Full wwPDB X-ray Structure Validation Report (i)

Dec 19, 2023 – 06:07 PM EST

PDB ID	:	8SRX
Title	:	Crystal structure of BAK-BAX heterodimer with lysoPC
Authors	:	Brouwer, J.M.; Czabotar, P.E.; Colman, P.M.; Miller, M.S.
Deposited on	:	2023-05-07
Resolution	:	2.09 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
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)	:	2.36

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 2.09 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.
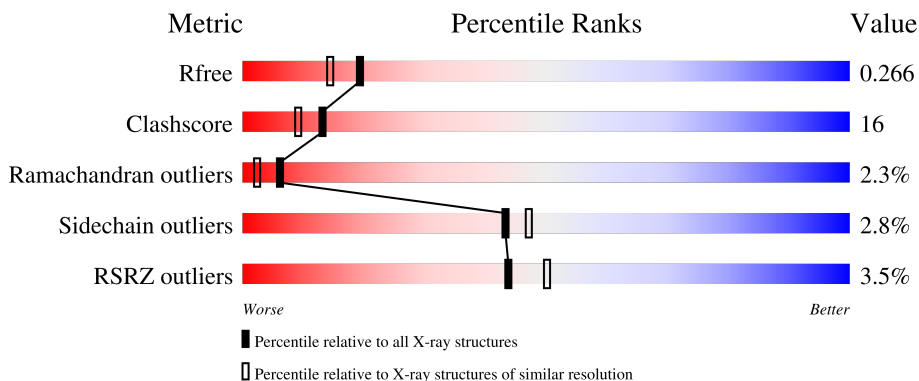
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	91	4% / 60% 31% 9%
1	C	91	3% / 64% 21% · 13%
2	B	80	4% / 75% 16% · 5%
2	D	80	% / 65% 26% · 6%

2 Entry composition ⓘ

There are 9 unique types of molecules in this entry. The entry contains 2708 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 Bcl-2 homologous antagonist/killer.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	83	Total 656	C 413	N 119	O 122	S 2	0	1	0
1	C	79	Total 621	C 396	N 110	O 114	S 1	0	0	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	64	GLY	-	expression tag	UNP Q16611
A	65	PRO	-	expression tag	UNP Q16611
A	66	LEU	-	expression tag	UNP Q16611
A	67	GLY	-	expression tag	UNP Q16611
A	147	GLY	-	expression tag	UNP Q16611
A	148	SER	-	expression tag	UNP Q16611
A	149	GLY	-	expression tag	UNP Q16611
A	150	GLY	-	expression tag	UNP Q16611
A	151	SER	-	expression tag	UNP Q16611
A	152	GLY	-	expression tag	UNP Q16611
A	153	GLY	-	expression tag	UNP Q16611
A	154	SER	-	expression tag	UNP Q16611
C	64	GLY	-	expression tag	UNP Q16611
C	65	PRO	-	expression tag	UNP Q16611
C	66	LEU	-	expression tag	UNP Q16611
C	67	GLY	-	expression tag	UNP Q16611
C	147	GLY	-	expression tag	UNP Q16611
C	148	SER	-	expression tag	UNP Q16611
C	149	GLY	-	expression tag	UNP Q16611
C	150	GLY	-	expression tag	UNP Q16611
C	151	SER	-	expression tag	UNP Q16611
C	152	GLY	-	expression tag	UNP Q16611
C	153	GLY	-	expression tag	UNP Q16611
C	154	SER	-	expression tag	UNP Q16611

• Molecule 2 is a protein called Apoptosis regulator BAX.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	76	Total	C	N	O	S	0	0	0
			600	381	102	114	3			
2	D	75	Total	C	N	O	S	0	0	0
			592	377	101	111	3			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	49	GLY	-	expression tag	UNP Q07812
B	50	GLY	-	expression tag	UNP Q07812
B	51	SER	-	expression tag	UNP Q07812
B	52	GLY	-	expression tag	UNP Q07812
B	62	SER	CYS	conflict	UNP Q07812
B	126	SER	CYS	conflict	UNP Q07812
D	49	GLY	-	expression tag	UNP Q07812
D	50	GLY	-	expression tag	UNP Q07812
D	51	SER	-	expression tag	UNP Q07812
D	52	GLY	-	expression tag	UNP Q07812
D	62	SER	CYS	conflict	UNP Q07812
D	126	SER	CYS	conflict	UNP Q07812

• Molecule 3 is [(2 {R})-2-oxidanyl-3-[oxidanyl-[2-(trimethyl-l^{4}-azanyl)ethoxy]phosphoryl]oxy-propyl] hexadecanoate (three-letter code: K6G) (formula: $C_{24}H_{51}NO_7P$) (labeled as "Ligand of Interest" by depositor).

K6G
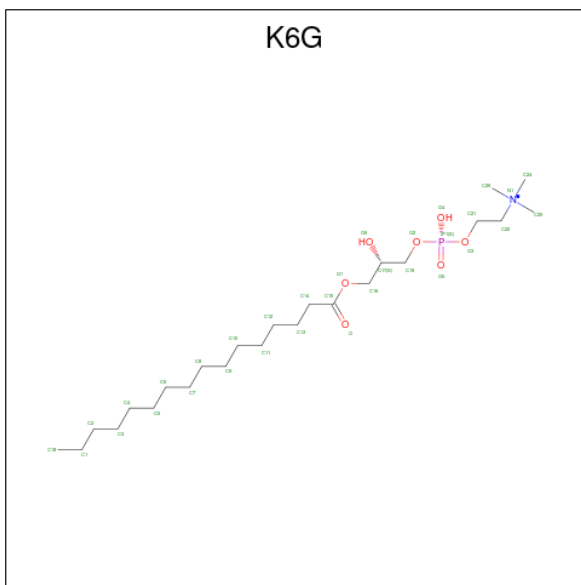
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total 33	C 24	N 1	O 7	P 1	0	0
3	B	1	Total 33	C 24	N 1	O 7	P 1	0	0
3	D	1	Total 33	C 24	N 1	O 7	P 1	0	0

- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total 1	Zn 1	0	0

- Molecule 5 is SODIUM ION (three-letter code: NA) (formula: Na).

