



wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 1, 2016 – 05:59 AM GMT

PDB ID : 2VAV
Title : CRYSTAL STRUCTURE OF DEACETYLCEPHALOSPORIN C ACETYL-TRANSFERASE (DAC-SOAK)
Authors : Lejon, S.; Ellis, J.; Valegard, K.
Deposited on : 2007-09-04
Resolution : 2.50 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

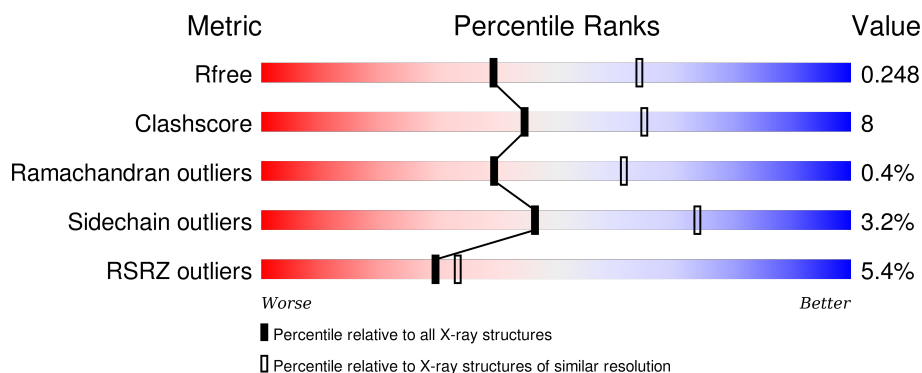
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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}	91344	3553 (2.50-2.50)
Clashscore	102246	4242 (2.50-2.50)
Ramachandran outliers	100387	4156 (2.50-2.50)
Sidechain outliers	100360	4158 (2.50-2.50)
RSRZ outliers	91569	3562 (2.50-2.50)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	444	<div> <div>2%</div> <div>66% 11% • 22%</div> </div>
1	B	444	<div> <div>2%</div> <div>68% 10% 21%</div> </div>
1	C	444	<div> <div>2%</div> <div>66% 11% • 22%</div> </div>
1	D	444	<div> <div>2%</div> <div>66% 11% • 22%</div> </div>
1	E	444	<div> <div>2%</div> <div>68% 9% • 22%</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	444	
1	G	444	
1	H	444	
1	I	444	
1	J	444	
1	K	444	
1	L	444	

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
1	OAS	F	149[A]	-	-	X	-
2	CSC	A	1383	-	-	X	-
2	CSC	B	1384	-	-	-	X
2	CSC	C	1383	-	-	-	X
2	CSC	F	1383[A]	-	-	X	X
2	CSC	F	1383[B]	-	-	-	X
2	CSC	G	1383	-	-	-	X
2	CSC	H	1383[A]	-	-	-	X
2	CSC	I	1383	-	-	-	X
2	CSC	J	1385	-	-	-	X
2	CSC	K	1385	-	-	-	X
2	CSC	L	1383[A]	-	-	-	X
2	CSC	L	1383[B]	-	-	-	X
3	ACT	A	1384	-	-	X	-
3	ACT	C	1384	-	-	X	-
3	ACT	E	1384	-	-	X	-
3	ACT	H	1384	-	-	X	-

2 Entry composition

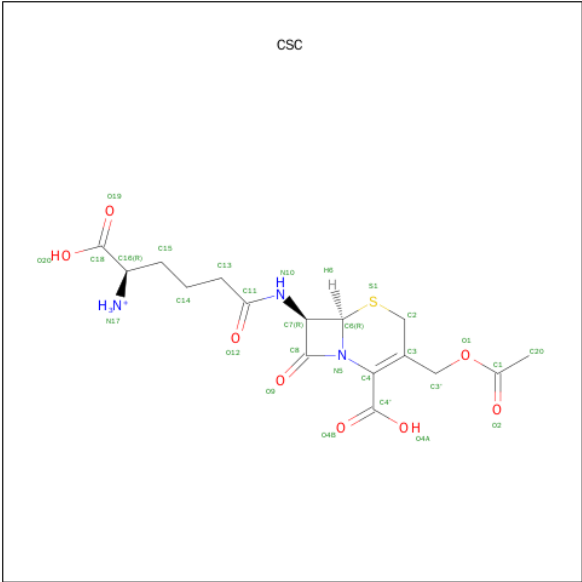
There are 4 unique types of molecules in this entry. The entry contains 33548 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 ACETYL-COA--DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	348	Total	C	N	O	S	0	2	0
			2743	1730	483	511	19			
1	B	350	Total	C	N	O	S	0	3	0
			2754	1736	486	513	19			
1	C	347	Total	C	N	O	S	0	4	0
			2758	1739	489	511	19			
1	D	345	Total	C	N	O	S	0	4	0
			2745	1732	487	507	19			
1	E	346	Total	C	N	O	S	0	3	0
			2723	1719	478	507	19			
1	F	341	Total	C	N	O	S	0	2	0
			2696	1702	473	502	19			
1	G	342	Total	C	N	O	S	0	3	0
			2707	1708	477	503	19			
1	H	343	Total	C	N	O	S	0	4	0
			2714	1713	478	504	19			
1	I	348	Total	C	N	O	S	0	3	1
			2735	1725	483	508	19			
1	J	344	Total	C	N	O	S	0	2	0
			2714	1713	476	506	19			
1	K	341	Total	C	N	O	S	0	2	0
			2694	1701	473	501	19			
1	L	340	Total	C	N	O	S	0	3	0
			2691	1699	472	501	19			

- Molecule 2 is 4-(3-ACETOXYMETHYL-2-CARBOXY-8-OXO-5-THIA-1-AZA-BICYCLO [4.2.0]OCT-2-EN-7-YLCARBAMOYL)-1-CARBOXY-BUTYL-AMMONIUM (three-letter code: CSC) (formula: C₁₆H₂₂N₃O₈S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			25	14	3	7	1		
2	B	1	Total	C	N	O	S	0	0
			25	14	3	7	1		
2	C	1	Total	C	N	O	S	0	0
			25	14	3	7	1		
2	D	1	Total	C	N	O	S	0	0
			25	14	3	7	1		
2	E	1	Total	C	N	O	S	0	0
			25	14	3	7	1		
2	F	1	Total	C	N	O	S	0	1
			30	17	3	9	1		
2	G	1	Total	C	N	O	S	0	0
			25	14	3	7	1		
2	H	1	Total	C	N	O	S	0	1
			30	17	3	9	1		
2	I	1	Total	C	N	O	S	0	0
			25	14	3	7	1		
2	J	1	Total	C	N	O	S	0	0
			25	14	3	7	1		
2	K	1	Total	C	N	O	S	0	0
			25	14	3	7	1		
2	L	1	Total	C	N	O	S	0	1
			30	17	3	9	1		

