Full wwPDB X-ray Structure Validation Report ⓘ

Apr 2, 2025 – 02:14 am BST

PDB ID	:	1UYP / pdb_00001uyp
Title	:	The three-dimensional structure of beta-fructosidase (invertase) from Thermotoga maritima
Authors	:	Alberto, F.; Bignon, C.; Sulzenbacher, G.; Henrissat, B.; Czjzek, M.
Deposited on	:	2004-03-02
Resolution	:	1.90 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:

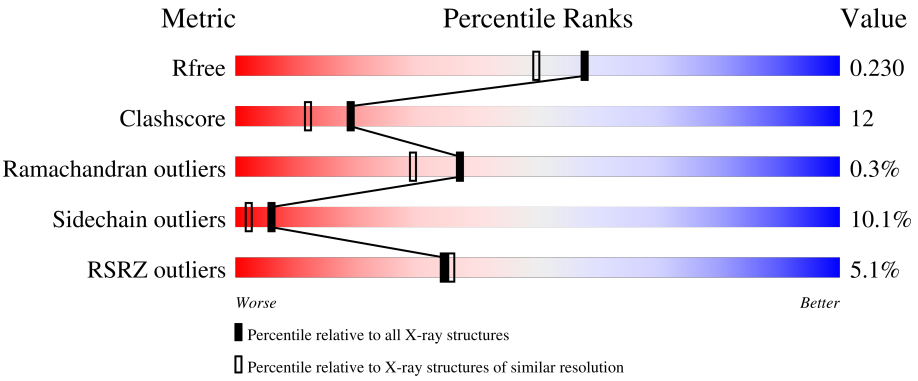
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.42

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.90 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}	164625	7293 (1.90-1.90)
Clashscore	180529	8090 (1.90-1.90)
Ramachandran outliers	177936	8022 (1.90-1.90)
Sidechain outliers	177891	8022 (1.90-1.90)
RSRZ outliers	164620	7292 (1.90-1.90)

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 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	432	3% 77% 17% 5%
1	B	432	5% 74% 22%
1	C	432	6% 73% 22%
1	D	432	5% 74% 19% 6%
1	E	432	6% 72% 22% 5%

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Mol	Chain	Length	Quality of chain
1	F	432	6% 73% 21% 6%

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
2	SO4	B	1435	-	-	X	-
2	SO4	C	1435	-	-	X	-
2	SO4	F	1433	-	-	X	-

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 22996 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 BETA-FRUCTOSIDASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	432	Total	C	N	O	S	0	0	0
			3520	2253	589	665	13			
1	B	432	Total	C	N	O	S	0	0	0
			3520	2253	589	665	13			
1	C	432	Total	C	N	O	S	0	0	0
			3520	2253	589	665	13			
1	D	432	Total	C	N	O	S	0	0	0
			3520	2253	589	665	13			
1	E	432	Total	C	N	O	S	0	0	0
			3520	2253	589	665	13			
1	F	432	Total	C	N	O	S	0	0	0
			3520	2253	589	665	13			

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	LEU	MET	conflict	UNP O33833
B	1	LEU	MET	conflict	UNP O33833
C	1	LEU	MET	conflict	UNP O33833
D	1	LEU	MET	conflict	UNP O33833
E	1	LEU	MET	conflict	UNP O33833
F	1	LEU	MET	conflict	UNP O33833
A	108	VAL	ALA	conflict	UNP O33833
B	108	VAL	ALA	conflict	UNP O33833
C	108	VAL	ALA	conflict	UNP O33833
D	108	VAL	ALA	conflict	UNP O33833
E	108	VAL	ALA	conflict	UNP O33833
F	108	VAL	ALA	conflict	UNP O33833
A	179	ALA	VAL	conflict	UNP O33833
B	179	ALA	VAL	conflict	UNP O33833
C	179	ALA	VAL	conflict	UNP O33833
D	179	ALA	VAL	conflict	UNP O33833
E	179	ALA	VAL	conflict	UNP O33833

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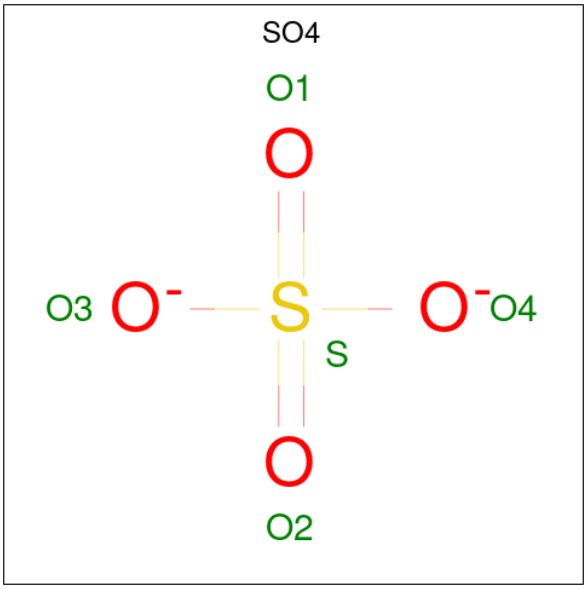
Chain	Residue	Modelled	Actual	Comment	Reference
F	179	ALA	VAL	conflict	UNP O33833

- Molecule 2 is SULFATE ION (CCD ID: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0

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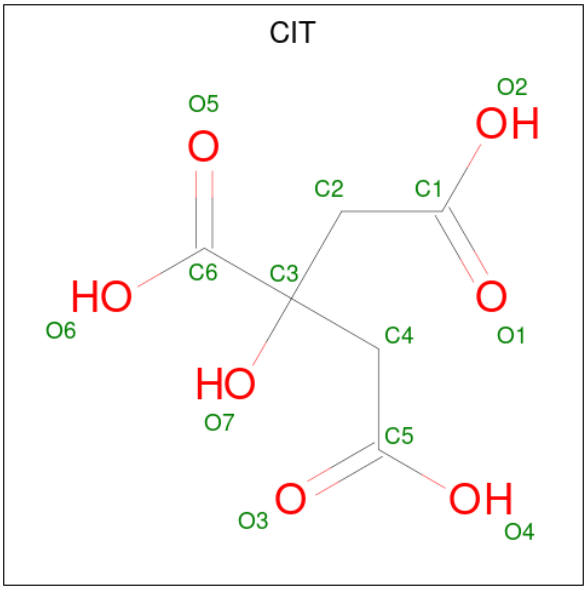
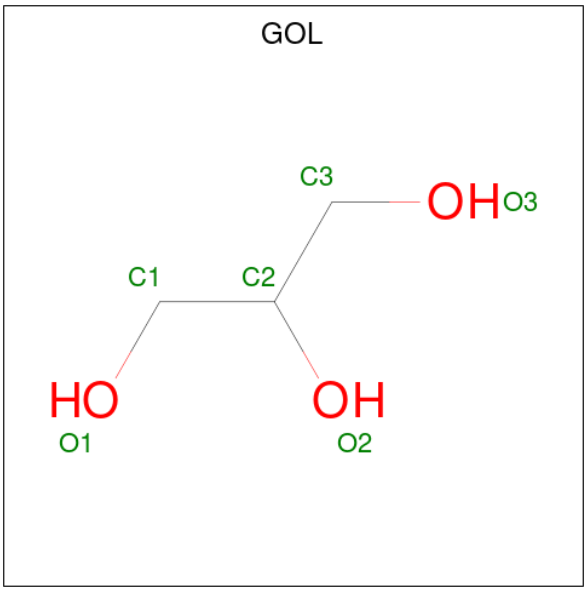
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0

- Molecule 3 is CITRIC ACID (CCD ID: CIT) (formula: $C_6H_8O_7$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 13 6 7	0	0

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 6 3 3	0	0
4	B	1	Total C O 6 3 3	0	0
4	C	1	Total C O 6 3 3	0	0
4	D	1	Total C O 6 3 3	0	0
4	E	1	Total C O 6 3 3	0	0
4	F	1	Total C O 6 3 3	0	0

- Molecule 5 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total Na 1 1	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	289	Total O 289 289	0	0
6	B	312	Total O 312 312	0	0

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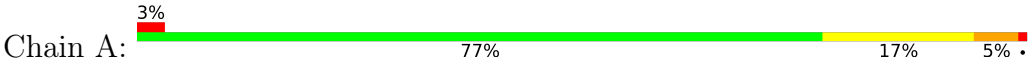
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	C	298	Total O 298 298	0	0
6	D	286	Total O 286 286	0	0
6	E	294	Total O 294 294	0	0
6	F	277	Total O 277 277	0	0

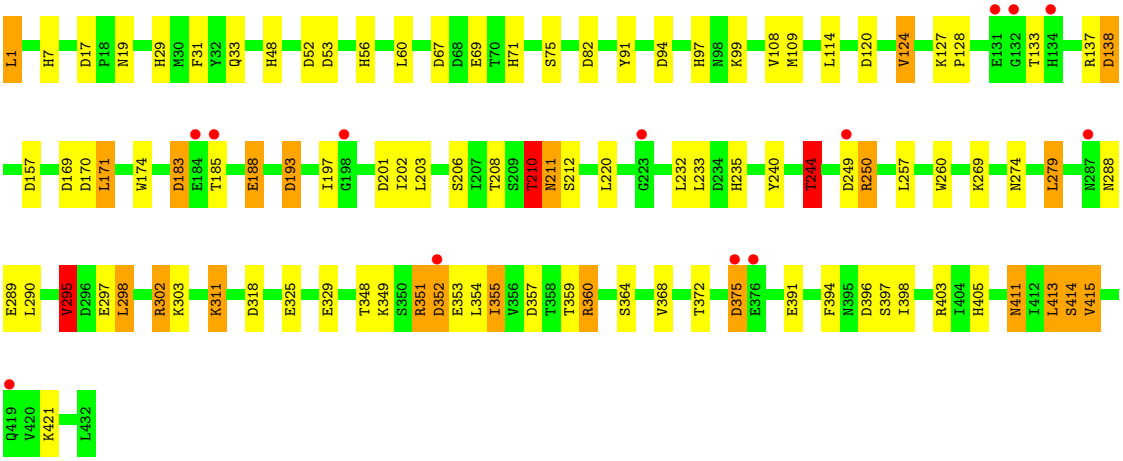
3 Residue-property plots (i)

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: BETA-FRUCTOSIDASE

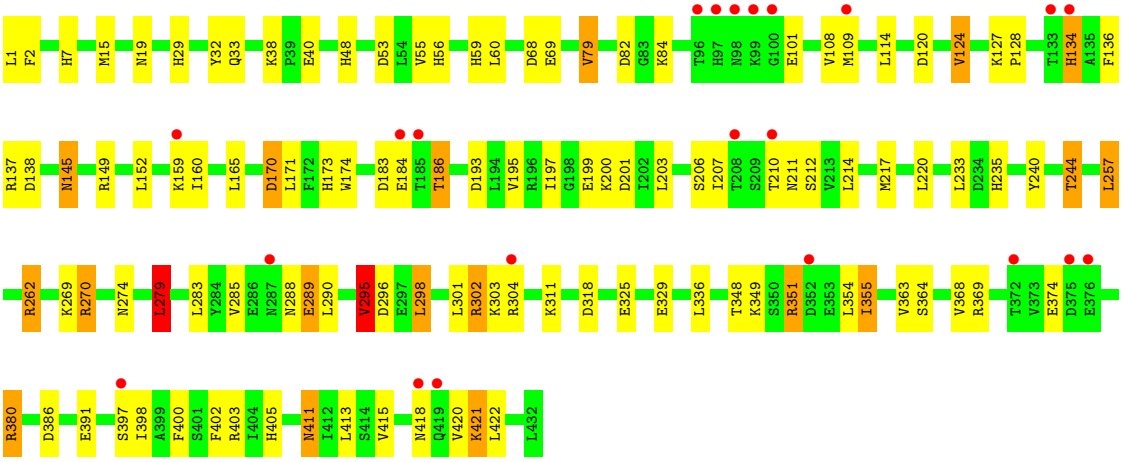
Chain A:





