



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 11:29 PM GMT

PDB ID : 1XHZ
Title : Phi29 DNA polymerase, orthorhombic crystal form, ssDNA complex
Authors : Kamtekar, S.; Berman, A.J.; Wang, J.; Lazaro, J.M.; de Vega, M.; Blanco, L.; Salas, M.; Steitz, T.A.
Deposited on : 2004-09-21
Resolution : 2.70 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

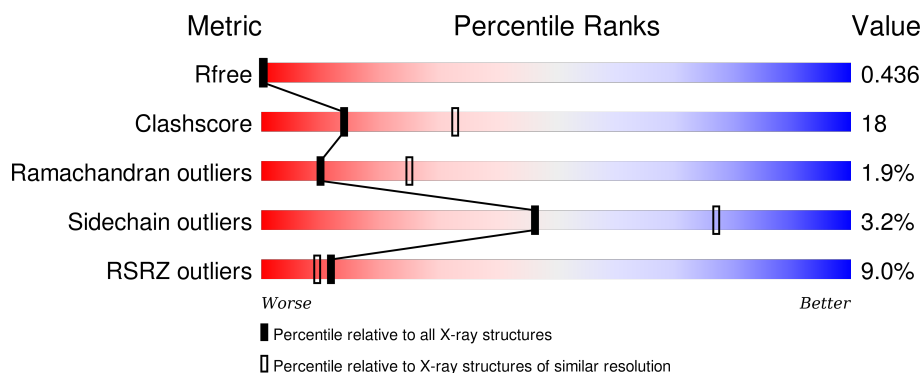
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.70 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	2103 (2.70-2.70)
Clashscore	102246	2422 (2.70-2.70)
Ramachandran outliers	100387	2382 (2.70-2.70)
Sidechain outliers	100360	2382 (2.70-2.70)
RSRZ outliers	91569	2107 (2.70-2.70)

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	E	5	<div> <div>100%</div> <div>100%</div> </div>
1	F	5	<div> <div>40%</div> <div>20% 20% 60%</div> </div>
1	G	5	<div> <div>100%</div> <div>100%</div> </div>
1	H	5	<div> <div>100%</div> <div>100%</div> </div>
2	A	575	<div> <div>11%</div> <div>61% 35% ..</div> </div>

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Mol	Chain	Length	Quality of chain
2	B	575	<div><div></div><div>6%</div><div>64%</div><div>34%</div><div>..</div></div>
2	C	575	<div><div></div><div>8%</div><div>66%</div><div>29%</div><div>...</div></div>
2	D	575	<div><div></div><div>8%</div><div>69%</div><div>29%</div><div>..</div></div>

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 19512 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 DNA chain called 5'-D(*TP*TP*TP*TP*T)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	E	5	Total	C	N	O	P	0	0	0
			97	50	10	33	4			
1	F	2	Total	C	N	O	P	0	0	0
			37	20	4	12	1			
1	G	5	Total	C	N	O	P	0	0	0
			97	50	10	33	4			
1	H	5	Total	C	N	O	P	0	0	0
			97	50	10	33	4			

- Molecule 2 is a protein called DNA polymerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	A	571	Total	C	N	O	S	0	0	0
			4668	3041	754	852	21			
2	B	571	Total	C	N	O	S	0	0	0
			4668	3041	754	852	21			
2	C	571	Total	C	N	O	S	0	0	0
			4668	3041	754	852	21			
2	D	571	Total	C	N	O	S	0	0	0
			4668	3041	754	852	21			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	12	ALA	ASP	ENGINEERED	UNP P03680
A	66	ALA	ASP	ENGINEERED	UNP P03680
B	12	ALA	ASP	ENGINEERED	UNP P03680
B	66	ALA	ASP	ENGINEERED	UNP P03680
C	12	ALA	ASP	ENGINEERED	UNP P03680
C	66	ALA	ASP	ENGINEERED	UNP P03680
D	12	ALA	ASP	ENGINEERED	UNP P03680
D	66	ALA	ASP	ENGINEERED	UNP P03680

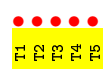
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	124	Total 124	O 124	0	0
3	B	129	Total 129	O 129	0	0
3	C	140	Total 140	O 140	0	0
3	D	116	Total 116	O 116	0	0
3	G	1	Total 1	O 1	0	0
3	H	2	Total 2	O 2	0	0

3 Residue-property plots [i](#)

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.

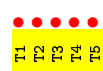
- Molecule 1: 5'-D(*TP*TP*TP*TP*T)-3'



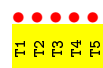
- Molecule 1: 5'-D(*TP*TP*TP*TP*T)-3'



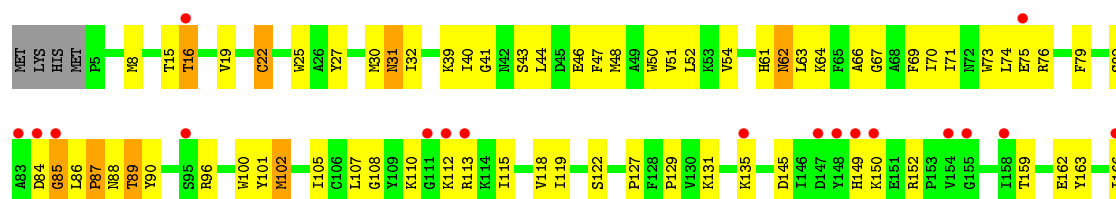
- Molecule 1: 5'-D(*TP*TP*TP*TP*T)-3'

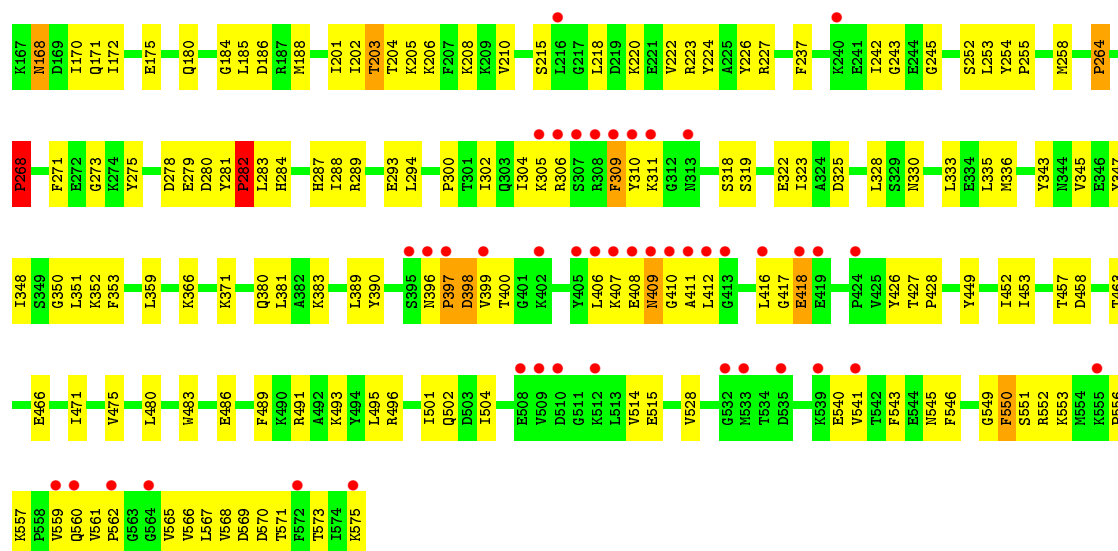


- Molecule 1: 5'-D(*TP*TP*TP*TP*T)-3'

