



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 22, 2024 – 11:26 AM EDT

PDB ID : 6B27
Title : Crystal structure of human STAC2 Tandem SH3 Domains (296-411) in complex with a CaV1.1 II-III loop peptide
Authors : Wong King Yuen, S.M.; Van Petegem, F.
Deposited on : 2017-09-19
Resolution : 1.73 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

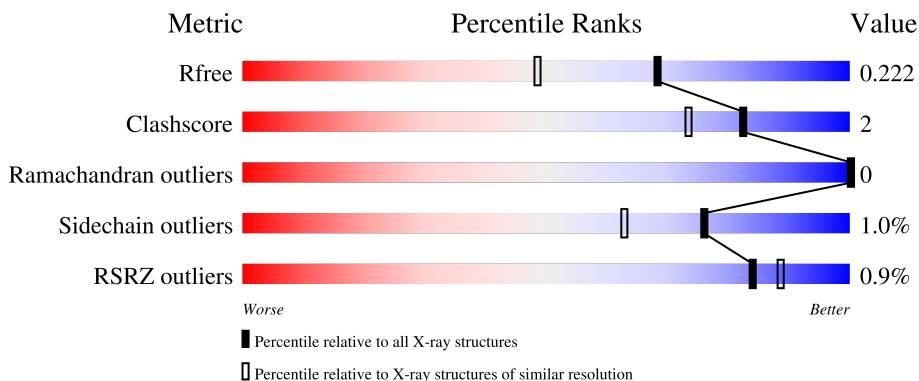
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.73 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	3764 (1.76-1.72)
Clashscore	141614	3923 (1.76-1.72)
Ramachandran outliers	138981	3878 (1.76-1.72)
Sidechain outliers	138945	3878 (1.76-1.72)
RSRZ outliers	127900	3705 (1.76-1.72)

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	120	90% 7% . .
1	B	120	90% 5% 5%
1	C	120	81% 13% 6%
1	D	120	91% 8% .
1	E	120	79% 10% . 10%

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Mol	Chain	Length	Quality of chain
1	F	120	 81% 12% 7%
2	G	14	 57% 14% 29%
2	H	14	 14% 71% 7% 21%
2	I	14	 7% 71% 7% 21%
2	J	14	 71% 29%
2	K	14	 71% 29%
2	L	14	 14% 64% 36%

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	A	501	-	-	X	-

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 6602 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 SH3 and cysteine-rich domain-containing protein 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	118	Total 943	C 596	N 170	O 172	S 5	0	5	0
1	B	114	Total 900	C 570	N 155	O 169	S 6	0	3	0
1	C	113	Total 925	C 589	N 161	O 168	S 7	0	7	0
1	D	118	Total 938	C 594	N 164	O 174	S 6	0	5	0
1	E	108	Total 851	C 541	N 145	O 160	S 5	0	3	0
1	F	112	Total 906	C 576	N 159	O 165	S 6	0	3	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	292	SER	-	expression tag	UNP Q6ZMT1
A	293	ASN	-	expression tag	UNP Q6ZMT1
A	294	ALA	-	expression tag	UNP Q6ZMT1
A	295	ASN	-	expression tag	UNP Q6ZMT1
B	292	SER	-	expression tag	UNP Q6ZMT1
B	293	ASN	-	expression tag	UNP Q6ZMT1
B	294	ALA	-	expression tag	UNP Q6ZMT1
B	295	ASN	-	expression tag	UNP Q6ZMT1
C	292	SER	-	expression tag	UNP Q6ZMT1
C	293	ASN	-	expression tag	UNP Q6ZMT1
C	294	ALA	-	expression tag	UNP Q6ZMT1
C	295	ASN	-	expression tag	UNP Q6ZMT1
D	292	SER	-	expression tag	UNP Q6ZMT1
D	293	ASN	-	expression tag	UNP Q6ZMT1
D	294	ALA	-	expression tag	UNP Q6ZMT1
D	295	ASN	-	expression tag	UNP Q6ZMT1
E	292	SER	-	expression tag	UNP Q6ZMT1

