



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 18, 2024 – 09:26 AM EDT

PDB ID : 4A0F
Title : Structure of selenomethionine substituted bifunctional DAPA aminotransferase-dethiobiotin synthetase from Arabidopsis thaliana in its apo form.
Authors : Cobessi, D.; Dumas, R.; Pautre, V.; Meinguet, C.; Ferrer, J.L.; Alban, C.
Deposited on : 2011-09-09
Resolution : 2.71 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.20.1
EDS : 2.37.1
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) : 2.37.1

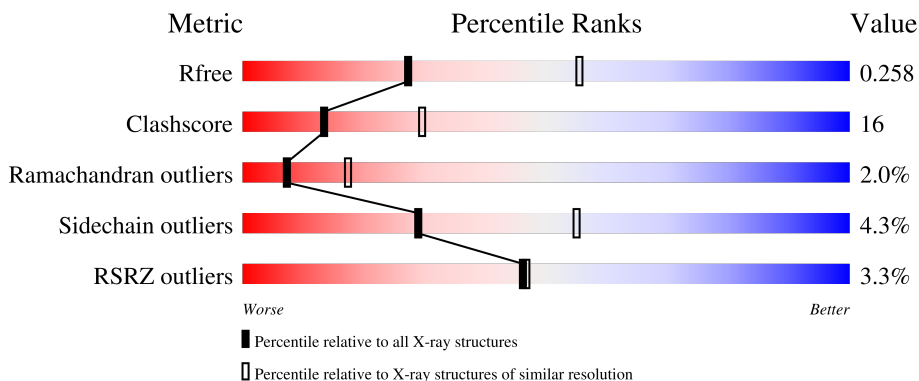
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.71 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}	130704	3359 (2.74-2.70)
Clashscore	141614	3686 (2.74-2.70)
Ramachandran outliers	138981	3622 (2.74-2.70)
Sidechain outliers	138945	3623 (2.74-2.70)
RSRZ outliers	127900	3276 (2.74-2.70)

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 $\leq 5\%$. 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	831	
1	B	831	

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
3	SO4	B	1810	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 11317 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 ADENOSYLMETHIONINE-8-AMINO-7-OXONONANOATE AMINOTRANSFERASE.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	746	5568	3562	937	1037	16	16	0	1	0
1	B	750	5619	3598	944	1046	16	15	0	0	0

There are 42 discrepancies between the modelled and reference sequences:

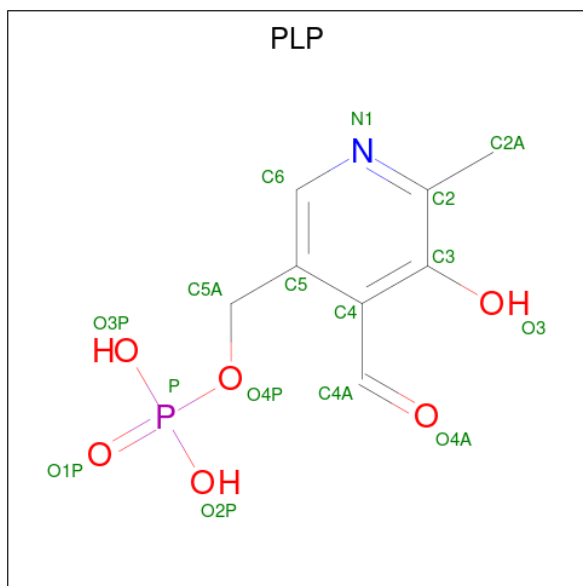
Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	GLY	-	expression tag	UNP B0F481
A	-18	SER	-	expression tag	UNP B0F481
A	-17	SER	-	expression tag	UNP B0F481
A	-16	HIS	-	expression tag	UNP B0F481
A	-15	HIS	-	expression tag	UNP B0F481
A	-14	HIS	-	expression tag	UNP B0F481
A	-13	HIS	-	expression tag	UNP B0F481
A	-12	HIS	-	expression tag	UNP B0F481
A	-11	HIS	-	expression tag	UNP B0F481
A	-10	SER	-	expression tag	UNP B0F481
A	-9	SER	-	expression tag	UNP B0F481
A	-8	GLY	-	expression tag	UNP B0F481
A	-7	LEU	-	expression tag	UNP B0F481
A	-6	VAL	-	expression tag	UNP B0F481
A	-5	PRO	-	expression tag	UNP B0F481
A	-4	ARG	-	expression tag	UNP B0F481
A	-3	GLY	-	expression tag	UNP B0F481
A	-2	SER	-	expression tag	UNP B0F481
A	-1	HIS	-	expression tag	UNP B0F481
A	0	MSE	-	expression tag	UNP B0F481
A	326	TYR	PHE	engineered mutation	UNP B0F481
B	-19	GLY	-	expression tag	UNP B0F481
B	-18	SER	-	expression tag	UNP B0F481
B	-17	SER	-	expression tag	UNP B0F481

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-16	HIS	-	expression tag	UNP B0F481
B	-15	HIS	-	expression tag	UNP B0F481
B	-14	HIS	-	expression tag	UNP B0F481
B	-13	HIS	-	expression tag	UNP B0F481
B	-12	HIS	-	expression tag	UNP B0F481
B	-11	HIS	-	expression tag	UNP B0F481
B	-10	SER	-	expression tag	UNP B0F481
B	-9	SER	-	expression tag	UNP B0F481
B	-8	GLY	-	expression tag	UNP B0F481
B	-7	LEU	-	expression tag	UNP B0F481
B	-6	VAL	-	expression tag	UNP B0F481
B	-5	PRO	-	expression tag	UNP B0F481
B	-4	ARG	-	expression tag	UNP B0F481
B	-3	GLY	-	expression tag	UNP B0F481
B	-2	SER	-	expression tag	UNP B0F481
B	-1	HIS	-	expression tag	UNP B0F481
B	0	MSE	-	expression tag	UNP B0F481
B	326	TYR	PHE	engineered mutation	UNP B0F481

- Molecule 2 is PYRIDOXAL-5'-PHOSPHATE (three-letter code: PLP) (formula: $C_8H_{10}NO_6P$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
2	A	1	Total	C	N	O	P	0	0
			15	8	1	5	1		
2	B	1	Total	C	N	O	P	0	0
			15	8	1	5	1		