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

- Molecule 6 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).

PEG

C4
OH O4
O2
O
C3
C1
C2
HO
O1
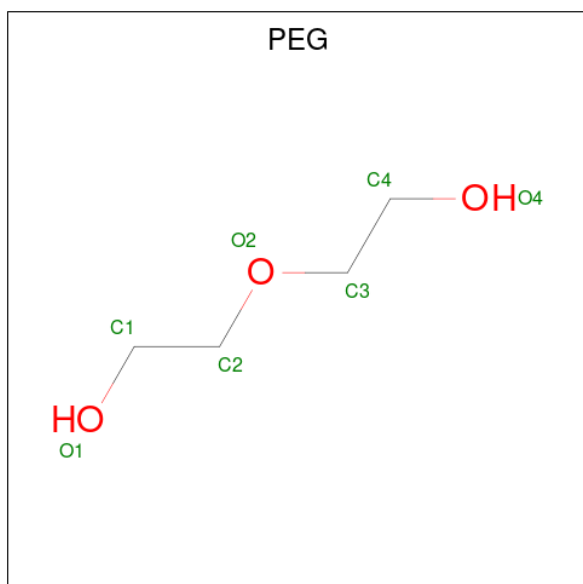
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total 7	C 4	O 3	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	D	1	Total 7	C 4	O 3	0	0

- Molecule 7 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	D	1	Total 4	C 2	O 2	0	0
7	D	1	Total 4	C 2	O 2	0	0

- Molecule 8 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	D	1	Total 1	Cl 1	0	0

- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	33	Total 33	O 33	0	0
9	B	32	Total 32	O 32	0	0
9	C	21	Total 21	O 21	0	0

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| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	D	28	Total 28	O 28	0	0

3 Residue-property plots ⓘ

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: Bcl-2 homologous antagonist/killer

• Molecule 1: Bcl-2 homologous antagonist/killer

• Molecule 2: Apoptosis regulator BAX

• Molecule 2: Apoptosis regulator BAX
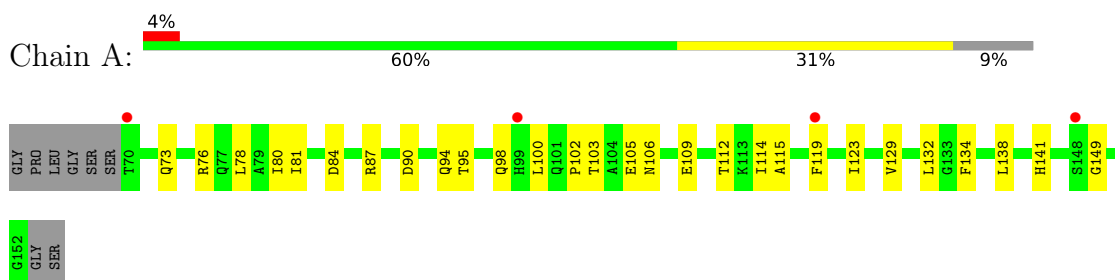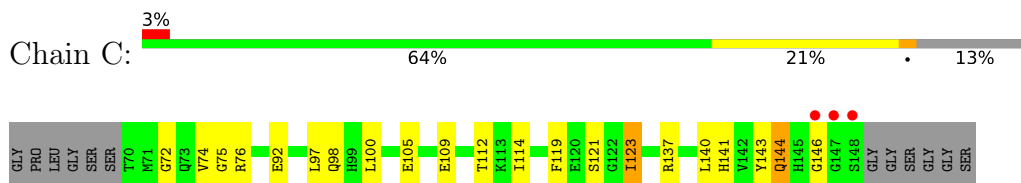
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	158.17Å 45.56Å 43.71Å 90.00° 101.76° 90.00°	Depositor
Resolution (Å)	38.71 – 2.09 43.71 – 2.09	Depositor EDS
% Data completeness (in resolution range)	99.7 (38.71-2.09) 99.8 (43.71-2.09)	Depositor EDS
R_{merge}	0.20	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.18 (at 2.10Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.216 , 0.265 0.216 , 0.266	Depositor DCC
R_{free} test set	1812 reflections (9.99%)	wwPDB-VP
Wilson B-factor (Å^2)	30.4	Xtriage
Anisotropy	0.358	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 39.1	EDS
L-test for twinning[2]	$< \lvert L \rvert > = 0.46, < L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	2708	wwPDB-VP
Average B, all atoms (Å^2)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 15.33% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< \lvert L \rvert >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: EDO, CL, NA, K6G, ZN, PEG

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	0.33	0/670	0.48	0/903
1	C	0.36	0/635	0.46	0/859
2	B	0.37	0/609	0.53	0/817
2	D	0.31	0/601	0.47	0/806
All	All	0.34	0/2515	0.49	0/3385

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 ⓘ

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	656	0	624	31	0
1	C	621	0	589	26	0
2	B	600	0	601	23	0
2	D	592	0	597	29	0
3	A	33	0	0	0	0
3	B	33	0	0	2	0
3	D	33	0	0	1	0
4	A	1	0	0	0	0
5	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	1	0	0	0	0
6	B	7	0	10	0	0
6	D	7	0	10	0	0
7	D	8	0	12	0	0
8	D	1	0	0	0	0
9	A	33	0	0	2	0
9	B	32	0	0	1	0
9	C	21	0	0	2	0
9	D	28	0	0	1	0
All	All	2708	0	2443	82	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 16.

