Full wwPDB X-ray Structure Validation Report (i)

Feb 1, 2016 – 08:00 AM GMT

PDB ID	:	3CTL
Title	:	Crystal structure of D-Allulose 6-Phosphate 3-Epimerase from Escherichia coli K12 complexed with D-glucitol 6-phosphate and magnesium
Authors	:	Fedorov, A.A.; Fedorov, E.V.; Chan, K.K.; Gerlt, J.A.; Almo, S.C.
Deposited on	:	2008-04-14
Resolution	:	2.20 Å(reported)

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

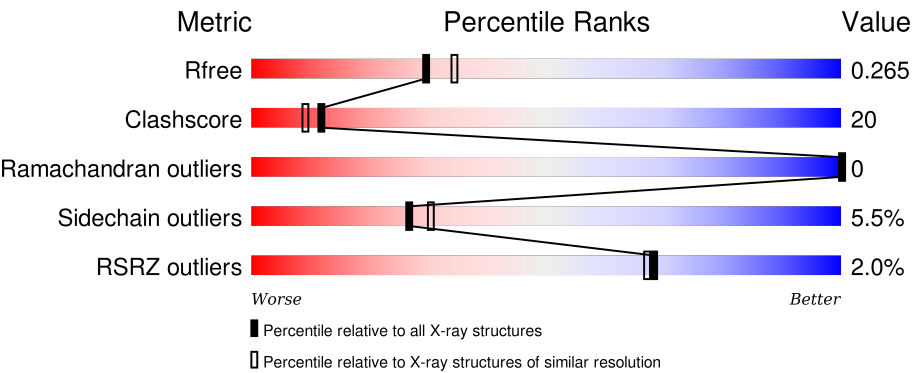|		
MolProbity	:	4.02b-467
Mogul	:	1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20026688
Percentile statistics	:	20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, 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	Percentile Ranks	Value
Rfree		0.265
Clashscore		20
Ramachandran outliers		0
Sidechain outliers		5.5%
RSRZ outliers		2.0%

Worse   *Better*

■ Percentile relative to all X-ray structures
▯ Percentile relative to X-ray structures of similar resolution

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 <=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	231	% 65% 26% • 5%
1	B	231	% 58% 33% • 5%
1	C	231	% 65% 26% • 5%
1	D	231	3% 63% 29% • 5%
1	E	231	3% 65% 27% • 5%

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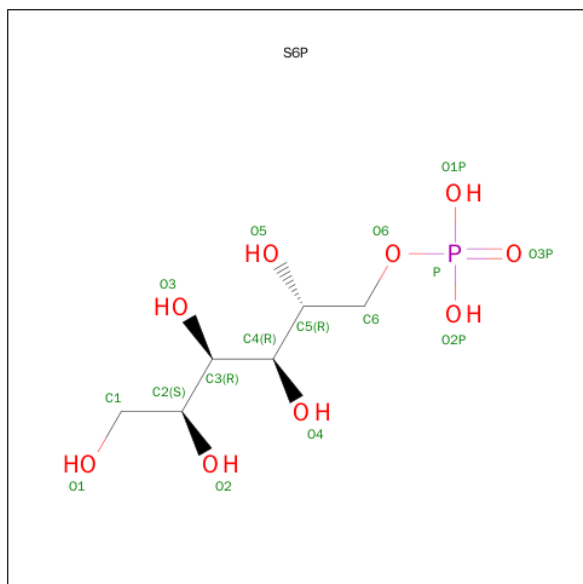| Mol	Chain	Length	Quality of chain
1	F	231	

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 10740 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 D-allulose-6-phosphate 3-epimerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	219	Total	C	N	O	S	0	0	0
			1744	1121	288	321	14			
1	B	219	Total	C	N	O	S	0	0	0
			1744	1121	288	321	14			
1	C	219	Total	C	N	O	S	0	0	0
			1744	1121	288	321	14			
1	D	219	Total	C	N	O	S	0	0	0
			1744	1121	288	321	14			
1	E	219	Total	C	N	O	S	0	0	0
			1744	1121	288	321	14			
1	F	219	Total	C	N	O	S	0	0	0
			1744	1121	288	321	14			

- Molecule 2 is SUGAR (D-SORBITOL-6-PHOSPHATE) (three-letter code: S6P) (formula: $C_6H_{15}O_9P$).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total 16	C 6	O 9	P 1	0	0
2	B	1	Total 16	C 6	O 9	P 1	0	0
2	C	1	Total 16	C 6	O 9	P 1	0	0
2	D	1	Total 16	C 6	O 9	P 1	0	0
2	E	1	Total 16	C 6	O 9	P 1	0	0
2	F	1	Total 16	C 6	O 9	P 1	0	0

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	31	Total 31	O 31	0	0
4	B	23	Total 23	O 23	0	0
4	C	42	Total 42	O 42	0	0
4	D	20	Total 20	O 20	0	0
4	E	25	Total 25	O 25	0	0
4	F	33	Total 33	O 33	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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: D-allulose-6-phosphate 3-epimerase
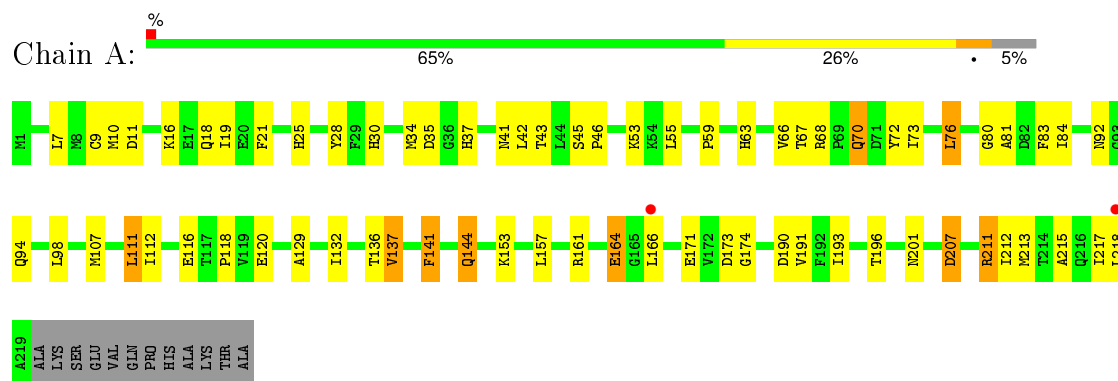
- Molecule 1: D-allulose-6-phosphate 3-epimerase

- Molecule 1: D-allulose-6-phosphate 3-epimerase

• Molecule 1: D-allulose-6-phosphate 3-epimerase

Chain D:

• Molecule 1: D-allulose-6-phosphate 3-epimerase

Chain E:

• Molecule 1: D-allulose-6-phosphate 3-epimerase

Chain F:
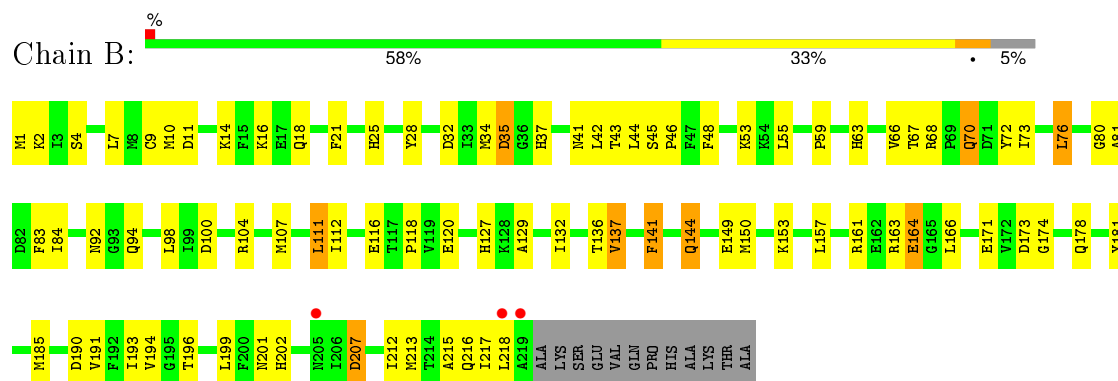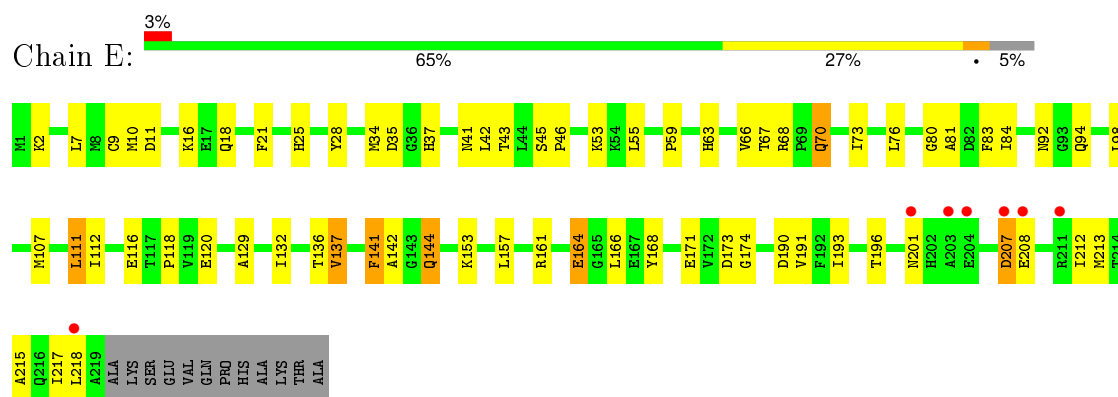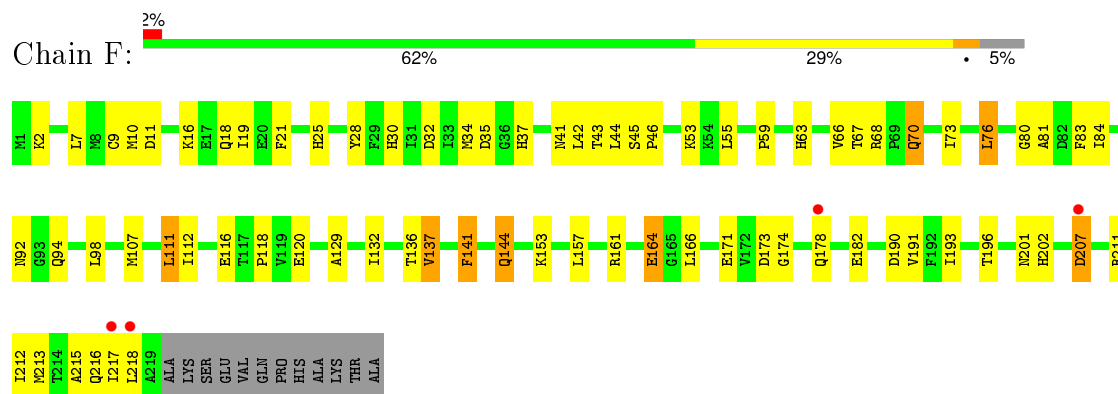
4 Data and refinement statistics (i)

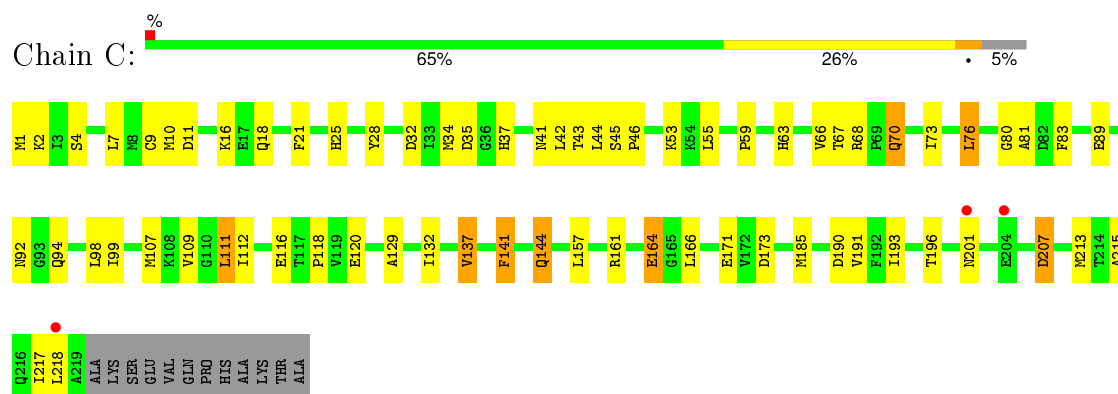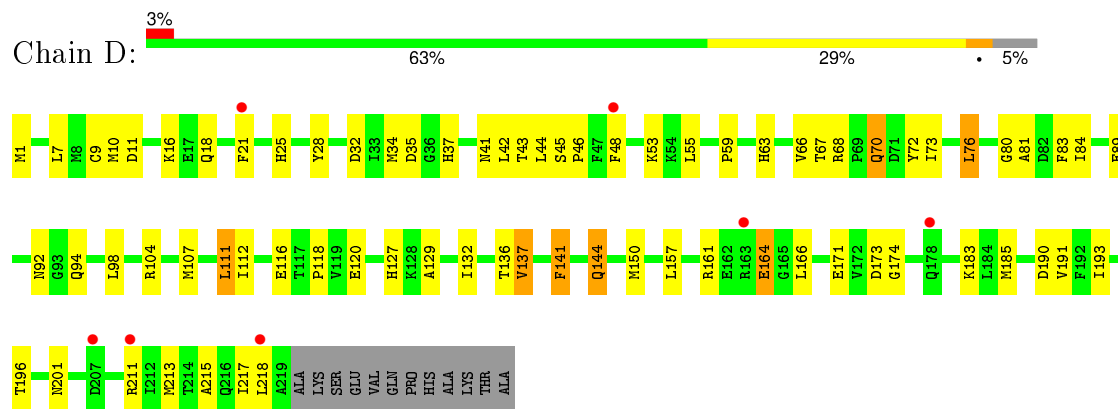| Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	75.71Å 129.04Å 154.87Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	24.96 – 2.20 37.40 – 2.20	Depositor EDS
% Data completeness (in resolution range)	96.5 (24.96-2.20) 96.4 (37.40-2.20)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.31 (at 2.20Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.243 , 0.265 0.243 , 0.265	Depositor DCC
R_{free} test set	3777 reflections (5.04%)	DCC
Wilson B-factor (Å^2)	34.8	Xtriage
Anisotropy	0.328	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 35.0	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning[2]	$<|L|> = 0.50$, $<L^2> = 0.33$	Xtriage
Outliers	1 of 75065 reflections (0.001%)	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	10740	wwPDB-VP
Average B, all atoms (Å^2)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.05% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1] Intensities estimated from amplitudes.
[2] Theoretical values of $<|L|>$, $<L^2>$ 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, S6P

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	0.37	0/1784	0.65	0/2414
1	B	0.37	0/1784	0.65	0/2414
1	C	0.38	0/1784	0.66	0/2414
1	D	0.37	0/1784	0.65	0/2414
1	E	0.37	0/1784	0.65	0/2414
1	F	0.37	0/1784	0.65	0/2414
All	All	0.37	0/10704	0.65	0/14484

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	1744	0	1737	74	0
1	B	1744	0	1737	79	0
1	C	1744	0	1737	70	0
1	D	1744	0	1737	74	0
1	E	1744	0	1737	70	0
1	F	1744	0	1737	73	0
2	A	16	0	12	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	16	0	12	1	0
2	C	16	0	12	1	0
2	D	16	0	12	1	0
2	E	16	0	12	2	0
2	F	16	0	12	1	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	31	0	0	4	0
4	B	23	0	0	4	0
4	C	42	0	0	3	0
4	D	20	0	0	3	0
4	E	25	0	0	2	0
4	F	33	0	0	2	0
All	All	10740	0	10494	424	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 20.

