WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Mar 22, 2025 – 02:19 PM EDT

PDB ID : 4Y0H

Title : Gamma-aminobutyric acid aminotransferase inactivated by (1S,3S)-3-amino-4-difluoromethylenyl-1-cyclopentanoic acid (CPP-115)

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Deposited on : 2015-02-06

Resolution : 1.63 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.41.4

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 1.63 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.
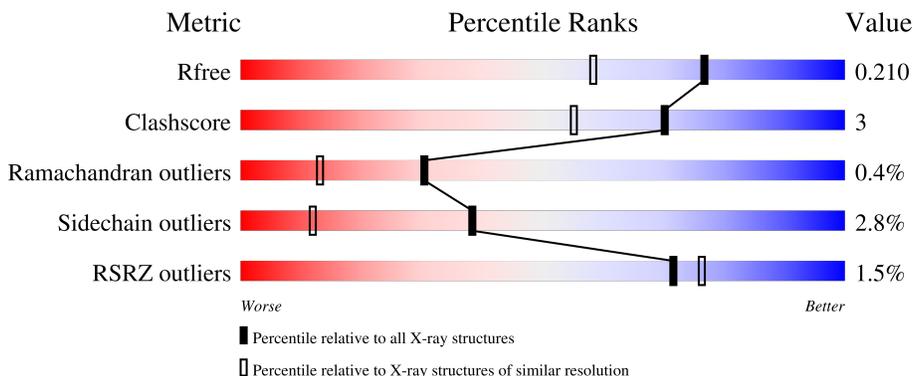
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1015 (1.64-1.64)
Clashscore	180529	1093 (1.64-1.64)
Ramachandran outliers	177936	1077 (1.64-1.64)
Sidechain outliers	177891	1077 (1.64-1.64)
RSRZ outliers	164620	1015 (1.64-1.64)

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	463	2% / 88% / 10% •
1	B	463	% / 90% / 8% •
1	C	463	% / 90% / 10%
1	D	463	2% / 92% / 8% •

2   Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 15894 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 4-aminobutyrate aminotransferase, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	461	Total 3739	C 2387	N 646	O 681	S 25	0	14	0
1	B	462	Total 3742	C 2382	N 649	O 686	S 25	0	12	0
1	C	462	Total 3724	C 2375	N 644	O 680	S 25	0	10	0
1	D	463	Total 3768	C 2407	N 648	O 687	S 26	0	16	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	10	GLY	-	expression tag	UNP P80147
A	158	GLU	GLN	conflict	UNP P80147
B	10	GLY	-	expression tag	UNP P80147
B	158	GLU	GLN	conflict	UNP P80147
C	10	GLY	-	expression tag	UNP P80147
C	158	GLU	GLN	conflict	UNP P80147
D	10	GLY	-	expression tag	UNP P80147
D	158	GLU	GLN	conflict	UNP P80147

- Molecule 2 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).
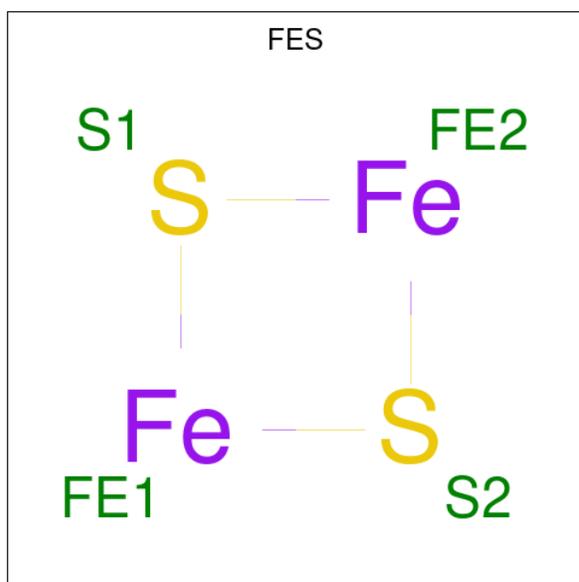
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 4	Fe 2	S 2	0	0
2	C	1	Total 4	Fe 2	S 2	0	0

• Molecule 3 is PYRIDOXAL-5'-PHOSPHATE (three-letter code: PLP) (formula: $C_8H_{10}NO_6P$).
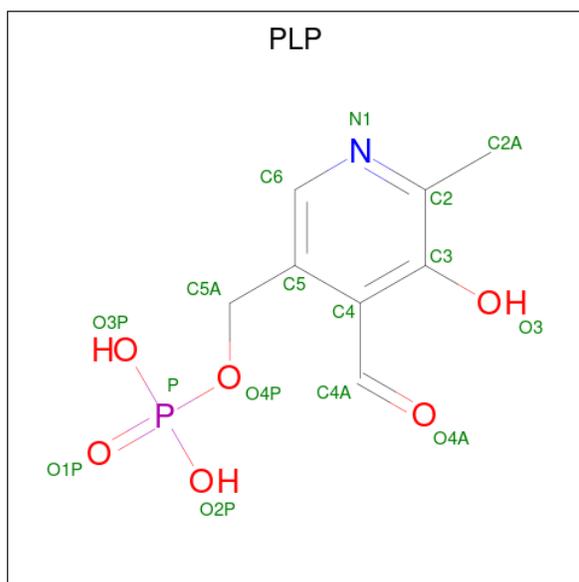
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total 15	C 8	N 1	O 5	P 1	0	0
3	B	1	Total 15	C 8	N 1	O 5	P 1	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	C	1	Total	C	N	O	P	0	0
			15	8	1	5	1		
3	D	1	Total	C	N	O	P	0	0
			15	8	1	5	1		

