



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 25, 2026 – 08:42 PM EDT

PDB ID : 7CXO / pdb_00007cxo
Title : Crystal structure of Arabinose isomerase from hybrid AI10
Authors : Hoang, N.K.Q.; Dhanasingh, I.; Cao, T.P.; Sung, J.Y.; Shin, S.M.; Lee, D.W.;
Lee, S.H.
Deposited on : 2020-09-02
Resolution : 3.20 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 ⓘ](#)) were used in the production of this report:

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

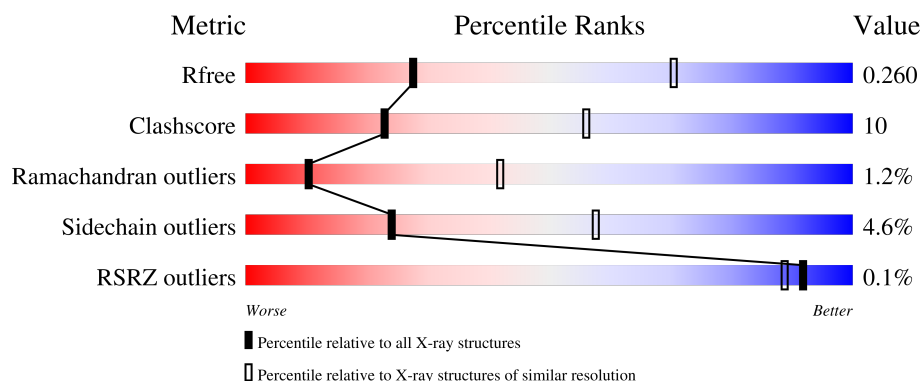
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.20 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}	180053	1466 (3.20-3.20)
Clashscore	190562	1573 (3.20-3.20)
Ramachandran outliers	187476	1548 (3.20-3.20)
Sidechain outliers	187428	1547 (3.20-3.20)
RSRZ outliers	180081	1466 (3.20-3.20)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	498	78% 19% ..
1	B	498	75% 22% .
1	C	498	73% 24% ..
1	D	498	72% 24% ..
1	E	498	71% 26% ..

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	F	498	71% 27% ..

2 Entry composition [i](#)

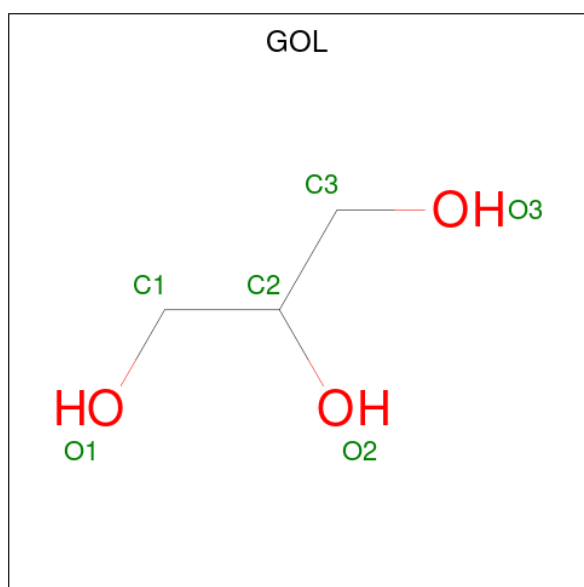
There are 4 unique types of molecules in this entry. The entry contains 23537 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 L-arabinose isomerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	494	Total	C	N	O	S	0	0	0
			3901	2478	687	715	21			
1	B	496	Total	C	N	O	S	0	0	0
			3918	2489	690	717	22			
1	C	486	Total	C	N	O	S	0	0	0
			3839	2443	673	702	21			
1	D	494	Total	C	N	O	S	0	0	0
			3901	2478	687	715	21			
1	E	496	Total	C	N	O	S	0	0	0
			3918	2489	690	717	22			
1	F	495	Total	C	N	O	S	0	0	0
			3910	2484	689	716	21			

- Molecule 2 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0
2	C	1	Total C O 6 3 3	0	0
2	D	1	Total C O 6 3 3	0	0
2	E	1	Total C O 6 3 3	0	0

- Molecule 3 is MANGANESE (II) ION (CCD ID: MN) (formula: Mn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Mn 1 1	0	0
3	B	1	Total Mn 1 1	0	0
3	C	1	Total Mn 1 1	0	0
3	D	1	Total Mn 1 1	0	0
3	E	1	Total Mn 1 1	0	0
3	F	1	Total Mn 1 1	0	0

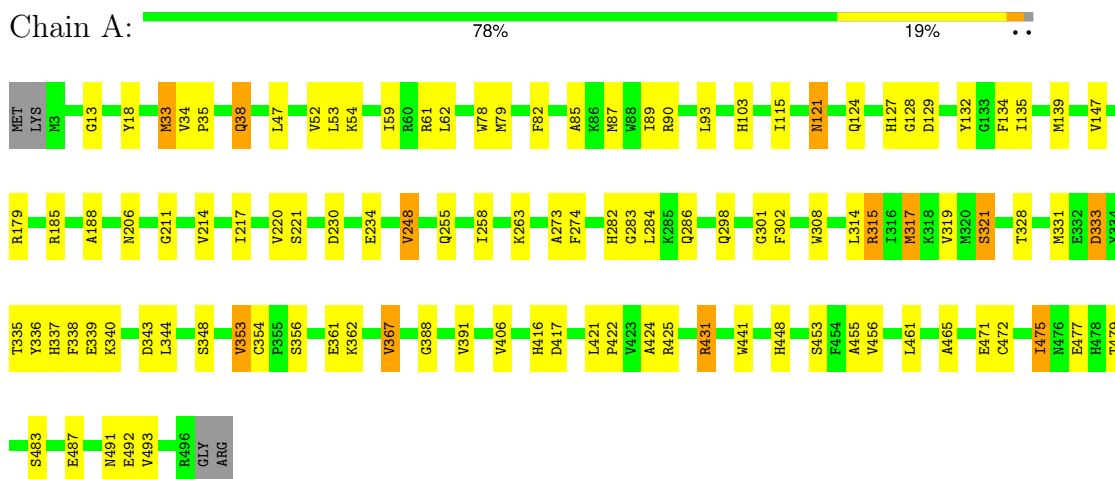
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	21	Total O 21 21	0	0
4	B	14	Total O 14 14	0	0
4	C	21	Total O 21 21	0	0
4	D	25	Total O 25 25	0	0
4	E	20	Total O 20 20	0	0
4	F	13	Total O 13 13	0	0