All (424) 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:B:127:HIS:HD2	4:B:619:HOH:O	1.37	1.06
1:B:68:ARG:HA	1:B:70:GLN:HE22	1.42	0.84
1:B:7:LEU:HD22	1:B:10:MET:HE2	1.58	0.84
1:D:7:LEU:HD22	1:D:10:MET:HE1	1.61	0.83
1:B:34:MET:HE1	1:B:43:THR:HG23	1.61	0.82
1:D:68:ARG:HA	1:D:70:GLN:HE22	1.44	0.82
1:C:68:ARG:HA	1:C:70:GLN:HE22	1.45	0.82
1:A:68:ARG:HA	1:A:70:GLN:HE22	1.45	0.82
1:E:68:ARG:HA	1:E:70:GLN:HE22	1.44	0.81
1:B:14:LYS:HE3	4:B:617:HOH:O	1.81	0.80
1:E:34:MET:HE1	1:E:43:THR:HG23	1.62	0.80
1:F:68:ARG:HA	1:F:70:GLN:HE22	1.46	0.80
1:C:7:LEU:HD22	1:C:10:MET:HE1	1.65	0.79
1:F:34:MET:HE1	1:F:43:THR:HG23	1.64	0.79
1:A:196:THR:HG22	4:A:615:HOH:O	1.81	0.78
1:A:211:ARG:HB3	1:A:211:ARG:HH11	1.50	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:7:LEU:HB3	1:B:10:MET:HE3	1.68	0.74
1:D:53:LYS:HG3	1:D:80:GLY:HA3	1.71	0.73
1:A:34:MET:HE1	1:A:43:THR:HG23	1.71	0.73
1:C:7:LEU:HB3	1:C:10:MET:HE2	1.70	0.72
1:C:34:MET:HE1	1:C:43:THR:HG23	1.71	0.72
1:F:53:LYS:HG3	1:F:80:GLY:HA3	1.70	0.72
1:D:34:MET:HE1	1:D:43:THR:HG23	1.71	0.71
1:C:53:LYS:HE2	4:C:620:HOH:O	1.89	0.71
1:F:34:MET:CE	1:F:43:THR:HG23	2.21	0.71
1:D:7:LEU:HB3	1:D:10:MET:HE2	1.73	0.70
1:F:70:GLN:NE2	1:F:70:GLN:H	1.90	0.70
1:C:70:GLN:H	1:C:70:GLN:NE2	1.88	0.70
1:E:70:GLN:NE2	1:E:70:GLN:H	1.89	0.70
1:B:70:GLN:H	1:B:70:GLN:NE2	1.90	0.70
1:E:7:LEU:HD22	1:E:10:MET:HE1	1.73	0.69
1:D:70:GLN:H	1:D:70:GLN:NE2	1.90	0.69
1:E:53:LYS:HG3	1:E:80:GLY:HA3	1.74	0.69
1:A:70:GLN:NE2	1:A:70:GLN:H	1.91	0.69
1:A:28:TYR:HD1	1:A:59:PRO:HG2	1.57	0.69
1:B:53:LYS:HG3	1:B:80:GLY:HA3	1.74	0.69
1:C:34:MET:CE	1:C:43:THR:HG23	2.24	0.68
1:E:168:TYR:HD2	4:E:635:HOH:O	1.75	0.68
1:C:111:LEU:HD22	1:C:129:ALA:HB2	1.76	0.68
1:B:111:LEU:HD22	1:B:129:ALA:HB2	1.76	0.68
1:D:28:TYR:HD1	1:D:59:PRO:HG2	1.59	0.68
1:A:111:LEU:HD22	1:A:129:ALA:HB2	1.75	0.68
1:C:53:LYS:HG3	1:C:80:GLY:HA3	1.75	0.68
1:A:7:LEU:HD22	1:A:10:MET:HE1	1.77	0.67
1:E:111:LEU:HD22	1:E:129:ALA:HB2	1.76	0.67
1:B:28:TYR:HD1	1:B:59:PRO:HG2	1.58	0.67
1:F:28:TYR:HD1	1:F:59:PRO:HG2	1.60	0.67
1:F:7:LEU:HD22	1:F:10:MET:HE1	1.75	0.67
1:A:30:HIS:HE1	4:A:612:HOH:O	1.76	0.67
1:B:34:MET:CE	1:B:43:THR:HG23	2.24	0.66
1:E:34:MET:CE	1:E:43:THR:HG23	2.25	0.66
1:E:63:HIS:CE1	1:E:112:ILE:HD13	2.30	0.66
1:E:7:LEU:HB3	1:E:10:MET:HE2	1.78	0.66
1:D:7:LEU:HD22	1:D:10:MET:CE	2.25	0.66
1:F:7:LEU:HB3	1:F:10:MET:HE2	1.77	0.65
1:A:34:MET:CE	1:A:43:THR:HG23	2.26	0.65
1:F:111:LEU:HD22	1:F:129:ALA:HB2	1.77	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:53:LYS:HG3	1:A:80:GLY:HA3	1.77	0.65
1:E:7:LEU:HD22	1:E:10:MET:CE	2.26	0.65
1:D:34:MET:CE	1:D:43:THR:HG23	2.26	0.64
1:D:211:ARG:HH11	1:D:211:ARG:HB3	1.61	0.64
1:A:7:LEU:HD22	1:A:10:MET:CE	2.27	0.64
1:A:7:LEU:HB3	1:A:10:MET:HE2	1.80	0.64
1:C:28:TYR:HD1	1:C:59:PRO:HG2	1.63	0.63
1:D:111:LEU:HD22	1:D:129:ALA:HB2	1.78	0.63
1:C:137:VAL:HG22	1:C:144:GLN:HB3	1.81	0.63
1:E:70:GLN:H	1:E:70:GLN:HE21	1.47	0.63
1:F:63:HIS:CE1	1:F:112:ILE:HD13	2.34	0.63
1:E:81:ALA:HB3	1:E:107:MET:HE1	1.81	0.63
1:C:70:GLN:H	1:C:70:GLN:HE21	1.46	0.62
1:F:34:MET:HE3	1:F:41:ASN:C	2.19	0.62
1:C:7:LEU:HD22	1:C:10:MET:CE	2.28	0.62
1:D:70:GLN:H	1:D:70:GLN:HE21	1.46	0.62
1:F:137:VAL:HG22	1:F:144:GLN:HB3	1.80	0.62
1:F:7:LEU:HD22	1:F:10:MET:CE	2.29	0.62
1:E:137:VAL:HG22	1:E:144:GLN:HB3	1.80	0.62
1:D:137:VAL:HG22	1:D:144:GLN:HB3	1.82	0.62
1:E:28:TYR:HD1	1:E:59:PRO:HG2	1.65	0.62
1:B:137:VAL:HG22	1:B:144:GLN:HB3	1.82	0.62
1:B:7:LEU:HD22	1:B:10:MET:CE	2.28	0.62
1:D:63:HIS:CE1	1:D:112:ILE:HD13	2.35	0.61
1:B:63:HIS:CE1	1:B:112:ILE:HD13	2.35	0.61
1:D:34:MET:HE3	1:D:41:ASN:C	2.20	0.61
1:E:34:MET:HE3	1:E:41:ASN:C	2.20	0.61
1:C:7:LEU:O	1:C:10:MET:HG2	2.00	0.61
1:F:70:GLN:HE21	1:F:70:GLN:H	1.48	0.60
1:A:34:MET:HE3	1:A:41:ASN:C	2.20	0.60
1:A:137:VAL:HG22	1:A:144:GLN:HB3	1.81	0.60
1:C:34:MET:HE3	1:C:41:ASN:C	2.22	0.60
1:D:53:LYS:HE2	4:D:611:HOH:O	2.02	0.59
1:B:81:ALA:C	1:B:107:MET:HE3	2.23	0.59
1:D:81:ALA:C	1:D:107:MET:HE3	2.22	0.59
1:B:34:MET:HE3	1:B:41:ASN:C	2.23	0.59
1:E:73:ILE:HD12	1:E:98:LEU:HD22	1.85	0.59
1:A:81:ALA:C	1:A:107:MET:HE3	2.23	0.59
1:F:35:ASP:HB3	1:F:37:HIS:H	1.67	0.59
1:B:35:ASP:HB3	1:B:37:HIS:H	1.68	0.59
1:D:7:LEU:O	1:D:10:MET:HG2	2.03	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:7:LEU:O	1:E:10:MET:HG2	2.03	0.58
1:F:7:LEU:O	1:F:10:MET:HG2	2.03	0.58
1:E:35:ASP:HB3	1:E:37:HIS:H	1.68	0.58
1:F:73:ILE:HD12	1:F:98:LEU:HD22	1.86	0.58
1:B:70:GLN:H	1:B:70:GLN:HE21	1.51	0.58
1:A:70:GLN:HE21	1:A:70:GLN:H	1.50	0.58
1:A:7:LEU:O	1:A:10:MET:HG2	2.03	0.58
1:A:63:HIS:CE1	1:A:112:ILE:HD13	2.38	0.58
1:E:81:ALA:C	1:E:107:MET:HE3	2.24	0.58
1:B:81:ALA:HB3	1:B:107:MET:HE1	1.84	0.58
1:D:35:ASP:HB2	1:D:66:VAL:HA	1.86	0.58
1:B:7:LEU:O	1:B:10:MET:HG2	2.03	0.58