- Molecule 3 is ACETATE ION (three-letter code: ACT) (formula: C₂H₃O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	C	1	Total	C	O	0	0
			4	2	2		
3	D	1	Total	C	O	0	0
			4	2	2		
3	E	1	Total	C	O	0	0
			4	2	2		
3	E	1	Total	C	O	0	0
			4	2	2		
3	F	1	Total	C	O	0	0
			4	2	2		
3	G	1	Total	C	O	0	0
			4	2	2		
3	H	1	Total	C	O	0	0
			4	2	2		
3	I	1	Total	C	O	0	0
			4	2	2		
3	I	1	Total	C	O	0	0
			4	2	2		
3	I	1	Total	C	O	0	0
			4	2	2		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	L	1	Total	C	O	0	0
			4	2	2		

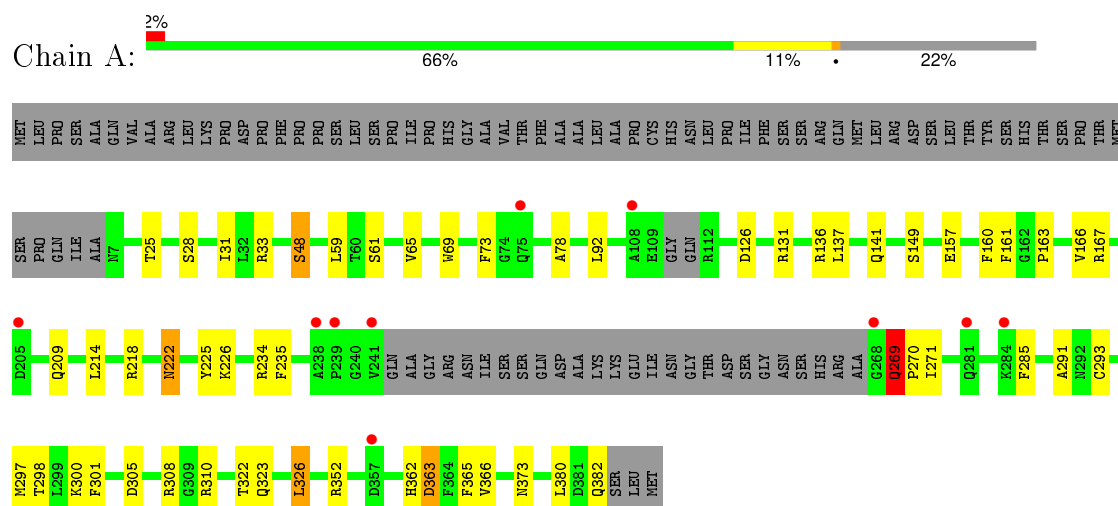
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	48	Total	O	0	0
			48	48		
4	B	51	Total	O	0	0
			51	51		
4	C	43	Total	O	0	0
			43	43		
4	D	49	Total	O	0	0
			49	49		
4	E	46	Total	O	0	0
			46	46		
4	F	41	Total	O	0	0
			41	41		
4	G	52	Total	O	0	0
			52	52		
4	H	48	Total	O	0	0
			48	48		
4	I	56	Total	O	0	0
			56	56		
4	J	17	Total	O	0	0
			17	17		
4	K	11	Total	O	0	0
			11	11		
4	L	37	Total	O	0	0
			37	37		

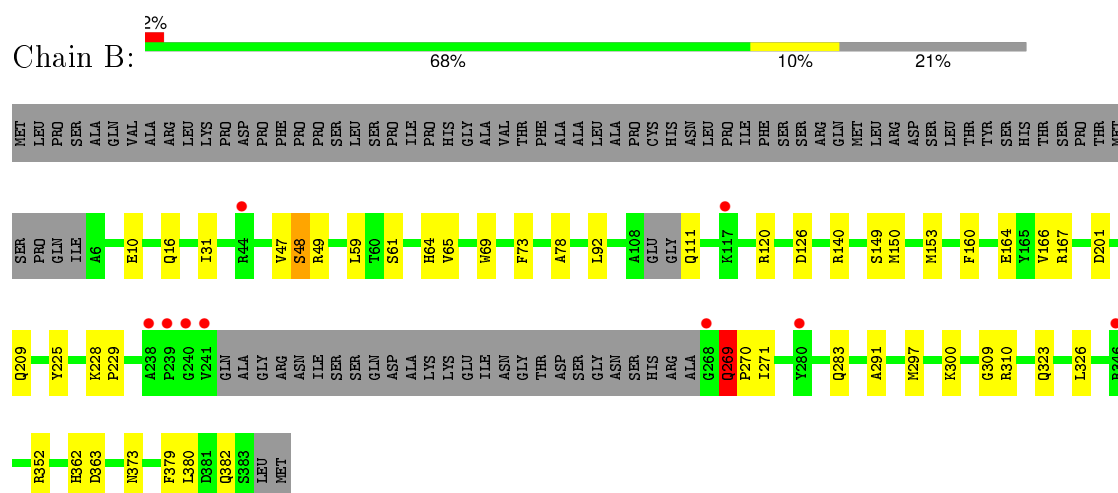
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

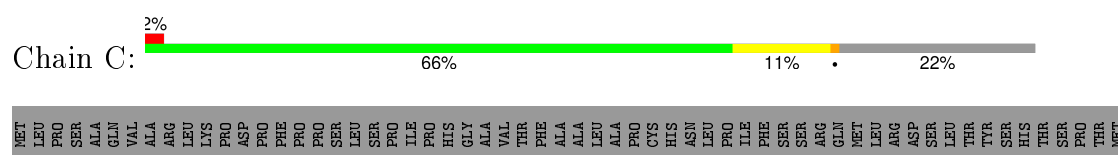
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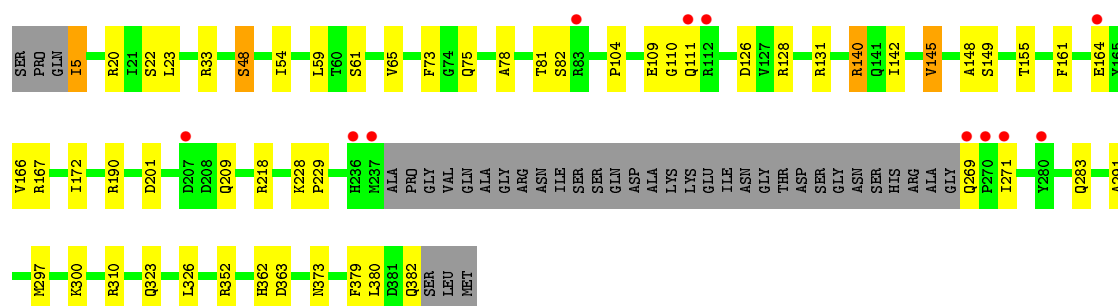


• Molecule 1: ACETYL-COA--DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE

