Full wwPDB X-ray Structure Validation Report (i)

Nov 3, 2024 – 03:56 am GMT

PDB ID	:	5MRW
Title	:	Structure of the KdpFABC complex
Authors	:	Huang, C.; Pedersen, B.P.; Stokes, D.L.
Deposited on	:	2016-12-27
Resolution	:	2.90 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

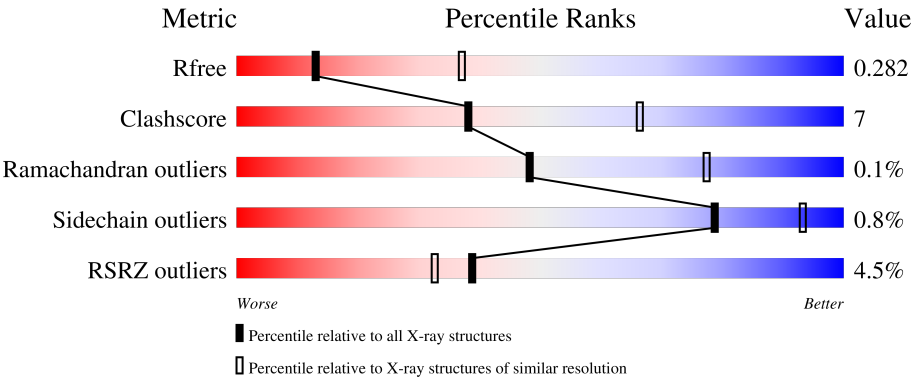
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.90 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	2335 (2.90-2.90)
Clashscore	180529	2564 (2.90-2.90)
Ramachandran outliers	177936	2514 (2.90-2.90)
Sidechain outliers	177891	2516 (2.90-2.90)
RSRZ outliers	164620	2337 (2.90-2.90)

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	557	4% 78% 21%
1	E	557	4% 79% 20%
1	I	557	3% 81% 18%
2	B	674	5% 82% 18%
2	F	674	7% 83% 17%

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Mol	Chain	Length	Quality of chain
2	J	674	6% 84% 16%
3	C	187	2% 83% 17%
3	G	187	3% 86% 14%
3	K	187	2% 86% 14%
4	D	27	7% 96%
4	H	27	7% 96%
4	L	27	4% 96%

2 Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 32666 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 Potassium-transporting ATPase potassium-binding subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	557	Total	C	N	O	S	0	0	0
			4157	2716	681	725	35			
1	E	557	Total	C	N	O	S	0	0	0
			4157	2716	681	725	35			
1	I	557	Total	C	N	O	S	0	0	0
			4157	2716	681	725	35			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	116	ARG	GLN	engineered mutation	UNP P03959
E	116	ARG	GLN	engineered mutation	UNP P03959
I	116	ARG	GLN	engineered mutation	UNP P03959

- Molecule 2 is a protein called Potassium-transporting ATPase ATP-binding subunit.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	674	Total	C	N	O	P	S	0	0	0
			5008	3187	864	932	1	24			
2	F	674	Total	C	N	O	P	S	0	0	0
			5008	3187	864	932	1	24			
2	J	674	Total	C	N	O	P	S	0	0	0
			5008	3187	864	932	1	24			

- Molecule 3 is a protein called Potassium-transporting ATPase KdpC subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	187	Total	C	N	O	S	0	0	0
			1413	903	245	264	1			
3	G	187	Total	C	N	O	S	0	0	0
			1413	903	245	264	1			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	K	187	Total	C	N	O	S	0	0	0
			1413	903	245	264	1			

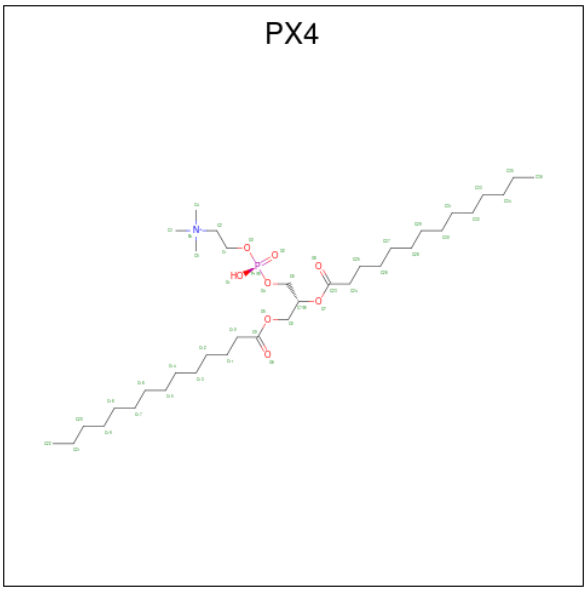
- Molecule 4 is a protein called Potassium-transporting ATPase KdpF subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	27	Total	C	N	O	S	0	0	0
			200	137	28	34	1			
4	H	27	Total	C	N	O	S	0	0	0
			200	137	28	34	1			
4	L	27	Total	C	N	O	S	0	0	0
			200	137	28	34	1			

- Molecule 5 is POTASSIUM ION (three-letter code: K) (formula: K).

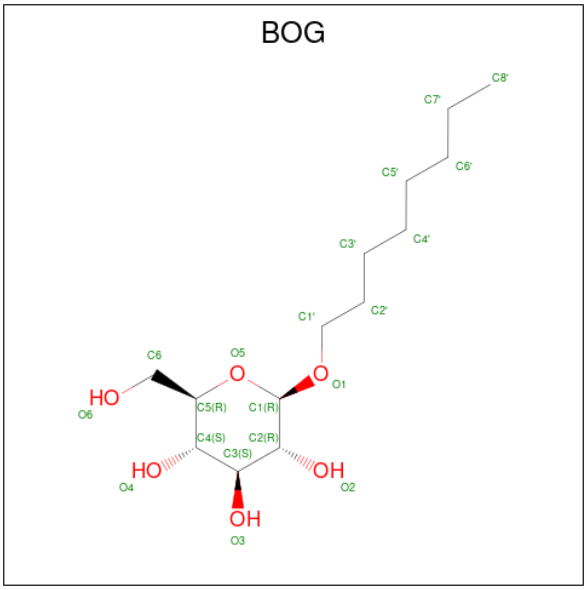
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	K	0	0
			1	1		
5	E	1	Total	K	0	0
			1	1		
5	I	1	Total	K	0	0
			1	1		

- Molecule 6 is 1,2-DIMYRISTOYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PX4) (formula: $C_{36}H_{73}NO_8P$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total	C	O	P	0	0
			41	32	8	1		
6	A	1	Total	C	O	P	0	0
			41	32	8	1		
6	E	1	Total	C	O	P	0	0
			41	32	8	1		
6	H	1	Total	C	O	P	0	0
			41	32	8	1		
6	I	1	Total	C	O	P	0	0
			41	32	8	1		
6	I	1	Total	C	O	P	0	0
			41	32	8	1		

- Molecule 7 is octyl beta-D-glucopyranoside (three-letter code: BOG) (formula: $C_{14}H_{28}O_6$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O	0	0
			20	14	6		
7	B	1	Total	C	O	0	0
			20	14	6		
7	E	1	Total	C	O	0	0
			20	14	6		
7	I	1	Total	C	O	0	0
			20	14	6		

- Molecule 8 is water.

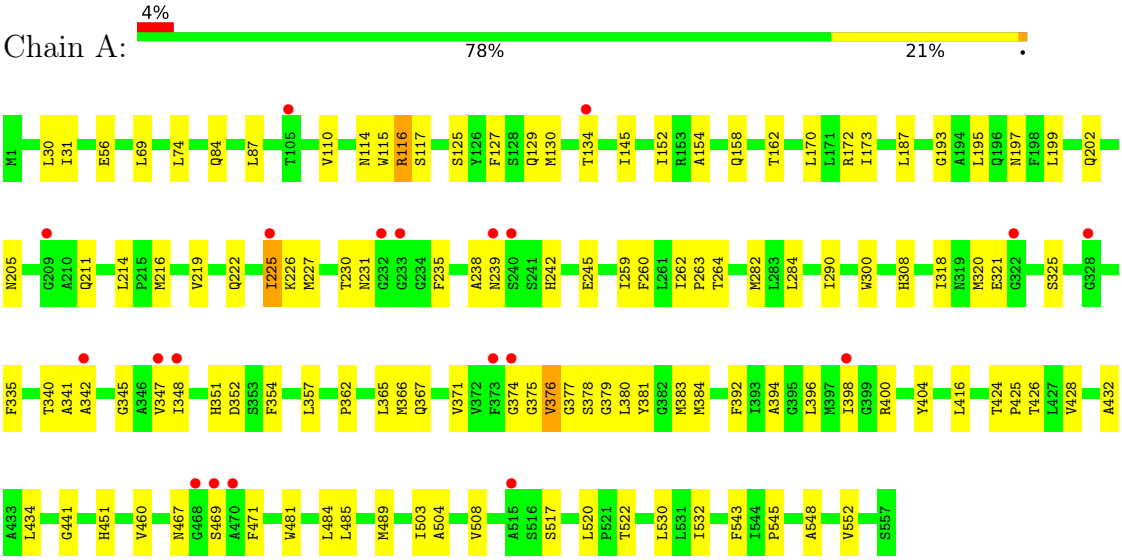
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	1	Total O 1 1	0	0
8	F	1	Total O 1 1	0	0
8	J	1	Total O 1 1	0	0

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.

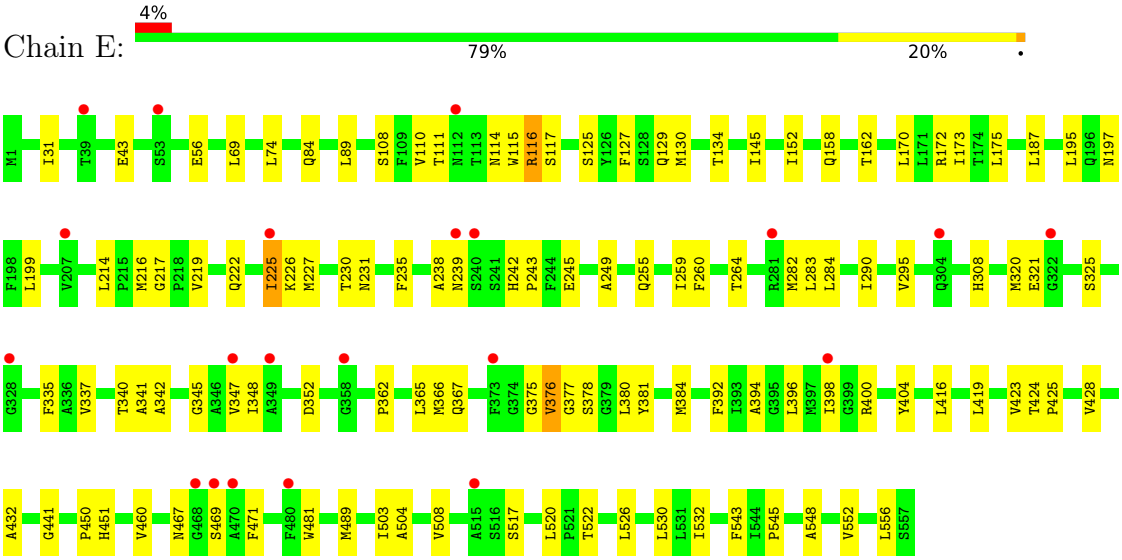
• Molecule 1: Potassium-transporting ATPase potassium-binding subunit

Chain A:



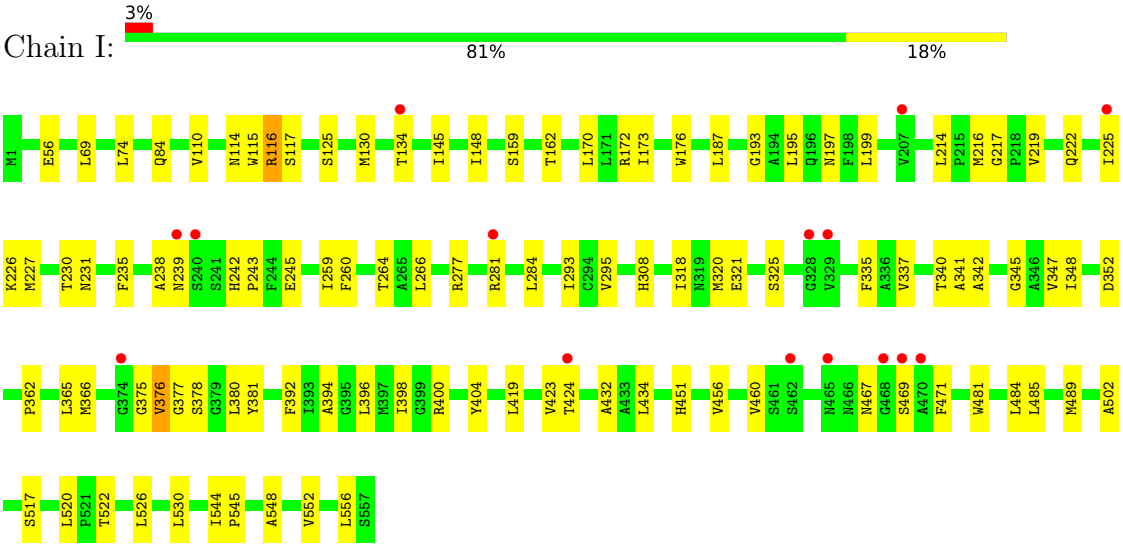
• Molecule 1: Potassium-transporting ATPase potassium-binding subunit

Chain E:



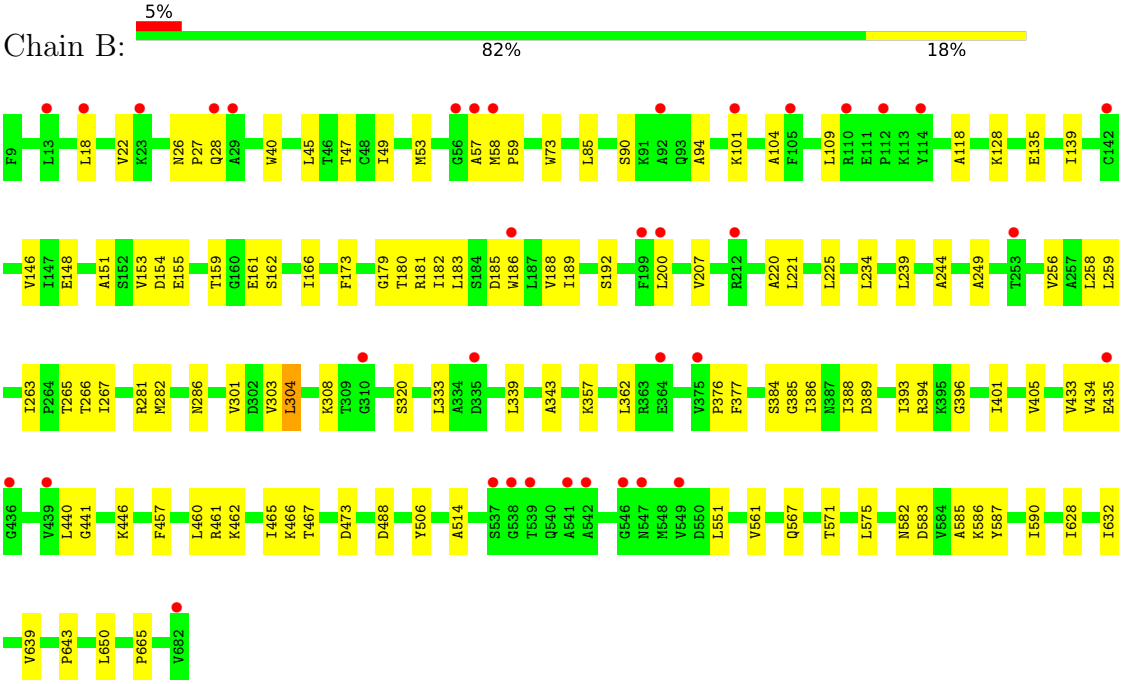
• Molecule 1: Potassium-transporting ATPase potassium-binding subunit

Chain I:



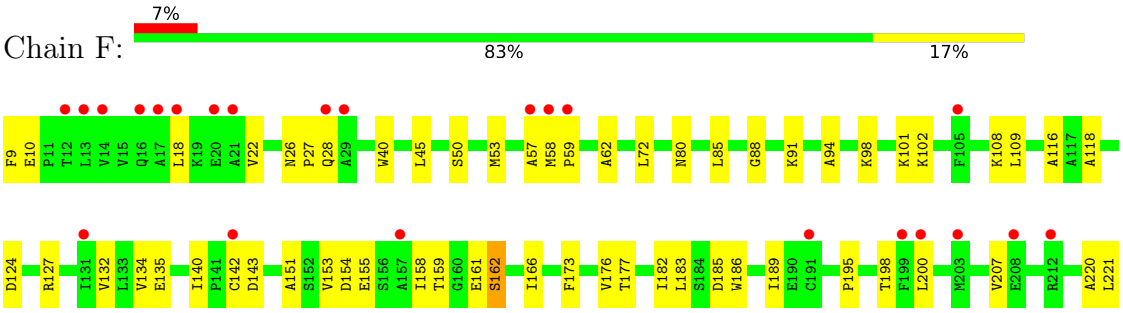
• Molecule 2: Potassium-transporting ATPase ATP-binding subunit