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).
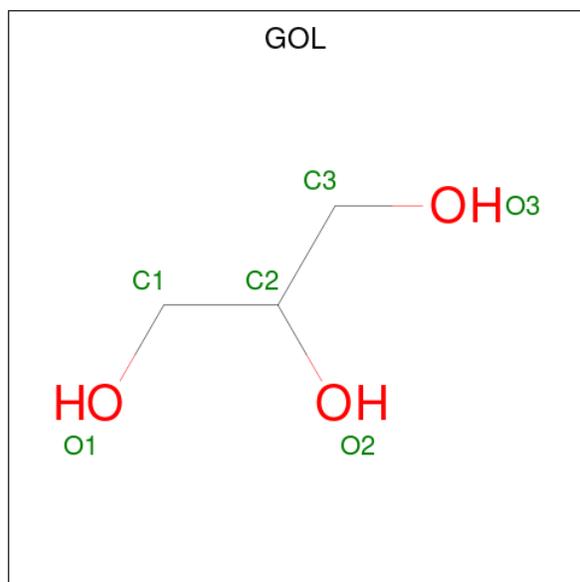
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total	C	O	0	0
			6	3	3		
4	C	1	Total	C	O	0	0
			6	3	3		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	213	Total	O	0	0
			213	213		
5	B	159	Total	O	0	0
			159	159		
5	C	199	Total	O	0	0
			199	199		
5	D	270	Total	O	0	0
			270	270		

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: 4-aminobutyrate aminotransferase, mitochondrial
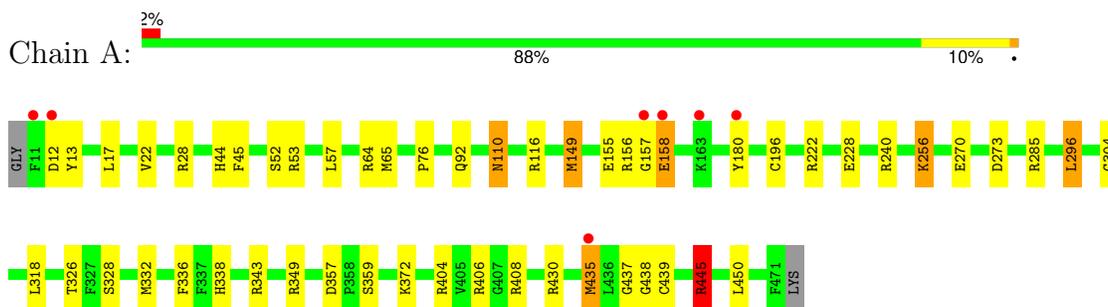
Chain A:

• Molecule 1: 4-aminobutyrate aminotransferase, mitochondrial

Chain B:

• Molecule 1: 4-aminobutyrate aminotransferase, mitochondrial

Chain C:

• Molecule 1: 4-aminobutyrate aminotransferase, mitochondrial

Chain D:

G10 F11 D12 Y13 D14 V22 H44 R53 L57 R64 Q92 R100 N110 R116 R152 E158 Y180 R192 R222 E228 R240 R253 K256 Q268 S269 D273 R285 D286 L296 G304 T326 F327 S328 F336

E340 E341 D357 E374 D375 L394 R430 M435 D441 R447 L450 F464 K472
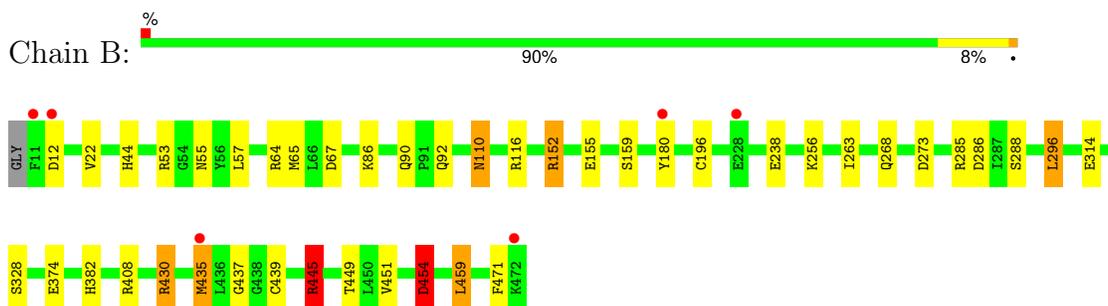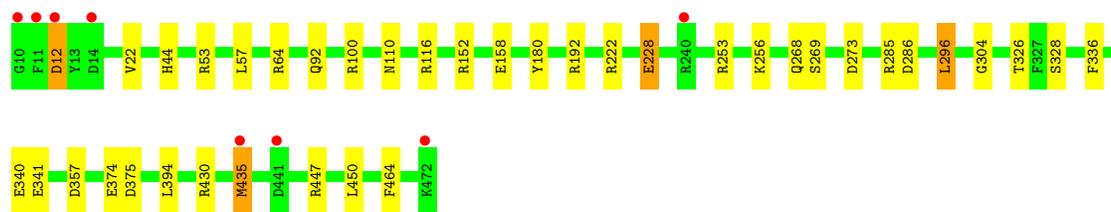
4 Data and refinement statistics (i)