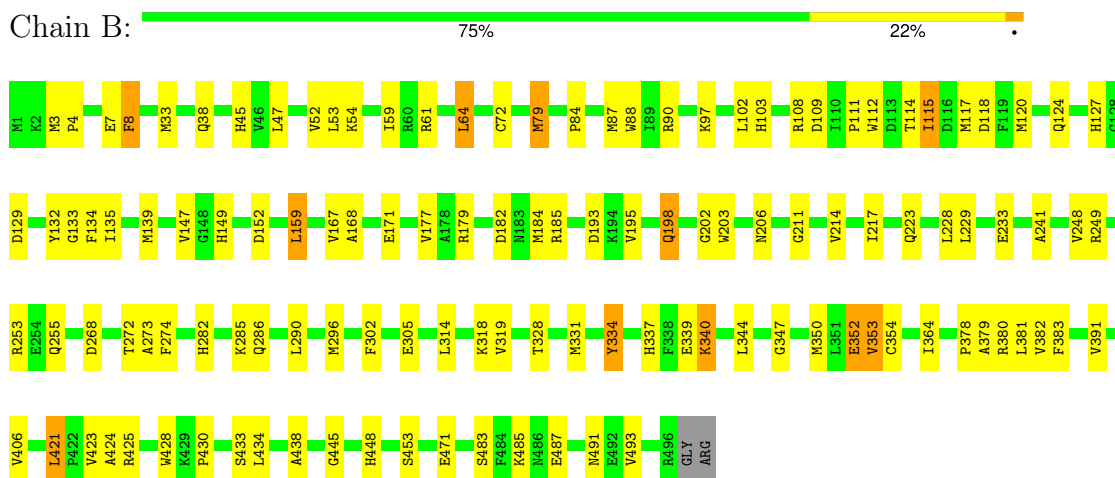
3 Residue-property plots

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

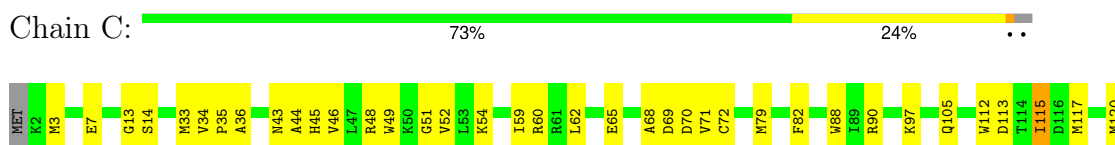
- Molecule 1: L-arabinose isomerase



- Molecule 1: L-arabinose isomerase



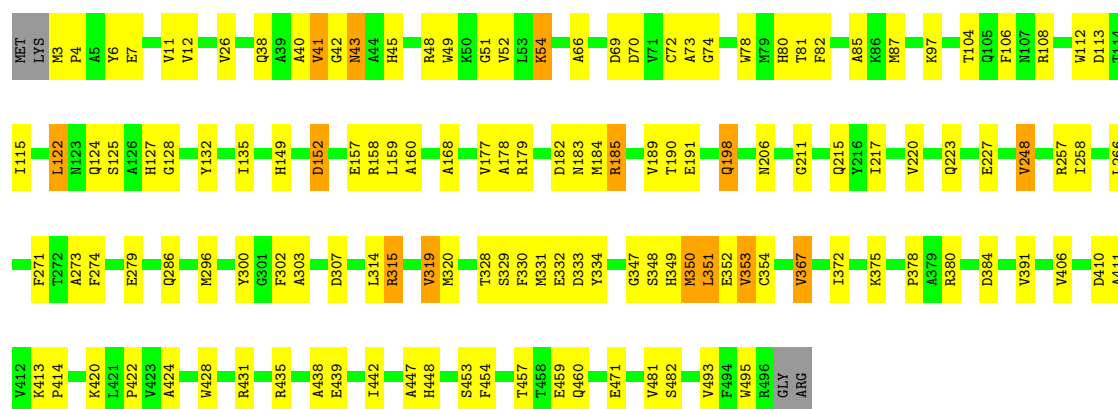
- Molecule 1: L-arabinose isomerase





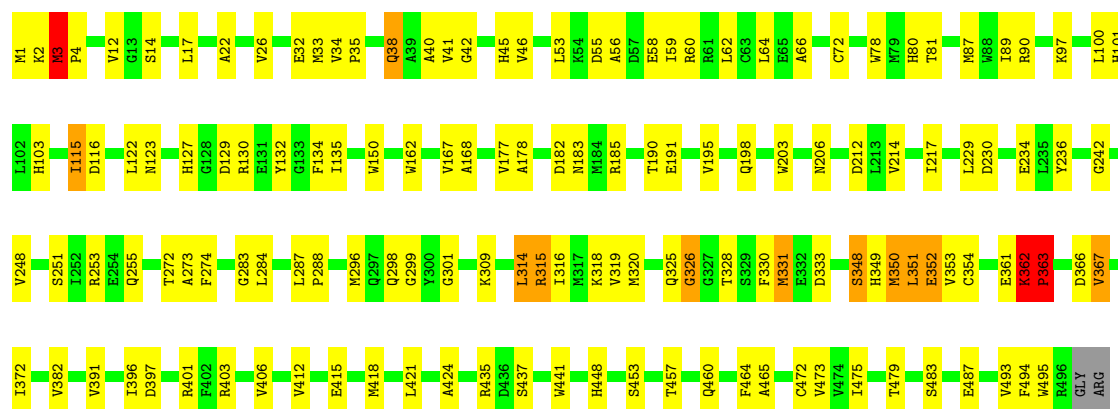
• Molecule 1: L-arabinose isomerase

Chain D: 72% 24%



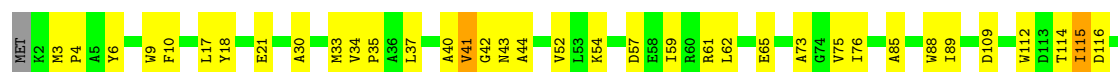
• Molecule 1: L-arabinose isomerase

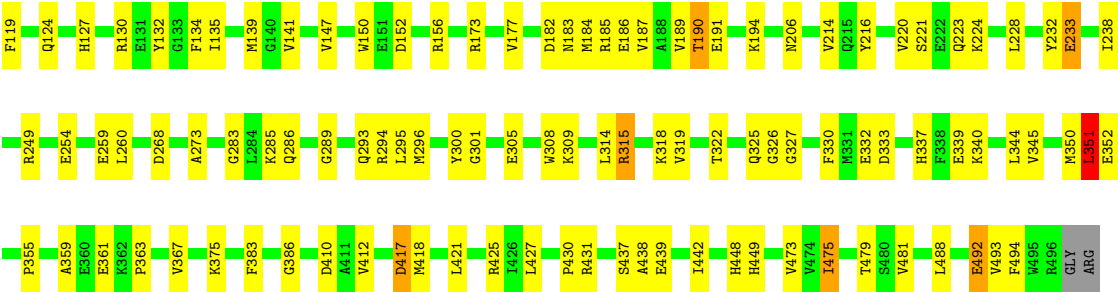
Chain E: 71% 26%



• Molecule 1: L-arabinose isomerase

Chain F: 71% 27%





4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	148.48Å 258.57Å 165.73Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.89 – 3.20 48.89 – 3.20	Depositor EDS
% Data completeness (in resolution range)	98.0 (48.89-3.20) 99.8 (48.89-3.20)	Depositor EDS
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.12 (at 3.12Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.176 , 0.270 0.175 , 0.260	Depositor DCC
R_{free} test set	2606 reflections (4.70%)	wwPDB-VP
Wilson B-factor (Å ²)	75.8	Xtriage
Anisotropy	0.064	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 47.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	0.026 for 1/2*h-1/2*k,-3/2*h-1/2*k,-l 0.027 for 1/2*h+1/2*k,3/2*h-1/2*k,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	23537	wwPDB-VP
Average B, all atoms (Å ²)	81.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.61% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 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: MN, GOL

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	0.95	0/3993	1.40	3/5406 (0.1%)
1	B	0.95	0/4010	1.45	3/5427 (0.1%)
1	C	0.98	0/3929	1.43	3/5318 (0.1%)
1	D	0.97	0/3993	1.40	0/5406
1	E	0.97	0/4010	1.43	1/5427 (0.0%)
1	F	0.99	0/4002	1.44	0/5417
All	All	0.97	0/23937	1.43	10/32401 (0.0%)

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

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

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	33	MET	CA-C-N	6.18	125.28	120.33
1	B	33	MET	C-N-CA	6.18	125.28	120.33
1	A	33	MET	CA-C-N	5.97	125.10	120.33
1	A	33	MET	C-N-CA	5.97	125.10	120.33
1	A	388	GLY	CA-C-O	-5.41	118.70	122.22
1	B	109	ASP	CA-CB-CG	5.24	117.84	112.60
1	C	388	GLY	CA-C-O	-5.22	118.56	122.37
1	C	51	GLY	CA-C-O	-5.14	118.12	122.29
1	C	148	GLY	CA-C-O	-5.12	118.18	122.33
1	E	397	ASP	CA-CB-CG	5.01	117.61	112.60

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	E	3	MET	Peptide
1	E	362	LYS	Peptide

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	3901	0	3809	80	0
1	B	3918	0	3834	84	0
1	C	3839	0	3753	93	0
1	D	3901	0	3809	94	0
1	E	3918	0	3834	105	0
1	F	3910	0	3822	93	0
2	A	6	0	8	0	0
2	B	6	0	8	0	0
2	C	6	0	8	0	0
2	D	6	0	8	0	0
2	E	6	0	8	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
3	F	1	0	0	0	0
4	A	21	0	0	0	0
4	B	14	0	0	2	0
4	C	21	0	0	2	0
4	D	25	0	0	2	0
4	E	20	0	0	1	0
4	F	13	0	0	1	0
All	All	23537	0	22901	481	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 10.

All (481) 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:7:GLU:OE1	1:D:48:ARG:NH1	1.94	1.00
1:A:421:LEU:HB2	1:C:115:ILE:HD13	1.50	0.94
1:B:3:MET:HG2	1:B:4:PRO:HD2	1.57	0.86
1:A:448:HIS:HB2	1:C:127:HIS:HB2	1.62	0.82
1:B:115:ILE:HG21	1:C:418:MET:HG2	1.66	0.78
1:A:493:VAL:HG11	1:C:493:VAL:HG12	1.66	0.77
1:B:3:MET:SD	4:B:703:HOH:O	2.41	0.77
1:E:348:SER:HB2	1:E:424:ALA:O	1.87	0.75
1:F:351:LEU:HD12	1:F:352:GLU:HG3	1.69	0.75
1:D:296:MET:HE2	1:D:354:CYS:HB2	1.69	0.75
1:F:89:ILE:HG12	1:F:139:MET:HE1	1.69	0.75
1:A:217:ILE:CD1	1:A:258:ILE:HA	2.18	0.74
1:E:229:LEU:HD11	1:E:253:ARG:HA	1.69	0.74
1:D:380:ARG:HD2	1:D:422:PRO:O	1.87	0.73
1:A:185:ARG:HG2	1:E:206:ASN:HB3	1.69	0.73
1:C:124:GLN:O	1:C:126:ALA:N	2.21	0.73
1:E:1:MET:HG2	1:E:298:GLN:O	1.89	0.73
1:D:220:VAL:HG11	1:D:257:ARG:HG3	1.72	0.71
1:D:72:CYS:SG	1:D:97:LYS:HG3	2.31	0.71
1:C:135:ILE:HG13	1:C:139:MET:HE2	1.75	0.69
1:B:229:LEU:HD21	1:B:253:ARG:HA	1.75	0.68
1:D:438:ALA:HB3	1:F:147:VAL:HG11	1.76	0.67
1:C:7:GLU:OE2	1:C:48:ARG:NE	2.28	0.67
1:D:52:VAL:HG23	1:D:54:LYS:HE3	1.76	0.67
1:E:127:HIS:HB3	1:F:333:ASP:O	1.95	0.67
1:C:124:GLN:HE21	1:C:124:GLN:HA	1.59	0.67
1:E:1:MET:CG	1:E:299:GLY:HA3	2.24	0.67
1:E:494:PHE:HA	1:F:493:VAL:HG21	1.76	0.66
1:F:6:TYR:HB3	1:F:73:ALA:HB2	1.75	0.66
1:C:3:MET:HE1	1:C:319:VAL:HG13	1.76	0.65
1:A:331:MET:HE3	1:A:331:MET:HA	1.77	0.65
1:A:206:ASN:HB3	1:E:185:ARG:HG2	1.78	0.65
1:B:135:ILE:HG13	1:B:139:MET:HE2	1.77	0.65
1:A:217:ILE:HD12	1:A:258:ILE:HA	1.78	0.65
1:C:380:ARG:HD2	1:C:422:PRO:O	1.96	0.65
1:F:363:PRO:HB3	1:F:383:PHE:HB3	1.80	0.64
1:E:60:ARG:HD2	1:E:90:ARG:HD3	1.80	0.64
1:C:217:ILE:HD13	1:C:258:ILE:HA	1.80	0.63
1:B:127:HIS:HB2	1:C:448:HIS:HB2	1.80	0.63
1:F:59:ILE:HG21	1:F:88:TRP:HA	1.79	0.63
1:D:106:PHE:O	1:D:149:HIS:NE2	2.31	0.63