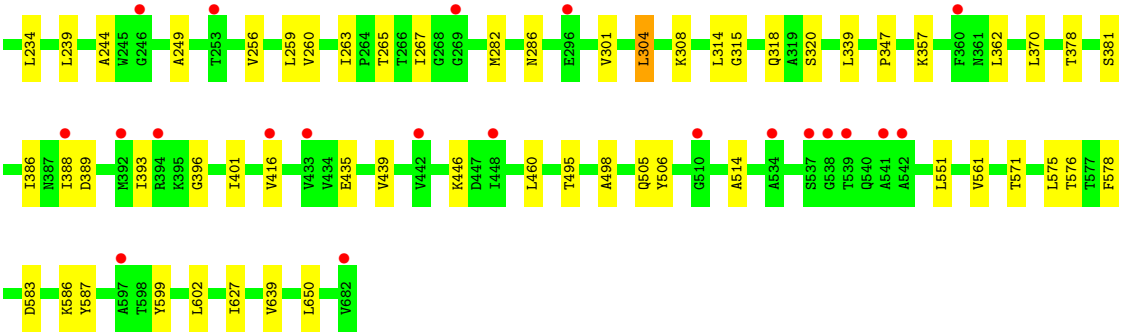
Chain B:



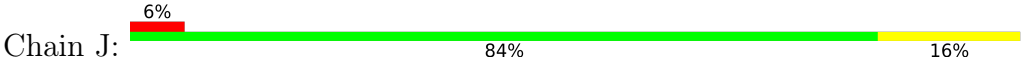
• Molecule 2: Potassium-transporting ATPase ATP-binding subunit

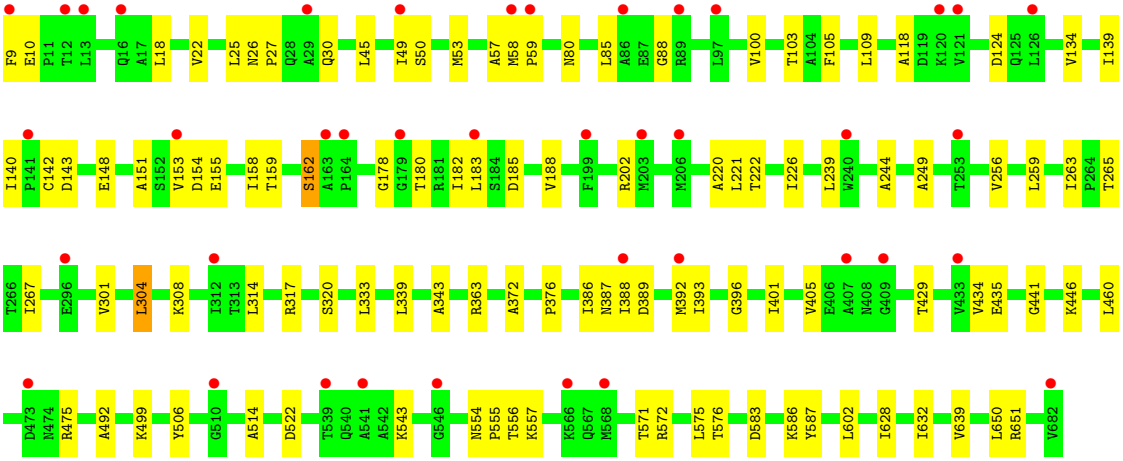
Chain F:



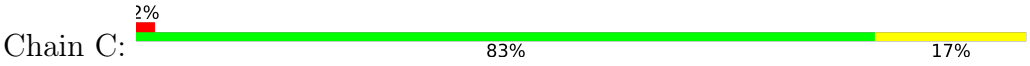


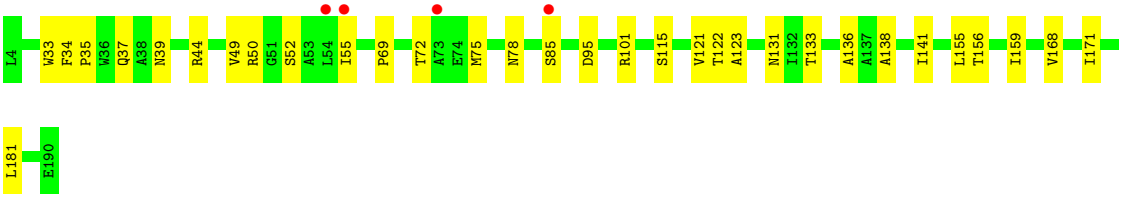
• Molecule 2: Potassium-transporting ATPase ATP-binding subunit



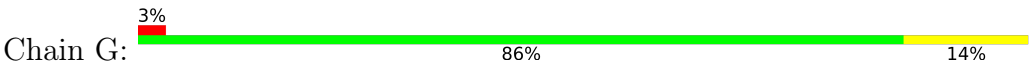


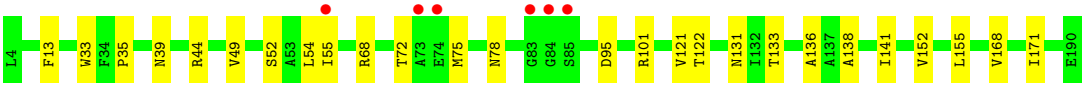
• Molecule 3: Potassium-transporting ATPase KdpC subunit



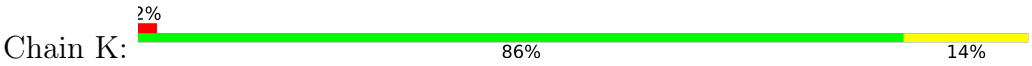


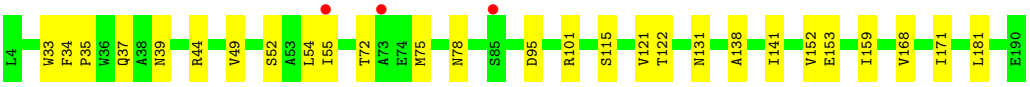
• Molecule 3: Potassium-transporting ATPase KdpC subunit



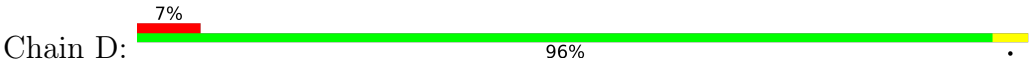


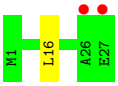
• Molecule 3: Potassium-transporting ATPase KdpC subunit



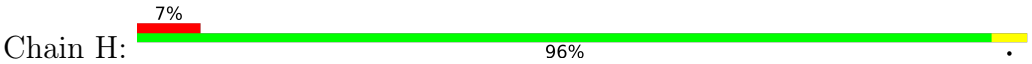


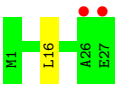
• Molecule 4: Potassium-transporting ATPase KdpF subunit



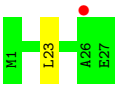


• Molecule 4: Potassium-transporting ATPase KdpF subunit





• Molecule 4: Potassium-transporting ATPase KdpF subunit



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	124.72Å 166.29Å 196.30Å 90.00° 107.41° 90.00°	Depositor
Resolution (Å)	20.00 – 2.90 20.00 – 2.90	Depositor EDS
% Data completeness (in resolution range)	99.1 (20.00-2.90) 99.1 (20.00-2.90)	Depositor EDS
R_{merge}	0.20	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.42 (at 2.91Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.243 , 0.275 0.252 , 0.282	Depositor DCC
R_{free} test set	9373 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	94.7	Xtriage
Anisotropy	0.473	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.27 , 89.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	0.000 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	32666	wwPDB-VP
Average B, all atoms (Å^2)	151.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.67% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: SEP, PX4, BOG, K

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	0.25	0/4249	0.39	0/5784
1	E	0.27	1/4249 (0.0%)	0.39	0/5784
1	I	0.26	1/4249 (0.0%)	0.39	0/5784
2	B	0.24	0/5072	0.40	0/6889
2	F	0.24	0/5072	0.40	0/6889
2	J	0.24	0/5072	0.40	0/6889
3	C	0.24	0/1444	0.40	0/1977
3	G	0.24	0/1444	0.39	0/1977
3	K	0.24	0/1444	0.38	0/1977
4	D	0.23	0/202	0.37	0/275
4	H	0.23	0/202	0.36	0/275
4	L	0.23	0/202	0.37	0/275
All	All	0.25	2/32901 (0.0%)	0.39	0/44775

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	217	GLY	C-N	7.48	1.48	1.34
1	I	217	GLY	C-N	5.58	1.44	1.34

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	4157	0	4286	78	0
1	E	4157	0	4286	78	0
1	I	4157	0	4286	70	0
2	B	5008	0	5195	71	0
2	F	5008	0	5195	72	0
2	J	5008	0	5195	66	0
3	C	1413	0	1428	24	0
3	G	1413	0	1428	22	0
3	K	1413	0	1428	21	0
4	D	200	0	221	1	0
4	H	200	0	221	1	0
4	L	200	0	221	1	0
5	A	1	0	0	0	0
5	E	1	0	0	0	0
5	I	1	0	0	0	0
6	A	82	0	118	1	0
6	E	41	0	59	1	0
6	H	41	0	59	0	0
6	I	82	0	118	3	0
7	A	20	0	28	0	0
7	B	20	0	28	0	0
7	E	20	0	28	1	0
7	I	20	0	28	1	0
8	B	1	0	0	0	0
8	F	1	0	0	0	0
8	J	1	0	0	0	0
All	All	32666	0	33856	453	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 7.