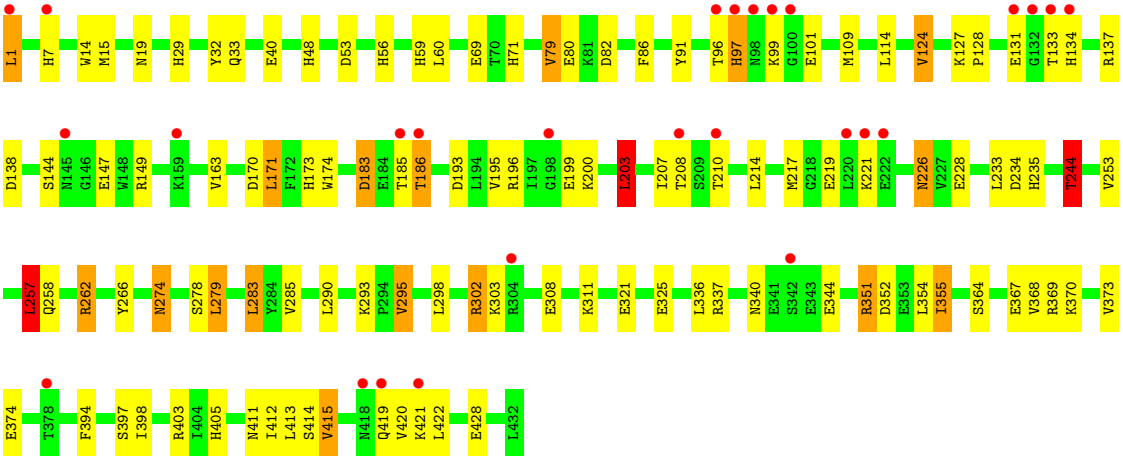
• Molecule 1: BETA-FRUCTOSIDASE

Chain B:



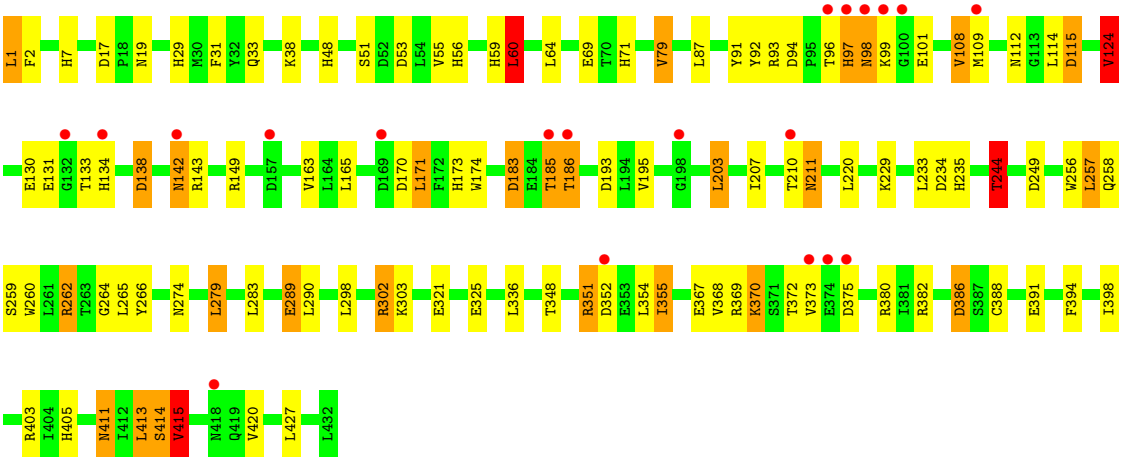
• Molecule 1: BETA-FRUCTOSIDASE

Chain C:



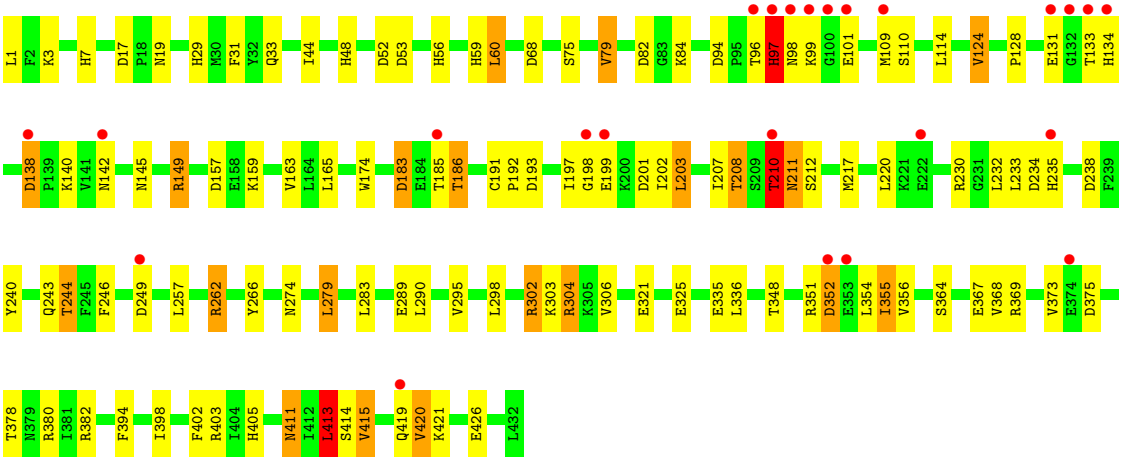
• Molecule 1: BETA-FRUCTOSIDASE

Chain D:



• Molecule 1: BETA-FRUCTOSIDASE

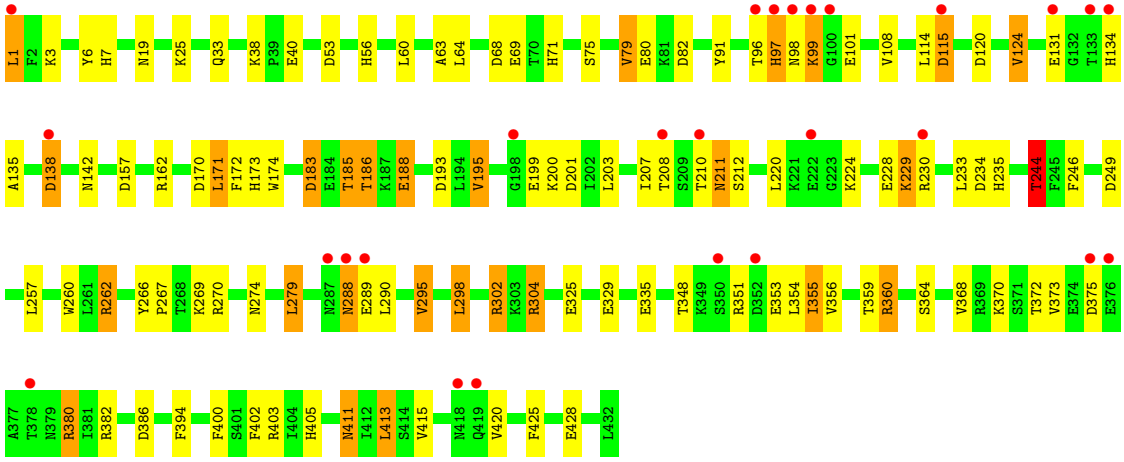
Chain E:



• Molecule 1: BETA-FRUCTOSIDASE

Chain F:


6%
73%
21%
6%


L1 F2 K3 Y6 H7 N19 K25 Q33 K38 P39 E40 D53 H56 L60 A63 L64 D68 E69 T70 H71 S75 V79 E80 K81 D82 Y91 T96 H97 N98 K99 G100 E101 V108 L114 D115 D120 V124 E131 G132 T133 H134
A135 D138 N142 D157 R162 D170 L171 F172 H173 W174 D183 E184 T185 T186 K187 E188 D193 L194 V195 G198 E199 K200 D201 I202 L203 I207 T208 S209 T210 N211 S212 L220 K221 E222 G223 K224 E228 K229 R230 L233 D234 H235 T244 F245 F246 D249
L257 W260 L261 R262 Y266 P267 T268 K269 R270 N274 L279 N287 N288 E289 L290 V295 L298 R302 K303 R304 E325 E329 E335 T348 K349 S350 R351 D352 E353 L354 I355 V356 T359 R360 S364 V368 R369 K370 S371 T372 V373 E374 D375 E376
A377 T378 N379 R380 I381 R382 D386 F394 F400 S401 F402 R403 I404 H405 N411 I412 L413 S414 V415 N418 Q419 V420 F425 E428 L432

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	94.48Å 114.67Å 130.03Å 90.00° 98.96° 90.00°	Depositor
Resolution (Å)	129.10 – 1.90 128.44 – 1.90	Depositor EDS
% Data completeness (in resolution range)	99.1 (129.10-1.90) 99.1 (128.44-1.90)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.61 (at 1.89Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.177 , 0.220 0.189 , 0.230	Depositor DCC
R_{free} test set	10694 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	21.2	Xtriage
Anisotropy	0.317	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 49.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	22996	wwPDB-VP
Average B, all atoms (Å^2)	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.55% of the height of the origin peak. No significant pseudotranslation is detected.*

[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 (i)

5.1 Standard geometry (i)

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

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	0.78	1/3611 (0.0%)	1.03	26/4886 (0.5%)
1	B	0.78	0/3611	0.99	14/4886 (0.3%)
1	C	0.77	0/3611	0.98	18/4886 (0.4%)
1	D	0.75	0/3611	1.07	21/4886 (0.4%)
1	E	0.75	0/3611	1.01	21/4886 (0.4%)
1	F	0.75	0/3611	1.02	21/4886 (0.4%)
All	All	0.76	1/21666 (0.0%)	1.02	121/29316 (0.4%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	244	THR	CB-CG2	-5.77	1.33	1.52

