



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 02:53 AM GMT

PDB ID : 2J4K
Title : CRYSTAL STRUCTURE OF URIDYLATE KINASE FROM SULFOLOBUS SOLFATARICUS IN COMPLEX WITH UMP TO 2.2 ANGSTROM RESOLUTION
Authors : Jensen, K.S.; Johansson, E.; Jensen, K.F.
Deposited on : 2006-09-01
Resolution : 2.20 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

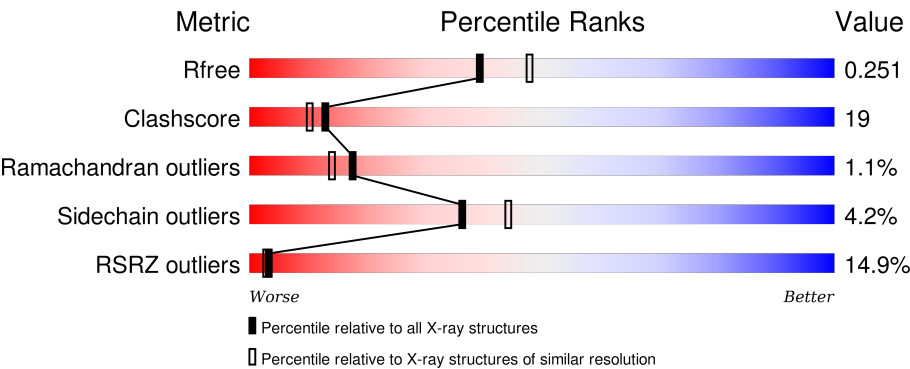
MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

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 2.20 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}	91344	3774 (2.20-2.20)
Clashscore	102246	4477 (2.20-2.20)
Ramachandran outliers	100387	4404 (2.20-2.20)
Sidechain outliers	100360	4405 (2.20-2.20)
RSRZ outliers	91569	3781 (2.20-2.20)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	226	<div><div>15%</div><div><div></div><div>59%</div><div>28%</div><div>•</div><div>8%</div></div></div>
1	B	226	<div><div>9%</div><div><div></div><div>65%</div><div>27%</div><div>•</div><div>5%</div></div></div>
1	C	226	<div><div>17%</div><div><div></div><div>57%</div><div>32%</div><div>•</div><div>9%</div></div></div>
1	D	226	<div><div>17%</div><div><div></div><div>63%</div><div>34%</div><div>•</div></div></div>
1	E	226	<div><div>14%</div><div><div></div><div>65%</div><div>30%</div><div>••</div></div></div>

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Mol	Chain	Length	Quality of chain
1	F	226	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	U5P	B	227	-	-	-	X
2	U5P	C	227	-	-	-	X

2 Entry composition [i](#)

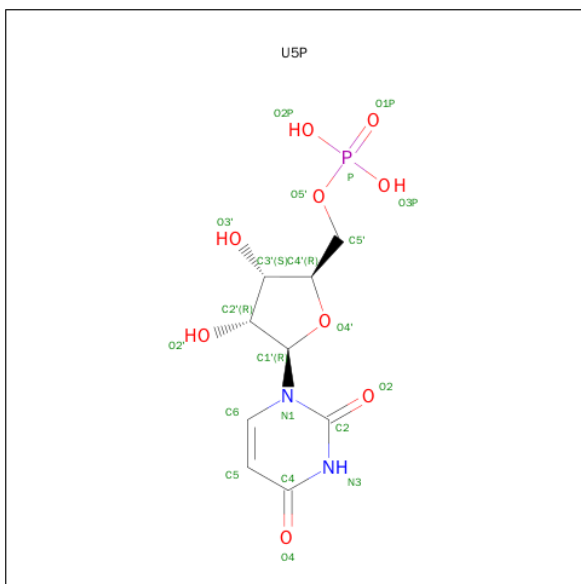
There are 5 unique types of molecules in this entry. The entry contains 10413 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 URIDYLATE KINASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	207	Total	C	N	O	S	0	0	0
			1620	1040	278	298	4			
1	B	214	Total	C	N	O	S	0	0	0
			1675	1074	286	311	4			
1	C	206	Total	C	N	O	S	0	0	0
			1612	1033	276	299	4			
1	D	226	Total	C	N	O	S	0	0	0
			1761	1126	300	331	4			
1	E	221	Total	C	N	O	S	0	0	0
			1722	1101	294	323	4			
1	F	208	Total	C	N	O	S	0	0	0
			1619	1039	276	300	4			

- Molecule 2 is URIDINE-5'-MONOPHOSPHATE (three-letter code: U5P) (formula: $C_9H_{13}N_2O_9P$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			21	9	2	9	1		
2	B	1	Total	C	N	O	P	0	0
			21	9	2	9	1		
2	C	1	Total	C	N	O	P	0	0
			21	9	2	9	1		
2	D	1	Total	C	N	O	P	0	0
			21	9	2	9	1		
2	E	1	Total	C	N	O	P	0	0
			21	9	2	9	1		
2	F	1	Total	C	N	O	P	0	0
			21	9	2	9	1		

- Molecule 3 is CADMIUM ION (three-letter code: CD) (formula: Cd).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	D	1	Total	Cd	0	0
			1	1		
3	E	2	Total	Cd	0	0
			2	2		
3	B	7	Total	Cd	0	0
			7	7		
3	C	3	Total	Cd	0	0
			3	3		
3	A	3	Total	Cd	0	0
			3	3		
3	F	2	Total	Cd	0	0
			2	2		

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

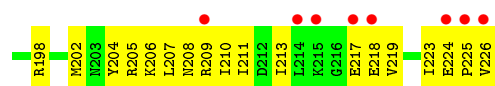
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	40	Total	O	0	0
			40	40		
5	B	49	Total	O	0	0
			49	49		

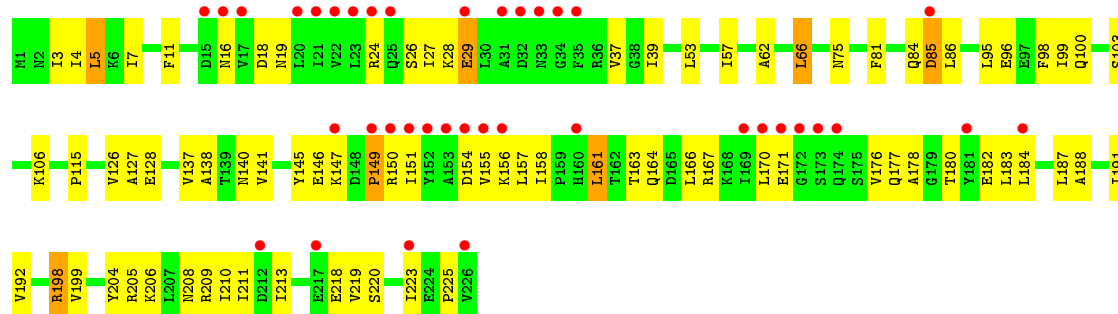
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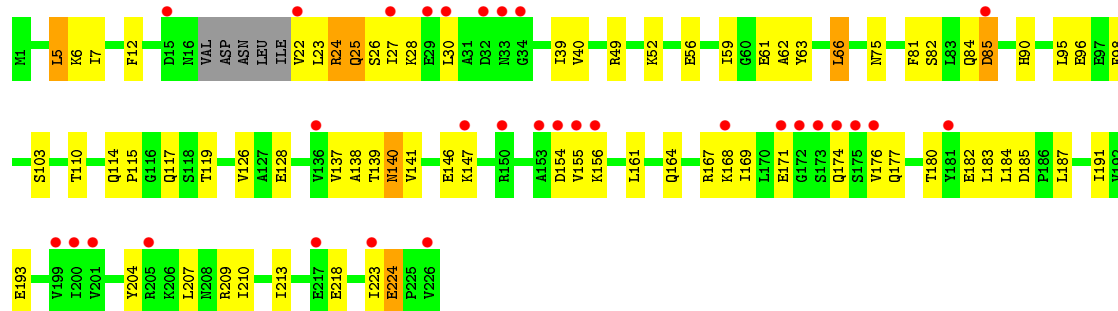
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	C	25	Total 25	O 25	0	0
5	D	51	Total 51	O 51	0	0
5	E	50	Total 50	O 50	0	0
5	F	44	Total 44	O 44	0	0