All (453) 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:545:PRO:HB2	2:B:239:LEU:HD21	1.65	0.79
1:I:545:PRO:HB2	2:J:239:LEU:HD21	1.65	0.76
1:E:545:PRO:HB2	2:F:239:LEU:HD21	1.69	0.72
1:E:340:THR:HG21	1:E:362:PRO:HB3	1.72	0.72
1:A:116:ARG:NH1	1:A:345:GLY:O	2.23	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:461:ARG:NH1	2:B:488:ASP:OD1	2.26	0.69
1:A:264:THR:HG23	1:A:284:LEU:HD11	1.75	0.69
2:B:303:VAL:HG22	2:B:466:LYS:HB2	1.75	0.69
1:A:340:THR:HG21	1:A:362:PRO:HB3	1.76	0.68
1:I:264:THR:HG23	1:I:284:LEU:HD11	1.76	0.68
1:I:116:ARG:NH1	1:I:345:GLY:O	2.26	0.67
1:A:214:LEU:HD11	3:C:55:ILE:HD11	1.77	0.67
1:I:398:ILE:HD11	2:J:650:LEU:HB2	1.76	0.66
2:B:385:GLY:HA3	2:B:394:ARG:HD3	1.78	0.66
1:A:195:LEU:HD21	1:A:216:MET:HA	1.78	0.65
2:J:158:ILE:HG13	2:J:159:THR:HG23	1.79	0.65
1:I:130:MET:O	1:I:134:THR:OG1	2.14	0.65
2:B:393:ILE:HG12	2:B:435:GLU:HG2	1.78	0.64
1:E:264:THR:HG23	1:E:284:LEU:HD11	1.79	0.64
1:I:214:LEU:HD11	3:K:55:ILE:HD11	1.79	0.64
2:J:45:LEU:HD11	2:J:256:VAL:HG21	1.80	0.64
2:B:396:GLY:H	2:B:401:ILE:HD11	1.61	0.64
1:E:195:LEU:HD21	1:E:216:MET:HA	1.80	0.64
3:K:35:PRO:O	3:K:39:ASN:ND2	2.31	0.64
2:J:304:LEU:HD21	2:J:460:LEU:HD21	1.80	0.63
3:C:168:VAL:HB	3:C:171:ILE:HG12	1.80	0.63
1:E:214:LEU:HD11	3:G:55:ILE:HD11	1.79	0.63
1:A:130:MET:O	1:A:134:THR:OG1	2.17	0.63
1:A:398:ILE:HD11	2:B:650:LEU:HB2	1.80	0.63
1:E:69:LEU:HD22	1:E:170:LEU:HD13	1.80	0.63
2:J:100:VAL:HG13	2:J:139:ILE:HD12	1.81	0.63
1:E:226:LYS:HA	1:E:231:ASN:HB2	1.81	0.63
1:I:230:THR:HG21	1:I:375:GLY:HA3	1.81	0.63
1:E:398:ILE:HD11	2:F:650:LEU:HB2	1.81	0.63
1:E:341:ALA:HB2	1:E:365:LEU:HD13	1.81	0.62
1:A:366:MET:SD	1:A:467:ASN:ND2	2.67	0.62
1:I:195:LEU:HD21	1:I:216:MET:HA	1.81	0.61
2:B:47:THR:HG21	2:B:73:TRP:HE1	1.63	0.61
1:A:400:ARG:NH2	1:A:517:SER:OG	2.33	0.61
3:G:168:VAL:HB	3:G:171:ILE:HG12	1.81	0.61
1:A:321:GLU:OE2	3:C:85:SER:OG	2.18	0.61
1:E:130:MET:O	1:E:134:THR:OG1	2.18	0.61
1:I:340:THR:HG21	1:I:362:PRO:HB3	1.83	0.61
2:F:45:LEU:HD11	2:F:256:VAL:HG21	1.82	0.61
1:A:226:LYS:HA	1:A:231:ASN:HB2	1.82	0.60
3:C:35:PRO:O	3:C:39:ASN:ND2	2.32	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:304:LEU:HD21	2:F:460:LEU:HD21	1.83	0.60
2:J:396:GLY:H	2:J:401:ILE:HD11	1.66	0.60
2:B:154:ASP:HB2	2:B:183:LEU:HD11	1.82	0.60
1:I:376:VAL:O	1:I:378:SER:N	2.32	0.60
1:A:376:VAL:O	1:A:378:SER:N	2.33	0.60
1:A:239:ASN:HD21	1:A:347:VAL:H	1.50	0.60
2:F:339:LEU:HB3	2:F:386:ILE:HG21	1.84	0.60
1:I:392:PHE:HZ	2:J:220:ALA:HB1	1.65	0.60
1:I:526:LEU:HD22	2:J:651:ARG:HE	1.67	0.59
2:F:18:LEU:HD11	2:F:88:GLY:HA3	1.84	0.59
1:A:230:THR:HG21	1:A:375:GLY:HA3	1.84	0.59
3:G:35:PRO:O	3:G:39:ASN:ND2	2.33	0.59
3:K:168:VAL:HB	3:K:171:ILE:HG12	1.84	0.59
1:A:227:MET:HE1	1:A:259:ILE:HD11	1.85	0.59
2:B:304:LEU:HD21	2:B:460:LEU:HD21	1.84	0.58
1:I:308:HIS:ND1	3:K:95:ASP:OD2	2.33	0.58
2:B:101:LYS:HD3	2:B:200:LEU:HD12	1.85	0.58
1:I:400:ARG:NH2	1:I:517:SER:OG	2.37	0.58
1:A:341:ALA:HB2	1:A:365:LEU:HD13	1.85	0.58
1:I:239:ASN:HD21	1:I:347:VAL:H	1.50	0.58
1:E:239:ASN:HD21	1:E:347:VAL:H	1.51	0.58
2:F:571:THR:HG22	2:F:639:VAL:HG23	1.86	0.58
1:I:226:LYS:HA	1:I:231:ASN:HB2	1.85	0.57
1:I:239:ASN:HD21	1:I:347:VAL:N	2.02	0.57
1:I:366:MET:SD	1:I:467:ASN:ND2	2.68	0.57
1:A:239:ASN:HD21	1:A:347:VAL:N	2.02	0.57
2:F:315:GLY:O	2:F:318:GLN:NE2	2.36	0.57
1:E:227:MET:HE1	1:E:259:ILE:HD11	1.87	0.57
2:B:18:LEU:HD13	2:B:85:LEU:HA	1.86	0.57
2:J:267:ILE:HD12	2:J:576:THR:HG22	1.85	0.57
2:F:101:LYS:HD2	2:F:200:LEU:HD12	1.86	0.57
2:F:396:GLY:H	2:F:401:ILE:HD11	1.70	0.57
1:E:392:PHE:HZ	2:F:220:ALA:HB1	1.70	0.56
1:E:398:ILE:HD12	1:E:520:LEU:HD11	1.86	0.56
2:B:435:GLU:HG3	2:B:440:LEU:HD11	1.87	0.56
1:E:239:ASN:HD21	1:E:347:VAL:N	2.02	0.56
1:A:290:ILE:HD11	1:A:532:ILE:HG23	1.86	0.56
1:E:404:TYR:HD1	1:E:522:THR:HG21	1.71	0.56
2:J:25:LEU:O	2:J:30:GLN:NE2	2.35	0.56
1:I:197:ASN:HD22	3:K:39:ASN:HA	1.70	0.56
3:G:72:THR:OG1	3:G:75:MET:O	2.24	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:404:TYR:HD1	1:A:522:THR:HG21	1.70	0.56
2:B:45:LEU:HD11	2:B:256:VAL:HG21	1.88	0.56
1:E:396:LEU:HD21	2:F:221:LEU:HB3	1.88	0.55
1:I:352:ASP:OD1	1:I:451:HIS:NE2	2.31	0.55
2:J:22:VAL:HG13	2:J:80:ASN:HB2	1.89	0.55
1:A:308:HIS:ND1	3:C:95:ASP:OD2	2.39	0.55
1:A:398:ILE:HD12	1:A:520:LEU:HD11	1.88	0.55
1:E:230:THR:HG21	1:E:375:GLY:HA3	1.88	0.55
3:G:138:ALA:HA	3:G:141:ILE:HG13	1.89	0.55
2:J:554:ASN:HB3	2:J:557:LYS:HG3	1.87	0.55
1:E:295:VAL:HA	1:E:337:VAL:HG21	1.88	0.55
3:G:141:ILE:HG23	3:G:155:LEU:HD23	1.88	0.55
2:J:109:LEU:HD23	2:J:118:ALA:HB2	1.87	0.55
1:A:396:LEU:HD21	2:B:221:LEU:HB3	1.88	0.55
1:E:400:ARG:NH2	1:E:517:SER:OG	2.39	0.55
1:I:260:PHE:HE1	1:I:342:ALA:HB2	1.72	0.55
2:J:339:LEU:HB3	2:J:386:ILE:HG21	1.89	0.55
3:C:72:THR:OG1	3:C:75:MET:O	2.23	0.55
2:F:162:SEP:HB3	2:F:357:LYS:HE2	1.88	0.55
1:A:260:PHE:HE1	1:A:342:ALA:HB2	1.71	0.55
1:E:416:LEU:HB2	1:E:503:ILE:HD11	1.89	0.55
1:A:197:ASN:HB2	1:A:199:LEU:HD13	1.89	0.54
1:I:69:LEU:HD22	1:I:170:LEU:HD13	1.88	0.54
2:J:162:SEP:O1P	2:J:363:ARG:NH2	2.40	0.54
2:F:135:GLU:HA	2:F:186:TRP:HA	1.89	0.54
2:B:571:THR:HG22	2:B:639:VAL:HG23	1.89	0.54
1:E:366:MET:SD	1:E:467:ASN:ND2	2.68	0.54
1:A:548:ALA:HA	1:A:552:VAL:HB	1.90	0.54
1:E:116:ARG:NH1	1:E:345:GLY:O	2.40	0.54
1:I:341:ALA:HB2	1:I:365:LEU:HD13	1.89	0.54
3:K:138:ALA:HA	3:K:141:ILE:HG13	1.89	0.54
1:E:325:SER:HB2	3:G:131:ASN:HB2	1.89	0.54
3:G:101:ARG:HB2	3:G:121:VAL:HG23	1.90	0.54
2:B:179:GLY:HA3	2:B:200:LEU:HD11	1.90	0.54
1:I:396:LEU:HD21	2:J:221:LEU:HB3	1.90	0.54
1:A:416:LEU:HB2	1:A:503:ILE:HD11	1.90	0.53
1:E:376:VAL:O	1:E:378:SER:N	2.33	0.53
3:K:101:ARG:HB2	3:K:121:VAL:HG23	1.89	0.53
2:F:495:THR:HG23	2:F:498:ALA:H	1.74	0.53
1:I:325:SER:HB2	3:K:131:ASN:HB2	1.90	0.53
2:B:339:LEU:HB3	2:B:386:ILE:HG21	1.89	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:290:ILE:HD11	1:E:532:ILE:HG23	1.90	0.53
1:E:260:PHE:HE1	1:E:342:ALA:HB2	1.73	0.53
1:E:548:ALA:HA	1:E:552:VAL:HB	1.90	0.53
1:I:394:ALA:HB2	1:I:530:LEU:HD21	1.90	0.53
3:C:115:SER:HB3	1:E:158:GLN:HG3	1.89	0.53
1:I:227:MET:HE1	1:I:259:ILE:HD11	1.91	0.53
1:A:352:ASP:HB2	1:A:471:PHE:O	2.09	0.53
2:B:153:VAL:HG12	2:B:182:ILE:HG13	1.91	0.53
1:I:398:ILE:HD12	1:I:520:LEU:HD11	1.89	0.53
1:A:352:ASP:OD1	1:A:451:HIS:NE2	2.27	0.53
2:B:433:VAL:HG13	2:B:440:LEU:HB2	1.90	0.53
2:F:18:LEU:HD13	2:F:85:LEU:HA	1.90	0.52
1:A:321:GLU:HA	3:C:122:THR:HB	1.91	0.52
1:A:432:ALA:HB2	1:A:460:VAL:HG21	1.91	0.52
1:I:392:PHE:CZ	2:J:220:ALA:HB1	2.43	0.52
2:J:154:ASP:HB2	2:J:183:LEU:HD11	1.90	0.52
1:E:321:GLU:HA	3:G:122:THR:HB	1.90	0.52
1:E:352:ASP:HB2	1:E:471:PHE:O	2.10	0.52
1:I:335:PHE:HB3	1:I:348:ILE:HG21	1.91	0.52
1:E:197:ASN:HD22	3:G:39:ASN:HA	1.75	0.52
1:E:432:ALA:HB2	1:E:460:VAL:HG21	1.90	0.52
1:A:238:ALA:O	1:A:242:HIS:HB2	2.09	0.52
3:C:138:ALA:HA	3:C:141:ILE:HG13	1.91	0.52
1:I:243:PRO:HB2	3:K:54:LEU:HB3	1.91	0.52
1:A:69:LEU:HD22	1:A:170:LEU:HD13	1.92	0.52
3:C:75:MET:HG3	3:C:78:ASN:HB2	1.92	0.52
1:I:295:VAL:HA	1:I:337:VAL:HG21	1.90	0.52
2:J:103:THR:HG21	2:J:139:ILE:HD11	1.91	0.52
3:K:72:THR:OG1	3:K:75:MET:O	2.26	0.52
1:E:352:ASP:OD1	1:E:451:HIS:NE2	2.28	0.51
1:I:544:ILE:HG22	1:I:545:PRO:HD3	1.92	0.51
2:B:90:SER:HB2	2:B:207:VAL:HG13	1.91	0.51
1:E:378:SER:HA	1:E:381:TYR:CZ	2.44	0.51
1:A:187:LEU:HD13	3:C:33:TRP:HZ3	1.76	0.51
2:F:53:MET:HA	2:F:57:ALA:HB3	1.92	0.51
2:F:153:VAL:HG12	2:F:182:ILE:HG13	1.91	0.51
1:I:548:ALA:HA	1:I:552:VAL:HB	1.91	0.51
2:J:393:ILE:HG12	2:J:435:GLU:HG2	1.93	0.51
2:F:109:LEU:HD22	2:F:116:ALA:HB3	1.92	0.51
1:A:197:ASN:HD22	3:C:39:ASN:HA	1.75	0.51
2:B:159:THR:HG23	2:B:161:GLU:H	1.74	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:111:THR:HG21	1:E:489:MET:HB3	1.91	0.51
2:J:49:ILE:O	2:J:53:MET:N	2.34	0.51
1:A:378:SER:HA	1:A:381:TYR:CE2	2.46	0.51
2:B:135:GLU:HA	2:B:186:TRP:HA	1.92	0.51
1:I:84:GLN:OE1	1:I:125:SER:N	2.44	0.51
1:I:321:GLU:HA	3:K:122:THR:HB	1.93	0.51
1:I:432:ALA:HB2	1:I:460:VAL:HG21	1.93	0.51
1:E:43:GLU:OE1	1:E:172:ARG:NH1	2.44	0.50
3:C:44:ARG:HG2	3:C:49:VAL:HA	1.93	0.50
1:E:335:PHE:HB3	1:E:348:ILE:HG21	1.92	0.50
1:I:197:ASN:HB2	1:I:199:LEU:HD13	1.93	0.50
2:F:154:ASP:HB2	2:F:183:LEU:HD11	1.93	0.50
1:I:238:ALA:O	1:I:242:HIS:HB2	2.11	0.50
2:J:571:THR:HG22	2:J:639:VAL:HG23	1.92	0.50
2:B:49:ILE:O	2:B:53:MET:N	2.34	0.50
2:B:466:LYS:HD3	3:K:153:GLU:OE2	2.12	0.50
2:B:18:LEU:O	2:B:22:VAL:HG23	2.12	0.50
1:E:238:ALA:O	1:E:242:HIS:HB2	2.11	0.50
2:J:301:VAL:HG21	2:J:514:ALA:HB2	1.93	0.50
2:F:109:LEU:HD23	2:F:118:ALA:HB2	1.94	0.49
1:E:378:SER:HA	1:E:381:TYR:CE2	2.47	0.49
2:B:281:ARG:NH2	2:B:567:GLN:OE1	2.45	0.49
1:I:114:ASN:ND2	1:I:231:ASN:HB3	2.28	0.49
2:B:583:ASP:HA	2:B:586:LYS:HD3	1.95	0.49
1:E:394:ALA:HB2	1:E:530:LEU:HD21	1.95	0.49
3:K:44:ARG:HG2	3:K:49:VAL:HA	1.95	0.49
1:I:148:ILE:HD13	1:I:381:TYR:HB3	1.95	0.49
2:B:109:LEU:HD23	2:B:118:ALA:HB2	1.94	0.49
1:E:197:ASN:HB2	1:E:199:LEU:HD13	1.93	0.49
6:I:603:PX4:H55	6:I:603:PX4:H16	1.95	0.49
2:B:53:MET:HG3	2:B:59:PRO:HG2	1.95	0.48
3:G:44:ARG:HG2	3:G:49:VAL:HA	1.94	0.48
1:I:378:SER:HA	1:I:381:TYR:CZ	2.47	0.48
2:F:134:VAL:HG11	2:F:140:ILE:HD13	1.95	0.48
2:F:159:THR:HG23	2:F:161:GLU:H	1.79	0.48
1:A:114:ASN:ND2	1:A:231:ASN:HB3	2.28	0.48
2:B:396:GLY:N	2:B:401:ILE:HD11	2.28	0.48
1:I:352:ASP:HB2	1:I:471:PHE:O	2.13	0.48
2:J:103:THR:HB	2:J:105:PHE:CE2	2.48	0.48
3:C:101:ARG:HB2	3:C:121:VAL:HG23	1.96	0.48
2:B:286:ASN:HB3	2:B:551:LEU:HB2	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:104:ALA:HB2	2:B:139:ILE:HD11	1.95	0.48
2:J:405:VAL:HG22	2:J:434:VAL:HG11	1.96	0.48
2:F:98:LYS:HG2	2:F:102:LYS:NZ	2.29	0.48
1:I:404:TYR:HD1	1:I:522:THR:HG21	1.79	0.47
2:F:9:PHE:CD2	2:F:10:GLU:HG3	2.49	0.47
2:J:53:MET:HA	2:J:57:ALA:HB3	1.95	0.47
2:B:357:LYS:HA	2:B:362:LEU:H	1.80	0.47
1:E:219:VAL:HG11	1:E:245:GLU:HG2	1.96	0.47
2:F:98:LYS:HG2	2:F:102:LYS:HZ1	1.78	0.47
2:F:158:ILE:HG21	2:F:177:THR:HG21	1.95	0.47
1:I:502:ALA:HB1	7:I:604:BOG:H2'2	1.96	0.47
1:A:394:ALA:HB2	1:A:530:LEU:HD21	1.96	0.47
1:A:145:ILE:HB	1:A:173:ILE:HD13	1.96	0.47
2:B:282:MET:HE3	2:B:561:VAL:HG22	1.95	0.47
2:J:244:ALA:HB2	2:J:249:ALA:HB2	1.97	0.47
3:K:75:MET:HG3	3:K:78:ASN:HB2	1.96	0.47
1:E:416:LEU:HD11	7:E:603:BOG:H4'2	1.97	0.47
2:J:9:PHE:CD2	2:J:10:GLU:HG3	2.50	0.47
1:A:378:SER:HA	1:A:381:TYR:CZ	2.50	0.47
1:A:434:LEU:HD23	1:A:484:LEU:HD13	1.97	0.47
1:E:74:LEU:HB3	1:E:110:VAL:HG21	1.96	0.47
2:F:26:ASN:N	2:F:27:PRO:HD2	2.30	0.47
2:J:343:ALA:HB1	2:J:376:PRO:HA	1.97	0.47
1:A:335:PHE:HB3	1:A:348:ILE:HG21	1.96	0.47
2:F:108:LYS:HA	2:F:132:VAL:HA	1.96	0.47
2:J:153:VAL:HG12	2:J:182:ILE:HG13	1.97	0.47
2:B:53:MET:HA	2:B:57:ALA:HB3	1.97	0.47
2:B:308:LYS:NZ	2:B:473:ASP:OD2	2.40	0.47
3:G:52:SER:OG	3:G:55:ILE:HG13	2.14	0.47
1:A:345:GLY:HA2	1:A:469:SER:OG	2.15	0.47
2:F:378:THR:HG1	2:F:381:SER:HG	1.55	0.47
1:I:56:GLU:HB3	1:I:162:THR:HB	1.97	0.46
2:J:221:LEU:HD21	2:J:572:ARG:HD3	1.96	0.46
2:J:267:ILE:HG22	2:J:575:LEU:HB3	1.98	0.46
1:A:158:GLN:HG3	3:K:115:SER:HB3	1.96	0.46
2:B:244:ALA:HB2	2:B:249:ALA:HB2	1.98	0.46
2:B:343:ALA:HB1	2:B:376:PRO:HA	1.96	0.46
2:B:146:VAL:HG22	2:B:189:ILE:HG22	1.97	0.46
1:E:392:PHE:CZ	2:F:220:ALA:HB1	2.48	0.46
2:F:357:LYS:HA	2:F:362:LEU:H	1.81	0.46
1:E:345:GLY:HA2	1:E:469:SER:OG	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:462:LYS:HB2	2:B:643:PRO:HB2	1.97	0.46
2:F:320:SER:HB2	2:F:446:LYS:HG2	1.97	0.46
1:E:114:ASN:ND2	1:E:231:ASN:HB3	2.31	0.46
1:I:345:GLY:HA2	1:I:469:SER:OG	2.15	0.46
2:J:26:ASN:N	2:J:27:PRO:HD2	2.30	0.46
2:J:155:GLU:HG2	2:J:180:THR:HG21	1.97	0.46
1:E:556:LEU:HD12	2:F:602:LEU:HD23	1.98	0.46
2:J:222:THR:O	2:J:226:ILE:HG12	2.16	0.46
1:E:56:GLU:HB3	1:E:162:THR:HB	1.97	0.46
2:F:416:VAL:HG11	2:F:439:VAL:HG11	1.98	0.46
2:B:26:ASN:N	2:B:27:PRO:HD2	2.31	0.45
1:I:187:LEU:HD13	3:K:33:TRP:HZ3	1.81	0.45
2:B:139:ILE:HG22	2:B:181:ARG:HB2	1.99	0.45
2:J:18:LEU:HD11	2:J:88:GLY:HA3	1.98	0.45
3:K:52:SER:OG	3:K:55:ILE:HG13	2.16	0.45
1:A:374:GLY:HA3	1:A:379:GLY:HA3	1.98	0.45
1:A:129:GLN:O	1:A:134:THR:HG23	2.17	0.45
1:E:419:LEU:O	1:E:423:VAL:HG23	2.17	0.45
1:E:450:PRO:HG3	2:F:599:TYR:CE1	2.52	0.45
2:F:53:MET:HG3	2:F:59:PRO:HG2	1.99	0.45
2:J:50:SER:HA	2:J:53:MET:HB3	1.98	0.45
2:B:173:PHE:CE2	2:B:343:ALA:HA	2.51	0.45
1:I:219:VAL:HG22	1:I:235:PHE:CG	2.52	0.45
1:I:219:VAL:HG11	1:I:245:GLU:HG2	1.98	0.45
2:B:263:ILE:O	2:B:265:THR:N	2.49	0.45
1:I:378:SER:HA	1:I:381:TYR:CE2	2.51	0.45
1:I:419:LEU:O	1:I:423:VAL:HG23	2.17	0.45
2:J:124:ASP:OD1	2:J:124:ASP:N	2.50	0.45
2:J:628:ILE:O	2:J:632:ILE:HG13	2.17	0.45
1:A:325:SER:OG	3:C:131:ASN:HB2	2.17	0.45
2:F:318:GLN:HE22	2:F:347:PRO:HB2	1.81	0.45
1:A:56:GLU:HB3	1:A:162:THR:HB	1.99	0.45
2:J:388:ILE:HG23	2:J:389:ASP:H	1.80	0.45
1:I:193:GLY:HA2	3:K:37:GLN:HB3	1.98	0.44
2:J:317:ARG:HH11	2:J:429:THR:HG23	1.82	0.44
2:J:320:SER:HB2	2:J:446:LYS:HG2	1.98	0.44
2:B:148:GLU:HB2	2:B:188:VAL:HB	1.99	0.44
2:B:155:GLU:O	2:B:159:THR:HG22	2.17	0.44
1:E:89:LEU:HB2	1:E:127:PHE:HB2	1.99	0.44
1:E:243:PRO:HB2	3:G:54:LEU:HB3	1.99	0.44
2:F:22:VAL:HG13	2:F:80:ASN:HB2	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:393:ILE:HG12	2:F:435:GLU:HG2	1.98	0.44
3:C:141:ILE:HG23	3:C:155:LEU:HD23	2.00	0.44
2:F:301:VAL:HG21	2:F:514:ALA:HB2	2.00	0.44
2:J:18:LEU:HD13	2:J:85:LEU:HA	1.99	0.44
2:J:583:ASP:HA	2:J:586:LYS:HD3	1.99	0.44
1:A:74:LEU:HB3	1:A:110:VAL:HG21	1.98	0.44
2:F:124:ASP:OD1	2:F:124:ASP:N	2.49	0.44
2:J:134:VAL:HG11	2:J:140:ILE:HD13	2.00	0.44
1:A:318:ILE:HG22	1:A:320:MET:HG2	2.00	0.44
2:B:234:LEU:HD21	4:D:16:LEU:HD11	1.99	0.44
2:B:320:SER:HB2	2:B:446:LYS:HG2	1.98	0.44
2:B:388:ILE:HG23	2:B:389:ASP:H	1.83	0.44
1:E:129:GLN:O	1:E:134:THR:HG23	2.17	0.44
2:F:263:ILE:O	2:F:265:THR:N	2.50	0.44
2:J:53:MET:HG3	2:J:59:PRO:HG2	2.00	0.44
2:J:499:LYS:NZ	2:J:522:ASP:OD1	2.48	0.44
1:A:205:ASN:OD1	1:A:211:GLN:NE2	2.51	0.44
2:F:176:VAL:HG11	2:F:189:ILE:HG21	1.99	0.44
1:I:197:ASN:ND2	3:K:39:ASN:HA	2.33	0.44
2:F:583:ASP:HA	2:F:586:LYS:HD3	1.99	0.44
3:K:141:ILE:HG21	3:K:152:VAL:HG13	2.00	0.44
1:A:219:VAL:HG11	1:A:245:GLU:HG2	1.99	0.44
1:A:351:HIS:HA	1:A:354:PHE:CD1	2.53	0.44
2:B:151:ALA:HB2	2:B:185:ASP:HB2	2.00	0.44
3:C:133:THR:HG23	3:C:136:ALA:H	1.83	0.44
3:C:159:ILE:HG12	3:C:181:LEU:HD21	2.00	0.44
2:F:282:MET:HE3	2:F:561:VAL:HG22	1.99	0.44
3:G:75:MET:HG3	3:G:78:ASN:HB2	1.99	0.44
2:J:18:LEU:O	2:J:22:VAL:HG23	2.18	0.44
2:J:148:GLU:HB2	2:J:188:VAL:HB	2.00	0.44
2:J:333:LEU:HD11	2:J:441:GLY:HA3	2.00	0.44
1:A:371:VAL:HG13	1:A:383:MET:HB2	2.00	0.43
2:B:377:PHE:HB2	2:B:384:SER:HB3	2.00	0.43
2:F:58:MET:N	2:F:59:PRO:HD2	2.33	0.43
2:F:388:ILE:HG23	2:F:389:ASP:H	1.82	0.43
2:J:314:LEU:O	2:J:555:PRO:HG2	2.18	0.43
2:B:457:PHE:CE1	2:B:467:THR:HG21	2.53	0.43
1:E:249:ALA:HB1	3:G:171:ILE:HG22	2.00	0.43
1:I:222:GLN:HA	1:I:225:ILE:HD12	1.99	0.43
1:A:84:GLN:OE1	1:A:125:SER:N	2.49	0.43
1:A:115:TRP:HE1	1:A:117:SER:HB3	1.82	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:31:ILE:HD13	1:E:152:ILE:HG21	1.99	0.43
1:I:434:LEU:HD23	1:I:484:LEU:HD13	1.99	0.43
1:I:544:ILE:HD12	1:I:544:ILE:HA	1.86	0.43
2:J:308:LYS:HG3	2:J:314:LEU:HD23	2.00	0.43
2:J:372:ALA:HB2	2:J:388:ILE:HA	2.00	0.43
1:A:154:ALA:HA	1:A:508:VAL:HG22	2.00	0.43
2:F:244:ALA:HB2	2:F:249:ALA:HB2	2.01	0.43
1:A:392:PHE:CZ	2:B:220:ALA:HB1	2.54	0.43
1:A:441:GLY:HA2	1:A:481:TRP:HE1	1.83	0.43
2:B:128:LYS:HG3	2:B:192:SER:HA	2.01	0.43
2:F:91:LYS:HD2	2:F:94:ALA:HB3	1.99	0.43
2:J:314:LEU:O	2:J:556:THR:OG1	2.37	0.43
2:J:475:ARG:HG2	2:J:492:ALA:HB3	2.00	0.43
1:A:441:GLY:HA2	1:A:481:TRP:NE1	2.33	0.43
3:C:52:SER:OG	3:C:55:ILE:HG13	2.18	0.43
2:F:18:LEU:O	2:F:22:VAL:HG23	2.17	0.43
2:F:127:ARG:NH1	2:F:195:PRO:HG2	2.34	0.43
2:J:58:MET:N	2:J:59:PRO:HD2	2.33	0.43
2:B:155:GLU:HG2	2:B:180:THR:HG21	2.01	0.43
1:I:556:LEU:HD12	2:J:602:LEU:HD23	2.01	0.43
2:B:301:VAL:HG21	2:B:514:ALA:HB2	2.00	0.43
1:E:84:GLN:OE1	1:E:125:SER:N	2.52	0.43
1:E:222:GLN:HA	1:E:225:ILE:HD12	2.00	0.43
1:E:441:GLY:HA2	1:E:481:TRP:NE1	2.34	0.43
1:I:115:TRP:HE1	1:I:117:SER:HB3	1.84	0.43
1:A:260:PHE:CE1	1:A:342:ALA:HB2	2.52	0.43
1:A:380:LEU:O	1:A:384:MET:HG2	2.18	0.43
2:F:578:PHE:HE2	2:F:627:ILE:HD11	1.83	0.43
2:J:263:ILE:O	2:J:265:THR:N	2.51	0.43
2:B:258:LEU:HB2	2:B:590:ILE:HG21	2.00	0.42
1:E:425:PRO:HA	1:E:428:VAL:HG22	2.00	0.42
1:I:293:ILE:HG22	6:I:603:PX4:H48	2.01	0.42
1:I:485:LEU:O	1:I:489:MET:HG3	2.19	0.42
2:J:202:ARG:HH22	2:J:543:LYS:HD3	1.84	0.42
2:B:333:LEU:HD11	2:B:441:GLY:HA3	2.01	0.42
1:E:115:TRP:HE1	1:E:117:SER:HB3	1.83	0.42
1:E:197:ASN:ND2	3:G:39:ASN:HA	2.33	0.42
3:G:133:THR:HG23	3:G:136:ALA:H	1.84	0.42
3:G:141:ILE:HG21	3:G:152:VAL:HG13	2.00	0.42
1:E:260:PHE:CE1	1:E:342:ALA:HB2	2.54	0.42
1:I:145:ILE:HB	1:I:173:ILE:HD13	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:K:159:ILE:HG12	3:K:181:LEU:HD21	2.01	0.42
2:B:58:MET:N	2:B:59:PRO:HD2	2.33	0.42
1:I:74:LEU:HB3	1:I:110:VAL:HG21	2.00	0.42
3:C:156:THR:HG21	2:F:505:GLN:HG2	2.00	0.42
2:F:155:GLU:O	2:F:159:THR:HG22	2.18	0.42
1:I:266:LEU:HB3	1:I:380:LEU:HD22	2.01	0.42
2:F:101:LYS:NZ	2:F:198:THR:HG21	2.35	0.42
1:I:456:VAL:HG13	1:I:481:TRP:HH2	1.84	0.42
1:A:426:THR:HG21	6:A:602:PX4:H48	2.00	0.42
2:B:28:GLN:HG2	2:B:40:TRP:CH2	2.54	0.42
1:E:219:VAL:HG22	1:E:235:PHE:CG	2.54	0.42
2:J:142:CYS:SG	2:J:143:ASP:N	2.92	0.42
1:A:31:ILE:HD13	1:A:152:ILE:HG21	2.01	0.42
1:A:300:TRP:HZ3	1:A:357:LEU:HD12	1.84	0.42
2:B:225:LEU:HD21	2:B:267:ILE:HD11	2.02	0.42
2:B:460:LEU:HG	2:B:465:ILE:HB	2.01	0.42
2:J:226:ILE:HG21	4:L:23:LEU:HB2	2.02	0.42
2:B:94:ALA:HB2	2:B:207:VAL:HG11	2.02	0.42
2:B:166:ILE:HG13	2:B:173:PHE:HD2	1.84	0.42
1:E:504:ALA:O	1:E:508:VAL:HG23	2.19	0.42
2:J:143:ASP:OD1	2:J:178:GLY:N	2.35	0.42
1:E:108:SER:HB3	1:E:115:TRP:H	1.85	0.41
1:A:367:GLN:HB3	1:A:543:PHE:CE2	2.54	0.41
1:E:255:GLN:O	1:E:259:ILE:HG13	2.20	0.41
1:I:318:ILE:HG22	1:I:320:MET:HG2	2.01	0.41
2:J:387:ASN:CG	2:J:392:MET:HG2	2.40	0.41
1:A:197:ASN:ND2	3:C:39:ASN:HA	2.34	0.41
1:A:222:GLN:HA	1:A:225:ILE:HD12	2.03	0.41
1:E:145:ILE:HB	1:E:173:ILE:HD13	2.03	0.41
2:F:142:CYS:SG	2:F:143:ASP:N	2.93	0.41
2:F:308:LYS:HG3	2:F:314:LEU:HD23	2.01	0.41
2:J:26:ASN:N	2:J:27:PRO:CD	2.84	0.41
1:E:175:LEU:HD11	3:G:13:PHE:HE2	1.85	0.41
2:F:151:ALA:HB2	2:F:185:ASP:HB2	2.02	0.41
1:I:260:PHE:CE1	1:I:342:ALA:HB2	2.52	0.41
6:I:602:PX4:H62	6:I:602:PX4:H69	1.92	0.41
2:J:151:ALA:HB2	2:J:185:ASP:HB2	2.02	0.41
2:F:28:GLN:HG2	2:F:40:TRP:CH2	2.56	0.41
1:A:219:VAL:HG22	1:A:235:PHE:CG	2.56	0.41
1:A:504:ALA:O	1:A:508:VAL:HG23	2.20	0.41
2:B:628:ILE:O	2:B:632:ILE:HG13	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:187:LEU:HD13	3:G:33:TRP:HZ3	1.86	0.41
2:F:26:ASN:N	2:F:27:PRO:CD	2.83	0.41
1:I:214:LEU:HD23	1:I:214:LEU:HA	1.93	0.41
2:B:582:ASN:HA	2:B:665:PRO:HG3	2.01	0.41
1:E:308:HIS:ND1	3:G:95:ASP:OD2	2.53	0.41
2:F:94:ALA:HB2	2:F:207:VAL:HG11	2.03	0.41
2:F:267:ILE:HD12	2:F:576:THR:HG22	2.03	0.41
1:A:202:GLN:HB3	1:A:214:LEU:HB2	2.03	0.41
2:B:405:VAL:HG22	2:B:434:VAL:HG11	2.03	0.41
1:E:367:GLN:HB3	1:E:543:PHE:CZ	2.56	0.41
1:E:441:GLY:HA2	1:E:481:TRP:HE1	1.84	0.41
1:I:172:ARG:HG2	1:I:176:TRP:CZ3	2.55	0.41
1:A:87:LEU:HD13	1:A:127:PHE:CE2	2.55	0.41
1:A:425:PRO:HA	1:A:428:VAL:HG22	2.03	0.41
2:B:585:ALA:HB3	2:B:665:PRO:HB2	2.02	0.41
3:C:69:PRO:HG2	3:C:123:ALA:HA	2.02	0.41
1:E:526:LEU:HD21	2:F:650:LEU:HD23	2.02	0.41
6:E:602:PX4:H54	6:E:602:PX4:H49	1.81	0.41
2:F:50:SER:HA	2:F:53:MET:HB3	2.03	0.41
2:F:234:LEU:HD21	4:H:16:LEU:HD11	2.02	0.41
2:F:370:LEU:HB3	2:F:388:ILE:HG13	2.03	0.41
1:I:277:ARG:HB3	1:I:281:ARG:NH1	2.35	0.41
1:A:485:LEU:O	1:A:489:MET:HG3	2.21	0.41
2:B:26:ASN:N	2:B:27:PRO:CD	2.84	0.41
2:B:267:ILE:HG22	2:B:575:LEU:HB3	2.03	0.41
1:E:380:LEU:O	1:E:384:MET:HG2	2.21	0.41
2:F:72:LEU:HD22	2:F:260:VAL:HG11	2.03	0.41
3:C:50:ARG:HA	3:C:50:ARG:HD3	1.89	0.40
2:F:53:MET:SD	2:F:62:ALA:HA	2.61	0.40
1:A:193:GLY:HA2	3:C:37:GLN:HB3	2.04	0.40
1:A:214:LEU:HD23	1:A:214:LEU:HA	1.95	0.40
1:E:283:LEU:HD12	1:E:283:LEU:HA	1.92	0.40
1:A:30:LEU:HD22	1:A:172:ARG:HD2	2.03	0.40
1:E:320:MET:O	3:G:68:ARG:NH2	2.53	0.40
2:F:166:ILE:HG13	2:F:173:PHE:HD2	1.86	0.40
2:F:286:ASN:HB3	2:F:551:LEU:HB2	2.04	0.40
2:F:575:LEU:HD23	2:F:575:LEU:HA	1.93	0.40
1:A:262:ILE:N	1:A:263:PRO:HD2	2.37	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	555/557 (100%)	529 (95%)	24 (4%)	2 (0%)	30	60
1	E	555/557 (100%)	531 (96%)	22 (4%)	2 (0%)	30	60
1	I	555/557 (100%)	529 (95%)	24 (4%)	2 (0%)	30	60
2	B	671/674 (100%)	648 (97%)	23 (3%)	0	100	100
2	F	671/674 (100%)	647 (96%)	24 (4%)	0	100	100
2	J	671/674 (100%)	647 (96%)	24 (4%)	0	100	100
3	C	185/187 (99%)	174 (94%)	11 (6%)	0	100	100
3	G	185/187 (99%)	175 (95%)	10 (5%)	0	100	100
3	K	185/187 (99%)	174 (94%)	11 (6%)	0	100	100
4	D	25/27 (93%)	25 (100%)	0	0	100	100
4	H	25/27 (93%)	25 (100%)	0	0	100	100
4	L	25/27 (93%)	25 (100%)	0	0	100	100
All	All	4308/4335 (99%)	4129 (96%)	173 (4%)	6 (0%)	48	77