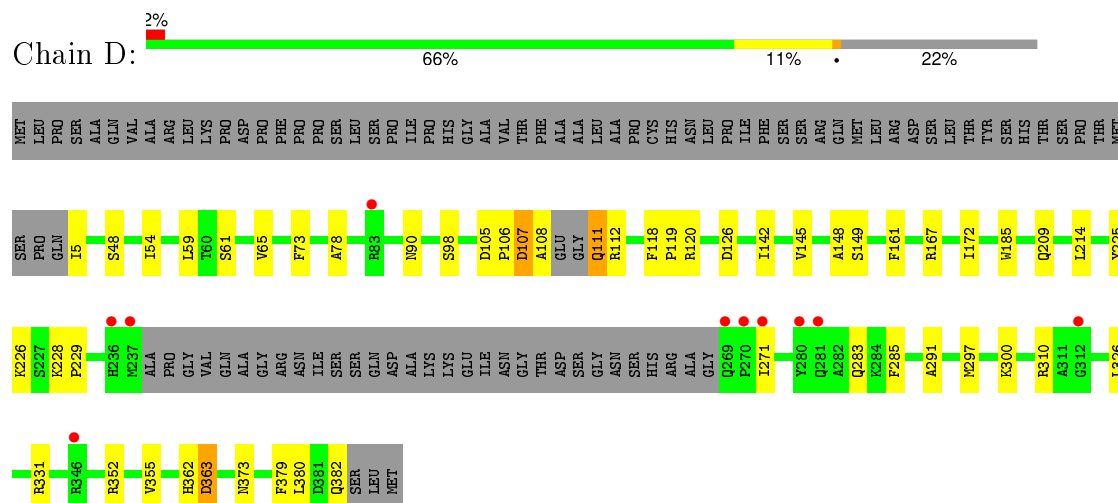


• Molecule 1: ACETYL-COA--DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE

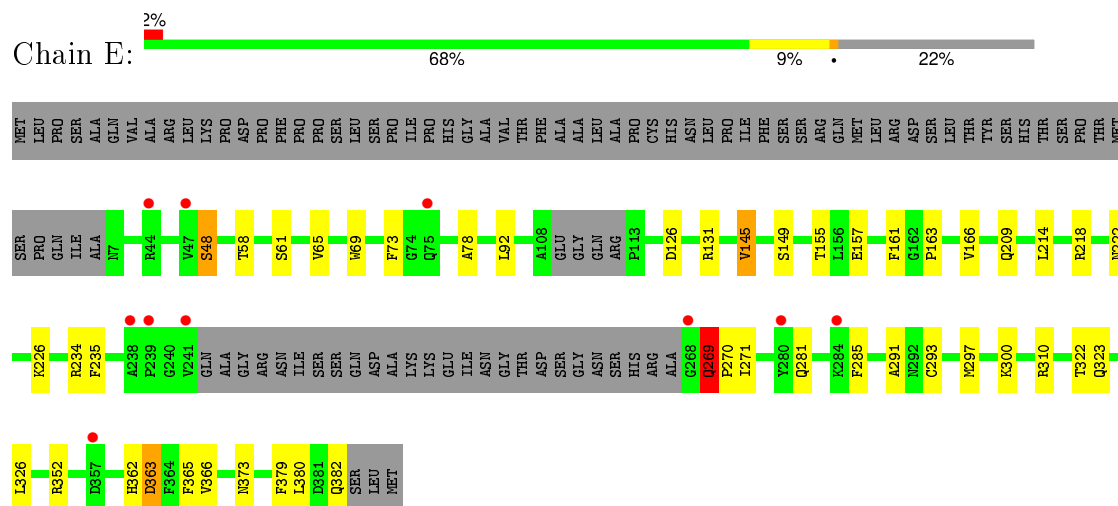




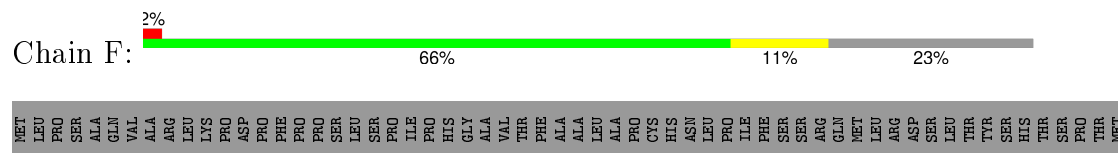
- Molecule 1: ACETYL-COA--DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE

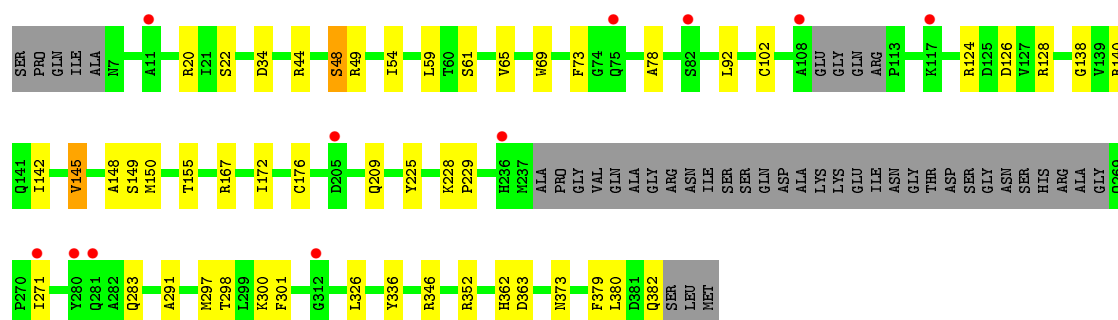


• Molecule 1: ACETYL-COA--DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE

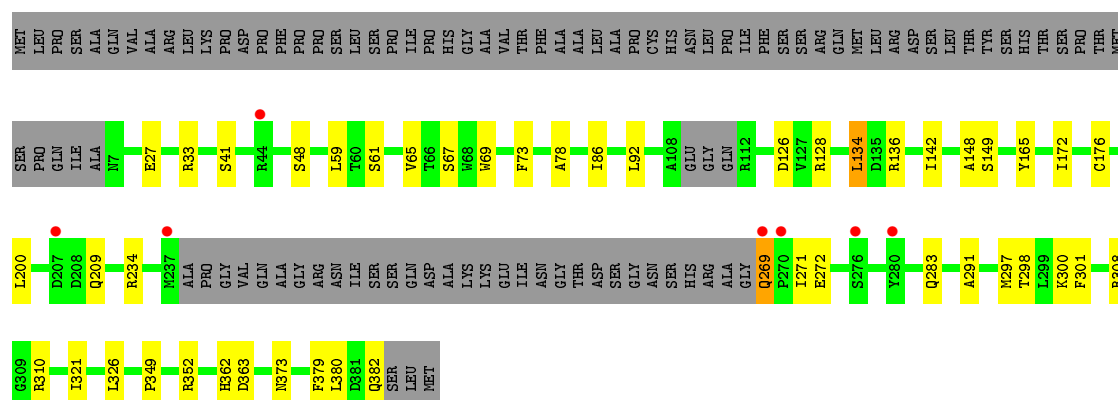


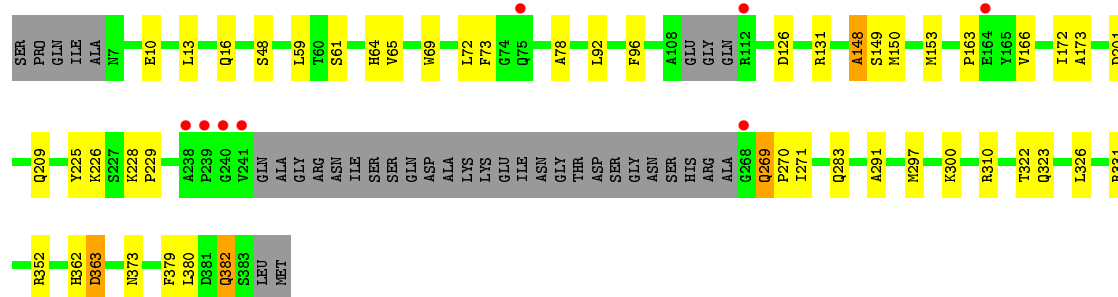
- Molecule 1: ACETYL-COA--DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE



