



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 16, 2023 – 02:25 AM EDT

PDB ID : 2GCE  
Title : The 1,1-proton transfer reaction mechanism by alpha-methylacyl-CoA racemase is catalyzed by an aspartate/histidine pair and involves a smooth, methionine-rich surface for binding the fatty acyl moiety  
Authors : Bhaumik, P.; Wierenga, R.K.  
Deposited on : 2006-03-14  
Resolution : 1.85 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](mailto: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>.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (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

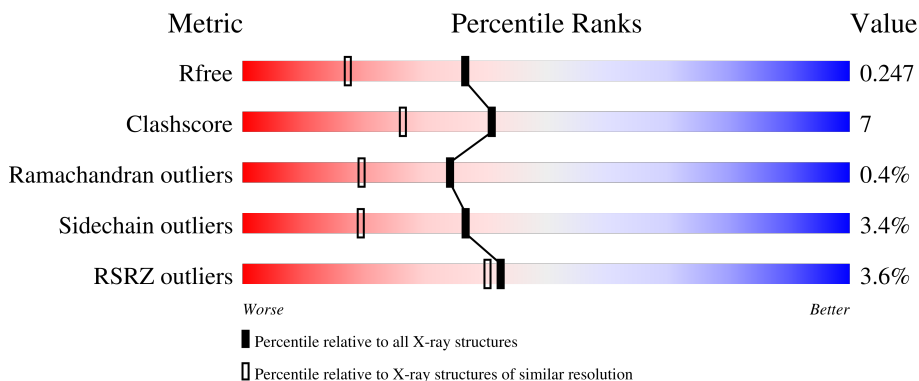
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*


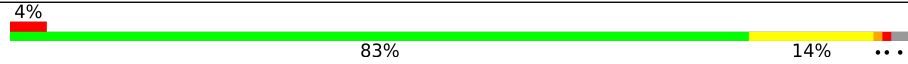
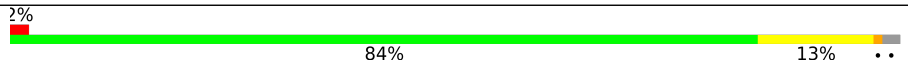

The reported resolution of this entry is 1.85 Å.

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	2469 (1.86-1.86)
Clashscore	141614	2625 (1.86-1.86)
Ramachandran outliers	138981	2592 (1.86-1.86)
Sidechain outliers	138945	2592 (1.86-1.86)
RSRZ outliers	127900	2436 (1.86-1.86)

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  $\geq 3$ , 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	360	 4% 80% 16% ..
1	B	360	 4% 83% 14% ...
1	C	360	 2% 84% 13% ..
1	D	360	 5% 84% 12% ..

## 2 Entry composition [i](#)

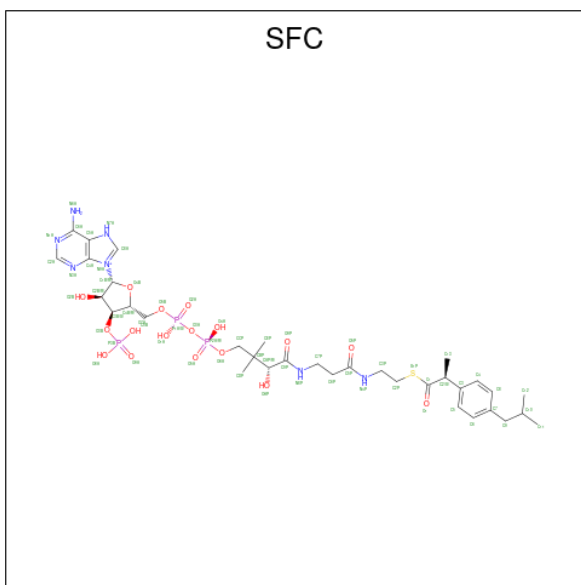
There are 4 unique types of molecules in this entry. The entry contains 12350 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 probable alpha-methylacyl-CoA racemase MCR.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	354	Total 2687	C 1688	N 481	O 502	S 16	0	2	0
1	B	354	Total 2687	C 1688	N 481	O 502	S 16	0	2	0
1	C	354	Total 2687	C 1688	N 481	O 502	S 16	0	2	0
1	D	354	Total 2687	C 1688	N 481	O 502	S 16	0	2	0

- Molecule 2 is (S)-IBUPROFENOYL-COENZYME A (three-letter code: SFC) (formula: C<sub>34</sub>H<sub>53</sub>N<sub>7</sub>O<sub>17</sub>P<sub>3</sub>S).



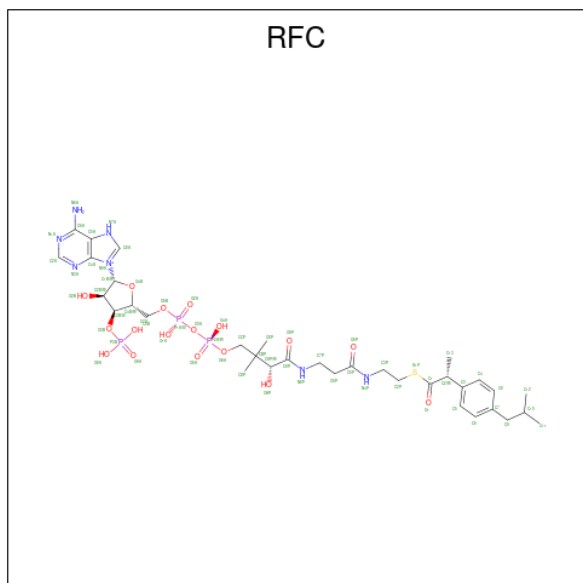
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	N	O	P			S
2	A	1	Total 62	C 34	N 7	O 17	P 3	S 1	0	1
2	B	1	Total 62	C 34	N 7	O 17	P 3	S 1	0	1

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	N	O	P			S
2	C	1	Total 62	C 34	N 7	O 17	P 3	S 1	0	1
2	D	1	Total 62	C 34	N 7	O 17	P 3	S 1	0	1

- Molecule 3 is (R)-IBUPROFENOYL-COENZYME A (three-letter code: RFC) (formula:  $C_{34}H_{53}N_7O_{17}P_3S$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	N	O	P			S
3	A	1	Total 62	C 34	N 7	O 17	P 3	S 1	0	1
3	B	1	Total 62	C 34	N 7	O 17	P 3	S 1	0	1
3	C	1	Total 62	C 34	N 7	O 17	P 3	S 1	0	1
3	D	1	Total 62	C 34	N 7	O 17	P 3	S 1	0	1

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	270	Total 270 O 270	0	0
4	B	290	Total 290 O 290	0	0
4	C	265	Total 265 O 265	0	0

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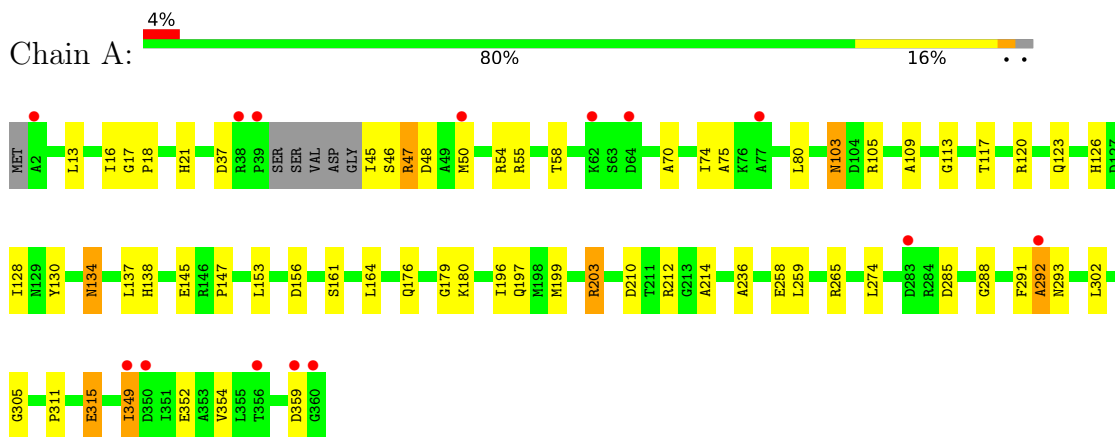
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
4	D	281	Total 281	O 281	0	0

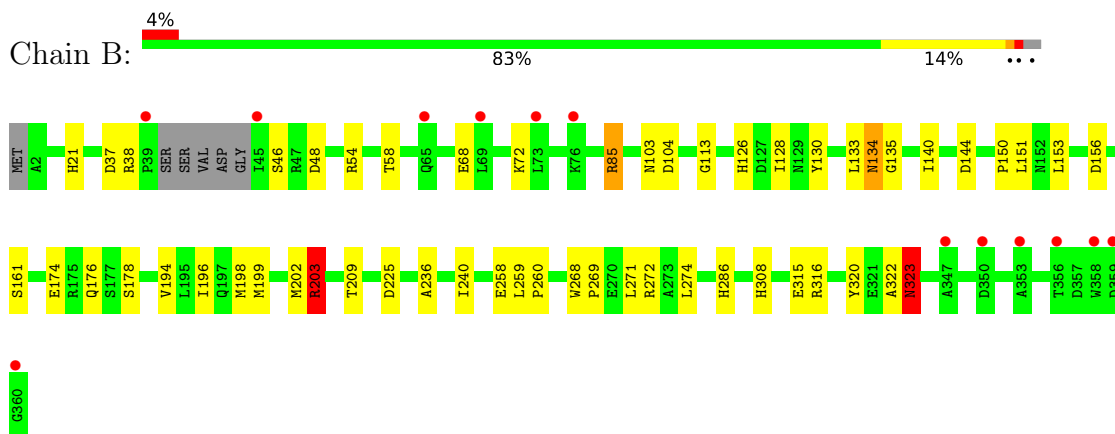
### 3 Residue-property plots [i](#)

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.