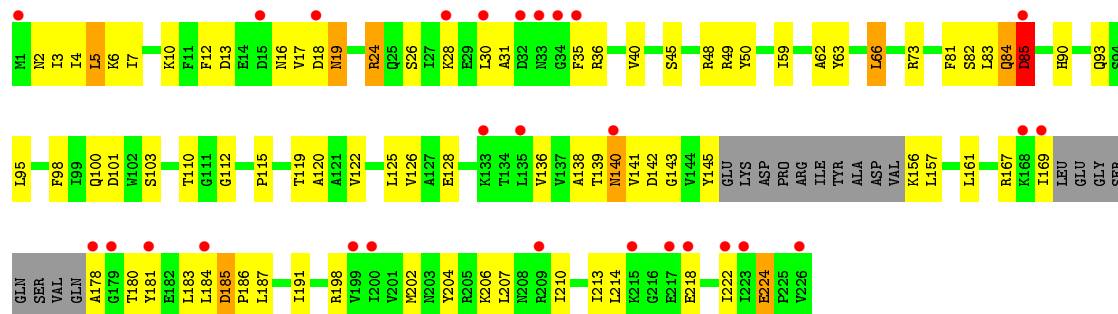
● Molecule 1: URIDYLATE KINASE



● Molecule 1: URIDYLATE KINASE



● Molecule 1: URIDYLATE KINASE



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	74.80Å 136.04Å 77.94Å 90.00° 113.17° 90.00°	Depositor
Resolution (Å)	21.67 – 2.20 21.67 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.0 (21.67-2.20) 99.1 (21.67-2.20)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.07 (at 2.19Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.219 , 0.251 0.219 , 0.251	Depositor DCC
R_{free} test set	3363 reflections (4.68%)	DCC
Wilson B-factor (Å ²)	27.1	Xtriage
Anisotropy	0.041	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 57.4	EDS
Estimated twinning fraction	0.028 for l,-k,h	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Outliers	0 of 71828 reflections	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	10413	wwPDB-VP
Average B, all atoms (Å ²)	35.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.87% 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, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: MG, U5P, CD

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.33	0/1643	0.61	0/2220
1	B	0.33	0/1699	0.62	0/2296
1	C	0.33	0/1635	0.62	0/2209
1	D	0.34	0/1787	0.61	0/2417
1	E	0.33	0/1747	0.62	0/2360
1	F	0.35	0/1641	0.63	0/2216
All	All	0.33	0/10152	0.62	0/13718

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1620	0	1687	78	0
1	B	1675	0	1742	68	0
1	C	1612	0	1669	68	0
1	D	1761	0	1822	76	0
1	E	1722	0	1780	72	0
1	F	1619	0	1684	70	0
2	A	21	0	11	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	21	0	11	1	0
2	C	21	0	11	0	0
2	D	21	0	11	0	0
2	E	21	0	11	0	0
2	F	21	0	11	0	0
3	A	3	0	0	0	0
3	B	7	0	0	0	0
3	C	3	0	0	0	0
3	D	1	0	0	0	0
3	E	2	0	0	0	0
3	F	2	0	0	0	0
4	A	1	0	0	0	0
5	A	40	0	0	6	0
5	B	49	0	0	2	0
5	C	25	0	0	1	0
5	D	51	0	0	2	0
5	E	50	0	0	3	0
5	F	44	0	0	2	0
All	All	10413	0	10450	394	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 19.

