



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 19, 2024 – 06:39 PM EDT

PDB ID : 9CQH
Title : CRYSTAL STRUCTURE OF APO CLEAVED N-TERMINAL HIS-TAG
GAGA-DOG HSP47(36-418) IN A C 2 CRYSTAL FORM
Authors : Sheriff, S.
Deposited on : 2024-07-19
Resolution : 2.01 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 : 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) : 2.39

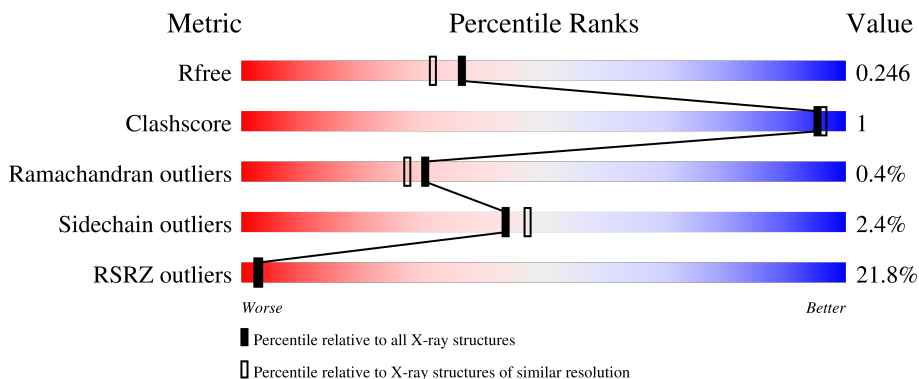
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.01 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	9409 (2.00-2.00)
Clashscore	180529	10737 (2.00-2.00)
Ramachandran outliers	177936	10628 (2.00-2.00)
Sidechain outliers	177891	10627 (2.00-2.00)
RSRZ outliers	164620	9409 (2.00-2.00)

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	387	
1	B	387	
1	C	387	
1	D	387	
1	E	387	

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Mol	Chain	Length	Quality of chain
1	F	387	
1	G	387	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 41762 atoms, of which 20444 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 Serpin H1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	383	5802	1864	2879	506	540	13	2879	0	0
1	B	382	5911	1885	2950	517	546	13	2950	1	0
1	C	383	5902	1885	2943	515	546	13	2943	0	0
1	D	383	5897	1882	2935	516	551	13	2935	0	0
1	E	383	5910	1887	2945	519	546	13	2945	1	0
1	F	383	5806	1864	2879	506	544	13	2879	0	0
1	G	383	5843	1876	2897	510	547	13	2897	0	0

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	32	GLY	-	expression tag	UNP C7C419
A	33	ALA	-	expression tag	UNP C7C419
A	34	GLY	-	expression tag	UNP C7C419
A	35	ALA	-	expression tag	UNP C7C419
B	32	GLY	-	expression tag	UNP C7C419
B	33	ALA	-	expression tag	UNP C7C419
B	34	GLY	-	expression tag	UNP C7C419
B	35	ALA	-	expression tag	UNP C7C419
C	32	GLY	-	expression tag	UNP C7C419
C	33	ALA	-	expression tag	UNP C7C419
C	34	GLY	-	expression tag	UNP C7C419
C	35	ALA	-	expression tag	UNP C7C419
D	32	GLY	-	expression tag	UNP C7C419
D	33	ALA	-	expression tag	UNP C7C419
D	34	GLY	-	expression tag	UNP C7C419

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Chain	Residue	Modelled	Actual	Comment	Reference
D	35	ALA	-	expression tag	UNP C7C419
E	32	GLY	-	expression tag	UNP C7C419
E	33	ALA	-	expression tag	UNP C7C419
E	34	GLY	-	expression tag	UNP C7C419
E	35	ALA	-	expression tag	UNP C7C419
F	32	GLY	-	expression tag	UNP C7C419
F	33	ALA	-	expression tag	UNP C7C419
F	34	GLY	-	expression tag	UNP C7C419
F	35	ALA	-	expression tag	UNP C7C419
G	32	GLY	-	expression tag	UNP C7C419
G	33	ALA	-	expression tag	UNP C7C419
G	34	GLY	-	expression tag	UNP C7C419
G	35	ALA	-	expression tag	UNP C7C419

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



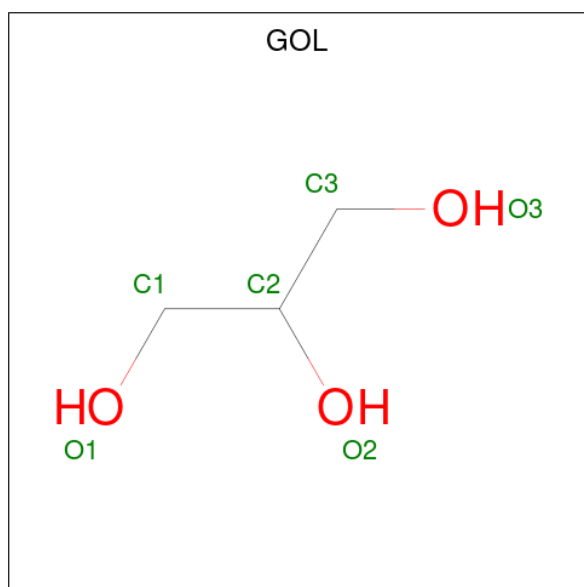
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		

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

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	B	1	Total	C	H	O	8	0
			14	3	8	3		
3	D	1	Total	C	H	O	8	0
			14	3	8	3		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	95	Total	O	0	0
			95	95		
4	B	88	Total	O	0	0
			88	88		
4	C	91	Total	O	0	0
			91	91		
4	D	86	Total	O	0	0
			86	86		