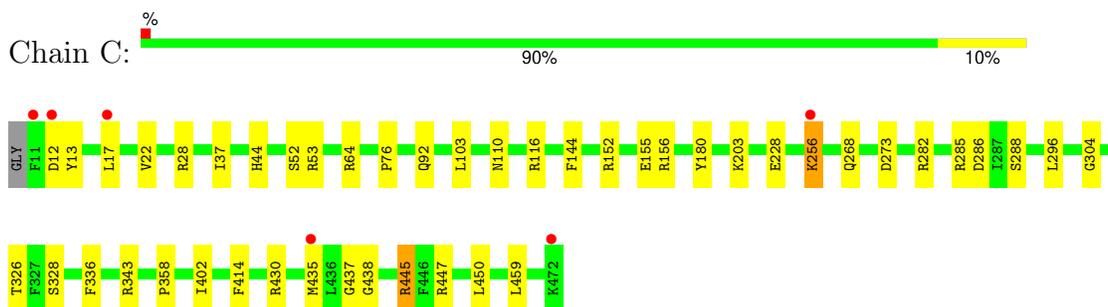| Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	69.50Å 226.92Å 71.44Å 90.00° 108.67° 90.00°	Depositor
Resolution (Å)	53.96 – 1.63 53.96 – 1.63	Depositor EDS
% Data completeness (in resolution range)	96.8 (53.96-1.63) 96.9 (53.96-1.63)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.67 (at 1.63Å)	Xtriage
Refinement program	REFMAC 5.8.0073, PHENIX	Depositor
R, R_{free}	0.176 , 0.203 0.186 , 0.210	Depositor DCC
R_{free} test set	12646 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	16.2	Xtriage
Anisotropy	0.018	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 31.5	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.017 for l,-k,h	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	15894	wwPDB-VP
Average B, all atoms (Å^2)	19.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.12% 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: FES, GOL, PLP

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	1.01	2/3858 (0.1%)	1.11	23/5205 (0.4%)
1	B	1.02	3/3837 (0.1%)	1.11	17/5183 (0.3%)
1	C	1.05	0/3819	1.12	19/5158 (0.4%)
1	D	1.08	2/3878 (0.1%)	1.08	15/5234 (0.3%)
All	All	1.04	7/15392 (0.0%)	1.10	74/20780 (0.4%)

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

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	374	GLU	CD-OE1	-6.25	1.18	1.25
1	A	359	SER	CB-OG	-5.72	1.34	1.42
1	B	12	ASP	CB-CG	5.67	1.63	1.51
1	D	341	GLU	CD-OE1	5.41	1.31	1.25
1	A	196	CYS	CB-SG	-5.22	1.73	1.81
1	B	454	ASP	CB-CG	-5.01	1.41	1.51
1	B	196	CYS	CB-SG	-5.00	1.73	1.81