All (82) 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:C:114:ILE:HD12	2:D:59:LEU:HD13	1.30	1.08
1:A:114:ILE:HD12	2:B:59:LEU:HD13	1.30	1.08
2:D:107:TRP:CE3	2:D:110:VAL:HG11	2.08	0.88
2:B:128:LYS:HE2	2:B:128:LYS:HA	1.60	0.81
2:D:107:TRP:HA	2:D:110:VAL:HG12	1.62	0.80
1:A:129:VAL:HG22	3:B:201:K6G:C3	2.13	0.79
1:A:114:ILE:CD1	2:B:59:LEU:HD13	2.14	0.77
2:B:80:ILE:HD13	2:B:119:LYS:HG3	1.66	0.77
2:B:127:THR:O	2:B:128:LYS:HB2	1.91	0.71
1:C:100:LEU:HD23	1:C:141:HIS:ND1	2.06	0.71
1:C:114:ILE:HD11	2:D:59:LEU:HD22	1.74	0.69
2:D:107:TRP:HE3	2:D:110:VAL:HG11	1.58	0.66
1:A:78:LEU:O	1:A:78:LEU:HD13	1.95	0.66
1:C:114:ILE:CD1	2:D:59:LEU:HD13	2.16	0.66
1:A:78:LEU:HD12	2:B:99:MET:CE	2.26	0.65
2:D:107:TRP:CA	2:D:110:VAL:HG12	2.27	0.65
1:A:123:ILE:HG13	9:C:205:HOH:O	1.98	0.64
1:C:114:ILE:HD11	2:D:63:LEU:CD1	2.28	0.64
1:C:97:LEU:HA	1:C:100:LEU:HD13	1.83	0.61
2:D:86:ASP:O	2:D:88:PRO:HD2	2.01	0.61
1:C:119:PHE:CD1	1:C:123:ILE:HG21	2.36	0.60
1:A:80:ILE:HG23	9:A:326:HOH:O	2.00	0.60
1:C:114:ILE:HD11	2:D:63:LEU:HD11	1.82	0.60
2:D:107:TRP:O	2:D:110:VAL:HG12	2.02	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:80:ILE:O	2:D:123:LYS:HE3	2.02	0.59
2:D:83:VAL:HG21	2:D:120:LEU:HD21	1.84	0.59
1:A:81:ILE:HD11	2:B:75:GLU:CD	2.24	0.58
1:C:141:HIS:ND1	9:C:202:HOH:O	2.33	0.57
2:B:127:THR:O	2:B:128:LYS:HD2	2.05	0.57
1:C:100:LEU:HD23	1:C:141:HIS:HD1	1.70	0.56
1:A:105:GLU:O	1:A:109:GLU:HG3	2.06	0.55
1:A:78:LEU:HD12	2:B:99:MET:HE3	1.88	0.55
1:C:137:ARG:HD2	2:D:107:TRP:CZ2	2.41	0.55
2:B:54:ALA:O	2:B:56:THR:HG23	2.08	0.54
1:A:134:PHE:CE2	1:A:138:LEU:HD11	2.42	0.54
1:C:74:VAL:HG13	2:D:79:MET:HE3	1.90	0.54
2:D:83:VAL:HG13	9:D:314:HOH:O	2.06	0.53
1:A:84:ASP:HA	1:A:87:ARG:NH1	2.23	0.53
2:D:107:TRP:HA	2:D:110:VAL:CG1	2.36	0.53
2:B:127:THR:O	2:B:128:LYS:CB	2.56	0.52
1:C:72:GLY:O	1:C:76:ARG:HG3	2.10	0.52
1:A:134:PHE:CZ	2:B:59:LEU:HD11	2.45	0.51
2:B:127:THR:C	2:B:128:LYS:HD2	2.30	0.51
1:C:121:SER:CB	2:D:64:LYS:HE2	2.40	0.51
1:A:84:ASP:OD1	1:A:87:ARG:NH1	2.44	0.51
1:A:76:ARG:HH21	2:B:101:SER:HB3	1.74	0.51
1:A:112:THR:OG1	1:C:123:ILE:HD12	2.10	0.50
1:A:114:ILE:HD11	2:B:63:LEU:CD1	2.41	0.50
1:A:132:LEU:HD12	3:B:201:K6G:C4	2.41	0.50
2:D:73:ASN:O	2:D:77:GLN:HG2	2.12	0.50
9:A:309:HOH:O	2:B:65:ARG:HD3	2.11	0.49
1:C:72:GLY:HA2	2:D:98:ASP:OD2	2.13	0.49
1:A:95:THR:HG21	2:B:58:LYS:HG3	1.95	0.49
2:D:99:MET:HE2	2:D:109:ARG:HB3	1.93	0.49
1:A:114:ILE:HD11	2:B:63:LEU:HD12	1.94	0.48
2:D:103:GLY:HA2	3:D:201:K6G:O5	2.14	0.48
1:A:78:LEU:HD12	2:B:99:MET:SD	2.53	0.48
2:D:107:TRP:C	2:D:110:VAL:HG12	2.34	0.48
1:C:92:GLU:OE1	1:C:92:GLU:N	2.47	0.47
1:A:76:ARG:HH11	1:A:76:ARG:HG3	1.80	0.47
1:C:114:ILE:HD11	2:D:63:LEU:HD12	1.96	0.47
2:D:85:THR:O	2:D:86:ASP:CB	2.62	0.47
2:B:65:ARG:NH2	9:B:307:HOH:O	2.49	0.45
1:A:115:ALA:O	1:A:119:PHE:HD1	1.99	0.45
1:C:114:ILE:CD1	2:D:63:LEU:HD11	2.47	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:110:VAL:HG13	2:D:111:VAL:N	2.31	0.45
1:A:100:LEU:HD13	1:A:141:HIS:CE1	2.52	0.45
1:A:76:ARG:HH21	2:B:101:SER:CB	2.30	0.44
1:A:119:PHE:HB3	1:C:112:THR:HG23	1.99	0.44
2:B:86:ASP:OD1	2:B:87:SER:N	2.50	0.44
1:C:143:TYR:CD2	1:C:143:TYR:O	2.72	0.43
2:D:83:VAL:HG11	2:D:91:VAL:HG11	2.00	0.43
1:C:119:PHE:HD1	1:C:123:ILE:HG21	1.81	0.43
1:C:75:GLY:HA3	2:D:98:ASP:HB2	2.01	0.43
1:A:90:ASP:O	1:A:94:GLN:HG2	2.19	0.42
1:A:102:PRO:HG2	1:A:106:ASN:HD22	1.83	0.42
1:A:123:ILE:C	1:A:123:ILE:HD12	2.40	0.42
1:A:123:ILE:HD12	1:A:123:ILE:O	2.19	0.41
1:A:103:THR:HG21	1:A:149:GLY:H	1.85	0.41
1:C:97:LEU:N	1:C:97:LEU:HD12	2.36	0.41
1:C:105:GLU:O	1:C:109:GLU:HG3	2.21	0.41
2:B:122:LEU:HD11	1:C:140:LEU:HA	2.04	0.40