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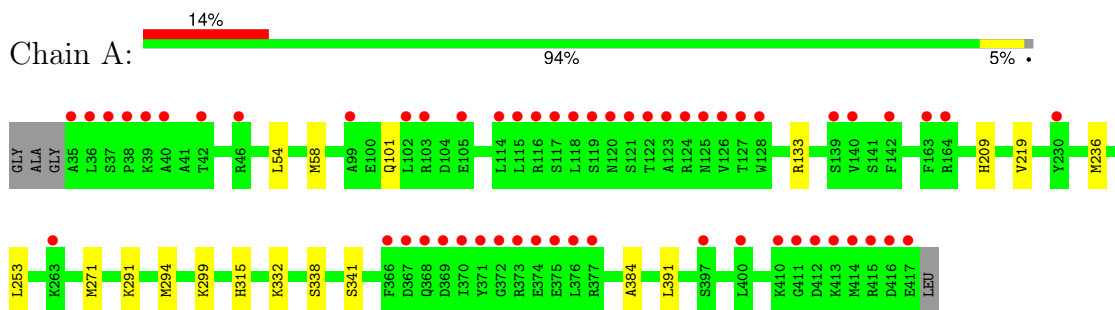
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	E	97	Total O 97 97	0	0
4	F	85	Total O 85 85	0	0
4	G	81	Total O 81 81	0	0

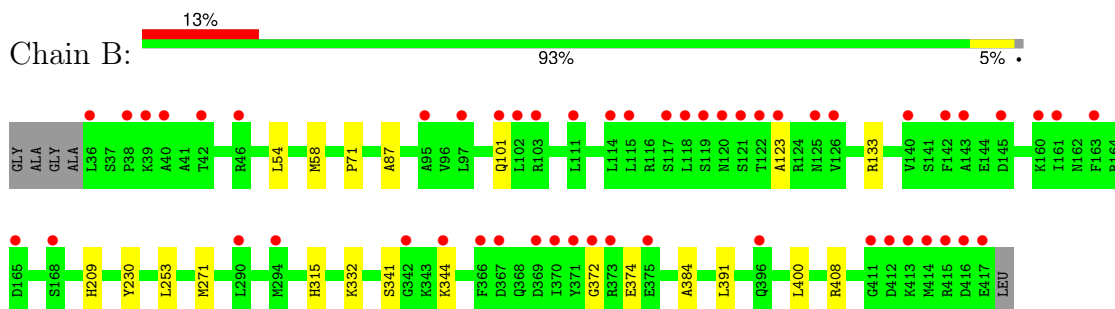
3 Residue-property plots [i](#)

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.

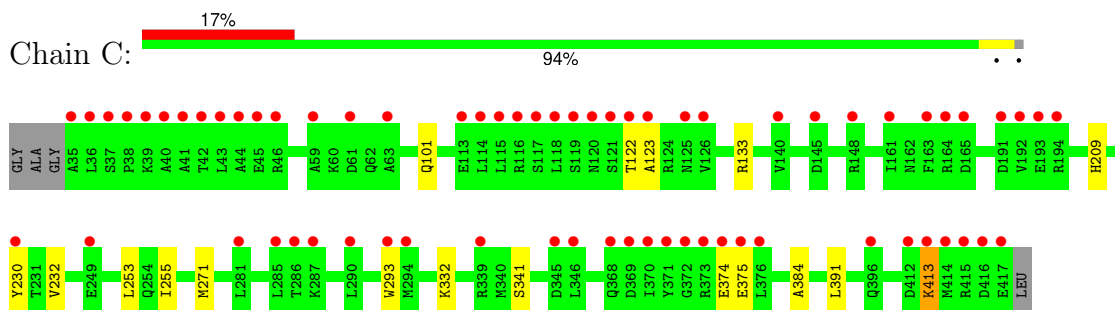
- Molecule 1: Serpin H1



- Molecule 1: Serpin H1

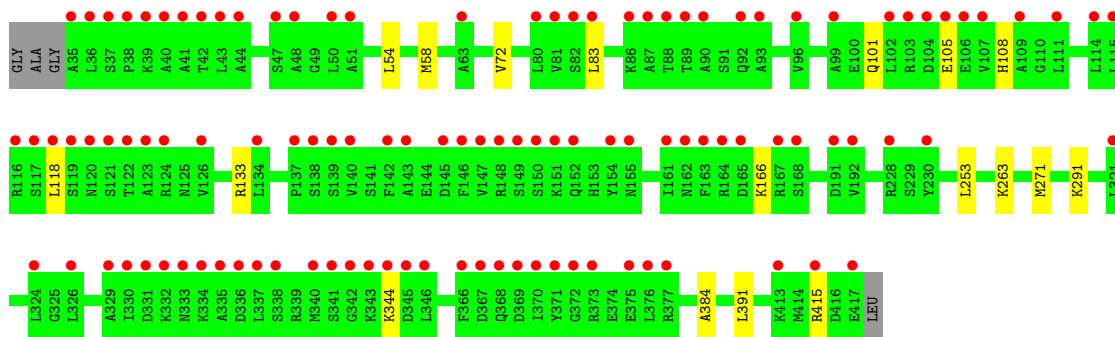


- Molecule 1: Serpin H1

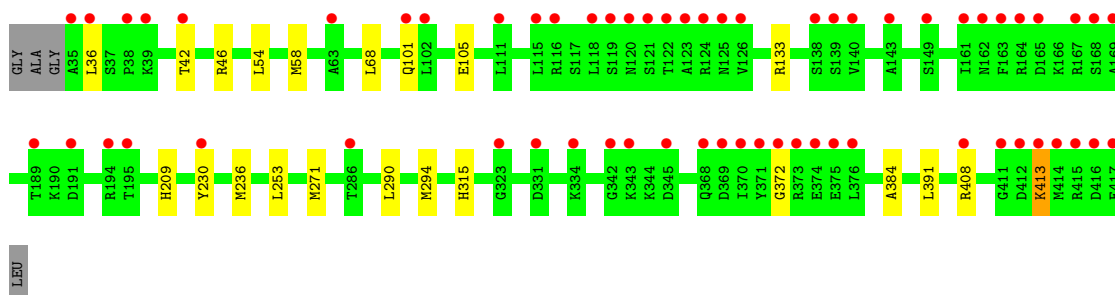
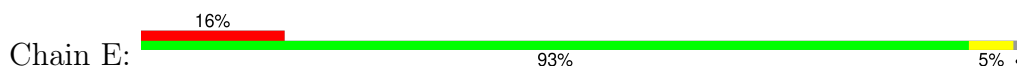