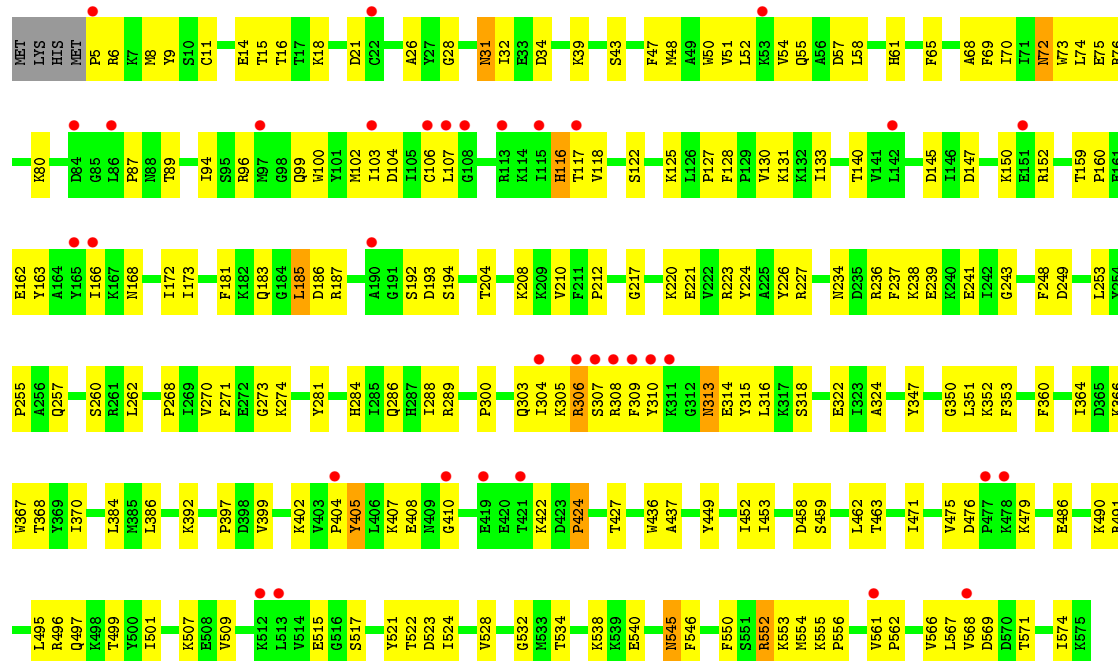


- Molecule 2: DNA polymerase

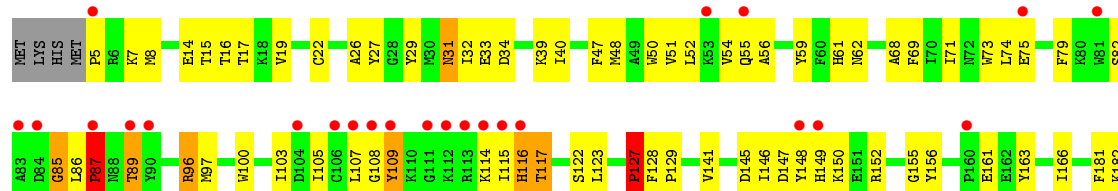


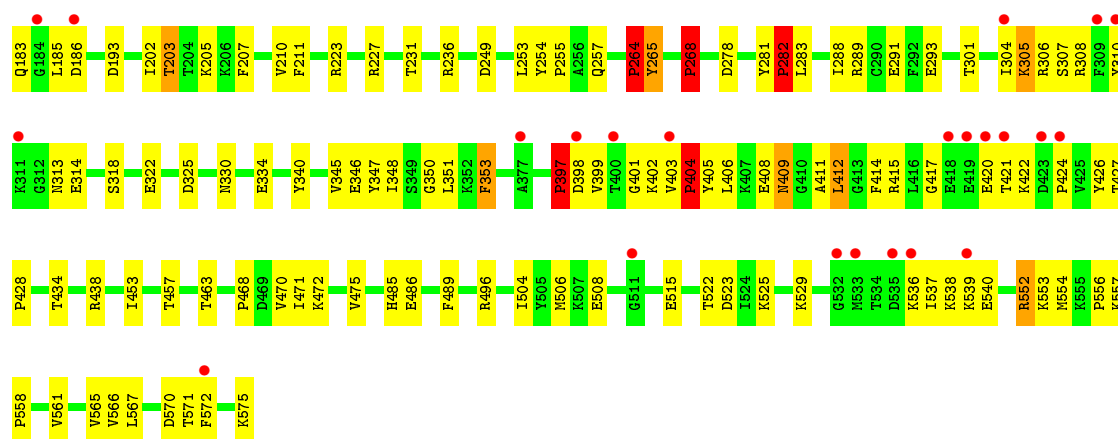


• Molecule 2: DNA polymerase

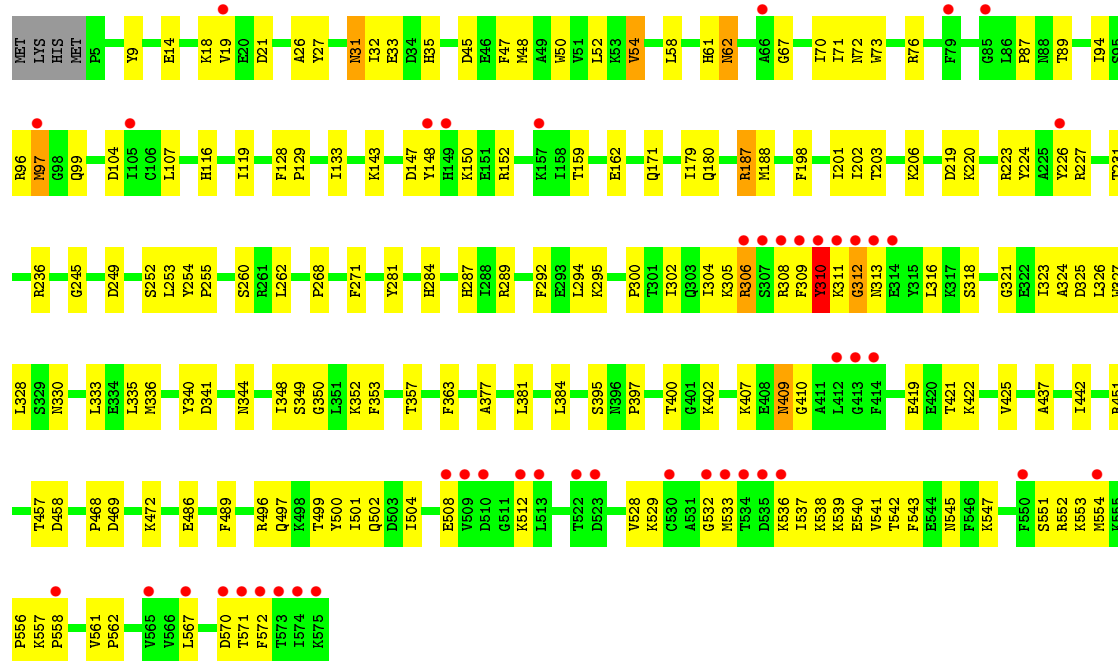


• Molecule 2: DNA polymerase





• Molecule 2: DNA polymerase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	96.66Å 150.40Å 198.32Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.99 – 2.70 48.33 – 2.34	Depositor EDS
% Data completeness (in resolution range)	97.7 (19.99-2.70) 98.5 (48.33-2.34)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.82 (at 2.34Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.219 , 0.268 0.301 , 0.436	Depositor DCC
R_{free} test set	1799 reflections (2.25%)	DCC
Wilson B-factor (Å ²)	42.9	Xtriage
Anisotropy	0.250	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 46.2	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	0 of 119945 reflections	Xtriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	19512	wwPDB-VP
Average B, all atoms (Å ²)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.64% 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

5.1 Standard geometry

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	E	0.34	0/106	0.79	0/162
1	F	0.32	0/40	0.80	0/60
1	G	0.62	0/106	0.86	0/162
1	H	0.46	0/106	0.78	0/162
2	A	0.41	0/4788	0.69	4/6459 (0.1%)
2	B	0.39	0/4788	0.64	0/6459
2	C	0.43	0/4788	0.78	7/6459 (0.1%)
2	D	0.40	0/4788	0.65	0/6459
All	All	0.41	0/19510	0.70	11/26382 (0.0%)

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	268	PRO	CA-N-CD	-16.41	88.52	111.50
2	C	264	PRO	CA-N-CD	-13.88	92.07	111.50
2	C	404	PRO	CA-N-CD	-13.55	92.53	111.50
2	A	397	PRO	CA-N-CD	-11.68	95.15	111.50
2	C	127	PRO	CA-N-CD	-11.42	95.51	111.50
2	C	397	PRO	CA-N-CD	-10.07	97.40	111.50
2	C	282	PRO	CA-N-CD	-9.53	98.15	111.50
2	A	282	PRO	CA-N-CD	-8.94	98.98	111.50
2	A	264	PRO	CA-N-CD	-8.27	99.92	111.50
2	A	268	PRO	CA-N-CD	-7.53	100.96	111.50
2	C	87	PRO	CA-N-CD	-7.21	101.40	111.50

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	97	0	62	10	0
1	F	37	0	26	1	0
1	G	97	0	62	13	0
1	H	97	0	62	12	0
2	A	4668	0	4676	189	0
2	B	4668	0	4676	149	0
2	C	4668	0	4676	195	0
2	D	4668	0	4676	152	0
3	A	124	0	0	4	0
3	B	129	0	0	6	0
3	C	140	0	0	2	0
3	D	116	0	0	6	0
3	G	1	0	0	0	0
3	H	2	0	0	0	0
All	All	19512	0	18916	692	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 18.

All (692) 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)
2:A:264:PRO:HD3	2:A:283:LEU:CD1	1.41	1.47
2:A:264:PRO:CD	2:A:283:LEU:HD12	1.60	1.28
2:A:264:PRO:CD	2:A:283:LEU:CD1	2.18	1.18
1:G:3:DT:H5'	2:C:129:PRO:HG3	1.24	1.13
2:B:453:ILE:HD11	2:B:463:THR:HG23	1.20	1.12
1:H:3:DT:H5'	2:D:129:PRO:HG3	1.28	1.10
1:E:3:DT:H5'	2:A:129:PRO:HG3	1.27	1.10
2:C:434:THR:HG22	2:C:438:ARG:NH1	1.68	1.09
2:C:404:PRO:HD3	2:C:414:PHE:HD2	1.19	1.03
1:H:1:DT:H3'	1:H:2:DT:H5'	1.39	1.02
2:C:87:PRO:HG3	2:C:108:GLY:HA2	1.44	0.98
2:A:86:LEU:O	2:A:89:THR:HB	1.62	0.98
2:A:52:LEU:HD22	2:A:107:LEU:HD21	1.42	0.97

