Full wwPDB X-ray Structure Validation Report ⓘ

Feb 4, 2025 – 02:10 PM EST

PDB ID	:	9DRS
Title	:	Crystal structure of M. tuberculosis PheRS-tRNA complex bound to inhibitor D-116
Authors	:	Gade, P.; Chang, C.; Forte, B.; Wower, J.; Gilbert, I.H.; Baragana, B.; Michalska, K.; Joachimiak, A.; Center for Structural Biology of Infectious Diseases (CSBID)
Deposited on	:	2024-09-26
Resolution	:	2.35 Å(reported)

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

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

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

The following versions of software and data (see references (1)) were used in the production of this report:

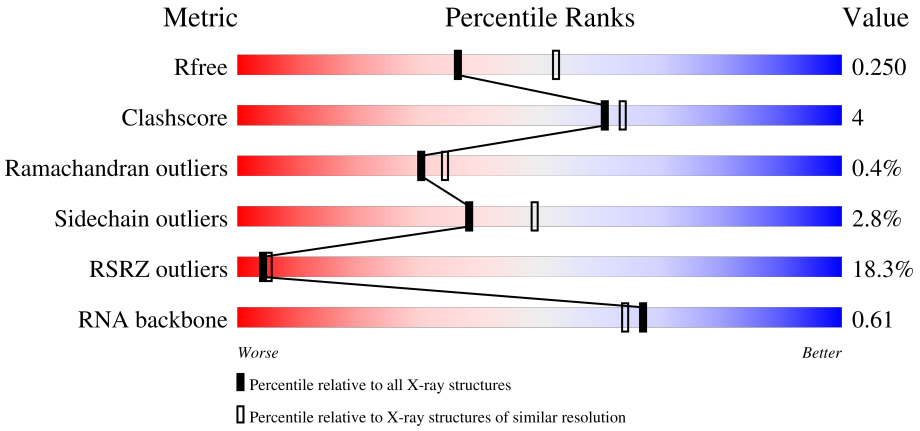
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

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 2.35 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.



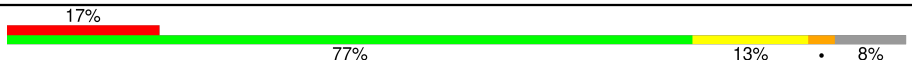
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1460 (2.36-2.36)
Clashscore	180529	1571 (2.36-2.36)
Ramachandran outliers	177936	1559 (2.36-2.36)
Sidechain outliers	177891	1559 (2.36-2.36)
RSRZ outliers	164620	1460 (2.36-2.36)
RNA backbone	3690	1124 (2.70-2.02)

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	341	25% 82% 14%
1	D	341	23% 84% 15%
2	B	835	3% 91% 9%
2	E	835	25% 84% 12%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
3	C	77	
3	F	77	

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 21276 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 Phenylalanine–tRNA ligase alpha subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	332	Total	C	N	O	S	0	0	0
			2531	1595	455	472	9			
1	D	338	Total	C	N	O	S	0	1	0
			2598	1637	471	481	9			

- Molecule 2 is a protein called Phenylalanine–tRNA ligase beta subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	834	Total	C	N	O	S	0	2	0
			6247	3924	1135	1167	21			
2	E	805	Total	C	N	O	S	0	0	0
			5963	3754	1072	1117	20			

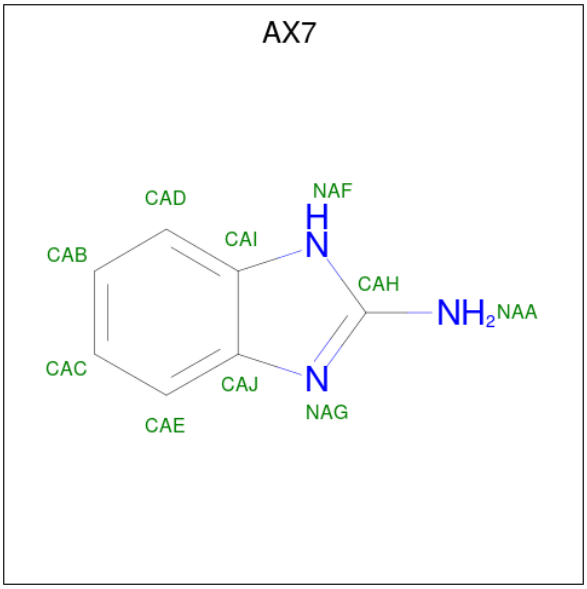
There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-3	GLN	-	expression tag	UNP P9WFU1
B	-2	SER	-	expression tag	UNP P9WFU1
B	-1	ASN	-	expression tag	UNP P9WFU1
B	0	ALA	-	expression tag	UNP P9WFU1
E	-3	GLN	-	expression tag	UNP P9WFU1
E	-2	SER	-	expression tag	UNP P9WFU1
E	-1	ASN	-	expression tag	UNP P9WFU1
E	0	ALA	-	expression tag	UNP P9WFU1

- Molecule 3 is a RNA chain called tRNA(Phe).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	71	Total	C	N	O	P	0	0	0
			1523	677	277	498	71			
3	F	71	Total	C	N	O	P	0	0	0
			1522	677	277	497	71			

- Molecule 4 is 1H-benzimidazol-2-amine (three-letter code: AX7) (formula: $C_7H_7N_3$) (labeled as "Ligand of Interest" by depositor).

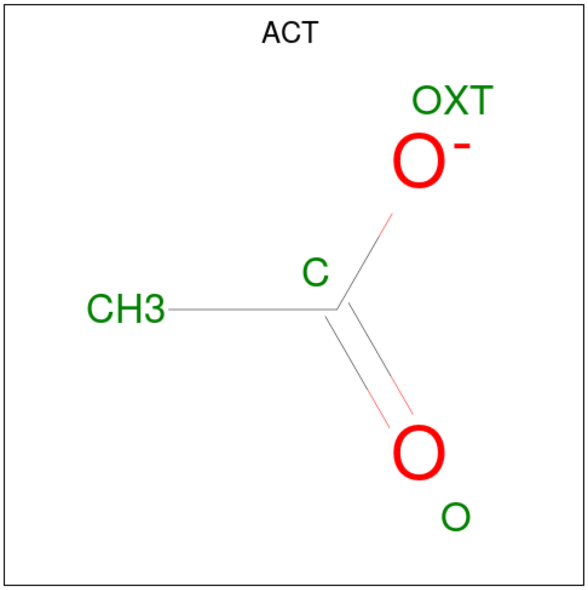


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C N 10 7 3	0	0
4	D	1	Total C N 10 7 3	0	0

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total Mg 1 1	0	0
5	C	4	Total Mg 4 4	0	0
5	D	1	Total Mg 1 1	0	0
5	F	1	Total Mg 1 1	0	0

- Molecule 6 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



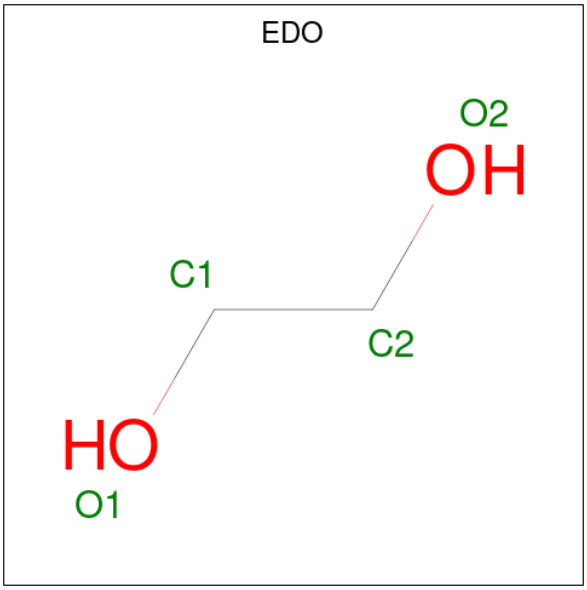
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 4 2 2	0	0
6	A	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	C	1	Total C O 4 2 2	0	0
6	D	1	Total C O 4 2 2	0	0
6	E	1	Total C O 4 2 2	0	0

Continued on next page...

Continued from previous page...

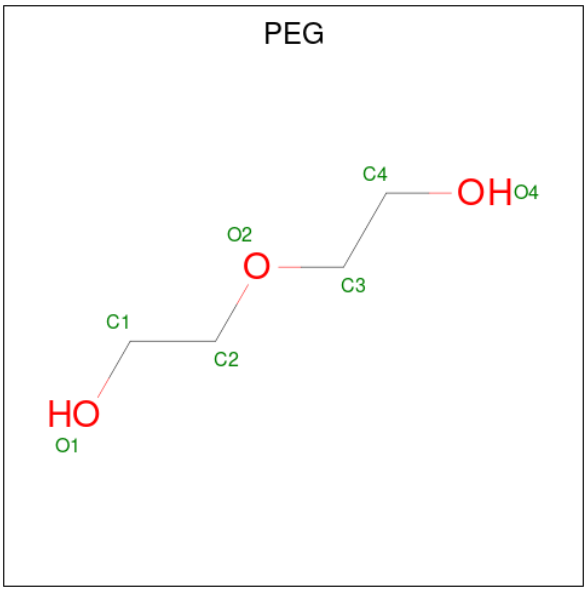
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	E	1	Total C O 4 2 2	0	0
6	E	1	Total C O 4 2 2	0	0