- Molecule 1: Serpin H1

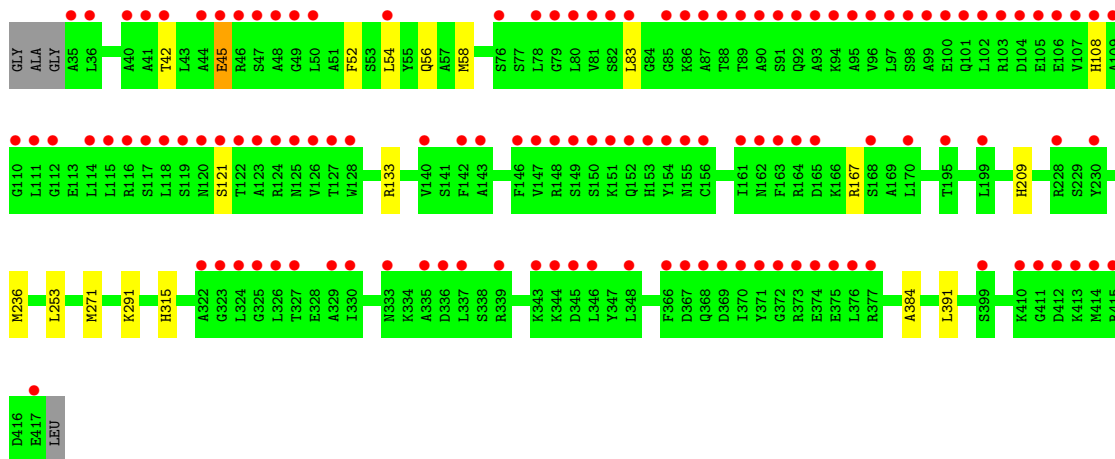




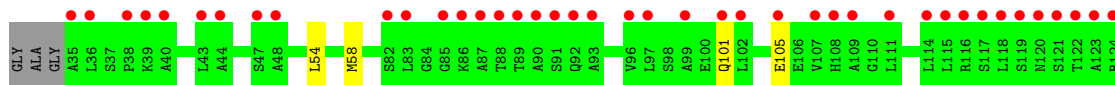
- Molecule 1: Serpin H1

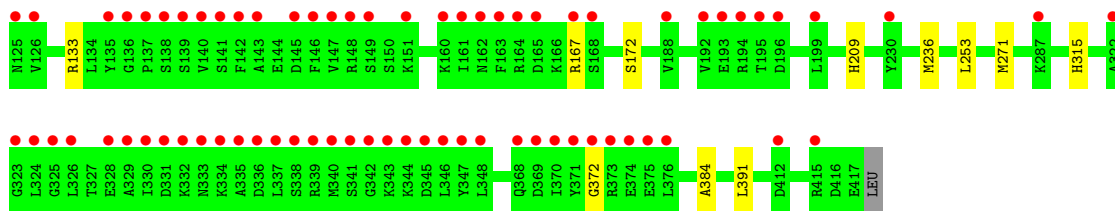


- Molecule 1: Serpin H1



- Molecule 1: Serpin H1





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	180.04Å 115.49Å 187.53Å 90.00° 106.80° 90.00°	Depositor
Resolution (Å)	28.87 – 2.01 28.87 – 2.01	Depositor EDS
% Data completeness (in resolution range)	61.5 (28.87-2.01) 61.5 (28.87-2.01)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.60 (at 2.01Å)	Xtrriage
Refinement program	BUSTER 2.11.8	Depositor
R, R_{free}	0.234 , 0.254 0.226 , 0.246	Depositor DCC
R_{free} test set	7538 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	39.5	Xtrriage
Anisotropy	0.043	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 39.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	41762	wwPDB-VP
Average B, all atoms (Å ²)	49.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.00% 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: SO4, 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	0.42	0/2984	0.60	0/4037
1	B	0.42	0/3025	0.61	0/4087
1	C	0.42	0/3020	0.61	0/4080
1	D	0.42	0/3023	0.62	0/4087
1	E	0.43	0/3029	0.60	0/4094
1	F	0.42	0/2988	0.62	0/4043
1	G	0.41	0/3007	0.60	0/4068
All	All	0.42	0/21076	0.61	0/28496

There are no bond length outliers.

There are no bond angle outliers.

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	2923	2879	2879	9	0
1	B	2961	2950	2950	8	0
1	C	2959	2943	2943	5	0
1	D	2962	2935	2935	5	0
1	E	2965	2945	2945	8	0
1	F	2927	2879	2879	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	G	2946	2897	2897	4	0
2	A	20	0	0	0	0
2	B	5	0	0	0	0
2	C	5	0	0	0	0
2	E	10	0	0	1	0
3	B	6	8	8	0	0
3	D	6	8	8	0	0
4	A	95	0	0	3	0
4	B	88	0	0	1	0
4	C	91	0	0	1	0
4	D	86	0	0	0	0
4	E	97	0	0	1	0
4	F	85	0	0	2	0
4	G	81	0	0	1	0
All	All	21318	20444	20444	46	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 1.