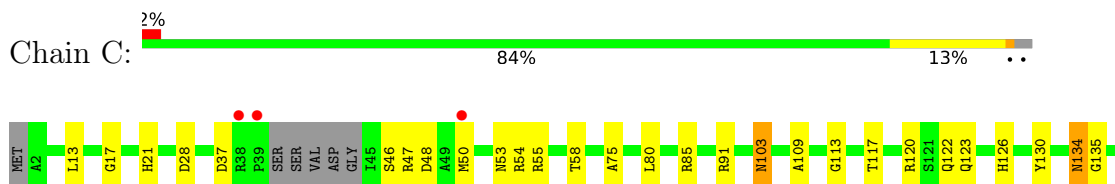
- Molecule 1: probable alpha-methylacyl-CoA racemase MCR



- Molecule 1: probable alpha-methylacyl-CoA racemase MCR

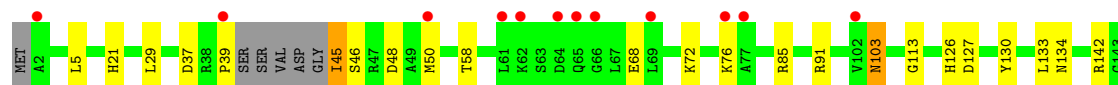
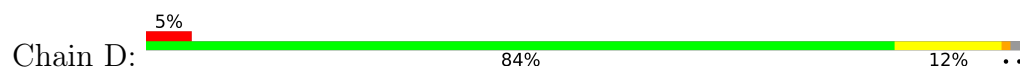


- Molecule 1: probable alpha-methylacyl-CoA racemase MCR





- Molecule 1: probable alpha-methylacyl-CoA racemase MCR



## 4 Data and refinement statistics i

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	179.95Å 79.58Å 117.43Å 90.00° 90.07° 90.00°	Depositor
Resolution (Å)	19.58 – 1.85 19.58 – 1.85	Depositor EDS
% Data completeness (in resolution range)	95.0 (19.58-1.85) 94.7 (19.58-1.85)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	0.07	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.57 (at 1.85Å)	Xtrriage
Refinement program	REFMAC 5.2.0005	Depositor
R, $R_{free}$	0.202 , 0.246 0.227 , 0.247	Depositor DCC
$R_{free}$ test set	6719 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	21.3	Xtrriage
Anisotropy	0.138	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.39 , 60.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.44$ , $\langle L^2 \rangle = 0.26$	Xtrriage
Estimated twinning fraction	0.487 for -h,-k,l	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	12350	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	31.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 75.96 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.1422e-06. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: RFC, SFC

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	0.63	0/2756	0.72	1/3748 (0.0%)
1	B	0.63	0/2756	0.71	1/3748 (0.0%)
1	C	0.59	0/2756	0.69	0/3748
1	D	0.59	0/2756	0.68	2/3748 (0.1%)
All	All	0.61	0/11024	0.70	4/14992 (0.0%)

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	A	0	1
1	B	0	1
1	C	0	1
All	All	0	3

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	203	ARG	NE-CZ-NH1	6.78	123.69	120.30
1	D	203	ARG	NE-CZ-NH1	6.23	123.42	120.30
1	A	203	ARG	NE-CZ-NH1	5.92	123.26	120.30
1	D	142	ARG	NE-CZ-NH1	-5.32	117.64	120.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	54	ARG	Peptide
1	B	54	ARG	Peptide
1	C	54	ARG	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	2687	0	2628	53	1
1	B	2687	0	2628	42	1
1	C	2687	0	2628	42	0
1	D	2687	0	2628	36	0
2	A	62	0	49	2	0
2	B	62	0	49	3	0
2	C	62	0	49	4	0
2	D	62	0	49	5	0
3	A	62	0	49	4	0
3	B	62	0	49	4	0
3	C	62	0	49	4	0
3	D	62	0	49	5	0
4	A	270	0	0	10	1
4	B	290	0	0	7	1
4	C	265	0	0	8	0
4	D	281	0	0	5	0
All	All	12350	0	10904	158	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 7.

All (158) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:46:SER:OG	1:A:48[B]:ASP:OD1	1.65	1.12
1:C:46:SER:OG	1:C:48[B]:ASP:OD1	1.70	1.07
1:C:17:GLY:H	2:C:1753[A]:SFC:H10	1.21	1.04
1:A:47:ARG:HH11	1:A:47:ARG:HG3	1.21	1.01
1:C:47:ARG:HH11	1:C:47:ARG:HB3	1.27	0.98

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:46:SER:OG	1:B:48[B]:ASP:OD1	1.85	0.92
1:A:47:ARG:HG3	1:A:47:ARG:NH1	1.85	0.88
1:A:349:ILE:HD11	1:A:354:VAL:HG23	1.58	0.85
1:B:198:MET:HG2	1:B:202:MET:HE2	1.56	0.85
1:A:288:GLY:O	1:A:292:ALA:HB2	1.77	0.85
1:A:120:ARG:HH11	1:A:123:GLN:HE22	1.25	0.83
1:C:259:LEU:HD22	1:C:274:LEU:HD13	1.63	0.81
1:A:156:ASP:OD2	3:A:2751[B]:RFC:H2	1.80	0.80
1:C:17:GLY:N	2:C:1753[A]:SFC:H10	1.97	0.80
1:C:47:ARG:HB3	1:C:47:ARG:NH1	1.97	0.79
1:A:259:LEU:HD22	1:A:274:LEU:HD13	1.64	0.79
1:A:265:ARG:NH1	4:A:2994:HOH:O	2.15	0.78
1:A:47:ARG:HH11	1:A:47:ARG:CG	1.99	0.76
1:D:21:HIS:HD2	1:D:161:SER:OG	1.71	0.73
1:C:126:HIS:ND1	3:C:2753[B]:RFC:H5	2.03	0.73
1:B:21:HIS:HD2	1:B:161:SER:OG	1.72	0.72
1:D:259:LEU:HD22	1:D:274:LEU:HD13	1.71	0.71
1:B:126:HIS:ND1	3:B:2752[B]:RFC:H5	2.06	0.71
1:C:48[B]:ASP:HB2	1:C:50[B]:MET:HG3	1.77	0.67
1:A:311:PRO:O	1:A:315:GLU:HG2	1.95	0.67
1:D:286:HIS:HE1	4:D:2820:HOH:O	1.77	0.67
1:B:156:ASP:OD2	2:B:1752[A]:SFC:H5	1.96	0.66
1:C:265:ARG:O	4:C:2952:HOH:O	2.14	0.66
1:B:286:HIS:HE1	4:B:2781:HOH:O	1.78	0.66
1:C:120:ARG:HH11	1:C:123:GLN:HE22	1.44	0.65
1:C:126:HIS:CE1	3:C:2753[B]:RFC:H5	2.32	0.64
1:A:291:PHE:O	1:A:293:ASN:N	2.21	0.64
1:C:269:PRO:HD3	4:C:2952:HOH:O	1.98	0.63
1:A:105:ARG:HG2	4:A:3015:HOH:O	1.97	0.63
1:A:305:GLY:HA2	1:B:203:ARG:HH22	1.62	0.63
1:B:85:ARG:HD2	4:B:2858:HOH:O	1.97	0.63
1:B:126:HIS:CE1	3:B:2752[B]:RFC:H5	2.34	0.62
1:D:156:ASP:OD2	3:D:2754[B]:RFC:H2	1.98	0.62
1:A:48[B]:ASP:HB2	1:A:50[B]:MET:HG3	1.81	0.62
1:B:156:ASP:OD2	3:B:2752[B]:RFC:H2	1.99	0.61
1:D:46:SER:OG	1:D:48[B]:ASP:OD1	2.18	0.61
1:B:258:GLU:HG3	4:B:2958:HOH:O	1.99	0.61
1:D:85:ARG:HD3	2:D:1754[A]:SFC:O1A	2.01	0.61
1:D:85:ARG:HD3	3:D:2754[B]:RFC:O1A	2.01	0.61
1:A:153:LEU:HD21	1:B:196:ILE:HG13	1.84	0.60
1:A:212:ARG:HD3	4:A:3016:HOH:O	2.02	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:259:LEU:HD22	1:B:274:LEU:HD13	1.84	0.59
1:C:176:GLN:NE2	4:C:3011:HOH:O	2.28	0.59
1:A:17:GLY:H	2:A:1751[A]:SFC:H112	1.68	0.58
1:B:320:TYR:CE1	1:B:322:ALA:HB2	2.38	0.58
1:C:156:ASP:OD2	3:C:2753[B]:RFC:H2	2.03	0.58
1:A:285:ASP:HB2	4:A:2965:HOH:O	2.03	0.58
1:C:145:GLU:HG2	4:C:2957:HOH:O	2.04	0.58
1:D:279:PHE:HB3	4:D:3027:HOH:O	2.02	0.58
1:D:258:GLU:HG3	4:D:2945:HOH:O	2.03	0.57
1:A:258:GLU:HG3	4:A:2960:HOH:O	2.05	0.57
1:A:176:GLN:HE21	1:B:176:GLN:NE2	2.03	0.56
1:C:75:ALA:HA	1:C:103:ASN:HB2	1.88	0.56
3:A:2751[B]:RFC:H5	1:B:240:ILE:CD1	2.36	0.55
1:C:50[A]:MET:SD	2:C:1753[A]:SFC:H111	2.47	0.55
1:D:322:ALA:O	1:D:323:ASN:C	2.44	0.54
1:A:196:ILE:HG13	1:B:153:LEU:HD21	1.90	0.54
1:A:349:ILE:CD1	1:A:354:VAL:HG23	2.34	0.54
1:A:113:GLY:HA3	1:A:130:TYR:CZ	2.43	0.54
1:A:126:HIS:ND1	2:A:1751[A]:SFC:H2	2.23	0.53
1:A:138:HIS:O	1:A:212:ARG:HD3	2.09	0.52
1:B:209:THR:HG23	4:B:3034:HOH:O	2.09	0.52
1:C:352:GLU:HG3	4:C:3016:HOH:O	2.09	0.52
1:D:156:ASP:OD2	2:D:1754[A]:SFC:H5	2.09	0.52
1:A:349:ILE:HD11	1:A:354:VAL:CG2	2.35	0.52
1:B:126:HIS:ND1	2:B:1752[A]:SFC:H2	2.24	0.52
1:D:45:ILE:HD11	4:D:3023:HOH:O	2.08	0.52
1:A:145:GLU:HG2	4:A:3007:HOH:O	2.10	0.51
1:A:147:PRO:HB3	4:A:3016:HOH:O	2.10	0.51
1:C:350:ASP:O	1:C:353:ALA:HB3	2.10	0.51
1:A:105:ARG:NH1	4:A:3015:HOH:O	2.43	0.51
1:A:21:HIS:HD2	1:A:161:SER:OG	1.94	0.51
1:B:113:GLY:HA3	1:B:130:TYR:CZ	2.45	0.51
1:D:126:HIS:ND1	2:D:1754[A]:SFC:H2	2.26	0.51
1:C:126:HIS:HB3	3:C:2753[B]:RFC:H133	1.93	0.50
1:C:288:GLY:O	1:C:292:ALA:HB2	2.11	0.50
1:B:85:ARG:HG2	4:B:3009:HOH:O	2.12	0.50
1:B:323:ASN:N	1:B:323:ASN:OD1	2.44	0.50
1:C:85:ARG:NH1	1:C:122:GLN:O	2.41	0.50
1:C:176:GLN:CD	1:D:176:GLN:HG2	2.33	0.50
1:C:91:ARG:NH2	4:C:3001:HOH:O	2.45	0.49
1:D:39:PRO:HA	1:D:58:THR:OG1	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:126:HIS:HB3	3:A:2751[B]:RFC:H133	1.96	0.48
1:D:126:HIS:CE1	3:D:2754[B]:RFC:H5	2.48	0.48
1:C:345:PRO:HG2	4:C:2849:HOH:O	2.14	0.48
1:A:70:ALA:O	1:A:74:ILE:HG13	2.13	0.48
1:C:113:GLY:HA3	1:C:130:TYR:CZ	2.48	0.48
1:C:359:ASP:HA	4:C:2965:HOH:O	2.14	0.48
1:B:308:HIS:HA	4:B:2920:HOH:O	2.13	0.47
1:D:76:LYS:HG3	1:D:360:GLY:HA3	1.95	0.47
1:A:13:LEU:HG	1:A:80:LEU:HD11	1.95	0.47
1:A:179:GLY:C	4:A:3015:HOH:O	2.53	0.47
1:B:174:GLU:OE2	1:B:178:SER:HB3	2.15	0.47
1:A:176:GLN:NE2	1:B:176:GLN:NE2	2.62	0.47
1:C:109:ALA:HB1	1:C:164:LEU:HD11	1.97	0.47
1:B:38:ARG:HG2	3:B:2752[B]:RFC:C6A	2.44	0.47
1:A:214:ALA:O	1:A:265:ARG:NH2	2.44	0.47
1:B:268:TRP:N	1:B:269:PRO:CD	2.78	0.47
1:A:128:ILE:HG12	1:B:236:ALA:HB1	1.97	0.46
1:C:13:LEU:HG	1:C:80:LEU:HD11	1.97	0.46
1:D:21:HIS:CD2	1:D:161:SER:OG	2.60	0.46
1:A:55:ARG:HD2	1:A:349:ILE:HD13	1.98	0.46
1:B:225:ASP:OD2	1:B:272:ARG:NH1	2.48	0.46
1:C:21:HIS:HD2	1:C:161:SER:OG	1.99	0.46
1:C:21:HIS:HE1	1:D:194:VAL:O	1.99	0.46
1:D:127:ASP:N	2:D:1754[A]:SFC:O1	2.43	0.46
1:B:38:ARG:HG2	2:B:1752[A]:SFC:C6A	2.44	0.46
1:C:55:ARG:HD2	1:C:349:ILE:CD1	2.45	0.45
1:C:135:GLY:HA2	1:D:302:LEU:O	2.16	0.45
1:A:75:ALA:HA	1:A:103:ASN:HB2	1.97	0.45
1:A:137:LEU:O	4:A:3016:HOH:O	2.21	0.45
1:D:149:PRO:HA	1:D:150:PRO:HD3	1.84	0.45
1:D:48[B]:ASP:HB3	1:D:50[B]:MET:HG3	1.99	0.45
1:D:113:GLY:HA3	1:D:130:TYR:CZ	2.52	0.45
1:C:287:TRP:CE3	1:C:287:TRP:HA	2.52	0.44
1:B:260:PRO:HG2	1:B:271:LEU:HB2	1.99	0.44
1:D:252:LEU:HD21	1:D:279:PHE:CE1	2.52	0.44
1:A:203:ARG:HD2	1:A:210:ASP:OD1	2.17	0.44
1:B:140:ILE:HD13	1:B:150:PRO:HG3	2.00	0.44
1:C:17:GLY:HA2	2:C:1753[A]:SFC:H8	1.99	0.44
1:C:134:ASN:HD22	1:C:134:ASN:C	2.20	0.44
1:A:120:ARG:NH1	1:A:123:GLN:HE22	2.05	0.43
1:C:113:GLY:HA3	1:C:130:TYR:CE1	2.53	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:320:TYR:CE1	1:D:322:ALA:HB2	2.53	0.43
1:A:21:HIS:HE1	1:B:194:VAL:O	2.02	0.43
1:A:134:ASN:C	1:A:134:ASN:HD22	2.22	0.43
1:A:236:ALA:HB1	1:B:128:ILE:HG12	2.00	0.43
1:C:55:ARG:HD2	1:C:349:ILE:HD11	2.01	0.43
1:D:196:ILE:HG12	1:D:199:MET:HB2	2.01	0.43
1:B:68:GLU:O	1:B:72:LYS:HG3	2.19	0.42
1:A:109:ALA:HB1	1:A:164:LEU:HD11	2.02	0.42
1:A:117:THR:O	1:B:316:ARG:HD2	2.19	0.42
1:B:259:LEU:HB3	1:B:260:PRO:HD2	2.01	0.42
1:D:5:LEU:HD12	1:D:29:LEU:HB2	2.02	0.42
1:D:241:GLU:HA	1:D:242:PRO:HD3	1.93	0.42
1:B:198:MET:HG2	1:B:202:MET:CE	2.40	0.41
1:D:91:ARG:NH1	2:D:1754[A]:SFC:O7A	2.48	0.41
1:D:91:ARG:NH1	3:D:2754[B]:RFC:O7A	2.48	0.41
1:C:117:THR:O	1:D:316:ARG:HD2	2.20	0.41
1:C:28:ASP:HA	1:C:53:ASN:ND2	2.35	0.41
1:D:126:HIS:HB3	3:D:2754[B]:RFC:H133	2.02	0.41
1:B:286:HIS:CE1	4:B:2781:HOH:O	2.61	0.41
1:B:134:ASN:C	1:B:134:ASN:HD22	2.23	0.41
1:D:68:GLU:HG2	1:D:72:LYS:HE3	2.02	0.41
1:C:196:ILE:HG13	1:D:153:LEU:HD21	2.03	0.41
1:D:229:CYS:SG	4:D:3027:HOH:O	2.63	0.41
1:A:16:ILE:HD12	3:A:2751[B]:RFC:S1P	2.62	0.40
1:A:18:PRO:HB3	1:A:156:ASP:O	2.21	0.40
1:C:320:TYR:CE1	1:C:322:ALA:HB2	2.56	0.40
1:A:302:LEU:O	1:B:135:GLY:HA2	2.21	0.40