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:278:ASP:O	2:C:282:PRO:HD3	1.64	0.96
2:A:82:SER:HB3	2:A:89:THR:HG23	1.46	0.95
2:A:323:ILE:HD12	2:B:307:SER:HB3	1.48	0.95
1:H:4:DT:OP1	1:H:4:DT:H4'	1.67	0.93
2:C:96:ARG:HH11	2:C:96:ARG:HB2	1.34	0.92
2:D:306:ARG:H	2:D:311:LYS:HD3	1.33	0.92
2:C:404:PRO:HD3	2:C:414:PHE:CD2	2.05	0.92
2:C:55:GLN:HE21	2:C:115:ILE:HG23	1.35	0.92
2:D:311:LYS:HG3	2:D:312:GLY:H	1.34	0.91
2:C:96:ARG:HH11	2:C:96:ARG:CB	1.82	0.91
2:C:288:ILE:HD11	2:C:345:VAL:HG13	1.54	0.90
2:C:96:ARG:NH1	2:C:96:ARG:HB2	1.87	0.89
2:C:289:ARG:HG3	2:C:348:ILE:HD11	1.52	0.89
2:D:304:ILE:HB	2:D:309:PHE:HE1	1.38	0.89
2:C:522:THR:HG22	2:C:523:ASP:OD2	1.72	0.88
2:C:223:ARG:NH2	2:C:397:PRO:HG2	1.87	0.88
1:G:1:DT:H3'	1:G:2:DT:H5'	1.54	0.87
2:C:404:PRO:HG3	2:C:414:PHE:CE2	2.11	0.86
2:A:398:ASP:O	2:A:398:ASP:OD1	1.94	0.85
2:A:268:PRO:HG3	2:A:353:PHE:CE2	2.12	0.84
2:A:15:THR:HG22	2:A:16:THR:N	1.93	0.83
2:D:19:VAL:O	2:D:561:VAL:HG11	1.79	0.83
2:D:306:ARG:N	2:D:311:LYS:HD3	1.93	0.82
2:B:553:LYS:HA	2:B:571:THR:HA	1.62	0.82
2:A:220:LYS:HE2	2:A:224:TYR:OH	1.81	0.80
2:A:86:LEU:HB2	2:A:89:THR:OG1	1.79	0.80
2:D:305:LYS:HA	2:D:311:LYS:CB	2.13	0.79
2:C:264:PRO:HD3	2:C:283:LEU:HD12	1.64	0.79
2:B:471:ILE:O	2:B:475:VAL:HG23	1.82	0.79
2:A:30:MET:HB2	2:A:170:ILE:HD12	1.63	0.79
2:B:55:GLN:HA	2:B:116:HIS:O	1.83	0.79
2:A:264:PRO:HD3	2:A:283:LEU:HD12	0.79	0.78
2:A:82:SER:HB3	2:A:89:THR:CG2	2.14	0.78
2:C:264:PRO:HD3	2:C:283:LEU:CD1	2.14	0.78
2:A:278:ASP:O	2:A:282:PRO:HD3	1.82	0.78
2:A:493:LYS:HE2	2:A:495:LEU:HD21	1.65	0.78
2:C:434:THR:HG22	2:C:438:ARG:HH12	1.49	0.77
1:G:4:DT:OP1	1:G:4:DT:H4'	1.85	0.77
1:E:1:DT:H3'	1:E:2:DT:H5'	1.67	0.77
2:C:146:ILE:HD12	2:C:146:ILE:H	1.50	0.77
2:B:162:GLU:O	2:B:166:ILE:HG12	1.85	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:1:DT:H3'	1:H:2:DT:C5'	2.16	0.76
2:D:305:LYS:HA	2:D:311:LYS:HB2	1.67	0.76
2:B:183:GLN:HB2	2:B:185:LEU:HD22	1.67	0.76
2:B:159:THR:OG1	2:B:162:GLU:HG3	1.87	0.75
2:D:96:ARG:O	2:D:402:LYS:HE3	1.87	0.75
2:A:345:VAL:HB	2:B:322:GLU:HG3	1.67	0.75
2:C:61:HIS:O	2:C:123:LEU:HB2	1.86	0.75
2:B:168:ASN:O	2:B:172:ILE:HG12	1.87	0.75
1:G:3:DT:H2''	1:G:4:DT:O5'	1.86	0.74
2:C:289:ARG:HE	2:C:348:ILE:HD11	1.51	0.74
2:D:409:ASN:N	2:D:409:ASN:HD22	1.83	0.74
2:C:350:GLY:O	2:C:351:LEU:HD23	1.88	0.74
2:A:264:PRO:HD3	2:A:283:LEU:HD11	1.65	0.74
2:C:308:ARG:HD2	2:C:308:ARG:H	1.52	0.74
2:B:31:ASN:HD22	2:B:32:ILE:N	1.86	0.74
2:A:202:ILE:O	2:A:203:THR:HB	1.87	0.73
2:B:226:TYR:HD2	2:B:306:ARG:HH21	1.36	0.73
2:B:183:GLN:HB2	2:B:185:LEU:CD2	2.18	0.73
2:D:48:MET:O	2:D:52:LEU:HG	1.88	0.73
2:A:74:LEU:O	2:A:79:PHE:HB2	1.89	0.73
1:H:1:DT:C3'	1:H:2:DT:H5'	2.18	0.72
2:A:496:ARG:HG3	2:A:496:ARG:HH11	1.55	0.72
2:A:204:THR:HG22	2:A:208:LYS:HE2	1.71	0.72
2:B:5:PRO:HG2	2:C:5:PRO:HG3	1.72	0.72
2:A:264:PRO:CG	2:A:283:LEU:HD12	2.20	0.71
1:H:4:DT:OP1	1:H:4:DT:C4'	2.37	0.71
2:B:366:LYS:O	2:B:370:ILE:HG12	1.91	0.71
2:C:301:THR:HB	2:C:340:TYR:HE1	1.56	0.71
2:B:304:ILE:HD12	2:B:314:GLU:OE1	1.91	0.71
2:C:85:GLY:HA3	2:C:114:LYS:NZ	2.04	0.71
2:C:293:GLU:OE2	2:C:318:SER:HB2	1.90	0.71
2:C:223:ARG:HH12	2:C:227:ARG:HH22	1.39	0.70
1:G:1:DT:H3'	1:G:2:DT:C5'	2.20	0.70
2:A:560:GLN:HG2	2:A:565:VAL:HG22	1.73	0.70
2:B:47:PHE:O	2:B:51:VAL:HG23	1.91	0.70
2:C:306:ARG:HD3	2:C:310:TYR:HB3	1.74	0.70
2:A:293:GLU:OE2	2:A:318:SER:HB2	1.91	0.70
2:D:304:ILE:HB	2:D:309:PHE:CE1	2.24	0.70
2:A:15:THR:HG22	2:A:16:THR:H	1.57	0.70
2:D:67:GLY:O	2:D:71:ILE:HG12	1.92	0.69
2:B:14:GLU:HB2	2:B:26:ALA:HB3	1.73	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:542:THR:H	2:D:545:ASN:HD22	1.39	0.69
2:C:202:ILE:O	2:C:203:THR:HB	1.89	0.69
2:D:302:ILE:HD11	2:D:336:MET:SD	2.33	0.69
2:C:29:TYR:CZ	2:C:39:LYS:HB3	2.27	0.69
2:A:87:PRO:HG3	2:A:108:GLY:HA2	1.74	0.69
2:D:304:ILE:HD11	2:D:326:LEU:HD21	1.73	0.69
2:C:453:ILE:HD11	2:C:463:THR:HG23	1.73	0.69
2:A:264:PRO:CD	2:A:283:LEU:HD13	2.21	0.68
2:A:273:GLY:HA2	2:A:347:TYR:O	1.93	0.68
2:C:71:ILE:HB	2:C:412:LEU:HD11	1.75	0.68
2:B:286:GLN:HG3	2:B:288:ILE:CG2	2.23	0.68
2:A:501:ILE:HG22	2:A:528:VAL:HG13	1.75	0.68
2:B:210:VAL:O	2:B:212:PRO:HD3	1.93	0.68
2:C:399:VAL:O	2:C:399:VAL:HG12	1.91	0.68
1:E:3:DT:H2''	1:E:4:DT:O5'	1.94	0.67
2:D:220:LYS:HE2	2:D:224:TYR:OH	1.94	0.67
2:D:496:ARG:HG3	2:D:496:ARG:HH11	1.58	0.67
2:A:15:THR:HG21	2:A:69:PHE:CZ	2.29	0.67
2:D:289:ARG:HG3	2:D:348:ILE:HD11	1.76	0.67
2:D:143:LYS:HE3	3:D:601:HOH:O	1.95	0.67
2:A:15:THR:CG2	2:A:16:THR:H	2.07	0.67
2:C:289:ARG:HG2	2:C:325:ASP:OD1	1.95	0.67
2:A:15:THR:CG2	2:A:16:THR:N	2.57	0.67
2:A:281:TYR:N	2:A:282:PRO:CD	2.58	0.67
2:A:67:GLY:O	2:A:71:ILE:HG12	1.95	0.66
2:B:130:VAL:HG22	2:B:173:ILE:HD11	1.77	0.66
2:D:311:LYS:CG	2:D:312:GLY:H	2.01	0.66
2:B:289:ARG:HA	2:B:324:ALA:O	1.95	0.66
2:A:61:HIS:HA	2:A:122:SER:OG	1.95	0.66