All (46) 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:E:230:TYR:OH	1:E:413:LYS:HB3	1.75	0.86
1:D:263:LYS:NZ	2:E:501:SO4:O4	2.22	0.72
1:C:230:TYR:OH	1:C:413:LYS:HB3	1.95	0.66
1:A:291:LYS:NZ	4:A:601:HOH:O	2.30	0.64
1:B:209:HIS:HD2	4:B:684:HOH:O	1.83	0.61
1:A:54:LEU:O	1:A:58:MET:HG3	2.04	0.57
1:G:54:LEU:O	1:G:58:MET:HG3	2.05	0.57
1:D:54:LEU:O	1:D:58:MET:HG3	2.05	0.57
1:D:72:VAL:HG21	1:D:118:LEU:HD21	1.85	0.56
1:E:42:THR:HG22	1:E:46:ARG:HD2	1.86	0.56
1:B:54:LEU:O	1:B:58:MET:HG3	2.06	0.55
1:E:290:LEU:O	1:E:294:MET:HG2	2.07	0.55
1:A:209:HIS:HD2	4:A:691:HOH:O	1.90	0.54
1:F:54:LEU:O	1:F:58:MET:HG3	2.07	0.54
1:F:42:THR:O	1:F:45:GLU:HG3	2.08	0.53
1:G:58:MET:HE1	1:G:315:HIS:HB3	1.90	0.52
1:A:58:MET:HE1	1:A:315:HIS:HB3	1.92	0.51
1:F:58:MET:HE1	1:F:315:HIS:HB3	1.94	0.49
1:F:209:HIS:HD2	4:F:580:HOH:O	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:209:HIS:HD2	4:C:683:HOH:O	1.96	0.48
1:E:54:LEU:O	1:E:58:MET:HG3	2.13	0.48
1:B:58:MET:HE1	1:B:315:HIS:HB3	1.94	0.48
1:E:58:MET:HE1	1:E:315:HIS:HB3	1.95	0.48
1:E:209:HIS:HD2	4:E:692:HOH:O	1.97	0.47
1:F:291:LYS:NZ	4:F:502:HOH:O	2.47	0.47
1:C:255:ILE:HD13	1:C:293:TRP:HB3	1.96	0.47
1:A:338:SER:HA	1:A:341:SER:O	2.14	0.46
1:B:230:TYR:HE2	1:B:408[B]:ARG:NH1	2.13	0.46
1:C:232:VAL:HG12	1:C:413:LYS:HA	1.98	0.45
1:G:209:HIS:HD2	4:G:575:HOH:O	1.99	0.44
1:B:230:TYR:CE2	1:B:408[B]:ARG:NH1	2.85	0.44
1:D:271:MET:SD	1:D:384:ALA:HA	2.57	0.44
1:F:271:MET:SD	1:F:384:ALA:HA	2.58	0.44
1:B:271:MET:SD	1:B:384:ALA:HA	2.57	0.43
1:F:52:PHE:O	1:F:56:GLN:HG2	2.18	0.43
1:G:271:MET:SD	1:G:384:ALA:HA	2.58	0.43
1:E:271:MET:SD	1:E:384:ALA:HA	2.59	0.43
1:F:83:LEU:HD13	1:F:108:HIS:CD2	2.54	0.43
1:C:271:MET:SD	1:C:384:ALA:HA	2.59	0.42
1:B:71:PRO:HG2	1:B:400:LEU:O	2.19	0.42
1:A:271:MET:SD	1:A:384:ALA:HA	2.59	0.42
1:A:299:LYS:NZ	4:A:605:HOH:O	2.52	0.41
1:A:294:MET:O	1:B:87:ALA:HA	2.21	0.41
1:A:219:VAL:HA	1:A:236:MET:O	2.20	0.41
1:D:83:LEU:HD13	1:D:108:HIS:CD2	2.56	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	381/387 (98%)	368 (97%)	13 (3%)	0	100	100
1	B	381/387 (98%)	366 (96%)	12 (3%)	3 (1%)	16	12
1	C	381/387 (98%)	364 (96%)	13 (3%)	4 (1%)	13	8
1	D	381/387 (98%)	370 (97%)	11 (3%)	0	100	100
1	E	382/387 (99%)	366 (96%)	14 (4%)	2 (0%)	25	21
1	F	381/387 (98%)	362 (95%)	19 (5%)	0	100	100
1	G	381/387 (98%)	364 (96%)	16 (4%)	1 (0%)	37	35
All	All	2668/2709 (98%)	2560 (96%)	98 (4%)	10 (0%)	30	27

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	375	GLU
1	B	123	ALA
1	B	374	GLU
1	E	36	LEU
1	G	372	GLY
1	C	374	GLU
1	C	123	ALA
1	C	122	THR
1	B	372	GLY
1	E	372	GLY

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	302/328 (92%)	297 (98%)	5 (2%)	56	61
1	B	312/328 (95%)	305 (98%)	7 (2%)	47	51
1	C	310/328 (94%)	303 (98%)	7 (2%)	45	49
1	D	312/328 (95%)	303 (97%)	9 (3%)	37	39
1	E	310/328 (94%)	302 (97%)	8 (3%)	41	44

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	F	304/328 (93%)	297 (98%)	7 (2%)	45	49
1	G	305/328 (93%)	297 (97%)	8 (3%)	41	44
All	All	2155/2296 (94%)	2104 (98%)	51 (2%)	44	47

All (51) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	101	GLN
1	A	133	ARG
1	A	253	LEU
1	A	332	LYS
1	A	391	LEU
1	B	101	GLN
1	B	133	ARG
1	B	253	LEU
1	B	332	LYS
1	B	341	SER
1	B	344	LYS
1	B	391	LEU
1	C	101	GLN
1	C	133	ARG
1	C	253	LEU
1	C	332	LYS
1	C	341	SER
1	C	391	LEU
1	C	413	LYS
1	D	101	GLN
1	D	105	GLU
1	D	133	ARG
1	D	166	LYS
1	D	253	LEU
1	D	291	LYS
1	D	344	LYS
1	D	391	LEU
1	D	415	ARG
1	E	68	LEU
1	E	101	GLN
1	E	105	GLU
1	E	133	ARG
1	E	236	MET
1	E	253	LEU

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Mol	Chain	Res	Type
1	E	391	LEU
1	E	413	LYS
1	F	45	GLU
1	F	121	SER
1	F	133	ARG
1	F	167	ARG
1	F	236	MET
1	F	253	LEU
1	F	391	LEU
1	G	101	GLN
1	G	105	GLU
1	G	133	ARG
1	G	167	ARG
1	G	172	SER
1	G	236	MET
1	G	253	LEU
1	G	391	LEU