All (121) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	262	ARG	NE-CZ-NH2	-18.66	110.97	120.30
1	D	302	ARG	NE-CZ-NH1	14.50	127.55	120.30
1	F	262	ARG	NE-CZ-NH2	-14.20	113.20	120.30
1	E	262	ARG	NE-CZ-NH2	-12.67	113.97	120.30
1	D	262	ARG	NE-CZ-NH1	12.40	126.50	120.30
1	D	302	ARG	NE-CZ-NH2	-11.82	114.39	120.30
1	F	262	ARG	NE-CZ-NH1	11.54	126.07	120.30
1	C	302	ARG	NE-CZ-NH1	10.99	125.80	120.30
1	A	302	ARG	NE-CZ-NH1	10.89	125.75	120.30
1	B	302	ARG	NE-CZ-NH1	10.29	125.44	120.30
1	E	302	ARG	NE-CZ-NH1	9.79	125.19	120.30
1	E	262	ARG	NE-CZ-NH1	9.70	125.15	120.30
1	F	115	ASP	CB-CG-OD2	9.39	126.75	118.30
1	A	17	ASP	CB-CG-OD1	9.19	126.57	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	138	ASP	CB-CG-OD2	9.07	126.46	118.30
1	F	302	ARG	NE-CZ-NH1	8.68	124.64	120.30
1	A	250	ARG	NE-CZ-NH1	-8.65	115.98	120.30
1	E	17	ASP	CB-CG-OD1	8.44	125.90	118.30
1	C	262	ARG	NE-CZ-NH2	-8.44	116.08	120.30
1	A	302	ARG	NE-CZ-NH2	-8.27	116.17	120.30
1	E	302	ARG	NE-CZ-NH2	-8.15	116.23	120.30
1	C	302	ARG	NE-CZ-NH2	-8.00	116.30	120.30
1	A	352	ASP	CB-CG-OD2	7.92	125.42	118.30
1	A	250	ARG	NE-CZ-NH2	7.54	124.07	120.30
1	E	183	ASP	CB-CG-OD2	7.47	125.03	118.30
1	B	302	ARG	NE-CZ-NH2	-7.43	116.59	120.30
1	B	183	ASP	CB-CG-OD2	7.15	124.74	118.30
1	D	415	VAL	CB-CA-C	-7.12	97.87	111.40
1	D	115	ASP	CB-CG-OD2	7.11	124.69	118.30
1	B	257	LEU	CA-CB-CG	7.01	131.43	115.30
1	C	183	ASP	CB-CG-OD2	6.98	124.58	118.30
1	D	262	ARG	CG-CD-NE	-6.92	97.26	111.80
1	F	82	ASP	CB-CG-OD2	6.86	124.47	118.30
1	A	138	ASP	CB-CG-OD2	6.81	124.43	118.30
1	F	234	ASP	CB-CG-OD2	6.69	124.32	118.30
1	D	382	ARG	NE-CZ-NH2	-6.63	116.98	120.30
1	C	138	ASP	CB-CG-OD2	6.62	124.26	118.30
1	F	38	LYS	CA-CB-CG	6.42	127.53	113.40
1	A	183	ASP	CB-CG-OD2	6.41	124.07	118.30
1	C	262	ARG	NE-CZ-NH1	6.40	123.50	120.30
1	F	413	LEU	CA-CB-CG	6.34	129.89	115.30
1	D	60	LEU	CB-CG-CD1	6.33	121.77	111.00
1	B	79	VAL	CG1-CB-CG2	6.31	120.99	110.90
1	C	344	GLU	CB-CA-C	-6.24	97.92	110.40
1	B	296	ASP	CB-CG-OD2	6.23	123.91	118.30
1	F	138	ASP	CB-CG-OD2	6.21	123.89	118.30
1	F	38	LYS	N-CA-CB	-6.20	99.44	110.60
1	C	415	VAL	CB-CA-C	-6.16	99.70	111.40
1	C	295	VAL	CG1-CB-CG2	6.15	120.75	110.90
1	E	415	VAL	CB-CA-C	-6.15	99.71	111.40
1	A	82	ASP	CB-CG-OD2	6.14	123.83	118.30
1	C	244	THR	N-CA-CB	-6.11	98.69	110.30
1	C	352	ASP	CB-CG-OD2	6.10	123.79	118.30
1	E	149	ARG	NE-CZ-NH2	-6.08	117.26	120.30
1	F	302	ARG	NE-CZ-NH2	-6.08	117.26	120.30
1	D	386	ASP	CB-CG-OD2	6.04	123.73	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	120	ASP	CB-CG-OD2	6.00	123.70	118.30
1	E	238	ASP	CB-CG-OD2	5.99	123.69	118.30
1	B	201	ASP	CB-CG-OD2	5.97	123.67	118.30
1	E	201	ASP	CB-CG-OD2	5.97	123.67	118.30
1	D	183	ASP	CB-CG-OD2	5.96	123.67	118.30
1	C	79	VAL	CG1-CB-CG2	5.95	120.42	110.90
1	E	157	ASP	CB-CG-OD2	5.94	123.64	118.30
1	D	234	ASP	CB-CG-OD2	5.92	123.63	118.30
1	A	415	VAL	CB-CA-C	-5.87	100.25	111.40
1	B	68	ASP	CB-CG-OD2	5.85	123.57	118.30
1	A	157	ASP	CB-CG-OD2	5.85	123.56	118.30
1	D	17	ASP	CB-CG-OD1	5.85	123.56	118.30
1	D	138	ASP	CB-CG-OD2	5.81	123.53	118.30
1	E	375	ASP	CB-CG-OD2	5.80	123.52	118.30
1	C	257	LEU	CB-CG-CD2	5.79	120.84	111.00
1	A	137	ARG	NE-CZ-NH2	-5.69	117.45	120.30
1	E	210	THR	OG1-CB-CG2	-5.65	97.01	110.00
1	E	52	ASP	CB-CG-OD2	5.61	123.34	118.30
1	F	249	ASP	CB-CG-OD2	5.60	123.34	118.30
1	F	183	ASP	CB-CG-OD2	5.54	123.28	118.30
1	A	169	ASP	CB-CG-OD2	5.52	123.27	118.30
1	C	147	GLU	CB-CA-C	-5.50	99.39	110.40
1	F	68	ASP	CB-CG-OD2	5.50	123.25	118.30
1	B	170	ASP	CB-CG-OD2	5.47	123.22	118.30
1	C	82	ASP	CB-CG-OD2	5.46	123.21	118.30
1	D	257	LEU	CA-CB-CG	5.44	127.81	115.30
1	B	82	ASP	CB-CG-OD2	5.44	123.19	118.30
1	A	52	ASP	CB-CG-OD2	5.43	123.19	118.30
1	A	396	ASP	CB-CG-OD2	5.42	123.18	118.30
1	A	193	ASP	CB-CG-OD1	5.42	123.18	118.30
1	A	357	ASP	CB-CG-OD1	5.42	123.18	118.30
1	B	262	ARG	NE-CZ-NH1	5.41	123.01	120.30
1	F	298	LEU	CB-CG-CD1	5.37	120.12	111.00
1	F	279	LEU	CB-CG-CD1	5.35	120.09	111.00
1	E	234	ASP	CB-CG-OD2	5.33	123.09	118.30
1	C	234	ASP	CB-CG-OD2	5.31	123.08	118.30
1	F	295	VAL	CG1-CB-CG2	5.31	119.39	110.90
1	C	257	LEU	CA-CB-CG	5.30	127.49	115.30
1	A	298	LEU	CB-CG-CD1	5.28	119.97	111.00
1	F	244	THR	N-CA-CB	-5.28	100.27	110.30
1	A	210	THR	N-CA-CB	-5.25	100.33	110.30
1	A	67	ASP	CB-CG-OD2	5.25	123.02	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	203	LEU	CA-CB-CG	5.24	127.36	115.30
1	D	244	THR	N-CA-CB	-5.24	100.34	110.30
1	E	82	ASP	CB-CG-OD2	5.23	123.01	118.30
1	D	262	ARG	CD-NE-CZ	5.21	130.90	123.60
1	D	352	ASP	CB-CG-OD2	5.21	122.99	118.30
1	B	295	VAL	N-CA-CB	-5.19	100.08	111.50
1	B	145	ASN	CB-CA-C	-5.19	100.03	110.40
1	E	413	LEU	CA-CB-CG	5.17	127.19	115.30
1	D	302	ARG	CD-NE-CZ	5.17	130.83	123.60
1	D	124	VAL	CG1-CB-CG2	5.16	119.15	110.90
1	F	201	ASP	CB-CG-OD2	5.16	122.94	118.30
1	A	318	ASP	CB-CG-OD2	5.13	122.92	118.30
1	D	94	ASP	CB-CA-C	-5.13	100.14	110.40
1	B	279	LEU	CB-CG-CD1	5.12	119.69	111.00
1	A	295	VAL	CG1-CB-CG2	5.09	119.04	110.90
1	A	352	ASP	CB-CG-OD1	-5.08	113.72	118.30
1	A	94	ASP	CB-CG-OD1	5.08	122.87	118.30
1	E	94	ASP	CB-CA-C	-5.06	100.28	110.40
1	F	157	ASP	CB-CG-OD2	5.05	122.85	118.30
1	E	68	ASP	CB-CG-OD2	5.03	122.83	118.30
1	A	17	ASP	CB-CG-OD2	-5.02	113.78	118.30
1	E	420	VAL	CB-CA-C	-5.01	101.88	111.40
1	A	201	ASP	CB-CG-OD2	5.00	122.80	118.30

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	3520	0	3413	61	0
1	B	3520	0	3413	72	0
1	C	3520	0	3413	81	0
1	D	3520	0	3413	82	0
1	E	3520	0	3413	101	0
1	F	3520	0	3413	97	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	15	0	0	1	0
2	B	20	0	0	3	0
2	C	15	0	0	2	0
2	E	5	0	0	0	0
2	F	15	0	0	4	0
3	A	13	0	5	1	0
4	A	6	0	8	0	0
4	B	6	0	8	0	0
4	C	6	0	8	0	0
4	D	6	0	8	0	0
4	E	6	0	8	0	0
4	F	6	0	8	0	0
5	A	1	0	0	0	0
6	A	289	0	0	10	0
6	B	312	0	0	22	0
6	C	298	0	0	16	0
6	D	286	0	0	17	0
6	E	294	0	0	30	0
6	F	277	0	0	27	0
All	All	22996	0	20531	485	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 12.

All (485) 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:109:MET:SD	1:A:109:MET:CE	2.03	1.46
1:F:7:HIS:CE1	6:F:2010:HOH:O	1.90	1.23
1:E:48:HIS:CE1	1:E:60:LEU:HD23	1.81	1.15
1:F:96:THR:HB	1:F:99:LYS:HZ2	1.00	1.09
1:D:96:THR:O	1:D:98:ASN:N	1.86	1.07
1:F:96:THR:CB	1:F:99:LYS:NZ	2.18	1.06
1:F:7:HIS:CG	6:F:2010:HOH:O	2.12	1.03
1:F:96:THR:HB	1:F:99:LYS:NZ	1.71	1.03
1:E:235:HIS:ND1	1:E:398:ILE:HD11	1.73	1.02
1:D:97:HIS:C	1:D:98:ASN:HD22	1.65	1.00
1:F:96:THR:CB	1:F:99:LYS:HZ2	1.76	0.94
1:A:7:HIS:CD2	1:A:279:LEU:HD13	2.03	0.93
1:D:1:LEU:HD22	6:D:2268:HOH:O	1.65	0.93
1:E:193:ASP:OD2	1:E:244:THR:HB	1.69	0.93