2:D:561:VAL:CG1	2:D:562:PRO:HD2	2.26	0.66
2:C:52:LEU:HD22	2:C:107:LEU:HD21	1.77	0.66
2:B:220:LYS:HE2	2:B:224:TYR:OH	1.96	0.66
2:C:434:THR:CG2	2:C:438:ARG:NH1	2.53	0.65
2:A:215:SER:OG	2:A:218:LEU:HB2	1.96	0.65
2:B:50:TRP:CE2	2:B:54:VAL:HG11	2.32	0.65
2:C:408:GLU:H	2:C:408:GLU:CD	2.00	0.65
2:B:226:TYR:CD2	2:B:306:ARG:NH2	2.63	0.65
2:C:50:TRP:CE2	2:C:54:VAL:HG11	2.32	0.65
2:A:302:ILE:HD11	2:A:336:MET:SD	2.37	0.65
2:A:226:TYR:O	2:A:227:ARG:HG3	1.97	0.64
2:C:55:GLN:NE2	2:C:115:ILE:HG23	2.10	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:403:VAL:HG23	2:C:417:GLY:HA3	1.78	0.64
2:B:253:LEU:HD21	2:B:437:ALA:HB1	1.79	0.64
2:C:146:ILE:N	2:C:146:ILE:HD12	2.11	0.64
2:A:323:ILE:HD11	2:B:305:LYS:HB2	1.78	0.64
2:B:522:THR:HG22	2:B:523:ASP:OD2	1.96	0.64
2:A:19:VAL:HG13	2:A:561:VAL:HG11	1.80	0.64
2:B:545:ASN:HD21	2:B:550:PHE:HD1	1.45	0.64
2:D:180:GLN:HE21	2:D:381:LEU:HD13	1.62	0.63
2:A:75:GLU:HB3	2:A:406:LEU:HD11	1.78	0.63
2:C:434:THR:HG22	2:C:438:ARG:HH11	1.63	0.63
2:C:87:PRO:HG3	2:C:108:GLY:CA	2.24	0.63
2:C:264:PRO:O	2:C:265:TYR:HB3	1.98	0.63
2:A:203:THR:HG22	2:A:205:LYS:H	1.63	0.63
1:E:4:DT:OP1	1:E:4:DT:H4'	1.99	0.63
2:A:206:LYS:O	2:A:210:VAL:HG23	1.99	0.63
2:C:61:HIS:HA	2:C:122:SER:OG	1.99	0.63
2:C:289:ARG:NE	2:C:348:ILE:HD11	2.13	0.62
2:D:542:THR:N	2:D:545:ASN:HD22	1.97	0.62
2:A:252:SER:HA	3:A:690:HOH:O	1.99	0.62
2:B:453:ILE:HD11	2:B:463:THR:CG2	2.12	0.62
2:C:404:PRO:HG3	2:C:414:PHE:HE2	1.60	0.62
1:H:2:DT:OP1	2:D:532:GLY:N	2.31	0.62
2:C:55:GLN:HA	2:C:116:HIS:O	1.99	0.62
2:A:224:TYR:HA	2:A:305:LYS:NZ	2.14	0.62
2:B:286:GLN:HG3	2:B:288:ILE:HG22	1.81	0.62
2:B:399:VAL:HG21	2:B:422:LYS:HG3	1.80	0.62
2:C:506:MET:HG3	2:C:525:LYS:HB2	1.81	0.62
2:A:131:LYS:O	2:A:135:LYS:HG3	2.00	0.62
2:A:150:LYS:O	2:A:152:ARG:HG3	1.99	0.61
2:B:52:LEU:HD22	2:B:107:LEU:HD21	1.81	0.61
1:G:4:DT:H6	1:G:4:DT:H5''	1.64	0.61
2:C:96:ARG:O	2:C:402:LYS:HE3	2.00	0.61
2:C:289:ARG:HE	2:C:348:ILE:CD1	2.13	0.61
2:D:561:VAL:HG12	2:D:562:PRO:HD2	1.81	0.61
2:C:288:ILE:HD11	2:C:345:VAL:CG1	2.30	0.61
2:A:184:GLY:O	2:A:186:ASP:N	2.34	0.61
2:D:311:LYS:HG3	2:D:312:GLY:N	2.13	0.61
2:B:308:ARG:O	2:B:309:PHE:HB2	2.01	0.61
2:C:31:ASN:ND2	2:C:33:GLU:H	1.99	0.61
1:H:4:DT:H5''	1:H:4:DT:H6	1.66	0.60
2:A:268:PRO:HG3	2:A:353:PHE:CD2	2.37	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:453:ILE:HD11	2:A:463:THR:CG2	2.31	0.60
2:A:15:THR:HG21	2:A:69:PHE:CE2	2.36	0.60
2:D:409:ASN:N	2:D:409:ASN:ND2	2.49	0.60
2:D:504:ILE:HD12	2:D:504:ILE:N	2.15	0.60
2:C:223:ARG:NH1	2:C:227:ARG:HH22	1.99	0.60
2:C:31:ASN:HD22	2:C:34:ASP:H	1.48	0.60
2:D:31:ASN:C	2:D:31:ASN:HD22	2.05	0.60
2:B:192:SER:HA	2:B:392:LYS:HE3	1.84	0.60
2:D:19:VAL:HG13	2:D:561:VAL:HG21	1.84	0.60
2:C:223:ARG:NH2	2:C:424:PRO:HG3	2.17	0.59
2:B:310:TYR:OH	2:B:314:GLU:HB3	2.01	0.59
2:B:399:VAL:O	2:B:399:VAL:HG12	2.02	0.59
2:C:96:ARG:NH1	2:C:398:ASP:OD1	2.35	0.59
2:B:52:LEU:O	2:B:107:LEU:HD11	2.02	0.59
2:C:210:VAL:HG13	2:C:265:TYR:HB2	1.83	0.59
2:A:553:LYS:HA	2:A:571:THR:HA	1.84	0.59
2:C:82:SER:HB3	2:C:89:THR:CG2	2.33	0.59
2:D:50:TRP:CE2	2:D:54:VAL:HG11	2.38	0.59
2:D:305:LYS:O	2:D:306:ARG:HB2	2.03	0.59
1:E:1:DT:H3'	1:E:2:DT:C5'	2.31	0.59
2:D:409:ASN:H	2:D:409:ASN:ND2	1.99	0.59
2:A:453:ILE:HD11	2:A:463:THR:HG22	1.84	0.59
2:D:325:ASP:O	2:D:326:LEU:HD23	2.02	0.59
2:A:171:GLN:O	2:A:175:GLU:HG3	2.03	0.59
2:B:495:LEU:HG	2:B:546:PHE:CE2	2.38	0.59
2:A:284:HIS:CE1	2:A:330:ASN:HB3	2.38	0.59
2:A:281:TYR:N	2:A:282:PRO:HD2	2.18	0.58
2:D:31:ASN:ND2	2:D:33:GLU:H	2.01	0.58
2:B:540:GLU:OE2	2:B:552:ARG:HD3	2.04	0.58
2:C:409:ASN:N	2:C:409:ASN:HD22	1.99	0.58
2:D:9:TYR:HB2	2:D:58:LEU:HD22	1.86	0.58
2:D:305:LYS:HA	2:D:311:LYS:HB3	1.86	0.58
2:D:327:TRP:O	2:D:328:LEU:HD23	2.04	0.58
2:C:97:MET:CE	2:C:308:ARG:HB3	2.32	0.58
2:C:268:PRO:HG3	2:C:353:PHE:CE2	2.39	0.58
2:D:504:ILE:HD12	2:D:504:ILE:H	1.68	0.58
2:C:19:VAL:HG13	2:C:561:VAL:HG11	1.86	0.57
2:B:496:ARG:HH11	2:B:496:ARG:HG2	1.68	0.57
2:A:271:PHE:CZ	2:A:275:TYR:HB2	2.39	0.57
2:D:310:TYR:CE1	2:D:316:LEU:HD23	2.39	0.57
2:A:328:LEU:HD12	2:A:333:LEU:HD13	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:87:PRO:O	2:B:89:THR:HG23	2.04	0.57
1:E:5:DT:C2	2:A:567:LEU:HD12	2.39	0.57
2:D:147:ASP:O	2:D:152:ARG:NH2	2.37	0.57
2:C:31:ASN:HD22	2:C:31:ASN:C	2.08	0.57
2:C:540:GLU:OE1	2:C:552:ARG:HD3	2.05	0.57
2:B:5:PRO:HG2	2:C:5:PRO:CG	2.35	0.57
2:A:302:ILE:HD11	2:A:336:MET:HG3	1.86	0.57
2:B:227:ARG:HD2	2:B:303:GLN:HE21	1.68	0.57
2:D:541:VAL:HA	2:D:545:ASN:ND2	2.20	0.56
2:C:289:ARG:HG3	2:C:348:ILE:CD1	2.29	0.56
2:D:253:LEU:HD21	2:D:437:ALA:HB1	1.86	0.56
2:B:367:TRP:HB2	2:B:386:LEU:HD21	1.87	0.56
2:D:262:LEU:HA	2:D:357:THR:HG22	1.88	0.56
2:C:85:GLY:HA3	2:C:114:LYS:HZ3	1.69	0.56
2:D:249:ASP:CG	2:D:486:GLU:HG3	2.24	0.56
2:C:291:GLU:HG2	2:C:322:GLU:O	2.05	0.56
2:D:50:TRP:O	2:D:54:VAL:HG22	2.05	0.56