All (394) 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:145:TYR:H	1:D:177:GLN:HE22	1.00	0.98
1:D:137:VAL:HG21	1:D:183:LEU:HD21	1.44	0.97
1:C:146:GLU:HG3	1:C:147:LYS:HG2	1.43	0.97
1:B:30:LEU:HD21	1:B:210:ILE:HD13	1.48	0.95
1:B:185:ASP:HB2	1:B:186:PRO:HD2	1.50	0.93
1:A:139:THR:HG22	1:A:140:ASN:H	1.33	0.92
1:A:185:ASP:HB2	1:A:186:PRO:HD2	1.56	0.88
1:D:164:GLN:HA	1:D:167:ARG:HE	1.41	0.85
1:D:198:ARG:HB3	1:D:198:ARG:HH11	1.44	0.83
1:A:203:ASN:HB2	5:A:2036:HOH:O	1.80	0.80
1:A:207:LEU:HA	5:A:2037:HOH:O	1.81	0.79
1:F:181:TYR:HA	1:F:184:LEU:HD12	1.64	0.78
1:E:176:VAL:HG12	1:E:177:GLN:H	1.48	0.78
1:A:115:PRO:HG2	1:E:95:LEU:HD23	1.65	0.78
1:F:198:ARG:HH21	1:F:222:ILE:HG21	1.50	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:213:ILE:HD13	1:E:218:GLU:HB3	1.66	0.76
1:F:24:ARG:HH11	1:F:28:LYS:HE3	1.50	0.76
1:A:139:THR:HG22	1:A:140:ASN:N	2.01	0.76
1:C:162:THR:OG1	1:C:165:ASP:HB2	1.85	0.76
1:B:164:GLN:HG3	1:B:226:VAL:CG2	2.16	0.76
1:F:84:GLN:O	1:F:85:ASP:HB2	1.87	0.75
1:B:206:LYS:HG2	1:B:209:ARG:HH21	1.52	0.74
1:D:176:VAL:HG22	1:D:177:GLN:H	1.52	0.74
1:C:164:GLN:HG3	1:C:226:VAL:HG23	1.69	0.74
1:B:164:GLN:HG3	1:B:226:VAL:HG23	1.70	0.73
1:E:146:GLU:OE1	1:E:156:LYS:HE3	1.89	0.72
1:C:207:LEU:HD22	1:C:210:ILE:HD11	1.72	0.71
1:E:59:ILE:HD11	1:F:82:SER:HA	1.73	0.71
1:D:26:SER:O	1:D:29:GLU:HB2	1.91	0.70
1:C:185:ASP:HB2	1:C:186:PRO:HD2	1.74	0.70
1:B:28:LYS:HG2	1:B:86:LEU:HD11	1.74	0.70
1:D:145:TYR:N	1:D:177:GLN:HE22	1.84	0.70
1:B:213:ILE:HD13	1:B:218:GLU:HB3	1.73	0.70
1:E:52:LYS:O	1:E:56:GLU:HG3	1.92	0.70
1:F:10:LYS:HD3	1:F:140:ASN:OD1	1.93	0.69
1:C:207:LEU:O	1:C:210:ILE:HG13	1.93	0.68
1:D:84:GLN:O	1:D:85:ASP:HB2	1.91	0.68
1:B:84:GLN:O	1:B:85:ASP:HB2	1.93	0.68
1:E:147:LYS:HB2	1:E:155:VAL:HG11	1.77	0.67
1:C:11:PHE:CE1	1:C:19:ASN:HB3	2.31	0.66
1:B:66:LEU:HD13	1:B:115:PRO:HG3	1.76	0.66
1:C:138:ALA:HB1	1:C:204:TYR:HB3	1.78	0.66
1:B:209:ARG:O	1:B:213:ILE:HG12	1.96	0.66
1:B:166:LEU:HD22	1:B:223:ILE:HD13	1.76	0.66
1:D:167:ARG:O	1:D:171:GLU:HG3	1.96	0.65
1:E:164:GLN:O	1:E:168:LYS:HG2	1.97	0.65
1:B:61:GLU:HG2	1:C:194:ARG:HD2	1.79	0.65
1:B:96:GLU:HG3	5:C:2017:HOH:O	1.96	0.65
1:D:62:ALA:HB2	1:F:128:GLU:HG2	1.77	0.65
1:A:187:LEU:O	1:A:191:ILE:HG12	1.97	0.65
1:E:176:VAL:O	1:E:177:GLN:HG3	1.98	0.64
1:B:95:LEU:HD23	1:C:115:PRO:HG2	1.80	0.64
1:D:96:GLU:HG3	5:F:2026:HOH:O	1.97	0.64
1:A:95:LEU:HD23	1:E:115:PRO:HG2	1.80	0.63
1:C:20:LEU:HD13	1:D:57:ILE:HD13	1.79	0.63
1:A:139:THR:CG2	1:A:140:ASN:H	2.09	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:84:GLN:O	1:A:85:ASP:HB2	1.98	0.63
1:D:145:TYR:H	1:D:177:GLN:NE2	1.84	0.62
1:C:188:ALA:O	1:C:192:VAL:HG13	1.99	0.62
1:F:24:ARG:NH1	1:F:28:LYS:HE3	2.12	0.62
1:F:138:ALA:HB1	1:F:204:TYR:HB3	1.82	0.62
1:D:141:VAL:HG21	1:D:178:ALA:O	2.00	0.62
1:B:138:ALA:HB1	1:B:204:TYR:HB3	1.81	0.61
1:E:224:GLU:HG3	5:E:2048:HOH:O	2.01	0.61
1:E:169:ILE:CD1	1:E:180:THR:HG21	2.31	0.61
1:A:168:LYS:HA	1:A:168:LYS:HE3	1.81	0.61
1:B:98:PHE:CZ	1:B:126:VAL:HG13	2.35	0.61
1:D:164:GLN:HA	1:D:167:ARG:NE	2.13	0.61
1:D:81:PHE:O	1:D:84:GLN:HG3	2.01	0.61
1:D:176:VAL:HG22	1:D:177:GLN:N	2.14	0.60
1:D:161:LEU:N	1:D:161:LEU:HD23	2.16	0.60
1:A:141:VAL:HG12	1:A:142:ASP:N	2.16	0.60
1:A:203:ASN:HD21	1:A:206:LYS:CG	2.15	0.60
1:D:198:ARG:CB	1:D:198:ARG:HH11	2.13	0.60
1:A:16:ASN:HD22	1:A:18:ASP:H	1.50	0.60
1:E:176:VAL:HG12	1:E:177:GLN:N	2.16	0.59
1:D:100:GLN:O	1:D:103:SER:HB3	2.02	0.59
1:D:206:LYS:HG2	1:D:209:ARG:HH21	1.67	0.59
1:F:3:ILE:HD11	1:F:136:VAL:CG2	2.32	0.59
1:E:5:LEU:HD13	1:E:7:ILE:HD11	1.85	0.59
1:C:163:THR:HG23	1:C:225:PRO:HA	1.83	0.58
1:E:169:ILE:HG12	1:E:174:GLN:HB3	1.86	0.58
1:F:210:ILE:O	1:F:214:LEU:HG	2.03	0.58
1:C:164:GLN:NE2	1:C:226:VAL:OXT	2.36	0.58
1:F:45:SER:HA	1:F:48:ARG:NH1	2.18	0.58
1:B:140:ASN:HD22	1:B:141:VAL:N	2.02	0.58
1:F:198:ARG:NH2	1:F:222:ILE:HG21	2.20	0.57
1:C:213:ILE:HD13	1:C:218:GLU:HB3	1.85	0.57
1:B:185:ASP:CB	1:B:186:PRO:HD2	2.29	0.57
1:A:115:PRO:HG2	1:E:95:LEU:CD2	2.35	0.57
1:E:84:GLN:O	1:E:85:ASP:HB2	2.04	0.57
1:C:26:SER:HB2	1:C:210:ILE:HD12	1.86	0.57
1:E:138:ALA:HB1	1:E:204:TYR:HB3	1.87	0.56
1:E:169:ILE:HD13	1:E:180:THR:HG21	1.88	0.56
1:E:169:ILE:CG1	1:E:174:GLN:HB3	2.36	0.56
1:B:18:ASP:O	1:B:22:VAL:HG12	2.05	0.56
1:E:49:ARG:HH22	1:F:13:ASP:HA	1.71	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:17:VAL:O	1:C:21:ILE:HG12	2.04	0.56