All (74) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	445	ARG	NE-CZ-NH2	18.38	129.49	120.30
1	A	445	ARG	NE-CZ-NH2	17.79	129.19	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	445	ARG	NE-CZ-NH1	-16.70	111.95	120.30
1	B	445	ARG	NE-CZ-NH2	14.61	127.60	120.30
1	B	445	ARG	NE-CZ-NH1	-13.85	113.38	120.30
1	C	445	ARG	NE-CZ-NH1	-13.62	113.49	120.30
1	D	64	ARG	NE-CZ-NH1	12.13	126.36	120.30
1	A	64	ARG	NE-CZ-NH1	9.55	125.08	120.30
1	B	12	ASP	CB-CG-OD1	9.05	126.44	118.30
1	C	296	LEU	CB-CG-CD2	8.98	126.26	111.00
1	A	28	ARG	NE-CZ-NH2	8.54	124.57	120.30
1	B	64	ARG	NE-CZ-NH2	-8.41	116.10	120.30
1	C	343	ARG	NE-CZ-NH2	-8.39	116.10	120.30
1	A	404	ARG	NE-CZ-NH2	-8.24	116.18	120.30
1	B	152[A]	ARG	NE-CZ-NH1	-8.09	116.25	120.30
1	B	152[B]	ARG	NE-CZ-NH1	-8.09	116.25	120.30
1	A	12	ASP	CB-CG-OD1	8.06	125.55	118.30
1	D	64	ARG	NE-CZ-NH2	-7.77	116.41	120.30
1	D	447	ARG	NE-CZ-NH1	-7.77	116.42	120.30
1	D	192	ARG	NE-CZ-NH2	-7.77	116.42	120.30
1	D	447	ARG	NE-CZ-NH2	7.56	124.08	120.30
1	C	447	ARG	NE-CZ-NH2	7.54	124.07	120.30
1	A	408	ARG	NE-CZ-NH1	7.35	123.97	120.30
1	A	64	ARG	NE-CZ-NH2	-7.30	116.65	120.30
1	C	447	ARG	NE-CZ-NH1	-7.21	116.69	120.30
1	D	222	ARG	NE-CZ-NH1	7.21	123.90	120.30
1	A	445	ARG	CD-NE-CZ	7.06	133.48	123.60
1	D	12	ASP	CB-CG-OD1	7.01	124.61	118.30
1	B	64	ARG	NE-CZ-NH1	7.00	123.80	120.30
1	D	296	LEU	CB-CG-CD2	6.95	122.81	111.00
1	C	64	ARG	NE-CZ-NH1	6.90	123.75	120.30
1	A	408	ARG	NE-CZ-NH2	-6.81	116.90	120.30
1	D	12	ASP	CB-CG-OD2	-6.67	112.30	118.30
1	C	445	ARG	CD-NE-CZ	6.60	132.83	123.60
1	A	406	ARG	NE-CZ-NH1	6.57	123.58	120.30
1	B	445	ARG	CD-NE-CZ	6.49	132.68	123.60
1	B	12	ASP	CB-CG-OD2	-6.47	112.48	118.30
1	A	343	ARG	NE-CZ-NH1	6.38	123.49	120.30
1	A	28	ARG	NE-CZ-NH1	-6.24	117.18	120.30
1	D	286	ASP	CB-CG-OD1	6.23	123.91	118.30
1	A	406	ARG	NE-CZ-NH2	-6.16	117.22	120.30
1	C	282	ARG	NE-CZ-NH2	6.10	123.35	120.30
1	D	253	ARG	NE-CZ-NH1	6.06	123.33	120.30
1	C	28	ARG	NE-CZ-NH2	6.05	123.33	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	238	GLU	OE1-CD-OE2	-6.01	116.09	123.30
1	D	375	ASP	CB-CG-OD1	5.94	123.65	118.30
1	A	116	ARG	NE-CZ-NH1	5.92	123.26	120.30
1	B	430	ARG	NE-CZ-NH2	-5.87	117.37	120.30
1	D	116	ARG	NE-CZ-NH1	5.87	123.23	120.30
1	D	100	ARG	NE-CZ-NH2	-5.78	117.41	120.30
1	B	152[A]	ARG	NE-CZ-NH2	5.76	123.18	120.30
1	B	152[B]	ARG	NE-CZ-NH2	5.76	123.18	120.30
1	A	149	MET	CG-SD-CE	-5.62	91.20	100.20
1	C	12	ASP	CB-CG-OD1	5.62	123.36	118.30
1	C	156	ARG	NE-CZ-NH2	-5.59	117.51	120.30
1	A	296	LEU	CB-CG-CD2	5.55	120.43	111.00
1	A	222	ARG	NE-CZ-NH1	5.48	123.04	120.30
1	A	156	ARG	NE-CZ-NH1	5.44	123.02	120.30
1	C	144	PHE	CB-CG-CD2	-5.44	116.99	120.80
1	A	240	ARG	NE-CZ-NH1	5.42	123.01	120.30
1	C	116	ARG	NE-CZ-NH2	-5.36	117.62	120.30
1	C	286	ASP	CB-CG-OD2	-5.32	113.51	118.30
1	B	286	ASP	CB-CG-OD1	5.29	123.06	118.30
1	B	116	ARG	NE-CZ-NH1	5.23	122.91	120.30
1	A	357	ASP	CB-CG-OD1	5.21	122.99	118.30
1	C	64	ARG	NE-CZ-NH2	-5.18	117.71	120.30
1	A	445	ARG	CB-CG-CD	5.15	125.00	111.60
1	A	318	LEU	CB-CG-CD1	-5.13	102.27	111.00
1	C	445	ARG	CB-CG-CD	5.11	124.89	111.60
1	D	357	ASP	CB-CG-OD1	5.11	122.89	118.30
1	C	343	ARG	NE-CZ-NH1	5.04	122.82	120.30
1	B	408	ARG	NE-CZ-NH2	-5.03	117.79	120.30
1	C	144	PHE	CB-CG-CD1	5.02	124.32	120.80
1	B	459	LEU	CA-CB-CG	5.01	126.81	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	471	PHE	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	3739	0	3713	31	0
1	B	3742	0	3655	29	0
1	C	3724	0	3654	22	0
1	D	3768	0	3695	17	0
2	A	4	0	0	0	0
2	C	4	0	0	0	0
3	A	15	0	6	0	0
3	B	15	0	6	0	0
3	C	15	0	6	0	0
3	D	15	0	6	0	0
4	B	6	0	7	3	0
4	C	6	0	8	0	0
5	A	213	0	0	4	0
5	B	159	0	0	1	0
5	C	199	0	0	3	0
5	D	270	0	0	3	0
All	All	15894	0	14756	99	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 3.