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)
4:A:2768:HOH:O	4:B:3034:HOH:O[4_546]	2.18	0.02
1:A:180:LYS:NZ	1:B:104:ASP:OD2[2_656]	2.19	0.01

## 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	352/360 (98%)	339 (96%)	12 (3%)	1 (0%)	41	26
1	B	352/360 (98%)	338 (96%)	12 (3%)	2 (1%)	25	12
1	C	352/360 (98%)	340 (97%)	11 (3%)	1 (0%)	41	26
1	D	352/360 (98%)	338 (96%)	12 (3%)	2 (1%)	25	12
All	All	1408/1440 (98%)	1355 (96%)	47 (3%)	6 (0%)	34	19

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	323	ASN
1	C	323	ASN
1	D	323	ASN
1	A	292	ALA
1	B	151	LEU
1	D	103	ASN

### 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	272/275 (99%)	261 (96%)	11 (4%)	31	14
1	B	272/275 (99%)	261 (96%)	11 (4%)	31	14
1	C	272/275 (99%)	266 (98%)	6 (2%)	52	36
1	D	272/275 (99%)	263 (97%)	9 (3%)	38	21

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1088/1100 (99%)	1051 (97%)	37 (3%)	37 19

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	37	ASP
1	A	45	ILE
1	A	47	ARG
1	A	58	THR
1	A	103	ASN
1	A	134	ASN
1	A	199	MET
1	A	315	GLU
1	A	349	ILE
1	A	352	GLU
1	A	359	ASP
1	B	37	ASP
1	B	58	THR
1	B	85	ARG
1	B	103	ASN
1	B	133	LEU
1	B	134	ASN
1	B	144	ASP
1	B	199	MET
1	B	203	ARG
1	B	315	GLU
1	B	323	ASN
1	C	37	ASP
1	C	58	THR
1	C	103	ASN
1	C	134	ASN
1	C	199	MET
1	C	352	GLU
1	D	37	ASP
1	D	45	ILE
1	D	103	ASN
1	D	133	LEU
1	D	134	ASN
1	D	144	ASP
1	D	199	MET
1	D	203	ARG
1	D	349	ILE



Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	21	HIS
1	A	103	ASN
1	A	123	GLN
1	A	134	ASN
1	A	286	HIS
1	B	21	HIS
1	B	103	ASN
1	B	134	ASN
1	B	176	GLN
1	B	263	ASN
1	B	286	HIS
1	C	21	HIS
1	C	103	ASN
1	C	123	GLN
1	C	134	ASN
1	C	286	HIS
1	D	21	HIS
1	D	103	ASN
1	D	116	GLN
1	D	134	ASN
1	D	263	ASN
1	D	286	HIS

### 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 monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

8 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	SFC	B	1752[A]	-	57,65,65	0.90	3 (5%)	73,96,96	1.52	10 (13%)
3	RFC	A	2751[B]	-	57,65,65	0.91	3 (5%)	73,96,96	1.81	14 (19%)
2	SFC	C	1753[A]	-	57,65,65	0.96	4 (7%)	73,96,96	1.60	11 (15%)
2	SFC	A	1751[A]	-	57,65,65	0.99	5 (8%)	73,96,96	1.58	12 (16%)
2	SFC	D	1754[A]	-	57,65,65	0.92	4 (7%)	73,96,96	1.92	13 (17%)
3	RFC	C	2753[B]	-	57,65,65	0.89	3 (5%)	73,96,96	1.75	11 (15%)
3	RFC	B	2752[B]	-	57,65,65	0.87	3 (5%)	73,96,96	1.92	12 (16%)
3	RFC	D	2754[B]	-	57,65,65	0.88	3 (5%)	73,96,96	1.94	13 (17%)

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	SFC	B	1752[A]	-	-	11/59/79/79	0/4/4/4
3	RFC	A	2751[B]	-	-	7/59/79/79	0/4/4/4
2	SFC	C	1753[A]	-	-	12/59/79/79	0/4/4/4
2	SFC	A	1751[A]	-	-	7/59/79/79	0/4/4/4
2	SFC	D	1754[A]	-	-	11/59/79/79	0/4/4/4
3	RFC	C	2753[B]	-	-	10/59/79/79	0/4/4/4
3	RFC	B	2752[B]	-	-	10/59/79/79	0/4/4/4
3	RFC	D	2754[B]	-	-	10/59/79/79	0/4/4/4