There are no symmetry-related clashes.

5.3   Torsion angles ⓘ

5.3.1   Protein backbone ⓘ

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	82/91 (90%)	78 (95%)	3 (4%)	1 (1%)	13	8
1	C	77/91 (85%)	73 (95%)	2 (3%)	2 (3%)	5	2
2	B	74/80 (92%)	69 (93%)	4 (5%)	1 (1%)	11	6
2	D	73/80 (91%)	68 (93%)	2 (3%)	3 (4%)	3	1
All	All	306/342 (90%)	288 (94%)	11 (4%)	7 (2%)	6	2

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	98	GLN
1	C	144	GLN
2	D	55	SER
2	D	86	ASP
1	C	146	GLY
2	D	84	ASP
2	B	54	ALA

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	65/70 (93%)	64 (98%)	1 (2%)	65	71
1	C	61/70 (87%)	58 (95%)	3 (5%)	25	23
2	B	65/66 (98%)	63 (97%)	2 (3%)	40	43
2	D	64/66 (97%)	63 (98%)	1 (2%)	62	69
All	All	255/272 (94%)	248 (97%)	7 (3%)	43	48

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	73	GLN
2	B	59	LEU
2	B	128	LYS
1	C	98	GLN
1	C	123	ILE
1	C	144	GLN
2	D	59	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	106	ASN
1	C	144	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 ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 11 ligands modelled in this entry, 4 are monoatomic - leaving 7 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	K6G	D	201	-	32,32,32	0.36	0	37,39,39	0.34	0
6	PEG	D	202	-	6,6,6	0.46	0	5,5,5	0.37	0
7	EDO	D	204	-	3,3,3	0.51	0	2,2,2	0.19	0
3	K6G	B	201	-	32,32,32	1.25	4 (12%)	37,39,39	1.07	2 (5%)
6	PEG	B	202	-	6,6,6	0.45	0	5,5,5	0.48	0
3	K6G	A	201	-	32,32,32	0.35	0	37,39,39	0.32	0
7	EDO	D	203	-	3,3,3	0.44	0	2,2,2	0.34	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	K6G	D	201	-	-	18/34/34/34	-
6	PEG	D	202	-	-	1/4/4/4	-
7	EDO	D	204	-	-	1/1/1/1	-

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W O R L D W I D E
wwPDB
PROTEIN DATA BANK

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	K6G	B	201	-	-	21/34/34/34	-
6	PEG	B	202	-	-	2/4/4/4	-
3	K6G	A	201	-	-	11/34/34/34	-
7	EDO	D	203	-	-	0/1/1/1	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	201	K6G	O1-C15	2.61	1.40	1.33
3	B	201	K6G	P1-O4	-2.49	1.43	1.55
3	B	201	K6G	O1-C16	-2.28	1.40	1.45
3	B	201	K6G	O-C15	-2.13	1.16	1.22

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	201	K6G	O1-C15-C14	3.09	121.60	111.91
3	B	201	K6G	O1-C15-O	-2.02	118.50	123.59

There are no chirality outliers.

All (54) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	201	K6G	C21-O3-P1-O4
3	A	201	K6G	C21-O3-P1-O5
3	A	201	K6G	O3-C21-C22-N1
3	B	201	K6G	C21-O3-P1-O4
3	B	201	K6G	C21-O3-P1-O5
3	D	201	K6G	C16-C17-C19-O2
3	D	201	K6G	O6-C17-C19-O2
3	D	201	K6G	C19-O2-P1-O5
3	D	201	K6G	O3-C21-C22-N1
3	B	201	K6G	O1-C16-C17-O6
3	A	201	K6G	C21-C22-N1-C26
3	B	201	K6G	O1-C16-C17-C19
3	B	201	K6G	C12-C13-C14-C15
3	A	201	K6G	C21-C22-N1-C25
6	D	202	PEG	O2-C3-C4-O4
3	D	201	K6G	O1-C16-C17-O6
3	A	201	K6G	C21-O3-P1-O2