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



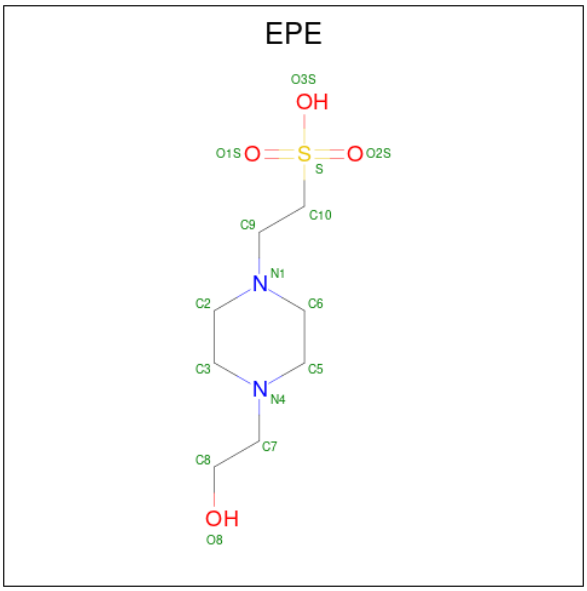
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	1	Total C O 4 2 2	0	0
7	B	1	Total C O 4 2 2	0	0
7	B	1	Total C O 4 2 2	0	0
7	C	1	Total C O 4 2 2	0	0
7	E	1	Total C O 4 2 2	0	0
7	E	1	Total C O 4 2 2	0	0
7	E	1	Total C O 4 2 2	0	0
7	E	1	Total C O 4 2 2	0	0

- Molecule 8 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



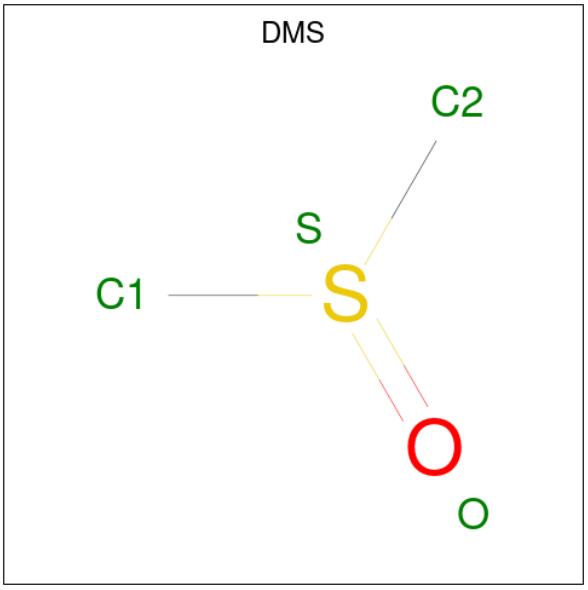
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	1	Total C O 7 4 3	0	0
8	B	1	Total C O 7 4 3	0	0
8	B	1	Total C O 7 4 3	0	0
8	E	1	Total C O 7 4 3	0	0

- Molecule 9 is 4-(2-HYDROXYETHYL)-1-PIPERAZINE ETHANESULFONIC ACID (three-letter code: EPE) (formula: $C_8H_{18}N_2O_4S$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
9	B	1	Total	C	N	O	S	0	0
			15	8	2	4	1		

- Molecule 10 is DIMETHYL SULFOXIDE (three-letter code: DMS) (formula: C_2H_6OS).



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

- Molecule 11 is water.

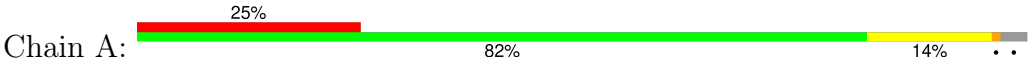
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	65	Total	O	0	0
			65	65		
11	B	327	Total	O	0	0
			327	327		
11	C	80	Total	O	0	0
			80	80		
11	D	59	Total	O	0	0
			59	59		
11	E	166	Total	O	0	0
			166	166		
11	F	25	Total	O	0	0
			25	25		

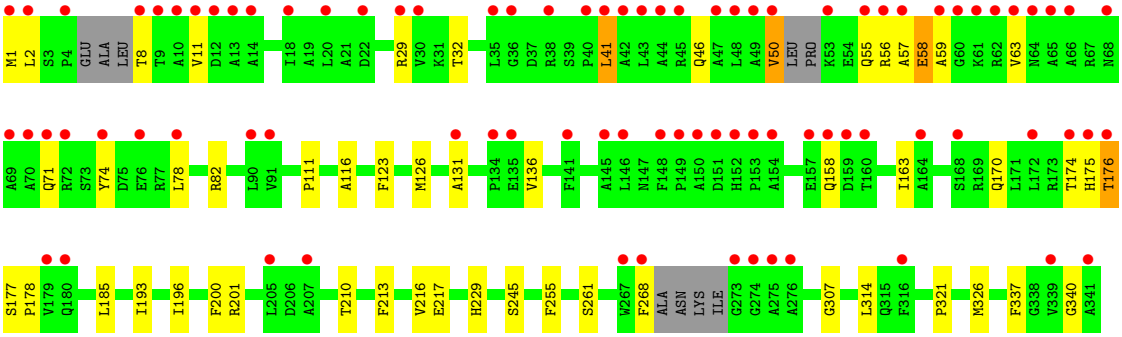
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Phenylalanine–tRNA ligase alpha subunit

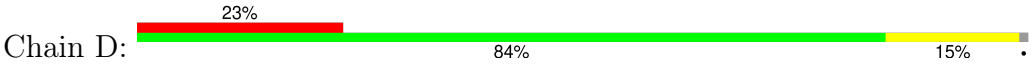
Chain A:

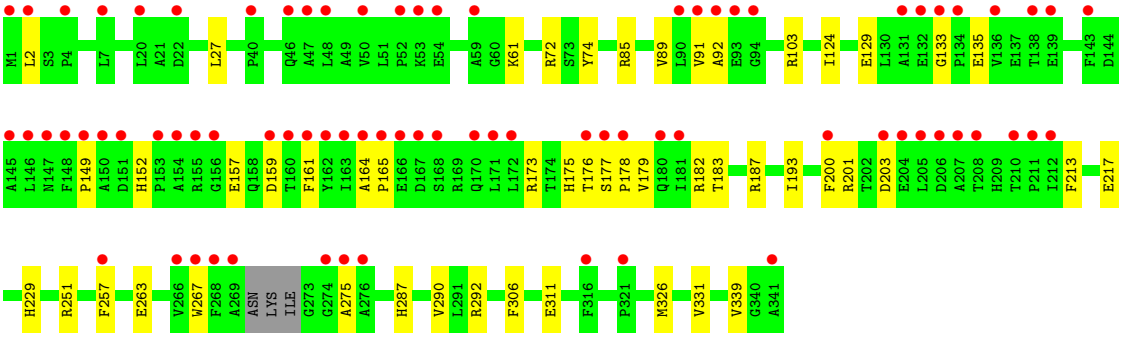




• Molecule 1: Phenylalanine–tRNA ligase alpha subunit

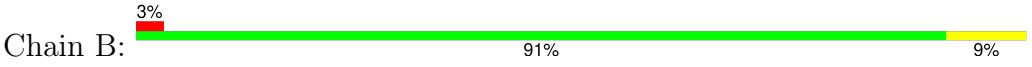
Chain D:

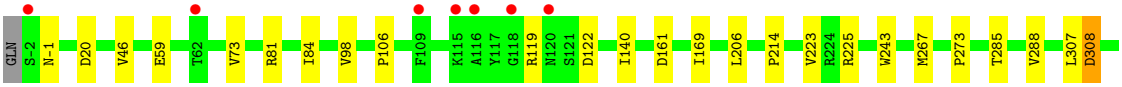


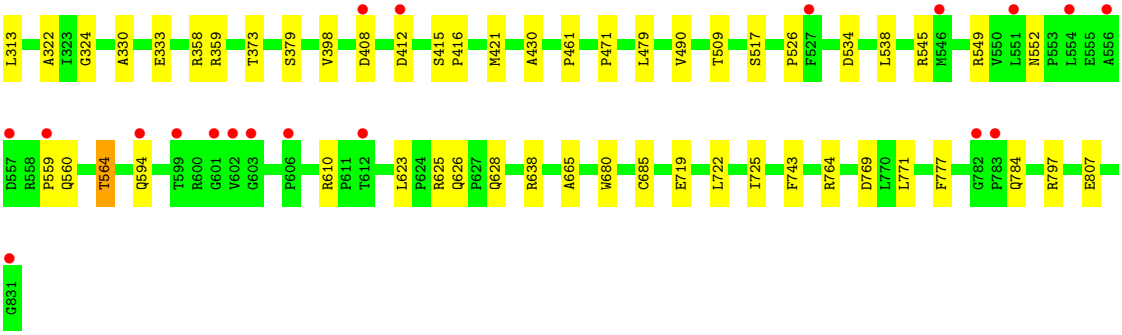


• Molecule 2: Phenylalanine–tRNA ligase beta subunit

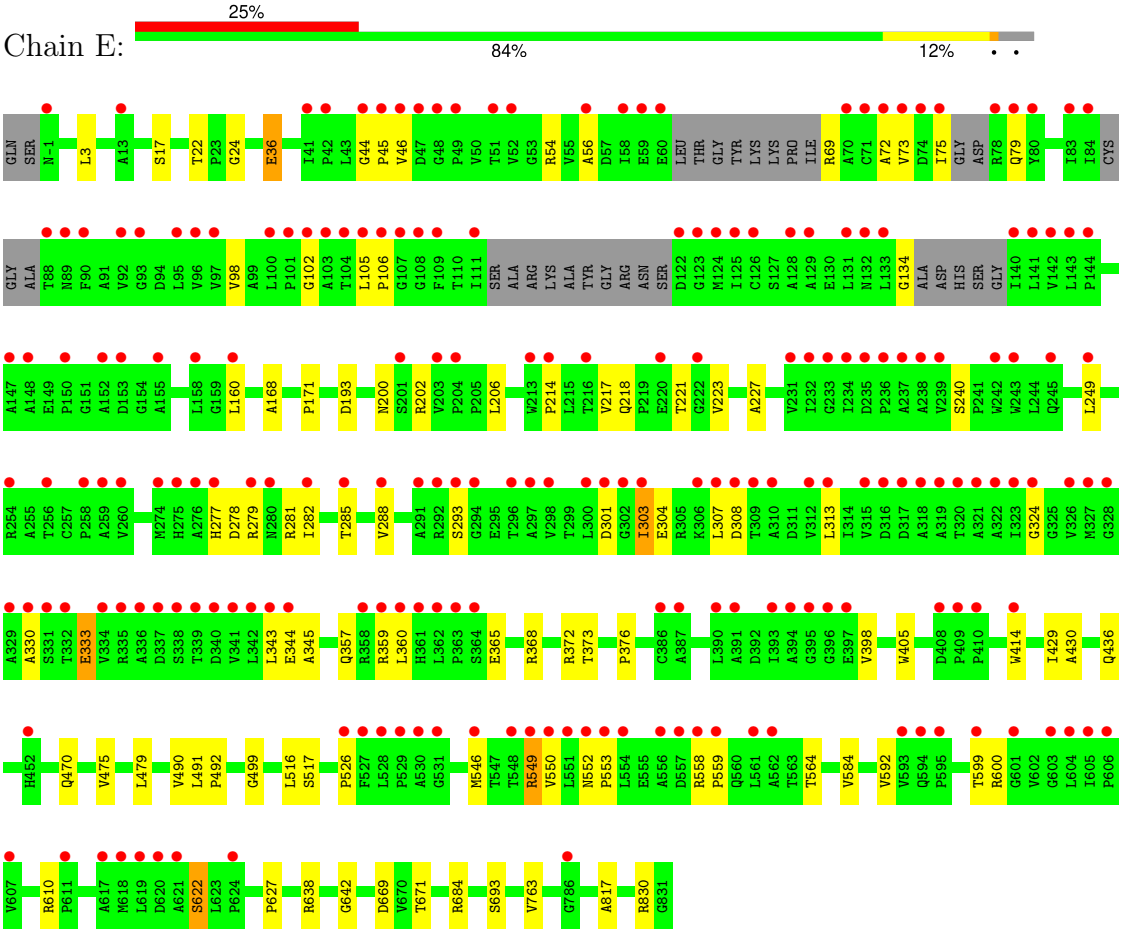
Chain B:



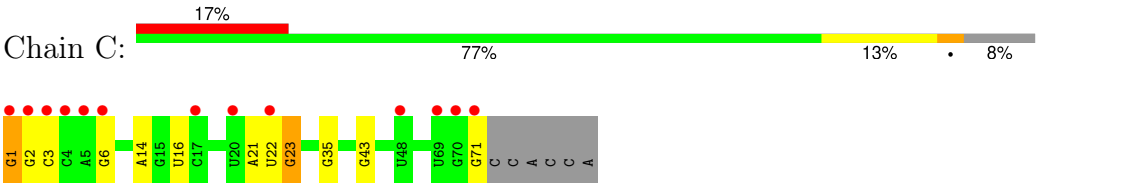




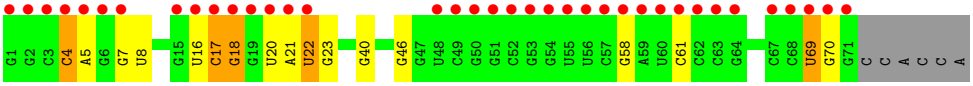
• Molecule 2: Phenylalanine–tRNA ligase beta subunit



• Molecule 3: tRNA(Phe)



• Molecule 3: tRNA(Phe)


G1
G2
C3
C4
A5
G6
G7
U8
G15
U16
C17
G18
G19
U20
A21
U22
G23
G40
G46
G47
U48
C49
G50
G51
C52
G53
G54
U55
U56
C57
G58
A59
U60
C61
C62
C63
G64
C67
C68
U69
G70
G71
C
C
A
C
C
A

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	146.68Å 64.11Å 188.33Å 90.00° 111.21° 90.00°	Depositor
Resolution (Å)	46.77 – 2.35 46.77 – 2.35	Depositor EDS
% Data completeness (in resolution range)	76.8 (46.77-2.35) 93.3 (46.77-2.35)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	0.12	Depositor
$< I/\sigma(I) >$ [1]	2.70 (at 2.37Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.201 , 0.250 0.201 , 0.250	Depositor DCC
R_{free} test set	6878 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	32.9	Xtriage
Anisotropy	0.063	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 52.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.011 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	21276	wwPDB-VP
Average B, all atoms (Å^2)	53.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.06% 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: ACT, PEG, AX7, EPE, MG, EDO, DMS

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	0.24	0/2587	0.50	0/3520
1	D	0.25	0/2660	0.51	0/3620
2	B	0.24	0/6390	0.52	0/8750
2	E	0.24	0/6088	0.51	0/8345
3	C	0.30	1/1702 (0.1%)	0.69	0/2652
3	F	0.13	0/1701	0.67	0/2652
All	All	0.24	1/21128 (0.0%)	0.55	0/29539

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1	G	OP3-P	-10.66	1.48	1.61

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	2531	0	2446	31	0
1	D	2598	0	2536	33	0
2	B	6247	0	6271	42	0
2	E	5963	0	5955	55	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	1523	0	770	5	0
3	F	1522	0	770	10	0
4	A	10	0	7	1	0
4	D	10	0	7	0	0
5	A	1	0	0	0	0
5	C	4	0	0	0	0
5	D	1	0	0	0	0
5	F	1	0	0	0	0
6	A	8	0	6	0	0
6	B	36	0	27	0	0
6	C	4	0	3	0	0
6	D	4	0	3	0	0
6	E	12	0	9	0	0
7	B	12	0	18	1	0
7	C	4	0	6	2	0
7	E	16	0	24	2	0
8	B	21	0	30	1	0
8	E	7	0	10	0	0
9	B	15	0	17	2	0
10	D	4	0	6	0	0
11	A	65	0	0	0	0
11	B	327	0	0	1	0
11	C	80	0	0	0	0
11	D	59	0	0	0	0
11	E	166	0	0	0	0
11	F	25	0	0	0	0
All	All	21276	0	18921	159	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 4.

All (159) 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:D:135:GLU:HA	1:D:173:ARG:HD3	1.61	0.81
1:D:183:THR:HG23	1:D:187:ARG:HD3	1.62	0.80
2:B:267:MET:HG3	2:B:273:PRO:HA	1.64	0.80
1:D:173:ARG:HH21	1:D:176:THR:HG22	1.48	0.78
1:A:174:THR:HB	1:A:201:ARG:HH11	1.49	0.76
3:C:3:C:H42	3:C:71:G:H1	1.34	0.73
1:D:183:THR:HG21	1:D:193:ILE:HG12	1.74	0.70