All (28) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	1753[A]	SFC	C2-C1	-2.89	1.51	1.53
2	A	1751[A]	SFC	C2-C1	-2.76	1.51	1.53
2	A	1751[A]	SFC	O4B-C1B	2.64	1.44	1.41
3	A	2751[B]	RFC	O4B-C1B	2.64	1.44	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	1754[A]	SFC	C2-C1	-2.59	1.51	1.53
2	C	1753[A]	SFC	O4B-C1B	2.43	1.44	1.41
3	C	2753[B]	RFC	O4B-C1B	2.43	1.44	1.41
2	D	1754[A]	SFC	O4B-C1B	2.34	1.44	1.41
3	D	2754[B]	RFC	O4B-C1B	2.34	1.44	1.41
2	D	1754[A]	SFC	C1-S1P	-2.30	1.67	1.75
3	B	2752[B]	RFC	C3-C2	-2.24	1.48	1.52
2	B	1752[A]	SFC	C2-C1	-2.23	1.51	1.53
2	C	1753[A]	SFC	C2A-N3A	2.15	1.35	1.32
3	C	2753[B]	RFC	C2A-N3A	2.15	1.35	1.32
2	B	1752[A]	SFC	O1-C1	2.12	1.23	1.20
2	C	1753[A]	SFC	C1-S1P	-2.11	1.68	1.75
3	D	2754[B]	RFC	C1-S1P	-2.11	1.68	1.75
2	A	1751[A]	SFC	C1-S1P	-2.10	1.68	1.75
2	A	1751[A]	SFC	C2A-N3A	2.08	1.35	1.32
3	A	2751[B]	RFC	C2A-N3A	2.08	1.35	1.32
2	D	1754[A]	SFC	C2A-N3A	2.06	1.35	1.32
3	D	2754[B]	RFC	C2A-N3A	2.06	1.35	1.32
3	A	2751[B]	RFC	C3-C2	-2.05	1.49	1.52
2	B	1752[A]	SFC	C2A-N3A	2.04	1.35	1.32
3	B	2752[B]	RFC	C2A-N3A	2.04	1.35	1.32
2	A	1751[A]	SFC	O1-C1	2.01	1.23	1.20
3	C	2753[B]	RFC	C1-S1P	-2.01	1.68	1.75
3	B	2752[B]	RFC	C1-S1P	-2.00	1.68	1.75

All (96) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	2752[B]	RFC	C2-C1-S1P	10.60	123.32	111.81
2	D	1754[A]	SFC	C2-C1-S1P	10.44	123.14	111.81
3	D	2754[B]	RFC	C2-C1-S1P	10.02	122.68	111.81
3	A	2751[B]	RFC	C2-C1-S1P	9.58	122.21	111.81
3	C	2753[B]	RFC	C2-C1-S1P	8.95	121.52	111.81
2	A	1751[A]	SFC	C2-C1-S1P	7.85	120.33	111.81
2	C	1753[A]	SFC	C2-C1-S1P	7.56	120.02	111.81
2	B	1752[A]	SFC	C2-C1-S1P	6.00	118.33	111.81
3	D	2754[B]	RFC	C3P-N4P-C5P	5.43	132.93	122.84
3	A	2751[B]	RFC	C3P-N4P-C5P	5.21	132.50	122.84
2	B	1752[A]	SFC	C3P-N4P-C5P	4.68	131.53	122.84
3	B	2752[B]	RFC	O1-C1-S1P	-4.66	117.53	123.80
2	D	1754[A]	SFC	O1-C1-S1P	-4.43	117.84	123.80
3	D	2754[B]	RFC	O1-C1-S1P	-4.38	117.90	123.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	2753[B]	RFC	C3P-N4P-C5P	4.07	130.39	122.84
2	C	1753[A]	SFC	C2P-C3P-N4P	-4.04	103.93	112.42
2	D	1754[A]	SFC	N3A-C2A-N1A	-4.01	122.41	128.68
3	D	2754[B]	RFC	N3A-C2A-N1A	-4.01	122.41	128.68
2	B	1752[A]	SFC	N3A-C2A-N1A	-4.01	122.41	128.68
3	B	2752[B]	RFC	N3A-C2A-N1A	-4.01	122.41	128.68
3	C	2753[B]	RFC	O1-C1-S1P	-4.00	118.41	123.80
2	C	1753[A]	SFC	N3A-C2A-N1A	-3.99	122.44	128.68
3	C	2753[B]	RFC	N3A-C2A-N1A	-3.99	122.44	128.68
2	A	1751[A]	SFC	N3A-C2A-N1A	-3.94	122.53	128.68
3	A	2751[B]	RFC	N3A-C2A-N1A	-3.94	122.53	128.68
2	D	1754[A]	SFC	C3P-N4P-C5P	3.92	130.11	122.84
2	A	1751[A]	SFC	C2P-C3P-N4P	-3.89	104.23	112.42
3	A	2751[B]	RFC	O1-C1-S1P	-3.87	118.59	123.80
3	B	2752[B]	RFC	C3P-N4P-C5P	3.64	129.60	122.84
2	C	1753[A]	SFC	C7P-N8P-C9P	3.58	128.97	122.59
3	C	2753[B]	RFC	C7P-N8P-C9P	3.58	128.97	122.59
2	B	1752[A]	SFC	C7P-N8P-C9P	3.50	128.84	122.59
3	B	2752[B]	RFC	C7P-N8P-C9P	3.50	128.84	122.59
2	D	1754[A]	SFC	C7P-N8P-C9P	3.43	128.70	122.59
3	D	2754[B]	RFC	C7P-N8P-C9P	3.43	128.70	122.59
3	D	2754[B]	RFC	C3-C2-C1	3.32	117.06	109.90
2	D	1754[A]	SFC	O1-C1-C2	-3.18	119.02	124.12
3	B	2752[B]	RFC	O1-C1-C2	-3.11	119.12	124.12
3	A	2751[B]	RFC	O1-C1-C2	-3.07	119.18	124.12
2	C	1753[A]	SFC	O1-C1-S1P	-3.00	119.76	123.80
2	A	1751[A]	SFC	O1-C1-S1P	-2.96	119.82	123.80
3	D	2754[B]	RFC	O1-C1-C2	-2.94	119.40	124.12
2	D	1754[A]	SFC	C3-C2-C1	2.93	116.22	109.90
2	A	1751[A]	SFC	C7P-N8P-C9P	2.82	127.62	122.59
3	A	2751[B]	RFC	C7P-N8P-C9P	2.82	127.62	122.59
3	B	2752[B]	RFC	C2P-S1P-C1	2.80	110.17	101.75
2	C	1753[A]	SFC	C3P-N4P-C5P	2.78	128.00	122.84
2	A	1751[A]	SFC	O1-C1-C2	-2.67	119.83	124.12
2	B	1752[A]	SFC	O1-C1-S1P	-2.63	120.26	123.80
2	C	1753[A]	SFC	C6P-C7P-N8P	-2.63	106.59	111.90
3	C	2753[B]	RFC	C6P-C7P-N8P	-2.63	106.59	111.90
3	C	2753[B]	RFC	O1-C1-C2	-2.53	120.05	124.12
2	A	1751[A]	SFC	C6P-C7P-N8P	-2.47	106.91	111.90
3	A	2751[B]	RFC	C6P-C7P-N8P	-2.47	106.91	111.90
3	C	2753[B]	RFC	C2P-S1P-C1	2.46	109.16	101.75
3	C	2753[B]	RFC	C3-C2-C1	2.45	115.17	109.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	1754[A]	SFC	O6A-CCP-CBP	2.44	114.47	110.55
3	D	2754[B]	RFC	O6A-CCP-CBP	2.44	114.47	110.55
2	D	1754[A]	SFC	C6P-C7P-N8P	-2.43	106.99	111.90
3	D	2754[B]	RFC	C6P-C7P-N8P	-2.43	106.99	111.90
2	C	1753[A]	SFC	O1-C1-C2	-2.43	120.22	124.12
3	D	2754[B]	RFC	C2P-S1P-C1	2.43	109.05	101.75
2	C	1753[A]	SFC	C4A-C5A-N7A	-2.41	106.88	109.40
3	C	2753[B]	RFC	C4A-C5A-N7A	-2.41	106.88	109.40
3	B	2752[B]	RFC	C3-C2-C1	2.38	115.03	109.90
2	A	1751[A]	SFC	CEP-CBP-CAP	2.35	112.89	108.82
3	A	2751[B]	RFC	CEP-CBP-CAP	2.35	112.89	108.82
3	A	2751[B]	RFC	C3-C2-C1	2.32	114.89	109.90
2	C	1753[A]	SFC	C2P-S1P-C1	2.28	108.62	101.75
2	A	1751[A]	SFC	C4A-C5A-N7A	-2.26	107.04	109.40
3	A	2751[B]	RFC	C4A-C5A-N7A	-2.26	107.04	109.40
3	A	2751[B]	RFC	C2P-S1P-C1	2.26	108.55	101.75
2	B	1752[A]	SFC	CEP-CBP-CAP	2.26	112.74	108.82
3	B	2752[B]	RFC	CEP-CBP-CAP	2.26	112.74	108.82
2	B	1752[A]	SFC	CDP-CBP-CAP	2.25	112.72	108.82
3	B	2752[B]	RFC	CDP-CBP-CAP	2.25	112.72	108.82
2	B	1752[A]	SFC	C2P-S1P-C1	2.24	108.49	101.75
2	D	1754[A]	SFC	C2P-S1P-C1	2.20	108.37	101.75
2	A	1751[A]	SFC	C2B-C3B-C4B	2.16	107.06	103.22
3	A	2751[B]	RFC	C2B-C3B-C4B	2.16	107.06	103.22
2	D	1754[A]	SFC	C2P-C3P-N4P	-2.13	107.93	112.42
2	C	1753[A]	SFC	CDP-CBP-CCP	-2.10	104.81	108.23
3	C	2753[B]	RFC	CDP-CBP-CCP	-2.10	104.81	108.23
3	D	2754[B]	RFC	C7-C9-C10	-2.06	108.76	114.27
2	D	1754[A]	SFC	CDP-CBP-CAP	2.06	112.39	108.82
3	D	2754[B]	RFC	CDP-CBP-CAP	2.06	112.39	108.82
2	A	1751[A]	SFC	O8A-P3B-O7A	2.05	115.48	107.64
3	A	2751[B]	RFC	O8A-P3B-O7A	2.05	115.48	107.64
2	D	1754[A]	SFC	CEP-CBP-CAP	2.05	112.38	108.82
3	D	2754[B]	RFC	CEP-CBP-CAP	2.05	112.38	108.82
2	B	1752[A]	SFC	O5P-C5P-C6P	-2.05	118.28	122.02
3	B	2752[B]	RFC	O5P-C5P-C6P	-2.05	118.28	122.02
2	A	1751[A]	SFC	O3B-P3B-O9A	-2.03	101.54	109.39
3	A	2751[B]	RFC	O3B-P3B-O9A	-2.03	101.54	109.39
2	B	1752[A]	SFC	C4A-C5A-N7A	-2.02	107.30	109.40
3	B	2752[B]	RFC	C4A-C5A-N7A	-2.02	107.30	109.40

There are no chirality outliers.