1:C:63:HIS:CE1	1:C:112:ILE:HD13	2.38	0.57
1:A:70:GLN:CG	1:A:94:GLN:OE1	2.52	0.57
1:C:81:ALA:C	1:C:107:MET:HE3	2.25	0.57
1:E:118:PRO:HB2	1:E:120:GLU:OE1	2.04	0.57
1:F:81:ALA:C	1:F:107:MET:HE3	2.25	0.57
1:F:211:ARG:NH1	1:F:211:ARG:HB3	2.20	0.57
1:A:35:ASP:HB3	1:A:37:HIS:H	1.70	0.57
1:C:35:ASP:HB3	1:C:37:HIS:H	1.69	0.56
1:F:70:GLN:CG	1:F:94:GLN:OE1	2.53	0.56
1:C:173:ASP:OD2	2:C:503:S6P:H3	2.05	0.56
1:A:70:GLN:HG2	1:A:94:GLN:OE1	2.05	0.56
1:E:67:THR:HG22	1:E:68:ARG:HG3	1.87	0.56
1:D:53:LYS:CE	4:D:611:HOH:O	2.54	0.56
1:D:183:LYS:HG3	4:D:607:HOH:O	2.06	0.55
1:B:67:THR:HG22	1:B:68:ARG:HG3	1.88	0.55
1:C:11:ASP:H	1:C:18:GLN:HE22	1.54	0.55
1:F:213:MET:O	1:F:217:ILE:HG12	2.07	0.55
1:D:118:PRO:HB2	1:D:120:GLU:OE1	2.06	0.55
1:A:173:ASP:OD2	2:A:501:S6P:H3	2.06	0.55
1:D:68:ARG:CA	1:D:70:GLN:HE22	2.18	0.55
1:D:35:ASP:HB3	1:D:37:HIS:H	1.70	0.55
1:E:70:GLN:CG	1:E:94:GLN:OE1	2.55	0.55
1:A:30:HIS:CE1	4:A:612:HOH:O	2.54	0.55
1:D:211:ARG:HB3	1:D:211:ARG:NH1	2.21	0.54
1:B:173:ASP:OD2	2:B:502:S6P:H3	2.07	0.54
1:D:213:MET:O	1:D:217:ILE:HG12	2.07	0.54
1:A:213:MET:O	1:A:217:ILE:HG12	2.07	0.54
1:B:116:GLU:HG3	1:D:92:ASN:HA	1.89	0.54
1:B:118:PRO:HB2	1:B:120:GLU:OE1	2.08	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:73:ILE:HD12	1:D:98:LEU:HD22	1.88	0.54
1:B:35:ASP:HB2	1:B:66:VAL:HA	1.88	0.54
1:A:118:PRO:HB2	1:A:120:GLU:OE1	2.06	0.54
1:C:35:ASP:HB2	1:C:66:VAL:HA	1.90	0.54
1:C:118:PRO:HB2	1:C:120:GLU:OE1	2.07	0.54
1:D:70:GLN:CG	1:D:94:GLN:OE1	2.56	0.53
1:F:70:GLN:HG2	1:F:94:GLN:OE1	2.08	0.53
1:D:81:ALA:O	1:D:107:MET:HE3	2.09	0.53
1:F:182:GLU:HB3	4:F:622:HOH:O	2.09	0.53
1:F:81:ALA:HB3	1:F:107:MET:HE1	1.90	0.53
1:E:70:GLN:HG2	1:E:94:GLN:OE1	2.08	0.53
1:A:35:ASP:HB2	1:A:66:VAL:HA	1.90	0.53
1:E:213:MET:O	1:E:217:ILE:HG12	2.08	0.53
1:F:67:THR:HG22	1:F:68:ARG:HG3	1.91	0.53
1:D:81:ALA:HB3	1:D:107:MET:CE	2.39	0.53
1:B:28:TYR:CD1	1:B:59:PRO:HG2	2.43	0.52
1:A:81:ALA:HB3	1:A:107:MET:HE1	1.90	0.52
1:C:213:MET:O	1:C:217:ILE:HG12	2.10	0.52
1:F:9:CYS:SG	1:F:196:THR:HG23	2.49	0.52
1:C:116:GLU:H	1:C:116:GLU:CD	2.13	0.52
1:C:67:THR:HG22	1:C:68:ARG:HG3	1.91	0.52
1:A:67:THR:HG22	1:A:68:ARG:HG3	1.92	0.52
1:E:68:ARG:CA	1:E:70:GLN:HE22	2.18	0.52
1:E:92:ASN:HA	1:F:116:GLU:HG3	1.92	0.52
1:A:173:ASP:HB2	1:A:193:ILE:HD12	1.92	0.52
1:D:173:ASP:HB2	1:D:193:ILE:HD12	1.92	0.52
1:F:118:PRO:HB2	1:F:120:GLU:OE1	2.08	0.52
1:C:68:ARG:CA	1:C:70:GLN:HE22	2.19	0.52
1:A:116:GLU:H	1:A:116:GLU:CD	2.13	0.52
1:D:173:ASP:OD2	2:D:504:S6P:H3	2.09	0.52
1:E:171:GLU:HG3	1:E:191:VAL:HB	1.92	0.52
1:F:68:ARG:CA	1:F:70:GLN:HE22	2.20	0.51
1:E:11:ASP:H	1:E:18:GLN:HE22	1.57	0.51
1:F:35:ASP:HB2	1:F:66:VAL:HA	1.92	0.51
1:B:213:MET:O	1:B:217:ILE:HG12	2.10	0.51
1:B:171:GLU:HG3	1:B:191:VAL:HB	1.92	0.51
1:C:171:GLU:HG3	1:C:191:VAL:HB	1.93	0.51
1:F:45:SER:HB2	1:F:46:PRO:CD	2.41	0.51
1:A:171:GLU:HG3	1:A:191:VAL:HB	1.93	0.51
1:E:173:ASP:HB2	1:E:193:ILE:HD12	1.93	0.51
1:F:171:GLU:HG3	1:F:191:VAL:HB	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:70:GLN:HG2	1:D:94:GLN:OE1	2.10	0.51
1:B:196:THR:O	1:B:201:ASN:HB2	2.09	0.51
1:D:196:THR:O	1:D:201:ASN:HB2	2.11	0.51
1:A:28:TYR:CD1	1:A:59:PRO:HG2	2.42	0.51
1:F:141:PHE:N	1:F:141:PHE:CD1	2.79	0.51
1:F:45:SER:HB2	1:F:46:PRO:HD2	1.92	0.51
1:B:16:LYS:HG3	1:B:55:LEU:HD21	1.92	0.51
1:B:73:ILE:HD12	1:B:98:LEU:HD22	1.93	0.51
1:B:127:HIS:CD2	4:B:619:HOH:O	2.27	0.51
1:D:11:ASP:H	1:D:18:GLN:HE22	1.59	0.51
1:B:173:ASP:HB2	1:B:193:ILE:HD12	1.91	0.51
1:E:116:GLU:CD	1:E:116:GLU:H	2.14	0.51
1:E:81:ALA:HB3	1:E:107:MET:CE	2.41	0.51
1:C:92:ASN:HA	1:D:116:GLU:HG3	1.93	0.51
1:C:73:ILE:HD12	1:C:98:LEU:HD22	1.93	0.51
1:D:67:THR:HG22	1:D:68:ARG:HG3	1.92	0.50
1:C:173:ASP:HB2	1:C:193:ILE:HD12	1.94	0.50
1:F:196:THR:O	1:F:201:ASN:HB2	2.11	0.50
1:E:53:LYS:CG	1:E:80:GLY:HA3	2.41	0.50
1:B:81:ALA:HB3	1:B:107:MET:CE	2.41	0.50
1:E:196:THR:O	1:E:201:ASN:HB2	2.11	0.50
1:C:164:GLU:HB3	1:C:166:LEU:HG	1.93	0.50
1:E:164:GLU:HB3	1:E:166:LEU:HG	1.93	0.50
1:D:45:SER:HB2	1:D:46:PRO:CD	2.42	0.50
1:F:173:ASP:HB2	1:F:193:ILE:HD12	1.92	0.50
1:A:16:LYS:HG3	1:A:55:LEU:HD21	1.93	0.50
1:E:45:SER:HB2	1:E:46:PRO:HD2	1.94	0.50
1:A:141:PHE:CD1	1:A:141:PHE:N	2.80	0.50
1:B:81:ALA:O	1:B:107:MET:HE3	2.12	0.50
1:B:116:GLU:CD	1:B:116:GLU:H	2.15	0.50
1:D:44:LEU:HD13	1:D:48:PHE:CD2	2.47	0.50
1:C:137:VAL:CG2	1:C:144:GLN:HB3	2.41	0.50
1:A:137:VAL:CG2	1:A:144:GLN:HB3	2.42	0.50
1:C:196:THR:O	1:C:201:ASN:HB2	2.11	0.50
1:A:196:THR:O	1:A:201:ASN:HB2	2.12	0.49
1:E:141:PHE:HB2	1:E:144:GLN:OE1	2.12	0.49
1:E:137:VAL:CG2	1:E:144:GLN:HB3	2.42	0.49
1:E:45:SER:HB2	1:E:46:PRO:CD	2.42	0.49
1:A:116:GLU:HG3	1:F:92:ASN:HA	1.93	0.49
1:B:164:GLU:HB3	1:B:166:LEU:HG	1.94	0.49