2:B:68:ALA:O	2:B:72:ASN:HB2	2.05	0.56
2:A:416:LEU:HD12	2:A:417:GLY:H	1.70	0.56
2:C:306:ARG:HD3	2:C:310:TYR:CB	2.36	0.56
2:C:14:GLU:HB2	2:C:26:ALA:HB3	1.88	0.56
2:B:102:MET:HG2	2:B:103:ILE:N	2.20	0.56
2:B:75:GLU:OE2	2:B:80:LYS:HA	2.06	0.56
2:C:554:MET:O	2:C:556:PRO:HD3	2.05	0.56
2:A:168:ASN:O	2:A:172:ILE:HG13	2.05	0.56
2:C:427:THR:OG1	2:C:428:PRO:HD3	2.05	0.56
2:C:96:ARG:NH1	2:C:96:ARG:CB	2.55	0.55
1:E:1:DT:C3'	1:E:2:DT:H5'	2.36	0.55
2:A:202:ILE:O	2:A:203:THR:CB	2.55	0.55
2:D:180:GLN:NE2	2:D:381:LEU:HD13	2.20	0.55
2:D:407:LYS:HB2	2:D:409:ASN:HD21	1.70	0.55
2:A:294:LEU:HD22	2:A:300:PRO:HG3	1.89	0.55
2:B:210:VAL:C	2:B:212:PRO:HD3	2.27	0.55
2:A:495:LEU:O	2:A:496:ARG:HG3	2.06	0.55
2:D:543:PHE:C	2:D:545:ASN:H	2.10	0.55
2:C:31:ASN:ND2	2:C:33:GLU:N	2.55	0.55
2:A:162:GLU:O	2:A:166:ILE:HG13	2.07	0.55
1:H:5:DT:C2	2:D:567:LEU:HD12	2.42	0.55
2:D:302:ILE:HD11	2:D:336:MET:HG3	1.89	0.55
2:A:159:THR:OG1	2:A:162:GLU:HG3	2.07	0.55
2:D:159:THR:OG1	2:D:162:GLU:HG3	2.07	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:453:ILE:HD11	2:C:463:THR:CG2	2.37	0.55
2:C:31:ASN:ND2	2:C:34:ASP:H	2.04	0.55
2:A:253:LEU:HD22	2:A:458:ASP:HB3	1.88	0.55
2:D:409:ASN:H	2:D:409:ASN:HD22	1.49	0.55
2:A:287:HIS:HE1	2:A:325:ASP:OD1	1.90	0.55
2:D:538:LYS:C	2:D:540:GLU:H	2.09	0.55
2:C:51:VAL:O	2:C:117:THR:HG21	2.07	0.55
2:C:223:ARG:NH2	2:C:424:PRO:CG	2.70	0.54
2:C:150:LYS:HD3	2:C:152:ARG:NH1	2.22	0.54
2:D:31:ASN:HD22	2:D:33:GLU:H	1.56	0.54
2:C:223:ARG:HH21	2:C:424:PRO:CG	2.20	0.54
2:D:536:LYS:HG2	2:D:554:MET:HE2	1.89	0.54
2:B:217:GLY:O	2:B:221:GLU:HG3	2.07	0.54
2:D:496:ARG:HG3	2:D:496:ARG:NH1	2.23	0.54
2:D:501:ILE:HG22	2:D:528:VAL:HG13	1.89	0.54
2:A:410:GLY:O	2:A:562:PRO:HA	2.08	0.54
2:C:289:ARG:CG	2:C:348:ILE:HD11	2.32	0.54
2:C:223:ARG:NH2	2:C:397:PRO:CG	2.67	0.54
2:A:350:GLY:O	2:A:351:LEU:HD23	2.08	0.54
2:B:545:ASN:ND2	2:B:550:PHE:HD1	2.04	0.54
2:C:231:THR:HB	2:C:313:ASN:HD22	1.73	0.54
2:A:27:TYR:CE2	2:A:41:GLY:HA3	2.43	0.54
2:C:420:GLU:O	2:C:421:THR:OG1	2.23	0.54
2:A:471:ILE:HG22	2:A:475:VAL:CG2	2.38	0.54
2:D:397:PRO:HA	2:D:422:LYS:HG2	1.89	0.54
2:D:14:GLU:HB2	2:D:26:ALA:HB3	1.89	0.54
2:C:489:PHE:HB3	2:C:504:ILE:HD13	1.90	0.54
2:B:5:PRO:HG2	2:C:5:PRO:CB	2.37	0.54
2:C:31:ASN:HD22	2:C:33:GLU:N	2.05	0.54
2:C:305:LYS:HB3	2:D:344:ASN:CG	2.27	0.53
2:D:253:LEU:HD22	2:D:458:ASP:HB3	1.90	0.53
2:A:47:PHE:CD2	2:A:48:MET:HE2	2.43	0.53
2:D:554:MET:O	2:D:556:PRO:HD3	2.09	0.53
2:C:421:THR:HG22	2:C:422:LYS:N	2.24	0.53
2:D:202:ILE:O	2:D:206:LYS:HB3	2.08	0.53
2:C:281:TYR:N	2:C:282:PRO:CD	2.71	0.53
2:D:284:HIS:CE1	2:D:330:ASN:HB3	2.44	0.53
2:B:424:PRO:HB3	2:B:427:THR:HG23	1.91	0.53
2:A:501:ILE:HG23	2:A:546:PHE:CE2	2.44	0.53
2:B:501:ILE:HG22	2:B:528:VAL:HG22	1.90	0.53
2:D:500:TYR:CZ	2:D:529:LYS:HG3	2.44	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:203:THR:HG22	2:A:205:LYS:N	2.23	0.52
2:B:253:LEU:O	2:B:257:GLN:HG2	2.10	0.52
2:A:289:ARG:NH2	2:B:309:PHE:HB3	2.25	0.52
2:D:202:ILE:HB	2:D:206:LYS:HD3	1.92	0.52
2:B:550:PHE:HB3	2:B:574:ILE:HD12	1.91	0.52
2:B:160:PRO:O	2:B:163:TYR:HB3	2.10	0.52
2:D:295:LYS:HE3	2:D:340:TYR:O	2.09	0.52
2:B:140:THR:O	2:B:172:ILE:HD11	2.09	0.52
2:C:31:ASN:HD21	2:C:33:GLU:HB2	1.74	0.52
2:D:179:ILE:HD12	2:D:377:ALA:HB1	1.92	0.52
2:A:407:LYS:O	2:A:409:ASN:N	2.42	0.52
2:D:311:LYS:O	2:D:313:ASN:N	2.43	0.52
2:A:31:ASN:HD22	2:A:31:ASN:C	2.13	0.52
2:C:185:LEU:HD22	2:C:193:ASP:HB3	1.91	0.52
2:A:466:GLU:H	2:A:466:GLU:CD	2.12	0.52
2:C:50:TRP:CZ2	2:C:54:VAL:HG11	2.44	0.52
2:B:236:ARG:NH1	3:B:601:HOH:O	2.42	0.52
2:C:434:THR:CG2	2:C:438:ARG:HH12	2.20	0.52
2:A:31:ASN:HD22	2:A:32:ILE:N	2.08	0.52
2:A:549:GLY:O	2:A:573:THR:HG23	2.10	0.52
2:C:399:VAL:O	2:C:399:VAL:CG1	2.58	0.51
2:B:281:TYR:HB3	2:B:352:LYS:HB3	1.93	0.51
2:B:271:PHE:CZ	2:B:350:GLY:HA3	2.45	0.51
2:D:451:ARG:NH1	2:D:468:PRO:HG3	2.25	0.51
2:C:405:TYR:CE2	2:C:415:ARG:HG3	2.46	0.51
2:D:198:PHE:O	2:D:201:ILE:HG22	2.11	0.51
2:B:51:VAL:HG13	2:B:117:THR:HG21	1.93	0.51
2:A:180:GLN:HE21	2:A:381:LEU:HD22	1.75	0.51
2:A:502:GLN:HB2	2:A:504:ILE:HD11	1.93	0.51
2:C:305:LYS:HD3	2:D:344:ASN:ND2	2.25	0.51
2:A:223:ARG:HG2	2:A:427:THR:HG21	1.92	0.51
2:A:222:VAL:HG11	2:A:428:PRO:HG3	1.91	0.51
2:A:79:PHE:CE2	2:A:88:ASN:HA	2.45	0.51
2:D:333:LEU:CD1	2:D:336:MET:HE1	2.40	0.51
2:A:71:ILE:HG23	2:A:90:TYR:OH	2.11	0.51
2:B:257:GLN:OE1	2:B:436:TRP:HB3	2.11	0.51
2:D:538:LYS:O	2:D:540:GLU:N	2.44	0.51
2:D:469:ASP:HA	2:D:472:LYS:HG3	1.92	0.51
2:D:281:TYR:HB3	2:D:352:LYS:HB3	1.91	0.51
2:C:85:GLY:HA3	2:C:114:LYS:HZ2	1.74	0.51
2:A:25:TRP:CD2	2:A:152:ARG:HD3	2.46	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:541:VAL:HG22	2:A:550:PHE:CZ	2.45	0.51
2:C:468:PRO:O	2:C:472:LYS:HG3	2.10	0.51
2:C:223:ARG:NH1	2:C:227:ARG:NH2	2.59	0.51
2:D:48:MET:HG3	2:D:73:TRP:CD2	2.46	0.51