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Mol	Chain	Res	Type	Atoms
3	B	201	K6G	C21-O3-P1-O2
3	D	201	K6G	C19-O2-P1-O3
3	B	201	K6G	C21-C22-N1-C24
3	B	201	K6G	C21-C22-N1-C25
3	D	201	K6G	O1-C16-C17-C19
3	D	201	K6G	C11-C12-C13-C14
3	B	201	K6G	C10-C11-C12-C13
3	B	201	K6G	C11-C10-C9-C8
3	D	201	K6G	C10-C11-C12-C13
3	B	201	K6G	C9-C10-C11-C12
3	B	201	K6G	C21-C22-N1-C26
3	D	201	K6G	C1-C2-C3-C4
3	D	201	K6G	C7-C8-C9-C10
3	A	201	K6G	C3-C4-C5-C6
3	A	201	K6G	C21-C22-N1-C24
3	B	201	K6G	C7-C8-C9-C10
3	D	201	K6G	C3-C4-C5-C6
3	B	201	K6G	C6-C7-C8-C9
3	B	201	K6G	O6-C17-C19-O2
3	D	201	K6G	C18-C1-C2-C3
3	B	201	K6G	C16-C17-C19-O2
7	D	204	EDO	O1-C1-C2-O2
6	B	202	PEG	C1-C2-O2-C3
6	B	202	PEG	C4-C3-O2-C2
3	B	201	K6G	C19-O2-P1-O5
3	D	201	K6G	C19-O2-P1-O4
3	D	201	K6G	C9-C10-C11-C12
3	B	201	K6G	C22-C21-O3-P1
3	B	201	K6G	C18-C1-C2-C3
3	B	201	K6G	C5-C6-C7-C8
3	D	201	K6G	C2-C3-C4-C5
3	A	201	K6G	C10-C11-C12-C13
3	D	201	K6G	C17-C16-O1-C15
3	A	201	K6G	C13-C14-C15-O1
3	B	201	K6G	C3-C4-C5-C6
3	D	201	K6G	C22-C21-O3-P1
3	A	201	K6G	C13-C14-C15-O

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	201	K6G	1	0
3	B	201	K6G	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand K6G D 201