1:B:68:ARG:CA	1:B:70:GLN:HE22	2.17	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:11:ASP:H	1:B:18:GLN:HE22	1.60	0.49
1:D:28:TYR:CD1	1:D:59:PRO:HG2	2.44	0.49
1:F:81:ALA:HB3	1:F:107:MET:CE	2.43	0.49
1:C:1:MET:HE1	1:C:185:MET:HG2	1.92	0.49
1:A:164:GLU:HB3	1:A:166:LEU:HG	1.94	0.49
1:B:70:GLN:HG2	1:B:94:GLN:OE1	2.11	0.49
1:D:141:PHE:N	1:D:141:PHE:CD1	2.80	0.49
1:D:164:GLU:HB3	1:D:166:LEU:HG	1.94	0.49
1:B:100:ASP:O	1:B:104:ARG:HG3	2.12	0.49
1:A:211:ARG:HH12	1:A:212:ILE:CG1	2.25	0.49
1:C:141:PHE:N	1:C:141:PHE:CD1	2.81	0.49
1:F:11:ASP:H	1:F:18:GLN:HE22	1.60	0.49
1:A:81:ALA:HB3	1:A:107:MET:CE	2.43	0.49
1:D:45:SER:HB2	1:D:46:PRO:HD2	1.95	0.49
1:B:178:GLN:HB2	1:B:216:GLN:NE2	2.27	0.49
1:F:164:GLU:HB3	1:F:166:LEU:HG	1.94	0.49
1:D:137:VAL:CG2	1:D:144:GLN:HB3	2.43	0.49
1:C:81:ALA:HB3	1:C:107:MET:CE	2.42	0.49
1:A:92:ASN:HA	1:E:116:GLU:HG3	1.94	0.49
1:F:116:GLU:H	1:F:116:GLU:CD	2.16	0.49
1:A:73:ILE:HD12	1:A:98:LEU:HD22	1.94	0.49
1:E:9:CYS:SG	1:E:196:THR:HG23	2.53	0.49
1:B:141:PHE:HB2	1:B:144:GLN:OE1	2.13	0.48
1:F:81:ALA:O	1:F:107:MET:HE3	2.13	0.48
1:C:45:SER:HB2	1:C:46:PRO:HD2	1.95	0.48
1:E:35:ASP:HB2	1:E:66:VAL:HA	1.95	0.48
1:E:173:ASP:OD2	2:E:505:S6P:H3	2.12	0.48
1:C:45:SER:HB2	1:C:46:PRO:CD	2.44	0.48
1:C:16:LYS:HG3	1:C:55:LEU:HD21	1.95	0.48
1:E:10:MET:HB2	1:E:18:GLN:NE2	2.29	0.48
1:E:141:PHE:N	1:E:141:PHE:CD1	2.81	0.48
1:B:10:MET:HB2	1:B:18:GLN:NE2	2.29	0.48
1:C:141:PHE:HB2	1:C:144:GLN:OE1	2.14	0.48
1:F:137:VAL:CG2	1:F:144:GLN:HB3	2.42	0.48
1:B:141:PHE:N	1:B:141:PHE:CD1	2.82	0.48
1:B:92:ASN:HA	1:C:116:GLU:HG3	1.96	0.48
1:F:141:PHE:HB2	1:F:144:GLN:OE1	2.13	0.48
1:C:70:GLN:CG	1:C:94:GLN:OE1	2.62	0.48
1:A:11:ASP:H	1:A:18:GLN:HE22	1.60	0.48
1:F:28:TYR:CD1	1:F:59:PRO:HG2	2.45	0.48
1:D:141:PHE:HB2	1:D:144:GLN:OE1	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:73:ILE:CD1	1:E:98:LEU:HD22	2.42	0.48
1:B:70:GLN:CG	1:B:94:GLN:OE1	2.62	0.47
1:D:10:MET:HB2	1:D:18:GLN:NE2	2.29	0.47
1:B:137:VAL:CG2	1:B:144:GLN:HB3	2.44	0.47
1:D:171:GLU:HG3	1:D:191:VAL:HB	1.95	0.47
1:D:81:ALA:HB3	1:D:107:MET:HE1	1.97	0.47
1:A:9:CYS:SG	1:A:196:THR:HG23	2.54	0.47
1:A:81:ALA:O	1:A:107:MET:HE3	2.13	0.47
1:A:141:PHE:HB2	1:A:144:GLN:OE1	2.14	0.47
1:C:81:ALA:O	1:C:107:MET:HE3	2.13	0.47
1:D:215:ALA:O	1:D:218:LEU:HB2	2.14	0.47
1:F:16:LYS:HG3	1:F:55:LEU:HD21	1.96	0.47
1:B:45:SER:HB2	1:B:46:PRO:CD	2.45	0.47
1:D:9:CYS:SG	1:D:196:THR:HG23	2.55	0.47
1:B:46:PRO:HG3	1:B:76:LEU:HD13	1.96	0.47
1:D:161:ARG:NH2	1:D:190:ASP:OD1	2.48	0.47
1:A:45:SER:HB2	1:A:46:PRO:CD	2.45	0.47
1:E:84:ILE:HG13	1:E:107:MET:HE2	1.97	0.47
1:E:81:ALA:O	1:E:107:MET:HE3	2.14	0.47
1:E:16:LYS:HG3	1:E:55:LEU:HD21	1.97	0.47
1:A:10:MET:HB2	1:A:18:GLN:NE2	2.30	0.46
1:B:116:GLU:CG	1:D:92:ASN:HA	2.45	0.46
1:A:211:ARG:CB	1:A:211:ARG:HH11	2.25	0.46
1:C:53:LYS:CE	4:C:620:HOH:O	2.54	0.46
1:F:215:ALA:O	1:F:218:LEU:HB2	2.16	0.46
1:F:161:ARG:NH2	1:F:190:ASP:OD1	2.49	0.46
1:B:215:ALA:O	1:B:218:LEU:HB2	2.16	0.46
1:F:10:MET:HB2	1:F:18:GLN:NE2	2.29	0.46
1:C:28:TYR:CD1	1:C:59:PRO:HG2	2.47	0.46
1:A:45:SER:HB2	1:A:46:PRO:HD2	1.97	0.46
1:C:10:MET:HB2	1:C:18:GLN:NE2	2.30	0.46
1:F:153:LYS:HE3	4:F:612:HOH:O	2.16	0.46
1:D:116:GLU:CD	1:D:116:GLU:H	2.18	0.46
1:A:46:PRO:HG3	1:A:76:LEU:HD13	1.98	0.46
1:B:163:ARG:NH2	4:B:623:HOH:O	2.47	0.46
1:D:132:ILE:HG22	1:D:157:LEU:HD21	1.98	0.46
1:E:92:ASN:HA	1:F:116:GLU:CG	2.46	0.46
1:C:215:ALA:O	1:C:218:LEU:HB2	2.16	0.46
1:D:16:LYS:HG3	1:D:55:LEU:HD21	1.98	0.45
1:D:73:ILE:CD1	1:D:98:LEU:HD22	2.47	0.45
1:B:45:SER:HB2	1:B:46:PRO:HD2	1.97	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:215:ALA:O	1:E:218:LEU:HB2	2.16	0.45
1:C:9:CYS:SG	1:C:196:THR:HG23	2.56	0.45
1:A:215:ALA:O	1:A:218:LEU:HB2	2.17	0.45
1:B:68:ARG:HA	1:B:70:GLN:NE2	2.22	0.45
1:A:37:HIS:HE1	1:C:35:ASP:OD2	2.00	0.45
1:A:161:ARG:NH2	1:A:190:ASP:OD1	2.49	0.45
1:C:161:ARG:NH2	1:C:190:ASP:OD1	2.50	0.45
1:B:181:TYR:CD1	1:B:217:ILE:HD13	2.52	0.45
1:C:2:LYS:HB2	1:C:191:VAL:HG22	1.99	0.45
1:D:46:PRO:HG3	1:D:76:LEU:HD13	1.99	0.45
1:B:1:MET:HE1	1:B:185:MET:HG2	1.99	0.45
1:F:178:GLN:HB2	1:F:216:GLN:NE2	2.32	0.45
1:C:132:ILE:HG22	1:C:157:LEU:HD21	1.99	0.45
1:F:84:ILE:HG13	1:F:107:MET:CE	2.47	0.44
1:A:132:ILE:HG22	1:A:157:LEU:HD21	1.99	0.44
1:E:161:ARG:NH2	1:E:190:ASP:OD1	2.50	0.44
1:A:35:ASP:OD2	1:C:37:HIS:HE1	2.00	0.44
1:E:84:ILE:HG13	1:E:107:MET:CE	2.47	0.44
1:D:68:ARG:HA	1:D:70:GLN:NE2	2.24	0.44
1:A:68:ARG:CA	1:A:70:GLN:HE22	2.20	0.44
1:F:136:THR:OG1	1:F:174:GLY:O	2.35	0.44
1:B:2:LYS:HB2	1:B:191:VAL:HG22	1.99	0.44
1:F:202:HIS:HB3	1:F:212:ILE:HD12	1.99	0.44
1:F:73:ILE:CD1	1:F:98:LEU:HD22	2.46	0.44
1:A:211:ARG:HH12	1:A:212:ILE:HG12	1.81	0.44
1:D:1:MET:HE1	1:D:185:MET:HG2	2.00	0.44
1:F:211:ARG:HH11	1:F:211:ARG:HB3	1.81	0.43