2:C:540:GLU:OE2	2:C:554:MET:SD	2.68	0.51
2:B:9:TYR:HB2	2:B:58:LEU:HD22	1.93	0.51
2:B:360:PHE:O	2:B:364:ILE:HG12	2.11	0.51
2:A:201:ILE:HD11	2:A:366:LYS:HD3	1.93	0.51
2:A:264:PRO:HD2	2:A:283:LEU:CD1	2.32	0.50
2:B:226:TYR:HD2	2:B:306:ARG:NH2	2.02	0.50
2:C:146:ILE:HG22	2:C:147:ASP:N	2.26	0.50
2:A:74:LEU:HD21	2:A:105:ILE:HD13	1.93	0.50
2:D:50:TRP:CZ2	2:D:54:VAL:HG11	2.45	0.50
2:C:47:PHE:O	2:C:51:VAL:HG23	2.11	0.50
2:C:249:ASP:HB2	2:C:486:GLU:HG2	1.92	0.50
2:D:333:LEU:HD12	2:D:336:MET:CE	2.41	0.50
2:A:471:ILE:HG22	2:A:475:VAL:HG23	1.91	0.50
2:A:8:MET:HB3	2:A:32:ILE:HD12	1.94	0.50
2:D:52:LEU:O	2:D:107:LEU:CD1	2.60	0.50
2:D:499:THR:HA	2:D:529:LYS:O	2.11	0.50
2:D:70:ILE:HD13	2:D:119:ILE:HD13	1.93	0.50
2:A:96:ARG:HB2	2:A:400:THR:O	2.10	0.50
2:D:31:ASN:HD22	2:D:32:ILE:N	2.10	0.50
2:B:274:LYS:HE2	3:B:631:HOH:O	2.12	0.50
2:C:506:MET:CG	2:C:525:LYS:HB2	2.42	0.50
2:C:161:GLU:HB2	3:C:603:HOH:O	2.11	0.50
2:A:86:LEU:HB2	2:A:89:THR:CB	2.40	0.50
2:C:75:GLU:HA	2:C:75:GLU:OE1	2.11	0.50
2:C:146:ILE:CD1	2:C:146:ILE:H	2.22	0.50
2:C:353:PHE:CD1	2:C:353:PHE:N	2.80	0.50
2:B:234:ASN:OD1	2:B:236:ARG:HG2	2.12	0.50
2:C:304:ILE:O	2:C:306:ARG:N	2.45	0.49
2:D:542:THR:OG1	2:D:545:ASN:HB3	2.12	0.49
2:C:202:ILE:O	2:C:203:THR:CB	2.59	0.49
1:G:5:DT:H5'	2:C:14:GLU:OE1	2.12	0.49
2:C:404:PRO:CD	2:C:414:PHE:CD2	2.88	0.49
2:B:147:ASP:OD2	2:B:150:LYS:HE3	2.11	0.49
2:C:508:GLU:HB2	2:C:522:THR:HG21	1.94	0.49
2:A:281:TYR:HB3	2:A:352:LYS:HB3	1.94	0.49
2:D:150:LYS:HD3	2:D:152:ARG:HH12	1.76	0.49
2:C:86:LEU:O	2:C:89:THR:HG22	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:279:GLU:O	2:A:282:PRO:CD	2.61	0.49
2:C:203:THR:HG22	2:C:205:LYS:N	2.28	0.49
2:B:6:ARG:HH22	2:B:118:VAL:HG23	1.78	0.49
2:B:273:GLY:HA2	2:B:347:TYR:O	2.13	0.49
2:B:476:ASP:OD2	2:B:479:LYS:HE3	2.12	0.49
1:G:1:DT:C3'	1:G:2:DT:H5'	2.35	0.49
2:A:496:ARG:HG3	2:A:496:ARG:NH1	2.22	0.49
2:D:245:GLY:HA3	2:D:489:PHE:CZ	2.48	0.49
2:A:224:TYR:HA	2:A:305:LYS:HZ2	1.76	0.49
2:B:227:ARG:HH11	2:B:227:ARG:HG2	1.78	0.49
2:A:549:GLY:O	2:A:550:PHE:C	2.50	0.49
2:D:561:VAL:HG12	2:D:562:PRO:CD	2.43	0.48
2:A:8:MET:CB	2:A:32:ILE:HD12	2.43	0.48
2:C:68:ALA:CB	2:C:565:VAL:HG23	2.42	0.48
2:D:268:PRO:HG3	2:D:353:PHE:CE2	2.48	0.48
2:A:245:GLY:HA3	2:A:489:PHE:CZ	2.48	0.48
2:C:74:LEU:HD11	2:C:105:ILE:CD1	2.43	0.48
2:C:570:ASP:OD1	2:C:571:THR:N	2.46	0.48
2:C:281:TYR:N	2:C:282:PRO:HD2	2.29	0.48
2:D:410:GLY:O	2:D:562:PRO:HA	2.13	0.48
2:D:502:GLN:HB2	2:D:504:ILE:HD11	1.95	0.48
2:C:409:ASN:N	2:C:409:ASN:ND2	2.61	0.48
2:A:557:LYS:O	2:A:559:VAL:HG23	2.13	0.48
2:D:304:ILE:O	2:D:311:LYS:HB3	2.14	0.48
2:A:400:THR:HG23	2:A:418:GLU:O	2.13	0.48
2:B:532:GLY:O	2:B:555:LYS:HE2	2.13	0.48
2:A:100:TRP:N	2:A:100:TRP:CD1	2.81	0.48
2:B:18:LYS:HB2	2:B:21:ASP:HB3	1.96	0.48
1:G:4:DT:H1'	2:C:62:ASN:HD22	1.79	0.48
2:C:7:LYS:O	2:C:56:ALA:HB1	2.14	0.48
2:B:125:LYS:NZ	2:B:193:ASP:OD2	2.46	0.48
2:C:82:SER:HB3	2:C:89:THR:HG23	1.94	0.48
2:A:399:VAL:HG12	2:A:399:VAL:O	2.14	0.48
2:A:252:SER:HB2	2:A:480:LEU:HD12	1.95	0.48
2:D:252:SER:HA	3:D:629:HOH:O	2.14	0.48
2:B:255:PRO:HD3	3:B:612:HOH:O	2.13	0.48
2:A:39:LYS:HG3	2:A:40:ILE:N	2.27	0.48
2:A:40:ILE:HD12	2:A:163:TYR:CE1	2.47	0.48
2:A:380:GLN:HE22	2:A:383:LYS:NZ	2.12	0.48
2:C:22:CYS:SG	2:C:566:VAL:HG23	2.54	0.48
2:C:203:THR:HG22	2:C:205:LYS:H	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:302:ILE:HD11	2:D:336:MET:CG	2.44	0.47
2:C:453:ILE:HD11	2:C:463:THR:N	2.29	0.47
2:D:150:LYS:HD3	2:D:152:ARG:NH1	2.29	0.47
2:C:406:LEU:HD12	2:C:411:ALA:O	2.14	0.47
2:C:330:ASN:O	2:C:334:GLU:HG2	2.13	0.47
2:D:561:VAL:CG1	2:D:562:PRO:CD	2.92	0.47
2:A:48:MET:HE2	2:A:51:VAL:HG21	1.95	0.47
2:B:31:ASN:C	2:B:31:ASN:HD22	2.13	0.47
2:C:470:VAL:HG23	2:C:471:ILE:HG23	1.95	0.47
2:B:300:PRO:HB2	2:B:315:TYR:HB2	1.97	0.47
2:A:61:HIS:O	2:A:62:ASN:CB	2.62	0.47
2:B:11:CYS:HA	2:B:28:GLY:O	2.14	0.47
2:B:268:PRO:HG3	2:B:353:PHE:CE2	2.49	0.47
2:C:207:PHE:CE1	2:C:211:PHE:HD1	2.33	0.47
1:G:4:DT:C1'	2:C:62:ASN:HD22	2.28	0.47
2:D:561:VAL:HG13	2:D:562:PRO:HD2	1.95	0.47
2:A:302:ILE:HD11	2:A:336:MET:CG	2.45	0.47
2:C:538:LYS:C	2:C:540:GLU:H	2.17	0.47
2:C:223:ARG:HH21	2:C:424:PRO:HG2	1.80	0.47
2:A:62:ASN:O	2:A:63:LEU:C	2.53	0.47
2:B:303:GLN:NE2	3:B:639:HOH:O	2.47	0.47
2:C:48:MET:CE	2:C:51:VAL:HG21	2.45	0.47
2:B:94:ILE:HG23	2:B:100:TRP:CD1	2.50	0.47
2:A:86:LEU:C	2:A:89:THR:HB	2.33	0.47
2:C:403:VAL:CG2	2:C:417:GLY:HA3	2.42	0.47
2:D:551:SER:O	2:D:552:ARG:CG	2.63	0.47
2:A:50:TRP:CE2	2:A:54:VAL:HG11	2.50	0.47
2:A:319:SER:HB2	2:A:322:GLU:O	2.14	0.47
2:B:61:HIS:HA	2:B:122:SER:OG	2.14	0.47
2:C:288:ILE:HD13	2:C:347:TYR:CE2	2.49	0.46
2:B:5:PRO:HG2	2:C:5:PRO:HB3	1.97	0.46
2:A:514:VAL:HG12	2:A:515:GLU:N	2.30	0.46
2:B:73:TRP:CE3	2:B:74:LEU:HD23	2.50	0.46
2:B:73:TRP:HE3	2:B:74:LEU:HD23	1.80	0.46
2:D:254:TYR:HB2	2:D:255:PRO:HD3	1.97	0.46