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O S 5 4 1	0	0
3	A	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	50	Total O 50 50	0	0
4	B	30	Total O 30 30	0	0

T99	T49	H138	L262	G373	V464	H562	L645	T99
SER	K50	E139	V266	P374	K465	LEU	M650	ALA
HIS	L51	I142	L269	L382	I467	GLN	V651	S757
HIS	Q58	H145	L277	A383	R470	HIS	P652	Y759
HIS	T59	L146	D277	R384	H474	GLY	T659	L763
HIS	G60	R150	F276	E385	L478	VAL	D660	L764
HIS	F61	L168	S279	M386	L479	ARG	V662	M766
HIS	P62	L172	D280	Y388	G478	SER	F666	E769
SER	S67	M172	L282	R392	A480	A573	S667	T774
LEU	F71	GLU	V287	H395	M481	H574	G688	M779
LEU	S72	CYS	F293	V396	E482	V575	D689	L783
VAL	K73	GLY	L296	M397	A485	G576	S670	S790
PRO	L74	VAL	K297	F398	P486	A577	L671	L787
ARG	L74	LYS	L297	P399	P488	I579	L672	L798
GLY	L79	SER	M300	V402	G491	I580	L675	L801
SER	R80	GLU	V301	Y403	W497	V583	S680	R804
HIS	R81	LYS	L302	E411	W497	I584	Y681	L805
MSE	R81	SER	A315	L414	R501	M590	A685	G806
LYS	R85	LYS	K316	V417	P508	M592	M686	E807
SER	T85	SER	L317	S428	T509	D594	G687	F808
THR	S86	D182	V321	D429	V510	P595	C688	ASN
SER	I87	L183	V325	M430	S513	L596	T708	ARG
V5	M89	L184	V326	M433	H514	F597	S709	THR
S6	S90	C185	T327	T433	G515	G598	Q710	
P7	V91	L186	K330	I437	G515	R599	L714	
H9	L92	V187	H333	A438	I619	V600	L717	
L10	H93	P196	T336	M441	S520	V602	W718	
P11	S94	L206	V337	A442	F525	I610	D719	
L12	L96	F207	I340	F443	SER	P611	V723	
M13	S95	R208	ALA	R444	GLU	V612	Q724	
H14	P97	P209	F445	F446	ILE	I613	H729	
L18	S101	F210	C447	C447	PRO	F614	S730	
S21	L104	R211	V448	V448	TYR	D615	A731	
T24	ASN	G218	D449	D450	GLY	V617	V737	
S25	GLU	D219	H450	H451	T534	W622	I738	
L26	VAL	G220	M451	F452	F535	R623	L741	
G27	SER	R221	CYS	GLU	T536	L624	L746	
K28	E110	L222	ALA	ALA	S537	T628	LYS	
T29	M113	G224	GLU	GLU	R538	T629	ALA	
L30	C114	I225	THR	THR	R538	T630	ALA	
V31	R119	I229	GLU	GLU	R538	K636	ASP	
G34	A127	E233	S357	CYS	R538	I639	ALA	
I35	P128	K236	S360	ALA	R546	T630	SER	
A36	E129	L237	Q361	ALA	D547	T630	ASN	
L41	L131	D241	A367	GLU	S556	K644	GLY	
Q42	L131	L252	S369	LYS	L559	A643		
Q43	T134	P257	I462	HIS	S560	K644		
PRO	L136		V463		K561			
SER	S47							
SER	A48							

4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	233.67Å 75.97Å 88.63Å 90.00° 109.20° 90.00°	Depositor
Resolution (Å)	41.85 – 2.71 41.85 – 2.71	Depositor EDS
% Data completeness (in resolution range)	99.1 (41.85-2.71) 99.2 (41.85-2.71)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.82 (at 2.73Å)	Xtrriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.200 , 0.261 0.194 , 0.258	Depositor DCC
R_{free} test set	1990 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å ²)	48.0	Xtrriage
Anisotropy	0.463	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 46.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	11317	wwPDB-VP
Average B, all atoms (Å ²)	58.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.71% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PLP, SO4

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	0.44	0/5681	0.60	1/7722 (0.0%)
1	B	0.45	0/5731	0.60	0/7787
All	All	0.45	0/11412	0.60	1/15509 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	44	PRO	N-CA-CB	6.07	110.59	103.30

There are no chirality outliers.

There are no planarity outliers.

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	5568	0	5367	172	0
1	B	5619	0	5425	206	0
2	A	15	0	6	2	0
2	B	15	0	6	2	0
3	A	10	0	0	1	0
3	B	10	0	0	3	0
4	A	50	0	0	1	0
4	B	30	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	11317	0	10804	355	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 16.