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:7:HIS:CD2	6:F:2010:HOH:O	2.22	0.92
1:F:96:THR:O	1:F:98:ASN:N	2.02	0.92
1:E:31:PHE:CE2	1:E:48:HIS:CD2	2.58	0.91
1:B:134:HIS:ND1	2:B:1435:SO4:O2	2.08	0.87
1:D:193:ASP:OD2	1:D:244:THR:HB	1.75	0.86
1:F:193:ASP:OD2	1:F:244:THR:HB	1.76	0.85
1:C:302:ARG:HD3	1:C:325:GLU:OE1	1.76	0.84
1:D:31:PHE:CE2	1:D:48:HIS:CD2	2.67	0.83
1:D:235:HIS:ND1	1:D:398:ILE:HD11	1.94	0.82
1:B:193:ASP:OD2	1:B:244:THR:HB	1.79	0.82
1:E:149:ARG:HD2	6:E:2116:HOH:O	1.80	0.82
1:F:115:ASP:HB2	6:F:2101:HOH:O	1.80	0.80
1:F:142:ASN:HB3	6:F:2122:HOH:O	1.81	0.80
1:F:96:THR:OG1	1:F:99:LYS:NZ	2.09	0.80
1:E:211:ASN:OD1	6:E:2161:HOH:O	1.99	0.80
1:E:48:HIS:ND1	1:E:60:LEU:HD23	1.97	0.79
1:B:235:HIS:ND1	1:B:398:ILE:HD11	1.98	0.79
1:D:48:HIS:CE1	1:D:60:LEU:HD23	2.17	0.79
1:D:302:ARG:HD3	1:D:325:GLU:OE1	1.82	0.79
1:F:134:HIS:CD2	1:F:135:ALA:H	2.01	0.79
1:F:96:THR:CB	1:F:99:LYS:HZ1	1.89	0.77
1:F:200:LYS:NZ	1:F:288:ASN:HD21	1.82	0.77
1:C:29:HIS:HD2	1:C:48:HIS:NE2	1.83	0.77
1:E:235:HIS:CE1	1:E:398:ILE:HD11	2.19	0.77
1:B:269:LYS:HE3	6:B:2195:HOH:O	1.86	0.75
1:D:19:ASN:HD21	1:D:33:GLN:HE21	1.34	0.75
1:F:304:ARG:HG2	6:F:2206:HOH:O	1.87	0.75
1:A:193:ASP:OD2	1:A:244:THR:HB	1.86	0.74
1:C:373:VAL:HG11	1:C:394:PHE:CE2	2.22	0.74
1:D:373:VAL:HG11	1:D:394:PHE:CE2	2.23	0.74
1:F:7:HIS:ND1	6:F:2010:HOH:O	1.96	0.74
1:E:53:ASP:OD2	1:E:56:HIS:HD2	1.71	0.73
1:D:97:HIS:C	1:D:98:ASN:ND2	2.41	0.73
1:F:186:THR:CG2	1:F:207:ILE:HG23	2.18	0.73
1:E:31:PHE:CE2	1:E:48:HIS:HD2	2.05	0.73
1:C:137:ARG:NH1	2:C:1435:SO4:O3	2.22	0.73
1:F:6:TYR:CE1	1:F:7:HIS:CE1	2.77	0.72
1:E:7:HIS:CE1	1:E:279:LEU:HD13	2.25	0.72
1:A:349:LYS:NZ	1:A:375:ASP:OD2	2.19	0.72
1:E:348:THR:HG21	6:E:2238:HOH:O	1.89	0.72
1:A:302:ARG:HD3	1:A:325:GLU:OE1	1.88	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:134:HIS:CE1	6:C:2119:HOH:O	2.41	0.72
1:B:302:ARG:HD3	1:B:325:GLU:OE1	1.90	0.72
1:A:197:ILE:HD12	1:A:202:ILE:HD13	1.72	0.71
1:B:29:HIS:HD2	1:B:48:HIS:NE2	1.89	0.71
1:A:29:HIS:HD2	1:A:48:HIS:NE2	1.89	0.71
1:F:183:ASP:OD1	1:F:185:THR:HB	1.91	0.70
1:F:1:LEU:HD13	6:F:2262:HOH:O	1.90	0.70
1:A:210:THR:HG23	1:A:212:SER:OG	1.91	0.70
1:B:7:HIS:HE1	1:B:391:GLU:OE1	1.75	0.70
6:B:2132:HOH:O	1:C:80:GLU:HG2	1.91	0.70
1:E:373:VAL:HG11	1:E:394:PHE:CE2	2.26	0.70
1:F:302:ARG:HD3	1:F:325:GLU:OE1	1.91	0.70
1:E:249:ASP:HB2	6:E:2178:HOH:O	1.90	0.69
1:A:138:ASP:OD2	6:A:2114:HOH:O	2.10	0.69
1:B:418:ASN:HA	6:B:2303:HOH:O	1.92	0.69
1:E:138:ASP:HB3	6:E:2067:HOH:O	1.92	0.69
1:D:149:ARG:CG	1:D:165:LEU:HD11	2.24	0.68
1:D:29:HIS:HD2	1:D:48:HIS:NE2	1.91	0.68
1:D:7:HIS:HE1	1:D:391:GLU:OE1	1.77	0.68
1:C:19:ASN:HD21	1:C:33:GLN:HE21	1.39	0.68
1:E:7:HIS:ND1	1:E:279:LEU:HD13	2.07	0.68
1:F:210:THR:HG21	6:F:2078:HOH:O	1.93	0.68
1:A:249:ASP:HB2	1:D:249:ASP:OD1	1.94	0.68
1:E:96:THR:O	1:E:98:ASN:N	2.26	0.68
1:A:235:HIS:ND1	1:A:398:ILE:HD11	2.08	0.68
1:B:7:HIS:HD2	1:B:386:ASP:OD2	1.77	0.68
1:C:69:GLU:CD	1:C:69:GLU:H	1.95	0.68
1:C:193:ASP:OD2	1:C:244:THR:HB	1.94	0.68
1:D:235:HIS:CE1	1:D:398:ILE:HD11	2.27	0.68
1:C:208:THR:HB	6:C:2154:HOH:O	1.92	0.67
1:C:235:HIS:ND1	1:C:398:ILE:HD11	2.08	0.67
1:D:134:HIS:HB2	6:D:2060:HOH:O	1.94	0.67
1:B:210:THR:HG23	1:B:212:SER:OG	1.93	0.67
1:F:210:THR:HG23	1:F:212:SER:OG	1.93	0.67
1:D:96:THR:O	1:D:97:HIS:C	2.32	0.67
1:C:1:LEU:HD22	6:C:2278:HOH:O	1.93	0.67
1:F:200:LYS:HZ1	1:F:288:ASN:HD21	1.42	0.67
1:E:302:ARG:HD3	1:E:325:GLU:OE1	1.95	0.67
1:F:373:VAL:HG11	1:F:394:PHE:CE2	2.30	0.67
1:C:1:LEU:HD13	6:C:2278:HOH:O	1.93	0.66
1:F:1:LEU:N	6:F:2002:HOH:O	2.27	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:413:LEU:HD12	1:A:414:SER:N	2.10	0.66
1:B:19:ASN:HD21	1:B:33:GLN:HE21	1.42	0.66
1:C:367:GLU:OE1	1:C:369:ARG:NH2	2.29	0.66
1:D:348:THR:HG23	6:D:2237:HOH:O	1.95	0.66
1:B:262:ARG:NH2	6:B:2191:HOH:O	2.27	0.66
1:F:7:HIS:NE2	6:F:2010:HOH:O	2.03	0.66
1:D:7:HIS:HD2	1:D:386:ASP:OD2	1.78	0.65
1:D:130:GLU:O	1:D:133:THR:HG23	1.97	0.65
1:D:53:ASP:OD2	1:D:56:HIS:HD2	1.80	0.65
1:C:186:THR:CG2	1:C:207:ILE:HG23	2.27	0.65
1:E:31:PHE:CZ	1:E:48:HIS:CD2	2.84	0.65
1:F:359:THR:OG1	1:F:360:ARG:HD3	1.96	0.65
1:F:96:THR:C	1:F:98:ASN:H	2.01	0.64
1:C:186:THR:HG23	1:C:207:ILE:HG23	1.79	0.64
1:E:352:ASP:CB	6:E:2244:HOH:O	2.46	0.64
1:F:360:ARG:HG2	6:F:2238:HOH:O	1.97	0.64
1:E:96:THR:O	1:E:99:LYS:N	2.25	0.64
1:F:186:THR:HG23	1:F:207:ILE:HG23	1.77	0.64
1:F:6:TYR:CE1	1:F:7:HIS:HE1	2.15	0.64
1:E:193:ASP:HB2	6:E:2152:HOH:O	1.97	0.64
1:E:210:THR:HG21	6:E:2160:HOH:O	1.98	0.64
1:E:306:VAL:HG11	1:E:426:GLU:HG3	1.80	0.64
1:F:360:ARG:CG	6:F:2238:HOH:O	2.44	0.63
1:C:7:HIS:CE1	1:C:279:LEU:HD13	2.34	0.63
1:C:53:ASP:OD2	1:C:56:HIS:HD2	1.82	0.63
1:E:19:ASN:HD21	1:E:33:GLN:HE21	1.46	0.63
1:A:19:ASN:HD21	1:A:33:GLN:HE21	1.46	0.63
1:C:97:HIS:CE1	6:C:2082:HOH:O	2.50	0.63
1:E:403:ARG:HH21	1:E:405:HIS:HE1	1.46	0.62
1:B:336:LEU:HD11	1:B:413:LEU:HD11	1.82	0.61
1:C:19:ASN:ND2	1:C:33:GLN:HE21	1.99	0.61
1:A:244:THR:CG2	6:A:2165:HOH:O	2.49	0.61
1:A:403:ARG:HH21	1:A:405:HIS:HE1	1.49	0.60
1:C:7:HIS:ND1	1:C:279:LEU:HD13	2.16	0.60
1:A:53:ASP:OD2	1:A:56:HIS:HD2	1.83	0.60
1:B:53:ASP:OD2	1:B:56:HIS:HD2	1.85	0.60
1:C:96:THR:OG1	1:C:99:LYS:NZ	2.33	0.60
1:B:270:ARG:H	1:B:270:ARG:HD2	1.67	0.60
1:A:359:THR:OG1	1:A:360:ARG:HD3	2.02	0.59
1:D:112:ASN:ND2	1:D:115:ASP:OD2	2.23	0.59
1:E:131:GLU:OE1	1:E:131:GLU:HA	2.02	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:210:THR:CG2	1:A:212:SER:OG	2.51	0.59
1:A:348:THR:HG21	6:A:2223:HOH:O	2.02	0.59
1:C:29:HIS:HE1	6:C:2018:HOH:O	1.82	0.59
1:D:124:VAL:HG13	1:D:174:TRP:CD1	2.37	0.59
1:D:262:ARG:HD3	1:D:266:TYR:OH	2.01	0.59
1:E:186:THR:CG2	1:E:207:ILE:HG23	2.33	0.59
1:E:364:SER:OG	1:E:405:HIS:HD2	1.86	0.59
1:D:96:THR:O	1:D:99:LYS:N	2.35	0.58
1:E:367:GLU:OE1	1:E:369:ARG:NH2	2.36	0.58
1:C:364:SER:OG	1:C:405:HIS:HD2	1.86	0.58
1:D:149:ARG:HG3	1:D:165:LEU:HD11	1.84	0.58
1:E:134:HIS:HB2	6:E:2130:HOH:O	2.02	0.58
1:A:31:PHE:CE2	1:A:48:HIS:CD2	2.91	0.58
1:F:3:LYS:CE	6:F:2005:HOH:O	2.50	0.58
1:D:19:ASN:ND2	1:D:33:GLN:HE21	1.99	0.58
1:F:1:LEU:HG	2:F:1433:SO4:O1	2.04	0.58
1:C:86:PHE:CE2	1:C:109:MET:HG2	2.39	0.58
1:E:96:THR:O	1:E:97:HIS:C	2.42	0.58
1:B:19:ASN:ND2	1:B:33:GLN:HE21	2.01	0.57
1:E:84:LYS:NZ	6:E:2073:HOH:O	2.31	0.57
1:E:133:THR:O	1:E:134:HIS:ND1	2.36	0.57
1:E:149:ARG:HG2	1:E:165:LEU:HD11	1.86	0.57
1:F:69:GLU:CD	1:F:69:GLU:H	2.08	0.57
1:D:133:THR:HG22	6:D:2122:HOH:O	2.03	0.57
1:C:303:LYS:NZ	6:C:2211:HOH:O	2.38	0.57
1:F:53:ASP:OD2	1:F:56:HIS:HD2	1.86	0.57
1:F:353:GLU:OE2	1:F:372:THR:HG22	2.05	0.57
1:A:170:ASP:O	1:A:171:LEU:HB2	2.05	0.57
1:B:186:THR:CG2	1:B:207:ILE:HG23	2.35	0.56
1:A:183:ASP:OD1	1:A:185:THR:HB	2.05	0.56
1:B:348:THR:HG23	6:B:2263:HOH:O	2.04	0.56
1:B:186:THR:HG23	1:B:207:ILE:HG23	1.88	0.56
1:D:31:PHE:CZ	1:D:48:HIS:CD2	2.92	0.56
1:A:7:HIS:NE2	1:A:279:LEU:HD13	2.21	0.56
1:E:134:HIS:CD2	6:E:2130:HOH:O	2.59	0.56
1:E:352:ASP:HB3	6:E:2244:HOH:O	2.06	0.56
1:B:269:LYS:HB2	6:B:2195:HOH:O	2.05	0.56