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	377	GLY
1	I	377	GLY
1	E	377	GLY
1	A	376	VAL
1	E	376	VAL
1	I	376	VAL

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	439/439 (100%)	435 (99%)	4 (1%)	75 92
1	E	439/439 (100%)	435 (99%)	4 (1%)	75 92
1	I	439/439 (100%)	436 (99%)	3 (1%)	81 94
2	B	523/523 (100%)	518 (99%)	5 (1%)	73 91
2	F	523/523 (100%)	519 (99%)	4 (1%)	79 93
2	J	523/523 (100%)	519 (99%)	4 (1%)	79 93
3	C	149/149 (100%)	148 (99%)	1 (1%)	81 94
3	G	149/149 (100%)	149 (100%)	0	100 100
3	K	149/149 (100%)	148 (99%)	1 (1%)	81 94
4	D	21/21 (100%)	21 (100%)	0	100 100
4	H	21/21 (100%)	21 (100%)	0	100 100
4	L	21/21 (100%)	21 (100%)	0	100 100
All	All	3396/3396 (100%)	3370 (99%)	26 (1%)	79 93

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	116	ARG
1	A	225	ILE
1	A	282	MET
1	A	424	THR
2	B	259	LEU
2	B	266	THR
2	B	304	LEU
2	B	506	TYR
2	B	587	TYR
3	C	34	PHE
1	E	116	ARG
1	E	225	ILE
1	E	282	MET
1	E	424	THR
2	F	259	LEU
2	F	304	LEU
2	F	506	TYR
2	F	587	TYR

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Mol	Chain	Res	Type
1	I	116	ARG
1	I	159	SER
1	I	424	THR
2	J	259	LEU
2	J	304	LEU
2	J	506	TYR
2	J	587	TYR
3	K	34	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	112	ASN
1	A	114	ASN
1	A	211	GLN
1	A	239	ASN
1	E	114	ASN
1	E	239	ASN
2	F	624	ASN
2	J	624	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

3 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	$\#\|Z\| > 2$
2	SEP	B	162	2	8,9,10	1.55	1 (12%)	8,12,14	1.82	2 (25%)
2	SEP	F	162	2	8,9,10	1.56	1 (12%)	8,12,14	1.66	2 (25%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	SEP	J	162	2	8,9,10	1.56	1 (12%)	8,12,14	1.79	2 (25%)