All (355) 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:21:SER:HB2	1:A:28:LYS:HD3	1.41	1.01
1:B:21:SER:HB2	1:B:28:LYS:HD3	1.41	1.00
1:A:510:VAL:HB	1:A:592:MSE:HE2	1.48	0.96
1:B:510:VAL:HB	1:B:592:MSE:HE2	1.51	0.91
1:B:766:MSE:HE2	1:B:804:ARG:HD2	1.57	0.86
1:A:766:MSE:HE2	1:A:804:ARG:HD2	1.58	0.84
1:A:397:MSE:HE3	1:A:397:MSE:HA	1.57	0.84
1:A:94:SER:N	1:A:113:MSE:HE1	1.92	0.84
1:A:628:THR:HG22	1:A:630:THR:H	1.43	0.83
1:B:628:THR:HG22	1:B:630:THR:H	1.43	0.82
1:B:113:MSE:HE2	1:B:136:TYR:HD1	1.43	0.81
1:A:93:HIS:HB3	1:A:113:MSE:CE	2.11	0.80
1:B:36:ALA:HA	1:B:51:LEU:HD13	1.64	0.79
1:B:397:MSE:HA	1:B:397:MSE:HE3	1.63	0.79
1:A:428:SER:HB2	1:A:433:THR:OG1	1.83	0.78
1:B:708:THR:HG22	1:B:709:SER:N	1.98	0.77
1:A:113:MSE:HE3	1:A:114:CYS:H	1.50	0.77
1:A:61:PHE:O	1:A:139:GLU:HA	1.84	0.76
1:B:428:SER:HB2	1:B:433:THR:OG1	1.85	0.75
1:B:437:ILE:O	1:B:441:MSE:HG3	1.87	0.75
1:A:36:ALA:HA	1:A:51:LEU:HD13	1.67	0.75
1:A:67:SER:HB3	1:A:89:ASN:OD1	1.85	0.75
1:A:538:ARG:NH2	1:A:716:GLU:OE2	2.16	0.74
1:B:237:LEU:HD21	1:B:384:ARG:HG2	1.68	0.73
1:A:590:MSE:HE2	1:A:741:LEU:HD21	1.69	0.73
1:B:590:MSE:HE2	1:B:741:LEU:HD21	1.69	0.73
1:A:237:LEU:HD21	1:A:384:ARG:HG2	1.70	0.72
1:A:515:GLY:HA2	1:A:724:GLN:OE1	1.90	0.71
1:A:321:VAL:HG22	1:B:414:LEU:HD12	1.72	0.70
1:A:221:ARG:O	1:A:222:LEU:HB2	1.91	0.70
1:A:93:HIS:HB3	1:A:113:MSE:HE2	1.73	0.69
1:B:67:SER:HB3	1:B:89:ASN:OD1	1.91	0.69
1:B:659:THR:HG22	1:B:662:VAL:H	1.56	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:437:ILE:O	1:A:441:MSE:HG3	1.93	0.69
1:B:708:THR:CG2	1:B:709:SER:N	2.57	0.68
1:A:28:LYS:HE2	3:A:1809:SO4:O2	1.94	0.67
1:B:142:ILE:HD12	1:B:146:LEU:HB3	1.78	0.66
1:B:221:ARG:O	1:B:222:LEU:HB2	1.94	0.66
1:B:757:SER:O	1:B:759:TYR:N	2.28	0.66
1:B:42:GLN:HE21	1:B:42:GLN:HA	1.61	0.66
1:B:590:MSE:HE2	1:B:741:LEU:CD2	2.26	0.66
1:A:386:MSE:CE	1:A:686:MSE:HE1	2.24	0.66
1:A:103:GLY:O	1:A:104:LEU:C	2.34	0.65
1:B:333:HIS:O	1:B:336:THR:HG22	1.96	0.65
1:B:519:ILE:HD11	1:B:535:PHE:HZ	1.61	0.65
1:B:386:MSE:CE	1:B:686:MSE:HE1	2.26	0.65
1:A:659:THR:HG22	1:A:662:VAL:H	1.62	0.65
1:B:590:MSE:HE3	1:B:590:MSE:HA	1.79	0.65
1:A:590:MSE:HE2	1:A:741:LEU:CD2	2.27	0.65
1:A:686:MSE:HE3	1:A:686:MSE:C	2.18	0.64
1:A:590:MSE:HE3	1:A:590:MSE:HA	1.78	0.64
1:B:536:THR:HG23	1:B:537:SER:H	1.62	0.64
1:B:441:MSE:HE3	1:B:639:ILE:HG12	1.78	0.64
1:B:519:ILE:HD11	1:B:535:PHE:CZ	2.32	0.64
1:B:296:LEU:O	1:B:300:MSE:HG2	1.98	0.63
1:A:184:LEU:HD12	1:A:185:CYS:H	1.64	0.63
1:A:94:SER:H	1:A:113:MSE:HE1	1.61	0.63
1:A:369:TRP:HB2	1:B:397:MSE:HE1	1.80	0.63
1:A:386:MSE:HE2	1:A:686:MSE:HE1	1.80	0.63
1:B:764:LEU:HD22	1:B:774:THR:HG23	1.81	0.62
1:B:397:MSE:HA	1:B:397:MSE:CE	2.29	0.62
1:B:686:MSE:C	1:B:686:MSE:HE3	2.20	0.62
1:A:81:ARG:HH21	1:A:287:VAL:HG13	1.65	0.62
1:B:81:ARG:HH21	1:B:287:VAL:HG13	1.63	0.62
1:A:113:MSE:CE	1:A:114:CYS:H	2.13	0.62
1:A:699:LYS:NZ	4:A:2039:HOH:O	2.33	0.62
1:A:296:LEU:O	1:A:300:MSE:HG2	2.00	0.61
1:B:281:ASP:O	1:B:282:LEU:HB2	1.99	0.61
1:B:388:TYR:OH	1:B:392:ARG:NH1	2.33	0.61
1:A:397:MSE:HE2	1:A:399:PRO:HD2	1.82	0.61
1:A:397:MSE:HA	1:A:397:MSE:CE	2.29	0.61
1:B:397:MSE:HE2	1:B:399:PRO:HD2	1.82	0.61
1:A:510:VAL:HB	1:A:592:MSE:CE	2.27	0.61
1:B:225:ILE:HD13	1:B:257:PRO:HG2	1.82	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:184:LEU:HD12	1:B:185:CYS:H	1.66	0.60
1:A:50:LYS:HG2	1:A:129:GLU:HB3	1.82	0.60
1:B:474:HIS:O	1:B:480:ALA:HB1	2.02	0.60
1:A:497:TRP:CD2	1:B:501:ARG:HD2	2.36	0.60
1:B:386:MSE:HE2	1:B:686:MSE:HE1	1.83	0.60
1:B:441:MSE:CE	1:B:639:ILE:HG23	2.32	0.60
1:A:356:ASN:O	1:A:357:SER:O	2.20	0.59
1:B:31:VAL:O	1:B:35:ILE:HG12	2.03	0.59
1:B:50:LYS:HG2	1:B:129:GLU:HB3	1.84	0.59
1:A:31:VAL:O	1:A:35:ILE:HG12	2.02	0.59
1:B:584:ILE:HG21	1:B:590:MSE:HE1	1.83	0.58
1:A:396:VAL:HG13	1:B:340:ILE:HD12	1.85	0.58
1:B:42:GLN:HA	1:B:42:GLN:NE2	2.18	0.58
1:B:575:VAL:HG12	1:B:610:ILE:HD13	1.86	0.57
1:B:515:GLY:HA2	1:B:724:GLN:OE1	2.04	0.57