All (78) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1751[A]	SFC	C2-C1-S1P-C2P
2	A	1751[A]	SFC	C12-C10-C9-C7
2	B	1752[A]	SFC	C3B-O3B-P3B-O9A
2	B	1752[A]	SFC	C2P-C3P-N4P-C5P
2	B	1752[A]	SFC	S1P-C1-C2-C3
2	C	1753[A]	SFC	C2-C1-S1P-C2P
2	C	1753[A]	SFC	S1P-C1-C2-C3
2	C	1753[A]	SFC	C12-C10-C9-C7
2	D	1754[A]	SFC	C3B-O3B-P3B-O8A
2	D	1754[A]	SFC	O9P-C9P-CAP-OAP
2	D	1754[A]	SFC	N8P-C9P-CAP-OAP
2	D	1754[A]	SFC	C2-C1-S1P-C2P
3	A	2751[B]	RFC	C2P-C3P-N4P-C5P
3	A	2751[B]	RFC	C12-C10-C9-C7
3	B	2752[B]	RFC	C3B-O3B-P3B-O9A
3	B	2752[B]	RFC	S1P-C1-C2-C13
3	B	2752[B]	RFC	C11-C10-C9-C7
3	C	2753[B]	RFC	C12-C10-C9-C7
3	D	2754[B]	RFC	C3B-O3B-P3B-O8A
3	D	2754[B]	RFC	O9P-C9P-CAP-OAP
3	D	2754[B]	RFC	N8P-C9P-CAP-OAP
3	D	2754[B]	RFC	C2P-C3P-N4P-C5P
2	A	1751[A]	SFC	C11-C10-C9-C7
2	C	1753[A]	SFC	C11-C10-C9-C7
2	D	1754[A]	SFC	C12-C10-C9-C7
3	D	2754[B]	RFC	C12-C10-C9-C7
3	D	2754[B]	RFC	C11-C10-C9-C7
3	A	2751[B]	RFC	C11-C10-C9-C7
3	B	2752[B]	RFC	C12-C10-C9-C7
3	C	2753[B]	RFC	C11-C10-C9-C7
2	B	1752[A]	SFC	O4B-C4B-C5B-O5B
3	B	2752[B]	RFC	O4B-C4B-C5B-O5B
2	A	1751[A]	SFC	O1-C1-S1P-C2P
2	C	1753[A]	SFC	O1-C1-S1P-C2P
2	B	1752[A]	SFC	P2A-O3A-P1A-O2A
3	B	2752[B]	RFC	P2A-O3A-P1A-O2A
2	D	1754[A]	SFC	C11-C10-C9-C7
2	D	1754[A]	SFC	C3B-O3B-P3B-O9A
3	D	2754[B]	RFC	C3B-O3B-P3B-O9A
2	C	1753[A]	SFC	C3B-O3B-P3B-O8A
3	C	2753[B]	RFC	C3B-O3B-P3B-O8A
2	C	1753[A]	SFC	P2A-O3A-P1A-O2A

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Mol	Chain	Res	Type	Atoms
3	C	2753[B]	RFC	P2A-O3A-P1A-O2A
2	B	1752[A]	SFC	C8-C7-C9-C10
2	D	1754[A]	SFC	O1-C1-S1P-C2P
3	A	2751[B]	RFC	O1-C1-C2-C3
2	B	1752[A]	SFC	C6-C7-C9-C10
2	A	1751[A]	SFC	P2A-O3A-P1A-O1A
2	B	1752[A]	SFC	P2A-O3A-P1A-O1A
2	C	1753[A]	SFC	P2A-O3A-P1A-O1A
3	A	2751[B]	RFC	P2A-O3A-P1A-O1A
3	B	2752[B]	RFC	P2A-O3A-P1A-O1A
3	C	2753[B]	RFC	P2A-O3A-P1A-O1A
2	B	1752[A]	SFC	C3B-C4B-C5B-O5B
3	B	2752[B]	RFC	C3B-C4B-C5B-O5B
2	D	1754[A]	SFC	O4B-C4B-C5B-O5B
3	D	2754[B]	RFC	O4B-C4B-C5B-O5B
2	B	1752[A]	SFC	O1-C1-C2-C3
3	C	2753[B]	RFC	O1-C1-C2-C3
2	A	1751[A]	SFC	S1P-C1-C2-C3
2	D	1754[A]	SFC	S1P-C1-C2-C3
3	A	2751[B]	RFC	S1P-C1-C2-C3
3	C	2753[B]	RFC	S1P-C1-C2-C3
3	D	2754[B]	RFC	S1P-C1-C2-C3
2	C	1753[A]	SFC	C6-C7-C9-C10
2	C	1753[A]	SFC	C8-C7-C9-C10
3	C	2753[B]	RFC	C2P-C3P-N4P-C5P
2	C	1753[A]	SFC	O1-C1-C2-C3
3	B	2752[B]	RFC	O1-C1-C2-C3
2	B	1752[A]	SFC	C3B-O3B-P3B-O7A
3	B	2752[B]	RFC	C3B-O3B-P3B-O7A
2	A	1751[A]	SFC	O4B-C4B-C5B-O5B
3	A	2751[B]	RFC	O4B-C4B-C5B-O5B
2	C	1753[A]	SFC	O4B-C4B-C5B-O5B
3	C	2753[B]	RFC	O4B-C4B-C5B-O5B
2	D	1754[A]	SFC	CEP-CBP-CCP-O6A
3	D	2754[B]	RFC	CEP-CBP-CCP-O6A
3	C	2753[B]	RFC	C6-C7-C9-C10

There are no ring outliers.

8 monomers are involved in 31 short contacts:

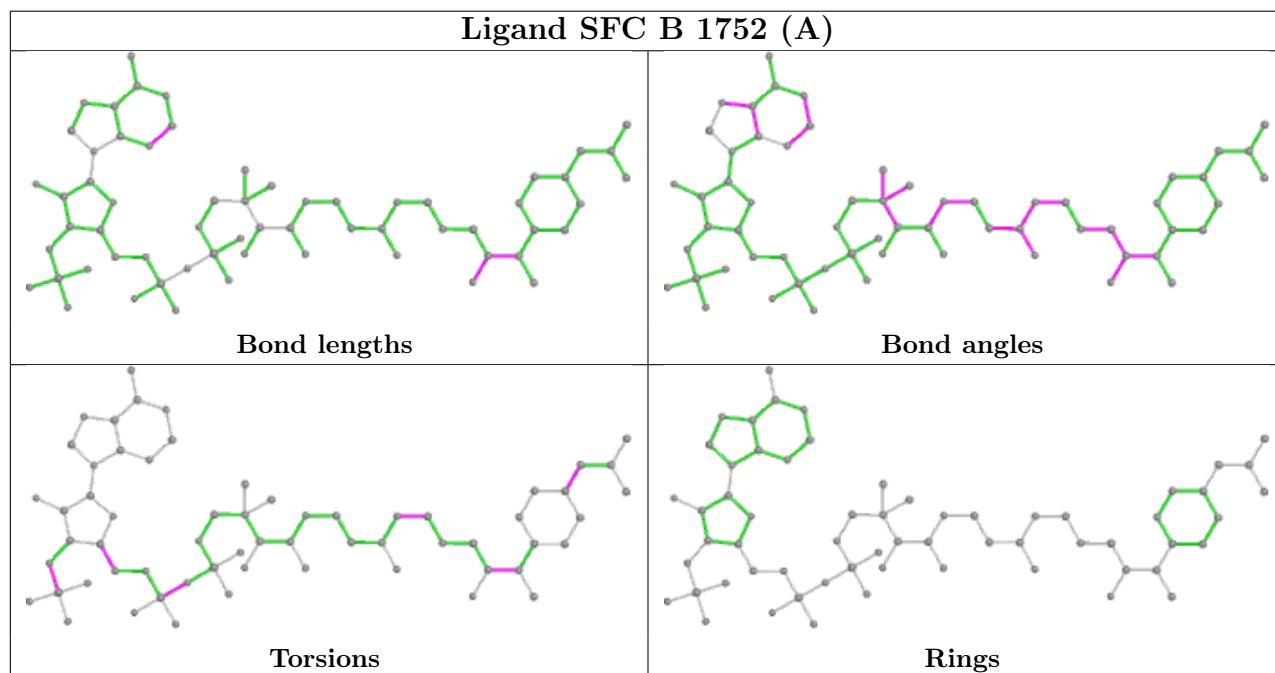
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	1752[A]	SFC	3	0