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:46:GLN:HG2	3:F:20:U:H5"	1.73	0.70
1:D:251:ARG:NH1	1:D:263:GLU:OE1	2.27	0.68
1:A:217:GLU:OE2	4:A:401:AX7:NAG	2.29	0.66
1:D:311:GLU:HA	1:D:326:MET:HE1	1.77	0.65
3:C:35:G:N7	2:E:830:ARG:NH2	2.38	0.65
2:E:217:VAL:HG22	2:E:288:VAL:HB	1.79	0.64
2:E:206:LEU:HD13	2:E:398:VAL:HG11	1.80	0.64
2:B:308:ASP:HB2	2:B:359:ARG:HH12	1.63	0.64
1:D:200:PHE:HE2	2:E:526:PRO:HG3	1.64	0.63
3:C:23:G:H21	7:C:101:EDO:H11	1.63	0.63
2:E:227:ALA:HB3	2:E:345:ALA:HB3	1.80	0.63
2:B:206:LEU:HD13	2:B:398:VAL:HG11	1.81	0.62
2:B:81:ARG:NH1	2:B:122:ASP:OD2	2.32	0.62
2:E:279:ARG:HA	2:E:282:ILE:HD12	1.83	0.61
1:D:27:LEU:HD21	1:D:74:TYR:HE1	1.66	0.60
1:A:174:THR:HB	1:A:201:ARG:NH1	2.16	0.59
1:A:123:PHE:HA	1:A:126:MET:HE2	1.83	0.59
1:A:196:ILE:HG12	1:A:216:VAL:HG22	1.86	0.57
2:E:553:PRO:HG3	2:E:559:PRO:HB3	1.86	0.57
2:B:322:ALA:HB1	8:B:905:PEG:H42	1.86	0.57
2:E:36:GLU:HB3	2:E:168:ALA:HB3	1.87	0.56
2:B:538:LEU:O	2:B:545:ARG:NH1	2.38	0.56
2:E:277:HIS:CE1	2:E:344:GLU:HG2	2.41	0.56
2:E:278:ASP:HB3	2:E:281:ARG:HB2	1.87	0.56
1:D:159:ASP:OD2	1:D:201:ARG:NH2	2.38	0.55
2:E:73:VAL:HG11	2:E:98:VAL:HG21	1.88	0.55
2:B:421:MET:HG3	2:B:471:PRO:HB3	1.89	0.54
2:B:594:GLN:NE2	11:B:1008:HOH:O	2.38	0.54
2:E:365:GLU:OE2	2:E:368:ARG:NH1	2.42	0.53
2:B:534:ASP:OD1	2:B:545:ARG:NH2	2.41	0.53
2:E:105:LEU:HG	2:E:106:PRO:HD2	1.91	0.53
2:B:623:LEU:O	2:B:625:ARG:NH2	2.37	0.53
2:E:75:ILE:HD11	2:E:79:GLN:HB3	1.91	0.53
2:E:223:VAL:HG12	2:E:405:TRP:HZ3	1.74	0.53
1:D:91:VAL:HG12	1:D:92:ALA:H	1.75	0.52
1:D:177:SER:N	1:D:178:PRO:HD2	2.25	0.52
1:D:292:ARG:NH2	2:E:470:GLN:OE1	2.42	0.51
3:F:4:C:H2'	3:F:5:A:C8	2.45	0.51
3:F:69:U:H2'	3:F:70:G:H8	1.76	0.51
2:E:600:ARG:HE	2:E:622:SER:HB2	1.77	0.50
1:D:157:GLU:O	2:E:552:ASN:ND2	2.44	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:163:ILE:HB	1:A:170:GLN:HB3	1.94	0.50
2:E:218:GLN:O	2:E:221:THR:OG1	2.20	0.50
1:D:149:PRO:HD2	1:D:152:HIS:HD2	1.77	0.50
3:C:14:A:H1'	7:C:101:EDO:H12	1.93	0.50
2:E:491:LEU:HD23	2:E:492:PRO:HD2	1.94	0.49
2:B:223:VAL:HG21	2:B:288:VAL:HG11	1.95	0.49
1:A:131:ALA:HB2	1:A:193:ILE:HG12	1.95	0.49
2:E:223:VAL:HG12	2:E:405:TRP:CZ3	2.48	0.49
2:E:517:SER:O	2:E:638:ARG:NH2	2.45	0.49
1:D:164:ALA:HB2	2:E:549:ARG:HB2	1.95	0.49
1:A:200:PHE:HE2	2:B:526:PRO:HG3	1.76	0.49
1:A:32:THR:OG1	3:F:46:G:OP1	2.29	0.49
2:B:59:GLU:OE1	2:B:119:ARG:NH2	2.42	0.48
1:A:158:GLN:OE1	1:A:201:ARG:NH2	2.42	0.48
2:E:669:ASP:HB2	7:E:908:EDO:H12	1.95	0.48
2:B:549:ARG:HG3	2:B:560:GLN:HG2	1.95	0.48
2:E:45:PRO:HA	2:E:160:LEU:HD23	1.95	0.48
1:D:173:ARG:NH2	1:D:176:THR:HG22	2.25	0.48
1:A:229:HIS:HA	2:B:490:VAL:O	2.14	0.47
3:F:69:U:H2'	3:F:70:G:C8	2.49	0.47
2:E:171:PRO:HA	2:E:372:ARG:HE	1.80	0.47
3:F:17:C:O2'	3:F:61:C:O2'	2.32	0.47
2:B:46:VAL:HG12	2:B:106:PRO:HD3	1.96	0.47
2:E:376:PRO:HG2	2:E:414:TRP:HB3	1.96	0.47
2:B:243:TRP:CG	9:B:915:EPE:H32	2.49	0.47
2:E:134:GLY:HA3	2:E:249:LEU:HD11	1.96	0.47
2:B:416:PRO:HB2	2:B:461:PRO:HG2	1.96	0.47
1:D:149:PRO:HD2	1:D:152:HIS:CD2	2.50	0.46
2:B:412:ASP:OD1	2:B:412:ASP:N	2.40	0.46
3:C:1:G:H2'	3:C:2:G:C8	2.50	0.46
1:D:217:GLU:HG3	1:D:306:PHE:O	2.15	0.46
2:E:359:ARG:HG2	2:E:360:LEU:HD23	1.98	0.46
1:D:129:GLU:OE1	1:D:187:ARG:NH2	2.42	0.46
2:E:558:ARG:N	2:E:559:PRO:HD3	2.31	0.46
1:D:165:PRO:HG2	2:E:599:THR:HB	1.98	0.45
2:E:22:THR:HG22	2:E:24:GLY:H	1.82	0.45
3:F:8:U:O2'	3:F:21:A:N1	2.34	0.45
2:B:564:THR:OG1	2:B:719:GLU:OE1	2.29	0.45
1:D:135:GLU:HG2	1:D:200:PHE:CE1	2.52	0.45
2:E:214:PRO:HG2	2:E:285:THR:HA	1.98	0.44
1:D:175:HIS:CE1	1:D:177:SER:HB2	2.52	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:277:HIS:NE2	2:E:344:GLU:HG2	2.32	0.44
2:E:552:ASN:N	2:E:552:ASN:OD1	2.51	0.44
3:F:21:A:H3'	3:F:22:U:H5"	1.99	0.44
2:B:214:PRO:HB2	2:B:285:THR:HG23	1.99	0.44
2:E:429:ILE:HD12	2:E:475:VAL:HG21	2.00	0.44
2:B:84:ILE:HD11	2:B:119:ARG:HB2	1.99	0.44
2:E:308:ASP:HB2	2:E:359:ARG:HH12	1.83	0.44
2:B:517:SER:O	2:B:638:ARG:NH2	2.49	0.44
1:D:229:HIS:HA	2:E:490:VAL:O	2.16	0.44
1:A:185:LEU:O	2:B:610:ARG:NH2	2.50	0.44
1:A:255:PHE:HD2	1:A:261:SER:HB3	1.81	0.44
2:B:722:LEU:HD23	2:B:725:ILE:HD12	2.00	0.44
1:A:55:GLN:O	1:A:56:ARG:HB3	2.18	0.43
2:B:73:VAL:HG11	2:B:98:VAL:HG21	1.99	0.43
3:F:18:G:O2'	3:F:58:G:N2	2.46	0.43
1:A:41:LEU:HD23	1:A:41:LEU:HA	1.83	0.43
1:A:177:SER:N	1:A:178:PRO:HD2	2.33	0.43
2:B:307:LEU:HD13	2:B:313:LEU:HD11	2.00	0.43
2:B:807:GLU:HG2	3:F:40:G:P	2.57	0.43
2:E:592:VAL:HG23	2:E:627:PRO:HD2	2.00	0.43
2:E:56:ALA:N	2:E:72:ALA:O	2.47	0.43
2:E:330:ALA:HA	2:E:333:GLU:HB3	1.99	0.43
2:E:671:THR:HB	7:E:906:EDO:H22	2.00	0.43
1:A:314:LEU:HB3	1:A:326:MET:HE1	1.99	0.43
1:A:116:ALA:HB1	1:A:196:ILE:HG21	2.00	0.43
2:B:680:TRP:HB3	2:B:685:CYS:HB2	2.00	0.43
1:A:210:THR:HG23	1:A:213:PHE:HB3	2.01	0.43
2:B:330:ALA:O	2:B:333:GLU:HG2	2.19	0.43
2:E:202:ARG:HE	2:E:202:ARG:HB3	1.63	0.43
2:E:430:ALA:HB2	2:E:479:LEU:HD11	2.01	0.43
2:E:763:VAL:HG13	2:E:817:ALA:HB1	2.00	0.43
1:D:133:GLY:HA3	1:D:179:VAL:HG22	2.01	0.43
2:E:308:ASP:HB2	2:E:359:ARG:NH1	2.34	0.43
1:A:55:GLN:C	1:A:57:ALA:H	2.22	0.42
1:D:161:PHE:HD2	2:E:550:VAL:HG11	1.83	0.42
2:E:307:LEU:HD13	2:E:313:LEU:HD11	2.00	0.42
2:B:777:PHE:HA	2:E:642:GLY:HA2	2.01	0.42
1:D:267:TRP:HE1	1:D:275:ALA:HA	1.84	0.42
2:E:171:PRO:HA	2:E:372:ARG:NE	2.34	0.42
2:B:-1:ASN:HB2	2:B:169:ILE:O	2.19	0.42
2:B:119:ARG:HD2	2:B:119:ARG:HA	1.85	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:430:ALA:HB2	2:B:479:LEU:HD11	2.02	0.42
1:D:61:LYS:HB2	1:D:61:LYS:HE2	1.71	0.42
1:D:124:ILE:HD12	2:E:499:GLY:HA2	2.02	0.42
2:B:225:ARG:HD3	2:B:379:SER:HB2	2.02	0.42
1:D:182:ARG:HG2	1:D:182:ARG:NH1	2.35	0.42
1:A:111:PRO:HG3	1:A:337:PHE:CD1	2.55	0.42
1:D:339:VAL:HG11	2:E:516:LEU:HD23	2.02	0.42
1:A:216:VAL:O	1:A:307:GLY:HA2	2.20	0.42
2:B:743:PHE:CE1	2:B:797:ARG:HG3	2.55	0.42
1:A:50:VAL:HG22	1:A:56:ARG:NH1	2.35	0.41
1:A:58:GLU:HB3	1:A:59:ALA:H	1.64	0.41
1:D:85:ARG:O	1:D:89:VAL:HG13	2.20	0.41
2:E:44:GLY:HA3	2:E:45:PRO:HA	1.81	0.41
2:B:509:THR:HG22	2:B:665:ALA:HB1	2.01	0.41
1:A:55:GLN:HG2	1:A:56:ARG:N	2.35	0.41
2:E:46:VAL:HG22	2:E:160:LEU:HD22	2.03	0.41
2:B:552:ASN:OD1	2:B:552:ASN:N	2.54	0.41
1:D:287:HIS:HB3	1:D:290:VAL:HG23	2.02	0.41
1:A:78:LEU:O	1:A:82:ARG:HB2	2.21	0.41
2:B:20:ASP:H	7:B:914:EDO:H11	1.86	0.41
2:B:140:ILE:H	2:B:140:ILE:HG13	1.71	0.41
1:A:8:THR:HG22	1:A:11:VAL:HG23	2.04	0.40
1:A:71:GLN:O	1:A:74:TYR:N	2.54	0.40
1:D:182:ARG:HG2	1:D:182:ARG:HH11	1.86	0.40
1:A:136:VAL:H	2:B:626:GLN:HE22	1.69	0.40
1:A:176:THR:OG1	1:A:217:GLU:OE1	2.28	0.40
2:B:764:ARG:HG2	2:B:771:LEU:HD23	2.04	0.40
9:B:915:EPE:H61	9:B:915:EPE:H102	1.66	0.40
2:E:303:ILE:HG13	2:E:304:GLU:N	2.35	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	324/341 (95%)	310 (96%)	11 (3%)	3 (1%)	14	14
1	D	335/341 (98%)	324 (97%)	11 (3%)	0	100	100
2	B	834/835 (100%)	810 (97%)	21 (2%)	3 (0%)	30	34
2	E	793/835 (95%)	762 (96%)	28 (4%)	3 (0%)	30	34
All	All	2286/2352 (97%)	2206 (96%)	71 (3%)	9 (0%)	30	34