1:B:218:LEU:HA	1:B:218:LEU:HD23	1.88	0.43
1:B:161:ARG:NH2	1:B:190:ASP:OD1	2.51	0.43
1:E:207:ASP:N	1:E:207:ASP:OD2	2.51	0.43
1:F:173:ASP:OD2	2:F:506:S6P:H3	2.17	0.43
1:B:149:GLU:OE1	1:D:127:HIS:HE1	2.02	0.43
1:B:9:CYS:SG	1:B:196:THR:HG23	2.58	0.43
1:D:44:LEU:HD13	1:D:48:PHE:CE2	2.54	0.43
1:C:46:PRO:HG3	1:C:76:LEU:HD13	2.00	0.43
1:B:10:MET:HE1	1:B:48:PHE:HZ	1.84	0.43
1:E:2:LYS:HB2	1:E:191:VAL:HG22	2.01	0.43
1:C:70:GLN:HG2	1:C:94:GLN:OE1	2.18	0.43
1:A:132:ILE:CG2	1:A:157:LEU:HD21	2.48	0.43
1:C:99:ILE:HG23	1:C:109:VAL:HG21	2.00	0.43
1:C:21:PHE:O	1:C:25:HIS:HD2	2.02	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:68:ARG:HA	1:A:70:GLN:NE2	2.24	0.43
1:A:10:MET:HE1	1:A:19:ILE:HD11	2.00	0.43
1:E:153:LYS:HE3	4:E:621:HOH:O	2.17	0.43
1:D:84:ILE:HG13	1:D:107:MET:CE	2.49	0.43
1:D:132:ILE:CG2	1:D:157:LEU:HD21	2.49	0.43
1:B:149:GLU:OE1	1:D:127:HIS:CE1	2.72	0.43
1:E:132:ILE:HG22	1:E:157:LEU:HD21	2.01	0.43
1:A:136:THR:OG1	1:A:174:GLY:O	2.37	0.43
1:F:70:GLN:HG3	1:F:94:GLN:OE1	2.19	0.42
1:D:136:THR:OG1	1:D:174:GLY:O	2.35	0.42
1:E:136:THR:OG1	1:E:174:GLY:O	2.35	0.42
1:C:68:ARG:HA	1:C:70:GLN:NE2	2.25	0.42
1:D:89:GLU:H	1:D:89:GLU:CD	2.22	0.42
1:E:28:TYR:CD1	1:E:59:PRO:HG2	2.48	0.42
1:B:202:HIS:HB3	1:B:212:ILE:HD12	2.02	0.42
1:A:84:ILE:HG13	1:A:107:MET:CE	2.49	0.42
1:C:132:ILE:CG2	1:C:157:LEU:HD21	2.49	0.42
1:F:132:ILE:HG22	1:F:157:LEU:HD21	2.01	0.42
1:D:21:PHE:O	1:D:25:HIS:HD2	2.02	0.42
1:C:70:GLN:HB3	4:C:632:HOH:O	2.19	0.42
1:D:53:LYS:CG	1:D:80:GLY:HA3	2.45	0.42
1:B:53:LYS:CG	1:B:80:GLY:HA3	2.48	0.42
1:B:32:ASP:O	1:B:44:LEU:HB2	2.20	0.42
1:F:21:PHE:O	1:F:25:HIS:HD2	2.03	0.42
1:E:81:ALA:CB	1:E:107:MET:HE1	2.47	0.42
1:B:84:ILE:HG13	1:B:107:MET:CE	2.49	0.42
1:F:2:LYS:HB2	1:F:191:VAL:HG22	2.02	0.42
1:B:72:TYR:O	1:B:76:LEU:HB2	2.20	0.42
1:E:208:GLU:O	1:E:212:ILE:HG13	2.19	0.42
1:F:10:MET:HE1	1:F:19:ILE:HD11	2.02	0.42
1:E:11:ASP:H	1:E:18:GLN:NE2	2.18	0.41
1:E:63:HIS:NE2	1:E:112:ILE:HD13	2.34	0.41
1:E:21:PHE:O	1:E:25:HIS:HD2	2.02	0.41
1:B:92:ASN:HA	1:C:116:GLU:CG	2.50	0.41
1:F:218:LEU:HD23	1:F:218:LEU:HA	1.89	0.41
1:B:207:ASP:N	1:B:207:ASP:OD2	2.53	0.41
1:A:207:ASP:OD2	1:A:207:ASP:N	2.53	0.41
1:C:81:ALA:HB3	1:C:107:MET:HE1	2.01	0.41
1:B:136:THR:OG1	1:B:174:GLY:O	2.36	0.41
1:F:132:ILE:CG2	1:F:157:LEU:HD21	2.51	0.41
1:F:53:LYS:CG	1:F:80:GLY:HA3	2.44	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:4:SER:O	1:C:193:ILE:HA	2.21	0.41
1:C:207:ASP:OD2	1:C:207:ASP:N	2.53	0.41
1:E:68:ARG:HA	1:E:70:GLN:NE2	2.24	0.41
1:B:4:SER:O	1:B:193:ILE:HA	2.20	0.41
1:E:142:ALA:HA	2:E:505:S6P:H61	2.03	0.41
1:B:21:PHE:O	1:B:25:HIS:HD2	2.03	0.41
1:B:132:ILE:HG22	1:B:157:LEU:HD21	2.02	0.41
1:C:11:ASP:H	1:C:18:GLN:NE2	2.18	0.41
1:F:157:LEU:HA	1:F:157:LEU:HD12	1.94	0.41
1:D:11:ASP:H	1:D:18:GLN:NE2	2.19	0.41
1:E:70:GLN:HG3	1:E:94:GLN:OE1	2.21	0.41
1:A:7:LEU:CB	1:A:10:MET:HE2	2.50	0.41
1:F:63:HIS:NE2	1:F:112:ILE:HD13	2.36	0.41
1:C:73:ILE:CD1	1:C:98:LEU:HD22	2.50	0.41
1:D:218:LEU:HA	1:D:218:LEU:HD23	1.89	0.41
1:A:72:TYR:HB3	1:A:76:LEU:HD22	2.03	0.41
1:B:194:VAL:CG2	1:B:199:LEU:HB2	2.51	0.41
1:A:153:LYS:HE3	4:A:603:HOH:O	2.21	0.41
1:C:34:MET:HE2	1:C:43:THR:N	2.36	0.41
1:B:84:ILE:HG13	1:B:107:MET:HE2	2.02	0.41
1:A:116:GLU:CG	1:F:92:ASN:HA	2.51	0.41
1:A:21:PHE:O	1:A:25:HIS:HD2	2.03	0.41
1:A:11:ASP:H	1:A:18:GLN:NE2	2.19	0.40
1:D:72:TYR:O	1:D:76:LEU:HB2	2.21	0.40
1:D:136:THR:HA	1:D:150:MET:HG3	2.03	0.40
1:B:150:MET:SD	1:B:153:LYS:HE2	2.61	0.40
1:C:34:MET:HE2	1:C:43:THR:HG23	2.02	0.40
1:A:72:TYR:O	1:A:76:LEU:HB2	2.21	0.40
1:A:70:GLN:HG3	1:A:94:GLN:OE1	2.21	0.40
1:F:207:ASP:N	1:F:207:ASP:OD2	2.53	0.40
1:F:76:LEU:HD12	1:F:76:LEU:HA	1.93	0.40
1:E:7:LEU:CB	1:E:10:MET:HE2	2.49	0.40
1:B:37:HIS:HE1	1:E:35:ASP:OD2	2.04	0.40
1:A:92:ASN:HA	1:E:116:GLU:CG	2.50	0.40
1:C:32:ASP:O	1:C:44:LEU:HB2	2.21	0.40
1:C:89:GLU:H	1:C:89:GLU:CD	2.25	0.40
1:F:30:HIS:CE1	1:F:193:ILE:HD13	2.56	0.40
1:D:32:ASP:O	1:D:44:LEU:HB2	2.21	0.40
1:F:32:ASP:O	1:F:44:LEU:HB2	2.21	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	217/231 (94%)	209 (96%)	8 (4%)	0	100	100
1	B	217/231 (94%)	208 (96%)	9 (4%)	0	100	100
1	C	217/231 (94%)	209 (96%)	8 (4%)	0	100	100
1	D	217/231 (94%)	208 (96%)	9 (4%)	0	100	100
1	E	217/231 (94%)	208 (96%)	9 (4%)	0	100	100
1	F	217/231 (94%)	208 (96%)	9 (4%)	0	100	100
All	All	1302/1386 (94%)	1250 (96%)	52 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	188/197 (95%)	177 (94%)	11 (6%)	24	27
1	B	188/197 (95%)	177 (94%)	11 (6%)	24	27
1	C	188/197 (95%)	178 (95%)	10 (5%)	28	32
1	D	188/197 (95%)	178 (95%)	10 (5%)	28	32
1	E	188/197 (95%)	178 (95%)	10 (5%)	28	32
1	F	188/197 (95%)	178 (95%)	10 (5%)	28	32
All	All	1128/1182 (95%)	1066 (94%)	62 (6%)	27	30