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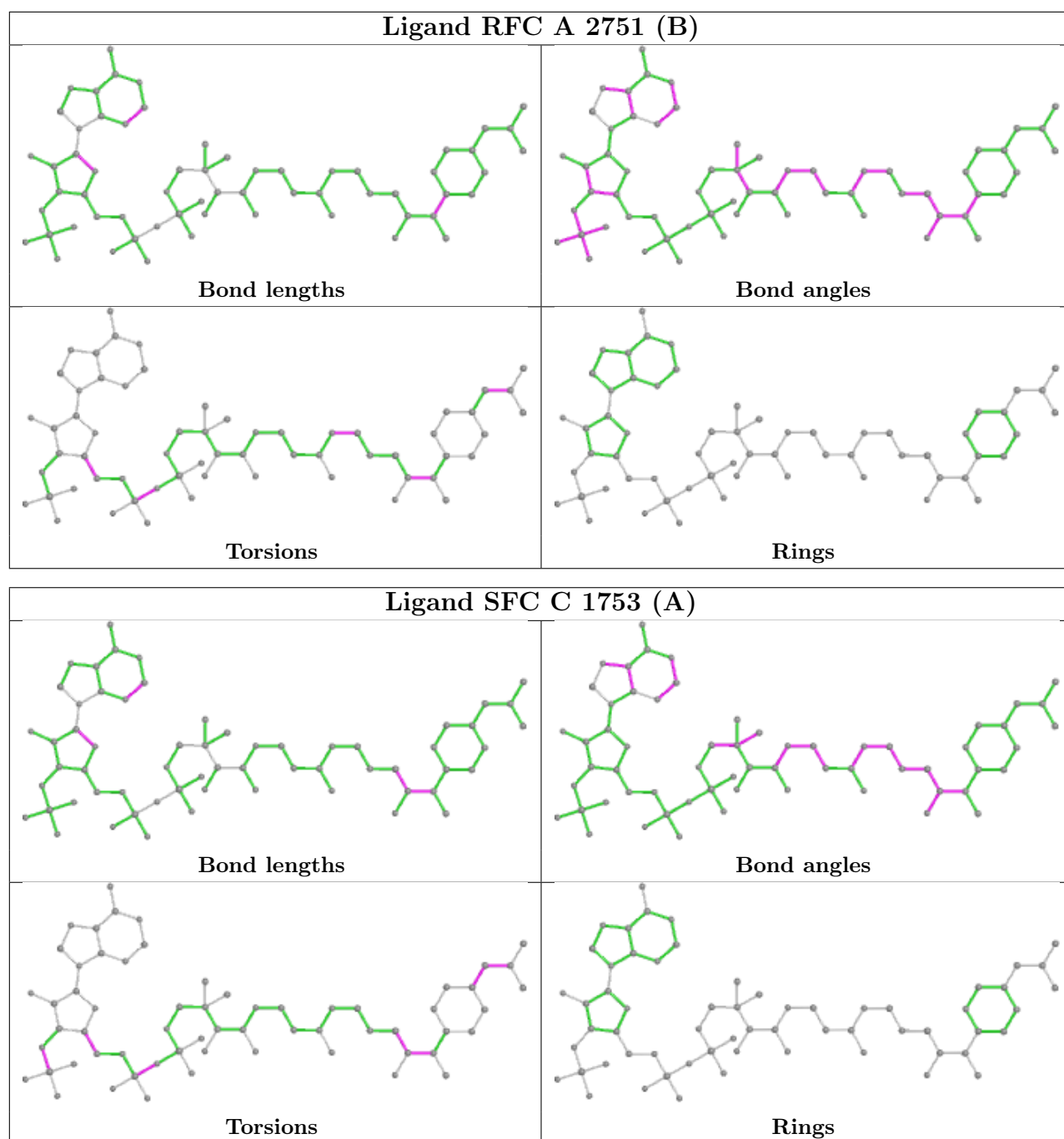
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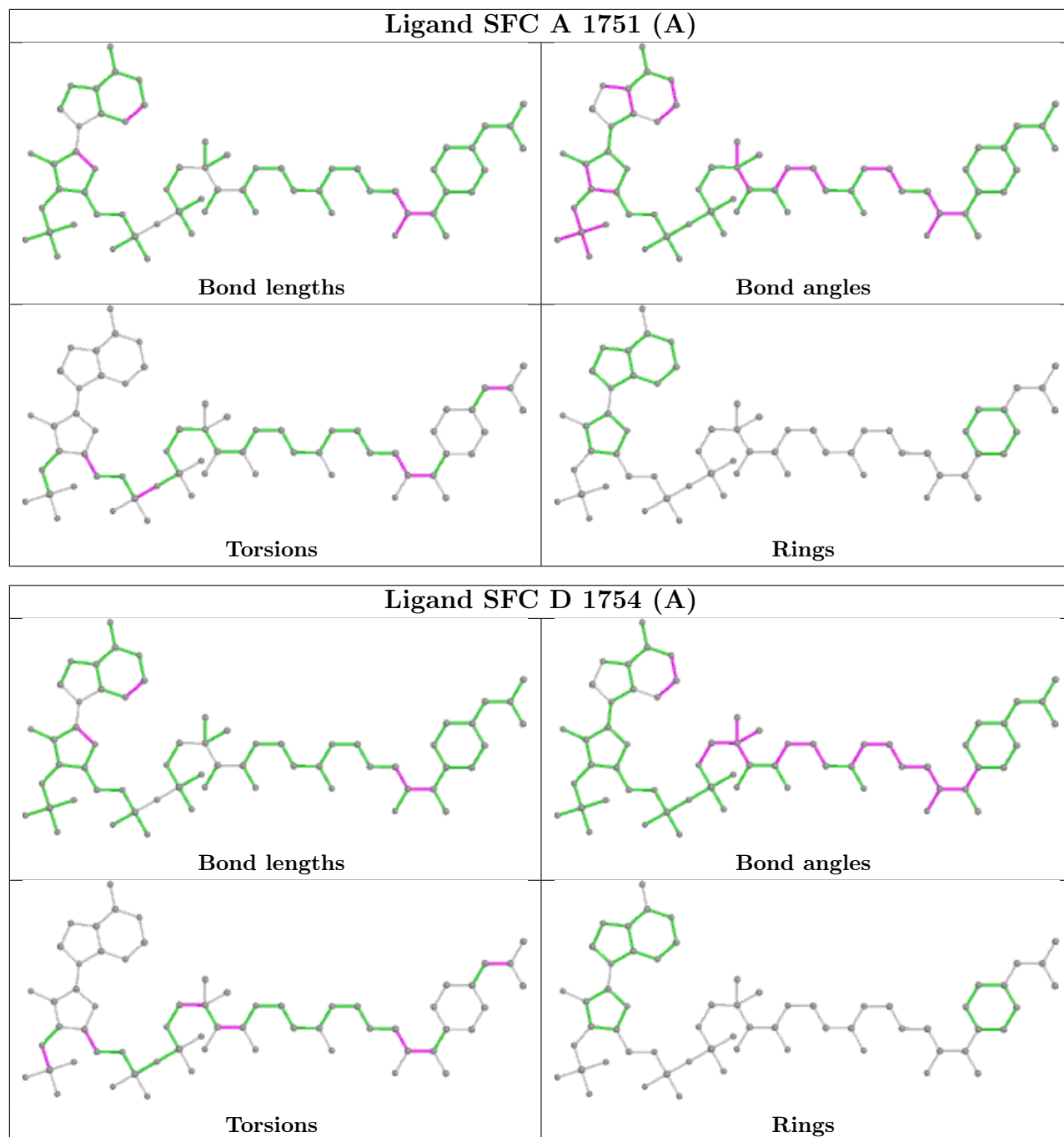
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	2751[B]	RFC	4	0
2	C	1753[A]	SFC	4	0
2	A	1751[A]	SFC	2	0
2	D	1754[A]	SFC	5	0
3	C	2753[B]	RFC	4	0
3	B	2752[B]	RFC	4	0
3	D	2754[B]	RFC	5	0

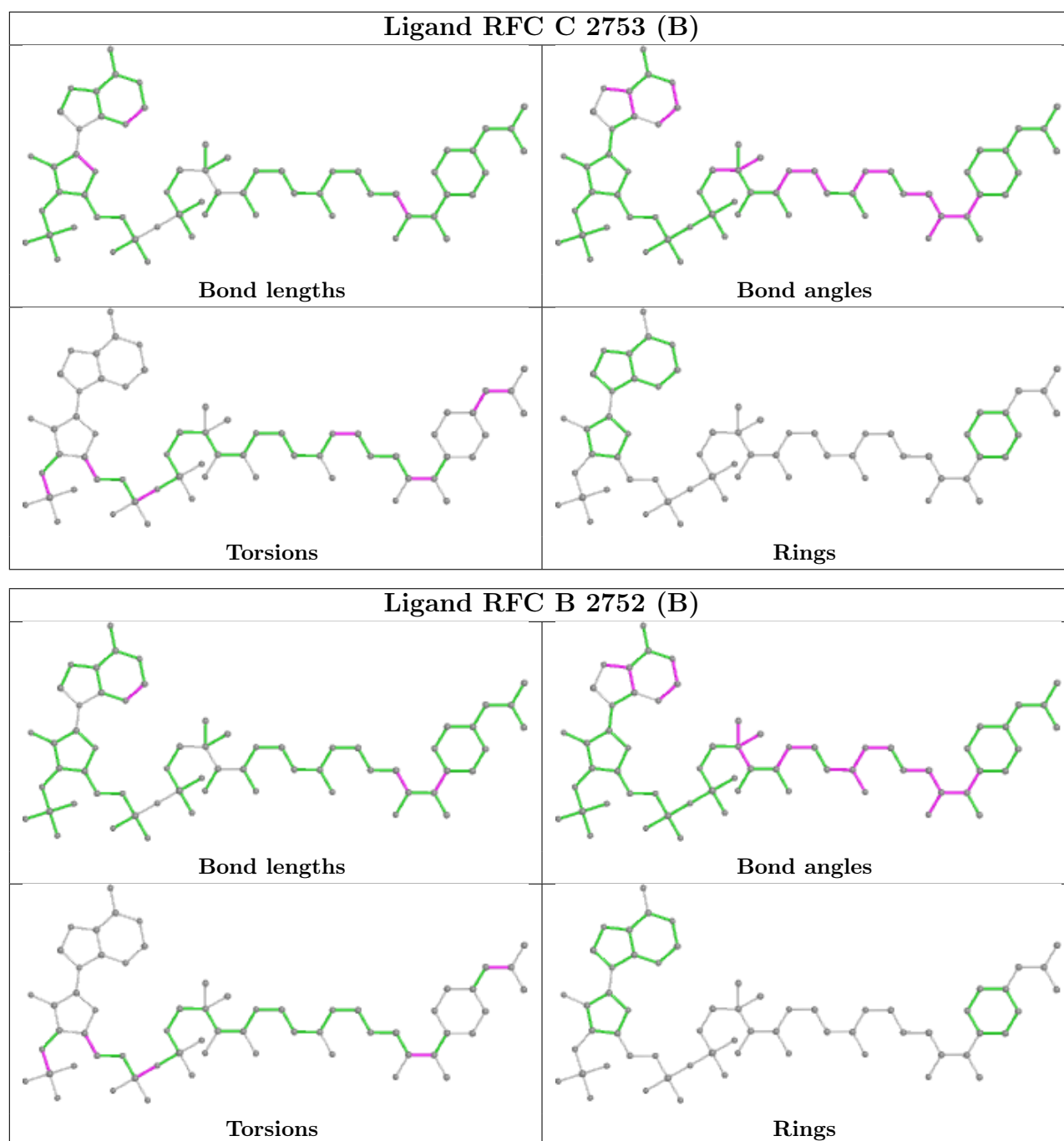
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 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.

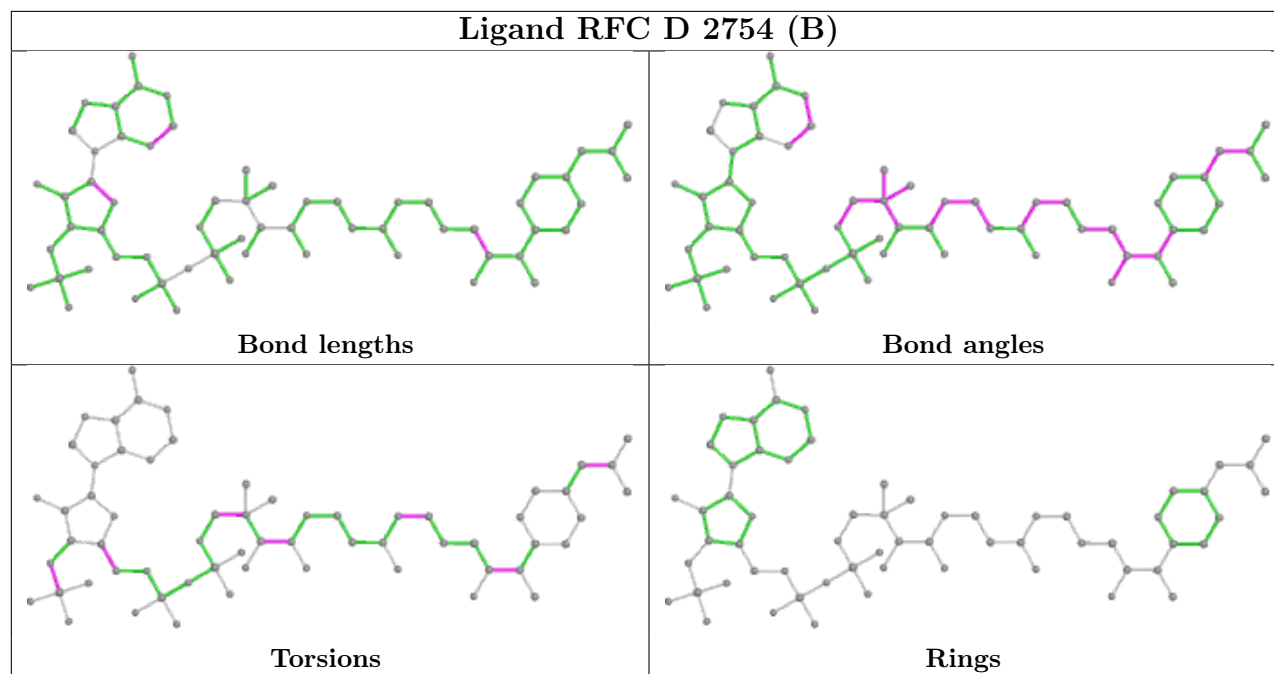












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	354/360 (98%)	0.32	14 (3%) 38 36	21, 26, 41, 50	0
1	B	354/360 (98%)	0.30	13 (3%) 41 39	20, 26, 41, 49	0
1	C	354/360 (98%)	0.26	6 (1%) 70 70	20, 27, 42, 52	0
1	D	354/360 (98%)	0.29	18 (5%) 28 26	19, 27, 42, 51	0
All	All	1416/1440 (98%)	0.30	51 (3%) 42 40	19, 27, 42, 52	0