1:B:29:HIS:HE1	6:B:2023:HOH:O	1.88	0.56
1:F:1:LEU:CG	2:F:1433:SO4:O1	2.54	0.56
1:F:134:HIS:CG	1:F:135:ALA:H	2.24	0.56
1:C:336:LEU:HD11	1:C:413:LEU:HD11	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:243:GLN:HG3	6:E:2152:HOH:O	2.05	0.55
1:F:142:ASN:CB	6:F:2122:HOH:O	2.48	0.55
1:C:403:ARG:HH21	1:C:405:HIS:HE1	1.53	0.55
1:E:244:THR:CG2	6:E:2172:HOH:O	2.54	0.55
1:D:186:THR:HG23	1:D:207:ILE:HG23	1.88	0.55
1:E:348:THR:HG23	6:E:2247:HOH:O	2.06	0.55
1:F:228:GLU:HG2	1:F:229:LYS:HG2	1.89	0.55
1:D:71:HIS:CE1	1:D:93:ARG:HG3	2.41	0.55
1:F:186:THR:HG21	1:F:207:ILE:HG23	1.87	0.55
1:F:262:ARG:HD3	1:F:266:TYR:OH	2.06	0.55
1:B:149:ARG:HG3	1:B:165:LEU:HD11	1.89	0.55
1:E:249:ASP:CB	6:E:2178:HOH:O	2.52	0.55
1:F:329:GLU:HG3	1:F:380:ARG:HG2	1.89	0.55
1:E:208:THR:HG22	1:E:240:TYR:OH	2.06	0.54
1:B:355:ILE:CD1	1:B:368:VAL:HG13	2.38	0.54
1:A:1:LEU:HD12	1:A:1:LEU:H3	1.72	0.54
1:C:253:VAL:HG21	1:C:283:LEU:HD22	1.89	0.54
1:D:264:GLY:C	6:D:2177:HOH:O	2.45	0.54
1:D:59:HIS:HD2	6:D:2029:HOH:O	1.91	0.54
1:D:170:ASP:O	1:D:171:LEU:HB2	2.08	0.54
1:E:186:THR:HG23	1:E:207:ILE:HG23	1.90	0.54
1:C:244:THR:OG1	1:C:253:VAL:HG22	2.08	0.54
1:D:403:ARG:HH21	1:D:405:HIS:HE1	1.55	0.54
1:A:7:HIS:CD2	1:A:279:LEU:CD1	2.86	0.54
1:A:411:ASN:HD22	1:A:411:ASN:H	1.56	0.54
1:E:208:THR:HG23	6:E:2145:HOH:O	2.08	0.54
1:B:137:ARG:NH1	2:B:1435:SO4:O4	2.42	0.53
1:D:163:VAL:HG21	1:D:203:LEU:HD11	1.91	0.53
1:B:120:ASP:HB2	6:B:2111:HOH:O	2.08	0.53
1:E:59:HIS:HD2	6:E:2028:HOH:O	1.90	0.53
1:C:253:VAL:CG2	1:C:283:LEU:HD22	2.39	0.53
1:C:99:LYS:NZ	6:C:2084:HOH:O	2.41	0.53
1:B:170:ASP:OD2	1:B:173:HIS:HD2	1.91	0.53
1:A:250:ARG:NH1	1:A:295:VAL:HG22	2.22	0.53
1:E:124:VAL:HG13	1:E:174:TRP:CD1	2.43	0.53
1:C:7:HIS:HD1	1:C:279:LEU:HD13	1.74	0.53
1:F:101:GLU:OE2	1:F:134:HIS:NE2	2.40	0.53
1:F:230:ARG:CD	6:F:2160:HOH:O	2.56	0.53
1:C:302:ARG:CD	1:C:325:GLU:OE1	2.54	0.53
1:D:64:LEU:HD21	1:D:108:VAL:HG11	1.91	0.53
1:A:19:ASN:ND2	1:A:33:GLN:HE21	2.07	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:170:ASP:OD2	1:C:173:HIS:HD2	1.92	0.52
1:C:340:ASN:HA	1:C:412:ILE:HD12	1.91	0.52
1:D:55:VAL:C	6:D:2049:HOH:O	2.48	0.52
1:A:364:SER:OG	1:A:405:HIS:HD2	1.93	0.52
1:B:210:THR:HG21	6:B:2172:HOH:O	2.09	0.52
1:B:235:HIS:ND1	1:B:398:ILE:CD1	2.70	0.52
1:B:364:SER:OG	1:B:405:HIS:HD2	1.92	0.52
1:B:124:VAL:HG13	1:B:174:TRP:CD1	2.44	0.52
1:D:302:ARG:CD	1:D:325:GLU:OE1	2.56	0.52
1:F:3:LYS:HE2	6:F:2005:HOH:O	2.10	0.52
1:A:352:ASP:OD1	1:C:228:GLU:OE2	2.27	0.52
1:A:250:ARG:HD3	2:A:1434:SO4:O3	2.09	0.52
1:A:302:ARG:CD	1:A:325:GLU:OE1	2.55	0.52
1:B:235:HIS:CE1	1:B:398:ILE:HD11	2.44	0.52
1:B:329:GLU:HG3	1:B:380:ARG:HG2	1.91	0.52
1:C:71:HIS:HD2	1:C:91:TYR:CE2	2.28	0.52
1:E:48:HIS:HE1	1:E:60:LEU:HD23	1.60	0.52
1:D:289:GLU:HG2	6:D:2256:HOH:O	2.10	0.52
1:F:134:HIS:CD2	1:F:135:ALA:N	2.75	0.52
1:B:421:LYS:NZ	6:B:2305:HOH:O	2.43	0.51
1:B:15:MET:HG3	1:B:32:TYR:CD1	2.45	0.51
1:E:7:HIS:CE1	1:E:279:LEU:CD1	2.94	0.51
1:F:69:GLU:HG3	6:F:2038:HOH:O	2.11	0.51
1:F:138:ASP:HB3	6:F:2079:HOH:O	2.10	0.51
1:D:98:ASN:N	1:D:98:ASN:ND2	2.58	0.51
1:E:355:ILE:CD1	1:E:368:VAL:HG13	2.41	0.51
1:D:7:HIS:CE1	1:D:391:GLU:OE1	2.62	0.51
1:D:69:GLU:HG3	6:D:2031:HOH:O	2.10	0.51
1:B:101:GLU:OE2	2:B:1435:SO4:O3	2.28	0.51
1:B:403:ARG:HH21	1:B:405:HIS:HE1	1.58	0.51
1:C:19:ASN:HD21	1:C:33:GLN:NE2	2.09	0.51
1:F:355:ILE:CD1	1:F:368:VAL:HG13	2.40	0.51
1:C:124:VAL:HG13	1:C:174:TRP:CD1	2.46	0.51
1:C:355:ILE:HB	1:C:370:LYS:HG2	1.92	0.51
1:F:411:ASN:HD22	1:F:411:ASN:H	1.58	0.51
1:B:295:VAL:HG12	1:B:298:LEU:HD22	1.91	0.51
1:C:144:SER:HB3	1:C:149:ARG:HD2	1.93	0.50
1:D:336:LEU:HD13	1:D:415:VAL:HG13	1.92	0.50
1:D:71:HIS:HD2	1:D:91:TYR:CE2	2.30	0.50
1:B:369:ARG:NE	6:B:2281:HOH:O	2.40	0.50
1:E:335:GLU:HG3	1:E:348:THR:HG22	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:133:THR:O	1:D:134:HIS:ND1	2.45	0.50
1:F:329:GLU:HG3	1:F:380:ARG:CG	2.40	0.50
1:B:1:LEU:HD11	1:B:2:PHE:CE1	2.47	0.50
1:E:235:HIS:CE1	1:E:398:ILE:CD1	2.93	0.50
1:F:195:VAL:HG21	1:F:244:THR:HG21	1.94	0.50
1:E:262:ARG:NH2	6:E:2183:HOH:O	2.20	0.50
1:E:19:ASN:ND2	1:E:33:GLN:HE21	2.10	0.50
1:E:336:LEU:CD1	1:E:413:LEU:HD11	2.42	0.50
1:F:124:VAL:HG13	1:F:174:TRP:CD1	2.46	0.50
1:A:372:THR:OG1	1:C:226:ASN:OD1	2.29	0.49
1:D:7:HIS:CE1	1:D:279:LEU:HD13	2.47	0.49
1:F:25:LYS:NZ	6:F:2025:HOH:O	2.40	0.49
1:C:199:GLU:O	1:C:219:GLU:OE2	2.30	0.49
1:C:373:VAL:HG11	1:C:394:PHE:HE2	1.70	0.49
1:A:71:HIS:HD2	1:A:91:TYR:CE2	2.30	0.49
1:E:207:ILE:HG22	1:E:210:THR:HG22	1.95	0.49
1:A:235:HIS:CE1	1:A:398:ILE:HD11	2.47	0.49
1:B:160:ILE:HD12	1:B:184:GLU:HG3	1.93	0.49
1:C:373:VAL:HG12	1:C:374:GLU:N	2.28	0.49
1:E:183:ASP:OD1	1:E:185:THR:HB	2.13	0.49
1:C:134:HIS:NE2	6:C:2119:HOH:O	2.34	0.49
1:D:235:HIS:CE1	1:D:398:ILE:CD1	2.96	0.49
1:A:97:HIS:CE1	6:A:2085:HOH:O	2.66	0.48
1:A:355:ILE:HD12	1:A:368:VAL:HG13	1.95	0.48
1:C:1:LEU:N	6:C:2003:HOH:O	2.45	0.48
1:C:96:THR:O	1:C:97:HIS:C	2.50	0.48
1:D:133:THR:CG2	6:D:2122:HOH:O	2.60	0.48
1:A:249:ASP:CB	1:D:249:ASP:OD1	2.61	0.48
1:B:1:LEU:HD13	6:B:2295:HOH:O	2.12	0.48
1:B:336:LEU:CD1	1:B:413:LEU:HD11	2.43	0.48
1:D:97:HIS:CA	1:D:98:ASN:HD22	2.24	0.48
1:D:355:ILE:CD1	1:D:368:VAL:HG13	2.43	0.48
1:E:29:HIS:HD2	1:E:48:HIS:NE2	2.12	0.48
1:E:373:VAL:CG1	1:E:394:PHE:CE2	2.96	0.48
1:F:170:ASP:O	1:F:171:LEU:HB2	2.12	0.48
1:B:289:GLU:HG3	6:B:2212:HOH:O	2.14	0.48
1:F:40:GLU:OE2	1:F:269:LYS:CD	2.62	0.48
1:C:40:GLU:HG3	6:C:2031:HOH:O	2.13	0.48
1:B:304:ARG:HG2	6:B:2226:HOH:O	2.13	0.47
1:F:124:VAL:HG22	1:F:172:PHE:HA	1.96	0.47
1:F:230:ARG:HD2	6:F:2160:HOH:O	2.13	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:197:ILE:HG21	1:B:285:VAL:HG23	1.97	0.47
1:A:279:LEU:HD22	1:A:391:GLU:OE1	2.14	0.47
1:B:145:ASN:HA	1:C:80:GLU:O	2.15	0.47
1:A:69:GLU:CD	1:A:69:GLU:H	2.18	0.47
1:B:7:HIS:CE1	1:B:391:GLU:OE1	2.61	0.47
1:D:138:ASP:HB3	6:D:2063:HOH:O	2.14	0.47
1:D:170:ASP:OD2	1:D:173:HIS:CD2	2.68	0.47
1:D:186:THR:CG2	1:D:207:ILE:HG23	2.44	0.47
1:E:193:ASP:CG	6:E:2152:HOH:O	2.52	0.47
1:E:411:ASN:H	1:E:411:ASN:HD22	1.62	0.47
1:F:356:VAL:HG11	1:F:402:PHE:CE2	2.49	0.47
1:F:364:SER:OG	1:F:405:HIS:HD2	1.98	0.47
1:E:210:THR:HG1	1:E:212:SER:HG	1.46	0.47
1:B:411:ASN:H	1:B:411:ASN:HD22	1.62	0.47
1:C:128:PRO:HB2	1:C:133:THR:OG1	2.15	0.47
1:D:109:MET:HE1	6:D:2097:HOH:O	2.14	0.47
1:E:31:PHE:CD2	1:E:48:HIS:HD2	2.33	0.47
1:E:29:HIS:HE1	6:E:2022:HOH:O	1.98	0.46
1:E:33:GLN:OE1	1:E:44:ILE:HG21	2.14	0.46
1:E:75:SER:HB2	1:E:138:ASP:OD1	2.15	0.46
1:F:79:VAL:HG22	1:F:246:PHE:CE1	2.49	0.46
1:C:128:PRO:CB	1:C:133:THR:OG1	2.64	0.46
1:D:69:GLU:CG	6:D:2031:HOH:O	2.62	0.46
1:F:71:HIS:HD2	1:F:91:TYR:CE2	2.33	0.46
1:F:373:VAL:CG1	1:F:394:PHE:CE2	2.98	0.46
1:D:29:HIS:HE1	6:D:2022:HOH:O	1.98	0.46
1:D:411:ASN:H	1:D:411:ASN:HD22	1.62	0.46
1:E:336:LEU:HD11	1:E:413:LEU:HD11	1.97	0.46
1:B:138:ASP:HB3	6:B:2078:HOH:O	2.14	0.46
1:E:378:THR:HG22	6:E:2286:HOH:O	2.15	0.46
1:D:183:ASP:OD1	1:D:185:THR:HB	2.14	0.46