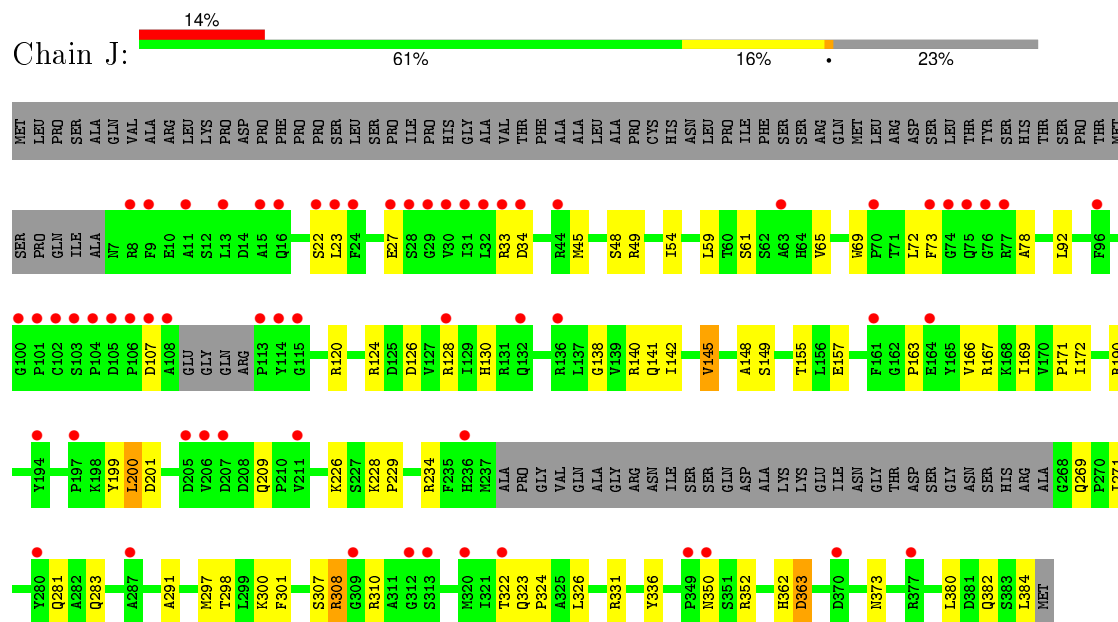


• Molecule 1: ACETYL-COA--DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE

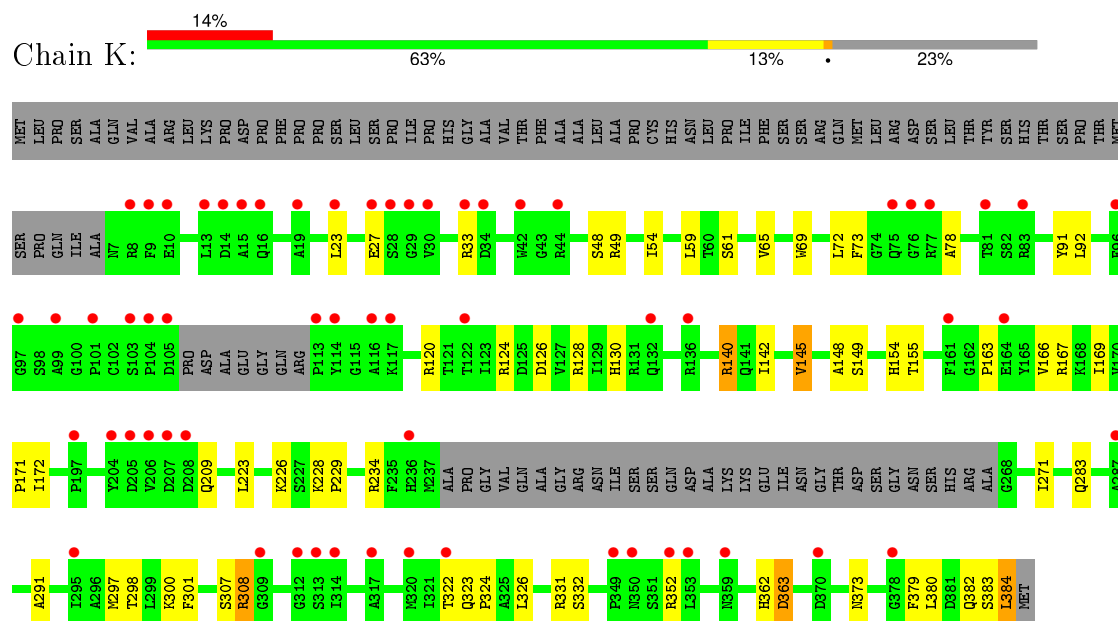




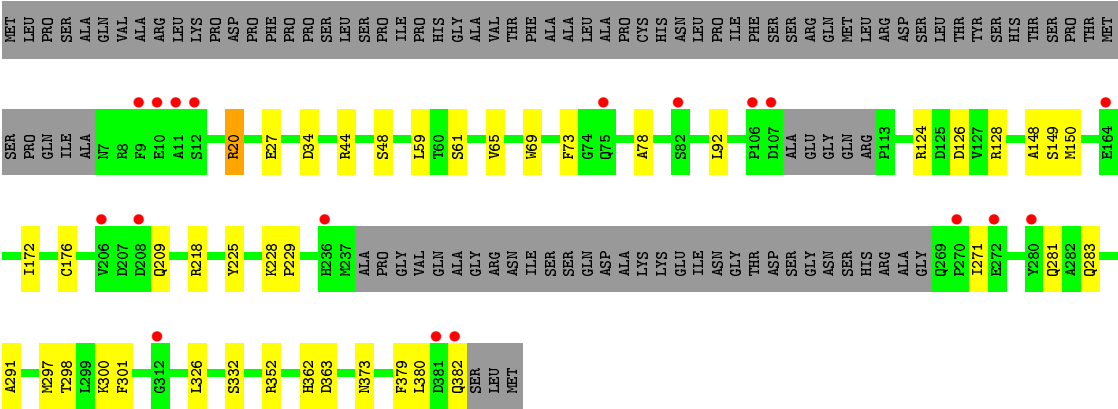
• Molecule 1: ACETYL-COA--DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE



• Molecule 1: ACETYL-COA--DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE



• Molecule 1: ACETYL-COA--DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	122.06Å 108.86Å 195.79Å 90.00° 90.03° 90.00°	Depositor
Resolution (Å)	103.70 – 2.50 103.56 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.9 (103.70-2.50) 99.7 (103.56-2.50)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.96 (at 2.52Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.219 , 0.255 0.214 , 0.248	Depositor DCC
R_{free} test set	3419 reflections (1.97%)	DCC
Wilson B-factor (Å ²)	35.0	Xtriage
Anisotropy	0.161	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 10.0	EDS
Estimated twinning fraction	0.468 for h,-k,-l	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	1 of 177127 reflections (0.001%)	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	33548	wwPDB-VP
Average B, all atoms (Å ²)	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 17.42% 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, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: OAS, CSC, ACT

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	0.70	1/2796 (0.0%)	0.73	1/3789 (0.0%)
1	B	0.68	0/2807	0.72	3/3804 (0.1%)
1	C	0.70	0/2817	0.75	5/3816 (0.1%)
1	D	0.71	0/2803	0.80	5/3796 (0.1%)
1	E	0.70	0/2776	0.73	0/3762
1	F	0.73	1/2748 (0.0%)	0.74	1/3723 (0.0%)
1	G	0.71	1/2759 (0.0%)	0.75	2/3738 (0.1%)
1	H	0.70	0/2766	0.74	3/3747 (0.1%)
1	I	0.69	0/2788	0.73	2/3779 (0.1%)
1	J	0.82	0/2766	0.75	0/3747
1	K	0.83	0/2745	0.76	1/3717 (0.0%)
1	L	0.71	1/2743 (0.0%)	0.74	0/3716
All	All	0.72	4/33314 (0.0%)	0.75	23/45134 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	I	0	2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	176	CYS	CB-SG	-7.04	1.70	1.82
1	L	176	CYS	CB-SG	-6.52	1.71	1.82
1	G	176	CYS	CB-SG	-5.73	1.72	1.81
1	A	222	ASN	CB-CG	5.24	1.63	1.51

The worst 5 of 23 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	310	ARG	NE-CZ-NH1	-13.12	113.74	120.30
1	D	310	ARG	NE-CZ-NH2	13.03	126.82	120.30
1	K	140	ARG	NE-CZ-NH1	7.27	123.93	120.30
1	D	310	ARG	CD-NE-CZ	6.99	133.38	123.60
1	C	310	ARG	NE-CZ-NH1	6.72	123.66	120.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	I	148	ALA	Peptide

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	2743	0	2645	48	0
1	B	2754	0	2656	37	0
1	C	2758	0	2673	43	0
1	D	2745	0	2661	48	0
1	E	2723	0	2624	39	0
1	F	2696	0	2600	60	0
1	G	2707	0	2610	31	1
1	H	2714	0	2613	41	1
1	I	2735	0	2638	42	0
1	J	2714	0	2618	55	1
1	K	2694	0	2602	47	1
1	L	2691	0	2592	36	0
2	A	25	0	16	9	0
2	B	25	0	17	1	0
2	C	25	0	17	2	0
2	D	25	0	16	2	0
2	E	25	0	16	6	0
2	F	30	0	6	14	0
2	G	25	0	16	3	0
2	H	30	0	4	5	0
2	I	25	0	17	2	0
2	J	25	0	15	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	K	25	0	15	4	0
2	L	30	0	3	3	0
3	A	8	0	6	2	0
3	B	8	0	6	1	0
3	C	4	0	3	2	0
3	D	4	0	3	1	0
3	E	8	0	6	4	0
3	F	4	0	3	1	0
3	G	4	0	3	1	0
3	H	4	0	3	2	0
3	I	12	0	9	0	0
3	L	4	0	3	0	0
4	A	48	0	0	1	0
4	B	51	0	0	3	0
4	C	43	0	0	5	0
4	D	49	0	0	1	0
4	E	46	0	0	2	0
4	F	41	0	0	5	0
4	G	52	0	0	2	0
4	H	48	0	0	3	0
4	I	56	0	0	1	0
4	J	17	0	0	1	0
4	K	11	0	0	0	0
4	L	37	0	0	3	0
All	All	33548	0	31735	514	2

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 8.

The worst 5 of 514 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:F:149[A]:OAS:HB2	2:F:1383[A]:CSC:C20	1.24	1.54
1:F:149[A]:OAS:CB	2:F:1383[A]:CSC:C20	1.89	1.48
1:F:149[A]:OAS:CB	2:F:1383[A]:CSC:H201	1.57	1.27
1:F:149[A]:OAS:OG	2:F:1383[A]:CSC:H202	1.40	1.21
1:F:149[A]:OAS:CB	2:F:1383[A]:CSC:H202	1.65	1.11

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:283:GLN:OE1	1:K:49:ARG:NH2[2_655]	1.99	0.21
1:G:283:GLN:OE1	1:J:49:ARG:NH2[1_556]	2.13	0.07

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	341/444 (77%)	328 (96%)	11 (3%)	2 (1%)	30	50
1	B	343/444 (77%)	329 (96%)	12 (4%)	2 (1%)	30	50
1	C	344/444 (78%)	330 (96%)	13 (4%)	1 (0%)	46	68
1	D	340/444 (77%)	329 (97%)	9 (3%)	2 (1%)	30	50
1	E	339/444 (76%)	327 (96%)	10 (3%)	2 (1%)	30	50
1	F	334/444 (75%)	323 (97%)	10 (3%)	1 (0%)	46	68
1	G	335/444 (76%)	323 (96%)	11 (3%)	1 (0%)	46	68
1	H	336/444 (76%)	324 (96%)	11 (3%)	1 (0%)	46	68
1	I	341/444 (77%)	328 (96%)	11 (3%)	2 (1%)	30	50
1	J	337/444 (76%)	322 (96%)	14 (4%)	1 (0%)	46	68
1	K	334/444 (75%)	319 (96%)	14 (4%)	1 (0%)	46	68
1	L	333/444 (75%)	319 (96%)	13 (4%)	1 (0%)	46	68
All	All	4057/5328 (76%)	3901 (96%)	139 (3%)	17 (0%)	39	61

5 of 17 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	363	ASP
1	B	363	ASP
1	C	363	ASP
1	D	363	ASP
1	E	363	ASP

5.3.2 Protein sidechains ⓘ

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	290/371 (78%)	282 (97%)	8 (3%)	51	78
1	B	291/371 (78%)	281 (97%)	10 (3%)	44	72
1	C	292/371 (79%)	278 (95%)	14 (5%)	31	55
1	D	291/371 (78%)	284 (98%)	7 (2%)	57	82
1	E	288/371 (78%)	280 (97%)	8 (3%)	51	78
1	F	286/371 (77%)	279 (98%)	7 (2%)	57	82
1	G	287/371 (77%)	278 (97%)	9 (3%)	47	75
1	H	287/371 (77%)	279 (97%)	8 (3%)	51	78
1	I	289/371 (78%)	280 (97%)	9 (3%)	47	75
1	J	288/371 (78%)	276 (96%)	12 (4%)	36	62
1	K	286/371 (77%)	276 (96%)	10 (4%)	43	70
1	L	286/371 (77%)	278 (97%)	8 (3%)	51	78
All	All	3461/4452 (78%)	3351 (97%)	110 (3%)	46	74