1:A:169:ILE:O	1:A:169:ILE:HG22	2.06	0.56
1:A:203:ASN:HD21	1:A:206:LYS:HG3	1.71	0.56
1:C:163:THR:CG2	1:C:225:PRO:HA	2.36	0.56
1:D:28:LYS:HE3	1:D:86:LEU:HD21	1.87	0.56
1:C:26:SER:O	1:C:30:LEU:HD23	2.05	0.56
1:F:180:THR:O	1:F:184:LEU:HG	2.06	0.56
1:B:206:LYS:CG	1:B:209:ARG:HH21	2.17	0.55
1:F:66:LEU:HD13	1:F:115:PRO:HG3	1.86	0.55
1:E:82:SER:HA	1:F:59:ILE:HD11	1.88	0.55
1:D:177:GLN:H	1:D:180:THR:HG22	1.71	0.55
1:B:206:LYS:HG2	1:B:209:ARG:NH2	2.21	0.55
1:E:75:ASN:ND2	1:F:50:TYR:OH	2.40	0.55
1:E:12:PHE:O	1:F:49:ARG:NH2	2.35	0.55
1:E:139:THR:HG23	1:E:141:VAL:H	1.71	0.55
1:E:22:VAL:O	1:E:25:GLN:NE2	2.39	0.55
1:E:207:LEU:O	1:E:210:ILE:HG13	2.07	0.55
1:D:28:LYS:HG2	1:D:86:LEU:HD11	1.89	0.55
1:C:224:GLU:OE2	1:C:225:PRO:HD2	2.07	0.55
1:A:164:GLN:HG3	1:A:226:VAL:CG2	2.37	0.55
1:D:187:LEU:O	1:D:191:ILE:HG12	2.07	0.55
1:B:16:ASN:HD22	1:B:16:ASN:N	2.04	0.54
1:F:2:ASN:OD1	1:F:36:ARG:HB2	2.08	0.54
1:F:48:ARG:NH1	5:F:2010:HOH:O	2.40	0.54
1:A:29:GLU:HB3	1:A:209:ARG:NH2	2.23	0.54
1:A:115:PRO:CG	1:E:95:LEU:HD23	2.36	0.54
1:A:28:LYS:HG2	1:A:86:LEU:HD11	1.89	0.54
1:D:128:GLU:HG2	1:F:62:ALA:HB2	1.89	0.54
1:A:164:GLN:HG3	1:A:226:VAL:HG23	1.88	0.54
1:B:146:GLU:HG2	1:B:155:VAL:HG13	1.89	0.54
1:A:45:SER:HA	1:A:48:ARG:NH1	2.23	0.54
1:D:16:ASN:HD22	1:D:18:ASP:H	1.56	0.54
1:B:140:ASN:ND2	1:B:141:VAL:HG13	2.23	0.54
1:B:100:GLN:O	1:B:103:SER:HB2	2.07	0.54
1:C:208:ASN:OD1	1:C:209:ARG:HG3	2.08	0.53
1:D:66:LEU:HD13	1:D:115:PRO:HG3	1.90	0.53
1:F:26:SER:O	1:F:30:LEU:HB2	2.08	0.53
1:F:141:VAL:HG12	1:F:143:GLY:H	1.73	0.53
1:B:208:ASN:OD1	1:B:209:ARG:HG3	2.09	0.53
1:C:66:LEU:HD13	1:C:115:PRO:HG3	1.89	0.53
1:B:24:ARG:HD3	1:B:82:SER:O	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:3:ILE:HD11	1:C:136:VAL:CG2	2.38	0.53
1:E:209:ARG:O	1:E:213:ILE:HG12	2.08	0.53
1:C:3:ILE:HD11	1:C:136:VAL:HG23	1.89	0.53
1:D:98:PHE:CZ	1:D:126:VAL:HG13	2.44	0.53
1:C:151:ILE:HG22	1:C:151:ILE:O	2.08	0.53
1:C:166:LEU:HD22	1:C:223:ILE:HD13	1.91	0.53
1:F:95:LEU:HD13	1:F:125:LEU:HB3	1.90	0.52
1:F:120:ALA:HB1	1:F:183:LEU:HD12	1.90	0.52
1:E:27:ILE:HD11	1:E:39:ILE:HD11	1.91	0.52
1:F:3:ILE:HD11	1:F:136:VAL:HG23	1.90	0.52
1:B:23:LEU:O	1:B:27:ILE:HG12	2.08	0.52
1:C:33:ASN:OD1	1:C:211:ILE:HD13	2.09	0.52
1:D:177:GLN:O	1:D:180:THR:HG22	2.09	0.52
1:A:81:PHE:O	1:A:84:GLN:HG3	2.10	0.52
1:E:30:LEU:HD21	1:E:210:ILE:CG2	2.40	0.52
1:C:206:LYS:HG2	1:C:209:ARG:HH21	1.74	0.52
1:E:174:GLN:NE2	5:E:2038:HOH:O	2.39	0.52
1:E:167:ARG:CZ	1:E:193:GLU:OE1	2.58	0.52
1:C:140:ASN:HD22	1:C:140:ASN:H	1.58	0.52
1:D:27:ILE:HD11	1:D:39:ILE:HD11	1.91	0.52
1:F:183:LEU:HG	1:F:183:LEU:O	2.10	0.51
1:B:121:ALA:HB1	1:B:187:LEU:HD23	1.92	0.51
1:B:11:PHE:CE1	1:B:19:ASN:HB3	2.45	0.51
1:A:66:LEU:HD13	1:A:115:PRO:HG3	1.91	0.51
1:C:95:LEU:HD11	1:C:129:ALA:HB2	1.91	0.51
1:C:140:ASN:HD22	1:C:140:ASN:N	2.07	0.51
1:C:141:VAL:HG12	1:C:143:GLY:H	1.75	0.51
1:B:206:LYS:HZ3	1:B:219:VAL:HB	1.75	0.51
1:D:4:ILE:HG13	1:D:127:ALA:HA	1.93	0.51
1:C:84:GLN:O	1:C:85:ASP:HB2	2.11	0.51
1:F:187:LEU:O	1:F:191:ILE:HG12	2.10	0.51
1:A:194:ARG:HD2	1:E:61:GLU:HG2	1.93	0.51
1:A:203:ASN:HD22	1:A:203:ASN:N	2.07	0.51
1:B:61:GLU:HG2	1:C:194:ARG:CD	2.41	0.51
1:A:24:ARG:O	1:A:28:LYS:HG3	2.10	0.50
1:B:115:PRO:HG2	1:C:95:LEU:HD23	1.92	0.50
1:B:66:LEU:HD13	1:B:115:PRO:CG	2.41	0.50
1:C:15:ASP:OD1	1:C:18:ASP:HB2	2.11	0.50
1:D:188:ALA:O	1:D:192:VAL:HG13	2.12	0.50
1:E:147:LYS:HB2	1:E:155:VAL:CG1	2.41	0.50
1:D:163:THR:HG23	1:D:225:PRO:HA	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:33:ASN:HD22	1:C:33:ASN:N	2.08	0.50
1:D:147:LYS:H	1:D:155:VAL:HG11	1.76	0.50
1:A:149:PRO:HG3	1:A:154:ASP:O	2.12	0.49
1:E:176:VAL:HG13	1:E:184:LEU:CD1	2.42	0.49
1:A:168:LYS:C	1:A:170:LEU:H	2.15	0.49
1:A:224:GLU:HG3	1:A:225:PRO:HD2	1.94	0.49
1:B:16:ASN:ND2	1:B:16:ASN:H	2.10	0.49
1:F:30:LEU:O	1:F:35:PHE:HB2	2.12	0.49
1:B:218:GLU:HG3	1:B:219:VAL:N	2.28	0.49
1:E:6:LYS:HE3	1:E:119:THR:OG1	2.13	0.49
1:D:206:LYS:HG2	1:D:209:ARG:NH2	2.27	0.49
1:A:209:ARG:HG3	5:A:2039:HOH:O	2.13	0.49
1:F:95:LEU:HG	1:F:95:LEU:O	2.13	0.49
1:A:155:VAL:HG23	1:A:155:VAL:O	2.13	0.49
1:E:49:ARG:NH2	1:F:13:ASP:HA	2.28	0.49
1:E:30:LEU:HD21	1:E:210:ILE:HG22	1.94	0.49
1:E:24:ARG:NH1	1:E:28:LYS:HE3	2.28	0.49
1:D:11:PHE:CZ	1:D:19:ASN:HB2	2.48	0.49
1:E:140:ASN:HD22	1:E:140:ASN:N	2.11	0.48
1:D:5:LEU:HD13	1:D:7:ILE:HD11	1.95	0.48
1:C:17:VAL:HG23	1:C:18:ASP:N	2.28	0.48