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:183:ASN:ND2	1:D:191:GLU:OE2	2.32	0.63
1:B:179:ARG:NH1	1:D:182:ASP:OD2	2.32	0.62
1:E:320:MET:O	1:E:460:GLN:NE2	2.32	0.62
1:D:333:ASP:O	1:F:127:HIS:HB3	1.99	0.62
1:C:179:ARG:NH2	1:C:183:ASN:OD1	2.32	0.62
1:D:448:HIS:HB2	1:F:127:HIS:HB2	1.79	0.62
1:E:3:MET:CB	1:E:4:PRO:HD3	2.29	0.62
1:B:185:ARG:HG2	1:D:206:ASN:HB3	1.81	0.62
1:F:139:MET:HB3	1:F:141:VAL:HG13	1.83	0.61
1:E:198:GLN:HG3	1:E:203:TRP:O	2.01	0.60
1:E:1:MET:HB2	1:E:2:LYS:HD2	1.84	0.60
1:D:384:ASP:CG	1:D:414:PRO:HG2	2.26	0.60
1:D:177:VAL:HA	1:D:273:ALA:O	2.02	0.59
1:C:68:ALA:HA	1:E:64:LEU:HD23	1.83	0.59
1:D:38:GLN:O	1:D:42:GLY:HA3	2.02	0.59
1:E:38:GLN:O	1:E:42:GLY:HA3	2.02	0.59
1:E:441:TRP:HE3	1:E:475:ILE:HD11	1.68	0.59
1:F:233:GLU:HG3	1:F:238:ILE:HD12	1.85	0.58
1:B:52:VAL:HG23	1:B:54:LYS:HE3	1.85	0.58
1:B:296:MET:HE2	1:B:354:CYS:HB2	1.85	0.58
1:E:56:ALA:O	1:E:60:ARG:HG3	2.02	0.58
1:E:331:MET:HA	1:E:331:MET:HE3	1.85	0.58
1:A:475:ILE:HG23	1:A:479:THR:HG21	1.86	0.58
1:E:60:ARG:O	1:E:64:LEU:HD13	2.02	0.58
1:A:38:GLN:HG2	1:A:47:LEU:HB2	1.85	0.57
1:F:177:VAL:HG22	1:F:273:ALA:HB3	1.87	0.57
1:D:127:HIS:HB2	1:E:448:HIS:HB2	1.85	0.57
1:F:189:VAL:O	1:F:309:LYS:NZ	2.38	0.57
1:A:448:HIS:CB	1:C:127:HIS:HB2	2.33	0.57
1:F:61:ARG:O	1:F:65:GLU:HG2	2.05	0.57
1:F:325:GLN:O	1:F:327:GLY:N	2.38	0.56
1:D:168:ALA:CB	1:D:320:MET:HG3	2.36	0.56
1:C:52:VAL:HG13	1:C:54:LYS:HE3	1.88	0.56
1:F:315:ARG:O	1:F:319:VAL:HG23	2.06	0.56
1:D:349:HIS:ND1	1:D:352:GLU:OE1	2.38	0.55
1:E:349:HIS:ND1	1:E:352:GLU:OE1	2.37	0.55
1:C:214:VAL:HA	1:C:217:ILE:HG22	1.88	0.55
1:E:315:ARG:NH2	1:E:319:VAL:HG11	2.22	0.55
1:D:331:MET:HE3	1:D:331:MET:HA	1.89	0.55
1:C:34:VAL:HG21	1:C:49:TRP:HB2	1.89	0.55
1:D:48:ARG:HG3	1:D:48:ARG:HH11	1.72	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:104:THR:O	1:D:125:SER:OG	2.20	0.55
1:D:152:ASP:OD2	1:E:435:ARG:NH1	2.38	0.55
1:C:296:MET:HE2	1:C:354:CYS:HB2	1.89	0.54
1:B:198:GLN:HG2	1:B:203:TRP:O	2.08	0.54
1:D:158:ARG:NE	1:D:459:GLU:OE2	2.39	0.54
1:E:34:VAL:HB	1:E:35:PRO:HD3	1.88	0.54
1:E:301:GLY:HA2	1:E:314:LEU:HD12	1.90	0.54
1:A:103:HIS:HA	1:A:129:ASP:OD2	2.08	0.54
1:E:3:MET:HB3	1:E:4:PRO:HD3	1.88	0.54
1:B:72:CYS:HB3	1:B:97:LYS:HE3	1.89	0.54
1:C:60:ARG:HD2	1:C:90:ARG:HG3	1.90	0.54
1:C:190:THR:HG23	1:C:307:ASP:HA	1.90	0.54
1:E:115:ILE:HD13	1:F:421:LEU:HB2	1.88	0.54
1:A:185:ARG:CG	1:E:206:ASN:HB3	2.37	0.54
1:D:41:VAL:HG21	1:D:160:ALA:HB2	1.88	0.54
1:E:40:ALA:O	1:E:41:VAL:HG22	2.08	0.54
1:A:124:GLN:HA	1:B:334:TYR:O	2.07	0.54
1:D:185:ARG:NH2	1:D:279:GLU:HB3	2.22	0.54
1:E:296:MET:HE2	1:E:354:CYS:HB2	1.89	0.54
1:A:317:MET:HE3	1:A:461:LEU:HD11	1.89	0.53
1:B:255:GLN:HG3	1:B:379:ALA:HB3	1.89	0.53
1:C:179:ARG:NH1	1:F:182:ASP:OD2	2.42	0.53
1:D:7:GLU:O	1:D:72:CYS:O	2.27	0.53
1:B:214:VAL:HA	1:B:217:ILE:HG22	1.90	0.53
1:C:120:MET:O	1:C:124:GLN:NE2	2.42	0.53
1:B:421:LEU:HD13	1:B:425:ARG:HD2	1.89	0.53
1:F:296:MET:C	1:F:318:LYS:HZ3	2.16	0.53
1:C:126:ALA:O	1:C:130:ARG:NE	2.40	0.53
1:D:493:VAL:HG11	1:F:493:VAL:HG12	1.91	0.53
1:D:493:VAL:HG21	1:F:494:PHE:HA	1.90	0.53
1:C:410:ASP:CG	1:C:431:ARG:HH12	2.16	0.53
1:D:112:TRP:HA	1:D:115:ILE:HD11	1.89	0.53
1:E:55:ASP:HB2	1:E:58:GLU:HB2	1.91	0.53
1:C:72:CYS:O	1:C:97:LYS:HE2	2.09	0.53
1:C:475:ILE:HG23	1:C:479:THR:HG21	1.90	0.52
1:D:410:ASP:OD2	1:D:431:ARG:NH1	2.41	0.52
1:F:85:ALA:HB1	1:F:135:ILE:HB	1.90	0.52
1:E:230:ASP:O	1:E:234:GLU:HG2	2.09	0.52
1:C:220:VAL:HG11	1:C:257:ARG:HG3	1.91	0.52
1:D:351:LEU:HD12	1:D:352:GLU:HG3	1.92	0.52
1:B:134:PHE:CD1	1:C:189:VAL:HG23	2.44	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:127:HIS:HB2	1:F:448:HIS:HB2	1.92	0.52
1:E:214:VAL:HA	1:E:217:ILE:HG12	1.91	0.52
1:F:488:LEU:O	1:F:492:GLU:HB2	2.09	0.52
1:E:493:VAL:HG12	1:F:493:VAL:HG11	1.92	0.52
1:A:493:VAL:HG12	1:B:493:VAL:HG11	1.91	0.52
1:A:115:ILE:HD12	1:B:421:LEU:HD12	1.91	0.52
1:B:328:THR:HG23	1:B:453:SER:HB2	1.92	0.52
1:E:178:ALA:O	1:E:274:PHE:HA	2.11	0.51
1:E:296:MET:HE1	1:E:330:PHE:H	1.75	0.51
1:C:410:ASP:OD2	1:C:431:ARG:NH1	2.43	0.51
1:F:421:LEU:HD23	1:F:425:ARG:HD2	1.92	0.51
1:B:152:ASP:OD2	1:C:435:ARG:NH2	2.43	0.51
1:F:286:GLN:HA	1:F:375:LYS:HB3	1.93	0.51
1:C:62:LEU:HD13	1:C:62:LEU:C	2.36	0.51
1:E:60:ARG:HD2	1:E:90:ARG:HB3	1.92	0.51
1:A:61:ARG:NH2	1:D:70:ASP:OD2	2.44	0.51
1:C:344:LEU:HD13	1:C:427:LEU:HD22	1.93	0.51
1:F:112:TRP:O	1:F:115:ILE:HG22	2.11	0.51
1:F:301:GLY:HA2	1:F:314:LEU:HD12	1.93	0.51
1:C:217:ILE:HD11	1:C:257:ARG:HG2	1.93	0.51
1:E:132:TYR:O	1:E:135:ILE:HG22	2.10	0.51
1:E:287:LEU:HD21	1:E:350:MET:HE3	1.93	0.51
1:D:54:LYS:O	1:D:87:MET:SD	2.69	0.51
1:A:53:LEU:HD13	1:A:59:ILE:HA	1.92	0.50
1:B:171:GLU:HG3	1:B:319:VAL:HG21	1.92	0.50
1:B:53:LEU:HD13	1:B:59:ILE:HA	1.93	0.50
1:F:296:MET:HE1	1:F:330:PHE:H	1.75	0.50
1:C:208:TYR:CZ	1:F:185:ARG:HD3	2.47	0.50
1:A:425:ARG:HD3	1:A:425:ARG:N	2.27	0.50
1:C:69:ASP:OD1	1:C:71:VAL:HG12	2.11	0.50
1:A:255:GLN:HE21	1:A:286:GLN:HG3	1.76	0.50
1:B:103:HIS:ND1	1:C:442:ILE:HD11	2.27	0.50
1:B:90:ARG:CZ	1:F:173:ARG:HD2	2.42	0.49
1:B:302:PHE:HE2	1:B:352:GLU:HG3	1.77	0.49
1:B:353:VAL:HG23	1:B:383:PHE:CZ	2.46	0.49
1:A:336:TYR:O	1:C:105:GLN:NE2	2.45	0.49
1:D:320:MET:CE	1:D:460:GLN:HB3	2.43	0.49
1:D:266:LEU:HD13	1:D:300:TYR:CD2	2.47	0.49
1:E:177:VAL:HG22	1:E:273:ALA:HB3	1.93	0.49
1:A:248:VAL:HG13	1:A:367:VAL:CG1	2.42	0.49
1:A:179:ARG:NH1	1:E:182:ASP:OD2	2.46	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:442:ILE:HA	4:C:709:HOH:O	2.11	0.49
1:E:318:LYS:NZ	1:E:354:CYS:SG	2.86	0.49
1:D:3:MET:HB3	1:D:4:PRO:HD3	1.95	0.49
1:A:471:GLU:HG3	1:A:491:ASN:HD22	1.78	0.49
1:B:177:VAL:HG22	1:B:273:ALA:HB3	1.94	0.49
1:B:211:GLY:O	1:B:214:VAL:HG12	2.13	0.49
1:C:59:ILE:HG21	1:C:88:TRP:HA	1.93	0.49
1:C:177:VAL:HG22	1:C:273:ALA:HB3	1.95	0.49
1:D:378:PRO:O	1:D:380:ARG:NH2	2.45	0.49
1:A:147:VAL:HG11	1:B:438:ALA:HB3	1.94	0.49
1:A:248:VAL:HG13	1:A:367:VAL:HG11	1.94	0.49
1:D:132:TYR:O	1:D:135:ILE:HG22	2.12	0.49
1:A:317:MET:HG2	1:A:456:VAL:HG21	1.94	0.48
1:A:282:HIS:NE2	1:E:212:ASP:OD1	2.46	0.48
1:B:3:MET:HG2	1:B:4:PRO:CD	2.36	0.48
1:B:206:ASN:HB3	1:D:185:ARG:HG2	1.94	0.48
1:C:69:ASP:CG	1:C:71:VAL:HG12	2.38	0.48
1:C:284:LEU:HD23	1:C:288:PRO:HD3	1.95	0.48
1:D:42:GLY:O	1:D:43:ASN:HB2	2.14	0.48
1:D:353:VAL:CG1	1:D:424:ALA:HB3	2.44	0.48
1:E:122:LEU:HD12	1:E:123:ASN:OD1	2.13	0.48
1:F:183:ASN:HD22	1:F:190:THR:HG23	1.78	0.48
1:F:439:GLU:CD	1:F:481:VAL:HG11	2.39	0.48
1:A:416:HIS:HD1	1:C:112:TRP:CD1	2.32	0.48
1:C:34:VAL:HB	1:C:35:PRO:HD3	1.96	0.48
1:A:315:ARG:O	1:A:319:VAL:HG12	2.14	0.48
1:B:184:MET:HB2	1:B:305:GLU:HB3	1.95	0.48
1:D:334:TYR:O	1:F:124:GLN:HA	2.14	0.48
1:E:248:VAL:HG13	1:E:367:VAL:HG11	1.95	0.48
1:E:351:LEU:HD12	1:E:352:GLU:HG3	1.96	0.48
1:E:353:VAL:CG1	1:E:424:ALA:HB3	2.42	0.48
1:F:115:ILE:HG23	1:F:115:ILE:O	2.14	0.48
1:F:194:LYS:HE2	1:F:308:TRP:CD1	2.48	0.48
1:F:221:SER:OG	1:F:224:LYS:HB2	2.14	0.48
1:D:190:THR:HG23	1:D:307:ASP:HA	1.96	0.48
1:E:348:SER:O	1:E:348:SER:OG	2.31	0.48
1:D:49:TRP:CZ2	1:D:51:GLY:HA2	2.49	0.48
1:D:248:VAL:HG13	1:D:367:VAL:HG11	1.95	0.48
1:C:331:MET:HG3	1:C:452:PHE:HB2	1.95	0.47
1:D:66:ALA:O	1:D:72:CYS:SG	2.61	0.47
1:B:493:VAL:HG12	1:C:493:VAL:HG11	1.95	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:54:LYS:O	1:B:87:MET:SD	2.73	0.47
1:B:59:ILE:HG21	1:B:88:TRP:HA	1.97	0.47
1:D:391:VAL:HG13	1:D:406:VAL:HG13	1.96	0.47
1:D:41:VAL:HG23	1:D:41:VAL:O	2.14	0.47
1:E:183:ASN:ND2	1:E:191:GLU:OE2	2.47	0.47
1:A:302:PHE:H	1:A:314:LEU:HD23	1.78	0.47
1:C:214:VAL:HA	1:C:217:ILE:CG2	2.45	0.47
1:D:12:VAL:HA	1:D:78:TRP:O	2.15	0.47
1:F:9:TRP:HB2	1:F:75:VAL:HG22	1.96	0.47
1:A:339:GLU:O	1:A:340:LYS:C	2.58	0.47
1:B:347:GLY:HA3	1:B:428:TRP:CZ3	2.50	0.47
1:C:465:ALA:CB	1:C:472:CYS:HB2	2.45	0.47
1:E:12:VAL:HA	1:E:78:TRP:O	2.15	0.47
1:E:33:MET:HG2	1:E:150:TRP:CD2	2.50	0.47
1:E:475:ILE:HA	1:E:479:THR:OG1	2.15	0.47
1:A:214:VAL:HG12	1:A:284:LEU:HD12	1.97	0.47
1:B:103:HIS:CD2	1:B:129:ASP:OD2	2.67	0.47
1:D:40:ALA:O	1:D:41:VAL:C	2.58	0.47
1:E:17:LEU:O	1:E:17:LEU:HD23	2.15	0.47
1:E:309:LYS:HE2	4:E:702:HOH:O	2.14	0.47
1:F:3:MET:HB3	1:F:4:PRO:HD3	1.97	0.46
1:F:228:LEU:HD22	1:F:260:LEU:HD23	1.96	0.46
1:E:33:MET:HG2	1:E:150:TRP:CE2	2.50	0.46
1:B:337:HIS:HB3	1:B:344:LEU:HB2	1.98	0.46
1:C:36:ALA:HB3	1:C:150:TRP:HZ3	1.80	0.46
1:F:430:PRO:HB2	1:F:437:SER:OG	2.15	0.46
1:B:103:HIS:HA	1:B:129:ASP:OD2	2.15	0.46
1:B:430:PRO:HG2	1:B:434:LEU:HA	1.98	0.46
1:E:45:HIS:NE2	1:E:167:VAL:HG21	2.31	0.46
1:F:40:ALA:O	1:F:41:VAL:C	2.58	0.46
1:E:1:MET:HG3	1:E:299:GLY:HA3	1.93	0.46
1:E:41:VAL:O	1:E:41:VAL:HG23	2.15	0.46
1:F:114:THR:O	1:F:116:ASP:N	2.48	0.46
1:B:111:PRO:HB2	1:B:114:THR:HG22	1.97	0.46
1:C:438:ALA:O	1:C:442:ILE:HD12	2.16	0.46
1:D:296:MET:HE1	1:D:330:PHE:H	1.79	0.46
1:D:328:THR:HG23	1:D:453:SER:HB2	1.98	0.46
1:F:17:LEU:HD22	1:F:18:TYR:CE1	2.50	0.46
1:B:132:TYR:O	1:B:135:ILE:HG22	2.14	0.46
1:D:442:ILE:HD13	1:F:130:ARG:HA	1.97	0.46
1:E:367:VAL:HG22	1:E:367:VAL:O	2.15	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:350:MET:O	1:B:423:VAL:HG11	2.15	0.46
1:E:87:MET:HG3	1:F:186:GLU:HG2	1.98	0.46
1:A:274:PHE:O	1:A:302:PHE:HA	2.16	0.46
1:A:338:PHE:HA	1:A:343:ASP:OD1	2.16	0.46
1:B:193:ASP:OD1	1:B:195:VAL:HG22	2.16	0.46
1:D:315:ARG:O	1:D:319:VAL:HG12	2.16	0.46
1:E:14:SER:HA	1:E:81:THR:OG1	2.16	0.46
1:C:14:SER:O	1:C:54:LYS:HA	2.16	0.46
1:C:175:LEU:HD23	1:C:203:TRP:CD1	2.51	0.46
1:C:273:ALA:HA	1:C:301:GLY:O	2.15	0.46
1:A:93:LEU:HG	1:A:139:MET:CE	2.46	0.45
1:B:45:HIS:NE2	1:B:167:VAL:HG21	2.31	0.45
1:D:80:HIS:CE1	1:D:122:LEU:HD13	2.51	0.45
1:E:1:MET:SD	1:E:299:GLY:HA3	2.56	0.45
1:C:124:GLN:O	1:C:125:SER:C	2.59	0.45
1:C:362:LYS:N	1:C:363:PRO:HD3	2.31	0.45
1:E:3:MET:HB2	1:E:4:PRO:HD3	1.97	0.45
1:F:34:VAL:HB	1:F:35:PRO:HD3	1.98	0.45
1:C:368:GLN:O	1:C:380:ARG:NH2	2.49	0.45