1:B:622:TRP:HE3	1:B:714:LEU:HD13	1.68	0.57
1:A:93:HIS:HB3	1:A:113:MSE:HE1	1.85	0.57
1:B:74:LEU:HD12	1:B:130:LEU:HD22	1.85	0.57
1:A:547:ASP:CG	1:A:599:ARG:HH11	2.07	0.57
1:A:74:LEU:HD12	1:A:130:LEU:HD22	1.87	0.57
1:A:764:LEU:HD22	1:A:774:THR:HG23	1.87	0.57
1:A:584:ILE:HG21	1:A:590:MSE:HE1	1.86	0.57
1:B:93:HIS:HB3	1:B:113:MSE:HE3	1.87	0.57
1:A:269:LEU:HD12	1:A:296:LEU:HD13	1.87	0.56
1:B:719:ASP:O	1:B:723:VAL:HG23	2.05	0.56
1:A:113:MSE:HE3	1:A:114:CYS:N	2.19	0.56
1:A:325:PRO:O	1:A:327:THR:HG23	2.06	0.56
1:B:142:ILE:HD12	1:B:146:LEU:CB	2.35	0.56
1:A:143:SER:OG	1:A:145:HIS:ND1	2.35	0.55
1:A:652:PRO:HG3	1:B:681:TYR:CB	2.36	0.55
1:B:60:GLY:HA2	1:B:139:GLU:O	2.06	0.55
1:B:74:LEU:CD1	1:B:130:LEU:HD22	2.36	0.55
1:B:547:ASP:CG	1:B:599:ARG:HH11	2.10	0.55
1:B:325:PRO:O	1:B:327:THR:HG23	2.06	0.55
1:B:6:SER:HB3	1:B:7:PRO:HD2	1.89	0.55
1:B:91:VAL:HG22	1:B:134:THR:HB	1.89	0.55
1:A:225:ILE:HD13	1:A:257:PRO:HG2	1.88	0.55
1:A:474:HIS:O	1:A:480:ALA:HB1	2.07	0.54
1:A:651:VAL:HG22	1:A:652:PRO:HD2	1.89	0.54
1:B:510:VAL:HB	1:B:592:MSE:CE	2.31	0.54
1:B:27:GLY:CA	3:B:1810:SO4:O4	2.55	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:446:PHE:CE1	1:B:450:HIS:HD2	2.25	0.54
1:B:61:PHE:CD1	1:B:62:PRO:HA	2.43	0.54
1:B:446:PHE:CE1	1:B:450:HIS:CD2	2.95	0.54
1:B:487:SER:HB2	1:B:488:PRO:HD2	1.89	0.54
1:B:222:LEU:C	1:B:224:GLY:H	2.11	0.54
1:B:487:SER:HB2	1:B:488:PRO:CD	2.38	0.54
1:B:644:LYS:NZ	2:B:1644:PLP:O3	2.39	0.54
1:A:74:LEU:CD1	1:A:130:LEU:HD22	2.37	0.54
1:A:547:ASP:OD2	1:A:599:ARG:NH1	2.41	0.54
1:A:91:VAL:HG22	1:A:134:THR:HB	1.90	0.54
1:A:443:PHE:CD1	1:A:464:VAL:HG11	2.43	0.54
1:A:681:TYR:CB	1:B:652:PRO:HG3	2.36	0.53
1:A:446:PHE:CE1	1:A:450:HIS:CD2	2.96	0.53
1:B:710:GLN:OE1	1:B:710:GLN:HA	2.08	0.53
1:A:317:LEU:HD21	1:B:411:GLU:OE2	2.08	0.53
1:A:388:TYR:OH	1:A:392:ARG:NH1	2.39	0.53
1:A:407:LEU:HD21	1:B:317:LEU:HD23	1.90	0.53
1:A:27:GLY:O	1:A:30:LEU:N	2.42	0.53
1:A:222:LEU:C	1:A:224:GLY:H	2.11	0.53
1:A:708:THR:N	1:A:713:THR:O	2.34	0.53
1:A:584:ILE:HG21	1:A:590:MSE:CE	2.39	0.53
1:B:269:LEU:HD12	1:B:296:LEU:HD13	1.89	0.53
1:B:559:LEU:HD21	1:B:601:LEU:HD12	1.90	0.53
1:B:547:ASP:OD2	1:B:599:ARG:NH1	2.42	0.53
1:A:71:PHE:CE1	1:A:87:ILE:HG13	2.44	0.52
1:A:644:LYS:NZ	2:A:1644:PLP:O3	2.39	0.52
1:A:746:LEU:HD13	1:A:759:TYR:HD1	1.74	0.52
1:A:335:GLU:HA	1:A:335:GLU:OE1	2.09	0.52
1:B:221:ARG:O	1:B:252:LEU:HD12	2.09	0.52
1:A:446:PHE:CE1	1:A:450:HIS:HD2	2.26	0.52
1:B:8:PHE:C	1:B:8:PHE:CD1	2.83	0.52
1:A:487:SER:HB2	1:A:488:PRO:HD2	1.91	0.52
1:B:27:GLY:O	1:B:30:LEU:N	2.41	0.52
1:A:321:VAL:HG22	1:B:414:LEU:CD1	2.40	0.52
1:A:397:MSE:HE1	1:B:369:TRP:HB2	1.91	0.52
1:B:237:LEU:HG	1:B:237:LEU:O	2.10	0.52
1:A:441:MSE:HE3	1:A:639:ILE:HG12	1.91	0.51
1:B:211:ARG:NH2	1:B:241:ASP:OD2	2.44	0.51
1:A:113:MSE:HE3	1:A:113:MSE:CA	2.40	0.51
1:A:221:ARG:O	1:A:222:LEU:CB	2.58	0.51
1:B:729:HIS:O	1:B:731:ALA:N	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:441:MSE:CE	1:A:639:ILE:HG23	2.40	0.51
1:A:184:LEU:HD12	1:A:185:CYS:N	2.25	0.51
1:B:538:ARG:NH1	1:B:737:VAL:O	2.41	0.51
1:A:575:VAL:HG12	1:A:610:ILE:HD13	1.93	0.51
1:A:221:ARG:O	1:A:252:LEU:HD12	2.11	0.51
1:A:211:ARG:NH2	1:A:241:ASP:OD2	2.43	0.51
1:A:348:PHE:CE1	1:B:396:VAL:HG22	2.46	0.51
1:A:487:SER:HB2	1:A:488:PRO:CD	2.40	0.51
1:B:443:PHE:CD1	1:B:464:VAL:HG11	2.46	0.50
1:B:367:ALA:HB1	1:B:372:GLN:HB2	1.94	0.50
1:B:546:ARG:HG2	1:B:596:LEU:HD22	1.93	0.50
1:B:584:ILE:HG21	1:B:590:MSE:CE	2.41	0.50
1:B:470:ARG:HG3	1:B:485:ALA:CB	2.42	0.50
1:B:556:SER:O	1:B:560:SER:HB2	2.11	0.50
1:A:680:SER:HA	1:B:369:TRP:CG	2.47	0.50
1:A:501:ARG:HD2	1:B:497:TRP:CD2	2.47	0.49
1:B:478:LEU:O	1:B:482:GLU:HG2	2.13	0.49
1:B:35:ILE:HD12	1:B:300:MSE:SE	2.63	0.49
1:A:652:PRO:HG3	1:B:681:TYR:HB3	1.94	0.49
1:A:724:GLN:OE1	1:A:724:GLN:HA	2.12	0.49
1:A:168:LEU:O	1:A:172:MSE:HG2	2.13	0.49
1:A:681:TYR:HB3	1:B:652:PRO:HG3	1.94	0.49