Bond lengths

Bond angles

Torsions

Rings

Ligand K6G B 201

Bond lengths

Bond angles

Torsions

Rings

Ligand K6G A 201
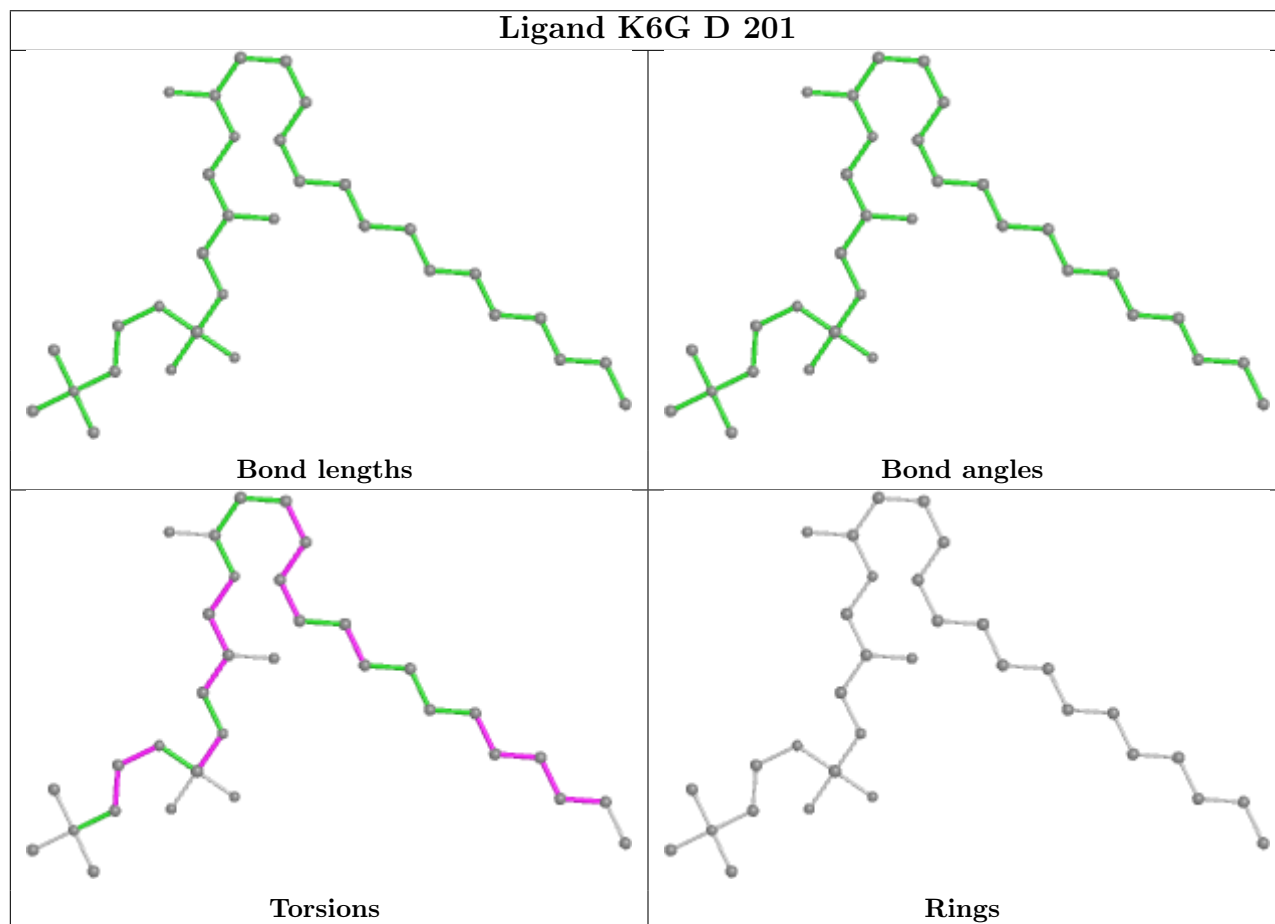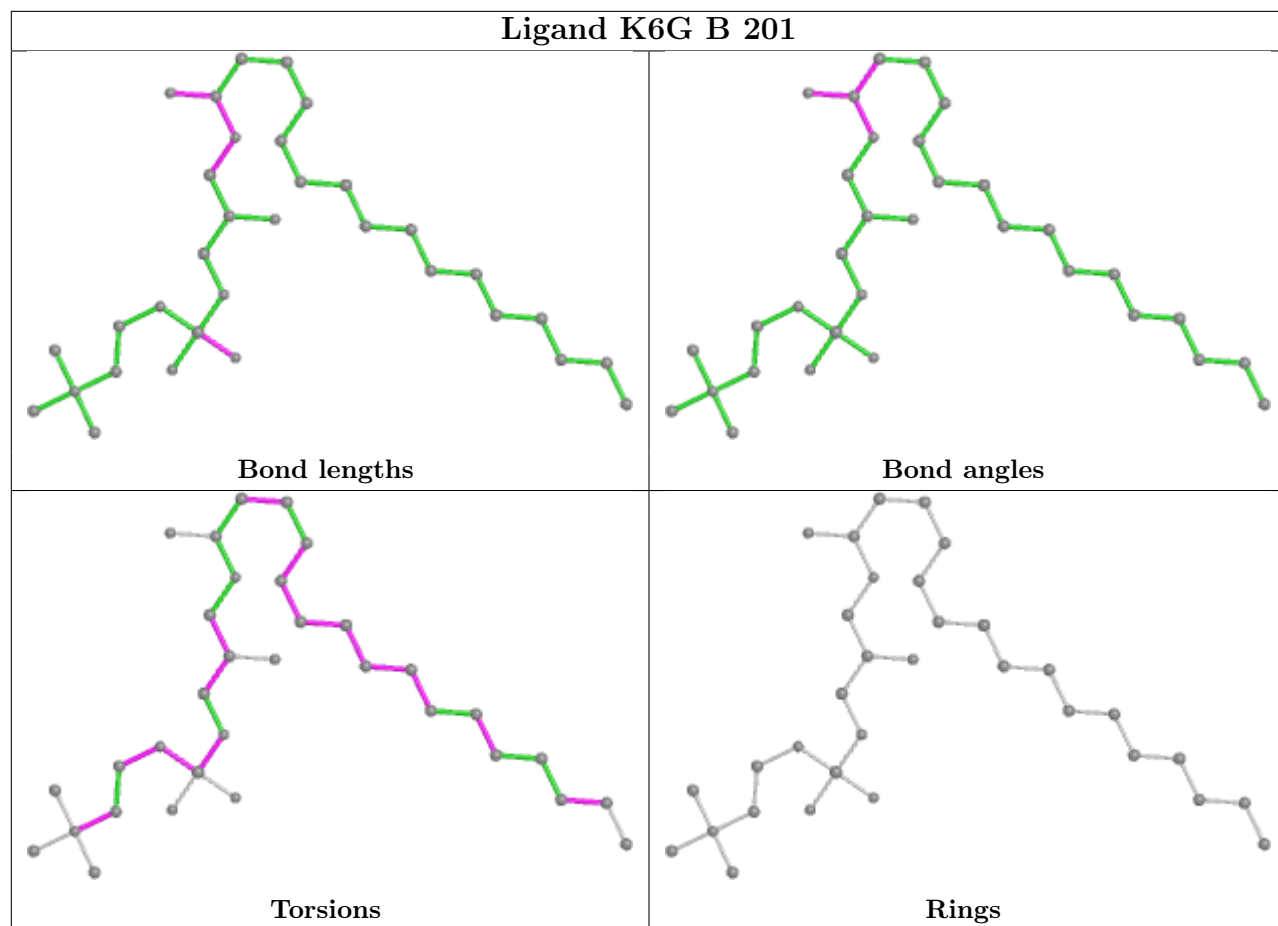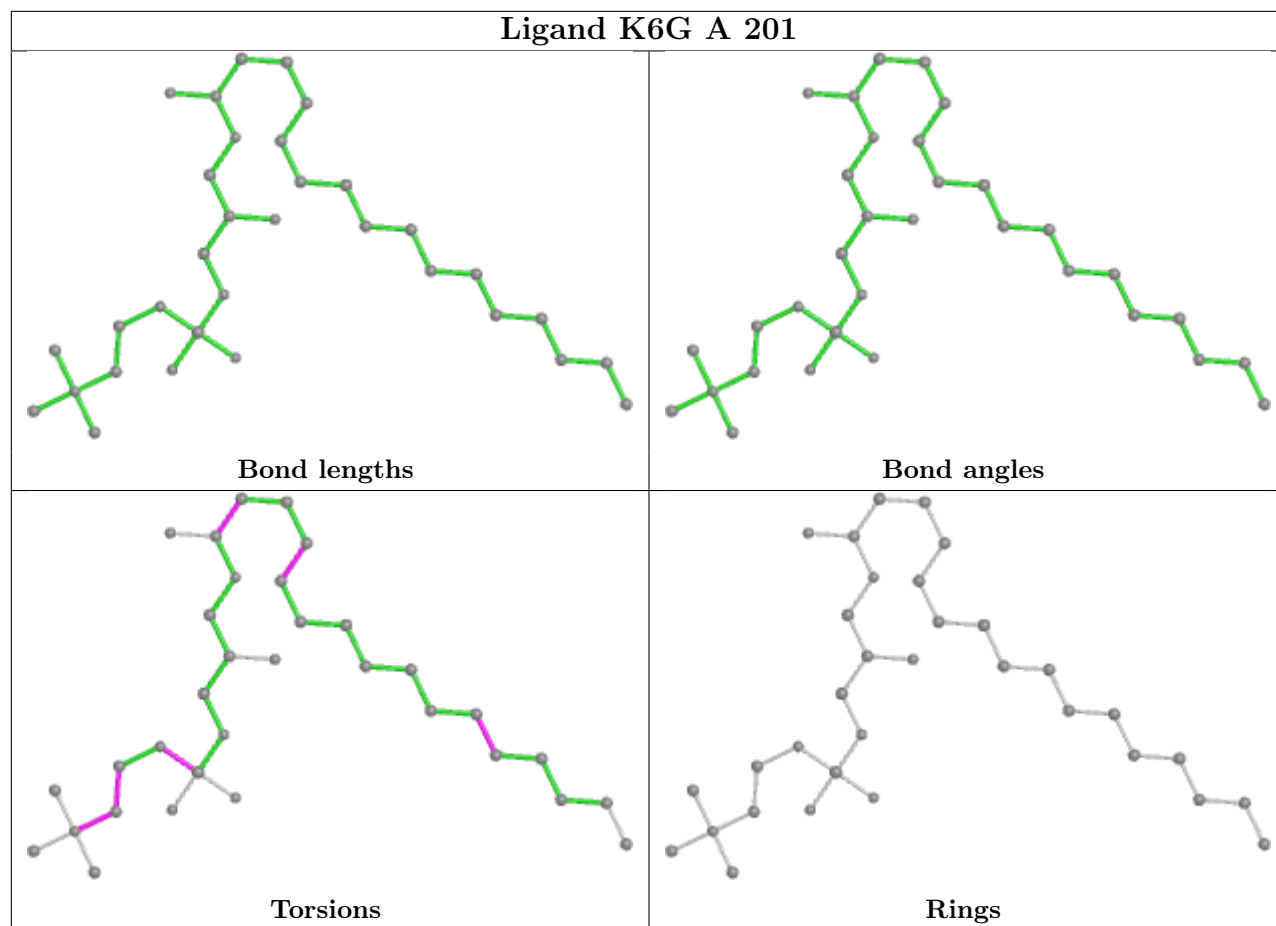
5.7 Other polymers ⓘ