1:E:328:THR:HG23	1:E:453:SER:HB2	1.98	0.45
1:A:206:ASN:HB3	1:E:185:ARG:CG	2.45	0.45
1:D:82:PHE:HA	1:D:128:GLY:HA2	1.98	0.45
1:D:471:GLU:HB2	1:D:495:TRP:CD1	2.51	0.45
1:E:236:TYR:HD1	1:E:363:PRO:HB2	1.80	0.45
1:E:396:ILE:HD11	1:E:403:ARG:HD2	1.99	0.45
1:D:348:SER:OG	1:D:349:HIS:N	2.49	0.45
1:E:22:ALA:O	1:E:26:VAL:HG12	2.17	0.45
1:E:100:LEU:HD12	1:E:162:TRP:CG	2.52	0.45
1:E:103:HIS:ND1	1:E:129:ASP:OD2	2.36	0.45
1:F:214:VAL:HG21	1:F:283:GLY:HA3	1.98	0.45
1:A:127:HIS:HB2	1:B:448:HIS:HB2	1.98	0.45
1:A:331:MET:HE2	1:A:348:SER:N	2.31	0.45
1:E:316:ILE:HG22	1:E:320:MET:HE3	1.99	0.45
1:E:353:VAL:HG13	1:E:424:ALA:HB3	1.97	0.45
1:F:220:VAL:CG2	1:F:260:LEU:HB3	2.46	0.45
1:B:198:GLN:O	1:B:202:GLY:HA2	2.16	0.45
1:C:274:PHE:O	1:C:302:PHE:HA	2.16	0.45
1:E:465:ALA:CB	1:E:472:CYS:HB2	2.47	0.45
1:A:230:ASP:O	1:A:234:GLU:HG3	2.17	0.45
1:D:286:GLN:HA	1:D:375:LYS:HB3	1.99	0.45
1:D:296:MET:HE3	1:D:314:LEU:HD11	1.99	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:319:VAL:HA	1:F:322:THR:HG23	1.98	0.45
1:B:120:MET:O	1:B:124:GLN:HB3	2.17	0.44
1:B:286:GLN:OE1	1:B:378:PRO:HA	2.16	0.44
1:C:486:ASN:HB3	1:C:490:TRP:CH2	2.52	0.44
1:D:127:HIS:HB3	1:E:333:ASP:O	2.17	0.44
1:D:183:ASN:O	1:D:185:ARG:N	2.49	0.44
1:B:274:PHE:O	1:B:302:PHE:HA	2.17	0.44
1:A:188:ALA:HB1	1:C:135:ILE:HD13	2.00	0.44
1:A:263:LYS:NZ	1:A:298:GLN:OE1	2.50	0.44
1:E:168:ALA:HA	1:E:319:VAL:HG23	1.98	0.44
1:F:233:GLU:OE2	1:F:249:ARG:NH1	2.50	0.44
1:F:254:GLU:OE1	1:F:254:GLU:HA	2.17	0.44
1:F:345:VAL:O	1:F:427:LEU:HA	2.18	0.44
1:A:33:MET:SD	1:A:78:TRP:CZ3	3.11	0.44
1:D:108:ARG:HG2	1:D:149:HIS:CE1	2.52	0.44
1:F:315:ARG:O	1:F:315:ARG:HD3	2.18	0.44
1:F:339:GLU:O	1:F:340:LYS:C	2.60	0.44
1:A:315:ARG:O	1:A:315:ARG:HD3	2.18	0.44
1:B:84:PRO:HB2	1:C:186:GLU:C	2.43	0.44
1:D:81:THR:HA	1:D:124:GLN:HB2	1.98	0.44
1:E:214:VAL:HG21	1:E:283:GLY:HA3	2.00	0.44
1:B:168:ALA:HA	1:B:319:VAL:HG13	2.00	0.44
1:D:347:GLY:HA3	1:D:428:TRP:CZ3	2.53	0.44
1:E:60:ARG:CD	1:E:90:ARG:HB3	2.48	0.44
1:F:42:GLY:O	1:F:44:ALA:N	2.50	0.44
1:A:62:LEU:HD13	1:A:62:LEU:C	2.43	0.44
1:A:211:GLY:O	1:A:214:VAL:HG22	2.18	0.44
1:A:483:SER:O	1:A:487:GLU:HG3	2.18	0.44
1:D:329:SER:HB2	1:D:354:CYS:HB3	2.00	0.44
1:D:334:TYR:HE2	1:D:349:HIS:HA	1.83	0.44
1:F:115:ILE:HD12	1:F:119:PHE:CD1	2.53	0.44
1:C:82:PHE:H	1:C:124:GLN:HG3	1.83	0.43
1:C:184:MET:O	1:C:186:GLU:N	2.51	0.43
1:C:328:THR:HG23	1:C:453:SER:HB2	1.99	0.43
1:F:89:ILE:HD11	1:F:135:ILE:HD11	1.99	0.43
1:A:13:GLY:HA3	1:A:79:MET:SD	2.57	0.43
1:B:117:MET:HE2	1:C:422:PRO:HG2	2.00	0.43
1:E:66:ALA:O	1:E:97:LYS:NZ	2.49	0.43
1:A:90:ARG:HG3	4:D:710:HOH:O	2.17	0.43
1:D:178:ALA:HB2	1:D:271:PHE:CE1	2.53	0.43
1:E:198:GLN:CG	1:E:203:TRP:O	2.65	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:216:TYR:HE2	1:F:268:ASP:OD2	2.01	0.43
1:B:84:PRO:HB2	1:C:186:GLU:O	2.18	0.43
1:D:439:GLU:CD	1:D:481:VAL:HG11	2.42	0.43
1:B:38:GLN:OE1	1:B:47:LEU:N	2.48	0.43
1:C:175:LEU:HD12	1:C:272:THR:OG1	2.19	0.43
1:C:124:GLN:HE21	1:C:124:GLN:CA	2.29	0.43
1:D:435:ARG:NH2	1:F:152:ASP:OD2	2.51	0.43
1:E:483:SER:O	1:E:487:GLU:HG3	2.19	0.43
1:F:410:ASP:OD1	1:F:431:ARG:NH1	2.50	0.43
1:B:233:GLU:OE1	1:B:249:ARG:NH1	2.50	0.43
1:B:241:ALA:O	1:B:248:VAL:CG1	2.66	0.43
1:D:320:MET:HE2	1:D:460:GLN:HB3	2.00	0.43
1:F:232:TYR:CE1	1:F:294:ARG:HD2	2.53	0.43
1:A:255:GLN:NE2	1:A:286:GLN:HG3	2.34	0.43
1:C:211:GLY:O	1:C:214:VAL:HG12	2.19	0.43
1:F:475:ILE:HG23	1:F:479:THR:HG21	2.00	0.43
1:A:18:TYR:CE1	1:A:121:ASN:HB2	2.53	0.43
1:B:282:HIS:CG	1:D:211:GLY:HA3	2.54	0.43
1:E:72:CYS:O	1:E:97:LYS:HE2	2.19	0.43
1:A:354:CYS:HG	1:A:356:SER:CB	2.28	0.43
1:C:13:GLY:HA3	1:C:79:MET:SD	2.59	0.43
1:E:62:LEU:HD13	1:E:62:LEU:C	2.44	0.43
1:E:391:VAL:HG22	1:E:406:VAL:HG13	2.01	0.43
1:F:332:GLU:HG3	1:F:449:HIS:HD2	1.83	0.43
1:F:417:ASP:OD1	1:F:418:MET:N	2.52	0.43
1:A:422:PRO:CG	1:C:117:MET:HG2	2.49	0.42
1:C:439:GLU:CD	1:C:481:VAL:HG11	2.43	0.42
1:F:3:MET:HB3	1:F:4:PRO:CD	2.49	0.42
1:F:3:MET:CB	1:F:4:PRO:CD	2.97	0.42
1:F:184:MET:HB2	1:F:305:GLU:HB3	1.99	0.42
1:A:89:ILE:HG12	1:A:135:ILE:HD11	2.01	0.42
1:B:112:TRP:O	1:B:115:ILE:HG22	2.19	0.42
1:E:134:PHE:CD1	1:F:189:VAL:HG23	2.55	0.42
1:E:464:PHE:CD1	1:E:464:PHE:C	2.96	0.42
1:A:465:ALA:CB	1:A:472:CYS:HB2	2.50	0.42
1:D:12:VAL:O	1:D:52:VAL:HA	2.18	0.42
1:F:37:LEU:HD12	1:F:37:LEU:HA	1.84	0.42
1:A:82:PHE:HA	1:A:128:GLY:HA2	2.00	0.42
1:B:103:HIS:NE2	1:C:336:TYR:HE2	2.18	0.42
1:D:189:VAL:HG23	1:F:134:PHE:CD1	2.54	0.42
1:D:411:ALA:HB3	1:D:454:PHE:HE1	1.85	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:361:GLU:HG2	1:E:362:LYS:HG3	2.01	0.42
1:F:132:TYR:O	1:F:135:ILE:HG22	2.20	0.42
1:F:150:TRP:O	1:F:156:ARG:NE	2.51	0.42
1:B:149:HIS:O	1:B:152:ASP:HB3	2.20	0.42
1:B:228:LEU:HD12	1:B:228:LEU:HA	1.94	0.42
1:B:290:LEU:HD13	1:B:381:LEU:HG	2.02	0.42
1:C:33:MET:HG2	1:C:150:TRP:CD2	2.55	0.42
1:C:177:VAL:HA	1:C:273:ALA:O	2.20	0.42
1:D:302:PHE:CG	1:D:303:ALA:N	2.87	0.42
1:D:349:HIS:O	1:D:350:MET:C	2.62	0.42
1:E:38:GLN:NE2	1:E:46:VAL:HA	2.35	0.42
1:F:363:PRO:CB	1:F:383:PHE:HB3	2.50	0.42
1:A:406:VAL:CG2	1:A:461:LEU:HD13	2.50	0.42
1:B:182:ASP:OD2	1:D:179:ARG:NH1	2.53	0.42
1:F:30:ALA:O	1:F:33:MET:N	2.53	0.42
1:B:3:MET:SD	1:B:319:VAL:HG23	2.59	0.42
1:C:113:ASP:N	1:C:113:ASP:OD1	2.52	0.42
1:C:214:VAL:CA	1:C:217:ILE:HG22	2.50	0.42
1:D:41:VAL:CG2	1:D:160:ALA:HB2	2.50	0.42
1:A:353:VAL:CG1	1:A:424:ALA:HB3	2.50	0.42
1:C:45:HIS:HA	4:C:717:HOH:O	2.19	0.42
1:D:69:ASP:O	1:D:72:CYS:SG	2.78	0.42
1:D:85:ALA:HB1	1:D:135:ILE:HB	2.02	0.42
1:E:3:MET:HB3	1:E:4:PRO:CD	2.49	0.42
1:E:101:HIS:HE1	1:F:442:ILE:HD12	1.84	0.42
1:A:255:GLN:HG2	1:A:286:GLN:OE1	2.20	0.41
1:A:417:ASP:OD1	1:A:417:ASP:C	2.62	0.41
1:C:168:ALA:HA	1:C:319:VAL:CG1	2.50	0.41
1:E:401:ARG:HD2	1:E:495:TRP:HB3	2.02	0.41
1:F:206:ASN:ND2	4:F:601:HOH:O	2.50	0.41
1:D:223:GLN:NE2	1:D:227:GLU:OE2	2.53	0.41
1:F:76:ILE:O	1:F:76:ILE:HG13	2.20	0.41
1:A:441:TRP:CD1	1:C:130:ARG:HH11	2.38	0.41
1:B:214:VAL:HA	1:B:217:ILE:CG2	2.50	0.41
1:B:391:VAL:HG22	1:B:406:VAL:HG13	2.03	0.41
1:C:296:MET:CE	1:C:354:CYS:HB2	2.50	0.41
1:C:326:GLY:HA3	1:C:455:ALA:HB2	2.01	0.41
1:D:178:ALA:O	1:D:274:PHE:HA	2.20	0.41
1:D:189:VAL:HG21	1:D:447:ALA:HA	2.02	0.41
1:D:217:ILE:HD13	1:D:258:ILE:HG12	2.03	0.41
1:E:100:LEU:C	1:E:100:LEU:HD23	2.45	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:320:MET:HG2	1:E:460:GLN:NE2	2.35	0.41
1:A:328:THR:HG23	1:A:453:SER:HB2	2.02	0.41
1:B:7:GLU:O	1:B:8:PHE:CD2	2.73	0.41
1:E:255:GLN:HA	1:E:255:GLN:NE2	2.35	0.41
1:E:284:LEU:HD23	1:E:288:PRO:HD3	2.03	0.41
1:A:54:LYS:O	1:A:87:MET:SD	2.79	0.41
1:A:321:SER:HB3	1:A:455:ALA:HB3	2.01	0.41
1:A:391:VAL:CG2	1:A:406:VAL:HG13	2.51	0.41
1:B:64:LEU:HD13	1:B:64:LEU:HA	1.93	0.41
1:B:127:HIS:HB2	1:C:448:HIS:CB	2.50	0.41
1:D:438:ALA:O	1:D:442:ILE:HG12	2.20	0.41
1:A:217:ILE:O	1:A:220:VAL:HG12	2.21	0.41
1:A:431:ARG:HE	1:A:477:GLU:HG3	1.85	0.41
1:B:133:GLY:CA	1:C:442:ILE:HG23	2.50	0.41
1:E:103:HIS:HA	1:E:129:ASP:OD2	2.20	0.41
1:E:255:GLN:HA	1:E:255:GLN:HE21	1.85	0.41
1:F:62:LEU:HD13	1:F:62:LEU:C	2.46	0.41
1:B:318:LYS:HE3	1:B:328:THR:O	2.21	0.41
1:B:471:GLU:OE2	1:B:491:ASN:CB	2.68	0.41
1:C:368:GLN:O	1:C:377:ASP:HB2	2.21	0.41
1:D:332:GLU:OE2	1:F:127:HIS:CE1	2.74	0.41
1:E:296:MET:HE1	1:E:330:PHE:HB3	2.03	0.41
1:F:438:ALA:O	1:F:442:ILE:HG12	2.21	0.41
1:C:194:LYS:HB2	1:F:191:GLU:HG2	2.02	0.41
1:C:302:PHE:H	1:C:314:LEU:HD23	1.85	0.41
1:D:248:VAL:HG13	1:D:367:VAL:CG1	2.50	0.41
1:A:134:PHE:HA	1:B:445:GLY:HA2	2.03	0.41
1:B:255:GLN:HE21	1:B:286:GLN:HG3	1.86	0.41
1:B:302:PHE:H	1:B:314:LEU:HD23	1.86	0.41
1:B:339:GLU:O	1:B:340:LYS:C	2.64	0.41
1:C:345:VAL:O	1:C:427:LEU:HA	2.21	0.41
1:D:6:TYR:HB3	1:D:73:ALA:HB2	2.02	0.41
1:E:130:ARG:HA	1:F:442:ILE:HD13	2.03	0.41
1:E:325:GLN:HG3	1:E:326:GLY:N	2.36	0.41
1:F:52:VAL:HG23	1:F:54:LYS:HE3	2.03	0.41
1:F:289:GLY:HA3	1:F:351:LEU:HD13	2.03	0.41
1:F:295:LEU:O	1:F:300:TYR:HB2	2.21	0.41
1:A:34:VAL:HB	1:A:35:PRO:HD3	2.04	0.41
1:A:132:TYR:O	1:A:135:ILE:HG22	2.20	0.41
1:A:406:VAL:HG22	1:A:461:LEU:HD13	2.03	0.41
1:B:79:MET:HE2	1:B:132:TYR:CD1	2.55	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:138:ARG:HA	1:C:138:ARG:HD2	1.97	0.41
1:C:178:ALA:O	1:C:274:PHE:HA	2.21	0.41
1:E:26:VAL:HG23	1:E:80:HIS:ND1	2.36	0.41
1:E:350:MET:SD	1:E:372:ILE:HG21	2.61	0.41
1:F:293:GLN:NE2	1:F:351:LEU:O	2.54	0.41
1:A:52:VAL:HG23	1:A:54:LYS:HE3	2.03	0.40
1:A:85:ALA:HB1	1:A:135:ILE:HB	2.03	0.40
1:A:93:LEU:HG	1:A:139:MET:HE1	2.03	0.40
1:D:168:ALA:HB2	1:D:320:MET:HG3	2.03	0.40
1:D:353:VAL:HG13	1:D:424:ALA:HB3	2.03	0.40
1:E:3:MET:CB	1:E:4:PRO:CD	2.96	0.40
1:F:337:HIS:HB3	1:F:344:LEU:HB2	2.03	0.40
1:B:483:SER:O	1:B:487:GLU:HG3	2.22	0.40
1:D:198:GLN:HG2	4:D:703:HOH:O	2.20	0.40
1:F:10:PHE:CD2	1:F:76:ILE:HD11	2.57	0.40
1:A:179:ARG:HD2	1:A:308:TRP:HB3	2.04	0.40
1:A:333:ASP:O	1:C:127:HIS:HB3	2.21	0.40
1:B:364:ILE:HD13	4:B:714:HOH:O	2.21	0.40
1:C:122:LEU:HD23	1:C:122:LEU:HA	1.92	0.40
1:E:53:LEU:HD13	1:E:59:ILE:HA	2.03	0.40
1:A:273:ALA:HA	1:A:301:GLY:O	2.22	0.40
1:A:337:HIS:HB3	1:A:344:LEU:HB2	2.03	0.40
1:B:147:VAL:HG11	1:C:438:ALA:HB3	2.03	0.40
1:E:100:LEU:HD12	1:E:162:TRP:CD2	2.56	0.40
1:F:184:MET:HB3	1:F:187:VAL:CG2	2.52	0.40
1:A:214:VAL:HG11	1:A:283:GLY:HA3	2.03	0.40
1:B:102:LEU:HD13	1:B:159:LEU:HD11	2.03	0.40
1:B:353:VAL:CG2	1:B:424:ALA:HB3	2.52	0.40
1:D:72:CYS:O	1:D:74:GLY:N	2.46	0.40
1:F:355:PRO:HA	1:F:383:PHE:CZ	2.57	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	492/498 (99%)	465 (94%)	26 (5%)	1 (0%)	43	73
1	B	494/498 (99%)	466 (94%)	25 (5%)	3 (1%)	21	56
1	C	482/498 (97%)	437 (91%)	38 (8%)	7 (2%)	8	37
1	D	492/498 (99%)	451 (92%)	35 (7%)	6 (1%)	10	42
1	E	494/498 (99%)	449 (91%)	35 (7%)	10 (2%)	6	31
1	F	493/498 (99%)	453 (92%)	31 (6%)	9 (2%)	6	34
All	All	2947/2988 (99%)	2721 (92%)	190 (6%)	36 (1%)	10	42