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	58	GLU
2	B	373	THR
2	E	324	GLY
2	E	373	THR
1	A	321	PRO
2	B	559	PRO
2	B	324	GLY
1	A	340	GLY
2	E	102	GLY

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	253/268 (94%)	243 (96%)	10 (4%)	27	34
1	D	261/268 (97%)	253 (97%)	8 (3%)	35	44
2	B	651/652 (100%)	642 (99%)	9 (1%)	62	75
2	E	616/652 (94%)	593 (96%)	23 (4%)	29	38
All	All	1781/1840 (97%)	1731 (97%)	50 (3%)	38	49

All (50) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	2	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	29	ARG
1	A	41	LEU
1	A	50	VAL
1	A	63	VAL
1	A	175	HIS
1	A	176	THR
1	A	245	SER
1	A	268	PHE
2	B	161	ASP
2	B	308	ASP
2	B	358	ARG
2	B	408	ASP
2	B	415	SER
2	B	564	THR
2	B	628	GLN
2	B	769	ASP
2	B	784	GLN
1	D	2	LEU
1	D	72	ARG
1	D	103[A]	ARG
1	D	103[B]	ARG
1	D	203	ASP
1	D	213	PHE
1	D	257	PHE
1	D	331	VAL
2	E	3	LEU
2	E	17	SER
2	E	36	GLU
2	E	54	ARG
2	E	69	ARG
2	E	193	ASP
2	E	200	ASN
2	E	240	SER
2	E	293	SER
2	E	301	ASP
2	E	303	ILE
2	E	333	GLU
2	E	343	LEU
2	E	357	GLN
2	E	436	GLN
2	E	546	MET
2	E	549	ARG

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	E	564	THR
2	E	584	VAL
2	E	610	ARG
2	E	622	SER
2	E	684	ARG
2	E	693	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	452	HIS
2	E	200	ASN
2	E	594	GLN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
3	C	70/77 (90%)	6 (8%)	0
3	F	70/77 (90%)	8 (11%)	0
All	All	140/154 (90%)	14 (10%)	0

All (14) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	C	6	G
3	C	16	U
3	C	21	A
3	C	22	U
3	C	23	G
3	C	43	G
3	F	4	C
3	F	7	G
3	F	16	U
3	F	17	C
3	F	18	G
3	F	22	U
3	F	23	G
3	F	69	U

There are no RNA pucker outliers to report.

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 39 ligands modelled in this entry, 7 are monoatomic - leaving 32 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	$\#\|Z\| > 2$
6	ACT	C	102	-	3,3,3	1.36	0	3,3,3	1.36	0
4	AX7	D	401	-	11,11,11	3.38	6 (54%)	8,15,15	4.39	3 (37%)
6	ACT	B	903	-	3,3,3	1.37	0	3,3,3	1.37	0
7	EDO	C	101	-	3,3,3	0.42	0	2,2,2	0.42	0
4	AX7	A	401	-	11,11,11	3.39	6 (54%)	8,15,15	4.41	3 (37%)
6	ACT	A	403	-	3,3,3	1.32	0	3,3,3	1.35	0
6	ACT	B	901	-	3,3,3	1.36	0	3,3,3	1.36	0
8	PEG	B	916	-	6,6,6	0.10	0	5,5,5	0.10	0
8	PEG	E	902	-	6,6,6	0.11	0	5,5,5	0.11	0
6	ACT	B	910	-	3,3,3	1.36	0	3,3,3	1.35	0
6	ACT	B	908	-	3,3,3	1.37	0	3,3,3	1.36	0
6	ACT	B	909	-	3,3,3	1.37	0	3,3,3	1.38	0
6	ACT	D	403	-	3,3,3	1.37	0	3,3,3	1.33	0
6	ACT	E	903	-	3,3,3	1.38	0	3,3,3	1.36	0
7	EDO	B	913	-	3,3,3	0.42	0	2,2,2	0.37	0
6	ACT	A	404	-	3,3,3	1.38	0	3,3,3	1.36	0
7	EDO	E	907	-	3,3,3	0.42	0	2,2,2	0.40	0
7	EDO	E	906	-	3,3,3	0.43	0	2,2,2	0.38	0
8	PEG	B	905	-	6,6,6	0.10	0	5,5,5	0.13	0
6	ACT	B	912	-	3,3,3	1.38	0	3,3,3	1.36	0
7	EDO	B	914	-	3,3,3	0.41	0	2,2,2	0.40	0
6	ACT	B	904	-	3,3,3	1.35	0	3,3,3	1.36	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
9	EPE	B	915	-	15,15,15	0.80	1 (6%)	19,20,20	1.65	4 (21%)
7	EDO	E	908	-	3,3,3	0.42	0	2,2,2	0.38	0
6	ACT	E	905	-	3,3,3	1.36	0	3,3,3	1.38	0
6	ACT	B	911	-	3,3,3	1.38	0	3,3,3	1.37	0
6	ACT	B	907	-	3,3,3	1.38	0	3,3,3	1.37	0
8	PEG	B	906	-	6,6,6	0.11	0	5,5,5	0.12	0
10	DMS	D	404	-	3,3,3	0.67	0	3,3,3	0.52	0
6	ACT	E	904	-	3,3,3	1.37	0	3,3,3	1.36	0
7	EDO	B	902	-	3,3,3	0.42	0	2,2,2	0.39	0
7	EDO	E	901	-	3,3,3	0.43	0	2,2,2	0.37	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	EDO	E	908	-	-	0/1/1/1	-
7	EDO	B	913	-	-	0/1/1/1	-
7	EDO	B	914	-	-	0/1/1/1	-
7	EDO	E	907	-	-	0/1/1/1	-
8	PEG	B	916	-	-	2/4/4/4	-
7	EDO	E	906	-	-	0/1/1/1	-
8	PEG	E	902	-	-	2/4/4/4	-
8	PEG	B	906	-	-	1/4/4/4	-
7	EDO	C	101	-	-	0/1/1/1	-
4	AX7	D	401	-	-	-	0/2/2/2
4	AX7	A	401	-	-	-	0/2/2/2
8	PEG	B	905	-	-	1/4/4/4	-
7	EDO	B	902	-	-	0/1/1/1	-
7	EDO	E	901	-	-	0/1/1/1	-
9	EPE	B	915	-	-	6/9/19/19	0/1/1/1

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	401	AX7	CAH-NAA	5.84	1.45	1.33
4	A	401	AX7	CAH-NAA	5.70	1.45	1.33
4	A	401	AX7	CAH-NAG	-5.57	1.25	1.34
4	D	401	AX7	CAH-NAG	-5.45	1.25	1.34
4	A	401	AX7	CAI-NAF	4.99	1.55	1.38

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	401	AX7	CAI-NAF	4.98	1.55	1.38
4	A	401	AX7	CAJ-NAG	-4.12	1.25	1.38
4	D	401	AX7	CAJ-NAG	-4.04	1.25	1.38
4	A	401	AX7	CAE-CAJ	-3.13	1.36	1.41
4	D	401	AX7	CAE-CAJ	-3.04	1.36	1.41
9	B	915	EPE	C10-S	2.61	1.81	1.77
4	D	401	AX7	CAB-CAD	2.07	1.41	1.36
4	A	401	AX7	CAB-CAD	2.06	1.41	1.36

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	401	AX7	CAH-NAG-CAJ	11.16	122.17	106.73
4	D	401	AX7	CAH-NAG-CAJ	11.16	122.16	106.73
4	A	401	AX7	CAH-NAF-CAI	-4.89	99.98	106.73
4	D	401	AX7	CAH-NAF-CAI	-4.73	100.20	106.73
9	B	915	EPE	C5-N4-C3	4.23	117.96	108.84
9	B	915	EPE	C7-N4-C3	3.11	119.52	111.24
9	B	915	EPE	C7-N4-C5	2.31	117.39	111.24
9	B	915	EPE	O3S-S-C10	2.30	110.50	106.00
4	D	401	AX7	CAE-CAJ-NAG	2.13	136.94	130.78
4	A	401	AX7	CAE-CAJ-NAG	2.05	136.73	130.78

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	B	915	EPE	C9-C10-S-O1S
9	B	915	EPE	C9-C10-S-O2S
9	B	915	EPE	C9-C10-S-O3S
8	E	902	PEG	O2-C3-C4-O4
9	B	915	EPE	N4-C7-C8-O8
9	B	915	EPE	C8-C7-N4-C3
8	E	902	PEG	O1-C1-C2-O2
9	B	915	EPE	S-C10-C9-N1
8	B	916	PEG	O2-C3-C4-O4
8	B	906	PEG	C4-C3-O2-C2
8	B	905	PEG	C1-C2-O2-C3
8	B	916	PEG	C4-C3-O2-C2

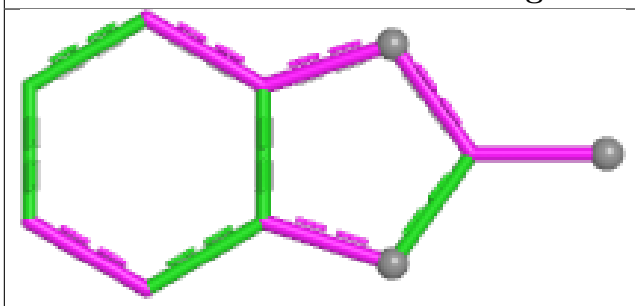
There are no ring outliers.