1:B:714:LEU:HD23	1:B:717:LEU:HD11	1.94	0.49
1:A:556:SER:O	1:A:560:SER:HB2	2.13	0.49
1:A:145:HIS:HB3	1:A:196:PRO:HB2	1.93	0.49
1:B:184:LEU:HD12	1:B:185:CYS:N	2.28	0.49
1:B:536:THR:HG23	1:B:537:SER:N	2.26	0.49
1:B:616:GLU:OE2	1:B:628:THR:HG23	2.12	0.49
1:B:622:TRP:CE3	1:B:714:LEU:HD13	2.47	0.48
1:B:622:TRP:CE3	1:B:714:LEU:CD1	2.96	0.48
1:B:746:LEU:HD13	1:B:759:TYR:HD1	1.77	0.48
1:B:221:ARG:O	1:B:222:LEU:CB	2.59	0.48
1:A:6:SER:HB3	1:A:7:PRO:HD2	1.96	0.48
1:B:61:PHE:CG	1:B:62:PRO:HA	2.48	0.48
1:B:9:HIS:CE1	1:B:360:SER:HB3	2.49	0.48
1:A:602:VAL:HG13	1:A:612:VAL:HG21	1.95	0.48
1:B:610:ILE:HD11	4:B:2020:HOH:O	2.12	0.48
1:A:546:ARG:HG2	1:A:596:LEU:HD22	1.96	0.48
1:A:113:MSE:HE2	1:A:113:MSE:HB3	1.60	0.48
1:A:94:SER:HA	1:A:137:ALA:O	2.14	0.48
1:A:466:VAL:HG22	1:A:467:ILE:N	2.28	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:61:PHE:CD1	1:A:62:PRO:HA	2.49	0.48
1:B:168:LEU:O	1:B:172:MSE:HG2	2.13	0.48
1:B:373:GLY:H	1:B:374:PRO:CD	2.27	0.48
1:B:382:LEU:HD13	1:B:650:MSE:HG3	1.95	0.48
1:B:386:MSE:HE3	1:B:686:MSE:HE1	1.95	0.48
1:B:659:THR:HG23	1:B:661:ALA:H	1.79	0.48
1:A:801:LEU:O	1:A:805:LEU:HB2	2.14	0.47
1:A:444:ARG:HG3	1:A:666:PHE:CZ	2.49	0.47
1:A:616:GLU:OE2	1:A:628:THR:HG23	2.14	0.47
1:A:113:MSE:HE3	1:A:113:MSE:HA	1.94	0.47
1:A:397:MSE:HE1	1:B:369:TRP:HE3	1.80	0.47
1:A:8:PHE:CD1	1:A:8:PHE:C	2.87	0.47
1:A:617:VAL:HG13	1:A:643:ALA:HB3	1.96	0.47
1:B:757:SER:N	1:B:779:ASN:OD1	2.47	0.47
1:B:764:LEU:CD2	1:B:774:THR:HG23	2.44	0.47
1:B:470:ARG:HG3	1:B:485:ALA:HB3	1.96	0.47
1:B:645:LEU:HB2	4:B:2024:HOH:O	2.14	0.47
1:B:18:LEU:HD23	1:B:187:VAL:HB	1.97	0.47
1:A:369:TRP:CG	1:B:680:SER:HA	2.50	0.47
1:B:708:THR:CG2	1:B:709:SER:H	2.27	0.47
1:B:94:SER:HA	1:B:137:ALA:O	2.15	0.47
1:B:519:ILE:HG12	1:B:535:PHE:HE2	1.79	0.46
1:B:801:LEU:O	1:B:805:LEU:HB2	2.15	0.46
1:A:222:LEU:C	1:A:224:GLY:N	2.67	0.46
1:A:333:HIS:O	1:A:336:THR:HG22	2.16	0.46
1:A:470:ARG:HG3	1:A:485:ALA:CB	2.44	0.46
1:A:477:THR:O	1:A:481[B]:MSE:HG3	2.15	0.46
1:A:373:GLY:H	1:A:374:PRO:CD	2.28	0.46
1:B:229:ILE:O	1:B:233:GLU:HG3	2.15	0.46
1:B:352:LYS:O	1:B:357:SER:HA	2.15	0.46
1:B:71:PHE:CE1	1:B:87:ILE:HG13	2.51	0.46
1:B:466:VAL:HG22	1:B:467:ILE:N	2.31	0.46
1:A:229:ILE:O	1:A:233:GLU:HG3	2.15	0.46
1:B:222:LEU:C	1:B:224:GLY:N	2.68	0.46
1:B:729:HIS:C	1:B:731:ALA:H	2.19	0.46
1:B:783:LEU:HD13	1:B:797:LEU:HB3	1.98	0.46
1:A:470:ARG:HG3	1:A:485:ALA:HB3	1.98	0.46
1:B:651:VAL:HG22	1:B:652:PRO:HD2	1.97	0.46
1:B:559:LEU:HD11	1:B:601:LEU:HB2	1.98	0.45
1:A:237:LEU:O	1:A:237:LEU:HG	2.16	0.45
1:A:262:LEU:HD13	1:A:266:VAL:HB	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:763:LEU:HD23	1:A:763:LEU:HA	1.77	0.45
1:B:636:LYS:HB2	1:B:636:LYS:HE2	1.73	0.45
1:A:14:HIS:HB2	1:A:172:MSE:CE	2.46	0.45
1:A:579:ILE:O	1:A:579:ILE:HG23	2.16	0.45
1:B:444:ARG:HG3	1:B:666:PHE:CZ	2.51	0.45
1:A:369:TRP:HE3	1:B:397:MSE:HE1	1.82	0.45
1:A:386:MSE:HE3	1:A:686:MSE:HE1	1.97	0.45
1:B:559:LEU:HD21	1:B:601:LEU:CD1	2.46	0.45
1:A:113:MSE:CE	1:A:114:CYS:N	2.79	0.45
1:A:352:LYS:O	1:A:357:SER:HA	2.17	0.45
1:A:11:PRO:HB2	1:A:172:MSE:HE2	1.98	0.45
1:A:508:PRO:HD2	1:A:597:PHE:CD2	2.52	0.45
1:A:649:GLY:O	1:B:395:HIS:HB3	2.16	0.45
1:B:145:HIS:HB3	1:B:196:PRO:HB2	1.98	0.45
1:B:602:VAL:HG13	1:B:612:VAL:HG21	1.99	0.45
1:B:96:LEU:CB	1:B:97:PRO:HD3	2.47	0.45
1:A:442:ALA:O	1:A:611:PRO:HG2	2.17	0.44
1:B:442:ALA:O	1:B:611:PRO:HG2	2.18	0.44
1:A:42:GLN:HA	1:A:42:GLN:OE1	2.16	0.44
1:A:478:LEU:O	1:A:482:GLU:HG2	2.17	0.44
1:B:27:GLY:C	3:B:1810:SO4:O4	2.55	0.44
1:B:236:LYS:HD2	1:B:236:LYS:HA	1.45	0.44
1:A:340:ILE:HD12	1:B:396:VAL:HG13	2.00	0.44
1:A:8:PHE:CZ	1:A:361:GLN:HG3	2.53	0.44
1:B:763:LEU:HD23	1:B:763:LEU:HA	1.76	0.44
1:B:26:LEU:HD13	1:B:218:GLY:O	2.17	0.44
1:A:466:VAL:HG23	1:A:577:ALA:O	2.17	0.44
1:B:8:PHE:CZ	1:B:361:GLN:HG3	2.53	0.44
1:B:14:HIS:HB2	1:B:172:MSE:CE	2.48	0.44
1:A:140:ALA:HB1	1:A:142:ILE:HD13	1.99	0.44
1:A:783:LEU:HD13	1:A:797:LEU:HB3	2.00	0.44