1:C:170:ASP:O	1:C:171:LEU:HB2	2.16	0.46
1:D:207:ILE:HG22	1:D:210:THR:HG22	1.97	0.46
1:D:355:ILE:HB	1:D:370:LYS:HG3	1.97	0.46
1:E:380:ARG:NH2	1:E:382:ARG:HD2	2.30	0.46
1:C:183:ASP:OD1	1:C:185:THR:HB	2.16	0.46
1:C:214:LEU:N	1:C:214:LEU:HD12	2.30	0.46
1:E:211:ASN:HB3	6:E:2161:HOH:O	2.16	0.46
1:F:270:ARG:HD2	2:F:1433:SO4:O4	2.16	0.46
1:A:29:HIS:HE1	6:A:2019:HOH:O	1.99	0.46
1:E:232:LEU:CD1	1:E:235:HIS:HD2	2.29	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:69:GLU:CG	6:B:2034:HOH:O	2.63	0.46
1:C:144:SER:CB	1:C:149:ARG:HD2	2.46	0.46
1:C:336:LEU:CD1	1:C:413:LEU:HD11	2.45	0.46
1:D:142:ASN:HD22	1:D:143:ARG:N	2.14	0.46
1:F:359:THR:OG1	1:F:360:ARG:NH1	2.49	0.46
1:F:403:ARG:HH21	1:F:405:HIS:HE1	1.63	0.46
1:F:19:ASN:HD21	1:F:33:GLN:HG2	1.81	0.45
1:B:400:PHE:HB3	1:B:402:PHE:CE2	2.51	0.45
1:D:413:LEU:HD12	1:D:414:SER:N	2.31	0.45
1:F:211:ASN:HD21	1:F:260:TRP:HB2	1.80	0.45
1:A:128:PRO:CB	1:A:133:THR:OG1	2.65	0.45
1:D:87:LEU:HB2	1:D:108:VAL:HG12	1.97	0.45
1:B:69:GLU:HG3	6:B:2034:HOH:O	2.15	0.45
1:E:193:ASP:CB	6:E:2152:HOH:O	2.62	0.45
1:A:206:SER:HB3	1:A:240:TYR:CE1	2.51	0.45
1:C:15:MET:HG3	1:C:32:TYR:CD1	2.51	0.45
1:B:235:HIS:CE1	1:B:398:ILE:CD1	3.00	0.45
1:C:253:VAL:HG21	1:C:283:LEU:CD2	2.47	0.45
1:D:265:LEU:HD23	6:D:2177:HOH:O	2.16	0.45
1:E:149:ARG:CG	1:E:165:LEU:HD11	2.45	0.45
1:F:235:HIS:HD2	6:F:2248:HOH:O	1.99	0.45
1:E:140:LYS:HG3	6:E:2152:HOH:O	2.17	0.45
1:F:56:HIS:HE1	1:F:428:GLU:OE1	2.00	0.45
1:A:188:GLU:CD	6:A:2139:HOH:O	2.55	0.45
1:E:142:ASN:ND2	6:E:2116:HOH:O	2.41	0.45
1:E:202:ILE:CG1	1:E:217:MET:HG3	2.47	0.45
1:E:355:ILE:HD12	1:E:368:VAL:HG13	2.00	0.45
1:A:185:THR:HG21	6:A:2063:HOH:O	2.16	0.44
1:E:235:HIS:ND1	1:E:398:ILE:CD1	2.62	0.44
1:E:262:ARG:HD3	1:E:266:TYR:OH	2.17	0.44
1:B:422:LEU:HD23	1:B:422:LEU:C	2.37	0.44
1:A:232:LEU:HD12	1:A:235:HIS:CD2	2.53	0.44
1:B:7:HIS:CE1	1:B:279:LEU:HD13	2.52	0.44
1:B:244:THR:CG2	6:B:2187:HOH:O	2.64	0.44
1:D:1:LEU:CD1	1:D:2:PHE:CD1	3.00	0.44
1:E:369:ARG:NE	6:E:2256:HOH:O	2.36	0.44
1:F:1:LEU:HD11	2:F:1433:SO4:O1	2.17	0.44
1:E:128:PRO:HB2	1:E:133:THR:OG1	2.18	0.44
1:A:250:ARG:NH1	1:A:297:GLU:OE1	2.50	0.44
1:A:394:PHE:HB3	1:A:398:ILE:CG2	2.48	0.44
1:C:59:HIS:HD2	6:C:2023:HOH:O	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:351:ARG:NE	6:A:2237:HOH:O	2.49	0.44
1:B:170:ASP:O	1:B:171:LEU:HB2	2.17	0.44
1:F:244:THR:CG2	6:F:2173:HOH:O	2.65	0.44
1:A:232:LEU:HD12	1:A:235:HIS:HD2	1.83	0.44
1:B:160:ILE:HD12	1:B:184:GLU:CG	2.47	0.44
1:C:29:HIS:CD2	1:C:48:HIS:NE2	2.73	0.44
1:E:232:LEU:HD13	1:E:235:HIS:HD2	1.83	0.44
1:F:266:TYR:HA	1:F:267:PRO:HD3	1.92	0.44
1:B:200:LYS:HD3	1:B:217:MET:HE2	2.00	0.44
1:D:211:ASN:HD21	1:D:260:TRP:HB2	1.83	0.44
1:A:211:ASN:HD21	1:A:260:TRP:HB2	1.81	0.43
1:B:127:LYS:CG	1:B:128:PRO:HD2	2.47	0.43
1:F:69:GLU:CG	6:F:2038:HOH:O	2.65	0.43
1:E:197:ILE:HD12	1:E:202:ILE:HD13	2.00	0.43
1:A:124:VAL:HG13	1:A:174:TRP:CD1	2.53	0.43
1:F:19:ASN:HD21	1:F:33:GLN:HE21	1.66	0.43
1:A:128:PRO:HB2	1:A:133:THR:OG1	2.19	0.43
1:C:7:HIS:CE1	1:C:279:LEU:CD1	2.99	0.43
1:C:337:ARG:O	1:C:413:LEU:HD12	2.18	0.43
1:A:75:SER:HB2	1:A:138:ASP:OD1	2.18	0.43
1:F:98:ASN:OD1	6:F:2091:HOH:O	2.21	0.43
1:F:162:ARG:HD3	6:F:2129:HOH:O	2.18	0.43
1:A:120:ASP:CG	3:A:1436:CIT:H22	2.39	0.43
1:D:256:TRP:CE2	1:D:258:GLN:HB3	2.54	0.43
1:E:356:VAL:HG11	1:E:402:PHE:CE2	2.53	0.43
1:F:134:HIS:CG	1:F:135:ALA:N	2.87	0.43
1:F:359:THR:CB	1:F:360:ARG:HH11	2.32	0.43
1:C:149:ARG:NH1	6:C:2131:HOH:O	2.51	0.43
1:D:325:GLU:HB2	1:D:427:LEU:HD11	2.01	0.43
1:D:373:VAL:CG1	1:D:394:PHE:CE2	2.99	0.43
1:C:163:VAL:HG21	1:C:203:LEU:HD11	2.01	0.43
1:C:217:MET:CE	1:C:285:VAL:HG21	2.49	0.42
1:E:97:HIS:CD2	6:E:2081:HOH:O	2.72	0.42
1:F:360:ARG:HD3	1:F:360:ARG:N	2.34	0.42
1:F:40:GLU:OE2	1:F:269:LYS:HD3	2.19	0.42
1:F:96:THR:O	1:F:99:LYS:N	2.51	0.42
1:A:329:GLU:OE1	1:E:304:ARG:CZ	2.68	0.42
1:A:353:GLU:OE2	1:C:226:ASN:ND2	2.53	0.42
1:B:348:THR:HG21	6:B:2254:HOH:O	2.18	0.42
1:E:191:CYS:N	1:E:192:PRO:CD	2.83	0.42
1:A:211:ASN:HB3	6:A:2151:HOH:O	2.18	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:14:TRP:CD1	1:C:14:TRP:C	2.93	0.42
1:E:109:MET:SD	1:E:110:SER:N	2.92	0.42
1:B:59:HIS:HE1	6:B:2011:HOH:O	2.02	0.42
1:C:195:VAL:HG21	1:C:244:THR:HG21	2.00	0.42
1:D:109:MET:CE	6:D:2097:HOH:O	2.66	0.42
1:D:403:ARG:HH21	1:D:405:HIS:CE1	2.37	0.42
1:E:3:LYS:NZ	6:E:2005:HOH:O	2.52	0.42
1:C:262:ARG:NH2	6:C:2183:HOH:O	2.53	0.42
1:E:210:THR:OG1	1:E:212:SER:OG	2.18	0.42
1:F:75:SER:HB2	1:F:138:ASP:OD1	2.20	0.42
1:B:55:VAL:CG1	1:B:301:LEU:HD21	2.50	0.41
1:C:210:THR:HG21	6:C:2066:HOH:O	2.19	0.41
1:D:388:CYS:HB2	1:D:405:HIS:CE1	2.55	0.41
1:C:262:ARG:HD3	1:C:266:TYR:OH	2.20	0.41
1:D:48:HIS:ND1	1:D:60:LEU:HD23	2.33	0.41
1:E:302:ARG:CD	1:E:325:GLU:OE1	2.66	0.41
1:E:403:ARG:HH21	1:E:405:HIS:CE1	2.32	0.41
1:B:40:GLU:HG3	6:B:2041:HOH:O	2.19	0.41
1:C:355:ILE:CD1	1:C:368:VAL:HG13	2.49	0.41
1:E:1:LEU:HA	6:E:2006:HOH:O	2.20	0.41
1:E:79:VAL:HG22	1:E:246:PHE:CE1	2.55	0.41
1:E:163:VAL:HG21	1:E:203:LEU:HD11	2.02	0.41
1:F:131:GLU:OE1	1:F:131:GLU:HA	2.21	0.41
1:A:421:LYS:HG2	1:E:306:VAL:HA	2.03	0.41
1:C:221:LYS:NZ	1:C:226:ASN:ND2	2.68	0.41
1:F:7:HIS:NE2	1:F:386:ASP:HB2	2.35	0.41
1:E:31:PHE:CZ	1:E:48:HIS:HD2	2.34	0.41
1:F:200:LYS:HZ2	1:F:288:ASN:HD21	1.63	0.41
1:F:335:GLU:HG3	1:F:348:THR:HG22	2.03	0.41
1:D:149:ARG:HG2	1:D:165:LEU:HD11	2.01	0.41
1:D:71:HIS:HA	1:D:92:TYR:O	2.21	0.41
1:D:259:SER:HB3	1:D:262:ARG:HB2	2.01	0.41
1:E:145:ASN:HA	1:F:80:GLU:O	2.21	0.41
1:C:422:LEU:C	1:C:422:LEU:HD23	2.41	0.41
1:A:69:GLU:CG	6:A:2030:HOH:O	2.68	0.41
1:A:311:LYS:HE3	1:A:311:LYS:HB3	1.88	0.41
1:B:235:HIS:ND1	1:B:398:ILE:CG1	2.83	0.41
1:C:257:LEU:HG	1:C:278:SER:HA	2.03	0.41
1:F:170:ASP:OD2	1:F:173:HIS:CD2	2.73	0.41
1:B:1:LEU:H3	1:B:1:LEU:HG	1.82	0.41
1:B:136:PHE:CE1	1:B:152:LEU:HD13	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:206:SER:HB3	1:B:240:TYR:CE1	2.56	0.41
1:C:56:HIS:HE1	1:C:428:GLU:OE1	2.04	0.41
1:C:311:LYS:NZ	6:C:2224:HOH:O	2.54	0.41
1:F:302:ARG:HD2	1:F:425:PHE:CG	2.56	0.41
1:B:207:ILE:HD12	1:B:214:LEU:HD13	2.02	0.40
1:D:79:VAL:HG11	1:D:171:LEU:HD21	2.03	0.40
1:E:198:GLY:O	1:E:199:GLU:HB2	2.22	0.40
1:E:7:HIS:ND1	1:E:279:LEU:CD1	2.81	0.40
1:E:202:ILE:HG13	1:E:217:MET:HG3	2.02	0.40
1:F:400:PHE:HB3	1:F:402:PHE:CE2	2.56	0.40
1:B:398:ILE:HD13	1:B:398:ILE:HG21	1.88	0.40
1:D:51:SER:HB3	6:D:2049:HOH:O	2.21	0.40
1:F:63:ALA:O	1:F:64:LEU:HD23	2.22	0.40
1:C:101:GLU:OE2	2:C:1435:SO4:O1	2.40	0.40
1:C:258:GLN:HE22	1:C:274:ASN:ND2	2.20	0.40
1:B:84:LYS:HD3	1:B:109:MET:SD	2.62	0.40
1:B:84:LYS:NZ	6:B:2084:HOH:O	2.55	0.40
1:D:367:GLU:OE1	1:D:369:ARG:NH2	2.53	0.40
1:E:355:ILE:CD1	1:E:368:VAL:CG1	2.99	0.40
1:F:188:GLU:OE1	6:F:2139:HOH:O	2.22	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	430/432 (100%)	414 (96%)	16 (4%)	0	100	100
1	B	430/432 (100%)	412 (96%)	17 (4%)	1 (0%)	44	36
1	C	430/432 (100%)	411 (96%)	18 (4%)	1 (0%)	44	36
1	D	430/432 (100%)	415 (96%)	13 (3%)	2 (0%)	25	17