2:B:106:CYS:HA	2:B:116:HIS:HB3	1.97	0.46
2:B:9:TYR:HB2	2:B:58:LEU:CD2	2.45	0.46
2:B:238:LYS:HG2	2:B:239:GLU:HG3	1.97	0.46
2:A:66:ALA:O	2:A:70:ILE:HG13	2.15	0.46
2:A:52:LEU:CD2	2:A:107:LEU:HD21	2.30	0.46
2:D:287:HIS:HE1	2:D:325:ASP:OD1	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:75:GLU:HB3	2:A:406:LEU:CD1	2.45	0.46
2:A:101:TYR:HB3	2:A:188:MET:CE	2.45	0.46
2:A:570:ASP:OD1	2:A:571:THR:N	2.38	0.46
2:B:568:VAL:HG12	2:B:569:ASP:N	2.31	0.46
2:B:561:VAL:HG13	2:B:562:PRO:HD2	1.96	0.46
2:D:305:LYS:O	2:D:306:ARG:CB	2.63	0.46
2:D:76:ARG:NH2	2:D:410:GLY:O	2.49	0.46
2:C:350:GLY:C	2:C:351:LEU:HD23	2.35	0.46
2:D:52:LEU:O	2:D:107:LEU:HD11	2.16	0.46
2:A:281:TYR:HA	2:A:353:PHE:O	2.15	0.46
2:D:333:LEU:CD1	2:D:336:MET:CE	2.93	0.46
2:A:102:MET:HG3	2:A:118:VAL:CG1	2.46	0.46
2:B:515:GLU:H	2:B:515:GLU:CD	2.19	0.46
2:B:534:THR:O	2:B:538:LYS:HG3	2.15	0.46
2:B:405:TYR:CE1	2:B:407:LYS:HA	2.50	0.46
2:C:109:TYR:N	2:C:109:TYR:CD1	2.83	0.46
2:B:187:ARG:HB3	2:B:192:SER:HB2	1.98	0.46
2:A:556:PRO:HA	2:A:568:VAL:O	2.16	0.46
2:D:570:ASP:OD1	2:D:571:THR:N	2.41	0.45
2:C:17:THR:HG21	2:C:149:HIS:CE1	2.51	0.45
2:C:254:TYR:HB2	2:C:255:PRO:HD3	1.97	0.45
2:A:110:LYS:HG3	2:A:115:ILE:HD11	1.98	0.45
2:A:565:VAL:HG12	2:A:566:VAL:N	2.30	0.45
2:C:268:PRO:HG3	2:C:353:PHE:HE2	1.79	0.45
2:D:397:PRO:O	2:D:421:THR:HA	2.16	0.45
2:A:101:TYR:O	2:A:102:MET:HB2	2.16	0.45
2:A:540:GLU:O	2:A:545:ASN:ND2	2.48	0.45
2:A:43:SER:O	2:A:46:GLU:HB3	2.15	0.45
2:A:553:LYS:HA	2:A:570:ASP:O	2.16	0.45
2:A:64:LYS:HA	2:A:100:TRP:CD1	2.51	0.45
2:B:237:PHE:CE1	2:B:453:ILE:HD12	2.51	0.45
1:E:3:DT:H5'	2:A:129:PRO:CG	2.20	0.45
2:B:55:GLN:CA	2:B:116:HIS:O	2.61	0.45
2:C:31:ASN:C	2:C:31:ASN:ND2	2.69	0.45
2:C:48:MET:HE2	2:C:51:VAL:HG21	1.97	0.45
2:A:309:PHE:O	2:A:309:PHE:CD2	2.69	0.45
2:B:486:GLU:O	2:B:515:GLU:HG2	2.16	0.45
2:C:8:MET:HB3	2:C:32:ILE:HD12	1.97	0.45
2:D:226:TYR:O	2:D:227:ARG:HG3	2.16	0.45
2:C:27:TYR:CD2	2:C:47:PHE:HB2	2.51	0.45
2:A:252:SER:HB2	2:A:480:LEU:CD1	2.47	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:288:ILE:HG12	2:A:289:ARG:N	2.32	0.45
2:C:150:LYS:O	2:C:152:ARG:HG3	2.17	0.45
2:A:76:ARG:NH2	2:A:410:GLY:O	2.50	0.45
2:D:533:MET:HG2	2:D:537:ILE:HB	1.98	0.45
2:C:86:LEU:O	2:C:89:THR:CG2	2.65	0.45
2:A:101:TYR:HB3	2:A:188:MET:HE3	1.99	0.45
2:A:22:CYS:O	2:A:22:CYS:SG	2.75	0.45
2:C:40:ILE:HD12	2:C:166:ILE:CG2	2.47	0.44
2:C:253:LEU:O	2:C:257:GLN:HG2	2.17	0.44
2:A:412:LEU:HD23	2:A:560:GLN:NE2	2.32	0.44
2:A:271:PHE:CZ	2:A:350:GLY:HA3	2.52	0.44
2:A:575:LYS:HG3	2:A:575:LYS:OXT	2.17	0.44
2:B:384:LEU:HA	2:B:384:LEU:HD23	1.81	0.44
2:C:496:ARG:NH1	2:C:575:LYS:OXT	2.49	0.44
2:C:289:ARG:HB2	2:C:346:GLU:HB2	2.00	0.44
2:C:109:TYR:CZ	2:C:114:LYS:HG2	2.52	0.44
2:B:48:MET:CE	2:B:70:ILE:HG12	2.47	0.44
2:B:308:ARG:O	2:B:309:PHE:CB	2.65	0.44
2:C:150:LYS:HD3	2:C:152:ARG:HH12	1.82	0.44
2:B:150:LYS:O	2:B:152:ARG:HG3	2.17	0.44
2:D:231:THR:HG22	2:D:497:GLN:HB3	1.99	0.44
2:A:264:PRO:CG	2:A:283:LEU:CD1	2.89	0.44
2:C:307:SER:HA	2:D:323:ILE:HD12	1.99	0.44
2:D:553:LYS:C	2:D:554:MET:HG3	2.38	0.44
2:D:400:THR:OG1	2:D:419:GLU:HA	2.18	0.44
2:B:243:GLY:O	2:B:491:ARG:HA	2.18	0.44
2:B:241:GLU:HG2	3:B:607:HOH:O	2.17	0.44
2:A:243:GLY:O	2:A:491:ARG:HA	2.16	0.44
2:D:541:VAL:HA	2:D:545:ASN:HD21	1.80	0.44
2:C:289:ARG:NH2	2:D:341:ASP:OD1	2.50	0.44
2:B:303:GLN:OE1	2:B:313:ASN:ND2	2.51	0.44
2:B:313:ASN:HB2	2:B:497:GLN:OE1	2.18	0.44
2:B:96:ARG:O	2:B:402:LYS:HE3	2.18	0.44
2:D:538:LYS:C	2:D:540:GLU:N	2.71	0.43
2:C:305:LYS:HB3	2:D:344:ASN:OD1	2.18	0.43
2:D:236:ARG:NH1	3:D:619:HOH:O	2.51	0.43
2:B:522:THR:HG22	2:B:523:ASP:CG	2.37	0.43
2:C:181:PHE:C	2:C:183:GLN:H	2.22	0.43
2:B:262:LEU:HB2	3:B:618:HOH:O	2.18	0.43
2:C:264:PRO:O	2:C:265:TYR:CB	2.64	0.43
2:D:536:LYS:HG2	2:D:554:MET:CE	2.48	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:245:GLY:HA3	2:A:489:PHE:CE1	2.53	0.43
2:A:551:SER:O	2:A:552:ARG:CD	2.66	0.43
2:C:97:MET:HE3	2:C:308:ARG:HB3	1.99	0.43
2:B:8:MET:HA	2:B:57:ASP:O	2.19	0.43
2:C:141:VAL:O	2:C:141:VAL:HG13	2.19	0.43
2:A:48:MET:HG3	2:A:73:TRP:CD2	2.54	0.43
2:A:70:ILE:HD13	2:A:119:ILE:CD1	2.49	0.43
2:C:529:LYS:HA	2:C:529:LYS:HD3	1.74	0.43
1:G:4:DT:OP1	1:G:4:DT:C4'	2.60	0.43
2:A:304:ILE:O	2:A:305:LYS:C	2.57	0.43
2:C:403:VAL:HG23	2:C:417:GLY:CA	2.48	0.43
2:A:64:LYS:HG3	2:A:100:TRP:NE1	2.34	0.43
2:A:84:ASP:O	2:A:85:GLY:O	2.36	0.43
2:D:308:ARG:HD2	2:D:308:ARG:HA	1.62	0.43
2:A:475:VAL:HA	2:A:483:TRP:O	2.19	0.43
2:C:486:GLU:O	2:C:515:GLU:HG2	2.18	0.43
2:B:556:PRO:HA	2:B:568:VAL:O	2.19	0.43
2:B:76:ARG:NH2	2:B:410:GLY:O	2.49	0.43
2:A:19:VAL:HG23	3:A:579:HOH:O	2.19	0.43
2:C:536:LYS:HE2	2:C:554:MET:CE	2.49	0.43
2:D:128:PHE:HB2	2:D:133:ILE:HG13	2.01	0.43
2:A:19:VAL:CG1	2:A:561:VAL:HG11	2.49	0.42
2:C:100:TRP:CZ3	2:C:103:ILE:HD11	2.54	0.42
2:A:201:ILE:HD11	2:A:366:LYS:CD	2.49	0.42