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	209	HIS
1	F	108	HIS
1	F	209	HIS
1	G	396	GLN

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

10 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	SO4	A	502	-	4,4,4	0.29	0	6,6,6	0.43	0
2	SO4	B	501	-	4,4,4	0.28	0	6,6,6	0.26	0
2	SO4	A	501	-	4,4,4	0.33	0	6,6,6	0.30	0
3	GOL	D	501	-	5,5,5	0.12	0	5,5,5	0.22	0
2	SO4	A	504	-	4,4,4	0.30	0	6,6,6	0.14	0
3	GOL	B	502	-	5,5,5	0.09	0	5,5,5	0.17	0
2	SO4	C	501	-	4,4,4	0.28	0	6,6,6	0.82	0
2	SO4	E	502	-	4,4,4	0.30	0	6,6,6	0.23	0
2	SO4	A	503	-	4,4,4	0.30	0	6,6,6	0.16	0
2	SO4	E	501	-	4,4,4	0.29	0	6,6,6	1.41	1 (16%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GOL	D	501	-	-	0/4/4/4	-
3	GOL	B	502	-	-	0/4/4/4	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	501	SO4	O4-S-O2	-3.14	93.16	109.56

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	501	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	383/387 (98%)	0.71	56 (14%) 7 6	10, 21, 47, 66	0
1	B	382/387 (98%)	0.65	52 (13%) 8 7	11, 22, 46, 63	1 (0%)
1	C	383/387 (98%)	0.80	67 (17%) 5 4	11, 22, 46, 60	0
1	D	383/387 (98%)	1.15	110 (28%) 1 1	11, 26, 51, 66	0
1	E	383/387 (98%)	0.73	62 (16%) 5 5	11, 22, 45, 57	1 (0%)
1	F	383/387 (98%)	1.44	126 (32%) 1 1	11, 26, 57, 74	0
1	G	383/387 (98%)	1.21	112 (29%) 1 1	11, 25, 55, 70	0
All	All	2680/2709 (98%)	0.96	585 (21%) 3 2	10, 23, 51, 74	2 (0%)

All (585) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	123	ALA	9.2
1	F	122	THR	8.1
1	F	123	ALA	7.8
1	E	120	ASN	7.0
1	C	371	TYR	6.7
1	A	122	THR	6.5
1	F	126	VAL	6.2
1	G	122	THR	6.1
1	B	120	ASN	6.1
1	G	346	LEU	6.1
1	G	35	ALA	6.1
1	F	370	ILE	6.0
1	G	118	LEU	6.0
1	G	123	ALA	6.0
1	F	118	LEU	6.0
1	G	371	TYR	5.9
1	A	371	TYR	5.8

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Mol	Chain	Res	Type	RSRZ
1	D	375	GLU	5.8
1	C	416	ASP	5.8
1	A	125	ASN	5.8
1	A	120	ASN	5.8
1	F	371	TYR	5.8
1	F	375	GLU	5.7
1	F	48	ALA	5.7
1	F	97	LEU	5.7
1	D	371	TYR	5.7
1	G	369	ASP	5.7
1	A	126	VAL	5.6
1	D	346	LEU	5.5
1	G	344	LYS	5.5
1	F	101	GLN	5.4
1	F	100	GLU	5.4
1	D	118	LEU	5.4
1	G	120	ASN	5.4
1	G	163	PHE	5.3
1	A	417	GLU	5.3
1	C	163	PHE	5.3
1	B	123	ALA	5.3
1	F	120	ASN	5.2
1	C	36	LEU	5.2
1	F	369	ASP	5.2
1	G	337	LEU	5.2
1	E	121	SER	5.2
1	F	107	VAL	5.1
1	C	415	ARG	5.1
1	B	371	TYR	5.1
1	C	121	SER	5.1
1	C	122	THR	5.1
1	D	370	ILE	5.1
1	F	102	LEU	5.1
1	F	147	VAL	5.1
1	F	99	ALA	5.0
1	C	370	ILE	5.0
1	F	111	LEU	5.0
1	G	143	ALA	5.0
1	F	161	ILE	4.8
1	D	345	ASP	4.8
1	A	368	GLN	4.8
1	G	90	ALA	4.8

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Mol	Chain	Res	Type	RSRZ
1	F	368	GLN	4.8
1	G	329	ALA	4.8
1	E	371	TYR	4.8
1	A	118	LEU	4.7
1	F	95	ALA	4.7
1	E	413	LYS	4.7
1	F	324	LEU	4.7
1	F	326	LEU	4.7
1	G	375	GLU	4.6
1	F	108	HIS	4.6
1	F	96	VAL	4.5
1	F	93	ALA	4.5
1	F	114	LEU	4.5
1	C	123	ALA	4.5
1	B	369	ASP	4.5
1	D	368	GLN	4.5
1	F	94	LYS	4.4
1	C	120	ASN	4.4
1	F	153	HIS	4.4
1	B	122	THR	4.4
1	F	124	ARG	4.4
1	F	109	ALA	4.4
1	G	88	THR	4.3
1	A	121	SER	4.3
1	F	121	SER	4.3
1	G	345	ASP	4.3
1	G	93	ALA	4.3
1	G	343	LYS	4.3
1	B	372	GLY	4.3
1	B	121	SER	4.3
1	B	126	VAL	4.3
1	B	161	ILE	4.3
1	D	120	ASN	4.3
1	D	107	VAL	4.2
1	G	115	LEU	4.2
1	A	370	ILE	4.2
1	D	88	THR	4.2
1	E	369	ASP	4.2
1	F	106	GLU	4.2
1	F	143	ALA	4.2
1	A	366	PHE	4.2
1	G	109	ALA	4.2