All (36) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	8	PHE
1	C	125	SER
1	D	184	MET
1	E	3	MET
1	E	362	LYS
1	E	363	PRO
1	F	41	VAL
1	F	115	ILE
1	F	326	GLY
1	F	367	VAL
1	B	115	ILE
1	C	43	ASN
1	C	46	VAL
1	C	185	ARG
1	C	240	PRO
1	D	351	LEU
1	E	350	MET
1	E	367	VAL
1	F	359	ALA
1	D	185	ARG
1	E	326	GLY
1	F	350	MET
1	F	386	GLY
1	A	362	LYS
1	C	126	ALA
1	D	350	MET
1	F	43	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	F	351	LEU
1	B	340	LYS
1	C	44	ALA
1	D	43	ASN
1	E	116	ASP
1	E	351	LEU
1	E	242	GLY
1	D	41	VAL
1	E	89	ILE

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	402/405 (99%)	387 (96%)	15 (4%)	30	63
1	B	404/405 (100%)	384 (95%)	20 (5%)	22	55
1	C	396/405 (98%)	379 (96%)	17 (4%)	26	59
1	D	402/405 (99%)	381 (95%)	21 (5%)	21	54
1	E	404/405 (100%)	382 (95%)	22 (5%)	20	53
1	F	403/405 (100%)	387 (96%)	16 (4%)	28	61
All	All	2411/2430 (99%)	2300 (95%)	111 (5%)	24	58