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	SEP	B	162	2	-	1/5/8/10	-
2	SEP	F	162	2	-	0/5/8/10	-
2	SEP	J	162	2	-	0/5/8/10	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	J	162	SEP	P-O1P	3.39	1.61	1.50
2	B	162	SEP	P-O1P	3.37	1.61	1.50
2	F	162	SEP	P-O1P	3.36	1.61	1.50

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	162	SEP	OG-CB-CA	3.41	111.46	108.14
2	J	162	SEP	OG-CB-CA	3.36	111.42	108.14
2	B	162	SEP	P-OG-CB	-3.36	109.03	118.30
2	J	162	SEP	P-OG-CB	-3.26	109.30	118.30
2	F	162	SEP	P-OG-CB	-3.18	109.54	118.30
2	F	162	SEP	OG-CB-CA	2.94	111.01	108.14

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	162	SEP	CA-CB-OG-P

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	162	SEP	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	J	162	SEP	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 13 ligands modelled in this entry, 3 are monoatomic - leaving 10 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	$\#\|Z\| > 2$
7	BOG	B	701	-	20,20,20	1.22	1 (5%)	25,25,25	0.80	0
6	PX4	H	101	-	40,40,45	1.27	5 (12%)	43,45,53	1.12	2 (4%)
6	PX4	I	603	-	40,40,45	1.26	5 (12%)	43,45,53	1.15	2 (4%)
7	BOG	A	604	-	20,20,20	1.21	1 (5%)	25,25,25	0.79	0
6	PX4	A	602	-	40,40,45	1.26	5 (12%)	43,45,53	1.15	2 (4%)
6	PX4	A	603	-	40,40,45	1.27	5 (12%)	43,45,53	1.10	2 (4%)
7	BOG	E	603	-	20,20,20	1.22	1 (5%)	25,25,25	0.82	0
7	BOG	I	604	-	20,20,20	1.21	1 (5%)	25,25,25	0.82	0
6	PX4	E	602	-	40,40,45	1.26	5 (12%)	43,45,53	1.11	2 (4%)
6	PX4	I	602	-	40,40,45	1.27	5 (12%)	43,45,53	1.07	2 (4%)

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
7	BOG	B	701	-	-	1/11/31/31	0/1/1/1
6	PX4	H	101	-	-	19/44/44/49	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	PX4	I	603	-	-	15/44/44/49	-
7	BOG	A	604	-	-	3/11/31/31	0/1/1/1
6	PX4	A	602	-	-	22/44/44/49	-
6	PX4	A	603	-	-	18/44/44/49	-
7	BOG	E	603	-	-	3/11/31/31	0/1/1/1
7	BOG	I	604	-	-	4/11/31/31	0/1/1/1
6	PX4	E	602	-	-	17/44/44/49	-
6	PX4	I	602	-	-	8/44/44/49	-

All (34) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	I	604	BOG	O5-C1	3.56	1.50	1.41
7	A	604	BOG	O5-C1	3.53	1.50	1.41
7	E	603	BOG	O5-C1	3.53	1.50	1.41
7	B	701	BOG	O5-C1	3.51	1.50	1.41
6	H	101	PX4	O5-C9	3.29	1.43	1.33
6	A	602	PX4	O5-C9	3.29	1.42	1.33
6	A	603	PX4	O5-C9	3.26	1.42	1.33
6	I	602	PX4	O5-C9	3.22	1.42	1.33
6	E	602	PX4	O5-C9	3.21	1.42	1.33
6	I	603	PX4	O5-C9	3.19	1.42	1.33
6	I	603	PX4	O7-C23	3.15	1.43	1.34
6	A	602	PX4	O7-C23	3.10	1.43	1.34
6	I	602	PX4	O7-C23	3.06	1.42	1.34
6	A	603	PX4	O7-C23	3.06	1.42	1.34
6	H	101	PX4	O7-C23	3.05	1.42	1.34
6	E	602	PX4	O7-C23	3.02	1.42	1.34
6	H	101	PX4	O7-C7	-2.60	1.40	1.46
6	E	602	PX4	O7-C7	-2.58	1.40	1.46
6	A	603	PX4	O7-C7	-2.58	1.40	1.46
6	I	602	PX4	O7-C7	-2.54	1.40	1.46
6	A	602	PX4	O7-C7	-2.48	1.40	1.46
6	I	603	PX4	O7-C7	-2.34	1.40	1.46
6	E	602	PX4	P1-O3	2.32	1.67	1.59
6	A	603	PX4	P1-O3	2.32	1.67	1.59
6	H	101	PX4	P1-O3	2.31	1.67	1.59
6	I	603	PX4	P1-O3	2.30	1.67	1.59
6	I	602	PX4	P1-O3	2.30	1.67	1.59
6	A	602	PX4	P1-O3	2.26	1.67	1.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	I	602	PX4	P1-O4	2.10	1.67	1.59
6	A	603	PX4	P1-O4	2.10	1.67	1.59
6	E	602	PX4	P1-O4	2.07	1.67	1.59
6	H	101	PX4	P1-O4	2.06	1.67	1.59
6	A	602	PX4	P1-O4	2.04	1.67	1.59
6	I	603	PX4	P1-O4	2.03	1.67	1.59

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	I	603	PX4	O7-C23-C24	4.49	121.19	111.50
6	A	602	PX4	O7-C23-C24	4.05	120.24	111.50
6	H	101	PX4	O7-C23-C24	3.90	119.90	111.50
6	A	603	PX4	O7-C23-C24	3.81	119.72	111.50
6	E	602	PX4	O7-C23-C24	3.81	119.71	111.50
6	I	602	PX4	O7-C23-C24	3.67	119.41	111.50
6	A	602	PX4	O5-C9-C10	2.71	120.41	111.91
6	A	603	PX4	O5-C9-C10	2.64	120.18	111.91
6	I	603	PX4	O5-C9-C10	2.61	120.08	111.91
6	E	602	PX4	O5-C9-C10	2.60	120.07	111.91
6	H	101	PX4	O5-C9-C10	2.56	119.94	111.91
6	I	602	PX4	O5-C9-C10	2.51	119.77	111.91

There are no chirality outliers.

All (110) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	602	PX4	C6-O4-P1-O1
6	A	602	PX4	O8-C23-O7-C7
6	A	602	PX4	C24-C23-O7-C7
6	A	603	PX4	C1-O3-P1-O1
6	E	602	PX4	C1-O3-P1-O1
6	E	602	PX4	C1-O3-P1-O2
6	E	602	PX4	C6-O4-P1-O3
6	H	101	PX4	C1-O3-P1-O1
6	I	603	PX4	O8-C23-O7-C7
6	I	603	PX4	C24-C23-O7-C7
7	A	604	BOG	O5-C1-O1-C1'
7	I	604	BOG	O5-C1-O1-C1'
6	A	602	PX4	O6-C9-O5-C8
6	H	101	PX4	O8-C23-O7-C7
6	H	101	PX4	C24-C23-O7-C7

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Mol	Chain	Res	Type	Atoms
6	A	602	PX4	C10-C9-O5-C8
7	I	604	BOG	O5-C5-C6-O6
7	I	604	BOG	C4-C5-C6-O6
6	E	602	PX4	C9-C10-C11-C12
6	A	603	PX4	C9-C10-C11-C12
6	I	603	PX4	C23-C24-C25-C26
6	A	603	PX4	C24-C23-O7-C7
6	A	602	PX4	C6-O4-P1-O3
6	H	101	PX4	C6-O4-P1-O3
6	A	603	PX4	O8-C23-O7-C7
6	A	603	PX4	C11-C12-C13-C14
6	A	602	PX4	C10-C11-C12-C13
6	E	602	PX4	C11-C12-C13-C14
6	A	603	PX4	C1-O3-P1-O2
6	H	101	PX4	C1-O3-P1-O2
6	H	101	PX4	C24-C25-C26-C27
6	I	603	PX4	C12-C13-C14-C15
6	H	101	PX4	C27-C28-C29-C30
6	I	602	PX4	C9-C10-C11-C12
6	A	603	PX4	C27-C28-C29-C30
6	I	603	PX4	C10-C11-C12-C13
6	I	602	PX4	C25-C26-C27-C28
6	H	101	PX4	C31-C32-C33-C34
6	H	101	PX4	C10-C11-C12-C13
6	A	602	PX4	C17-C18-C19-C20
6	A	602	PX4	C29-C30-C31-C32
7	A	604	BOG	C3'-C4'-C5'-C6'
6	E	602	PX4	C10-C9-O5-C8
7	E	603	BOG	C1'-C2'-C3'-C4'
6	E	602	PX4	O6-C9-O5-C8
6	H	101	PX4	C29-C30-C31-C32
6	I	603	PX4	C25-C26-C27-C28
6	A	602	PX4	C14-C15-C16-C17
7	E	603	BOG	O5-C1-O1-C1'
6	H	101	PX4	C25-C26-C27-C28
6	H	101	PX4	C32-C33-C34-C35
6	A	602	PX4	C18-C19-C20-C21
6	E	602	PX4	O7-C7-C8-O5
6	A	602	PX4	C1-O3-P1-O2
6	E	602	PX4	C23-C24-C25-C26
6	A	603	PX4	C25-C26-C27-C28
6	E	602	PX4	C33-C34-C35-C36

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Mol	Chain	Res	Type	Atoms
7	A	604	BOG	C2'-C1'-O1-C1
7	B	701	BOG	C3'-C4'-C5'-C6'
6	A	603	PX4	C10-C9-O5-C8
6	I	602	PX4	C26-C27-C28-C29
6	A	602	PX4	C25-C26-C27-C28
6	A	602	PX4	C26-C27-C28-C29
6	A	602	PX4	C24-C25-C26-C27
6	A	603	PX4	C6-C7-C8-O5
6	A	603	PX4	O6-C9-O5-C8
6	A	602	PX4	C27-C28-C29-C30
6	E	602	PX4	C6-O4-P1-O1
6	H	101	PX4	C6-O4-P1-O2
6	A	602	PX4	C11-C12-C13-C14
6	I	602	PX4	C32-C33-C34-C35
6	E	602	PX4	C6-C7-C8-O5
6	A	603	PX4	O7-C7-C8-O5
6	I	603	PX4	C11-C12-C13-C14
6	A	602	PX4	C31-C32-C33-C34
6	I	603	PX4	C6-C7-O7-C23
6	A	602	PX4	C7-C6-O4-P1
6	I	602	PX4	C7-C6-O4-P1
6	I	602	PX4	C16-C17-C18-C19
6	A	603	PX4	C6-O4-P1-O3
6	I	603	PX4	C6-O4-P1-O3
7	E	603	BOG	C3'-C4'-C5'-C6'
6	I	603	PX4	C13-C14-C15-C16
6	A	602	PX4	C28-C29-C30-C31
6	I	603	PX4	O7-C7-C8-O5
6	E	602	PX4	C1-O3-P1-O4
6	I	602	PX4	C1-O3-P1-O1
6	A	603	PX4	C24-C25-C26-C27
6	A	603	PX4	C6-C7-O7-C23
6	A	603	PX4	C8-C7-O7-C23
6	A	602	PX4	C30-C31-C32-C33
6	A	603	PX4	C17-C18-C19-C20
6	I	603	PX4	O7-C23-C24-C25
6	I	602	PX4	C28-C29-C30-C31
6	E	602	PX4	C14-C15-C16-C17
6	E	602	PX4	C24-C25-C26-C27
6	H	101	PX4	O7-C23-C24-C25
6	I	603	PX4	C6-C7-C8-O5
6	A	603	PX4	C14-C15-C16-C17

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Mol	Chain	Res	Type	Atoms
6	E	602	PX4	C17-C18-C19-C20
6	H	101	PX4	C11-C10-C9-O5
6	H	101	PX4	O7-C7-C8-O5
6	I	603	PX4	C18-C19-C20-C21
7	I	604	BOG	C4'-C5'-C6'-C7'
6	H	101	PX4	O8-C23-C24-C25
6	A	602	PX4	C13-C14-C15-C16
6	H	101	PX4	C11-C10-C9-O6
6	E	602	PX4	C25-C26-C27-C28
6	H	101	PX4	C14-C15-C16-C17
6	I	603	PX4	C26-C27-C28-C29

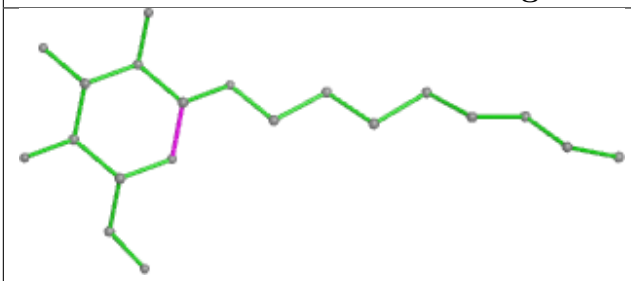
There are no ring outliers.

6 monomers are involved in 7 short contacts:

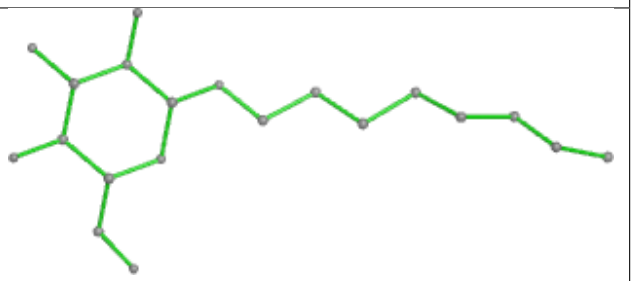
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	I	603	PX4	2	0
6	A	602	PX4	1	0
7	E	603	BOG	1	0
7	I	604	BOG	1	0
6	E	602	PX4	1	0
6	I	602	PX4	1	0

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.