All (51) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	360	GLY	6.0
1	C	360	GLY	4.3
1	D	356	THR	4.0
1	D	39	PRO	3.9
1	B	360	GLY	3.7
1	D	350	ASP	3.6
1	A	39	PRO	3.6
1	D	360	GLY	3.4
1	A	77	ALA	3.4
1	B	73	LEU	2.9
1	D	349	ILE	2.8
1	B	69	LEU	2.7
1	B	353	ALA	2.7
1	B	350	ASP	2.7
1	D	69	LEU	2.7
1	A	64	ASP	2.6
1	A	359	ASP	2.6
1	D	65	GLN	2.6
1	A	349	ILE	2.6
1	B	359	ASP	2.6
1	C	39	PRO	2.5

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Mol	Chain	Res	Type	RSRZ
1	D	64	ASP	2.5
1	C	38	ARG	2.5
1	B	356	THR	2.4
1	B	45	ILE	2.3
1	D	76	LYS	2.3
1	A	62	LYS	2.3
1	D	77	ALA	2.3
1	B	358	TRP	2.3
1	A	50[A]	MET	2.2
1	D	61	LEU	2.2
1	A	350	ASP	2.2
1	A	356	THR	2.2
1	D	2	ALA	2.2
1	C	50[A]	MET	2.2
1	D	66	GLY	2.2
1	D	359	ASP	2.2
1	C	347	ALA	2.1
1	A	38	ARG	2.1
1	A	283	ASP	2.1
1	D	102	VAL	2.1
1	D	50[A]	MET	2.1
1	B	76	LYS	2.1
1	B	65	GLN	2.1
1	A	292	ALA	2.1
1	D	353	ALA	2.1
1	A	2	ALA	2.1
1	B	347	ALA	2.1
1	B	39	PRO	2.1
1	C	350	ASP	2.0
1	D	62	LYS	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

## 6.3 Carbohydrates [i](#)

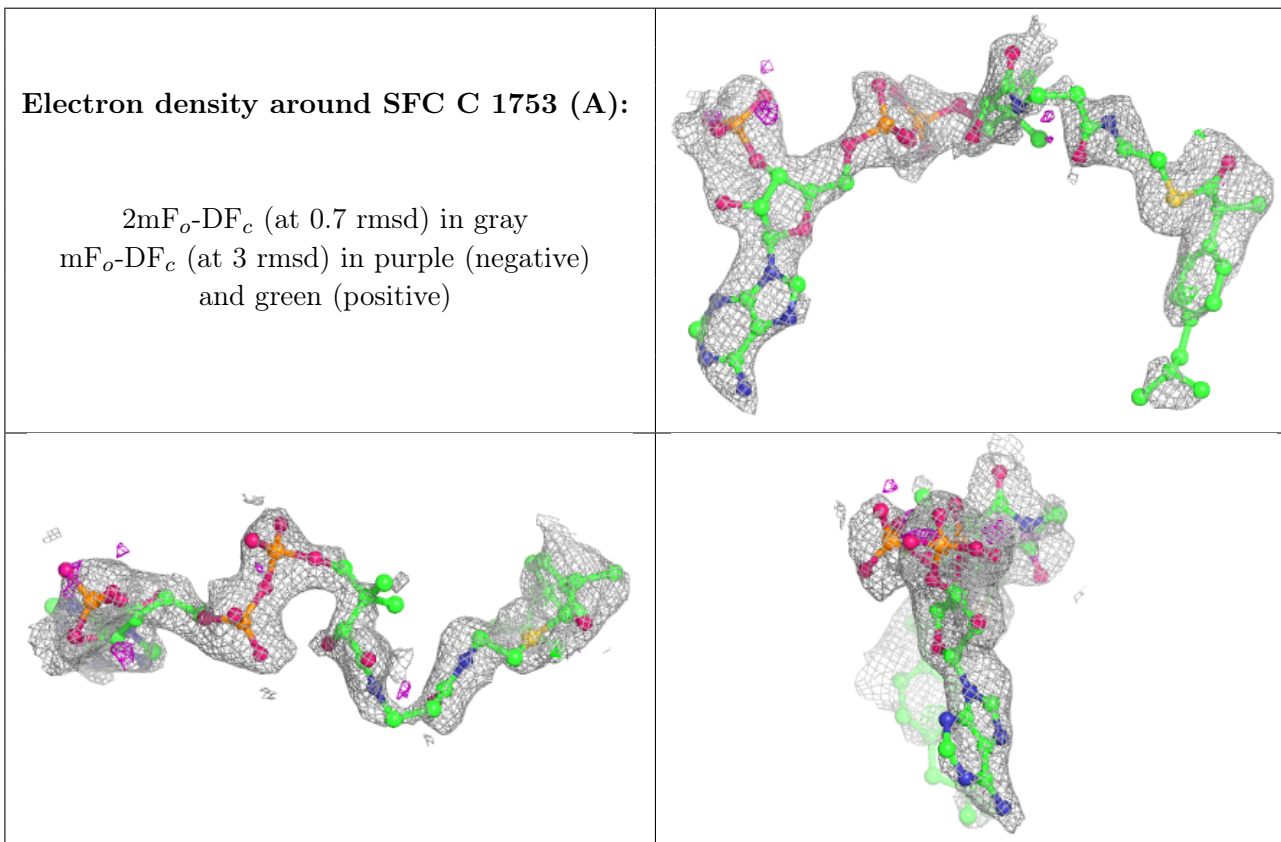
There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> 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.

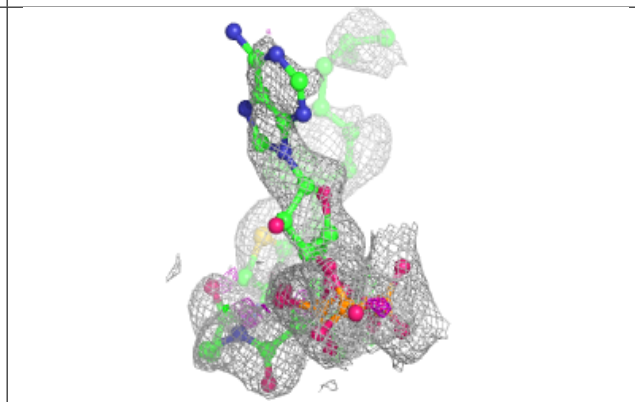
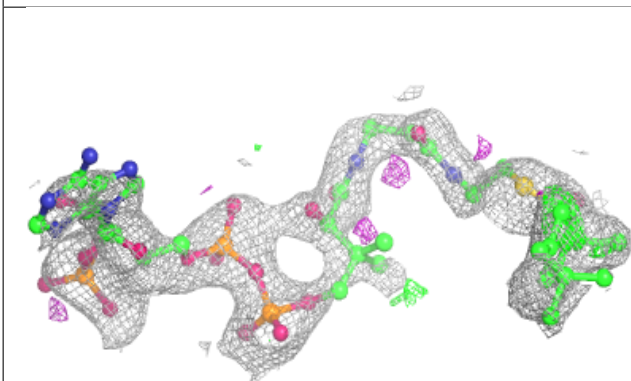
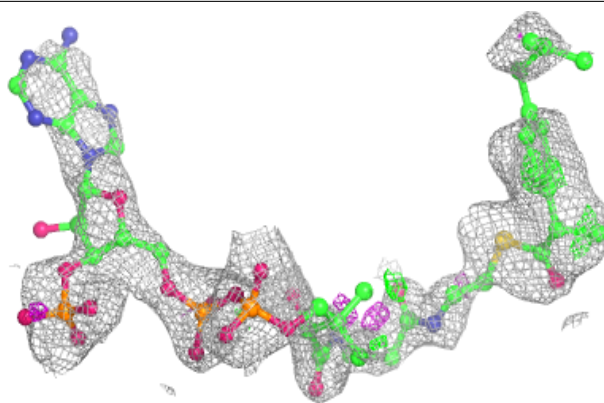
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	SFC	C	1753[A]	62/62	0.79	0.22	52,69,79,81	62
2	SFC	D	1754[A]	62/62	0.80	0.24	43,67,83,83	62
3	RFC	D	2754[B]	62/62	0.80	0.23	46,67,83,83	62
3	RFC	C	2753[B]	62/62	0.82	0.22	51,69,79,81	62
2	SFC	A	1751[A]	62/62	0.83	0.20	41,61,70,72	62
2	SFC	B	1752[A]	62/62	0.83	0.20	36,64,79,80	62
3	RFC	A	2751[B]	62/62	0.84	0.20	51,61,70,72	62
3	RFC	B	2752[B]	62/62	0.86	0.21	49,64,79,80	62

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.