5 of 110 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	69	TRP
1	G	271	ILE
1	K	384	LEU
1	F	271	ILE
1	G	48	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 56 such sidechains are listed below:

Mol	Chain	Res	Type
1	F	382	GLN
1	H	64	HIS
1	L	64	HIS
1	G	64	HIS

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Mol	Chain	Res	Type
1	G	269	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

24 non-standard protein/DNA/RNA residues 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$
1	OAS	A	149[A]	-	4,5,9	0.51	0	2,5,11	1.67	1 (50%)
1	OAS	A	149[B]	2	7,8,9	1.18	1 (14%)	6,9,11	1.31	1 (16%)
1	OAS	B	149[A]	-	4,5,9	0.39	0	2,5,11	1.67	1 (50%)
1	OAS	B	149[B]	2	7,8,9	1.07	1 (14%)	6,9,11	1.49	1 (16%)
1	OAS	C	149[A]	-	4,5,9	0.44	0	2,5,11	1.62	1 (50%)
1	OAS	C	149[B]	2	7,8,9	1.25	1 (14%)	6,9,11	1.44	2 (33%)
1	OAS	D	149[A]	-	4,5,9	0.32	0	2,5,11	1.69	1 (50%)
1	OAS	D	149[B]	2	7,8,9	1.21	1 (14%)	6,9,11	1.44	2 (33%)
1	OAS	E	149[A]	-	4,5,9	0.56	0	2,5,11	1.49	1 (50%)
1	OAS	E	149[B]	2	7,8,9	1.10	1 (14%)	6,9,11	1.36	1 (16%)
1	OAS	F	149[A]	-	4,5,9	0.48	0	2,5,11	1.39	0
1	OAS	F	149[B]	2	7,8,9	1.20	1 (14%)	6,9,11	1.16	0
1	OAS	G	149[A]	-	4,5,9	0.57	0	2,5,11	1.66	1 (50%)
1	OAS	G	149[B]	2	7,8,9	1.14	1 (14%)	6,9,11	1.35	1 (16%)
1	OAS	H	149[A]	2	4,5,9	0.48	0	2,5,11	1.70	1 (50%)
1	OAS	H	149[B]	2	7,8,9	1.12	1 (14%)	6,9,11	1.38	1 (16%)
1	OAS	I	149[A]	-	4,5,9	0.70	0	2,5,11	2.18	1 (50%)
1	OAS	I	149[B]	2	7,8,9	1.22	1 (14%)	6,9,11	2.12	3 (50%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	OAS	J	149[A]	-	4,5,9	0.56	0	2,5,11	1.74	1 (50%)
1	OAS	J	149[B]	-	7,8,9	1.22	1 (14%)	6,9,11	1.51	2 (33%)
1	OAS	K	149[A]	-	4,5,9	0.42	0	2,5,11	1.65	1 (50%)
1	OAS	K	149[B]	-	7,8,9	1.16	1 (14%)	6,9,11	1.54	1 (16%)
1	OAS	L	149[A]	2	4,5,9	0.51	0	2,5,11	1.48	1 (50%)
1	OAS	L	149[B]	2	7,8,9	1.13	1 (14%)	6,9,11	1.07	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
1	OAS	A	149[A]	-	-	0/2/4/9	0/0/0/0
1	OAS	A	149[B]	2	-	0/5/7/9	0/0/0/0
1	OAS	B	149[A]	-	-	0/2/4/9	0/0/0/0
1	OAS	B	149[B]	2	-	0/5/7/9	0/0/0/0
1	OAS	C	149[A]	-	-	0/2/4/9	0/0/0/0
1	OAS	C	149[B]	2	-	0/5/7/9	0/0/0/0
1	OAS	D	149[A]	-	-	0/2/4/9	0/0/0/0
1	OAS	D	149[B]	2	-	0/5/7/9	0/0/0/0
1	OAS	E	149[A]	-	-	0/2/4/9	0/0/0/0
1	OAS	E	149[B]	2	-	0/5/7/9	0/0/0/0
1	OAS	F	149[A]	-	-	0/2/4/9	0/0/0/0
1	OAS	F	149[B]	2	-	0/5/7/9	0/0/0/0
1	OAS	G	149[A]	-	-	0/2/4/9	0/0/0/0
1	OAS	G	149[B]	2	-	0/5/7/9	0/0/0/0
1	OAS	H	149[A]	2	-	0/2/4/9	0/0/0/0
1	OAS	H	149[B]	2	-	0/5/7/9	0/0/0/0
1	OAS	I	149[A]	-	-	0/2/4/9	0/0/0/0
1	OAS	I	149[B]	2	-	0/5/7/9	0/0/0/0
1	OAS	J	149[A]	-	-	0/2/4/9	0/0/0/0
1	OAS	J	149[B]	-	-	0/5/7/9	0/0/0/0
1	OAS	K	149[A]	-	-	0/2/4/9	0/0/0/0
1	OAS	K	149[B]	-	-	0/5/7/9	0/0/0/0
1	OAS	L	149[A]	2	-	0/2/4/9	0/0/0/0
1	OAS	L	149[B]	2	-	0/5/7/9	0/0/0/0

The worst 5 of 12 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	149[B]	OAS	OG-C1A	2.40	1.46	1.33
1	E	149[B]	OAS	OG-C1A	2.40	1.46	1.33
1	G	149[B]	OAS	OG-C1A	2.48	1.46	1.33
1	I	149[B]	OAS	OG-C1A	2.51	1.46	1.33
1	H	149[B]	OAS	OG-C1A	2.57	1.46	1.33

The worst 5 of 27 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	149[A]	OAS	O-C-CA	-2.59	118.73	125.49
1	J	149[A]	OAS	O-C-CA	-2.40	119.23	125.49
1	H	149[A]	OAS	O-C-CA	-2.40	119.25	125.49
1	D	149[A]	OAS	O-C-CA	-2.38	119.29	125.49
1	I	149[B]	OAS	O-C-CA	-2.37	119.30	125.49

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

21 monomers are involved in 34 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	149[A]	OAS	1	0
1	A	149[B]	OAS	3	0
1	B	149[A]	OAS	1	0
1	B	149[B]	OAS	1	0
1	C	149[A]	OAS	1	0
1	D	149[A]	OAS	1	0
1	D	149[B]	OAS	1	0
1	E	149[A]	OAS	1	0
1	F	149[A]	OAS	9	0
1	F	149[B]	OAS	1	0
1	G	149[A]	OAS	1	0
1	H	149[A]	OAS	1	0
1	H	149[B]	OAS	1	0
1	I	149[A]	OAS	2	0
1	I	149[B]	OAS	3	0
1	J	149[A]	OAS	1	0
1	J	149[B]	OAS	1	0
1	K	149[A]	OAS	1	0
1	K	149[B]	OAS	1	0
1	L	149[A]	OAS	1	0
1	L	149[B]	OAS	1	0