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   ⓘ

6.1   Protein, DNA and RNA chains   ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
1	A	83/91 (91%)	0.00	4 (4%)	30	36	20, 32, 69, 90	0
1	C	79/91 (86%)	0.03	3 (3%)	40	46	21, 35, 73, 81	0
2	B	76/80 (95%)	-0.20	3 (3%)	39	45	17, 32, 60, 86	0
2	D	75/80 (93%)	-0.16	1 (1%)	77	80	21, 32, 71, 81	0
All	All	313/342 (91%)	-0.08	11 (3%)	44	50	17, 33, 73, 90	0

All (11) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	146	GLY	6.6
1	A	70	THR	4.0
2	D	83	VAL	3.9
2	B	53	ASP	3.2
1	A	119	PHE	3.1
1	C	147	GLY	2.9
1	A	148	SER	2.4
1	A	99	HIS	2.4
2	B	54	ALA	2.2
2	B	128	LYS	2.2
1	C	148	SER	2.0

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

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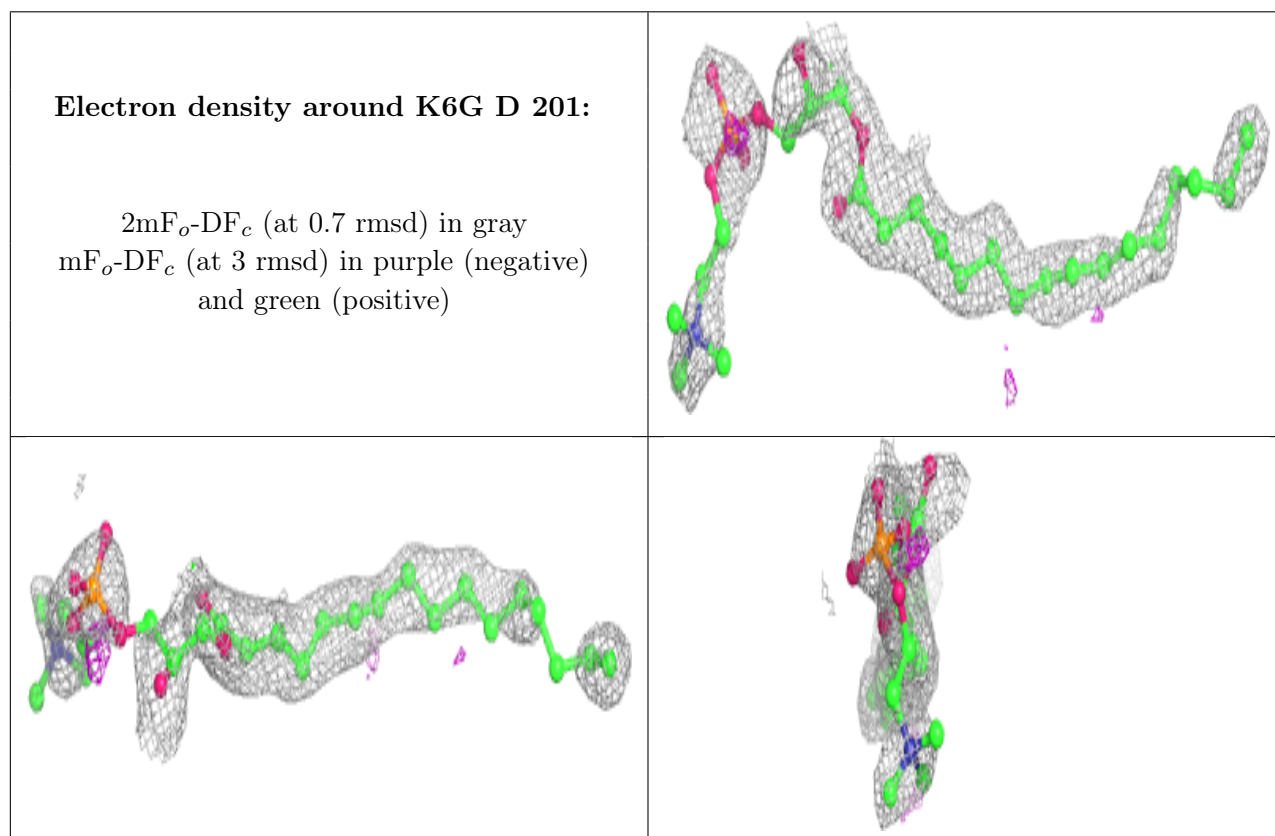
6.3   Carbohydrates   ⓘ