7 monomers are involved in 9 short contacts:

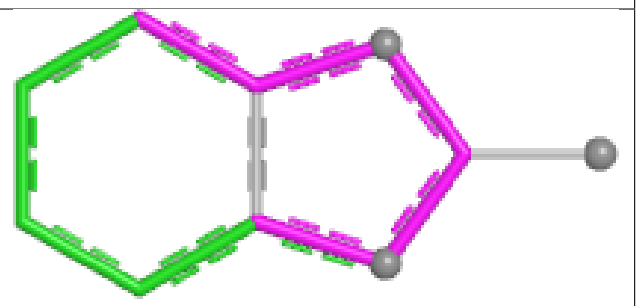
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	C	101	EDO	2	0
4	A	401	AX7	1	0
7	E	906	EDO	1	0
8	B	905	PEG	1	0
7	B	914	EDO	1	0
9	B	915	EPE	2	0
7	E	908	EDO	1	0

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.

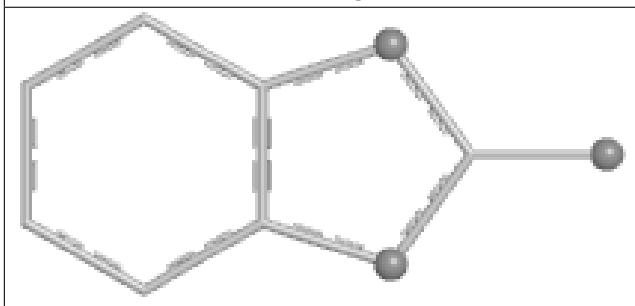
Ligand AX7 D 401



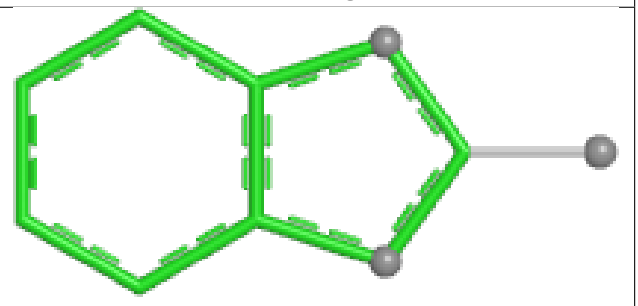
Bond lengths



Bond angles

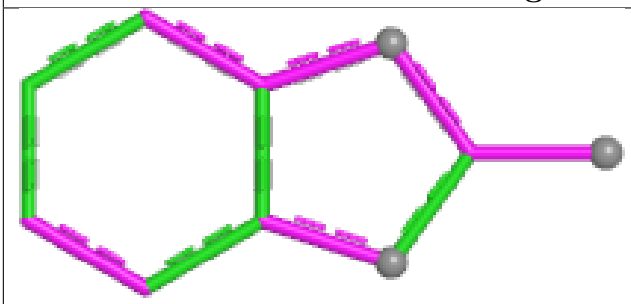


Torsions

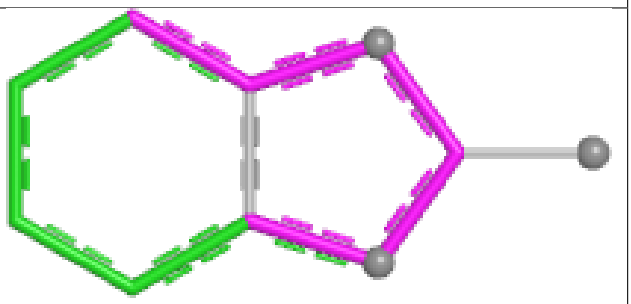


Rings

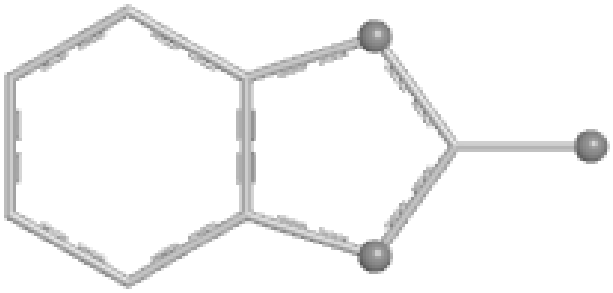
Ligand AX7 A 401



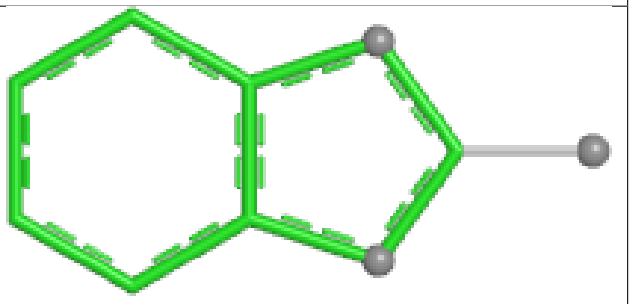
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	332/341 (97%)	1.02	86 (25%) 2 2	19, 51, 112, 159	0
1	D	338/341 (99%)	1.02	78 (23%) 2 2	20, 54, 105, 144	1 (0%)
2	B	834/835 (99%)	-0.14	26 (3%) 51 57	16, 30, 71, 111	2 (0%)
2	E	805/835 (96%)	0.96	209 (25%) 2 2	16, 51, 119, 215	0
3	C	71/77 (92%)	0.59	13 (18%) 4 5	22, 49, 165, 172	0
3	F	71/77 (92%)	1.80	37 (52%) 0 0	30, 75, 177, 205	0
All	All	2451/2506 (97%)	0.62	449 (18%) 4 5	16, 40, 112, 215	3 (0%)

All (449) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	152	HIS	6.8
2	E	554	LEU	6.7
1	A	341	ALA	6.4
2	E	557	ASP	6.2
1	A	59	ALA	5.6
2	E	78	ARG	5.6
2	E	319	ALA	5.5
1	D	341	ALA	5.4
1	D	145	ALA	5.3
1	A	149	PRO	5.2
2	E	103	ALA	5.2
1	D	275	ALA	5.2
2	E	102	GLY	5.1
1	D	136	VAL	5.0
2	E	234	ILE	4.9
2	B	599	THR	4.8
1	D	146	LEU	4.8
1	D	92	ALA	4.7
2	E	259	ALA	4.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	F	17	C	4.7
1	D	269	ALA	4.7
2	E	334	VAL	4.7
3	C	17	C	4.7
2	E	527	PHE	4.6
2	E	316	ASP	4.6
2	E	243	TRP	4.6
1	A	44	ALA	4.6
2	E	58	ILE	4.6
2	E	301	ASP	4.5
2	E	141	LEU	4.5
1	A	180	GLN	4.5
1	D	267	TRP	4.5
2	E	315	VAL	4.5
1	D	276	ALA	4.4
1	A	41	LEU	4.4
2	E	104	THR	4.4
1	A	268	PHE	4.4
1	A	47	ALA	4.4
1	A	65	ALA	4.4
1	D	164	ALA	4.4
3	F	61	C	4.3
2	E	394	ALA	4.3
2	E	300	LEU	4.3
2	E	362	LEU	4.2
1	A	158	GLN	4.2
2	E	318	ALA	4.1
2	E	336	ALA	4.1
2	E	84	ILE	4.1
1	A	35	LEU	4.1
2	E	607	VAL	4.1
3	F	57	C	4.1
1	A	50	VAL	4.1
2	E	160	LEU	4.1
2	E	294	GLY	4.1
1	D	132	GLU	4.1
3	F	71	G	4.1
1	D	1	MET	4.0
2	E	126	CYS	4.0
2	E	326	VAL	4.0
2	E	548	THR	4.0
1	A	42	ALA	4.0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	D	134	PRO	4.0
2	E	363	PRO	4.0
2	E	599	THR	4.0
2	E	619	LEU	4.0
2	E	313	LEU	4.0
2	E	71	CYS	4.0
3	F	1	G	3.9
2	E	216	THR	3.9
2	E	90	PHE	3.9
3	C	1	G	3.9
1	A	48	LEU	3.9
1	D	148	PHE	3.9
1	D	316	PHE	3.9
2	E	70	ALA	3.9
2	E	391	ALA	3.9
1	A	205	LEU	3.8
2	E	75	ILE	3.8
2	E	142	VAL	3.8
2	E	80	TYR	3.8
1	D	274	GLY	3.8
1	A	43	LEU	3.8
1	D	257	PHE	3.8
2	E	100	LEU	3.7
2	E	275	HIS	3.7
1	D	212	ILE	3.7
1	A	276	ALA	3.7
1	D	205	LEU	3.7
2	E	236	PRO	3.7
2	E	109	PHE	3.7
2	E	393	ILE	3.7
1	A	63	VAL	3.7
2	B	783	PRO	3.7
2	E	105	LEU	3.7
2	E	360	LEU	3.7
3	F	19	G	3.6
2	E	245	GLN	3.6
1	A	157	GLU	3.6
1	A	49	ALA	3.6
2	E	49	PRO	3.6
2	E	232	ILE	3.6
3	F	18	G	3.6
3	F	48	U	3.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	B	-2	SER	3.6
2	E	111	ILE	3.6
3	C	4	C	3.6
1	A	150	ALA	3.6
1	D	151	ASP	3.5
2	E	337	ASP	3.5
1	D	268	PHE	3.5
2	E	341	VAL	3.5
1	D	4	PRO	3.5
2	E	237	ALA	3.5
1	D	93	GLU	3.5
2	E	358	ARG	3.5
1	D	161	PHE	3.5
1	A	40	PRO	3.5
1	A	153	PRO	3.5
2	E	338	SER	3.4
2	E	95	LEU	3.4
2	E	330	ALA	3.4
1	D	163	ILE	3.4
1	D	91	VAL	3.4
1	A	146	LEU	3.4
2	E	291	ALA	3.4
2	E	618	MET	3.4
3	F	7	G	3.4
1	A	275	ALA	3.4
3	C	3	C	3.4
2	E	45	PRO	3.3
2	E	553	PRO	3.3
2	E	302	GLY	3.3
2	E	152	ALA	3.3
2	E	320	THR	3.3
1	D	149	PRO	3.3
1	D	165	PRO	3.3
2	E	239	VAL	3.3
3	F	5	A	3.3
1	A	267	TRP	3.3
1	A	2	LEU	3.3
2	E	143	LEU	3.3
2	E	258	PRO	3.3
2	E	131	LEU	3.3
3	F	51	G	3.2
2	E	303	ILE	3.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	E	606	PRO	3.2
2	B	109	PHE	3.2
1	A	69	ALA	3.2
3	F	62	C	3.2
1	D	155	ARG	3.2
1	D	176	THR	3.2
3	F	69	U	3.2
2	E	123	GLY	3.2
2	E	593	VAL	3.2
2	E	132	ASN	3.2
1	D	154	ALA	3.2
2	E	556	ALA	3.2
3	F	4	C	3.2
2	E	101	PRO	3.2
2	E	106	PRO	3.2
2	E	559	PRO	3.2
2	E	327	MET	3.2
3	F	56	U	3.2
1	A	11	VAL	3.2
2	E	203	VAL	3.2
2	E	222	GLY	3.2
3	F	54	G	3.2
1	A	76	GLU	3.2
2	E	204	PRO	3.2
1	A	316	PHE	3.2
1	D	172	LEU	3.2
2	B	551	LEU	3.2
2	E	293	SER	3.2
2	E	395	GLY	3.2
1	A	154	ALA	3.1
2	B	116	ALA	3.1
1	A	176	THR	3.1
2	E	307	LEU	3.1
2	E	546	MET	3.1
2	E	144	PRO	3.1
2	E	526	PRO	3.1
2	E	550	VAL	3.1
2	E	344	GLU	3.1
2	E	617	ALA	3.1
1	D	133	GLY	3.1
2	E	260	VAL	3.1
1	D	153	PRO	3.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	B	603	GLY	3.0
2	E	328	GLY	3.0
3	F	58	G	3.0
1	A	159	ASP	3.0
2	E	233	GLY	3.0
2	E	235	ASP	3.0
3	C	2	G	3.0
3	C	71	G	3.0
2	E	359	ARG	3.0
2	E	323	ILE	3.0
3	F	52	C	3.0
3	C	5	A	3.0
1	A	179	VAL	3.0
2	E	329	ALA	3.0
3	C	6	G	3.0
1	A	60	GLY	3.0
2	E	551	LEU	3.0
2	E	561	LEU	3.0
3	F	22	U	3.0
3	F	55	U	3.0
2	E	92	VAL	3.0
2	E	530	ALA	3.0
1	A	70	ALA	2.9
1	D	210	THR	2.9
2	E	125	ILE	2.9
2	B	115	LYS	2.9
2	E	552	ASN	2.9
3	C	48	U	2.9
1	A	4	PRO	2.9
1	A	57	ALA	2.9
1	D	207	ALA	2.9
1	A	274	GLY	2.9
2	E	528	LEU	2.9
2	B	412	ASP	2.9
2	E	317	ASP	2.9
3	F	50	G	2.9
3	F	49	C	2.9
1	D	147	ASN	2.9
1	D	159	ASP	2.8
2	E	46	VAL	2.8
1	A	66	ALA	2.8
2	E	60	GLU	2.8