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

30 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	CSC	A	1383	1	19,26,29	1.34	3 (15%)	26,37,41	2.29	8 (30%)
3	ACT	A	1384	-	1,3,3	0.58	0	0,3,3	0.00	-
3	ACT	A	1385	-	1,3,3	1.76	0	0,3,3	0.00	-
2	CSC	B	1384	1	19,26,29	1.41	5 (26%)	26,37,41	2.03	5 (19%)
3	ACT	B	1385	-	1,3,3	1.60	0	0,3,3	0.00	-
3	ACT	B	1386	-	1,3,3	1.58	0	0,3,3	0.00	-
2	CSC	C	1383	1	19,26,29	1.32	3 (15%)	26,37,41	2.15	3 (11%)
3	ACT	C	1384	-	1,3,3	1.01	0	0,3,3	0.00	-
2	CSC	D	1383	1	19,26,29	1.42	3 (15%)	26,37,41	2.37	3 (11%)
3	ACT	D	1384	-	1,3,3	0.70	0	0,3,3	0.00	-
2	CSC	E	1383	1	19,26,29	1.39	3 (15%)	26,37,41	2.25	9 (34%)
3	ACT	E	1384	-	1,3,3	1.18	0	0,3,3	0.00	-
3	ACT	E	1385	-	1,3,3	1.38	0	0,3,3	0.00	-
2	CSC	F	1383[A]	-	23,29,29	1.27	4 (17%)	29,41,41	2.31	6 (20%)
2	CSC	F	1383[B]	1	19,26,29	1.25	3 (15%)	26,37,41	2.40	6 (23%)
3	ACT	F	1384	-	1,3,3	1.30	0	0,3,3	0.00	-
2	CSC	G	1383	1	19,26,29	1.46	4 (21%)	26,37,41	2.16	6 (23%)
3	ACT	G	1384	-	1,3,3	1.28	0	0,3,3	0.00	-
2	CSC	H	1383[A]	1	23,29,29	1.27	5 (21%)	29,41,41	2.10	5 (17%)
2	CSC	H	1383[B]	1	19,26,29	1.26	4 (21%)	26,37,41	2.15	4 (15%)
3	ACT	H	1384	-	1,3,3	1.57	0	0,3,3	0.00	-
2	CSC	I	1383	1	19,26,29	1.37	5 (26%)	26,37,41	1.90	6 (23%)
3	ACT	I	1384	-	1,3,3	0.97	0	0,3,3	0.00	-
3	ACT	I	1385	-	1,3,3	1.34	0	0,3,3	0.00	-
3	ACT	I	1386	-	1,3,3	2.00	0	0,3,3	0.00	-

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	CSC	J	1385	-	19,26,29	1.35	4 (21%)	26,37,41	2.37	8 (30%)
2	CSC	K	1385	-	19,26,29	1.25	3 (15%)	26,37,41	2.45	9 (34%)
2	CSC	L	1383[A]	1	23,29,29	1.20	3 (13%)	29,41,41	1.93	9 (31%)
2	CSC	L	1383[B]	1	19,26,29	1.20	2 (10%)	26,37,41	1.99	9 (34%)
3	ACT	L	1384	-	1,3,3	1.53	0	0,3,3	0.00	-

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	CSC	A	1383	1	-	0/11/49/52	0/2/2/2
3	ACT	A	1384	-	-	0/0/0/0	0/0/0/0
3	ACT	A	1385	-	-	0/0/0/0	0/0/0/0
2	CSC	B	1384	1	-	0/11/49/52	0/2/2/2
3	ACT	B	1385	-	-	0/0/0/0	0/0/0/0
3	ACT	B	1386	-	-	0/0/0/0	0/0/0/0
2	CSC	C	1383	1	-	0/11/49/52	0/2/2/2
3	ACT	C	1384	-	-	0/0/0/0	0/0/0/0
2	CSC	D	1383	1	-	0/11/49/52	0/2/2/2
3	ACT	D	1384	-	-	0/0/0/0	0/0/0/0
2	CSC	E	1383	1	-	0/11/49/52	0/2/2/2
3	ACT	E	1384	-	-	0/0/0/0	0/0/0/0
3	ACT	E	1385	-	-	0/0/0/0	0/0/0/0
2	CSC	F	1383[A]	-	-	0/15/52/52	0/2/2/2
2	CSC	F	1383[B]	1	-	0/11/49/52	0/2/2/2
3	ACT	F	1384	-	-	0/0/0/0	0/0/0/0
2	CSC	G	1383	1	-	0/11/49/52	0/2/2/2
3	ACT	G	1384	-	-	0/0/0/0	0/0/0/0
2	CSC	H	1383[A]	1	-	0/15/52/52	0/2/2/2
2	CSC	H	1383[B]	1	-	0/11/49/52	0/2/2/2
3	ACT	H	1384	-	-	0/0/0/0	0/0/0/0
2	CSC	I	1383	1	-	0/11/49/52	0/2/2/2
3	ACT	I	1384	-	-	0/0/0/0	0/0/0/0
3	ACT	I	1385	-	-	0/0/0/0	0/0/0/0
3	ACT	I	1386	-	-	0/0/0/0	0/0/0/0
2	CSC	J	1385	-	-	0/11/49/52	0/2/2/2
2	CSC	K	1385	-	-	0/11/49/52	0/2/2/2
2	CSC	L	1383[A]	1	-	0/15/52/52	0/2/2/2
2	CSC	L	1383[B]	1	-	0/11/49/52	0/2/2/2
3	ACT	L	1384	-	-	0/0/0/0	0/0/0/0

The worst 5 of 54 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	1383	CSC	C4'-C4	-3.73	1.45	1.52
2	A	1383	CSC	C4'-C4	-3.56	1.46	1.52
2	G	1383	CSC	C4'-C4	-3.50	1.46	1.52
2	E	1383	CSC	C4'-C4	-3.47	1.46	1.52
2	C	1383	CSC	C4'-C4	-3.20	1.46	1.52

The worst 5 of 96 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	1383[B]	CSC	C6-C7-N10	-8.16	100.16	118.21
2	F	1383[A]	CSC	C6-C7-N10	-8.16	100.16	118.21
2	D	1383	CSC	C6-C7-N10	-7.23	102.20	118.21
2	G	1383	CSC	S1-C6-N5	-6.46	97.02	110.42
2	H	1383[A]	CSC	C6-C7-N10	-6.37	104.12	118.21