1:D:16:ASN:HB2	1:D:18:ASP:OD1	2.12	0.48
1:F:112:GLY:HA2	1:F:122:VAL:HG21	1.94	0.48
1:A:24:ARG:NH2	1:A:28:LYS:NZ	2.61	0.48
1:A:28:LYS:HE2	1:A:86:LEU:HD11	1.94	0.48
1:C:164:GLN:CG	1:C:226:VAL:HG23	2.42	0.48
1:D:146:GLU:HB3	1:D:158:ILE:HD11	1.95	0.48
1:D:209:ARG:O	1:D:213:ILE:HG12	2.13	0.48
1:C:163:THR:O	1:C:167:ARG:HG3	2.13	0.48
1:C:16:ASN:HB3	1:D:53:LEU:CD1	2.43	0.48
1:B:164:GLN:HB2	5:B:2038:HOH:O	2.14	0.48
1:B:16:ASN:ND2	1:B:16:ASN:N	2.62	0.48
1:B:11:PHE:CZ	1:B:19:ASN:HB3	2.49	0.48
1:D:166:LEU:HD12	1:D:166:LEU:N	2.29	0.48
1:E:81:PHE:O	1:E:84:GLN:HG3	2.14	0.48
1:E:114:GLN:O	1:E:117:GLN:HG2	2.13	0.48
1:A:203:ASN:O	1:A:203:ASN:ND2	2.47	0.47
1:F:81:PHE:O	1:F:84:GLN:HG3	2.13	0.47
1:A:141:VAL:HG12	1:A:142:ASP:H	1.79	0.47
1:C:12:PHE:C	1:C:16:ASN:HD21	2.18	0.47
1:E:98:PHE:CD2	1:E:126:VAL:HG22	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:24:ARG:HA	1:C:83:LEU:HD21	1.95	0.47
1:D:170:LEU:HD21	1:D:184:LEU:HB3	1.95	0.47
1:C:11:PHE:CZ	1:C:19:ASN:HB3	2.49	0.47
1:D:149:PRO:O	1:D:151:ILE:N	2.47	0.47
1:E:183:LEU:HD13	1:E:223:ILE:HD12	1.96	0.47
1:C:205:ARG:HG3	1:C:205:ARG:HH11	1.80	0.47
1:A:203:ASN:HD21	1:A:206:LYS:HD2	1.79	0.47
1:A:62:ALA:HB2	1:E:128:GLU:HG2	1.95	0.47
1:A:23:LEU:O	1:A:27:ILE:HG13	2.14	0.47
1:B:185:ASP:HB2	1:B:186:PRO:CD	2.36	0.47
1:A:203:ASN:HD21	1:A:206:LYS:CD	2.27	0.47
1:E:25:GLN:CD	1:E:25:GLN:H	2.17	0.47
1:F:141:VAL:CG1	1:F:145:TYR:HE2	2.27	0.47
1:A:204:TYR:O	1:A:204:TYR:HD1	1.98	0.47
1:A:141:VAL:CG1	1:A:145:TYR:HE2	2.27	0.47
1:D:84:GLN:O	1:D:85:ASP:CB	2.62	0.47
1:D:177:GLN:N	1:D:180:THR:HG22	2.30	0.47
1:F:3:ILE:HD11	1:F:136:VAL:HG21	1.95	0.47
1:E:23:LEU:HD12	1:E:26:SER:OG	2.14	0.47
1:A:88:TYR:CE2	1:A:90:HIS:HB3	2.50	0.47
1:D:11:PHE:CE1	1:D:19:ASN:HB2	2.50	0.46
1:A:5:LEU:HD13	1:A:7:ILE:HD11	1.97	0.46
1:F:98:PHE:CD2	1:F:126:VAL:HG22	2.50	0.46
1:D:19:ASN:ND2	5:D:2005:HOH:O	2.47	0.46
1:D:199:VAL:HB	1:D:223:ILE:HB	1.97	0.46
1:A:54:ALA:HB1	1:A:59:ILE:HG13	1.95	0.46
1:A:203:ASN:H	1:A:203:ASN:ND2	2.14	0.46
1:F:98:PHE:CZ	1:F:126:VAL:HG13	2.50	0.46
1:C:183:LEU:O	1:C:184:LEU:HD23	2.15	0.46
1:D:138:ALA:HB1	1:D:204:TYR:HB3	1.97	0.46
1:A:203:ASN:C	1:A:205:ARG:H	2.19	0.46
1:A:203:ASN:HD22	1:A:203:ASN:H	1.63	0.46
1:B:17:VAL:CG2	1:B:18:ASP:N	2.79	0.46
1:E:49:ARG:NH2	1:F:12:PHE:O	2.50	0.45
1:D:213:ILE:HD13	1:D:218:GLU:HB3	1.99	0.45
1:A:146:GLU:OE1	1:A:149:PRO:HA	2.16	0.45
1:A:95:LEU:CD2	1:E:115:PRO:HG2	2.44	0.45
1:B:205:ARG:HG3	1:B:205:ARG:HH11	1.80	0.45
1:F:17:VAL:C	1:F:19:ASN:N	2.69	0.45
1:C:185:ASP:CB	1:C:186:PRO:HD2	2.46	0.45
1:D:99:ILE:HD13	1:F:63:TYR:CE1	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:145:TYR:CD2	1:C:149:PRO:HD3	2.52	0.45
1:A:10:LYS:HD2	1:A:140:ASN:HB2	1.98	0.45
1:E:66:LEU:HD13	1:E:115:PRO:HG3	1.98	0.45
1:D:100:GLN:HG3	1:E:90:HIS:HB2	1.99	0.45
1:A:157:LEU:HD23	1:A:158:ILE:N	2.32	0.45
1:A:55:ARG:HD2	5:A:2013:HOH:O	2.15	0.45
1:A:82:SER:HA	1:B:59:ILE:HD11	1.99	0.45
1:F:213:ILE:HD13	1:F:218:GLU:HB3	1.99	0.45
1:A:28:LYS:CG	1:A:86:LEU:HD11	2.47	0.45
1:F:5:LEU:HD13	1:F:7:ILE:HD11	1.99	0.45
1:C:206:LYS:NZ	1:C:219:VAL:HB	2.32	0.44
1:B:17:VAL:HG22	5:B:2006:HOH:O	2.17	0.44
1:B:17:VAL:HG23	1:B:18:ASP:N	2.31	0.44
1:F:73:ARG:NH2	1:F:93:GLN:HB3	2.31	0.44
1:B:164:GLN:HG3	1:B:226:VAL:HG21	1.95	0.44
1:D:29:GLU:HB3	1:D:211:ILE:HD11	1.99	0.44
1:F:141:VAL:HG12	1:F:142:ASP:N	2.32	0.44
1:A:1:MET:O	1:A:35:PHE:HA	2.17	0.44
1:E:63:TYR:CD2	1:F:84:GLN:NE2	2.85	0.44
1:C:18:ASP:O	1:C:22:VAL:HG12	2.18	0.44
1:D:19:ASN:ND2	5:D:2004:HOH:O	2.51	0.44
1:E:23:LEU:HD12	1:E:23:LEU:O	2.17	0.44
1:F:16:ASN:HD21	1:F:18:ASP:CG	2.20	0.44
1:A:183:LEU:O	1:A:183:LEU:HD23	2.18	0.44
1:D:3:ILE:CG2	1:D:37:VAL:HG22	2.47	0.44
1:D:208:ASN:OD1	1:D:209:ARG:HG3	2.18	0.44
1:D:210:ILE:O	1:D:213:ILE:HB	2.17	0.44
5:A:2030:HOH:O	1:E:96:GLU:HG3	2.18	0.44
1:B:30:LEU:CD2	1:B:210:ILE:HG21	2.48	0.44
1:F:185:ASP:HA	1:F:186:PRO:HD2	1.88	0.44
1:E:24:ARG:HH11	1:E:24:ARG:CG	2.30	0.44
1:F:4:ILE:HG13	1:F:126:VAL:HG12	1.99	0.43
1:A:139:THR:O	1:A:203:ASN:HA	2.17	0.43
1:D:155:VAL:HG12	1:D:156:LYS:N	2.33	0.43
1:F:178:ALA:C	1:F:180:THR:H	2.22	0.43
1:C:209:ARG:O	1:C:213:ILE:HG12	2.18	0.43
1:E:25:GLN:OE1	1:E:25:GLN:N	2.51	0.43
1:A:49:ARG:NE	5:A:2011:HOH:O	2.51	0.43
1:F:198:ARG:NE	1:F:224:GLU:OE2	2.51	0.43
1:F:142:ASP:CG	1:F:206:LYS:HZ1	2.22	0.43