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	B	120	ASN	2.8
3	C	69	U	2.8
1	D	200	PHE	2.8
1	D	206	ASP	2.8
2	E	624	PRO	2.8
2	B	601	GLY	2.8
3	F	16	U	2.8
2	B	557	ASP	2.8
2	E	213	TRP	2.8
1	A	36	GLY	2.8
1	A	160	THR	2.8
2	E	339	THR	2.8
1	A	55	GLN	2.8
2	E	-1	ASN	2.8
2	E	594	GLN	2.8
3	C	20	U	2.8
1	A	61	LYS	2.8
1	A	151	ASP	2.8
1	D	204	GLU	2.8
2	E	150	PRO	2.8
2	E	56	ALA	2.8
2	E	332	THR	2.8
2	E	298	VAL	2.7
3	F	59	A	2.7
2	E	72	ALA	2.7
2	E	155	ALA	2.7
2	E	310	ALA	2.7
2	E	242	TRP	2.7
1	D	143	PHE	2.7
2	E	73	VAL	2.7
1	A	175	HIS	2.7
3	F	53	G	2.7
1	D	20	LEU	2.7
2	B	554	LEU	2.7
1	A	64	ASN	2.7
1	A	62	ARG	2.7
1	D	139	GLU	2.7
2	E	279	ARG	2.7
2	E	340	ASP	2.7
1	D	59	ALA	2.7
2	E	361	HIS	2.7
2	E	51	THR	2.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	E	88	THR	2.7
2	E	256	THR	2.7
3	C	70	G	2.7
3	F	6	G	2.7
2	E	83	ILE	2.7
1	D	203	ASP	2.7
2	E	79	GLN	2.7
1	A	207	ALA	2.7
2	E	601	GLY	2.6
1	D	2	LEU	2.6
2	B	62	THR	2.6
2	E	296	THR	2.6
2	E	390	LEU	2.6
1	A	22	ASP	2.6
2	E	562	ALA	2.6
1	A	56	ARG	2.6
2	E	409	PRO	2.6
2	E	47	ASP	2.6
1	D	180	GLN	2.6
2	E	335	ARG	2.6
3	F	68	C	2.6
1	D	150	ALA	2.6
2	E	107	GLY	2.6
2	E	321	ALA	2.6
1	D	54	GLU	2.6
2	E	410	PRO	2.6
1	A	38	ARG	2.6
2	E	558	ARG	2.6
1	D	166	GLU	2.6
2	B	118	GLY	2.6
2	E	396	GLY	2.6
2	E	280	ASN	2.6
2	E	331	SER	2.6
1	A	145	ALA	2.5
2	E	238	ALA	2.5
2	E	322	ALA	2.5
1	A	74	TYR	2.5
3	F	63	C	2.5
2	E	292	ARG	2.5
2	E	386	CYS	2.5
2	E	531	GLY	2.5
1	A	20	LEU	2.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	E	249	LEU	2.5
2	E	277	HIS	2.5
2	E	140	ILE	2.5
2	E	59	GLU	2.5
1	A	141	PHE	2.5
2	B	527	PHE	2.5
2	E	288	VAL	2.5
1	A	78	LEU	2.5
2	E	285	THR	2.5
1	D	170	GLN	2.5
1	A	10	ALA	2.4
1	A	91	VAL	2.4
3	F	15	G	2.4
3	F	70	G	2.4
2	E	89	ASN	2.4
1	A	9	THR	2.4
1	D	208	THR	2.4
1	A	134	PRO	2.4
3	F	21	A	2.4
1	D	162	TYR	2.4
2	E	282	ILE	2.4
1	A	45	ARG	2.4
1	A	71	GLN	2.4
2	E	148	ALA	2.4
1	A	148	PHE	2.4
1	D	156	GLY	2.4
2	B	831	GLY	2.4
1	D	131	ALA	2.4
2	E	13	ALA	2.4
2	E	387	ALA	2.4
1	D	211	PRO	2.4
2	E	42	PRO	2.4
2	E	74	ASP	2.4
1	A	72	ARG	2.4
2	E	108	GLY	2.4
2	E	452	HIS	2.4
2	E	549	ARG	2.4
1	A	172	LEU	2.4
2	E	274	MET	2.3
2	E	611	PRO	2.3
1	A	12	ASP	2.3
2	E	153	ASP	2.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	F	67	C	2.3
1	D	46	GLN	2.3
3	F	60	U	2.3
2	E	276	ALA	2.3
2	B	546	MET	2.3
2	E	220	GLU	2.3
1	A	53	LYS	2.3
1	D	321	PRO	2.3
2	E	529	PRO	2.3
1	A	131	ALA	2.3
2	E	129	ALA	2.3
1	D	50	VAL	2.3
2	B	559	PRO	2.3
1	D	167	ASP	2.3
2	E	308	ASP	2.3
3	F	3	C	2.3
1	D	138	THR	2.3
2	E	214	PRO	2.3
3	F	2	G	2.3
3	F	64	G	2.3
1	D	22	ASP	2.3
2	E	201	SER	2.3
2	E	620	ASP	2.3
2	E	306	LYS	2.2
1	A	1	MET	2.2
1	A	90	LEU	2.2
2	E	128	ALA	2.2
1	A	174	THR	2.2
1	D	40	PRO	2.2
1	D	52	PRO	2.2
1	D	160	THR	2.2
1	A	29	ARG	2.2
1	D	266	VAL	2.2
2	B	594	GLN	2.2
1	D	177	SER	2.2
2	E	122	ASP	2.2
2	E	603	GLY	2.2
1	D	171	LEU	2.2
2	E	309	THR	2.2
1	D	7	LEU	2.2
2	E	297	ALA	2.2
1	A	18	ILE	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	E	254	ARG	2.2
1	A	68	ASN	2.2
1	D	48	LEU	2.2
2	E	343	LEU	2.2
1	A	13	ALA	2.2
3	F	20	U	2.2
2	E	97	VAL	2.2
1	D	181	ILE	2.1
2	B	782	GLY	2.1
2	E	48	GLY	2.1
1	A	168	SER	2.1
2	E	93	GLY	2.1
2	E	342	LEU	2.1
1	A	14	ALA	2.1
1	A	164	ALA	2.1
2	B	556	ALA	2.1
2	E	147	ALA	2.1
2	E	621	ALA	2.1
2	E	124	MET	2.1
1	D	94	GLY	2.1
2	E	324	GLY	2.1
2	E	364	SER	2.1
2	E	786	GLY	2.1
2	E	133	LEU	2.1
2	E	158	LEU	2.1
1	D	178	PRO	2.1
2	B	606	PRO	2.1
1	D	47	ALA	2.1
2	B	612	THR	2.1
1	A	135	GLU	2.1
2	B	602	VAL	2.1
2	E	52	VAL	2.1
2	E	397	GLU	2.1
2	E	408	ASP	2.1
2	E	414	TRP	2.1
1	A	8	THR	2.1
2	E	96	VAL	2.0
2	B	408	ASP	2.0
3	C	22	U	2.0
1	A	30	VAL	2.0
1	A	339	VAL	2.0
2	E	231	VAL	2.0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	E	312	VAL	2.0
1	A	273	GLY	2.0
2	E	44	GLY	2.0
1	D	53	LYS	2.0
1	D	168	SER	2.0
2	E	41	ILE	2.0
2	E	605	ILE	2.0
1	D	90	LEU	2.0
2	E	595	PRO	2.0
2	E	604	LEU	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^{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
5	MG	F	101	1/1	0.74	0.17	56,56,56,56	0
8	PEG	E	902	7/7	0.78	0.29	41,47,53,54	0
9	EPE	B	915	15/15	0.80	0.22	65,74,84,92	0
7	EDO	B	914	4/4	0.82	0.14	41,43,45,47	0
6	ACT	B	909	4/4	0.83	0.17	43,43,49,54	0
6	ACT	B	907	4/4	0.85	0.16	49,51,52,59	0
7	EDO	E	907	4/4	0.85	0.13	43,45,48,48	0
6	ACT	E	904	4/4	0.86	0.16	44,53,54,57	0
8	PEG	B	905	7/7	0.86	0.14	30,36,48,48	0
8	PEG	B	906	7/7	0.87	0.13	45,57,63,63	0
5	MG	C	106	1/1	0.88	0.11	52,52,52,52	0
8	PEG	B	916	7/7	0.88	0.16	29,42,58,60	0
7	EDO	B	902	4/4	0.89	0.14	40,47,49,49	0