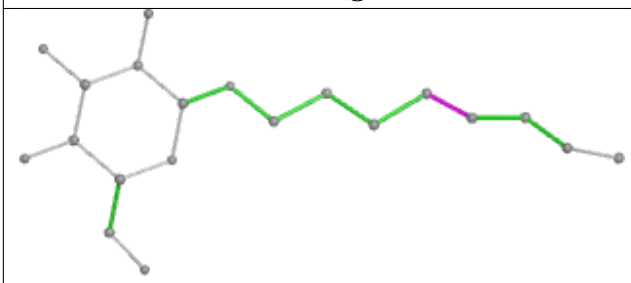
Ligand BOG B 701



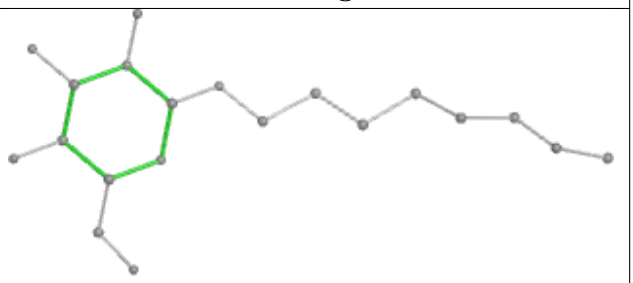
Bond lengths



Bond angles

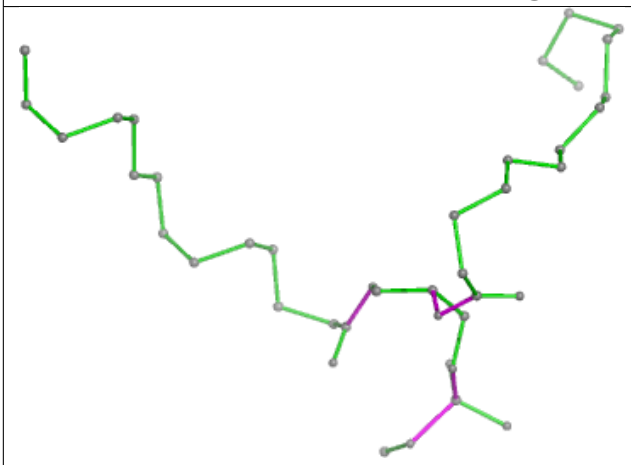


Torsions

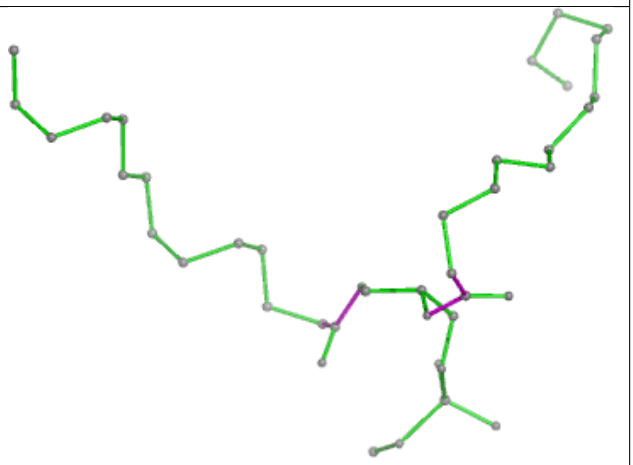


Rings

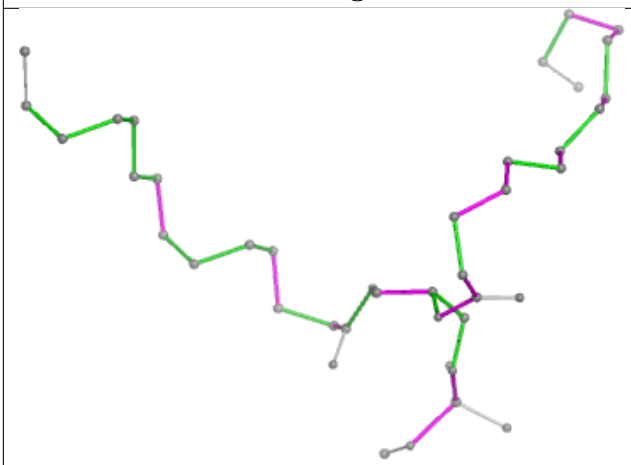
Ligand PX4 H 101



Bond lengths



Bond angles



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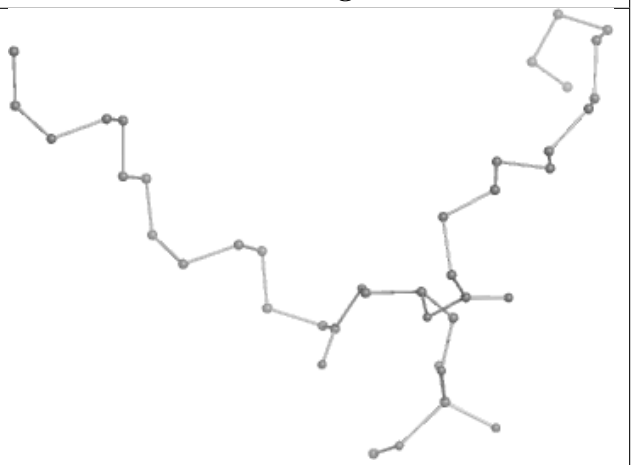
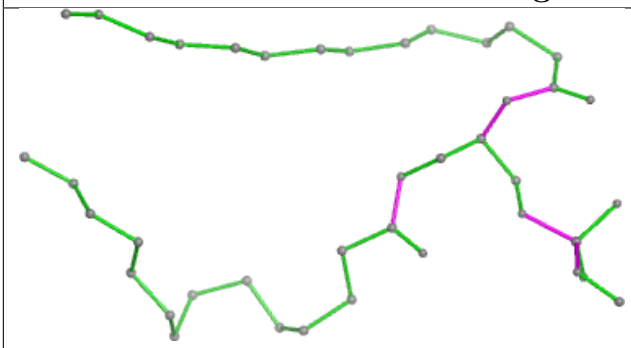
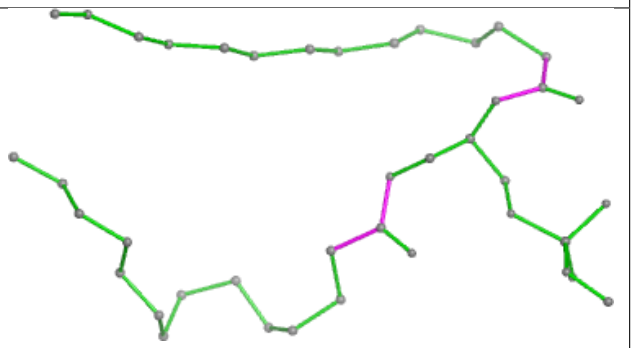