All (62) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	42	LEU
1	A	70	GLN
1	A	76	LEU
1	A	83	PHE
1	A	111	LEU
1	A	137	VAL
1	A	141	PHE
1	A	144	GLN
1	A	164	GLU
1	A	207	ASP
1	A	211	ARG
1	B	35	ASP
1	B	42	LEU
1	B	70	GLN
1	B	76	LEU
1	B	83	PHE
1	B	111	LEU
1	B	137	VAL
1	B	141	PHE
1	B	144	GLN
1	B	164	GLU
1	B	207	ASP
1	C	42	LEU
1	C	70	GLN
1	C	76	LEU
1	C	83	PHE
1	C	111	LEU
1	C	137	VAL
1	C	141	PHE
1	C	144	GLN
1	C	164	GLU
1	C	207	ASP
1	D	42	LEU
1	D	70	GLN
1	D	76	LEU
1	D	83	PHE
1	D	104	ARG
1	D	111	LEU
1	D	137	VAL
1	D	141	PHE
1	D	144	GLN
1	D	164	GLU

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Mol	Chain	Res	Type
1	E	42	LEU
1	E	70	GLN
1	E	76	LEU
1	E	83	PHE
1	E	111	LEU
1	E	137	VAL
1	E	141	PHE
1	E	144	GLN
1	E	164	GLU
1	E	207	ASP
1	F	42	LEU
1	F	70	GLN
1	F	76	LEU
1	F	83	PHE
1	F	111	LEU
1	F	137	VAL
1	F	141	PHE
1	F	144	GLN
1	F	164	GLU
1	F	207	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (30) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	GLN
1	A	25	HIS
1	A	37	HIS
1	A	70	GLN
1	A	216	GLN
1	B	18	GLN
1	B	25	HIS
1	B	37	HIS
1	B	70	GLN
1	B	216	GLN
1	C	18	GLN
1	C	25	HIS
1	C	37	HIS
1	C	70	GLN
1	C	216	GLN
1	D	18	GLN
1	D	25	HIS
1	D	37	HIS

