58	0.56
1:C:32:ASP:CG	1:C:33:GLY:N	2.60	0.55
1:C:199:SER:CB	5:C:608:HOH:O	2.57	0.53
5:A:611:HOH:O	1:B:577:THR:CG2	2.55	0.53
1:D:41:PHE:N	1:D:41:PHE:CD2	2.76	0.53
1:B:41:PHE:CE1	5:B:729:HOH:O	2.54	0.52
1:A:32:ASP:OD2	1:A:33:GLY:N	2.42	0.52
1:C:327:ARG:NH2	5:C:618:HOH:O	2.43	0.52
1:C:345:ARG:NH1	5:C:605:HOH:O	2.43	0.52
1:C:482:ASP:N	5:C:708:HOH:O	2.43	0.51
1:D:83:VAL:CG1	1:D:83:VAL:O	2.58	0.51
1:C:31[A]:VAL:CG1	1:C:32:ASP:N	2.72	0.51
1:D:192:SER:CB	1:D:195:GLY:O	2.60	0.50
1:A:367:HIS:ND1	1:A:368:GLY:O	2.45	0.50
1:D:558:ILE:O	1:D:558:ILE:CG1	2.60	0.49
1:A:133:ARG:NH1	1:A:133:ARG:CG	2.75	0.49
1:A:431:ARG:NH1	5:A:683:HOH:O	2.45	0.48
1:C:474:TRP:CZ3	1:C:477:MET:CE	2.96	0.48
1:D:174:ARG:NE	1:D:193:GLY:O	2.46	0.48
1:A:79:LEU:N	1:A:93:PHE:O	2.46	0.48
1:D:34:ASP:N	5:D:628:HOH:O	2.45	0.48
1:D:577:THR:CG2	5:D:665:HOH:O	2.62	0.48
1:B:397:TYR:O	1:B:400:SER:OG	2.32	0.47
1:C:367:HIS:ND1	1:C:368:GLY:O	2.47	0.47
1:B:58:LYS:NZ	5:B:674:HOH:O	2.47	0.47
1:C:474:TRP:CE3	1:C:477:MET:CE	3.00	0.45
1:B:367:HIS:ND1	1:B:368:GLY:O	2.50	0.45
1:A:5:MET:N	1:A:580:GLU:OE2	2.49	0.45
1:D:556[B]:HIS:O	1:D:557[B]:ALA:C	2.55	0.45
1:A:31:VAL:CG2	1:A:74:VAL:O	2.65	0.45
1:C:526:ARG:NH1	1:C:556[A]:HIS:CE1	2.85	0.45
1:D:133:ARG:NH2	1:D:146:GLU:OE1	2.50	0.44
1:A:61:ARG:NE	1:A:101:GLY:O	2.50	0.44
1:A:75:GLY:O	1:A:96[A]:ASN:ND2	2.51	0.44
1:A:479:GLU:OE2	5:A:604:HOH:O	2.21	0.44
1:C:133:ARG:NH2	1:C:146:GLU:OE1	2.51	0.43

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:D:397:TYR:O	1:D:400:SER:OG	2.36	0.43
1:B:445:SER:OG	1:B:446:TYR:N	2.52	0.43
1:A:439:LEU:CD1	5:A:683:HOH:O	2.67	0.43
1:A:132:ASP:OD2	1:A:133:ARG:NH1	2.52	0.43
1:D:130:THR:O	1:D:131:GLU:C	2.56	0.43
1:C:526:ARG:CZ	1:C:556[A]:HIS:ND1	2.82	0.43
1:A:414:ASP:N	1:A:415:PRO:CD	2.82	0.43
1:B:155:PHE:N	1:B:155:PHE:CD1	2.88	0.42
1:D:551:ILE:CD1	1:D:551:ILE:N	2.83	0.41
1:C:380:THR:N	5:C:715:HOH:O	2.54	0.41
1:D:190:PHE:CD1	1:D:190:PHE:N	2.89	0.41
1:B:524:ASN:OD1	1:B:524:ASN:C	2.59	0.41
1:D:524:ASN:C	1:D:524:ASN:OD1	2.60	0.41
1:B:192:SER:CB	1:B:195:GLY:O	2.68	0.40
1:C:41:PHE:CD2	1:C:41:PHE:C	2.95	0.40
1:C:524:ASN:ND2	1:C:556[B]:HIS:ND1	2.69	0.40
1:C:42:SER:O	1:C:43[B]:GLU:CG	2.70	0.40
1:D:155:PHE:N	1:D:155:PHE:CD1	2.89	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	578/582 (99%)	560 (97%)	18 (3%)	0	100	100
1	B	572/582 (98%)	550 (96%)	21 (4%)	1 (0%)	56	79
1	C	583/582 (100%)	566 (97%)	17 (3%)	0	100	100
1	D	579/582 (100%)	550 (95%)	24 (4%)	5 (1%)	25	42
All	All	2312/2328 (99%)	2226 (96%)	80 (4%)	6 (0%)	56	73

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	557[A]	ALA
1	D	557[B]	ALA
1	B	87	ALA
1	D	556[A]	HIS
1	D	556[B]	HIS
1	D	87	ALA

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	460/469 (98%)	452 (98%)	8 (2%)	73	92
1	B	454/469 (97%)	439 (97%)	15 (3%)	50	76
1	C	465/469 (99%)	455 (98%)	10 (2%)	64	88
1	D	453/469 (97%)	438 (97%)	15 (3%)	50	76
All	All	1832/1876 (98%)	1784 (97%)	48 (3%)	60	84