Continued on next page...

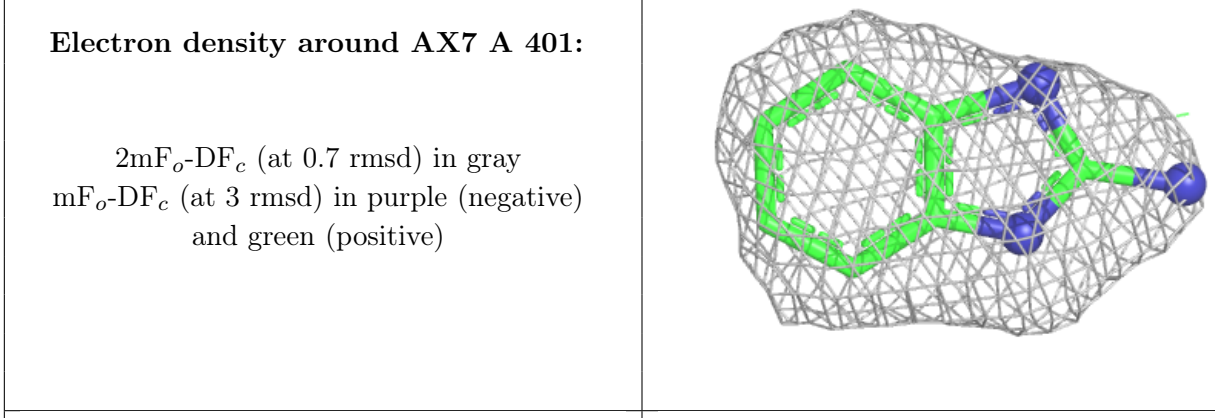
Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
7	EDO	B	913	4/4	0.90	0.14	36,38,50,52	0
7	EDO	C	101	4/4	0.90	0.14	39,48,49,51	0
7	EDO	E	906	4/4	0.90	0.14	39,46,46,47	0
6	ACT	B	903	4/4	0.91	0.10	26,40,42,53	0
6	ACT	E	903	4/4	0.91	0.11	41,43,43,45	0
6	ACT	B	911	4/4	0.92	0.09	24,30,38,43	0
6	ACT	E	905	4/4	0.92	0.10	37,41,43,50	0
7	EDO	E	908	4/4	0.92	0.09	41,41,44,50	0
5	MG	C	105	1/1	0.92	0.10	50,50,50,50	0
6	ACT	C	102	4/4	0.93	0.12	18,23,25,38	0
6	ACT	B	904	4/4	0.93	0.12	18,28,28,36	0
4	AX7	A	401	10/10	0.94	0.09	32,43,50,52	0
4	AX7	D	401	10/10	0.94	0.08	32,43,48,57	0
5	MG	C	103	1/1	0.94	0.08	47,47,47,47	0
7	EDO	E	901	4/4	0.94	0.09	36,37,39,56	0
6	ACT	B	910	4/4	0.94	0.09	29,33,33,39	0
5	MG	C	104	1/1	0.94	0.06	47,47,47,47	0
6	ACT	A	404	4/4	0.95	0.10	32,34,37,45	0
6	ACT	B	908	4/4	0.95	0.09	40,42,44,50	0
6	ACT	B	912	4/4	0.96	0.08	37,38,41,45	0
6	ACT	D	403	4/4	0.96	0.11	13,23,31,34	0
6	ACT	B	901	4/4	0.97	0.08	24,25,32,35	0
10	DMS	D	404	4/4	0.97	0.10	52,57,62,64	0
6	ACT	A	403	4/4	0.98	0.09	11,20,26,38	0
5	MG	D	402	1/1	0.99	0.03	33,33,33,33	0
5	MG	A	402	1/1	0.99	0.02	20,20,20,20	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.

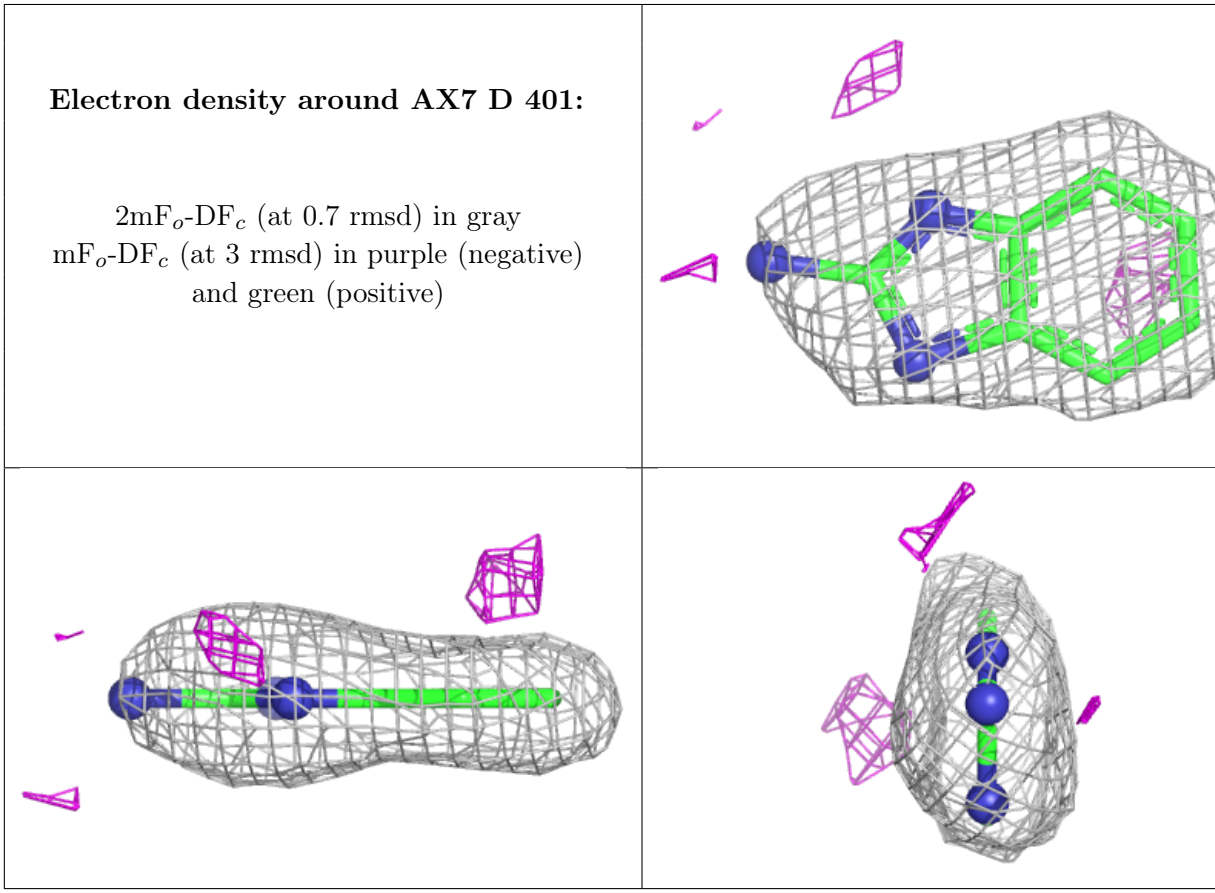
Electron density around AX7 A 401:

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



Electron density around AX7 D 401:

$2mF_o$-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.