All (99) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:53[B]:ARG:HG3	1:A:53[B]:ARG:HH11	1.12	1.05
1:D:53[B]:ARG:HG2	1:D:53[B]:ARG:HH11	1.12	1.03
1:D:228:GLU:HG3	5:D:696:HOH:O	1.59	1.01
1:B:65:MET:HB2	1:B:435[B]:MET:HE2	1.47	0.96
1:A:155:GLU:OE1	1:A:180:TYR:OH	1.87	0.91
1:D:53[B]:ARG:HH11	1:D:53[B]:ARG:CG	1.84	0.90
1:C:152:ARG:HD2	1:C:180:TYR:OH	1.72	0.90
1:A:65:MET:HB2	1:A:435[B]:MET:HE3	1.57	0.84
1:D:53[B]:ARG:HG2	1:D:53[B]:ARG:NH1	1.92	0.81
1:B:65:MET:HB2	1:B:435[B]:MET:CE	2.12	0.80
1:A:157:GLY:HA3	1:A:158:GLU:HB2	1.67	0.76
1:B:57:LEU:HB3	1:B:435[B]:MET:HE1	1.72	0.71
1:B:155:GLU:OE1	1:B:180:TYR:OH	2.08	0.71
1:C:17:LEU:HB3	5:C:797:HOH:O	1.91	0.70
1:A:53[B]:ARG:HG3	1:A:53[B]:ARG:NH1	1.93	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:53[B]:ARG:HG2	1:C:53[B]:ARG:HH11	1.56	0.70
1:C:155:GLU:OE1	1:C:180:TYR:OH	2.10	0.69
1:A:57:LEU:HD23	1:A:435[B]:MET:HE1	1.73	0.68
1:B:449[A]:THR:HG23	1:B:451:VAL:H	1.58	0.68
1:B:314:GLU:HA	4:B:501:GOL:H12	1.74	0.68
1:A:65:MET:SD	1:A:435[B]:MET:HE2	2.35	0.67
1:B:314:GLU:HA	4:B:501:GOL:C1	2.25	0.67
1:B:152[B]:ARG:HH21	1:B:155:GLU:HB2	1.59	0.66
1:D:53[B]:ARG:CG	1:D:53[B]:ARG:NH1	2.50	0.66
1:B:152[B]:ARG:HE	1:B:152[B]:ARG:HA	1.60	0.65
1:B:437:GLY:N	5:B:666:HOH:O	2.25	0.64
1:D:152:ARG:HG2	1:D:180[B]:TYR:HE2	1.64	0.63
1:C:268:GLN:O	1:C:273:ASP:HA	1.99	0.62
1:A:437:GLY:N	5:A:744:HOH:O	2.31	0.61
1:C:53[B]:ARG:HG2	1:C:53[B]:ARG:NH1	2.17	0.59
1:B:263:ILE:HD12	1:B:296:LEU:HD13	1.85	0.58
1:A:65:MET:HB2	1:A:435[B]:MET:CE	2.30	0.57
1:C:152:ARG:HD2	1:C:180:TYR:CZ	2.39	0.57
1:A:52:SER:O	1:A:53[B]:ARG:NH1	2.38	0.57
1:B:382:HIS:NE2	1:B:454:ASP:OD2	2.38	0.55
1:A:53[B]:ARG:HH11	1:A:53[B]:ARG:CG	2.00	0.54
1:B:57:LEU:HB3	1:B:435[B]:MET:CE	2.38	0.53
1:B:152[B]:ARG:HH21	1:B:155:GLU:CB	2.20	0.53
1:B:55:ASN:ND2	1:B:449[A]:THR:HG22	2.25	0.52
1:D:12:ASP:OD2	5:D:633:HOH:O	2.19	0.51
1:D:152:ARG:HG2	1:D:180[B]:TYR:CE2	2.43	0.51
1:B:92[B]:GLN:H	1:B:92[B]:GLN:CD	2.14	0.51
1:A:157:GLY:CA	1:A:158:GLU:HB2	2.39	0.51
1:A:439:CYS:HB3	1:A:445:ARG:HD2	1.93	0.50
1:B:268:GLN:O	1:B:273:ASP:HA	2.11	0.50
1:D:57:LEU:HD23	1:D:435[B]:MET:HE1	1.94	0.50
1:A:65:MET:CE	1:A:435[B]:MET:HE2	2.42	0.50
1:C:13:TYR:CE2	1:C:53[B]:ARG:HG3	2.48	0.49
1:B:152[B]:ARG:HE	1:B:152[B]:ARG:CA	2.24	0.49
1:A:326:THR:HG22	1:A:336:PHE:HB3	1.95	0.49
1:D:268:GLN:O	1:D:273:ASP:HA	2.13	0.49
1:A:438:GLY:O	1:A:445:ARG:HD3	2.12	0.49
1:A:57:LEU:HB3	1:A:435[B]:MET:CE	2.42	0.48