1:C:16:ASN:HB3	1:D:53:LEU:HD11	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:161:LEU:N	1:C:161:LEU:HD23	2.33	0.43
1:D:145:TYR:CE1	1:D:157:LEU:HG	2.53	0.43
1:A:204:TYR:O	1:A:204:TYR:CD1	2.70	0.43
1:A:83:LEU:O	1:A:84:GLN:C	2.56	0.43
1:A:25:GLN:HG2	1:A:29:GLU:OE1	2.19	0.43
1:D:182:GLU:O	1:D:183:LEU:HD23	2.18	0.43
1:B:146:GLU:CG	1:B:155:VAL:HG13	2.48	0.43
1:C:40:VAL:HG21	1:C:123:ALA:HA	2.00	0.43
1:B:13:ASP:C	1:B:16:ASN:HD21	2.21	0.43
1:B:112:GLY:HA3	2:B:227:U5P:C5	2.47	0.43
1:D:95:LEU:HD23	1:F:115:PRO:HG2	2.01	0.43
1:B:167:ARG:NH2	1:B:193:GLU:OE1	2.52	0.43
1:B:161:LEU:HD23	1:B:161:LEU:N	2.33	0.43
1:C:146:GLU:O	1:C:147:LYS:HD2	2.18	0.42
1:A:66:LEU:HA	1:A:66:LEU:HD12	1.87	0.42
1:F:140:ASN:HD22	1:F:140:ASN:C	2.23	0.42
1:F:139:THR:HG23	1:F:141:VAL:H	1.84	0.42
1:A:106:LYS:HE3	1:C:103:SER:O	2.18	0.42
1:E:169:ILE:HG21	1:E:184:LEU:HD11	2.01	0.42
1:D:5:LEU:CD1	1:D:7:ILE:HD11	2.48	0.42
1:B:106:LYS:HE3	1:E:103:SER:O	2.19	0.42
1:E:156:LYS:H	1:E:156:LYS:HG2	1.63	0.42
1:F:31:ALA:HA	1:F:35:PHE:O	2.19	0.42
1:B:5:LEU:HD22	1:B:7:ILE:CD1	2.49	0.42
1:D:3:ILE:HG23	1:D:37:VAL:HG22	2.00	0.42
1:C:45:SER:HA	1:C:48:ARG:NH1	2.33	0.42
1:F:204:TYR:O	1:F:207:LEU:HG	2.20	0.42
1:C:217:GLU:O	1:C:218:GLU:HB2	2.19	0.42
1:B:103:SER:O	1:D:106:LYS:HE3	2.20	0.42
1:A:40:VAL:HG21	1:A:123:ALA:HA	2.02	0.42
1:B:139:THR:OG1	1:B:140:ASN:N	2.52	0.42
1:E:22:VAL:C	1:E:25:GLN:NE2	2.72	0.42
1:F:167:ARG:O	1:F:169:ILE:HG22	2.20	0.42
1:A:203:ASN:ND2	1:A:203:ASN:N	2.68	0.42
1:C:65:ASP:O	1:C:69:ILE:HG13	2.20	0.42
1:C:90:HIS:HB2	1:F:100:GLN:HG3	2.02	0.42
1:B:113:PHE:CE2	1:B:122:VAL:HG13	2.54	0.42
1:E:137:VAL:HG11	1:E:182:GLU:HB3	2.01	0.42
1:D:176:VAL:HG23	1:D:184:LEU:HD11	2.00	0.42
1:E:95:LEU:HD21	5:E:2028:HOH:O	2.19	0.42
1:F:5:LEU:HD22	1:F:7:ILE:HD13	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:66:LEU:HD12	1:C:69:ILE:HD12	2.02	0.42
1:D:24:ARG:O	1:D:28:LYS:HG3	2.20	0.42
1:D:205:ARG:HG3	1:D:205:ARG:NH1	2.35	0.42
1:A:203:ASN:ND2	1:A:206:LYS:HG3	2.35	0.41
1:D:115:PRO:HG2	1:F:95:LEU:CD2	2.50	0.41
1:D:205:ARG:HG3	1:D:205:ARG:HH11	1.83	0.41
1:A:10:LYS:HA	1:A:13:ASP:OD2	2.20	0.41
1:F:140:ASN:HB3	1:F:204:TYR:OH	2.20	0.41
1:C:29:GLU:HG2	1:C:211:ILE:HD11	2.02	0.41
1:F:19:ASN:OD1	1:F:19:ASN:N	2.51	0.41
1:A:157:LEU:C	1:A:157:LEU:HD23	2.40	0.41
1:A:113:PHE:CE2	1:A:122:VAL:HG13	2.55	0.41
1:F:40:VAL:HG22	1:F:110:THR:CG2	2.50	0.41
1:F:90:HIS:ND1	1:F:101:ASP:OD2	2.45	0.41
1:C:95:LEU:HD11	1:C:129:ALA:CB	2.50	0.41
1:D:4:ILE:HG13	1:D:127:ALA:CA	2.51	0.41
1:D:219:VAL:O	1:D:220:SER:HB3	2.20	0.41
1:A:52:LYS:O	1:A:56:GLU:HG3	2.19	0.41
1:C:4:ILE:HG13	1:C:127:ALA:HA	2.03	0.41
1:B:147:LYS:O	1:B:155:VAL:HG11	2.21	0.41
1:C:205:ARG:HG3	1:C:205:ARG:NH1	2.35	0.41
1:E:176:VAL:CG1	1:E:177:GLN:H	2.27	0.41
1:B:24:ARG:HG2	1:B:28:LYS:HE3	2.02	0.41
1:A:128:GLU:HG2	1:E:62:ALA:HB2	2.03	0.41
1:C:50:TYR:OH	1:D:75:ASN:ND2	2.53	0.41
1:E:164:GLN:HA	1:E:167:ARG:HE	1.86	0.41
1:A:5:LEU:CD1	1:A:7:ILE:HD11	2.51	0.41
1:F:6:LYS:HE3	1:F:119:THR:OG1	2.20	0.41
1:B:185:ASP:CB	1:B:186:PRO:CD	2.98	0.41
1:B:206:LYS:CD	1:B:209:ARG:HH21	2.34	0.41
1:B:187:LEU:O	1:B:191:ILE:HG12	2.21	0.41
1:E:187:LEU:O	1:E:191:ILE:HG12	2.20	0.41
1:A:50:TYR:OH	1:B:75:ASN:ND2	2.53	0.41
1:A:141:VAL:CG1	1:A:142:ASP:N	2.82	0.41
1:B:30:LEU:HD21	1:B:210:ILE:HG21	2.02	0.40
1:B:147:LYS:HB3	1:B:152:TYR:CD2	2.55	0.40
1:E:140:ASN:H	1:E:140:ASN:HD22	1.67	0.40
1:C:164:GLN:H	1:C:226:VAL:CG2	2.34	0.40
1:A:194:ARG:CD	1:E:61:GLU:HG2	2.51	0.40
1:F:16:ASN:ND2	1:F:18:ASP:OD1	2.55	0.40
1:B:75:ASN:HD22	1:B:75:ASN:HA	1.73	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:167:ARG:O	1:E:171:GLU:HG3	2.21	0.40
1:B:61:GLU:HG2	1:C:194:ARG:NE	2.37	0.40
1:D:100:GLN:O	1:D:103:SER:CB	2.69	0.40
1:F:83:LEU:O	1:F:84:GLN:C	2.59	0.40
1:E:114:GLN:HA	1:E:115:PRO:HD3	1.93	0.40
1:A:168:LYS:HE3	1:A:168:LYS:CA	2.49	0.40
1:F:98:PHE:CG	1:F:126:VAL:HG22	2.57	0.40
1:F:156:LYS:HG2	1:F:157:LEU:N	2.36	0.40
1:B:88:TYR:CE2	1:B:90:HIS:HB3	2.56	0.40
1:E:40:VAL:HG22	1:E:110:THR:CG2	2.52	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	201/226 (89%)	189 (94%)	9 (4%)	3 (2%)	13	9
1	B	210/226 (93%)	199 (95%)	10 (5%)	1 (0%)	34	35
1	C	200/226 (88%)	186 (93%)	12 (6%)	2 (1%)	19	16
1	D	224/226 (99%)	210 (94%)	9 (4%)	5 (2%)	8	4
1	E	217/226 (96%)	209 (96%)	7 (3%)	1 (0%)	34	35
1	F	202/226 (89%)	193 (96%)	7 (4%)	2 (1%)	19	16
All	All	1254/1356 (92%)	1186 (95%)	54 (4%)	14 (1%)	17	14