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Mol	Chain	Res	Type	RSRZ
1	A	124	ARG	4.2
1	F	374	GLU	4.2
1	F	372	GLY	4.2
1	C	413	LYS	4.1
1	D	147	VAL	4.1
1	F	87	ALA	4.1
1	F	142	PHE	4.1
1	F	90	ALA	4.1
1	G	161	ILE	4.1
1	F	128	TRP	4.1
1	G	124	ARG	4.1
1	G	323	GLY	4.1
1	D	376	LEU	4.1
1	E	161	ILE	4.0
1	E	370	ILE	4.0
1	F	163	PHE	4.0
1	C	118	LEU	4.0
1	D	40	ALA	4.0
1	B	370	ILE	4.0
1	G	126	VAL	4.0
1	E	125	ASN	3.9
1	G	370	ILE	3.9
1	E	122	THR	3.9
1	B	118	LEU	3.9
1	D	87	ALA	3.9
1	A	411	GLY	3.9
1	A	102	LEU	3.9
1	F	337	LEU	3.9
1	F	322	ALA	3.9
1	G	192	VAL	3.9
1	F	89	THR	3.9
1	G	121	SER	3.8
1	C	375	GLU	3.8
1	F	327	THR	3.8
1	D	344	LYS	3.8
1	A	416	ASP	3.8
1	B	125	ASN	3.8
1	E	415	ARG	3.8
1	F	104	ASP	3.8
1	D	99	ALA	3.8
1	F	329	ALA	3.8
1	A	415	ARG	3.7

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Mol	Chain	Res	Type	RSRZ
1	F	151	LYS	3.7
1	C	38	PRO	3.7
1	F	367	ASP	3.7
1	E	373	ARG	3.7
1	F	155	ASN	3.7
1	E	123	ALA	3.7
1	G	146	PHE	3.7
1	G	147	VAL	3.7
1	E	36	LEU	3.7
1	C	42	THR	3.7
1	E	63	ALA	3.7
1	F	41	ALA	3.7
1	G	142	PHE	3.7
1	D	90	ALA	3.7
1	C	125	ASN	3.6
1	D	230	TYR	3.6
1	F	335	ALA	3.6
1	D	140	VAL	3.6
1	F	339	ARG	3.6
1	G	111	LEU	3.6
1	G	114	LEU	3.6
1	A	369	ASP	3.6
1	G	340	MET	3.6
1	F	47	SER	3.6
1	D	161	ILE	3.6
1	A	372	GLY	3.6
1	E	372	GLY	3.6
1	D	115	LEU	3.6
1	F	78	LEU	3.6
1	D	369	ASP	3.6
1	G	165	ASP	3.6
1	D	122	THR	3.6
1	A	163	PHE	3.6
1	F	86	LYS	3.6
1	F	81	VAL	3.6
1	F	152	GLN	3.5
1	E	230	TYR	3.5
1	C	37	SER	3.5
1	G	117	SER	3.5
1	C	115	LEU	3.5
1	D	80	LEU	3.5
1	F	162	ASN	3.5

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Mol	Chain	Res	Type	RSRZ
1	G	338	SER	3.5
1	F	49	GLY	3.5
1	G	342	GLY	3.5
1	D	35	ALA	3.5
1	G	40	ALA	3.5
1	F	146	PHE	3.5
1	C	369	ASP	3.5
1	F	164	ARG	3.5
1	G	162	ASN	3.5
1	G	335	ALA	3.4
1	A	140	VAL	3.4
1	C	39	LYS	3.4
1	E	334	LYS	3.4
1	D	102	LEU	3.4
1	G	195	THR	3.4
1	G	324	LEU	3.4
1	C	35	ALA	3.4
1	C	126	VAL	3.4
1	C	114	LEU	3.4
1	C	117	SER	3.4
1	E	139	SER	3.4
1	A	375	GLU	3.4
1	E	164	ARG	3.4
1	F	154	TYR	3.4
1	F	377	ARG	3.4
1	D	123	ALA	3.3
1	F	417	GLU	3.3
1	E	342	GLY	3.3
1	F	85	GLY	3.3
1	D	163	PHE	3.3
1	E	163	PHE	3.3
1	G	141	SER	3.3
1	C	40	ALA	3.3
1	G	105	GLU	3.3
1	A	367	ASP	3.3
1	G	372	GLY	3.3
1	B	163	PHE	3.3
1	D	43	LEU	3.3
1	F	83	LEU	3.3
1	D	333	ASN	3.3
1	C	192	VAL	3.3
1	C	417	GLU	3.3

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Mol	Chain	Res	Type	RSRZ
1	D	150	SER	3.3
1	F	149	SER	3.3
1	G	36	LEU	3.3
1	G	326	LEU	3.3
1	B	373	ARG	3.2
1	D	417	GLU	3.2
1	F	415	ARG	3.2
1	F	88	THR	3.2
1	A	35	ALA	3.2
1	F	344	LYS	3.2
1	F	414	MET	3.2
1	B	38	PRO	3.2
1	E	118	LEU	3.2
1	G	336	ASP	3.2
1	G	412	ASP	3.2
1	F	411	GLY	3.2
1	G	89	THR	3.2
1	B	119	SER	3.2
1	G	230	TYR	3.2
1	B	40	ALA	3.2
1	D	41	ALA	3.2
1	D	162	ASN	3.2
1	B	140	VAL	3.1
1	F	119	SER	3.1
1	B	36	LEU	3.1
1	A	413	LYS	3.1
1	D	343	LYS	3.1
1	C	396	GLN	3.1
1	E	101	GLN	3.1
1	D	103	ARG	3.1
1	G	194	ARG	3.1
1	D	143	ALA	3.1
1	G	125	ASN	3.1
1	D	81	VAL	3.1
1	D	86	LYS	3.1
1	A	414	MET	3.1
1	C	294	MET	3.1
1	G	38	PRO	3.1
1	D	50	LEU	3.1
1	D	93	ALA	3.1
1	F	330	ILE	3.1
1	G	330	ILE	3.1