1:C:37[B]:ILE:O	1:C:37[B]:ILE:HG22	2.14	0.48
1:C:437:GLY:N	5:C:744:HOH:O	2.36	0.48
1:B:65:MET:CB	1:B:435[B]:MET:CE	2.89	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:67:ASP:HA	1:B:435[A]:MET:HB2	1.97	0.46
1:C:22:VAL:CG1	1:C:430:ARG:HD3	2.45	0.46
1:A:256:LYS:N	1:A:256:LYS:HD3	2.30	0.46
1:D:152:ARG:HD2	1:D:180[B]:TYR:OH	2.16	0.46
1:A:13:TYR:CE2	1:A:53[A]:ARG:HB2	2.51	0.46
1:B:110:ASN:HD22	1:B:110:ASN:C	2.18	0.46
1:C:52:SER:C	1:C:53[B]:ARG:HG2	2.36	0.46
1:C:326:THR:HG22	1:C:336:PHE:HB3	1.98	0.46
1:B:110:ASN:C	1:B:110:ASN:ND2	2.68	0.45
1:D:326:THR:HG22	1:D:336:PHE:HB3	1.98	0.45
1:A:338:HIS:HE1	5:A:627:HOH:O	1.99	0.45
1:B:86:LYS:O	1:B:90[A]:GLN:HG2	2.16	0.45
1:D:435[B]:MET:HB3	1:D:435[B]:MET:HE3	1.64	0.45
1:A:22:VAL:HG11	1:A:430:ARG:HD3	2.00	0.44
1:A:45:PHE:HZ	1:A:435[B]:MET:CE	2.30	0.44
1:B:152[A]:ARG:HH11	1:B:152[A]:ARG:HD2	1.60	0.44
1:A:149:MET:HG2	1:A:349:ARG:NH2	2.32	0.44
1:A:338:HIS:CE1	5:A:627:HOH:O	2.69	0.44
1:A:304:GLY:O	1:A:450:LEU:HD11	2.18	0.44
1:B:314:GLU:HA	4:B:501:GOL:H11	1.99	0.44
1:D:304:GLY:O	1:D:450:LEU:HD11	2.17	0.44
1:A:332[B]:MET:HE2	1:A:332[B]:MET:HB3	1.85	0.44
1:C:304:GLY:O	1:C:450:LEU:HD11	2.19	0.43
1:A:110:ASN:C	1:A:110:ASN:HD22	2.21	0.43
1:C:103:LEU:HD21	1:C:358:PRO:HG3	2.00	0.43
1:C:438:GLY:O	1:C:445:ARG:HD3	2.19	0.43
1:D:22:VAL:HG11	1:D:430:ARG:HD3	2.00	0.42
1:A:57:LEU:HB3	1:A:435[B]:MET:HE3	2.01	0.42
1:C:402[A]:ILE:HD12	1:C:414:PHE:CE1	2.54	0.42
1:A:372:LYS:NZ	5:A:617:HOH:O	2.51	0.42
1:B:67:ASP:HB2	1:B:435[B]:MET:HE1	2.02	0.42
1:C:52:SER:O	1:C:53[B]:ARG:HG2	2.18	0.42
1:B:22:VAL:CG1	1:B:430:ARG:HD3	2.49	0.42
1:C:53[B]:ARG:HH11	1:C:53[B]:ARG:CG	2.28	0.42
1:A:270[B]:GLU:O	1:A:270[B]:GLU:HG3	2.19	0.41
1:D:394:LEU:HD13	1:D:464[B]:PHE:CD2	2.55	0.41
1:C:256:LYS:HE3	1:C:256:LYS:HB2	1.87	0.41
1:D:269:SER:HB2	5:D:810:HOH:O	2.19	0.41
1:C:430:ARG:HD2	5:C:759:HOH:O	2.21	0.41
1:A:110:ASN:C	1:A:110:ASN:ND2	2.73	0.41
1:B:57:LEU:HD23	1:B:435[B]:MET:SD	2.61	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:439:CYS:HB3	1:B:445:ARG:HD2	2.03	0.41
1:C:37[B]:ILE:O	1:C:37[B]:ILE:CG2	2.69	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	473/463 (102%)	453 (96%)	17 (4%)	3 (1%)	22	7
1	B	472/463 (102%)	455 (96%)	16 (3%)	1 (0%)	44	26
1	C	470/463 (102%)	454 (97%)	14 (3%)	2 (0%)	30	13
1	D	477/463 (103%)	461 (97%)	15 (3%)	1 (0%)	44	26
All	All	1892/1852 (102%)	1823 (96%)	62 (3%)	7 (0%)	30	13