1:A:85:ILE:HA	1:A:127:ALA:HB1	2.00	0.43
1:B:11:PRO:HB2	1:B:172:MSE:HE2	1.99	0.43
1:A:438:ALA:HA	1:A:441:MSE:HE2	2.00	0.43
1:B:85:ILE:HA	1:B:127:ALA:HB1	1.99	0.43
1:A:24:THR:O	1:A:25:SER:HB2	2.19	0.43
1:A:269:LEU:CD1	1:A:296:LEU:HB2	2.49	0.43
1:B:281:ASP:O	1:B:282:LEU:CB	2.66	0.43
1:A:96:LEU:CB	1:A:97:PRO:HD3	2.49	0.43
1:A:686:MSE:HE3	1:A:686:MSE:O	2.19	0.43
1:A:315:ALA:HA	1:A:337:VAL:HG11	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:92:LEU:O	1:A:115:SER:HA	2.19	0.43
1:A:438:ALA:HB1	1:A:639:ILE:HG21	2.00	0.43
1:B:11:PRO:HG3	1:B:172:MSE:HG3	2.00	0.43
1:B:280:ASP:OD1	1:B:282:LEU:N	2.49	0.43
1:B:96:LEU:HD23	1:B:114:CYS:SG	2.59	0.42
1:B:146:LEU:HD13	1:B:150:ARG:NH2	2.33	0.42
1:B:262:LEU:HD13	1:B:266:VAL:HB	2.01	0.42
1:B:277:ASP:HA	1:B:278:PRO:HD3	1.80	0.42
1:A:430:ASN:HB2	2:A:1644:PLP:O3P	2.18	0.42
1:B:508:PRO:HD2	1:B:597:PHE:CD2	2.54	0.42
1:B:546:ARG:HH22	1:B:594:ASP:CG	2.22	0.42
1:A:11:PRO:HG3	1:A:172:MSE:HG3	2.01	0.42
1:A:367:ALA:HB1	1:A:372:GLN:HB2	2.00	0.42
1:A:546:ARG:O	1:A:549:SER:OG	2.29	0.42
1:B:24:THR:O	1:B:25:SER:HB2	2.18	0.42
1:B:580:ILE:HD11	1:B:614:PHE:CE1	2.54	0.42
1:A:27:GLY:O	1:A:30:LEU:HB2	2.19	0.42
1:B:73:LYS:CE	1:B:281:ASP:O	2.67	0.42
1:B:221:ARG:O	1:B:252:LEU:CD1	2.67	0.42
1:B:58:GLN:O	1:B:137:ALA:HA	2.19	0.42
1:B:430:ASN:HB2	2:B:1644:PLP:O3P	2.19	0.42
1:B:466:VAL:HG23	1:B:577:ALA:O	2.19	0.42
1:B:766:MSE:HE1	1:B:807:GLU:CB	2.50	0.42
1:A:722:LEU:O	1:A:726:ILE:HG13	2.20	0.42
1:B:13:ASN:OD1	1:B:172:MSE:HE3	2.19	0.42
1:B:34:GLY:HA3	1:B:293:PHE:CZ	2.55	0.42
1:B:519:ILE:CG1	1:B:535:PHE:CE2	3.02	0.42
1:A:433:THR:O	1:A:437:ILE:HD12	2.20	0.42
1:A:546:ARG:NH1	1:A:596:LEU:HB3	2.35	0.42
1:B:11:PRO:CG	1:B:172:MSE:HG3	2.50	0.42
1:B:659:THR:CG2	1:B:661:ALA:H	2.32	0.42
1:A:378:PHE:CE1	1:A:382:LEU:HG	2.55	0.41
1:B:27:GLY:O	1:B:30:LEU:HB2	2.20	0.41
1:B:41:LEU:O	1:B:42:GLN:NE2	2.47	0.41
1:B:208:ARG:N	1:B:209:PRO:CD	2.84	0.41
1:B:315:ALA:HA	1:B:337:VAL:HG11	2.02	0.41
1:B:396:VAL:HG12	1:B:403:TYR:CE1	2.55	0.41
1:B:397:MSE:HE2	1:B:398:PHE:H	1.85	0.41
1:B:438:ALA:HB1	1:B:639:ILE:HG21	2.02	0.41
1:B:670:SER:C	1:B:672:LEU:H	2.23	0.41
1:A:297:LYS:O	1:A:301:VAL:HG23	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:18:LEU:HD23	1:A:187:VAL:HB	2.03	0.41
1:A:61:PHE:CG	1:A:62:PRO:HA	2.56	0.41
1:A:414:LEU:HD23	1:A:414:LEU:HA	1.87	0.41
1:B:617:VAL:HG13	1:B:643:ALA:HB3	2.03	0.41
1:B:718:TRP:HB3	1:B:798:LEU:HD11	2.01	0.41
1:A:14:HIS:O	1:A:172:MSE:HE1	2.21	0.41
1:A:89:ASN:O	1:A:119:ARG:HA	2.21	0.41
1:A:297:LYS:HE2	1:A:297:LYS:HB3	1.76	0.41
1:A:277:ASP:HA	1:A:278:PRO:HD3	1.79	0.41
1:A:396:VAL:HG12	1:A:403:TYR:CE1	2.55	0.41
1:A:396:VAL:HG22	1:B:348:PHE:CE1	2.56	0.41
1:B:146:LEU:O	1:B:150:ARG:HG3	2.21	0.41
1:B:559:LEU:HD11	1:B:601:LEU:HA	2.02	0.41
1:B:579:ILE:HG23	1:B:579:ILE:O	2.19	0.41
1:B:26:LEU:HD23	1:B:26:LEU:HA	1.80	0.41
1:A:766:MSE:O	1:A:769:GLU:HB2	2.21	0.41
1:B:47:SER:C	1:B:49:THR:H	2.23	0.41
1:B:219:ASP:OD1	1:B:221:ARG:HB2	2.21	0.41
1:A:14:HIS:HB2	1:A:172:MSE:HE3	2.03	0.41
1:B:297:LYS:O	1:B:301:VAL:HG23	2.21	0.41
1:B:766:MSE:O	1:B:769:GLU:HB2	2.21	0.41
1:A:314:MSE:HE2	1:B:402:VAL:HG22	2.03	0.40
1:B:27:GLY:HA2	3:B:1810:SO4:O4	2.20	0.40
1:A:669:ASP:OD1	1:B:330:LYS:HD3	2.21	0.40
1:B:89:ASN:O	1:B:119:ARG:HA	2.21	0.40
1:B:519:ILE:HG22	1:B:520:SER:N	2.36	0.40
1:B:113:MSE:HE2	1:B:136:TYR:CD1	2.35	0.40
1:A:744:LEU:C	1:A:744:LEU:HD12	2.41	0.40
1:B:96:LEU:N	1:B:97:PRO:CD	2.85	0.40
1:A:35:ILE:HD12	1:A:300:MSE:SE	2.72	0.40
1:A:659:THR:HG23	1:A:661:ALA:H	1.86	0.40
1:B:93:HIS:CB	1:B:113:MSE:HE3	2.50	0.40
1:B:430:ASN:OD1	1:B:433:THR:HG23	2.22	0.40
1:B:441:MSE:CE	1:B:639:ILE:CG2	2.99	0.40
1:B:806:GLY:C	1:B:808:PHE:H	2.25	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	733/831 (88%)	669 (91%)	50 (7%)	14 (2%)	8	18
1	B	734/831 (88%)	672 (92%)	46 (6%)	16 (2%)	6	15
All	All	1467/1662 (88%)	1341 (91%)	96 (6%)	30 (2%)	7	17