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	149	PRO
1	D	154	ASP

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Mol	Chain	Res	Type
1	A	169	ILE
1	B	16	ASN
1	C	16	ASN
1	D	85	ASP
1	D	150	ARG
1	A	84	GLN
1	A	204	TYR
1	D	29	GLU
1	E	85	ASP
1	F	85	ASP
1	F	84	GLN
1	C	149	PRO

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	177/192 (92%)	169 (96%)	8 (4%)	34	41
1	B	183/192 (95%)	177 (97%)	6 (3%)	45	56
1	C	176/192 (92%)	169 (96%)	7 (4%)	38	47
1	D	192/192 (100%)	187 (97%)	5 (3%)	54	66
1	E	187/192 (97%)	178 (95%)	9 (5%)	31	37
1	F	176/192 (92%)	165 (94%)	11 (6%)	22	24
All	All	1091/1152 (95%)	1045 (96%)	46 (4%)	36	44

All (46) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	5	LEU
1	A	16	ASN
1	A	66	LEU
1	A	148	ASP
1	A	168	LYS

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Mol	Chain	Res	Type
1	A	202	MET
1	A	203	ASN
1	B	5	LEU
1	B	66	LEU
1	B	140	ASN
1	B	161	LEU
1	B	198	ARG
1	B	202	MET
1	C	1	MET
1	C	5	LEU
1	C	66	LEU
1	C	140	ASN
1	C	165	ASP
1	C	198	ARG
1	C	202	MET
1	D	5	LEU
1	D	66	LEU
1	D	140	ASN
1	D	161	LEU
1	D	198	ARG
1	E	5	LEU
1	E	24	ARG
1	E	25	GLN
1	E	66	LEU
1	E	140	ASN
1	E	154	ASP
1	E	161	LEU
1	E	185	ASP
1	E	224	GLU
1	F	5	LEU
1	F	19	ASN
1	F	24	ARG
1	F	66	LEU
1	F	85	ASP
1	F	103	SER
1	F	140	ASN
1	F	161	LEU
1	F	185	ASP
1	F	202	MET
1	F	224	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (36) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	16	ASN
1	A	33	ASN
1	A	75	ASN
1	A	93	GLN
1	A	114	GLN
1	A	117	GLN
1	A	203	ASN
1	B	16	ASN
1	B	75	ASN
1	B	114	GLN
1	B	117	GLN
1	B	140	ASN
1	C	16	ASN
1	C	33	ASN
1	C	75	ASN
1	C	93	GLN
1	C	114	GLN
1	C	117	GLN
1	C	140	ASN
1	D	16	ASN
1	D	19	ASN
1	D	33	ASN
1	D	75	ASN
1	D	114	GLN
1	D	117	GLN
1	D	140	ASN
1	D	177	GLN
1	E	75	ASN
1	E	114	GLN
1	E	117	GLN
1	E	140	ASN
1	F	33	ASN
1	F	75	ASN
1	F	114	GLN
1	F	117	GLN
1	F	140	ASN

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 carbohydrates in this entry.

5.6 Ligand geometry ⓘ

Of 25 ligands modelled in this entry, 19 are monoatomic - leaving 6 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	U5P	A	227	4	16,22,22	4.65	5 (31%)	21,33,33	3.28	3 (14%)
2	U5P	B	227	-	16,22,22	4.85	5 (31%)	21,33,33	3.21	2 (9%)
2	U5P	C	227	-	16,22,22	4.90	5 (31%)	21,33,33	3.21	2 (9%)
2	U5P	D	227	-	16,22,22	4.58	6 (37%)	21,33,33	3.25	2 (9%)
2	U5P	E	227	-	16,22,22	4.66	5 (31%)	21,33,33	3.27	3 (14%)
2	U5P	F	227	-	16,22,22	4.57	6 (37%)	21,33,33	3.20	2 (9%)

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	U5P	A	227	4	-	0/6/26/26	0/2/2/2
2	U5P	B	227	-	-	0/6/26/26	0/2/2/2
2	U5P	C	227	-	-	0/6/26/26	0/2/2/2
2	U5P	D	227	-	-	0/6/26/26	0/2/2/2
2	U5P	E	227	-	-	0/6/26/26	0/2/2/2
2	U5P	F	227	-	-	0/6/26/26	0/2/2/2

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	227	U5P	O4'-C4'	-3.39	1.37	1.45
2	E	227	U5P	O4'-C4'	-3.29	1.37	1.45
2	B	227	U5P	O4'-C4'	-3.15	1.37	1.45
2	A	227	U5P	O4'-C4'	-3.13	1.37	1.45
2	C	227	U5P	O4'-C4'	-3.03	1.38	1.45
2	F	227	U5P	O4'-C4'	-3.01	1.38	1.45
2	D	227	U5P	P-O5'	-2.04	1.53	1.60
2	F	227	U5P	P-O5'	-2.01	1.53	1.60
2	A	227	U5P	C4-N3	5.32	1.43	1.33
2	D	227	U5P	C4-N3	5.60	1.43	1.33
2	E	227	U5P	C4-N3	5.75	1.43	1.33
2	B	227	U5P	C4-N3	5.78	1.43	1.33
2	F	227	U5P	C4-N3	5.92	1.44	1.33
2	D	227	U5P	O4'-C1'	6.01	1.48	1.41
2	C	227	U5P	C4-N3	6.11	1.44	1.33
2	F	227	U5P	O4'-C1'	6.35	1.49	1.41
2	A	227	U5P	O4'-C1'	6.41	1.49	1.41
2	E	227	U5P	O4'-C1'	6.45	1.49	1.41
2	C	227	U5P	O4'-C1'	7.30	1.50	1.41
2	B	227	U5P	O4'-C1'	7.45	1.50	1.41
2	F	227	U5P	C6-N1	10.11	1.50	1.35
2	E	227	U5P	C6-N1	10.61	1.50	1.35
2	A	227	U5P	C6-N1	10.85	1.51	1.35
2	B	227	U5P	C6-N1	10.88	1.51	1.35
2	D	227	U5P	O4-C4	10.97	1.50	1.24
2	D	227	U5P	C6-N1	10.99	1.51	1.35
2	C	227	U5P	C6-N1	11.10	1.51	1.35
2	F	227	U5P	O4-C4	11.47	1.52	1.24
2	E	227	U5P	O4-C4	11.67	1.52	1.24
2	A	227	U5P	O4-C4	11.74	1.52	1.24
2	B	227	U5P	O4-C4	12.03	1.53	1.24
2	C	227	U5P	O4-C4	12.06	1.53	1.24

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	227	U5P	C4'-O4'-C1'	2.22	112.16	109.72
2	E	227	U5P	C4'-O4'-C1'	2.31	112.26	109.72
2	E	227	U5P	O2'-C2'-C3'	5.25	128.89	111.83
2	F	227	U5P	O2'-C2'-C3'	5.29	129.02	111.83
2	D	227	U5P	O2'-C2'-C3'	5.35	129.22	111.83
2	A	227	U5P	O2'-C2'-C3'	5.41	129.44	111.83
2	C	227	U5P	O2'-C2'-C3'	5.44	129.51	111.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	227	U5P	O2'-C2'-C3'	5.47	129.63	111.83
2	F	227	U5P	C4-N3-C2	12.56	126.58	114.14
2	D	227	U5P	C4-N3-C2	12.67	126.69	114.14
2	B	227	U5P	C4-N3-C2	12.68	126.70	114.14
2	C	227	U5P	C4-N3-C2	12.72	126.73	114.14
2	E	227	U5P	C4-N3-C2	12.79	126.81	114.14
2	A	227	U5P	C4-N3-C2	12.97	126.99	114.14

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	227	U5P	1	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	207/226 (91%)	0.89	35 (16%) 2 2	14, 30, 70, 85	0
1	B	214/226 (94%)	0.59	21 (9%) 10 8	17, 30, 55, 67	0
1	C	206/226 (91%)	0.97	38 (18%) 2 2	17, 31, 67, 88	0
1	D	226/226 (100%)	0.90	38 (16%) 2 2	15, 32, 65, 73	0
1	E	221/226 (97%)	0.83	31 (14%) 4 3	14, 28, 66, 72	0
1	F	208/226 (92%)	0.78	28 (13%) 4 4	14, 27, 58, 76	0
All	All	1282/1356 (94%)	0.83	191 (14%) 3 3	14, 30, 64, 88	0

All (191) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	226	VAL	9.0
1	C	151	ILE	7.9
1	F	181	TYR	7.7
1	C	164	GLN	7.5
1	C	152	TYR	6.9
1	D	152	TYR	6.6
1	C	150	ARG	6.6
1	A	170	LEU	6.4
1	E	173	SER	6.4
1	A	226	VAL	5.9
1	E	176	VAL	5.8
1	C	147	LYS	5.8
1	E	32	ASP	5.8
1	B	15	ASP	5.7
1	D	170	LEU	5.6
1	F	217	GLU	5.6
1	D	15	ASP	5.6
1	C	148	ASP	5.6
1	B	164	GLN	5.3