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

22 monomers are involved in 68 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1383	CSC	9	0
3	A	1384	ACT	2	0
2	B	1384	CSC	1	0
3	B	1385	ACT	1	0
2	C	1383	CSC	2	0
3	C	1384	ACT	2	0
2	D	1383	CSC	2	0
3	D	1384	ACT	1	0
2	E	1383	CSC	6	0
3	E	1384	ACT	4	0
2	F	1383[A]	CSC	12	0
2	F	1383[B]	CSC	2	0
3	F	1384	ACT	1	0
2	G	1383	CSC	3	0
3	G	1384	ACT	1	0
2	H	1383[A]	CSC	3	0
2	H	1383[B]	CSC	2	0
3	H	1384	ACT	2	0
2	I	1383	CSC	2	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	J	1385	CSC	3	0
2	K	1385	CSC	4	0
2	L	1383[A]	CSC	3	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [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	347/444 (78%)	-0.05	10 (2%) 55 60	15, 27, 46, 60	1 (0%)
1	B	349/444 (78%)	-0.02	9 (2%) 59 63	11, 27, 47, 67	2 (0%)
1	C	346/444 (77%)	0.02	11 (3%) 51 56	13, 26, 46, 60	1 (0%)
1	D	344/444 (77%)	0.03	10 (2%) 55 60	13, 26, 45, 55	1 (0%)
1	E	345/444 (77%)	-0.02	10 (2%) 55 60	13, 27, 45, 61	2 (0%)
1	F	340/444 (76%)	0.02	11 (3%) 51 56	16, 27, 44, 59	1 (0%)
1	G	341/444 (76%)	-0.09	7 (2%) 67 71	16, 26, 44, 53	2 (0%)
1	H	342/444 (77%)	-0.10	5 (1%) 76 79	16, 27, 44, 59	3 (0%)
1	I	347/444 (78%)	-0.08	8 (2%) 64 67	12, 26, 46, 67	2 (0%)
1	J	343/444 (77%)	0.68	61 (17%) 2 2	16, 27, 45, 65	1 (0%)
1	K	340/444 (76%)	0.81	61 (17%) 2 2	16, 27, 44, 53	1 (0%)
1	L	339/444 (76%)	0.05	18 (5%) 30 34	16, 27, 44, 53	2 (0%)
All	All	4123/5328 (77%)	0.10	221 (5%) 29 33	11, 27, 45, 67	19 (0%)

The worst 5 of 221 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	239	PRO	6.6
1	B	268	GLY	5.9
1	J	312	GLY	5.5
1	K	206	VAL	5.5
1	K	309	GLY	5.5

6.2 Non-standard residues in protein, DNA, RNA chains [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. LLDF column lists the quality of electron

density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
1	OAS	C	149[B]	9/10	0.94	0.15	-	8,16,17,18	6
1	OAS	F	149[A]	6/10	0.91	0.17	-	15,16,17,17	3
1	OAS	A	149[B]	9/10	0.93	0.17	-	8,16,17,17	6
1	OAS	F	149[B]	9/10	0.91	0.17	-	8,16,17,17	6
1	OAS	H	149[B]	9/10	0.94	0.15	-	8,16,17,17	6
1	OAS	A	149[A]	6/10	0.93	0.17	-	15,16,17,17	3
1	OAS	H	149[A]	6/10	0.94	0.15	-	15,16,17,17	3
1	OAS	G	149[A]	6/10	0.95	0.16	-	15,17,17,17	3
1	OAS	G	149[B]	9/10	0.95	0.16	-	8,16,17,17	6
1	OAS	J	149[A]	6/10	0.93	0.14	-	15,17,17,18	3
1	OAS	B	149[A]	6/10	0.94	0.13	-	15,17,17,18	3
1	OAS	J	149[B]	9/10	0.93	0.14	-	8,16,17,18	6
1	OAS	I	149[B]	9/10	0.94	0.14	-	8,16,17,18	6
1	OAS	B	149[B]	9/10	0.94	0.13	-	8,16,17,18	6
1	OAS	I	149[A]	6/10	0.94	0.14	-	15,17,17,18	3
1	OAS	L	149[B]	9/10	0.87	0.17	-	8,16,17,17	6
1	OAS	L	149[A]	6/10	0.87	0.17	-	15,16,17,17	3
1	OAS	D	149[B]	9/10	0.94	0.17	-	7,16,17,18	6
1	OAS	E	149[B]	9/10	0.93	0.15	-	7,17,17,17	6
1	OAS	D	149[A]	6/10	0.94	0.17	-	15,16,17,18	3
1	OAS	K	149[A]	6/10	0.92	0.17	-	15,17,17,18	3
1	OAS	E	149[A]	6/10	0.93	0.15	-	15,17,17,17	3
1	OAS	K	149[B]	9/10	0.92	0.17	-	8,16,17,18	6
1	OAS	C	149[A]	6/10	0.94	0.15	-	15,17,17,18	3

6.3 Carbohydrates [i](#)

There are no carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(\AA^2)	Q<0.9
2	CSC	F	1383[B]	25/28	0.89	0.19	6.10	39,49,61,62	2
2	CSC	F	1383[A]	28/28	0.89	0.19	4.10	39,51,61,62	5
2	CSC	J	1385	25/28	0.88	0.26	3.79	19,23,30,30	25
2	CSC	I	1383	25/28	0.87	0.27	3.30	4,16,29,30	25
2	CSC	G	1383	25/28	0.83	0.30	3.09	11,21,36,37	25
2	CSC	B	1384	25/28	0.90	0.24	2.92	11,19,28,29	25
2	CSC	C	1383	25/28	0.89	0.23	2.48	11,22,33,34	25
2	CSC	K	1385	25/28	0.88	0.24	2.35	23,26,30,31	25
2	CSC	E	1383	25/28	0.81	0.26	1.99	14,27,29,31	25
3	ACT	C	1384	4/4	0.98	0.24	1.78	22,22,22,23	0
3	ACT	A	1385	4/4	0.91	0.17	1.77	43,44,44,45	0
2	CSC	D	1383	25/28	0.88	0.24	1.52	7,18,33,35	25
3	ACT	L	1384	4/4	0.97	0.22	1.46	43,43,43,44	0
2	CSC	H	1383[A]	28/28	0.88	0.20	1.44	46,60,84,84	5
2	CSC	H	1383[B]	25/28	0.88	0.20	1.44	46,60,84,84	2
3	ACT	B	1386	4/4	0.91	0.19	1.31	35,37,37,39	0
2	CSC	L	1383[B]	25/28	0.88	0.18	1.05	37,46,55,56	2
2	CSC	L	1383[A]	28/28	0.88	0.18	1.05	37,50,55,56	5
2	CSC	A	1383	25/28	0.86	0.20	1.05	29,43,48,48	25
3	ACT	F	1384	4/4	0.98	0.20	0.73	40,40,40,40	0
3	ACT	B	1385	4/4	0.90	0.17	0.71	30,31,31,33	0
3	ACT	I	1384	4/4	0.95	0.15	0.42	26,28,28,30	0
3	ACT	I	1385	4/4	0.96	0.15	0.07	37,37,38,40	0
3	ACT	E	1385	4/4	0.96	0.14	-0.18	39,39,40,40	0
3	ACT	D	1384	4/4	0.97	0.15	-0.34	23,24,24,25	0
3	ACT	I	1386	4/4	0.94	0.13	-0.79	41,42,42,42	0
3	ACT	E	1384	4/4	0.96	0.13	-0.81	25,26,26,26	0
3	ACT	A	1384	4/4	0.96	0.12	-1.27	26,26,27,27	0
3	ACT	G	1384	4/4	0.95	0.10	-1.27	37,37,37,38	0
3	ACT	H	1384	4/4	0.95	0.11	-1.39	37,37,38,38	0

6.5 Other polymers

There are no such residues in this entry.