All (111) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	38	GLN
1	A	121	ASN
1	A	221	SER
1	A	248	VAL
1	A	315	ARG
1	A	317	MET
1	A	321	SER
1	A	333	ASP
1	A	335	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	353	VAL
1	A	361	GLU
1	A	367	VAL
1	A	431	ARG
1	A	475	ILE
1	A	492	GLU
1	B	61	ARG
1	B	64	LEU
1	B	79	MET
1	B	108	ARG
1	B	118	ASP
1	B	159	LEU
1	B	198	GLN
1	B	223	GLN
1	B	268	ASP
1	B	272	THR
1	B	285	LYS
1	B	331	MET
1	B	334	TYR
1	B	352	GLU
1	B	353	VAL
1	B	380	ARG
1	B	382	VAL
1	B	421	LEU
1	B	433	SER
1	B	485	LYS
1	C	65	GLU
1	C	70	ASP
1	C	115	ILE
1	C	124	GLN
1	C	125	SER
1	C	154	GLU
1	C	184	MET
1	C	214	VAL
1	C	305	GLU
1	C	310	THR
1	C	320	MET
1	C	322	THR
1	C	333	ASP
1	C	335	THR
1	C	360	GLU
1	C	482	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	492	GLU
1	D	11	VAL
1	D	26	VAL
1	D	45	HIS
1	D	54	LYS
1	D	113	ASP
1	D	122	LEU
1	D	152	ASP
1	D	157	GLU
1	D	159	LEU
1	D	198	GLN
1	D	215	GLN
1	D	248	VAL
1	D	315	ARG
1	D	319	VAL
1	D	353	VAL
1	D	367	VAL
1	D	372	ILE
1	D	413	LYS
1	D	420	LYS
1	D	457	THR
1	D	482	SER
1	E	32	GLU
1	E	38	GLN
1	E	115	ILE
1	E	190	THR
1	E	195	VAL
1	E	251	SER
1	E	272	THR
1	E	314	LEU
1	E	315	ARG
1	E	331	MET
1	E	348	SER
1	E	352	GLU
1	E	363	PRO
1	E	366	ASP
1	E	382	VAL
1	E	412	VAL
1	E	415	GLU
1	E	418	MET
1	E	421	LEU
1	E	437	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	E	457	THR
1	E	473	VAL
1	F	21	GLU
1	F	57	ASP
1	F	109	ASP
1	F	190	THR
1	F	223	GLN
1	F	233	GLU
1	F	259	GLU
1	F	285	LYS
1	F	315	ARG
1	F	351	LEU
1	F	361	GLU
1	F	412	VAL
1	F	417	ASP
1	F	473	VAL
1	F	475	ILE
1	F	492	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	369	HIS
1	B	183	ASN
1	B	223	GLN
1	B	369	HIS
1	C	206	ASN
1	C	267	GLN
1	D	416	HIS
1	E	16	HIS
1	E	29	HIS
1	E	206	ASN
1	E	297	GLN
1	E	486	ASN
1	F	15	GLN
1	F	123	ASN
1	F	124	GLN
1	F	183	ASN
1	F	267	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 11 ligands modelled in this entry, 6 are monoatomic - leaving 5 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	$\# Z > 2$
2	GOL	E	601	-	5,5,5	0.13	0	5,5,5	0.29	0
2	GOL	D	601	-	5,5,5	0.07	0	5,5,5	0.26	0
2	GOL	A	601	-	5,5,5	0.12	0	5,5,5	0.29	0
2	GOL	C	601	-	5,5,5	0.11	0	5,5,5	0.32	0
2	GOL	B	601	-	5,5,5	0.09	0	5,5,5	0.21	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
2	GOL	E	601	-	-	2/4/4/4	-
2	GOL	D	601	-	-	2/4/4/4	-
2	GOL	A	601	-	-	3/4/4/4	-
2	GOL	C	601	-	-	4/4/4/4	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GOL	B	601	-	-	0/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	GOL	O1-C1-C2-C3
2	C	601	GOL	O1-C1-C2-C3
2	C	601	GOL	C1-C2-C3-O3
2	D	601	GOL	O1-C1-C2-C3
2	E	601	GOL	C1-C2-C3-O3
2	E	601	GOL	O2-C2-C3-O3
2	A	601	GOL	O1-C1-C2-O2
2	C	601	GOL	O1-C1-C2-O2
2	C	601	GOL	O2-C2-C3-O3
2	D	601	GOL	O1-C1-C2-O2
2	A	601	GOL	O2-C2-C3-O3

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	494/498 (99%)	-0.79	0 100 100	45, 70, 98, 113	0
1	B	496/498 (99%)	-0.71	0 100 100	48, 79, 112, 150	0
1	C	486/498 (97%)	-0.75	2 (0%) 88 79	45, 81, 113, 134	0
1	D	494/498 (99%)	-0.72	0 100 100	53, 78, 107, 134	0
1	E	496/498 (99%)	-0.69	0 100 100	51, 82, 111, 176	0
1	F	495/498 (99%)	-0.64	0 100 100	56, 89, 122, 150	0
All	All	2961/2988 (99%)	-0.72	2 (0%) 92 89	45, 79, 112, 176	0

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	251	SER	4.0
1	C	241	ALA	2.7

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 oligosaccharides in this entry.