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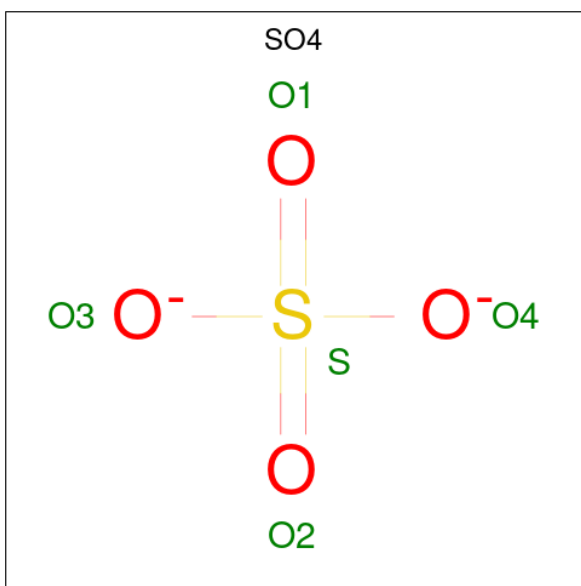
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Chain	Residue	Modelled	Actual	Comment	Reference
E	293	ASN	-	expression tag	UNP Q6ZMT1
E	294	ALA	-	expression tag	UNP Q6ZMT1
E	295	ASN	-	expression tag	UNP Q6ZMT1
F	292	SER	-	expression tag	UNP Q6ZMT1
F	293	ASN	-	expression tag	UNP Q6ZMT1
F	294	ALA	-	expression tag	UNP Q6ZMT1
F	295	ASN	-	expression tag	UNP Q6ZMT1

- Molecule 2 is a protein called Voltage-dependent L-type calcium channel subunit alpha-1S.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	G	10	Total	C	N	O	0	0	0
			79	51	13	15			
2	H	11	Total	C	N	O	0	0	0
			88	57	17	14			
2	I	11	Total	C	N	O	0	0	0
			86	55	17	14			
2	J	10	Total	C	N	O	0	0	0
			75	49	13	13			
2	K	10	Total	C	N	O	0	0	0
			79	51	13	15			
2	L	9	Total	C	N	O	0	0	0
			70	46	12	12			

- 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	A	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	C	1	Total O S 5 4 1	0	0
3	D	1	Total O S 5 4 1	0	0
3	E	1	Total O S 5 4 1	0	0
3	F	1	Total O S 5 4 1	0	0

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	E	2	Total Cl 2 2	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	109	Total O 109 109	0	0
5	B	95	Total O 95 95	0	0
5	C	83	Total O 83 83	0	0
5	D	107	Total O 107 107	0	0
5	E	87	Total O 87 87	0	0
5	F	100	Total O 100 100	0	0
5	G	9	Total O 9 9	0	0
5	H	8	Total O 8 8	0	0
5	I	6	Total O 6 6	0	0

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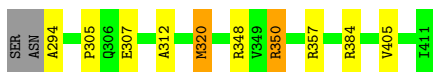
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	J	7	Total O 7 7	0	0
5	K	7	Total O 7 7	0	0
5	L	2	Total O 2 2	0	0

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: SH3 and cysteine-rich domain-containing protein 2

Chain A: 




- Molecule 1: SH3 and cysteine-rich domain-containing protein 2

Chain B: 




- Molecule 1: SH3 and cysteine-rich domain-containing protein 2

Chain C: 




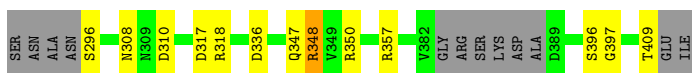
- Molecule 1: SH3 and cysteine-rich domain-containing protein 2

Chain D: 




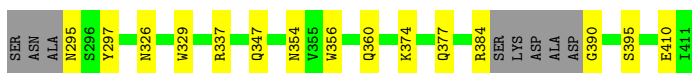
- Molecule 1: SH3 and cysteine-rich domain-containing protein 2

Chain E: 