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	K6G	D	201	33/33	0.72	0.30	37,57,87,94	0
5	NA	A	203	1/1	0.75	0.22	68,68,68,68	0
7	EDO	D	204	4/4	0.75	0.13	49,51,55,55	0
6	PEG	D	202	7/7	0.87	0.15	35,40,41,44	0
8	CL	D	205	1/1	0.89	0.09	48,48,48,48	0
5	NA	B	203	1/1	0.92	0.12	47,47,47,47	0
3	K6G	B	201	33/33	0.92	0.17	30,39,52,65	0
3	K6G	A	201	33/33	0.93	0.13	26,34,61,64	0
6	PEG	B	202	7/7	0.96	0.08	36,39,42,54	0
7	EDO	D	203	4/4	0.97	0.09	28,31,32,49	0
4	ZN	A	202	1/1	0.98	0.04	53,53,53,53	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.
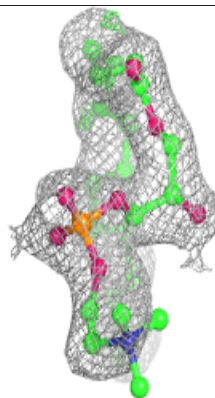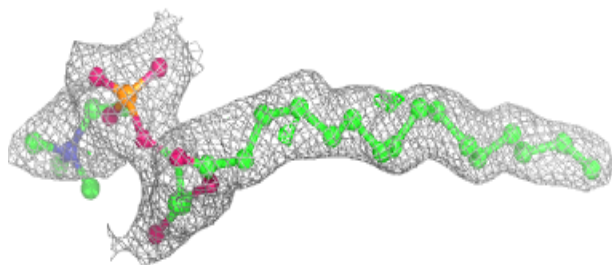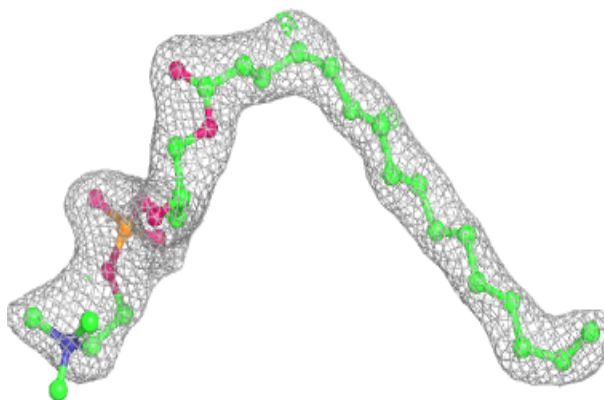

Electron density around K6G D 201:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

Electron density around K6G B 201:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
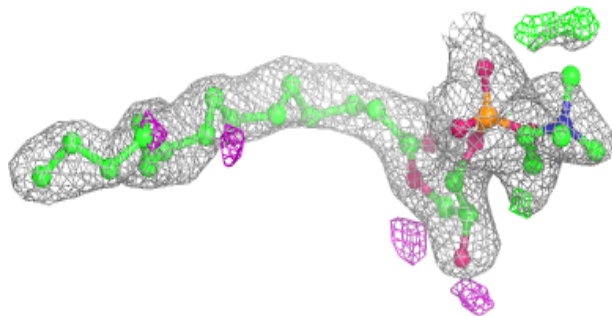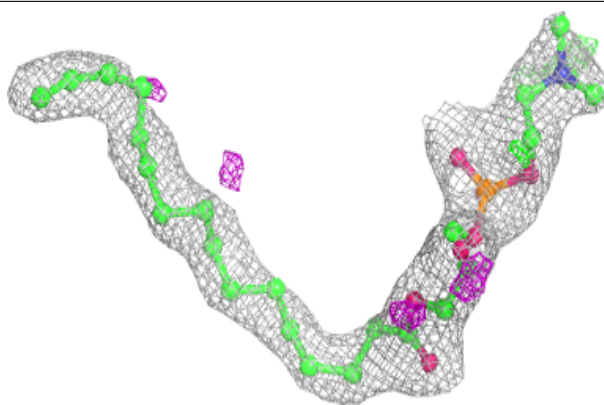
Electron density around K6G A 201:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

6.5 Other polymers (i)

There are no such residues in this entry.