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Mol	Chain	Res	Type	RSRZ
1	D	373	ARG	3.1
1	C	140	VAL	3.1
1	D	321	LEU	3.0
1	F	115	LEU	3.0
1	F	103	ARG	3.0
1	E	374	GLU	3.0
1	E	417	GLU	3.0
1	G	334	LYS	3.0
1	F	127	THR	3.0
1	G	107	VAL	3.0
1	F	45	GLU	3.0
1	E	168	SER	3.0
1	G	119	SER	3.0
1	G	139	SER	3.0
1	F	50	LEU	3.0
1	D	44	ALA	3.0
1	E	368	GLN	3.0
1	F	366	PHE	3.0
1	D	167	ARG	3.0
1	G	328	GLU	3.0
1	D	415	ARG	2.9
1	G	140	VAL	2.9
1	G	348	LEU	2.9
1	F	413	LYS	2.9
1	B	145	ASP	2.9
1	D	117	SER	2.9
1	F	323	GLY	2.9
1	B	111	LEU	2.9
1	C	414	MET	2.9
1	F	35	ALA	2.9
1	F	40	ALA	2.9
1	F	98	SER	2.9
1	E	42	THR	2.9
1	F	325	GLY	2.9
1	B	375	GLU	2.9
1	C	145	ASP	2.9
1	D	145	ASP	2.9
1	D	165	ASP	2.9
1	C	119	SER	2.9
1	F	150	SER	2.9
1	F	79	GLY	2.9
1	F	343	LYS	2.9

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Mol	Chain	Res	Type	RSRZ
1	C	43	LEU	2.8
1	C	290	LEU	2.8
1	A	412	ASP	2.8
1	B	412	ASP	2.8
1	D	119	SER	2.8
1	G	116	ARG	2.8
1	B	115	LEU	2.8
1	D	104	ASP	2.8
1	E	331	ASP	2.8
1	G	83	LEU	2.8
1	D	126	VAL	2.8
1	F	92	GLN	2.8
1	C	116	ARG	2.8
1	D	47	SER	2.8
1	E	124	ARG	2.8
1	F	82	SER	2.8
1	A	127	THR	2.8
1	A	115	LEU	2.8
1	D	36	LEU	2.8
1	G	92	GLN	2.8
1	G	97	LEU	2.8
1	G	368	GLN	2.8
1	E	140	VAL	2.8
1	A	139	SER	2.8
1	D	338	SER	2.8
1	D	330	ILE	2.8
1	A	400	LEU	2.8
1	F	140	VAL	2.8
1	A	119	SER	2.8
1	F	195	THR	2.7
1	F	156	CYS	2.7
1	A	46	ARG	2.7
1	B	103	ARG	2.7
1	C	230	TYR	2.7
1	B	102	LEU	2.7
1	D	114	LEU	2.7
1	E	39	LYS	2.7
1	D	48	ALA	2.7
1	B	411	GLY	2.7
1	E	412	ASP	2.7
1	F	412	ASP	2.7
1	D	105	GLU	2.7

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Mol	Chain	Res	Type	RSRZ
1	G	347	TYR	2.7
1	A	37	SER	2.7
1	A	142	PHE	2.7
1	A	116	ARG	2.7
1	B	417	GLU	2.7
1	B	117	SER	2.7
1	E	138	SER	2.7
1	F	44	ALA	2.7
1	D	377	ARG	2.7
1	C	412	ASP	2.7
1	F	105	GLU	2.7
1	C	287	LYS	2.6
1	G	86	LYS	2.6
1	A	36	LEU	2.6
1	C	285	LEU	2.6
1	D	83	LEU	2.6
1	G	91	SER	2.6
1	A	103	ARG	2.6
1	C	373	ARG	2.6
1	D	96	VAL	2.6
1	F	116	ARG	2.6
1	G	87	ALA	2.6
1	B	142	PHE	2.6
1	D	324	LEU	2.6
1	E	115	LEU	2.6
1	F	36	LEU	2.6
1	F	54	LEU	2.6
1	D	148	ARG	2.6
1	D	164	ARG	2.6
1	F	110	GLY	2.6
1	E	414	MET	2.6
1	C	376	LEU	2.6
1	D	111	LEU	2.6
1	C	372	GLY	2.6
1	C	374	GLU	2.6
1	D	332	LYS	2.6
1	D	336	ASP	2.6
1	A	38	PRO	2.6
1	C	161	ILE	2.6
1	D	341	SER	2.6
1	G	82	SER	2.6
1	E	411	GLY	2.5

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Mol	Chain	Res	Type	RSRZ
1	D	39	LYS	2.5
1	E	162	ASN	2.5
1	G	373	ARG	2.5
1	F	80	LEU	2.5
1	F	112	GLY	2.5
1	G	196	ASP	2.5
1	G	339	ARG	2.5
1	F	76	SER	2.5
1	F	117	SER	2.5
1	D	334	LYS	2.5
1	G	39	LYS	2.5
1	G	102	LEU	2.5
1	G	376	LEU	2.5
1	C	46	ARG	2.5
1	A	42	THR	2.5
1	C	286	THR	2.5
1	D	42	THR	2.5
1	F	42	THR	2.5
1	A	128	TRP	2.5
1	D	109	ALA	2.5
1	G	99	ALA	2.5
1	G	322	ALA	2.5
1	E	286	THR	2.5
1	G	137	PRO	2.4
1	D	146	PHE	2.4
1	G	108	HIS	2.4
1	A	397	SER	2.4
1	D	149	SER	2.4
1	A	114	LEU	2.4
1	B	97	LEU	2.4
1	D	337	LEU	2.4
1	F	148	ARG	2.4
1	A	40	ALA	2.4
1	C	41	ALA	2.4
1	E	375	GLU	2.4
1	G	96	VAL	2.4
1	A	117	SER	2.4
1	C	148	ARG	2.4
1	D	124	ARG	2.4
1	E	167	ARG	2.4
1	G	415	ARG	2.4
1	D	191	ASP	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	396	GLN	2.4
1	D	326	LEU	2.4
1	D	335	ALA	2.4
1	G	48	ALA	2.4
1	A	410	LYS	2.4
1	G	138	SER	2.4
1	D	154	TYR	2.4
1	D	116	ARG	2.4
1	G	85	GLY	2.4
1	E	165	ASP	2.4
1	A	376	LEU	2.4
1	B	114	LEU	2.4
1	E	111	LEU	2.4
1	F	376	LEU	2.4
1	D	155	ASN	2.4
1	B	415	ARG	2.4
1	E	408[A]	ARG	2.4
1	B	366	PHE	2.4
1	D	142	PHE	2.4
1	C	249	GLU	2.3
1	B	160	LYS	2.3
1	C	164	ARG	2.3
1	D	37	SER	2.3
1	D	38	PRO	2.3
1	D	138	SER	2.3
1	D	192	VAL	2.3
1	E	116	ARG	2.3
1	E	194	ARG	2.3
1	G	148	ARG	2.3
1	D	82	SER	2.3
1	E	149	SER	2.3
1	F	91	SER	2.3
1	G	168	SER	2.3
1	G	341	SER	2.3
1	C	345	ASP	2.3
1	D	331	ASP	2.3
1	G	325	GLY	2.3
1	C	45	GLU	2.3
1	F	230	TYR	2.3
1	G	374	GLU	2.3
1	E	376	LEU	2.3
1	F	170	LEU	2.3