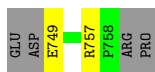
- Molecule 1: SH3 and cysteine-rich domain-containing protein 2

Chain F:  81% 12% 7%



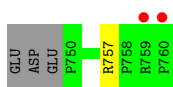
- Molecule 2: Voltage-dependent L-type calcium channel subunit alpha-1S

Chain G:  57% 14% 29%



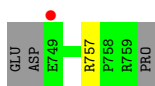
- Molecule 2: Voltage-dependent L-type calcium channel subunit alpha-1S

Chain H:  14% 71% 7% 21%



- Molecule 2: Voltage-dependent L-type calcium channel subunit alpha-1S

Chain I:  7% 71% 7% 21%



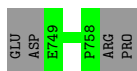
- Molecule 2: Voltage-dependent L-type calcium channel subunit alpha-1S

Chain J:  71% 29%



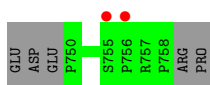
- Molecule 2: Voltage-dependent L-type calcium channel subunit alpha-1S

Chain K:  71% 29%



- Molecule 2: Voltage-dependent L-type calcium channel subunit alpha-1S

Chain L:  14% 64% 36%



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	47.92Å 114.65Å 144.68Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	35.00 – 1.73 33.99 – 1.73	Depositor EDS
% Data completeness (in resolution range)	99.1 (35.00-1.73) 99.1 (33.99-1.73)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.32 (at 1.73Å)	Xtrriage
Refinement program	REFMAC 5.8.0158	Depositor
R, R_{free}	0.179 , 0.216 0.188 , 0.222	Depositor DCC
R_{free} test set	4075 reflections (4.89%)	wwPDB-VP
Wilson B-factor (Å ²)	21.0	Xtrriage
Anisotropy	0.345	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 45.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	6602	wwPDB-VP
Average B, all atoms (Å ²)	25.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.49% 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: CL, 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	1.02	1/975 (0.1%)	1.08	6/1317 (0.5%)
1	B	1.06	1/928 (0.1%)	1.05	5/1252 (0.4%)
1	C	0.97	1/965 (0.1%)	1.11	9/1299 (0.7%)
1	D	1.08	1/973 (0.1%)	1.11	5/1313 (0.4%)
1	E	1.08	1/879 (0.1%)	1.12	9/1191 (0.8%)
1	F	1.12	1/933 (0.1%)	1.08	4/1259 (0.3%)
2	G	1.04	0/82	1.26	2/113 (1.8%)
2	H	0.88	0/92	1.08	2/126 (1.6%)
2	I	0.93	0/89	1.23	2/122 (1.6%)
2	J	0.87	0/78	0.89	0/108
2	K	0.90	0/82	0.80	0/113
2	L	1.16	0/73	0.98	0/100
All	All	1.05	6/6149 (0.1%)	1.09	44/8313 (0.5%)

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	307	GLU	CD-OE2	5.76	1.31	1.25
1	D	337	ARG	CZ-NH1	5.51	1.40	1.33
1	B	337	ARG	CZ-NH1	-5.38	1.26	1.33
1	F	390	GLY	N-CA	5.36	1.54	1.46
1	C	337	ARG	CZ-NH2	-5.22	1.26	1.33
1	E	296	SER	CB-OG	-5.02	1.35	1.42