6.4 Ligands [i](#)

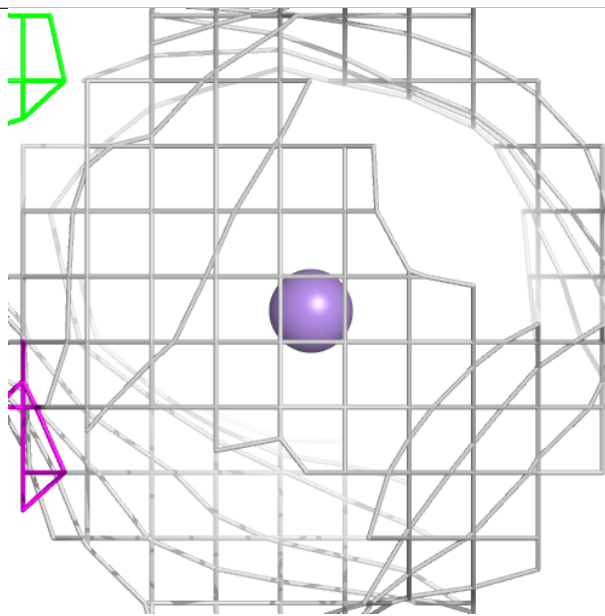
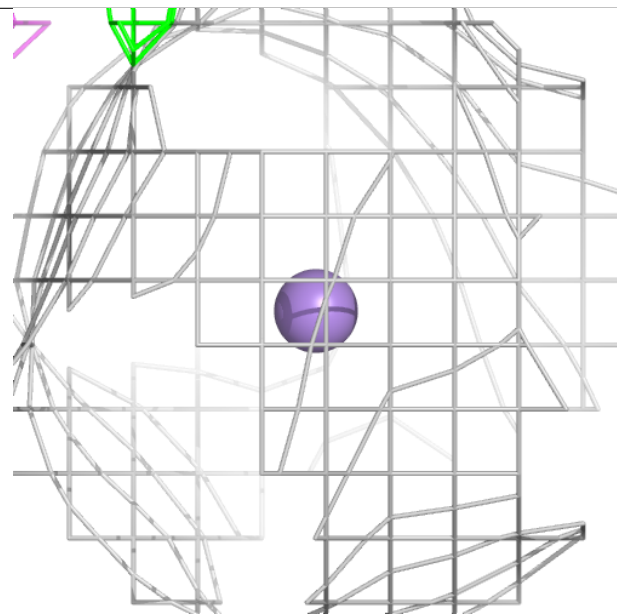
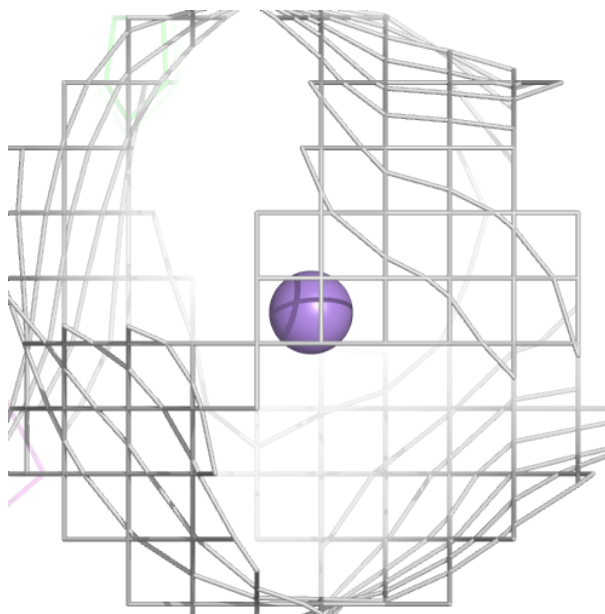
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	GOL	A	601	6/6	0.74	0.10	77,79,82,82	0
2	GOL	C	601	6/6	0.80	0.09	87,92,98,99	0
2	GOL	B	601	6/6	0.81	0.12	84,97,108,117	0
2	GOL	E	601	6/6	0.84	0.10	79,84,88,89	0
2	GOL	D	601	6/6	0.85	0.10	70,74,76,83	0
3	MN	A	602	1/1	1.00	0.01	75,75,75,75	0
3	MN	B	602	1/1	1.00	0.02	77,77,77,77	0
3	MN	C	602	1/1	1.00	0.01	82,82,82,82	0
3	MN	D	602	1/1	1.00	0.01	79,79,79,79	0
3	MN	E	602	1/1	1.00	0.01	75,75,75,75	0
3	MN	F	501	1/1	1.00	0.01	82,82,82,82	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.

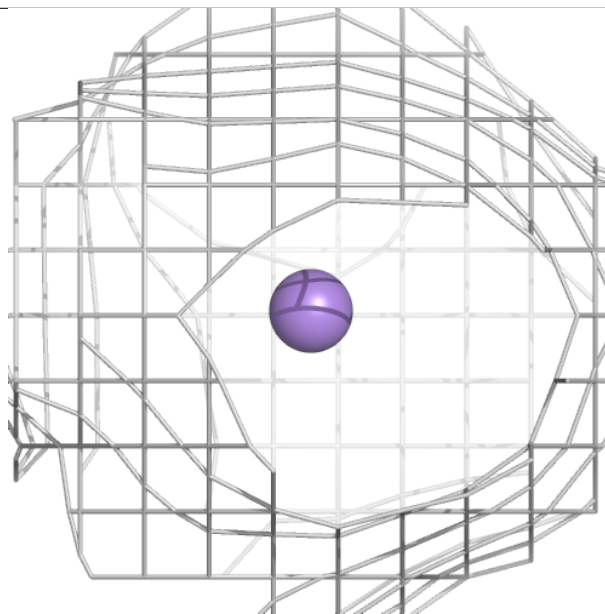
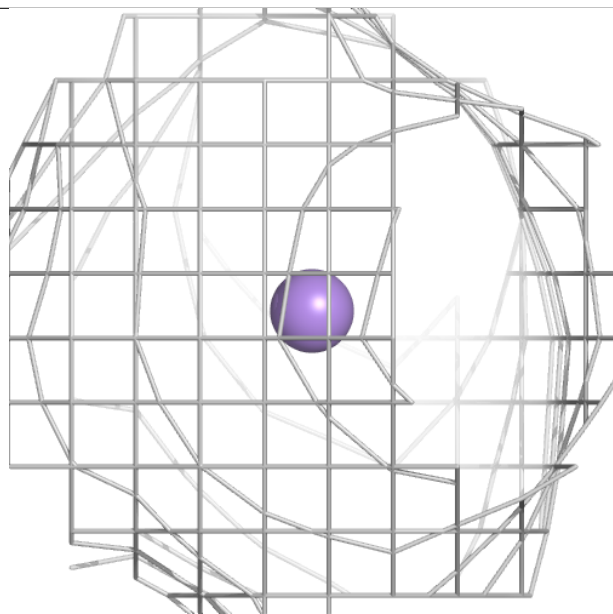
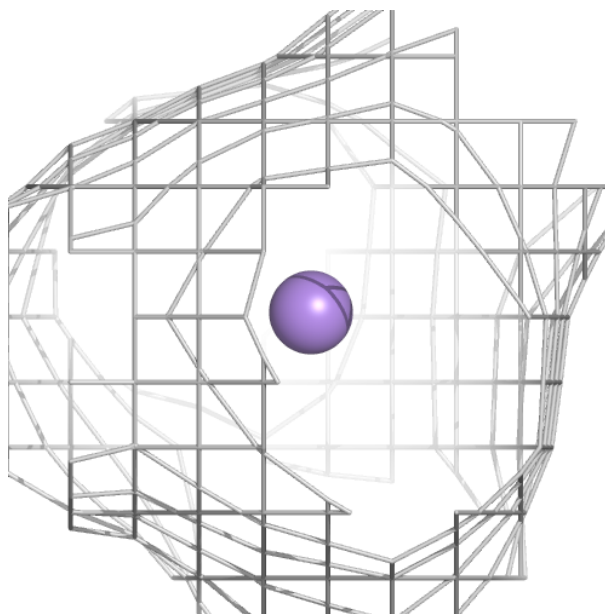
Electron density around MN A 602:

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



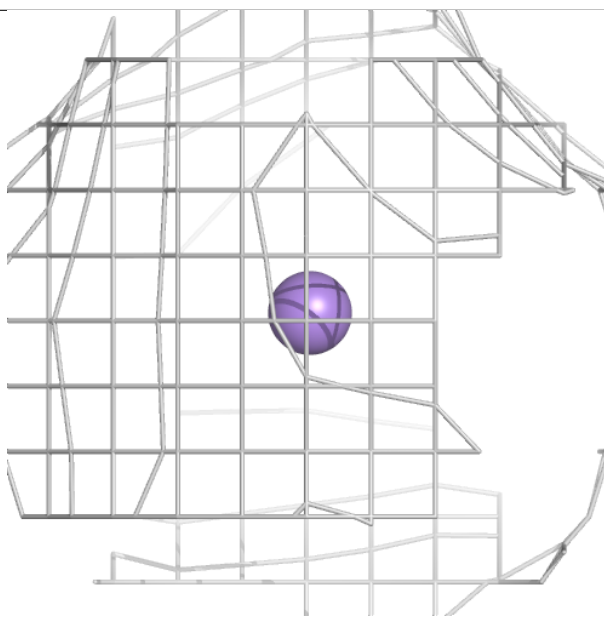
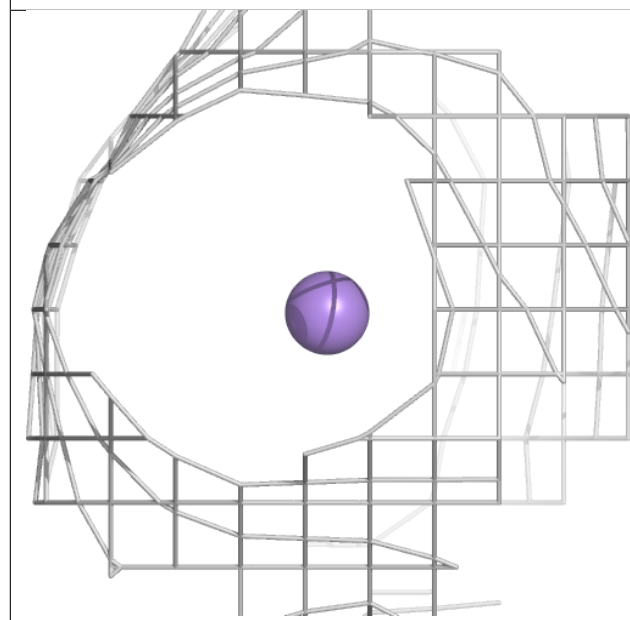
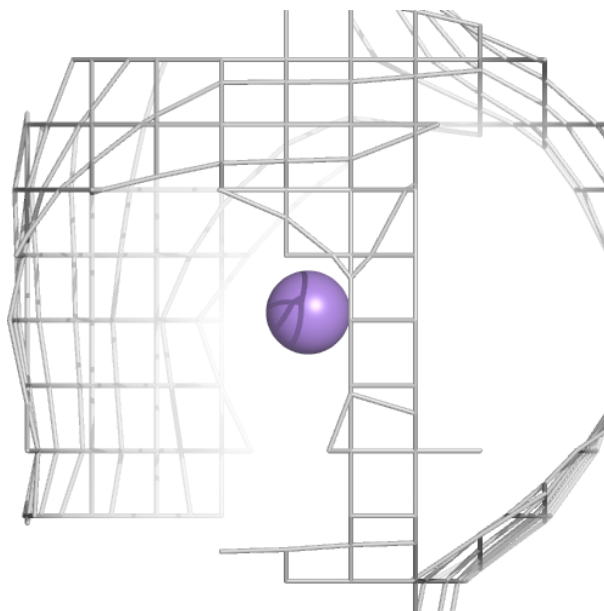
Electron density around MN B 602:

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



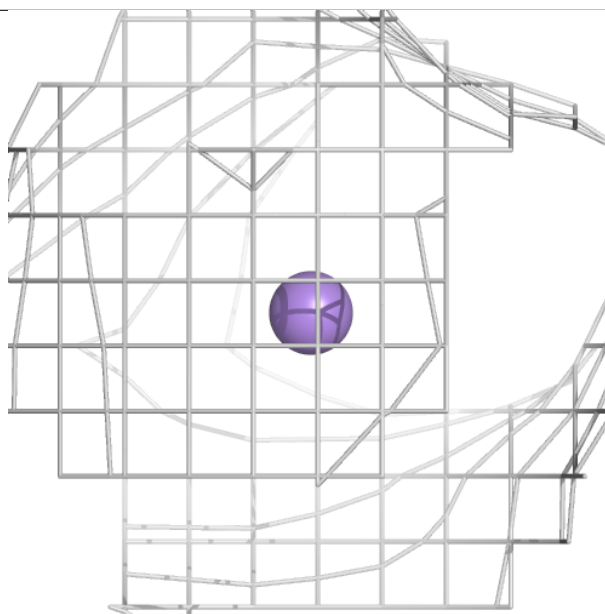
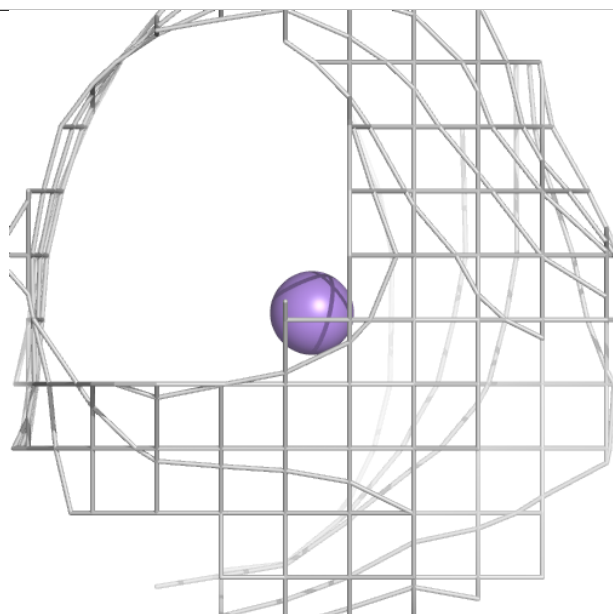
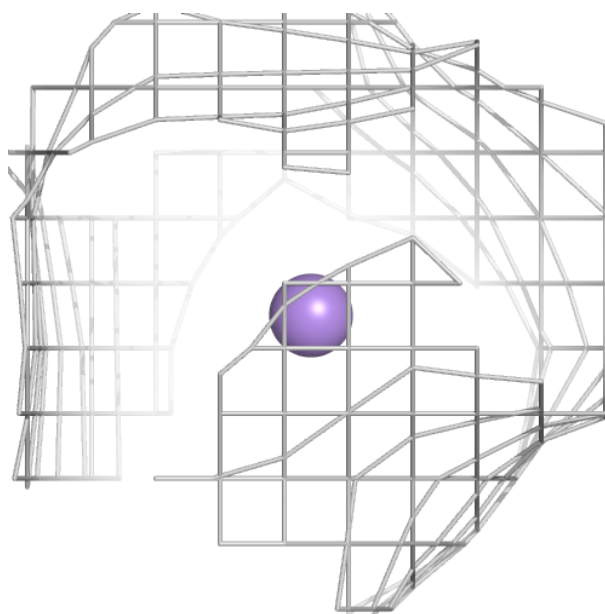
Electron density around MN C 602:

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



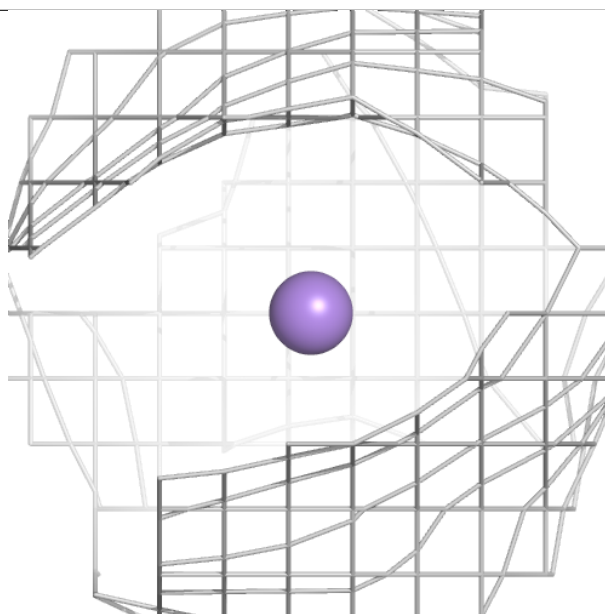
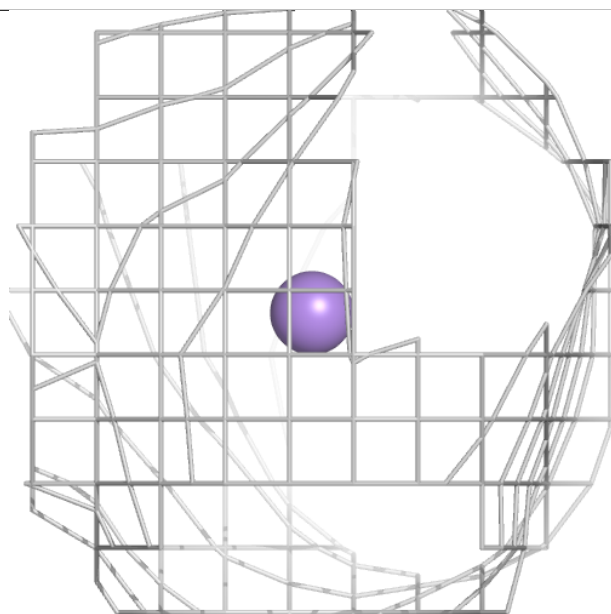
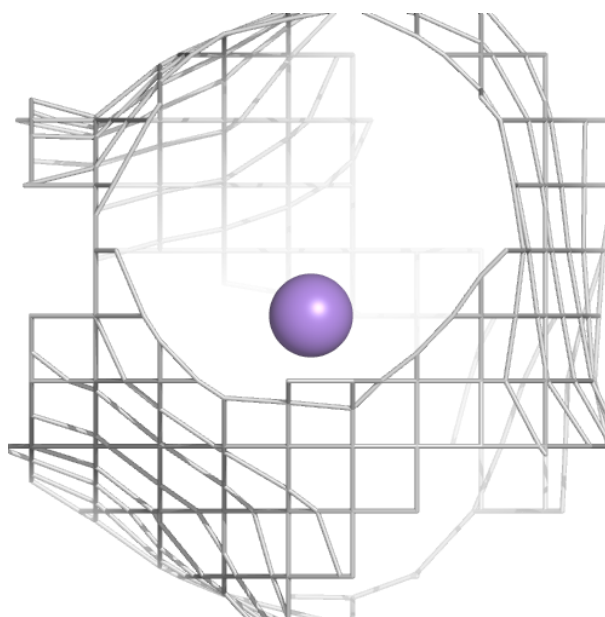
Electron density around MN D 602:

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



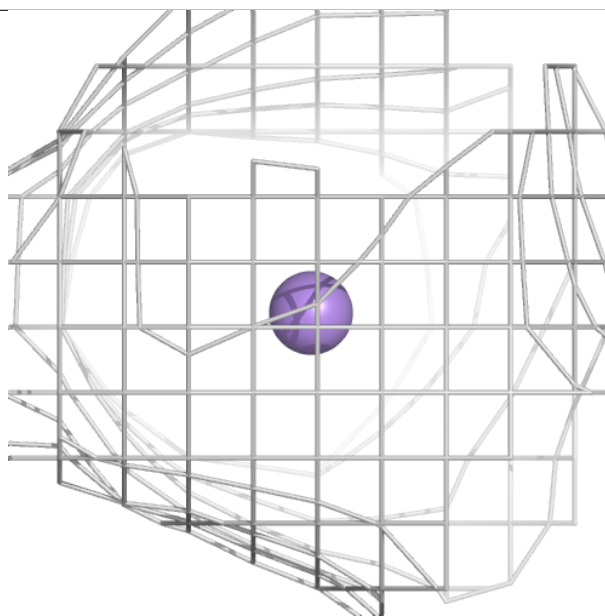
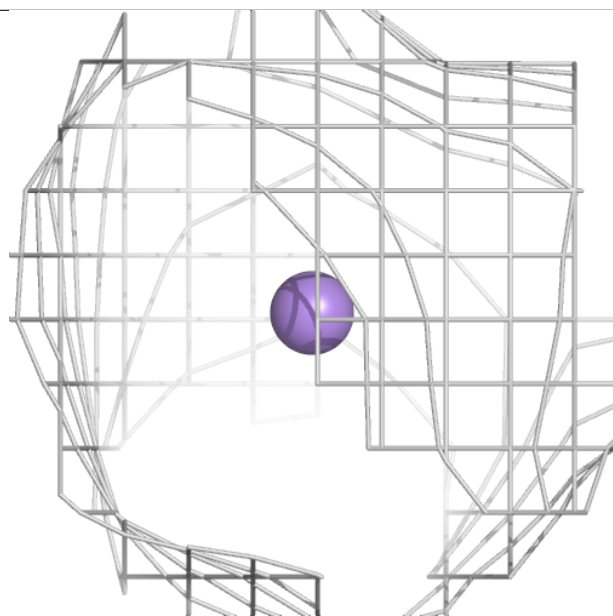
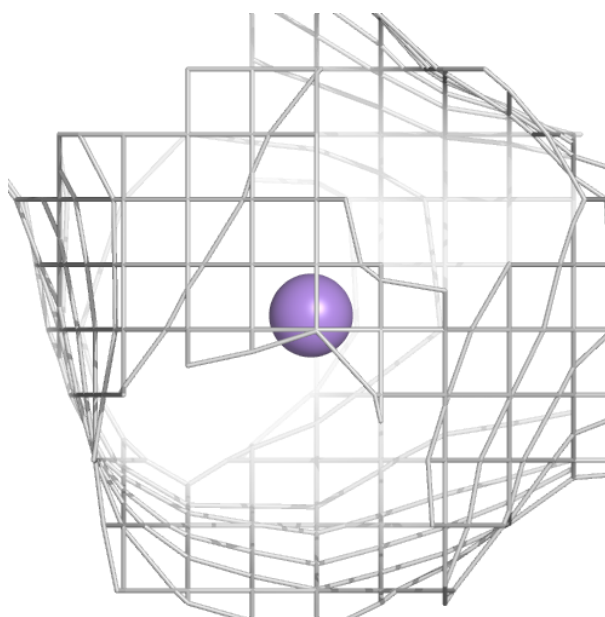
Electron density around MN E 602:

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



Electron density around MN F 501:

$2mF_o-DF_c$ (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.