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	158	GLU
1	A	328	SER
1	B	328	SER
1	D	328	SER
1	C	328	SER
1	A	76	PRO
1	C	76	PRO

5.3.2 Protein sidechains (i)

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	410/401 (102%)	398 (97%)	12 (3%)	37	11
1	B	403/401 (100%)	388 (96%)	15 (4%)	29	5
1	C	402/401 (100%)	390 (97%)	12 (3%)	36	10
1	D	406/401 (101%)	395 (97%)	11 (3%)	40	12
All	All	1621/1604 (101%)	1571 (97%)	50 (3%)	38	9

All (50) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	17	LEU
1	A	44	HIS
1	A	92	GLN
1	A	110	ASN
1	A	228	GLU
1	A	256	LYS
1	A	273	ASP
1	A	285	ARG
1	A	296	LEU
1	A	435[A]	MET
1	A	435[B]	MET
1	A	445	ARG
1	B	44	HIS
1	B	53[A]	ARG
1	B	53[B]	ARG
1	B	110	ASN
1	B	159	SER
1	B	256	LYS
1	B	285	ARG
1	B	288	SER
1	B	296	LEU
1	B	374	GLU
1	B	435[A]	MET
1	B	435[B]	MET
1	B	445	ARG
1	B	454	ASP
1	B	459	LEU
1	C	44	HIS
1	C	92	GLN
1	C	110	ASN

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Mol	Chain	Res	Type
1	C	203	LYS
1	C	228[A]	GLU
1	C	228[B]	GLU
1	C	256	LYS
1	C	285	ARG
1	C	288	SER
1	C	435[A]	MET
1	C	435[B]	MET
1	C	459	LEU
1	D	44	HIS
1	D	92	GLN
1	D	110	ASN
1	D	158	GLU
1	D	228	GLU
1	D	256	LYS
1	D	285	ARG
1	D	296	LEU
1	D	340	GLU
1	D	435[A]	MET
1	D	435[B]	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	44	HIS
1	A	110	ASN
1	A	338	HIS
1	B	55	ASN
1	B	110	ASN
1	B	338	HIS
1	C	44	HIS
1	C	55	ASN
1	C	110	ASN
1	C	338	HIS
1	D	55	ASN
1	D	110	ASN
1	D	338	HIS

5.3.3 RNA (i)

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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

8 ligands 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	$\#|Z| > 2$
3	PLP	C	503	1	15,15,16	2.88	4 (26%)	21,22,23	1.69	7 (33%)
3	PLP	B	502	1	15,15,16	2.95	5 (33%)	21,22,23	1.41	3 (14%)
3	PLP	A	502	1	15,15,16	2.25	6 (40%)	21,22,23	2.11	8 (38%)
4	GOL	C	502	-	5,5,5	0.66	0	5,5,5	1.18	0
2	FES	A	501	1	0,4,4	-	-	-		
2	FES	C	501	1	0,4,4	-	-	-		
3	PLP	D	501	1	15,15,16	2.11	5 (33%)	21,22,23	2.12	5 (23%)
4	GOL	B	501	-	5,5,5	1.08	1 (20%)	5,5,5	1.69	2 (40%)

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	PLP	C	503	1	-	0/6/6/8	0/1/1/1
3	PLP	B	502	1	-	0/6/6/8	0/1/1/1
3	PLP	A	502	1	-	0/6/6/8	0/1/1/1
4	GOL	C	502	-	-	2/4/4/4	-
2	FES	A	501	1	-	-	0/1/1/1
2	FES	C	501	1	-	-	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	PLP	D	501	1	-	0/6/6/8	0/1/1/1
4	GOL	B	501	-	-	1/4/4/4	-

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	503	PLP	C3-C2	8.36	1.49	1.41
3	B	502	PLP	C5-C4	7.34	1.48	1.40
3	B	502	PLP	C3-C2	6.50	1.47	1.41
3	D	501	PLP	C3-C2	5.69	1.46	1.41
3	A	502	PLP	C5-C4	5.43	1.46	1.40
3	C	503	PLP	C5-C4	4.72	1.45	1.40
3	C	503	PLP	C3-C4	4.31	1.48	1.40
3	A	502	PLP	C3-C2	3.58	1.44	1.41
3	B	502	PLP	P-O4P	3.47	1.71	1.60
3	B	502	PLP	C3-C4	3.29	1.46	1.40
3	D	501	PLP	C3-C4	2.66	1.45	1.40
3	D	501	PLP	C5-C4	2.53	1.43	1.40
3	D	501	PLP	C2A-C2	-2.51	1.46	1.50
3	A	502	PLP	C6-N1	2.33	1.39	1.34
4	B	501	GOL	O2-C2	-2.32	1.36	1.43
3	B	502	PLP	C6-N1	2.28	1.39	1.34
3	A	502	PLP	C2A-C2	-2.20	1.46	1.50
3	A	502	PLP	C3-C4	2.12	1.44	1.40
3	A	502	PLP	P-O1P	2.09	1.57	1.50
3	D	501	PLP	P-O1P	2.09	1.57	1.50
3	C	503	PLP	O3-C3	-2.04	1.32	1.36