All (44) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	337	ARG	NE-CZ-NH1	11.18	125.89	120.30
1	D	337	ARG	NE-CZ-NH1	10.36	125.48	120.30
1	D	337	ARG	NE-CZ-NH2	-9.57	115.52	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	337	ARG	NE-CZ-NH1	8.36	124.48	120.30
1	B	357	ARG	NE-CZ-NH1	7.79	124.19	120.30
2	I	757	ARG	NE-CZ-NH2	-7.75	116.42	120.30
1	B	357	ARG	NE-CZ-NH2	-7.72	116.44	120.30
1	C	348	ARG	NE-CZ-NH2	-7.48	116.56	120.30
2	I	757	ARG	NE-CZ-NH1	7.38	123.99	120.30
1	C	318	ARG	NE-CZ-NH2	-7.10	116.75	120.30
1	C	337	ARG	NE-CZ-NH2	-6.84	116.88	120.30
1	E	348	ARG	NE-CZ-NH1	6.71	123.66	120.30
2	G	757	ARG	NE-CZ-NH1	6.68	123.64	120.30
1	E	318	ARG	NE-CZ-NH2	6.59	123.60	120.30
1	A	384	ARG	NE-CZ-NH1	6.48	123.54	120.30
1	F	384	ARG	NE-CZ-NH1	6.47	123.53	120.30
1	C	357	ARG	NE-CZ-NH1	-6.39	117.11	120.30
1	D	406	ASP	CB-CG-OD2	-6.38	112.56	118.30
1	E	350	ARG	NE-CZ-NH1	6.34	123.47	120.30
1	A	320	MET	CG-SD-CE	6.29	110.27	100.20
1	E	348	ARG	NE-CZ-NH2	-6.17	117.22	120.30
2	G	757	ARG	NE-CZ-NH2	-6.10	117.25	120.30
1	C	318	ARG	NE-CZ-NH1	6.03	123.31	120.30
1	F	337	ARG	CG-CD-NE	6.01	124.42	111.80
1	E	357	ARG	NE-CZ-NH1	5.93	123.27	120.30
1	A	350	ARG	NE-CZ-NH1	5.91	123.25	120.30
1	C	350	ARG	NE-CZ-NH2	-5.87	117.36	120.30
1	D	318	ARG	NE-CZ-NH2	5.87	123.23	120.30
1	B	318	ARG	NE-CZ-NH1	5.77	123.19	120.30
1	F	384	ARG	NE-CZ-NH2	-5.74	117.43	120.30
1	F	337	ARG	NE-CZ-NH2	5.67	123.14	120.30
1	A	384	ARG	NE-CZ-NH2	-5.62	117.49	120.30
1	E	310	ASP	CB-CG-OD2	-5.48	113.36	118.30
1	E	336	ASP	CB-CG-OD1	-5.47	113.37	118.30
1	A	357[A]	ARG	NE-CZ-NH2	-5.34	117.63	120.30
1	A	357[B]	ARG	NE-CZ-NH2	-5.34	117.63	120.30
1	E	318	ARG	NE-CZ-NH1	-5.30	117.65	120.30
1	B	357	ARG	CD-NE-CZ	5.29	131.00	123.60
2	H	757	ARG	NE-CZ-NH1	5.24	122.92	120.30
1	C	357	ARG	NE-CZ-NH2	5.22	122.91	120.30
1	E	317	ASP	CB-CG-OD2	-5.21	113.61	118.30
1	C	328	ASP	CB-CG-OD2	-5.15	113.66	118.30
1	D	317	ASP	CB-CG-OD1	5.12	122.90	118.30
2	H	757	ARG	NE-CZ-NH2	-5.08	117.76	120.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	943	0	916	5	0
1	B	900	0	869	2	0
1	C	925	0	922	5	0
1	D	938	0	913	5	0
1	E	851	0	813	3	0
1	F	906	0	876	9	0
2	G	79	0	79	1	0
2	H	88	0	94	0	0
2	I	86	0	88	0	0
2	J	75	0	75	0	0
2	K	79	0	79	0	0
2	L	70	0	74	0	0
3	A	15	0	0	5	0
3	B	5	0	0	0	0
3	C	5	0	0	0	0
3	D	5	0	0	0	0
3	E	5	0	0	0	0
3	F	5	0	0	0	0
4	E	2	0	0	0	0
5	A	109	0	0	1	0
5	B	95	0	0	0	0
5	C	83	0	0	0	0
5	D	107	0	0	0	0
5	E	87	0	0	1	0
5	F	100	0	0	0	0
5	G	9	0	0	1	0
5	H	8	0	0	0	0
5	I	6	0	0	0	0
5	J	7	0	0	0	0
5	K	7	0	0	0	0
5	L	2	0	0	0	0
All	All	6602	0	5798	29	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 2.