All (30) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	222	LEU
1	A	357	SER
1	B	222	LEU
1	B	357	SER
1	B	730	SER
1	B	758	LEU
1	A	355	ASP
1	A	644	LYS
1	B	355	ASP
1	B	644	LYS
1	A	104	LEU
1	A	451	ASN
1	A	643	ALA
1	B	451	ASN
1	B	643	ALA
1	A	397	MSE
1	A	738	ILE
1	B	397	MSE
1	B	491	GLY
1	B	48	ALA
1	B	447	CYS
1	A	28	LYS
1	A	373	GLY
1	A	447	CYS
1	B	583	VAL

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Mol	Chain	Res	Type
1	B	738	ILE
1	A	583	VAL
1	A	491	GLY
1	B	373	GLY
1	B	417	VAL

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	575/688 (84%)	552 (96%)	23 (4%)	31 58
1	B	583/688 (85%)	556 (95%)	27 (5%)	27 52
All	All	1158/1376 (84%)	1108 (96%)	50 (4%)	29 55

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

Mol	Chain	Res	Type
1	A	51	LEU
1	A	96	LEU
1	A	113	MSE
1	A	115	SER
1	A	131	LEU
1	A	142	ILE
1	A	183	LEU
1	A	206	LEU
1	A	236	LYS
1	A	321	VAL
1	A	327	THR
1	A	369	TRP
1	A	396	VAL
1	A	397	MSE
1	A	417	VAL
1	A	428	SER
1	A	513	SER
1	A	659	THR