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Mol	Chain	Res	Type	RSRZ
1	F	348	LEU	2.3
1	G	333	ASN	2.3
1	E	35	ALA	2.3
1	B	46	ARG	2.3
1	D	340	MET	2.3
1	E	119	SER	2.3
1	B	367	ASP	2.3
1	A	105	GLU	2.3
1	F	125	ASN	2.3
1	G	160	LYS	2.3
1	G	164	ARG	2.3
1	G	101	GLN	2.3
1	G	188	VAL	2.3
1	C	61	ASP	2.3
1	C	191	ASP	2.3
1	G	193	GLU	2.3
1	G	167	ARG	2.3
1	D	63	ALA	2.3
1	D	89	THR	2.3
1	E	169	ALA	2.3
1	E	195	THR	2.3
1	C	113	GLU	2.2
1	D	372	GLY	2.2
1	F	46	ARG	2.2
1	A	230	TYR	2.2
1	G	43	LEU	2.2
1	B	42	THR	2.2
1	A	99	ALA	2.2
1	A	39	LYS	2.2
1	A	263	LYS	2.2
1	D	342	GLY	2.2
1	A	164	ARG	2.2
1	C	193	GLU	2.2
1	B	168	SER	2.2
1	D	51	ALA	2.2
1	F	165	ASP	2.2
1	G	331	ASP	2.2
1	B	413	LYS	2.2
1	E	323	GLY	2.2
1	A	373	ARG	2.2
1	B	414	MET	2.2
1	C	346	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	95	ALA	2.2
1	G	145	ASP	2.2
1	B	101	GLN	2.2
1	D	92	GLN	2.2
1	D	106	GLU	2.1
1	C	281	LEU	2.1
1	F	199	LEU	2.1
1	G	287	LYS	2.1
1	C	63	ALA	2.1
1	E	191	ASP	2.1
1	G	44	ALA	2.1
1	B	342	GLY	2.1
1	F	333	ASN	2.1
1	B	294	MET	2.1
1	D	134	LEU	2.1
1	E	102	LEU	2.1
1	F	346	LEU	2.1
1	F	410	LYS	2.1
1	G	199	LEU	2.1
1	G	332	LYS	2.1
1	B	416	ASP	2.1
1	D	121	SER	2.1
1	D	228	ARG	2.1
1	D	367	ASP	2.1
1	E	345	ASP	2.1
1	F	336	ASP	2.1
1	C	44	ALA	2.1
1	C	293	TRP	2.1
1	G	136	GLY	2.1
1	A	374	GLU	2.1
1	G	151	LYS	2.1
1	C	194	ARG	2.1
1	F	228	ARG	2.1
1	C	165	ASP	2.1
1	D	139	SER	2.1
1	G	47	SER	2.1
1	D	329	ALA	2.1
1	E	143	ALA	2.1
1	D	137	PRO	2.1
1	C	368	GLN	2.1
1	D	151	LYS	2.1
1	F	373	ARG	2.1

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Mol	Chain	Res	Type	RSRZ
1	F	345	ASP	2.1
1	B	290	LEU	2.1
1	D	168	SER	2.1
1	F	168	SER	2.1
1	E	38	PRO	2.0
1	G	135	TYR	2.0
1	C	339	ARG	2.0
1	D	413	LYS	2.0
1	E	126	VAL	2.0
1	E	416	ASP	2.0
1	F	399	SER	2.0
1	G	149	SER	2.0
1	D	152	GLN	2.0
1	E	189	THR	2.0
1	D	366	PHE	2.0
1	B	143	ALA	2.0
1	C	59	ALA	2.0
1	A	377	ARG	2.0
1	B	39	LYS	2.0
1	B	344	LYS	2.0
1	E	343	LYS	2.0
1	B	165	ASP	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(Å ²)	Q<0.9
2	SO4	A	504	5/5	0.72	0.21	116,116,117,117	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	SO4	B	501	5/5	0.76	0.14	100,100,100,100	0
2	SO4	A	502	5/5	0.83	0.12	84,84,84,84	0
2	SO4	A	501	5/5	0.85	0.14	89,89,90,90	0
3	GOL	D	501	6/6	0.87	0.14	40,41,41,41	8
2	SO4	E	502	5/5	0.88	0.11	111,111,111,111	0
2	SO4	A	503	5/5	0.88	0.13	100,100,100,100	0
2	SO4	E	501	5/5	0.93	0.09	61,62,62,62	0
3	GOL	B	502	6/6	0.94	0.09	41,41,42,42	8
2	SO4	C	501	5/5	0.95	0.09	43,43,44,44	0

6.5 Other polymers [\(i\)](#)

There are no such residues in this entry.