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Mol	Chain	Res	Type
1	D	70	GLN
1	D	216	GLN
1	E	18	GLN
1	E	25	HIS
1	E	37	HIS
1	E	70	GLN
1	E	216	GLN
1	F	18	GLN
1	F	25	HIS
1	F	37	HIS
1	F	70	GLN
1	F	216	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 carbohydrates in this entry.

5.6　Ligand geometry ⓘ

Of 12 ligands modelled in this entry, 6 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	S6P	A	501	3	15,15,15	1.13	1 (6%)	18,21,21	0.88	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
2	S6P	B	502	3	15,15,15	1.14	1 (6%)	18,21,21	0.90	1 (5%)
2	S6P	C	503	3	15,15,15	1.15	1 (6%)	18,21,21	0.88	1 (5%)
2	S6P	D	504	3	15,15,15	1.17	1 (6%)	18,21,21	0.87	1 (5%)
2	S6P	E	505	3	15,15,15	1.16	1 (6%)	18,21,21	0.89	1 (5%)
2	S6P	F	506	3	15,15,15	1.17	1 (6%)	18,21,21	0.88	1 (5%)

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	S6P	A	501	3	-	0/20/20/20	0/0/0/0
2	S6P	B	502	3	-	0/20/20/20	0/0/0/0
2	S6P	C	503	3	-	0/20/20/20	0/0/0/0
2	S6P	D	504	3	-	0/20/20/20	0/0/0/0
2	S6P	E	505	3	-	0/20/20/20	0/0/0/0
2	S6P	F	506	3	-	0/20/20/20	0/0/0/0

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	505	S6P	P-O3P	3.11	1.61	1.51
2	A	501	S6P	P-O3P	3.20	1.61	1.51
2	D	504	S6P	P-O3P	3.21	1.61	1.51
2	F	506	S6P	P-O3P	3.23	1.61	1.51
2	C	503	S6P	P-O3P	3.31	1.62	1.51
2	B	502	S6P	P-O3P	3.32	1.62	1.51

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	504	S6P	O2P-P-O6	2.74	114.45	106.56
2	E	505	S6P	O2P-P-O6	2.77	114.55	106.56
2	C	503	S6P	O2P-P-O6	2.78	114.56	106.56
2	F	506	S6P	O2P-P-O6	2.78	114.57	106.56
2	A	501	S6P	O2P-P-O6	2.80	114.64	106.56
2	B	502	S6P	O2P-P-O6	2.81	114.64	106.56

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

6 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	501	S6P	1	0
2	B	502	S6P	1	0
2	C	503	S6P	1	0
2	D	504	S6P	1	0
2	E	505	S6P	2	0
2	F	506	S6P	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 (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	219/231 (94%)	-0.10	2 (0%)	85	85	25, 36, 55, 65	0
1	B	219/231 (94%)	0.05	3 (1%)	78	77	24, 39, 56, 70	0
1	C	219/231 (94%)	-0.05	3 (1%)	78	77	21, 35, 58, 69	0
1	D	219/231 (94%)	0.03	7 (3%)	51	50	21, 40, 60, 77	0
1	E	219/231 (94%)	0.01	7 (3%)	51	50	21, 35, 62, 76	0
1	F	219/231 (94%)	0.07	4 (1%)	71	70	21, 38, 68, 79	0
All	All	1314/1386 (94%)	-0.00	26 (1%)	68	67	21, 37, 60, 79	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	218	LEU	4.7
1	A	218	LEU	3.8
1	B	218	LEU	3.4
1	F	218	LEU	3.0
1	B	205	ASN	2.9
1	F	178	GLN	2.7
1	E	211	ARG	2.7
1	E	204	GLU	2.6
1	F	207	ASP	2.6
1	D	218	LEU	2.5
1	E	203	ALA	2.5
1	F	217	ILE	2.4
1	C	218	LEU	2.4
1	E	207	ASP	2.3
1	D	178	GLN	2.3
1	E	201	ASN	2.3
1	E	208	GLU	2.3
1	D	207	ASP	2.2
1	A	166	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	163	ARG	2.2
1	B	219	ALA	2.2
1	C	204	GLU	2.1
1	C	201	ASN	2.1
1	D	48	PHE	2.1
1	D	211	ARG	2.1
1	D	21	PHE	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(Å²)	Q<0.9
2	S6P	C	503	16/16	0.91	0.16	0.84	58,60,61,61	0
2	S6P	D	504	16/16	0.93	0.16	0.83	57,59,61,62	0
2	S6P	A	501	16/16	0.93	0.15	0.48	53,57,60,61	0
2	S6P	F	506	16/16	0.90	0.14	0.46	52,56,60,61	0
2	S6P	E	505	16/16	0.93	0.15	0.34	57,63,64,64	0
2	S6P	B	502	16/16	0.95	0.12	-0.05	47,51,52,52	0
3	MG	F	606	1/1	0.91	0.11	-0.50	46,46,46,46	0
3	MG	D	604	1/1	0.94	0.08	-1.91	41,41,41,41	0
3	MG	B	602	1/1	0.81	0.08	-2.58	41,41,41,41	0
3	MG	E	605	1/1	0.95	0.07	-4.58	45,45,45,45	0
3	MG	C	603	1/1	0.96	0.05	-4.72	45,45,45,45	0
3	MG	A	601	1/1	0.98	0.02	-9.05	35,35,35,35	0

6.5 Other polymers (i)

There are no such residues in this entry.