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	E	430/432 (100%)	412 (96%)	16 (4%)	2 (0%)	25 17
1	F	430/432 (100%)	414 (96%)	13 (3%)	3 (1%)	19 11
All	All	2580/2592 (100%)	2478 (96%)	93 (4%)	9 (0%)	37 29

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	97	HIS
1	E	97	HIS
1	F	97	HIS
1	B	351	ARG
1	C	351	ARG
1	D	351	ARG
1	E	351	ARG
1	F	304	ARG
1	F	351	ARG

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	387/387 (100%)	350 (90%)	37 (10%)	7 2
1	B	387/387 (100%)	346 (89%)	41 (11%)	5 2
1	C	387/387 (100%)	351 (91%)	36 (9%)	7 3
1	D	387/387 (100%)	345 (89%)	42 (11%)	5 2
1	E	387/387 (100%)	350 (90%)	37 (10%)	7 2
1	F	387/387 (100%)	346 (89%)	41 (11%)	5 2
All	All	2322/2322 (100%)	2088 (90%)	234 (10%)	6 2

All (234) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	LEU

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Mol	Chain	Res	Type
1	A	60	LEU
1	A	99	LYS
1	A	108	VAL
1	A	114	LEU
1	A	124	VAL
1	A	127	LYS
1	A	171	LEU
1	A	188	GLU
1	A	203	LEU
1	A	208	THR
1	A	210	THR
1	A	211	ASN
1	A	220	LEU
1	A	233	LEU
1	A	244	THR
1	A	257	LEU
1	A	269	LYS
1	A	274	ASN
1	A	279	LEU
1	A	288	ASN
1	A	289	GLU
1	A	290	LEU
1	A	295	VAL
1	A	298	LEU
1	A	303	LYS
1	A	311	LYS
1	A	351	ARG
1	A	354	LEU
1	A	355	ILE
1	A	360	ARG
1	A	375	ASP
1	A	397	SER
1	A	411	ASN
1	A	413	LEU
1	A	414	SER
1	A	415	VAL
1	B	38	LYS
1	B	60	LEU
1	B	79	VAL
1	B	108	VAL
1	B	114	LEU
1	B	124	VAL

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Mol	Chain	Res	Type
1	B	134	HIS
1	B	159	LYS
1	B	186	THR
1	B	195	VAL
1	B	199	GLU
1	B	203	LEU
1	B	211	ASN
1	B	220	LEU
1	B	233	LEU
1	B	244	THR
1	B	257	LEU
1	B	270	ARG
1	B	274	ASN
1	B	279	LEU
1	B	283	LEU
1	B	288	ASN
1	B	289	GLU
1	B	290	LEU
1	B	295	VAL
1	B	298	LEU
1	B	303	LYS
1	B	311	LYS
1	B	318	ASP
1	B	349	LYS
1	B	351	ARG
1	B	354	LEU
1	B	355	ILE
1	B	363	VAL
1	B	374	GLU
1	B	380	ARG
1	B	397	SER
1	B	411	ASN
1	B	415	VAL
1	B	420	VAL
1	B	421	LYS
1	C	1	LEU
1	C	60	LEU
1	C	79	VAL
1	C	97	HIS
1	C	114	LEU
1	C	124	VAL
1	C	127	LYS

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Mol	Chain	Res	Type
1	C	131	GLU
1	C	171	LEU
1	C	186	THR
1	C	196	ARG
1	C	200	LYS
1	C	203	LEU
1	C	226	ASN
1	C	233	LEU
1	C	244	THR
1	C	257	LEU
1	C	274	ASN
1	C	279	LEU
1	C	283	LEU
1	C	290	LEU
1	C	293	LYS
1	C	295	VAL
1	C	298	LEU
1	C	308	GLU
1	C	321	GLU
1	C	351	ARG
1	C	354	LEU
1	C	355	ILE
1	C	397	SER
1	C	411	ASN
1	C	414	SER
1	C	415	VAL
1	C	419	GLN
1	C	420	VAL
1	C	421	LYS
1	D	1	LEU
1	D	38	LYS
1	D	60	LEU
1	D	79	VAL
1	D	98	ASN
1	D	101	GLU
1	D	108	VAL
1	D	114	LEU
1	D	124	VAL
1	D	131	GLU
1	D	142	ASN
1	D	171	LEU
1	D	185	THR

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Mol	Chain	Res	Type
1	D	186	THR
1	D	195	VAL
1	D	203	LEU
1	D	211	ASN
1	D	220	LEU
1	D	229	LYS
1	D	233	LEU
1	D	244	THR
1	D	257	LEU
1	D	274	ASN
1	D	279	LEU
1	D	283	LEU
1	D	289	GLU
1	D	290	LEU
1	D	298	LEU
1	D	303	LYS
1	D	321	GLU
1	D	351	ARG
1	D	354	LEU
1	D	355	ILE
1	D	370	LYS
1	D	372	THR
1	D	375	ASP
1	D	380	ARG
1	D	411	ASN
1	D	413	LEU
1	D	414	SER
1	D	415	VAL
1	D	420	VAL
1	E	60	LEU
1	E	79	VAL
1	E	97	HIS
1	E	101	GLU
1	E	114	LEU
1	E	124	VAL
1	E	159	LYS
1	E	186	THR
1	E	203	LEU
1	E	208	THR
1	E	210	THR
1	E	211	ASN
1	E	220	LEU

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Mol	Chain	Res	Type
1	E	230	ARG
1	E	233	LEU
1	E	244	THR
1	E	257	LEU
1	E	274	ASN
1	E	279	LEU
1	E	283	LEU
1	E	289	GLU
1	E	290	LEU
1	E	295	VAL
1	E	298	LEU
1	E	303	LYS
1	E	304	ARG
1	E	321	GLU
1	E	352	ASP
1	E	354	LEU
1	E	355	ILE
1	E	411	ASN
1	E	413	LEU
1	E	414	SER
1	E	415	VAL
1	E	419	GLN
1	E	420	VAL
1	E	421	LYS
1	F	1	LEU
1	F	60	LEU
1	F	79	VAL
1	F	97	HIS
1	F	99	LYS
1	F	108	VAL
1	F	114	LEU
1	F	124	VAL
1	F	171	LEU
1	F	185	THR
1	F	186	THR
1	F	188	GLU
1	F	195	VAL
1	F	199	GLU
1	F	203	LEU
1	F	208	THR
1	F	211	ASN
1	F	220	LEU

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Mol	Chain	Res	Type
1	F	224	LYS
1	F	229	LYS
1	F	233	LEU
1	F	244	THR
1	F	257	LEU
1	F	274	ASN
1	F	279	LEU
1	F	288	ASN
1	F	289	GLU
1	F	290	LEU
1	F	295	VAL
1	F	298	LEU
1	F	354	LEU
1	F	355	ILE
1	F	360	ARG
1	F	370	LYS
1	F	375	ASP
1	F	380	ARG
1	F	382	ARG
1	F	411	ASN
1	F	413	LEU
1	F	415	VAL
1	F	420	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (70) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	19	ASN
1	A	29	HIS
1	A	56	HIS
1	A	71	HIS
1	A	134	HIS
1	A	173	HIS
1	A	211	ASN
1	A	243	GLN
1	A	274	ASN
1	A	405	HIS
1	A	411	ASN
1	B	7	HIS
1	B	19	ASN
1	B	29	HIS
1	B	56	HIS

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Mol	Chain	Res	Type
1	B	59	HIS
1	B	173	HIS
1	B	243	GLN
1	B	274	ASN
1	B	405	HIS
1	B	411	ASN
1	C	19	ASN
1	C	29	HIS
1	C	56	HIS
1	C	59	HIS
1	C	134	HIS
1	C	142	ASN
1	C	173	HIS
1	C	211	ASN
1	C	243	GLN
1	C	274	ASN
1	C	405	HIS
1	C	411	ASN
1	D	7	HIS
1	D	19	ASN
1	D	29	HIS
1	D	56	HIS
1	D	59	HIS
1	D	71	HIS
1	D	98	ASN
1	D	142	ASN
1	D	235	HIS
1	D	243	GLN
1	D	274	ASN
1	D	405	HIS
1	D	411	ASN
1	E	19	ASN
1	E	29	HIS
1	E	48	HIS
1	E	56	HIS
1	E	59	HIS
1	E	173	HIS
1	E	235	HIS
1	E	243	GLN
1	E	274	ASN
1	E	405	HIS
1	E	411	ASN