Rings

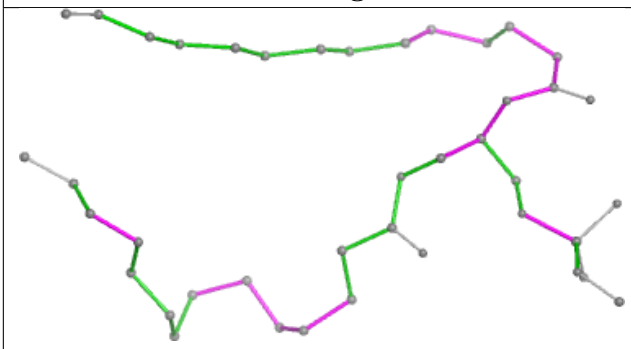
Ligand PX4 I 603



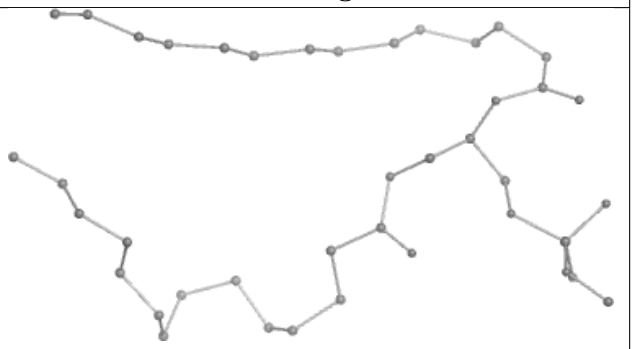
Bond lengths



Bond angles

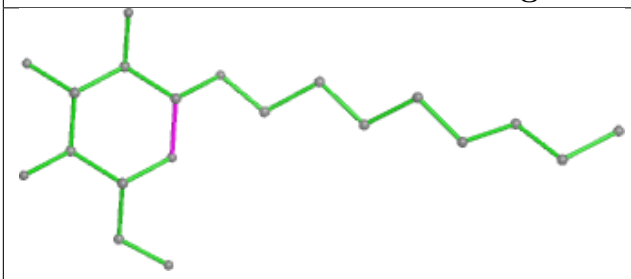


Torsions

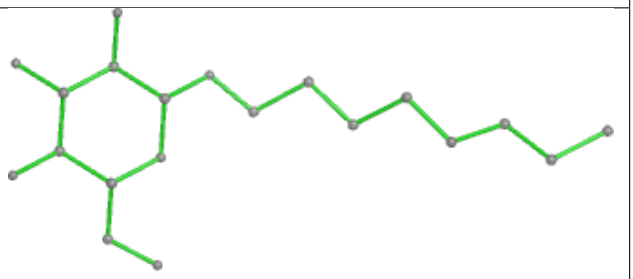


Rings

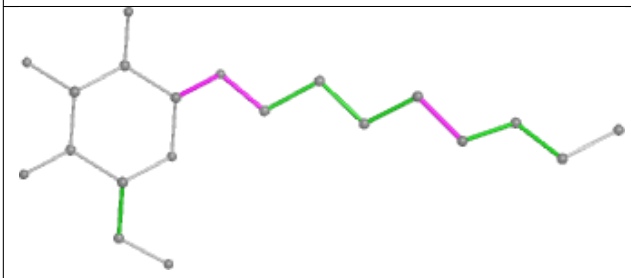
Ligand BOG A 604



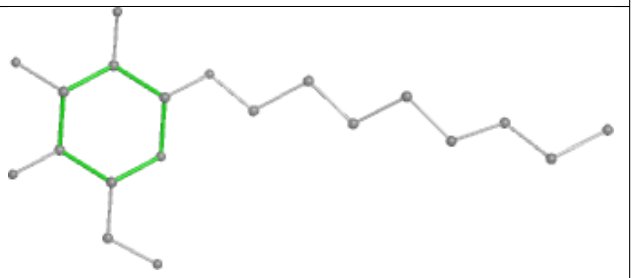
Bond lengths



Bond angles

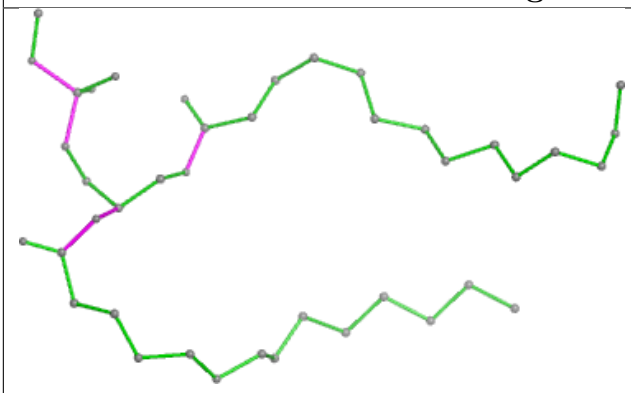


Torsions

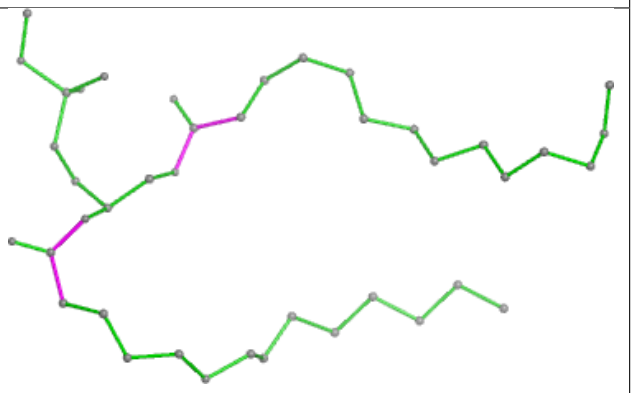


Rings

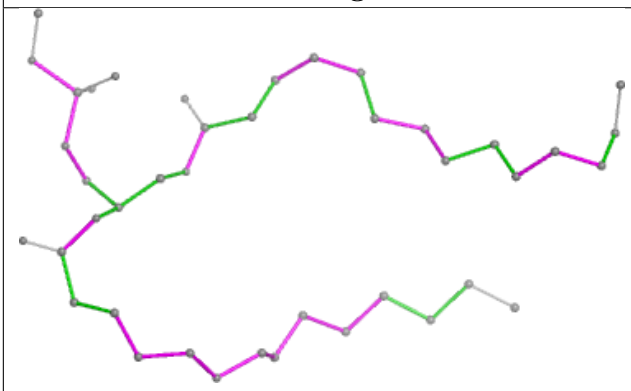
Ligand PX4 A 602



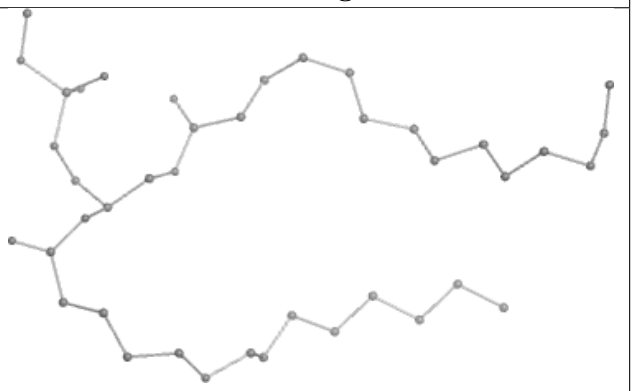
Bond lengths



Bond angles

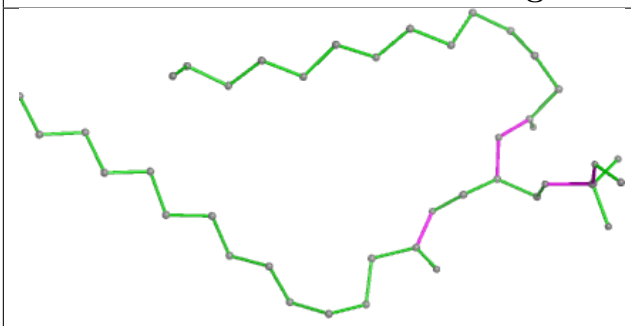


Torsions

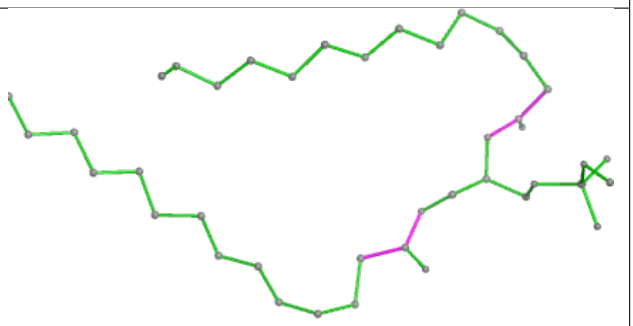


Rings

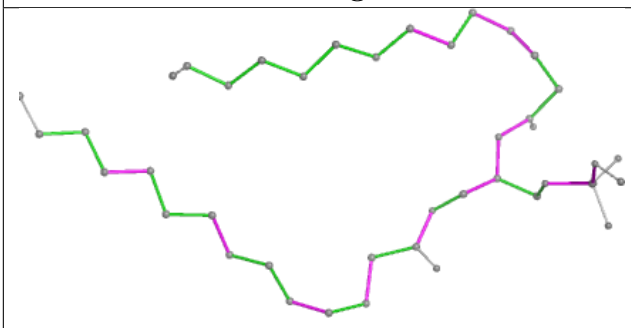
Ligand PX4 A 603



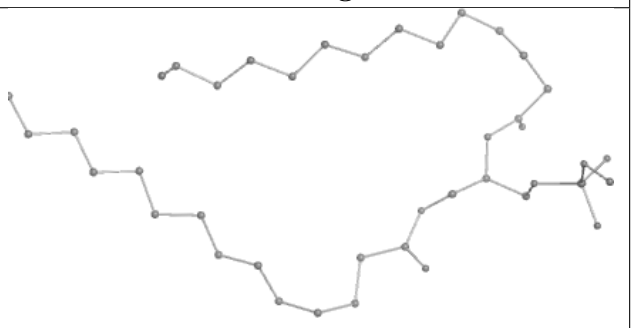
Bond lengths



Bond angles

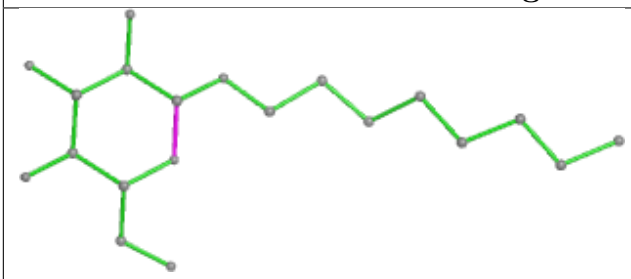


Torsions

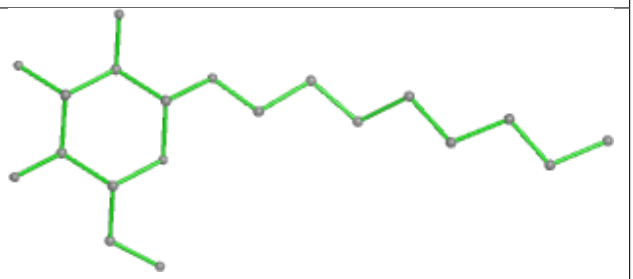


Rings

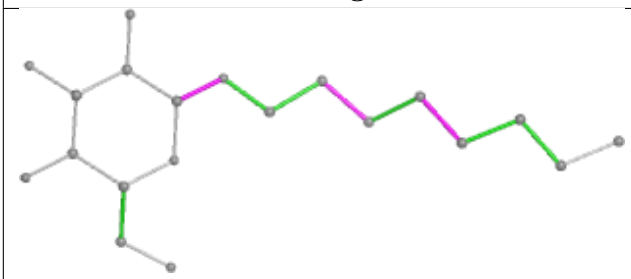
Ligand BOG E 603



Bond lengths



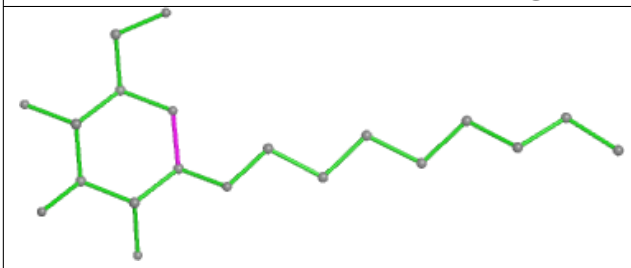
Bond angles



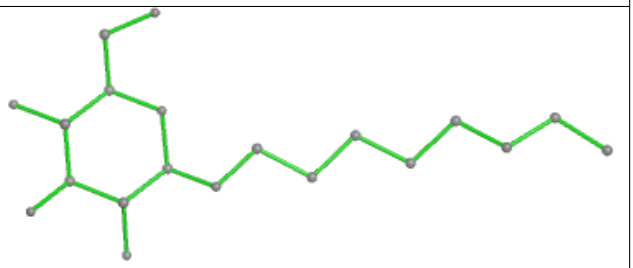
Torsions

Rings

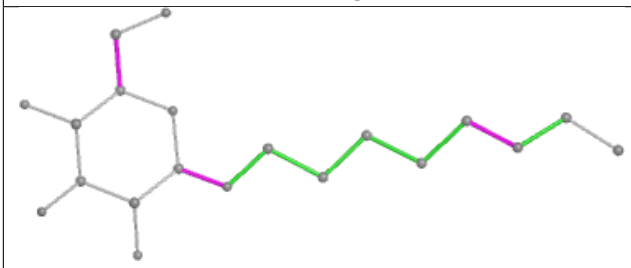
Ligand BOG I 604



Bond lengths



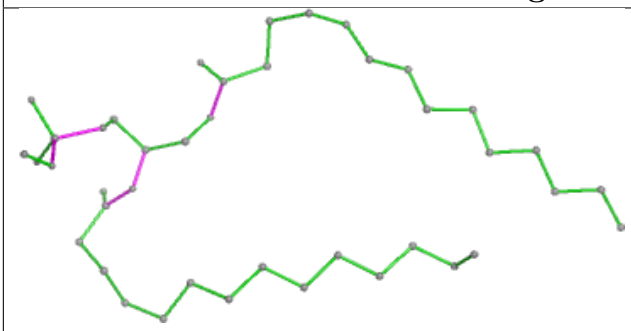
Bond angles



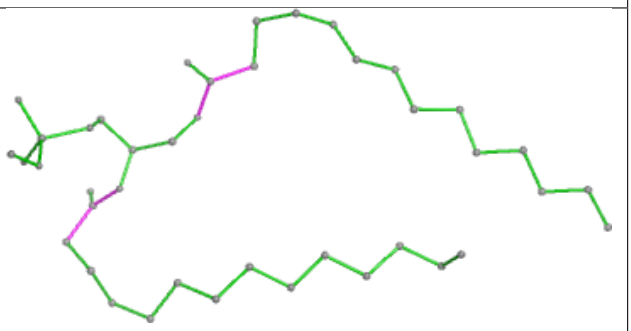
Torsions

Rings

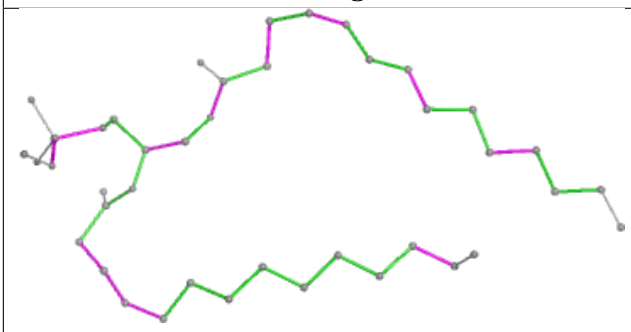
Ligand PX4 E 602



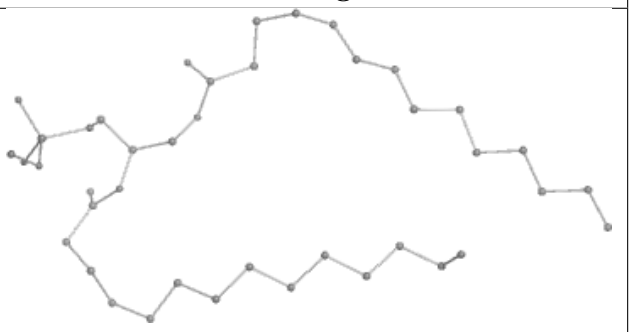
Bond lengths



Bond angles

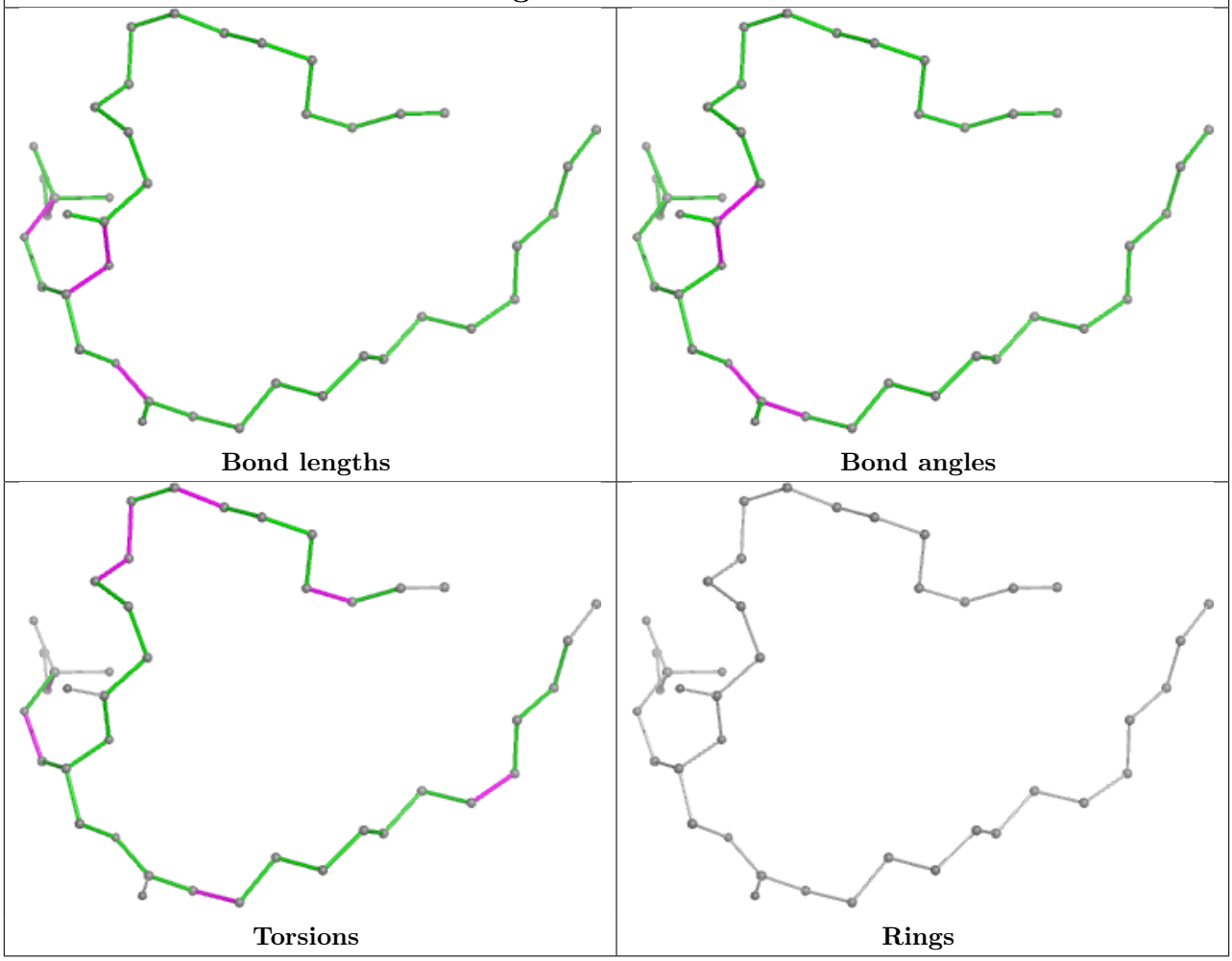


Torsions



Rings

Ligand PX4 I 602



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^{th} 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	557/557 (100%)	0.14	20 (3%)	46	40	84, 115, 153, 208	0
1	E	557/557 (100%)	0.14	21 (3%)	44	38	83, 116, 151, 232	0
1	I	557/557 (100%)	0.12	15 (2%)	56	50	92, 121, 160, 225	0
2	B	673/674 (99%)	0.33	36 (5%)	33	28	107, 152, 241, 371	0
2	F	673/674 (99%)	0.39	44 (6%)	26	22	108, 162, 253, 364	0
2	J	673/674 (99%)	0.34	40 (5%)	29	25	117, 184, 310, 484	0
3	C	187/187 (100%)	0.14	4 (2%)	63	57	102, 128, 169, 226	0
3	G	187/187 (100%)	0.14	6 (3%)	50	44	109, 134, 184, 250	0
3	K	187/187 (100%)	0.16	3 (1%)	70	64	103, 134, 191, 267	0
4	D	27/27 (100%)	0.31	2 (7%)	22	19	122, 149, 186, 203	0
4	H	27/27 (100%)	-0.02	2 (7%)	22	19	118, 143, 187, 212	0
4	L	27/27 (100%)	0.06	1 (3%)	45	39	132, 158, 231, 255	0
All	All	4332/4335 (99%)	0.24	194 (4%)	39	32	83, 138, 246, 484	0

All (194) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	114	TYR	5.7
2	J	163	ALA	5.0
2	F	18	LEU	4.9
2	J	12	THR	4.6
3	C	55	ILE	4.6
2	J	126	LEU	4.4
4	D	26	ALA	4.3
2	B	18	LEU	4.3
2	J	16	GLN	4.2
2	B	541	ALA	4.2
2	F	541	ALA	4.1

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Mol	Chain	Res	Type	RSRZ
2	F	13	LEU	4.0
1	A	134	THR	4.0
2	B	682	VAL	3.9
2	F	537	SER	3.8
1	E	469	SER	3.8
2	F	212	ARG	3.7
4	L	26	ALA	3.7
2	J	203	MET	3.7
3	K	55	ILE	3.7
2	F	16	GLN	3.6
3	G	73	ALA	3.6
2	J	59	PRO	3.6
2	F	416	VAL	3.5
1	E	240	SER	3.5
2	F	131	ILE	3.5
2	F	29	ALA	3.5
2	F	682	VAL	3.5
2	B	539	THR	3.4
3	K	85	SER	3.4
3	G	55	ILE	3.4
2	B	92	ALA	3.3
2	J	541	ALA	3.3
2	B	310	GLY	3.3
2	F	191	CYS	3.3
4	H	26	ALA	3.3
2	J	682	VAL	3.3
3	G	84	GLY	3.3
2	J	392	MET	3.3
1	E	112	ASN	3.2
2	F	12	THR	3.2
2	F	17	ALA	3.1
2	B	435	GLU	3.1
2	B	28	GLN	3.0
1	I	468	GLY	3.0
1	E	39	THR	3.0
2	J	58	MET	3.0
2	J	164	PRO	3.0
1	I	225	ILE	3.0
2	F	296	GLU	3.0
2	B	57	ALA	3.0
3	G	85	SER	3.0
1	A	398	ILE	3.0

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Mol	Chain	Res	Type	RSRZ
1	A	347	VAL	3.0
2	B	13	LEU	2.9
2	F	14	VAL	2.9
1	A	209	GLY	2.9
2	B	436	GLY	2.9
2	F	534	ALA	2.9
1	A	232	GLY	2.8
2	F	360	PHE	2.8
2	F	538	GLY	2.8
2	B	537	SER	2.8
2	B	549	VAL	2.8
1	A	239	ASN	2.8
2	B	112	PRO	2.8
1	I	329	VAL	2.8
1	I	469	SER	2.8
2	B	29	ALA	2.7
2	J	89	ARG	2.7
2	B	199	PHE	2.7
1	E	328	GLY	2.7
1	E	515	ALA	2.7
2	J	121	VAL	2.7
1	E	53	SER	2.7
2	B	105	PHE	2.7
1	E	468	GLY	2.7
1	E	398	ILE	2.7
2	J	296	GLU	2.7
2	J	179	GLY	2.7
2	F	597	ALA	2.6
1	I	240	SER	2.6
2	F	510	GLY	2.6
2	J	510	GLY	2.6
2	F	448	ILE	2.6
2	B	538	GLY	2.6
2	J	546	GLY	2.6
3	C	85	SER	2.6
2	F	105	PHE	2.6
1	I	465	ASN	2.6
2	B	186	TRP	2.6
4	H	27	GLU	2.6
3	G	83	GLY	2.6
2	J	153	VAL	2.6
2	J	433	VAL	2.6

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Mol	Chain	Res	Type	RSRZ
1	I	470	ALA	2.5
2	F	442	VAL	2.5
2	J	407	ALA	2.5
2	J	473	ASP	2.5
2	F	388	ILE	2.5
2	J	253	THR	2.5
2	F	21	ALA	2.5
2	F	203	MET	2.5
1	A	469	SER	2.5
2	F	433	VAL	2.5
2	J	183	LEU	2.5
2	J	97	LEU	2.5
1	A	348	ILE	2.5
1	I	134	THR	2.5
2	J	312	ILE	2.5
2	J	199	PHE	2.5
2	J	120	LYS	2.4
2	J	566	LYS	2.4
2	F	59	PRO	2.4
2	J	409	GLY	2.4
1	E	347	VAL	2.4
2	F	57	ALA	2.4
2	B	335	ASP	2.4
1	I	207	VAL	2.4
2	B	58	MET	2.4
1	A	470	ALA	2.4
1	E	470	ALA	2.4
2	B	542	ALA	2.4
2	F	542	ALA	2.4
2	F	539	THR	2.4
2	B	110	ARG	2.4
1	I	374	GLY	2.4
2	F	269	GLY	2.4
2	J	13	LEU	2.4
2	B	546	GLY	2.4
1	I	239	ASN	2.4
2	F	246	GLY	2.3
2	B	364	GLU	2.3
4	D	27	GLU	2.3
1	A	233	GLY	2.3
1	A	515	ALA	2.3
1	E	349	ALA	2.3

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Mol	Chain	Res	Type	RSRZ
2	B	200	LEU	2.3
2	B	101	LYS	2.3
1	E	225	ILE	2.3
2	J	568	MET	2.3
3	C	54	LEU	2.3
2	F	142	CYS	2.3
1	A	322	GLY	2.3
1	A	468	GLY	2.3
1	A	342	ALA	2.3
2	F	58	MET	2.3
2	F	253	THR	2.3
2	B	56	GLY	2.2
2	J	49	ILE	2.2
2	F	394	ARG	2.2
1	A	240	SER	2.2
2	J	141	PRO	2.2
1	A	374	GLY	2.2
2	J	539	THR	2.2
1	A	225	ILE	2.2
1	E	322	GLY	2.2
2	F	199	PHE	2.2
3	K	73	ALA	2.2
1	E	281	ARG	2.2
2	J	29	ALA	2.2
1	I	462	SER	2.2
2	B	439	VAL	2.2
1	A	105	THR	2.1
2	F	28	GLN	2.1
2	B	23	LYS	2.1
2	J	86	ALA	2.1
2	F	208	GLU	2.1
3	G	74	GLU	2.1
1	E	358	GLY	2.1
2	J	206	MET	2.1
1	E	239	ASN	2.1
2	J	388	ILE	2.1
2	B	375	VAL	2.1
1	I	328	GLY	2.1
2	B	212	ARG	2.1
2	F	392	MET	2.1
1	I	424	THR	2.1
2	B	253	THR	2.1

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Mol	Chain	Res	Type	RSRZ
3	C	73	ALA	2.1
1	E	207	VAL	2.1
2	B	142	CYS	2.1
1	E	373	PHE	2.1
2	F	200	LEU	2.0
2	F	157	ALA	2.0
2	B	547	ASN	2.0
1	I	281	ARG	2.0
1	A	373	PHE	2.0
1	E	480	PHE	2.0
1	E	304	GLN	2.0
2	F	20	GLU	2.0
2	J	240	TRP	2.0
1	A	328	GLY	2.0
2	J	9	PHE	2.0

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. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	SEP	F	162	10/11	0.77	0.11	169,175,199,205	0
2	SEP	J	162	10/11	0.77	0.10	218,226,232,235	0
2	SEP	B	162	10/11	0.85	0.08	153,163,177,182	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

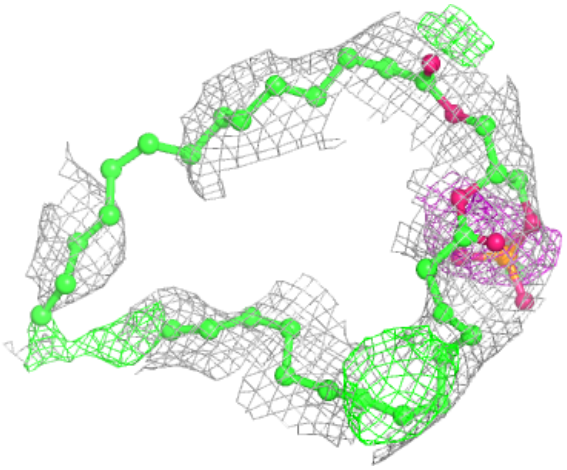
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

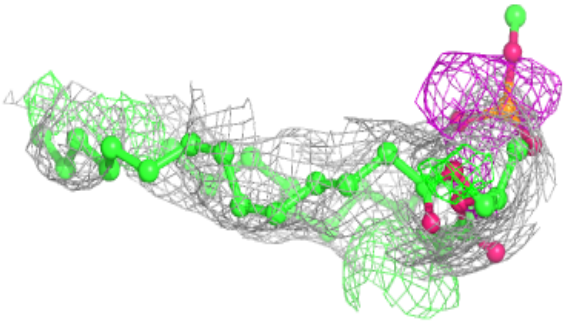
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	PX4	I	602	41/46	0.58	0.21	167,183,225,228	0
6	PX4	A	602	41/46	0.64	0.25	156,188,203,205	0
6	PX4	E	602	41/46	0.65	0.28	199,227,281,284	0
7	BOG	B	701	20/20	0.70	0.17	173,185,194,195	0
6	PX4	A	603	41/46	0.78	0.19	130,169,230,232	0
6	PX4	H	101	41/46	0.81	0.21	171,197,211,214	0
7	BOG	E	603	20/20	0.81	0.21	154,184,190,194	0
6	PX4	I	603	41/46	0.83	0.17	164,204,226,228	0
7	BOG	A	604	20/20	0.86	0.24	178,191,198,198	0
7	BOG	I	604	20/20	0.86	0.25	205,221,224,227	0
5	K	E	601	1/1	0.93	0.08	124,124,124,124	0
5	K	I	601	1/1	0.93	0.06	123,123,123,123	0
5	K	A	601	1/1	0.96	0.04	123,123,123,123	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 PX4 I 602:

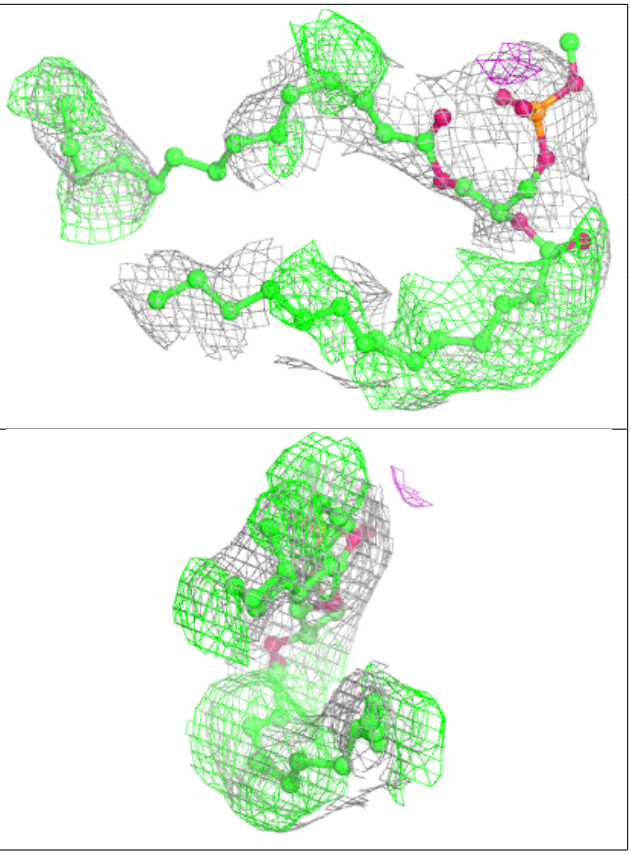
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)





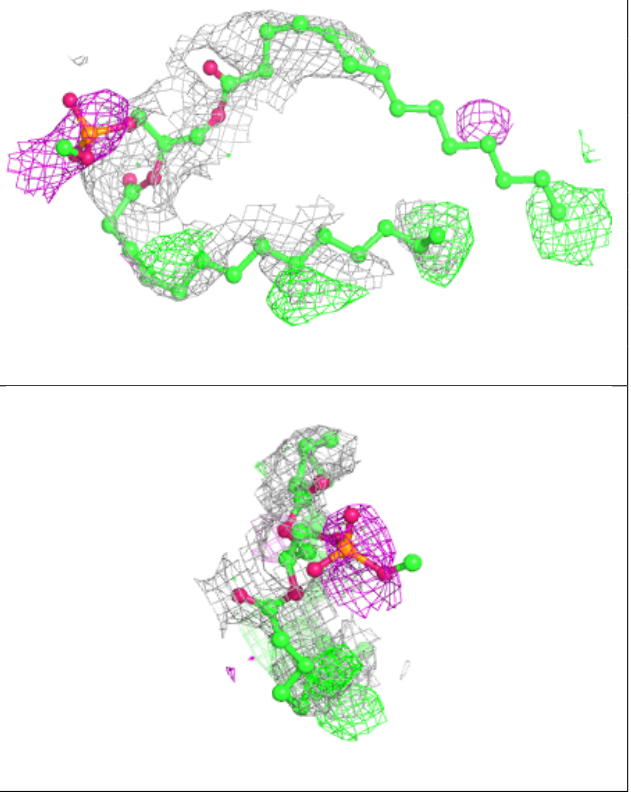
Electron density around PX4 A 602:

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



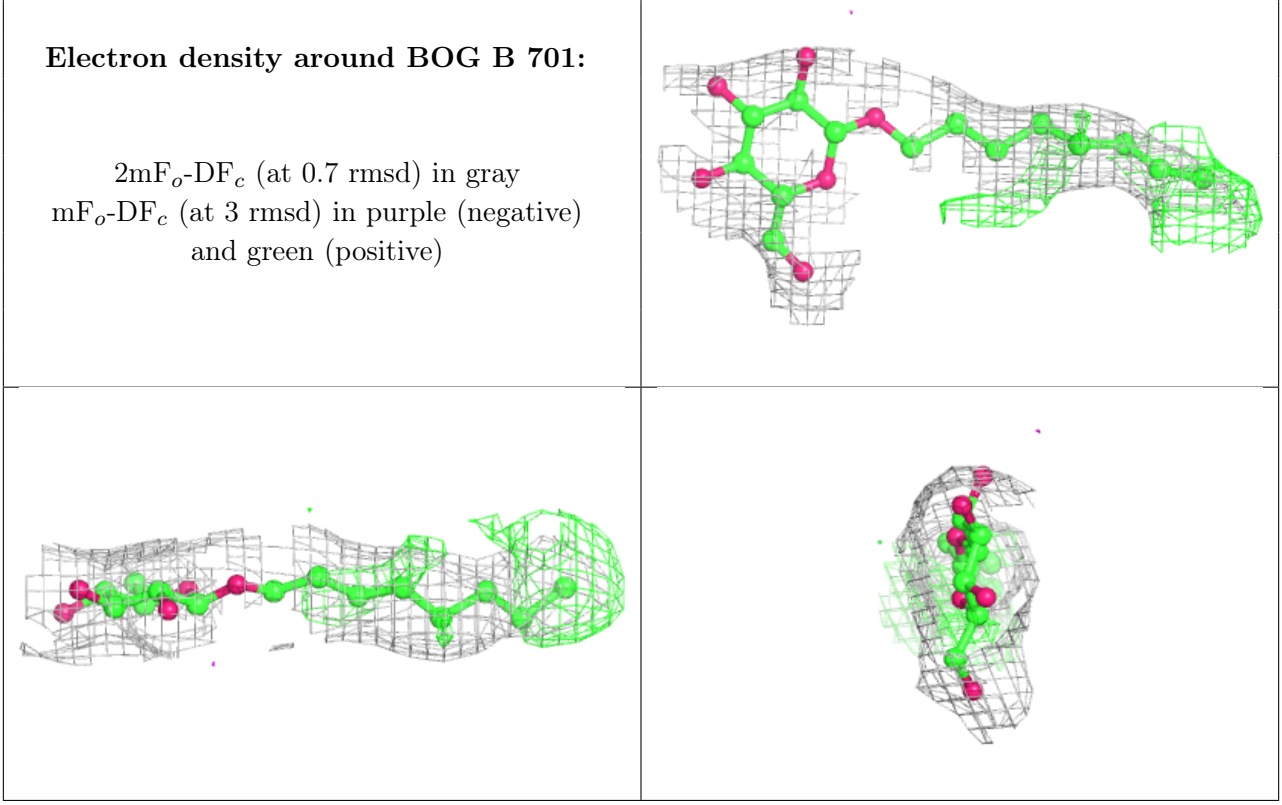
Electron density around PX4 E 602:

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



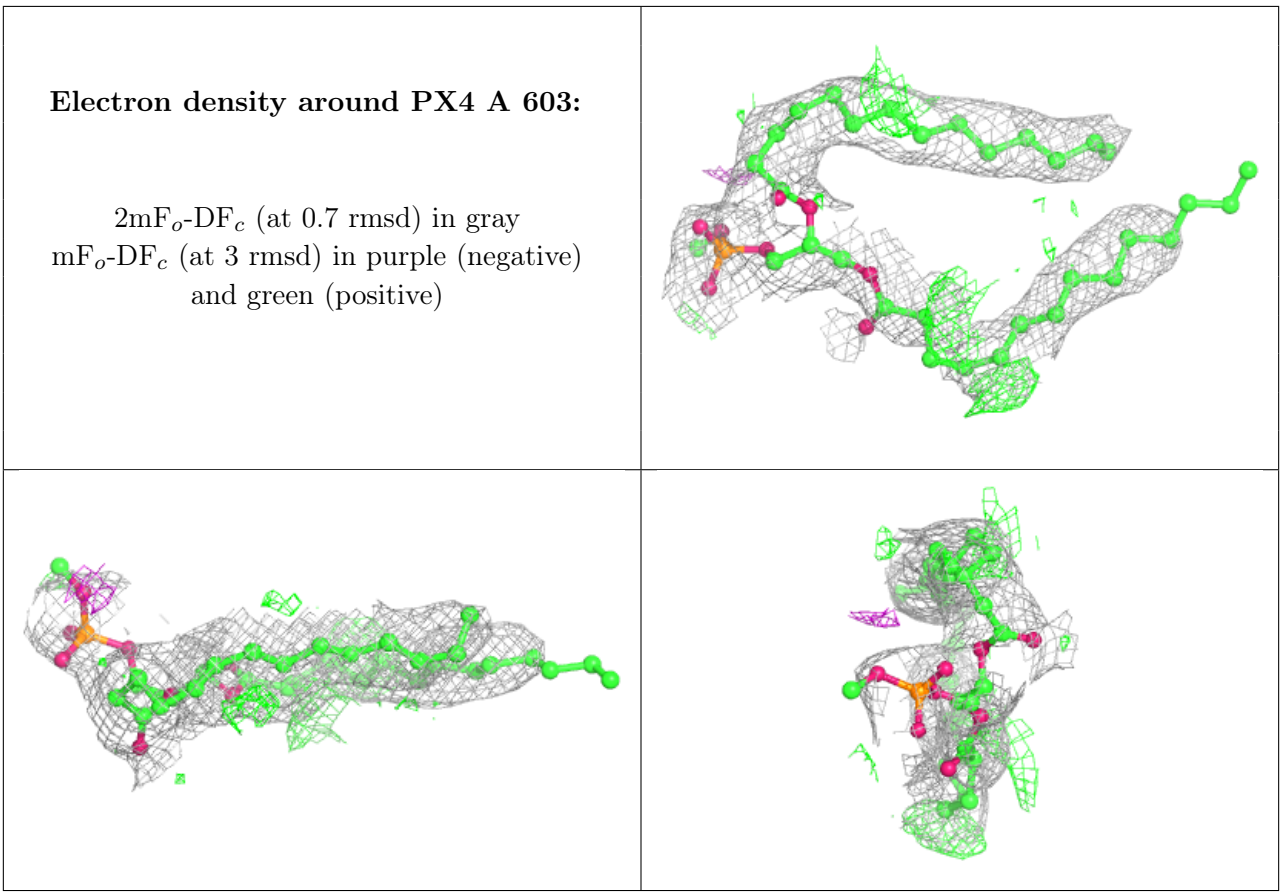
Electron density around BOG B 701:

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



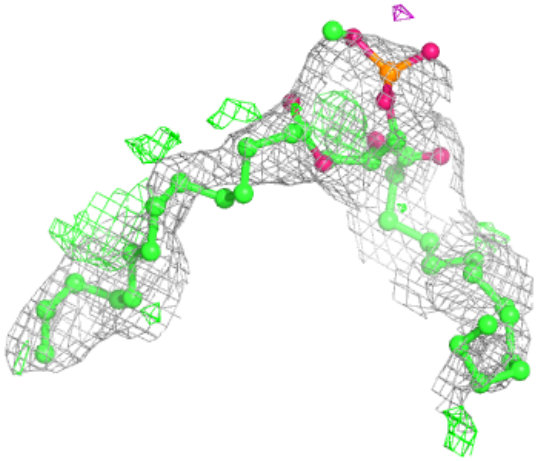
Electron density around PX4 A 603:

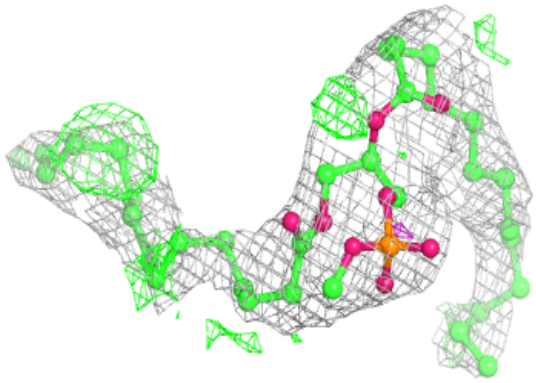
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

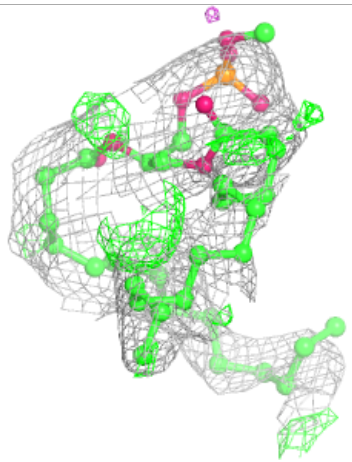


Electron density around PX4 H 101:

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

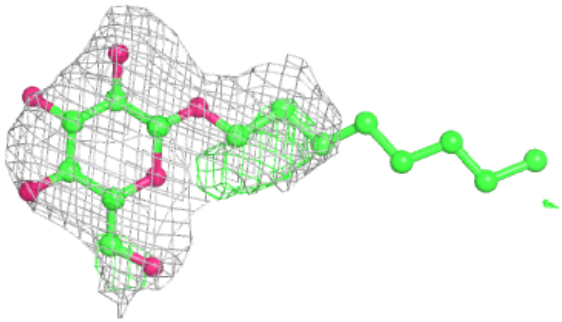


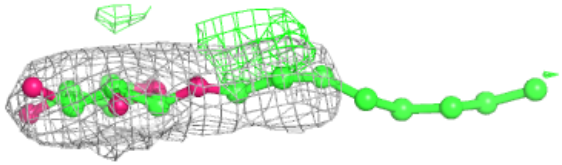


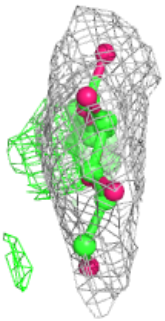


Electron density around BOG E 603:

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

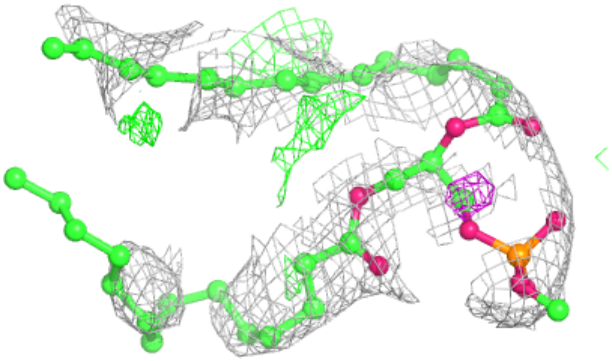


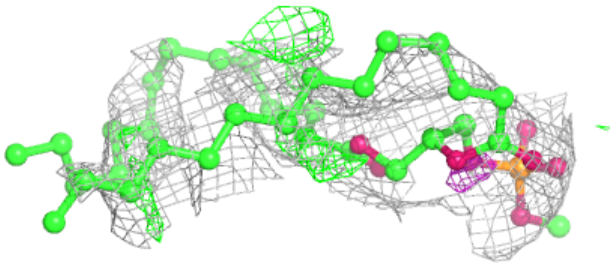




Electron density around PX4 I 603:

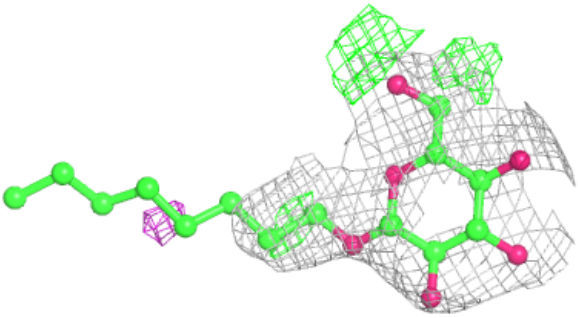
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

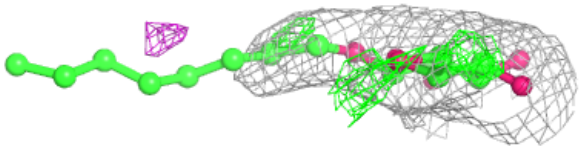


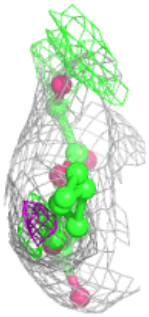


Electron density around BOG A 604:

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

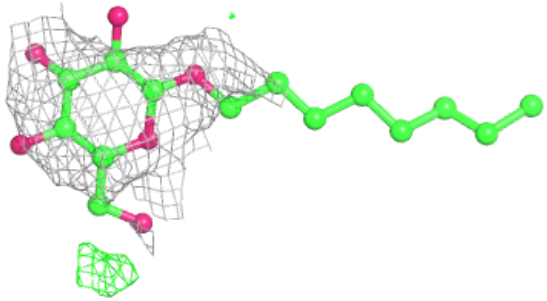


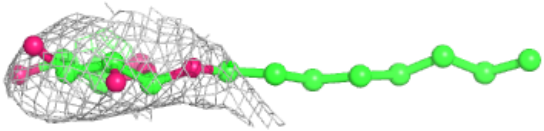


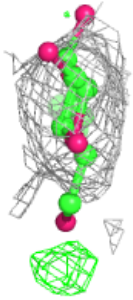


Electron density around BOG I 604:

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







6.5 Other polymers (i)

There are no such residues in this entry.