All (29) 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)
3:A:501:SO4:O1	1:D:348[A]:ARG:NH2	2.06	0.88
1:C:326:ASN:HD22	1:C:329:TRP:H	1.30	0.78
1:F:326:ASN:HD22	1:F:329:TRP:H	1.34	0.75
1:A:405:VAL:HG13	5:A:605:HOH:O	1.87	0.74
1:A:348[A]:ARG:NH1	3:A:501:SO4:O3	2.26	0.68
2:G:749:GLU:OE2	5:G:801:HOH:O	2.11	0.67
3:A:501:SO4:O2	1:D:350:ARG:NE	2.19	0.66
1:F:374:LYS:H	1:F:377:GLN:HE21	1.43	0.63
1:B:320[B]:MET:SD	1:F:360:GLN:OE1	2.56	0.63
1:E:347:GLN:NE2	1:E:397:GLY:H	2.00	0.59
1:A:350:ARG:NE	3:A:501:SO4:O3	2.38	0.56
1:F:374:LYS:H	1:F:377:GLN:NE2	2.04	0.54
1:A:294:ALA:N	3:A:502:SO4:O2	2.41	0.54
1:C:302:LYS:HE2	1:C:304:LEU:HD21	1.88	0.54
1:C:326:ASN:ND2	1:C:329:TRP:H	2.04	0.51
1:F:326:ASN:ND2	1:F:329:TRP:H	2.06	0.49
1:D:347[A]:GLN:NE2	1:D:395[A]:SER:HB2	2.28	0.49
1:B:302:LYS:HE2	1:B:304:LEU:HD21	1.94	0.48
1:F:356[A]:TRP:CD1	1:F:410:GLU:HA	2.48	0.47
1:D:294:ALA:HB1	1:D:348[A]:ARG:NH2	2.32	0.44
1:D:347[A]:GLN:HE22	1:D:395[A]:SER:HB2	1.83	0.43
1:C:359:CYS:O	1:C:375:GLU:OE1	2.36	0.43
1:E:347:GLN:HE22	1:E:396:SER:HA	1.82	0.43
1:F:354:ASN:HB2	1:F:356[A]:TRP:CH2	2.55	0.42
1:F:347:GLN:NE2	1:F:395:SER:OG	2.53	0.42
1:E:308:ASN:ND2	5:E:606:HOH:O	2.48	0.41
1:A:305:PRO:HG3	1:A:312:ALA:HB2	2.01	0.40
1:F:295:ASN:HB3	1:F:297:TYR:CE1	2.57	0.40
1:C:374[A]:LYS:HE3	1:C:374[A]:LYS:HB2	1.85	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	121/120 (101%)	120 (99%)	1 (1%)	0	100	100
1	B	113/120 (94%)	110 (97%)	3 (3%)	0	100	100
1	C	116/120 (97%)	113 (97%)	3 (3%)	0	100	100
1	D	121/120 (101%)	120 (99%)	1 (1%)	0	100	100
1	E	107/120 (89%)	106 (99%)	1 (1%)	0	100	100
1	F	111/120 (92%)	110 (99%)	1 (1%)	0	100	100
2	G	8/14 (57%)	8 (100%)	0	0	100	100
2	H	9/14 (64%)	9 (100%)	0	0	100	100
2	I	9/14 (64%)	9 (100%)	0	0	100	100
2	J	8/14 (57%)	8 (100%)	0	0	100	100
2	K	8/14 (57%)	8 (100%)	0	0	100	100
2	L	7/14 (50%)	7 (100%)	0	0	100	100
All	All	738/804 (92%)	728 (99%)	10 (1%)	0	100	100

There are no Ramachandran outliers to report.