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Mol	Chain	Res	Type
1	A	667	SER
1	A	675	LEU
1	A	680	SER
1	A	686	MSE
1	A	790	SER
1	B	9	HIS
1	B	51	LEU
1	B	67	SER
1	B	96	LEU
1	B	131	LEU
1	B	183	LEU
1	B	206	LEU
1	B	236	LYS
1	B	302	LEU
1	B	321	VAL
1	B	327	THR
1	B	349	SER
1	B	356	ASN
1	B	369	TRP
1	B	396	VAL
1	B	397	MSE
1	B	417	VAL
1	B	428	SER
1	B	513	SER
1	B	624	LEU
1	B	659	THR
1	B	667	SER
1	B	675	LEU
1	B	680	SER
1	B	686	MSE
1	B	709	SER
1	B	790	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	450	HIS
1	B	450	HIS
1	B	484	GLN
1	B	574	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

6 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
2	PLP	A	1644	1	15,15,16	1.83	2 (13%)	21,22,23	1.83	5 (23%)
3	SO4	A	1809	-	4,4,4	0.33	0	6,6,6	0.28	0
3	SO4	B	1809	-	4,4,4	0.35	0	6,6,6	0.21	0
2	PLP	B	1644	1	15,15,16	1.89	3 (20%)	21,22,23	1.73	4 (19%)
3	SO4	B	1810	-	4,4,4	0.36	0	6,6,6	0.31	0
3	SO4	A	1810	-	4,4,4	0.26	0	6,6,6	0.45	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
2	PLP	B	1644	1	-	5/6/6/8	0/1/1/1
2	PLP	A	1644	1	-	5/6/6/8	0/1/1/1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1644	PLP	O3-C3	-5.67	1.23	1.36
2	B	1644	PLP	O3-C3	-5.44	1.24	1.36
2	B	1644	PLP	C2-N1	2.98	1.39	1.33
2	B	1644	PLP	C6-N1	2.47	1.39	1.34
2	A	1644	PLP	C2-N1	2.43	1.38	1.33

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1644	PLP	O4P-C5A-C5	6.13	120.84	109.36
2	B	1644	PLP	O4P-C5A-C5	5.77	120.16	109.36
2	B	1644	PLP	C6-C5-C4	2.65	120.27	118.10
2	B	1644	PLP	O3P-P-O4P	-2.65	99.77	106.67
2	A	1644	PLP	O3P-P-O4P	-2.59	99.91	106.67
2	A	1644	PLP	C6-C5-C4	2.58	120.21	118.10
2	A	1644	PLP	C5-C6-N1	-2.39	119.95	123.83
2	A	1644	PLP	O3P-P-O2P	2.16	115.88	107.80
2	B	1644	PLP	O3P-P-O2P	2.11	115.69	107.80

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1644	PLP	C4-C5-C5A-O4P
2	A	1644	PLP	C6-C5-C5A-O4P
2	A	1644	PLP	C5A-O4P-P-O2P
2	A	1644	PLP	C5A-O4P-P-O3P
2	B	1644	PLP	C4-C5-C5A-O4P
2	B	1644	PLP	C6-C5-C5A-O4P
2	B	1644	PLP	C5A-O4P-P-O3P
2	A	1644	PLP	C5A-O4P-P-O1P
2	B	1644	PLP	C5A-O4P-P-O1P
2	B	1644	PLP	C5A-O4P-P-O2P

There are no ring outliers.

4 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1644	PLP	2	0
3	A	1809	SO4	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	1644	PLP	2	0
3	B	1810	SO4	3	0

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(Å ²)	Q<0.9
1	A	731/831 (87%)	-0.03	30 (4%) 37 36	28, 54, 95, 119	0
1	B	735/831 (88%)	-0.06	18 (2%) 59 60	27, 56, 89, 114	0
All	All	1466/1662 (88%)	-0.04	48 (3%) 46 47	27, 55, 92, 119	0

All (48) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	551	LEU	5.8
1	A	449	ASP	4.6
1	A	574	HIS	4.2
1	A	762	SER	4.2
1	A	512	LEU	4.1
1	A	759	TYR	3.9
1	B	448	VAL	3.8
1	B	79	LEU	3.8
1	A	547	ASP	3.5
1	A	450	HIS	3.5
1	A	493	LEU	3.5
1	A	552	ALA	3.4
1	A	448	VAL	3.3
1	A	521	LEU	3.2
1	B	805	LEU	3.2
1	A	555	TYR	3.1
1	B	746	LEU	2.9
1	A	758	LEU	2.8
1	A	605	CYS	2.7
1	A	669	ASP	2.6
1	B	279	SER	2.6
1	B	446	PHE	2.6
1	A	428	SER	2.5
1	A	604	GLU	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	449	ASP	2.5
1	A	576	GLY	2.4
1	A	451	ASN	2.4
1	A	805	LEU	2.4
1	B	779	ASN	2.3
1	A	463	VAL	2.3
1	A	806	GLY	2.3
1	B	81	ARG	2.3
1	B	685	ALA	2.3
1	A	600	VAL	2.3
1	B	96	LEU	2.2
1	B	652	PRO	2.2
1	B	513	SER	2.2
1	A	746	LEU	2.1
1	B	688	CYS	2.1
1	B	101	SER	2.1
1	A	744	LEU	2.1
1	B	450	HIS	2.1
1	A	607	ASN	2.1
1	A	545	SER	2.1
1	B	49	THR	2.1
1	B	668	GLY	2.0
1	A	802	TYR	2.0
1	A	447	CYS	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

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(\AA^2)	Q<0.9
3	SO4	B	1810	5/5	0.89	0.25	57,64,91,114	5
3	SO4	A	1809	5/5	0.93	0.22	48,57,85,89	5
3	SO4	B	1809	5/5	0.95	0.17	52,63,81,83	5
3	SO4	A	1810	5/5	0.96	0.21	31,34,44,57	5
2	PLP	B	1644	15/16	0.97	0.21	34,47,56,60	0
2	PLP	A	1644	15/16	0.98	0.20	44,48,58,61	0

6.5 Other polymers [i](#)

There are no such residues in this entry.