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Mol	Chain	Res	Type	RSRZ
1	D	32	ASP	5.3
1	A	150	ARG	5.3
1	C	149	PRO	5.2
1	D	226	VAL	5.2
1	E	154	ASP	5.1
1	F	15	ASP	5.1
1	B	14	GLU	5.0
1	C	15	ASP	5.0
1	A	169	ILE	5.0
1	F	1	MET	4.9
1	A	33	ASN	4.9
1	A	203	ASN	4.9
1	E	153	ALA	4.9
1	D	154	ASP	4.9
1	A	147	LYS	4.8
1	E	172	GLY	4.8
1	D	85	ASP	4.7
1	E	15	ASP	4.7
1	A	164	GLN	4.6
1	A	167	ARG	4.6
1	B	32	ASP	4.6
1	F	169	ILE	4.6
1	B	150	ARG	4.5
1	C	1	MET	4.5
1	C	14	GLU	4.5
1	A	15	ASP	4.5
1	D	151	ILE	4.4
1	C	225	PRO	4.3
1	D	153	ALA	4.3
1	C	146	GLU	4.3
1	C	13	ASP	4.2
1	C	158	ILE	4.2
1	F	33	ASN	4.2
1	D	150	ARG	4.1
1	A	148	ASP	4.1
1	A	85	ASP	4.1
1	C	166	LEU	4.0
1	B	31	ALA	3.9
1	A	25	GLN	3.9
1	A	32	ASP	3.8
1	E	156	LYS	3.8
1	E	174	GLN	3.8

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Mol	Chain	Res	Type	RSRZ
1	F	226	VAL	3.8
1	F	179	GLY	3.8
1	D	31	ALA	3.7
1	A	152	TYR	3.7
1	D	181	TYR	3.7
1	C	85	ASP	3.6
1	E	168	LYS	3.6
1	D	172	GLY	3.6
1	C	136	VAL	3.6
1	E	223	ILE	3.6
1	D	155	VAL	3.6
1	E	29	GLU	3.6
1	E	175	SER	3.5
1	A	218	GLU	3.5
1	A	149	PRO	3.5
1	A	153	ALA	3.5
1	A	209	ARG	3.5
1	D	217	GLU	3.5
1	D	149	PRO	3.5
1	D	17	VAL	3.4
1	A	145	TYR	3.4
1	F	32	ASP	3.3
1	B	154	ASP	3.3
1	C	217	GLU	3.3
1	E	171	GLU	3.3
1	B	168	LYS	3.3
1	A	141	VAL	3.3
1	B	1	MET	3.3
1	F	199	VAL	3.3
1	D	171	GLU	3.2
1	A	140	ASN	3.2
1	E	147	LYS	3.2
1	A	151	ILE	3.1
1	B	85	ASP	3.1
1	B	217	GLU	3.1
1	F	184	LEU	3.1
1	E	33	ASN	3.1
1	E	155	VAL	3.1
1	E	34	GLY	3.0
1	B	226	VAL	3.0
1	C	140	ASN	3.0
1	F	34	GLY	3.0

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Mol	Chain	Res	Type	RSRZ
1	D	21	ILE	3.0
1	A	155	VAL	3.0
1	E	22	VAL	3.0
1	E	150	ARG	3.0
1	D	212	ASP	2.9
1	A	146	GLU	2.9
1	E	85	ASP	2.9
1	D	20	LEU	2.9
1	A	168	LYS	2.8
1	C	167	ARG	2.8
1	F	178	ALA	2.8
1	E	217	GLU	2.8
1	D	174	GLN	2.8
1	C	186	PRO	2.8
1	F	209	ARG	2.8
1	D	33	ASN	2.7
1	C	185	ASP	2.7
1	B	182	GLU	2.7
1	C	118	SER	2.7
1	B	156	LYS	2.7
1	E	226	VAL	2.7
1	A	165	ASP	2.6
1	B	10	LYS	2.6
1	D	16	ASN	2.6
1	F	28	LYS	2.6
1	D	35	PHE	2.6
1	D	29	GLU	2.6
1	F	18	ASP	2.6
1	F	35	PHE	2.6
1	F	218	GLU	2.6
1	A	210	ILE	2.6
1	C	31	ALA	2.6
1	E	205	ARG	2.5
1	C	184	LEU	2.5
1	F	223	ILE	2.5
1	D	173	SER	2.5
1	C	133	LYS	2.5
1	A	185	ASP	2.5
1	A	166	LEU	2.5
1	C	32	ASP	2.5
1	D	34	GLY	2.4
1	B	225	PRO	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	154	ASP	2.4
1	C	183	LEU	2.4
1	E	200	ILE	2.4
1	F	168	LYS	2.4
1	B	165	ASP	2.4
1	E	181	TYR	2.3
1	B	169	ILE	2.3
1	C	17	VAL	2.3
1	F	133	LYS	2.3
1	C	214	LEU	2.3
1	F	135	LEU	2.3
1	C	224	GLU	2.3
1	D	169	ILE	2.3
1	F	140	ASN	2.3
1	D	24	ARG	2.3
1	E	136	VAL	2.2
1	F	215	LYS	2.2
1	F	30	LEU	2.2
1	E	199	VAL	2.2
1	A	10	LYS	2.2
1	D	223	ILE	2.2
1	F	85	ASP	2.2
1	B	215	LYS	2.2
1	E	27	ILE	2.2
1	C	209	ARG	2.2
1	D	156	LYS	2.2
1	D	184	LEU	2.2
1	E	30	LEU	2.2
1	C	163	THR	2.2
1	D	25	GLN	2.1
1	F	222	ILE	2.1
1	C	162	THR	2.1
1	C	218	GLU	2.1
1	A	205	ARG	2.1
1	B	209	ARG	2.1
1	D	23	LEU	2.1
1	C	215	LYS	2.1
1	D	147	LYS	2.1
1	D	160	HIS	2.1
1	F	200	ILE	2.1
1	A	29	GLU	2.0
1	E	201	VAL	2.0

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Mol	Chain	Res	Type	RSRZ
1	A	13	ASP	2.0
1	B	136	VAL	2.0
1	D	22	VAL	2.0
1	C	145	TYR	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
2	U5P	C	227	21/21	0.76	0.28	3.34	48,59,60,61	0
2	U5P	B	227	21/21	0.87	0.19	2.57	30,43,47,49	0
2	U5P	A	227	21/21	0.91	0.16	1.31	26,32,37,39	0
2	U5P	E	227	21/21	0.93	0.13	0.07	22,26,29,30	0
2	U5P	F	227	21/21	0.96	0.12	-0.57	18,23,28,32	0
2	U5P	D	227	21/21	0.95	0.11	-1.29	13,23,28,29	0
3	CD	B	228	1/1	1.00	0.09	-2.54	23,23,23,23	0
3	CD	A	228	1/1	1.00	0.09	-4.02	27,27,27,27	0
3	CD	A	229	1/1	0.99	0.05	-	43,43,43,43	0
3	CD	B	234	1/1	0.96	0.07	-	61,61,61,61	1
3	CD	B	233	1/1	0.99	0.04	-	45,45,45,45	0
3	CD	C	231	1/1	0.94	0.08	-	56,56,56,56	1
3	CD	C	228	1/1	0.98	0.05	-	49,49,49,49	0
3	CD	D	228	1/1	0.99	0.03	-	41,41,41,41	0
3	CD	B	229	1/1	0.99	0.04	-	46,46,46,46	0
3	CD	C	229	1/1	0.97	0.04	-	78,78,78,78	0
3	CD	E	229	1/1	0.98	0.07	-	47,47,47,47	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
3	CD	B	232	1/1	0.80	0.08	-	131,131,131,131	0
3	CD	F	228	1/1	0.99	0.04	-	38,38,38,38	0
3	CD	A	230	1/1	0.92	0.03	-	102,102,102,102	0
3	CD	B	230	1/1	0.96	0.07	-	78,78,78,78	0
4	MG	A	231	1/1	0.91	0.17	-	33,33,33,33	0
3	CD	B	231	1/1	0.97	0.04	-	80,80,80,80	0
3	CD	E	228	1/1	0.99	0.04	-	42,42,42,42	0
3	CD	F	229	1/1	0.98	0.06	-	52,52,52,52	0

6.5 Other polymers [i](#)

There are no such residues in this entry.