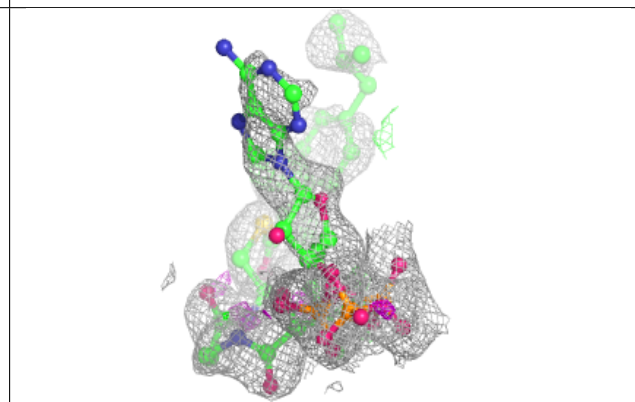
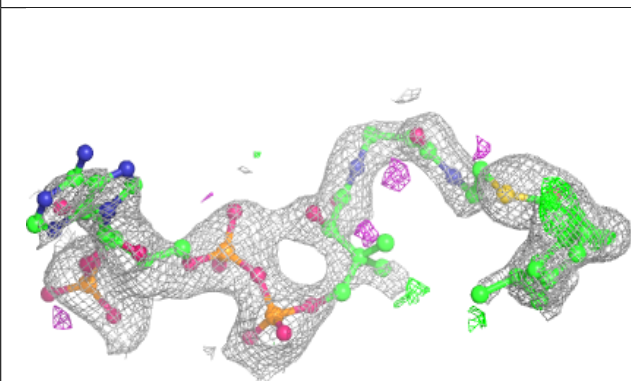
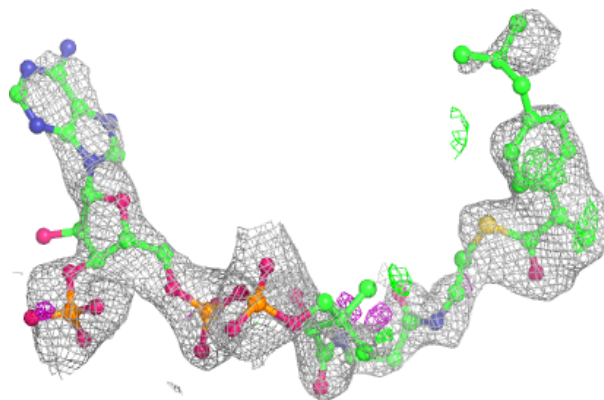


**Electron density around SFC D 1754 (A):**

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

**Electron density around RFC D 2754 (B):**

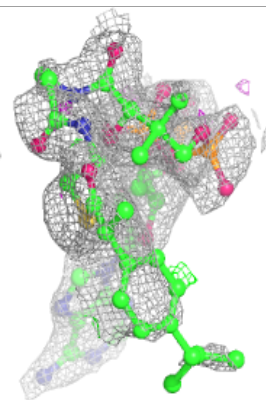
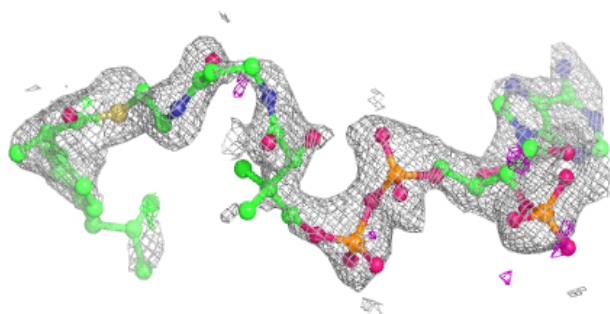
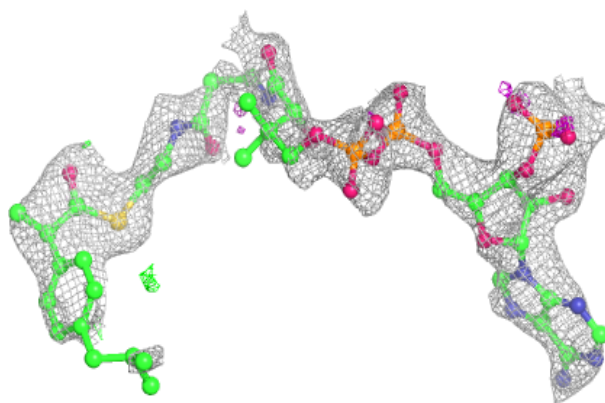
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



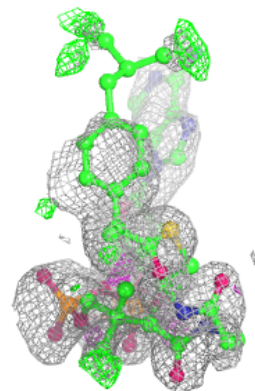
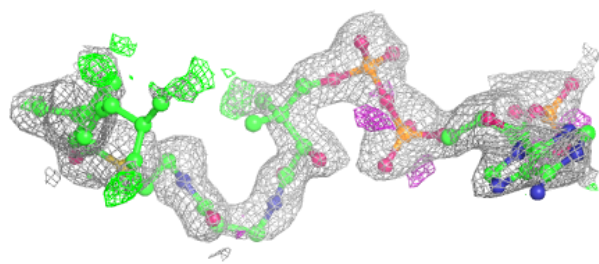
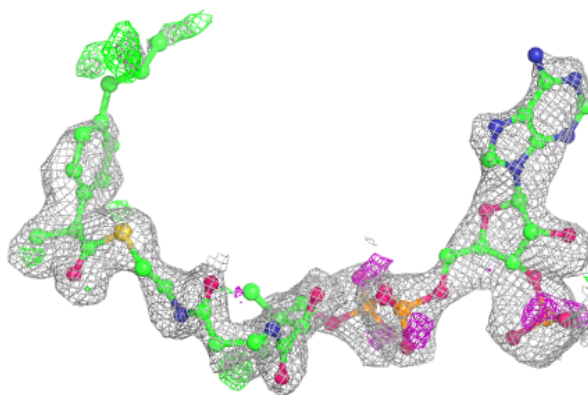


**Electron density around RFC C 2753 (B):**

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

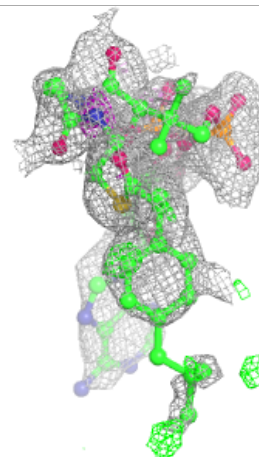
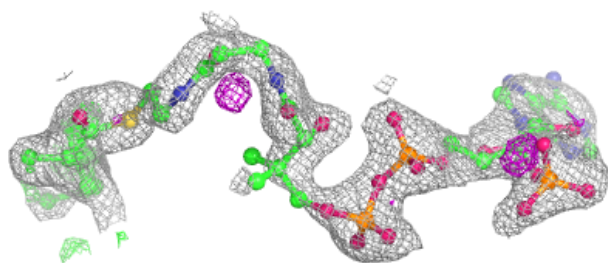
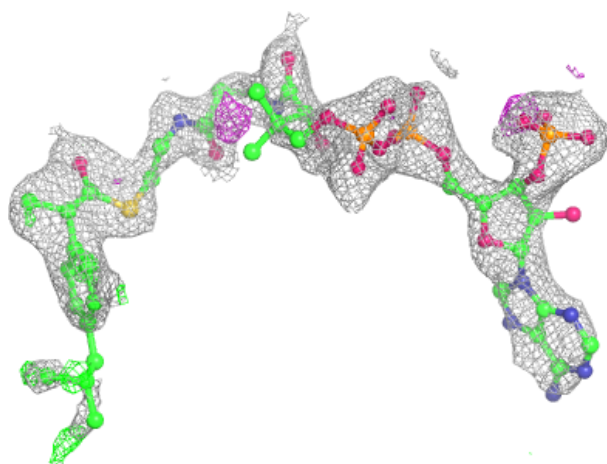
**Electron density around SFC A 1751 (A):**

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



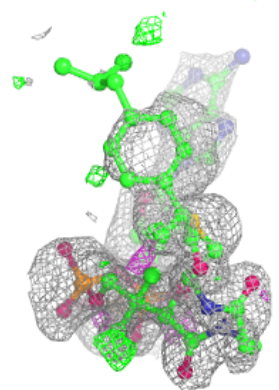
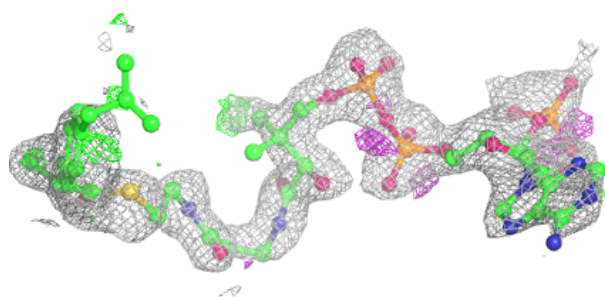
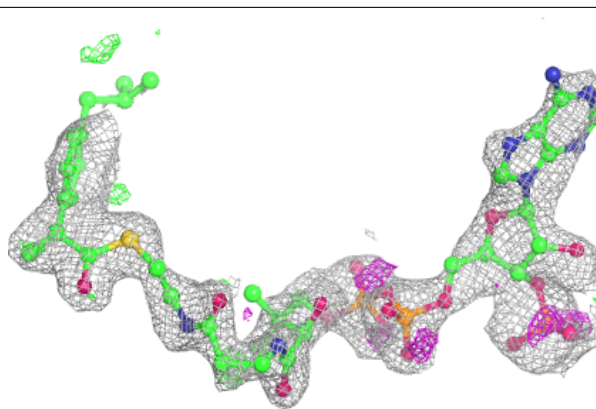
**Electron density around SFC B 1752 (A):**

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

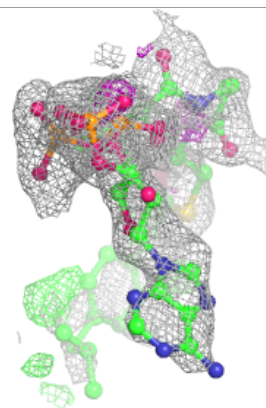
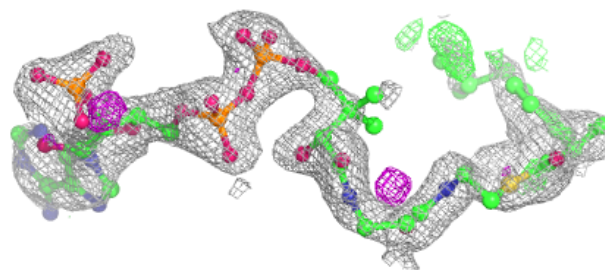
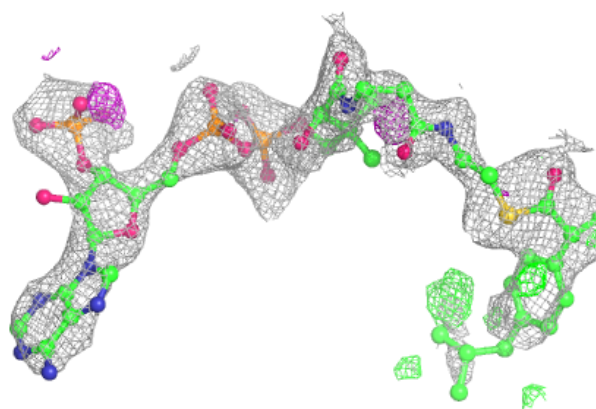


**Electron density around RFC A 2751 (B):**

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

**Electron density around RFC B 2752 (B):**

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



## 6.5 Other polymers [i](#)

There are no such residues in this entry.