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	99/102 (97%)	98 (99%)	1 (1%)	76	63
1	B	97/102 (95%)	97 (100%)	0	100	100
1	C	102/102 (100%)	99 (97%)	3 (3%)	42	18
1	D	100/102 (98%)	100 (100%)	0	100	100
1	E	92/102 (90%)	90 (98%)	2 (2%)	52	29
1	F	97/102 (95%)	97 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	G	10/14 (71%)	10 (100%)	0	100	100
2	H	11/14 (79%)	11 (100%)	0	100	100
2	I	10/14 (71%)	10 (100%)	0	100	100
2	J	9/14 (64%)	9 (100%)	0	100	100
2	K	10/14 (71%)	10 (100%)	0	100	100
2	L	9/14 (64%)	9 (100%)	0	100	100
All	All	646/696 (93%)	640 (99%)	6 (1%)	76	67

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	320	MET
1	C	366	LYS
1	C	367	GLU
1	C	404	PRO
1	E	348	ARG
1	E	409	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	326	ASN
1	E	347	GLN
1	F	326	ASN
1	F	376	ASN
1	F	377	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 2 are monoatomic - leaving 8 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	$\# Z > 2$
3	SO4	A	503	-	4,4,4	0.64	0	6,6,6	0.59	0
3	SO4	C	501	-	4,4,4	0.56	0	6,6,6	0.85	0
3	SO4	A	501	-	4,4,4	0.25	0	6,6,6	0.83	0
3	SO4	E	503	-	4,4,4	0.44	0	6,6,6	0.19	0
3	SO4	B	501	-	4,4,4	0.66	0	6,6,6	0.86	0
3	SO4	F	501	-	4,4,4	0.59	0	6,6,6	0.63	0
3	SO4	A	502	-	4,4,4	0.59	0	6,6,6	0.62	0
3	SO4	D	501	-	4,4,4	0.61	0	6,6,6	0.34	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	501	SO4	4	0
3	A	502	SO4	1	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data [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	118/120 (98%)	-0.21	0 100 100	15, 21, 36, 51	0
1	B	114/120 (95%)	-0.14	1 (0%) 84 88	14, 21, 40, 66	0
1	C	113/120 (94%)	0.04	0 100 100	14, 22, 46, 59	0
1	D	118/120 (98%)	-0.14	1 (0%) 86 90	15, 20, 39, 58	0
1	E	108/120 (90%)	-0.15	0 100 100	16, 23, 38, 53	0
1	F	112/120 (93%)	-0.10	0 100 100	15, 20, 34, 47	0
2	G	10/14 (71%)	0.11	0 100 100	26, 32, 44, 51	0
2	H	11/14 (78%)	0.53	2 (18%) 1 1	21, 26, 49, 52	0
2	I	11/14 (78%)	0.19	1 (9%) 9 11	21, 26, 53, 55	0
2	J	10/14 (71%)	0.19	0 100 100	22, 24, 35, 41	0
2	K	10/14 (71%)	-0.11	0 100 100	25, 29, 40, 58	0
2	L	9/14 (64%)	0.65	2 (22%) 0 0	29, 33, 46, 52	0
All	All	744/804 (92%)	-0.09	7 (0%) 84 88	14, 22, 44, 66	0

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	760	PRO	3.2
1	D	294	ALA	2.4
2	H	759	ARG	2.3
2	I	749	GLU	2.1
2	L	755	SER	2.1
1	B	384	ARG	2.1
2	L	756	PRO	2.1

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
3	SO4	A	503	5/5	0.91	0.25	51,53,57,67	0
3	SO4	E	503	5/5	0.91	0.36	77,79,84,85	0
3	SO4	C	501	5/5	0.94	0.26	53,56,65,69	0
4	CL	E	502	1/1	0.94	0.06	41,41,41,41	0
3	SO4	F	501	5/5	0.95	0.28	54,56,61,62	0
3	SO4	A	501	5/5	0.95	0.16	45,53,62,63	0
3	SO4	A	502	5/5	0.97	0.19	37,45,50,54	0
3	SO4	D	501	5/5	0.98	0.19	42,45,50,56	0
3	SO4	B	501	5/5	0.98	0.20	40,43,46,50	0
4	CL	E	501	1/1	1.00	0.05	27,27,27,27	0

6.5 Other polymers [i](#)

There are no such residues in this entry.