All (48) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	45	SER
1	A	133	ARG
1	A	201	SER
1	A	323	PRO
1	A	431	ARG
1	A	479	GLU
1	A	497	ARG
1	A	510	ASP
1	B	41	PHE
1	B	61	ARG
1	B	71	HIS
1	B	264	ARG
1	B	325	ASP
1	B	327[A]	ARG
1	B	327[B]	ARG
1	B	472	VAL
1	B	479	GLU

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Mol	Chain	Res	Type
1	B	491	GLN
1	B	522	GLN
1	B	551	ILE
1	B	558	ILE
1	B	567	ILE
1	B	577	THR
1	C	22	VAL
1	C	41	PHE
1	C	132	ASP
1	C	244	ARG
1	C	352	GLU
1	C	419	GLU
1	C	431[A]	ARG
1	C	431[B]	ARG
1	C	479	GLU
1	C	497	ARG
1	D	41	PHE
1	D	43[A]	GLU
1	D	43[B]	GLU
1	D	61	ARG
1	D	71	HIS
1	D	133	ARG
1	D	191	ASP
1	D	264	ARG
1	D	472	VAL
1	D	491	GLN
1	D	522	GLN
1	D	551	ILE
1	D	558	ILE
1	D	567	ILE
1	D	577	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 8 ligands modelled in this entry, 3 are monoatomic - leaving 5 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	$\# Z > 2$
2	GOL	B	583	-	5,5,5	0.62	0	5,5,5	1.13	0
2	GOL	C	583	-	5,5,5	0.79	0	5,5,5	0.68	0
2	GOL	C	584	-	5,5,5	0.60	0	5,5,5	0.66	0
2	GOL	D	583	-	5,5,5	0.64	0	5,5,5	0.70	0
2	GOL	D	584	-	5,5,5	0.63	0	5,5,5	1.33	1 (20%)

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
2	GOL	B	583	-	-	0/4/4/4	0/0/0/0
2	GOL	C	583	-	-	0/4/4/4	0/0/0/0
2	GOL	C	584	-	-	0/4/4/4	0/0/0/0
2	GOL	D	583	-	-	0/4/4/4	0/0/0/0
2	GOL	D	584	-	-	0/4/4/4	0/0/0/0

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	584	GOL	O3-C3-C2	2.06	119.77	109.71

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	578/582 (99%)	-0.33	4 (0%) 84 86	33, 48, 71, 91	0
1	B	574/582 (98%)	-0.18	20 (3%) 42 43	24, 36, 58, 67	0
1	C	579/582 (99%)	-0.48	4 (0%) 84 86	22, 33, 45, 65	0
1	D	576/582 (98%)	-0.09	29 (5%) 28 28	32, 44, 62, 80	0
All	All	2307/2328 (99%)	-0.27	57 (2%) 54 57	22, 40, 63, 91	0

All (57) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	555[A]	GLY	5.5
1	B	557	ALA	5.4
1	D	556[A]	HIS	4.6
1	D	523	ASN	4.3
1	D	554	ALA	4.3
1	D	485	PHE	4.2
1	D	557[A]	ALA	4.0
1	B	83	VAL	3.9
1	B	553	ASP	3.7
1	D	478	TYR	3.7
1	D	466	VAL	3.6
1	B	84	SER	3.5
1	D	451	THR	3.3
1	D	153	PHE	3.3
1	B	87	ALA	3.3
1	D	553	ASP	3.2
1	D	483	ALA	3.1
1	D	467	ALA	3.0
1	B	132	ASP	3.0
1	B	581	ARG	3.0
1	D	484	ALA	2.9

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Mol	Chain	Res	Type	RSRZ
1	D	518	LEU	2.9
1	D	482	ASP	2.9
1	D	524	ASN	2.8
1	B	466	VAL	2.8
1	C	4	ILE	2.7
1	A	4	ILE	2.7
1	B	85	LYS	2.7
1	D	452	LEU	2.6
1	B	441	ILE	2.6
1	B	525	SER	2.6
1	D	86	GLY	2.6
1	B	478	TYR	2.6
1	A	184	SER	2.6
1	C	582	ARG	2.5
1	C	5	MET	2.5
1	D	84	SER	2.5
1	B	523	ASN	2.5
1	D	441	ILE	2.5
1	B	485	PHE	2.5
1	D	132	ASP	2.4
1	B	554	ALA	2.4
1	B	86	GLY	2.3
1	D	448	GLY	2.3
1	A	61	ARG	2.3
1	B	483	ALA	2.3
1	D	517	ALA	2.3
1	D	87	ALA	2.3
1	A	142	GLY	2.3
1	B	172	GLY	2.3
1	D	481	SER	2.3
1	D	465	GLY	2.2
1	C	466	VAL	2.1
1	B	131	GLU	2.1
1	B	571	ALA	2.1
1	D	85	LYS	2.1
1	D	442	MET	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 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	CL	B	584	1/1	0.22	5.51	46,46,46,46	0
2	GOL	D	583	6/6	0.15	3.72	49,56,58,58	0
2	GOL	C	583	6/6	0.24	3.51	51,55,57,59	0
2	GOL	B	583	6/6	0.25	3.00	44,45,47,51	0
3	CL	B	585	1/1	0.15	1.68	42,42,42,42	0
2	GOL	D	584	6/6	0.23	1.62	42,48,49,50	0
2	GOL	C	584	6/6	0.15	1.10	49,51,52,53	0
4	NA	B	586	1/1	0.09	-3.68	48,48,48,48	0

6.5 Other polymers ⓘ

There are no such residues in this entry.