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	501	PLP	C4A-C4-C5	5.75	126.87	120.94
3	A	502	PLP	C6-C5-C4	5.43	122.55	118.10
3	D	501	PLP	O4P-C5A-C5	4.53	117.84	109.36
3	A	502	PLP	O3P-P-O2P	3.67	121.55	107.80
3	A	502	PLP	O4P-C5A-C5	3.24	115.43	109.36
3	A	502	PLP	C4A-C4-C5	3.16	124.20	120.94
3	C	503	PLP	C6-N1-C2	3.12	124.85	119.20
3	C	503	PLP	C6-C5-C4	3.10	120.64	118.10
3	B	502	PLP	O3P-P-O4P	-3.05	98.72	106.67
3	D	501	PLP	O3P-P-O2P	2.94	118.81	107.80
3	A	502	PLP	C3-C4-C5	-2.73	115.32	118.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	503	PLP	C2A-C2-N1	2.48	122.32	117.64
3	D	501	PLP	C2A-C2-N1	2.40	122.16	117.64
3	D	501	PLP	C4A-C4-C3	-2.37	116.57	120.52
3	B	502	PLP	C6-N1-C2	2.36	123.47	119.20
3	C	503	PLP	O3-C3-C2	2.30	122.34	117.58
4	B	501	GOL	O2-C2-C3	-2.28	99.75	109.18
3	B	502	PLP	O4P-P-O1P	-2.28	100.29	106.44
3	A	502	PLP	C5A-C5-C4	-2.26	118.18	122.64
3	C	503	PLP	O4P-P-O1P	-2.21	100.46	106.44
3	C	503	PLP	C4-C3-C2	-2.19	116.61	119.89
4	B	501	GOL	C3-C2-C1	2.15	119.69	111.80
3	A	502	PLP	O3P-P-O4P	-2.04	101.34	106.67
3	A	502	PLP	O3-C3-C4	2.04	123.43	118.10
3	C	503	PLP	C2A-C2-C3	-2.01	118.45	120.80

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	501	GOL	C1-C2-C3-O3
4	C	502	GOL	C1-C2-C3-O3
4	C	502	GOL	O2-C2-C3-O3

There are no ring outliers.

1 monomer is involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	501	GOL	3	0

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	461/463 (99%)	-0.30	7 (1%) 71	76	6, 17, 33, 65	14 (3%)
1	B	462/463 (99%)	-0.09	6 (1%) 74	79	8, 19, 33, 86	12 (2%)
1	C	462/463 (99%)	-0.20	6 (1%) 74	79	5, 17, 31, 51	10 (2%)
1	D	463/463 (100%)	-0.33	8 (1%) 69	74	6, 15, 28, 84	16 (3%)
All	All	1848/1852 (99%)	-0.23	27 (1%) 71	76	5, 17, 31, 86	52 (2%)

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	11	PHE	9.6
1	D	11	PHE	7.8
1	D	10	GLY	6.8
1	C	11	PHE	5.4
1	B	472	LYS	4.6
1	B	435[A]	MET	4.3
1	A	11	PHE	4.2
1	D	12	ASP	3.9
1	D	472	LYS	3.8
1	B	12	ASP	3.7
1	D	435[A]	MET	3.5
1	C	472	LYS	3.1
1	C	17	LEU	3.0
1	A	163	LYS	2.7
1	A	157	GLY	2.6
1	C	435[A]	MET	2.6
1	B	180	TYR	2.5
1	B	228	GLU	2.4
1	C	256	LYS	2.3
1	C	12	ASP	2.3
1	D	14	ASP	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	12	ASP	2.2
1	D	441	ASP	2.2
1	A	180	TYR	2.2
1	D	240[A]	ARG	2.1
1	A	158	GLU	2.0
1	A	435[A]	MET	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 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
4	GOL	B	501	6/6	0.86	0.16	23,38,46,49	0
4	GOL	C	502	6/6	0.86	0.14	36,47,48,48	0
3	PLP	B	502	15/16	0.97	0.07	13,16,19,22	0
3	PLP	D	501	15/16	0.98	0.06	10,14,17,24	0
3	PLP	C	503	15/16	0.99	0.04	10,12,15,21	0
3	PLP	A	502	15/16	0.99	0.04	12,15,19,20	0
2	FES	A	501	4/4	1.00	0.02	13,13,13,13	0
2	FES	C	501	4/4	1.00	0.02	11,11,11,12	0

6.5 Other polymers ⓘ

There are no such residues in this entry.