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Mol	Chain	Res	Type
1	F	7	HIS
1	F	19	ASN
1	F	56	HIS
1	F	59	HIS
1	F	71	HIS
1	F	142	ASN
1	F	173	HIS
1	F	235	HIS
1	F	243	GLN
1	F	274	ASN
1	F	288	ASN
1	F	405	HIS
1	F	411	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 22 ligands modelled in this entry, 1 is monoatomic - leaving 21 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	SO4	B	1434	-	4,4,4	0.13	0	6,6,6	0.21	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	SO4	A	1433	-	4,4,4	0.55	0	6,6,6	0.48	0
4	GOL	D	1433	-	5,5,5	0.43	0	5,5,5	0.44	0
4	GOL	A	1437	-	5,5,5	0.46	0	5,5,5	0.73	0
2	SO4	C	1433	-	4,4,4	0.41	0	6,6,6	0.61	0
2	SO4	B	1437	-	4,4,4	0.29	0	6,6,6	0.72	0
4	GOL	B	1436	-	5,5,5	0.40	0	5,5,5	0.35	0
2	SO4	F	1435	-	4,4,4	0.32	0	6,6,6	0.22	0
2	SO4	C	1435	-	4,4,4	0.27	0	6,6,6	0.41	0
4	GOL	F	1436	-	5,5,5	0.40	0	5,5,5	0.56	0
2	SO4	B	1433	-	4,4,4	0.33	0	6,6,6	0.59	0
2	SO4	F	1433	-	4,4,4	0.17	0	6,6,6	0.68	0
2	SO4	C	1434	-	4,4,4	0.12	0	6,6,6	0.26	0
3	CIT	A	1436	5	12,12,12	1.09	1 (8%)	17,17,17	2.48	7 (41%)
2	SO4	F	1434	-	4,4,4	0.23	0	6,6,6	0.45	0
2	SO4	E	1433	-	4,4,4	0.11	0	6,6,6	0.39	0
4	GOL	E	1434	-	5,5,5	0.69	0	5,5,5	0.64	0
2	SO4	B	1435	-	4,4,4	0.29	0	6,6,6	0.31	0
2	SO4	A	1434	-	4,4,4	0.22	0	6,6,6	0.25	0
4	GOL	C	1436	1	5,5,5	0.67	0	5,5,5	1.12	0
2	SO4	A	1435	-	4,4,4	0.31	0	6,6,6	0.51	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
4	GOL	B	1436	-	-	3/4/4/4	-
4	GOL	E	1434	-	-	4/4/4/4	-
4	GOL	D	1433	-	-	4/4/4/4	-
3	CIT	A	1436	5	-	2/16/16/16	-
4	GOL	F	1436	-	-	2/4/4/4	-
4	GOL	A	1437	-	-	4/4/4/4	-
4	GOL	C	1436	1	-	2/4/4/4	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1436	CIT	C2-C3	-2.01	1.51	1.53

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	1436	CIT	O6-C6-C3	4.73	121.27	113.05
3	A	1436	CIT	C2-C3-C6	-4.70	100.00	110.11
3	A	1436	CIT	C4-C3-C2	4.60	121.16	109.16
3	A	1436	CIT	O4-C5-C4	2.95	123.83	114.35
3	A	1436	CIT	O7-C3-C6	2.65	112.58	108.86
3	A	1436	CIT	O4-C5-O3	-2.13	118.00	123.30
3	A	1436	CIT	O6-C6-O5	-2.04	117.33	123.82

There are no chirality outliers.

All (21) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1437	GOL	C1-C2-C3-O3
4	A	1437	GOL	O2-C2-C3-O3
4	C	1436	GOL	C1-C2-C3-O3
4	E	1434	GOL	O1-C1-C2-C3
4	E	1434	GOL	C1-C2-C3-O3
4	E	1434	GOL	O2-C2-C3-O3
4	F	1436	GOL	C1-C2-C3-O3
4	A	1437	GOL	O1-C1-C2-C3
4	B	1436	GOL	C1-C2-C3-O3
4	D	1433	GOL	C1-C2-C3-O3
4	F	1436	GOL	O2-C2-C3-O3
4	B	1436	GOL	O2-C2-C3-O3
4	C	1436	GOL	O2-C2-C3-O3
4	D	1433	GOL	O2-C2-C3-O3
4	E	1434	GOL	O1-C1-C2-O2
4	A	1437	GOL	O1-C1-C2-O2
4	D	1433	GOL	O1-C1-C2-O2
3	A	1436	CIT	C6-C3-C4-C5
4	D	1433	GOL	O1-C1-C2-C3
3	A	1436	CIT	C2-C3-C4-C5
4	B	1436	GOL	O1-C1-C2-O2

There are no ring outliers.

5 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	1435	SO4	2	0
2	F	1433	SO4	4	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1436	CIT	1	0
2	B	1435	SO4	3	0
2	A	1434	SO4	1	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, 95^{th} 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	432/432 (100%)	0.11	13 (3%)	52	55	13, 24, 41, 50	4 (0%)
1	B	432/432 (100%)	0.18	22 (5%)	34	36	14, 24, 41, 51	6 (1%)
1	C	432/432 (100%)	0.23	27 (6%)	27	28	13, 24, 41, 51	8 (1%)
1	D	432/432 (100%)	0.20	20 (4%)	38	39	14, 24, 41, 52	8 (1%)
1	E	432/432 (100%)	0.19	24 (5%)	31	32	13, 24, 42, 51	9 (2%)
1	F	432/432 (100%)	0.28	26 (6%)	29	30	13, 25, 41, 51	10 (2%)
All	All	2592/2592 (100%)	0.20	132 (5%)	34	36	13, 24, 41, 52	45 (1%)

All (132) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	100	GLY	8.0
1	D	100	GLY	7.7
1	B	96	THR	7.6
1	C	96	THR	7.2
1	B	100	GLY	7.1
1	F	100	GLY	7.1
1	F	99	LYS	7.1
1	F	96	THR	6.7
1	E	99	LYS	6.4
1	E	97	HIS	6.4
1	D	99	LYS	6.3
1	F	97	HIS	6.3
1	D	96	THR	6.2
1	C	100	GLY	5.9
1	C	98	ASN	5.6
1	D	97	HIS	5.5
1	E	96	THR	5.3
1	C	99	LYS	5.2
1	D	98	ASN	5.2

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Mol	Chain	Res	Type	RSRZ
1	C	97	HIS	4.9
1	B	99	LYS	4.5
1	F	198	GLY	4.4
1	C	134	HIS	3.9
1	A	352	ASP	3.9
1	E	98	ASN	3.8
1	B	97	HIS	3.8
1	C	419	GLN	3.8
1	C	185	THR	3.7
1	F	98	ASN	3.7
1	A	134	HIS	3.7
1	F	134	HIS	3.7
1	C	418	ASN	3.6
1	B	134	HIS	3.5
1	B	98	ASN	3.5
1	B	419	GLN	3.5
1	C	145	ASN	3.4
1	C	133	THR	3.4
1	F	287	ASN	3.4
1	D	132	GLY	3.3
1	D	352	ASP	3.3
1	A	419	GLN	3.2
1	F	419	GLN	3.2
1	B	208	THR	3.1
1	D	185	THR	2.9
1	F	222	GLU	2.9
1	C	7	HIS	2.8
1	E	134	HIS	2.8
1	B	109	MET	2.8
1	B	375	ASP	2.8
1	D	198	GLY	2.8
1	D	373	VAL	2.8
1	E	352	ASP	2.8
1	D	134	HIS	2.7
1	B	418	ASN	2.7
1	B	185	THR	2.7
1	D	169	ASP	2.6
1	C	132	GLY	2.6
1	F	288	ASN	2.6
1	E	133	THR	2.6
1	F	418	ASN	2.6
1	E	249	ASP	2.6

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Mol	Chain	Res	Type	RSRZ
1	C	221	LYS	2.5
1	A	287	ASN	2.5
1	A	376	GLU	2.5
1	F	350	SER	2.5
1	C	1	LEU	2.5
1	C	208	THR	2.4
1	D	186	THR	2.4
1	F	378	THR	2.4
1	A	223	GLY	2.4
1	E	185	THR	2.4
1	B	304	ARG	2.4
1	A	375	ASP	2.4
1	E	138	ASP	2.4
1	C	131	GLU	2.4
1	D	109	MET	2.3
1	F	352	ASP	2.3
1	B	133	THR	2.3
1	F	375	ASP	2.3
1	E	142	ASN	2.3
1	E	131	GLU	2.3
1	F	376	GLU	2.3
1	B	352	ASP	2.3
1	B	376	GLU	2.3
1	F	289	GLU	2.3
1	D	418	ASN	2.2
1	C	378	THR	2.2
1	D	157	ASP	2.2
1	A	198	GLY	2.2
1	C	421	LYS	2.2
1	A	184	GLU	2.2
1	E	199	GLU	2.2
1	E	235	HIS	2.2
1	D	210	THR	2.2
1	C	159	LYS	2.2
1	E	198	GLY	2.2
1	E	101	GLU	2.2
1	F	138	ASP	2.2
1	F	208	THR	2.2
1	B	287	ASN	2.2
1	F	1	LEU	2.2
1	C	304	ARG	2.2
1	D	375	ASP	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	210	THR	2.1
1	B	397	SER	2.1
1	A	132	GLY	2.1
1	E	132	GLY	2.1
1	E	419	GLN	2.1
1	F	115	ASP	2.1
1	B	372	THR	2.1
1	F	210	THR	2.1
1	A	249	ASP	2.1
1	A	185	THR	2.1
1	B	210	THR	2.1
1	F	133	THR	2.1
1	F	131	GLU	2.1
1	D	142	ASN	2.1
1	C	342	SER	2.1
1	C	186	THR	2.1
1	E	109	MET	2.1
1	E	210	THR	2.1
1	E	222	GLU	2.1
1	E	374	GLU	2.1
1	C	198	GLY	2.1
1	C	220	LEU	2.0
1	A	131	GLU	2.0
1	D	374	GLU	2.0
1	B	159	LYS	2.0
1	B	184	GLU	2.0
1	C	222	GLU	2.0
1	E	353	GLU	2.0
1	F	230	ARG	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, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	SO4	B	1435	5/5	0.69	0.15	54,55,56,58	0
2	SO4	A	1435	5/5	0.71	0.16	57,63,66,67	0
2	SO4	B	1434	5/5	0.73	0.12	75,75,76,76	0
2	SO4	A	1433	5/5	0.77	0.25	32,39,47,49	0
2	SO4	A	1434	5/5	0.81	0.14	60,63,63,64	0
2	SO4	C	1435	5/5	0.82	0.12	51,52,53,53	0
2	SO4	F	1433	5/5	0.82	0.12	52,53,57,57	0
2	SO4	C	1434	5/5	0.84	0.12	63,64,65,66	0
3	CIT	A	1436	13/13	0.86	0.12	49,50,51,54	0
4	GOL	C	1436	6/6	0.86	0.15	18,30,34,41	0
4	GOL	A	1437	6/6	0.90	0.12	22,35,36,39	0
4	GOL	D	1433	6/6	0.92	0.11	26,37,37,42	0
2	SO4	E	1433	5/5	0.93	0.11	36,37,40,42	0
4	GOL	F	1436	6/6	0.93	0.14	23,34,39,40	0
4	GOL	E	1434	6/6	0.94	0.10	19,29,33,34	0
4	GOL	B	1436	6/6	0.94	0.09	30,36,37,37	0
2	SO4	F	1435	5/5	0.95	0.11	30,34,37,37	0
2	SO4	C	1433	5/5	0.96	0.08	29,31,32,35	0
2	SO4	F	1434	5/5	0.97	0.12	31,32,33,34	0
5	NA	A	1438	1/1	0.97	0.10	46,46,46,46	0
2	SO4	B	1437	5/5	0.98	0.06	29,34,34,36	0
2	SO4	B	1433	5/5	0.99	0.05	24,25,25,27	0

6.5 Other polymers (i)

There are no such residues in this entry.