2:D:87:PRO:O	2:D:89:THR:HG23	2.19	0.42
2:B:31:ASN:HB3	2:B:34:ASP:O	2.19	0.42
2:A:566:VAL:HG12	2:A:567:LEU:N	2.35	0.42
2:B:397:PRO:O	2:B:399:VAL:HG23	2.18	0.42
2:A:411:ALA:HA	2:A:562:PRO:HA	2.01	0.42
2:C:471:ILE:O	2:C:475:VAL:HG23	2.19	0.42
2:A:310:TYR:OH	2:A:322:GLU:HB2	2.19	0.42
2:B:15:THR:HG21	2:B:69:PHE:CZ	2.54	0.42
2:D:508:GLU:HG3	2:D:512:LYS:O	2.19	0.42
2:C:310:TYR:HE1	2:D:289:ARG:HD2	1.84	0.42
2:A:48:MET:CE	2:A:51:VAL:HG21	2.49	0.42
2:B:404:PRO:O	2:B:405:TYR:HB3	2.19	0.42
2:D:18:LYS:HB2	2:D:21:ASP:HB3	2.01	0.42
2:D:219:ASP:O	2:D:223:ARG:HB2	2.20	0.42
2:B:181:PHE:CE2	2:B:186:ASP:HA	2.54	0.42
2:B:284:HIS:HA	2:B:351:LEU:O	2.18	0.42
2:C:59:TYR:HB3	2:C:122:SER:HB3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:5:DT:H2'	2:C:148:TYR:CD1	2.54	0.42
2:D:201:ILE:HD13	2:D:363:PHE:HA	2.02	0.42
2:B:507:LYS:HG3	2:B:509:VAL:HG23	1.99	0.42
2:A:254:TYR:HB2	2:A:255:PRO:HD3	2.02	0.42
2:D:294:LEU:HD22	2:D:300:PRO:HG3	2.01	0.42
2:B:304:ILE:HG12	2:B:316:LEU:HG	2.02	0.42
2:C:307:SER:HG	2:C:310:TYR:HD1	1.65	0.42
2:D:289:ARG:HA	2:D:324:ALA:O	2.20	0.42
2:C:31:ASN:ND2	2:C:34:ASP:N	2.67	0.42
2:B:517:SER:O	2:B:521:TYR:HB3	2.20	0.42
2:B:566:VAL:HG12	2:B:567:LEU:N	2.34	0.42
2:D:27:TYR:CD1	2:D:27:TYR:C	2.92	0.42
2:D:171:GLN:NE2	3:D:606:HOH:O	2.53	0.42
2:C:71:ILE:HG21	2:C:412:LEU:HD21	2.00	0.42
2:D:50:TRP:NE1	2:D:54:VAL:CG1	2.82	0.42
2:A:110:LYS:HD2	2:A:113:ARG:NH2	2.34	0.42
2:C:155:GLY:O	2:C:156:TYR:C	2.58	0.42
2:D:547:LYS:HB2	3:D:622:HOH:O	2.19	0.42
2:A:52:LEU:O	2:A:107:LEU:HD11	2.20	0.42
2:C:453:ILE:CD1	2:C:463:THR:N	2.83	0.42
2:B:50:TRP:NE1	2:B:54:VAL:HG11	2.34	0.42
2:B:424:PRO:CB	2:B:427:THR:HG23	2.50	0.42
2:A:466:GLU:N	2:A:466:GLU:CD	2.72	0.42
2:B:248:PHE:O	2:B:459:SER:HA	2.20	0.42
2:D:187:ARG:HD2	2:D:187:ARG:HA	1.80	0.42
1:H:1:DT:C3'	1:H:2:DT:C5'	2.90	0.42
1:E:2:DT:H6	1:E:2:DT:H5''	1.84	0.42
2:B:281:TYR:HB2	2:B:352:LYS:HD2	2.02	0.42
2:C:40:ILE:HB	2:C:163:TYR:CE1	2.55	0.42
2:C:100:TRP:HZ3	2:C:103:ILE:HD11	1.85	0.42
1:E:3:DT:C2'	1:E:4:DT:O5'	2.60	0.41
2:D:305:LYS:NZ	3:D:615:HOH:O	2.53	0.41
2:C:236:ARG:NH2	3:C:618:HOH:O	2.52	0.41
2:D:72:ASN:O	2:D:76:ARG:HG3	2.19	0.41
2:A:50:TRP:O	2:A:54:VAL:HG22	2.20	0.41
2:D:94:ILE:HA	2:D:99:GLN:O	2.20	0.41
2:A:237:PHE:HD2	2:A:242:ILE:HG21	1.85	0.41
2:C:86:LEU:O	2:C:87:PRO:C	2.59	0.41
2:A:289:ARG:CD	2:A:348:ILE:HD11	2.50	0.41
2:C:48:MET:HG3	2:C:73:TRP:CD2	2.55	0.41
2:C:74:LEU:O	2:C:79:PHE:HB2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:310:TYR:O	2:A:311:LYS:C	2.58	0.41
2:B:286:GLN:CG	2:B:288:ILE:CG2	2.96	0.41
2:B:204:THR:O	2:B:208:LYS:HG3	2.20	0.41
2:D:287:HIS:HB3	2:D:349:SER:O	2.21	0.41
1:H:5:DT:H2'	2:D:148:TYR:CD2	2.55	0.41
2:C:15:THR:HG21	2:C:69:PHE:CZ	2.56	0.41
2:D:271:PHE:CZ	2:D:350:GLY:HA3	2.56	0.41
2:A:86:LEU:O	2:A:87:PRO:C	2.57	0.41
2:B:306:ARG:HB2	2:B:307:SER:H	1.71	0.41
2:D:333:LEU:HD12	2:D:336:MET:HE2	2.01	0.41
2:B:501:ILE:HG22	2:B:528:VAL:HG13	2.02	0.41
2:B:270:VAL:HG12	2:B:271:PHE:N	2.35	0.41
2:D:551:SER:HA	2:D:572:PHE:O	2.20	0.41
2:A:491:ARG:HG3	2:A:543:PHE:CZ	2.55	0.41
2:A:258:MET:HE1	2:A:389:LEU:HD23	2.01	0.41
2:B:253:LEU:HD22	2:B:458:ASP:HB3	2.01	0.41
2:B:227:ARG:HD2	2:B:303:GLN:NE2	2.34	0.41
2:B:94:ILE:HA	2:B:99:GLN:O	2.21	0.41
2:A:371:LYS:HE3	3:A:637:HOH:O	2.19	0.41
1:H:2:DT:H5''	1:H:2:DT:H6	1.85	0.41
2:D:304:ILE:HD12	2:D:309:PHE:CE1	2.55	0.41
2:C:223:ARG:NH1	2:C:397:PRO:HD2	2.36	0.41
2:B:187:ARG:HB3	2:B:192:SER:CB	2.50	0.41
2:D:35:HIS:CD2	2:D:35:HIS:N	2.88	0.41
2:D:304:ILE:CD1	2:D:326:LEU:HD21	2.45	0.41
2:A:218:LEU:O	2:A:222:VAL:HG23	2.21	0.41
2:C:553:LYS:O	2:C:554:MET:HG3	2.21	0.41
2:A:44:LEU:CD1	2:A:48:MET:HG2	2.51	0.41
2:B:11:CYS:SG	2:B:58:LEU:HB3	2.61	0.41
2:D:551:SER:C	2:D:552:ARG:HG3	2.40	0.41
2:A:449:TYR:O	2:A:452:ILE:HG22	2.20	0.41
2:A:453:ILE:HD11	2:A:463:THR:HG23	2.02	0.41
1:G:5:DT:C2	2:C:567:LEU:HD12	2.56	0.41
2:B:490:LYS:HD2	2:B:524:ILE:HD13	2.02	0.41
2:B:496:ARG:NH1	2:B:499:THR:OG1	2.54	0.40
2:B:28:GLY:HA2	2:B:39:LYS:O	2.21	0.40
2:B:364:ILE:O	2:B:368:THR:OG1	2.26	0.40
2:B:554:MET:O	2:B:556:PRO:HD3	2.21	0.40
2:D:61:HIS:O	2:D:62:ASN:HB3	2.21	0.40
2:C:223:ARG:HH21	2:C:424:PRO:HG3	1.81	0.40
2:C:52:LEU:HB3	2:C:107:LEU:HD11	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:408:GLU:N	2:C:408:GLU:CD	2.71	0.40
2:A:486:GLU:O	2:A:515:GLU:HG2	2.20	0.40
2:D:292:PHE:O	2:D:318:SER:HA	2.22	0.40
2:C:537:ILE:HG21	2:C:572:PHE:CE2	2.56	0.40
2:A:280:ASP:C	2:A:282:PRO:HD2	2.41	0.40
2:D:47:PHE:O	2:D:50:TRP:HB3	2.21	0.40
2:D:104:ASP:OD2	2:D:116:HIS:HD2	2.04	0.40
2:C:557:LYS:HA	2:C:558:PRO:HD3	1.92	0.40
2:B:449:TYR:O	2:B:452:ILE:HG22	2.21	0.40
2:A:89:THR:CG2	2:A:90:TYR:N	2.83	0.40
2:A:501:ILE:HG13	2:A:501:ILE:O	2.20	0.40
2:B:102:MET:HE3	2:B:104:ASP:HB2	2.03	0.40
2:B:452:ILE:HA	2:B:462:LEU:HD23	2.01	0.40
2:A:359:LEU:HB2	3:A:688:HOH:O	2.21	0.40
2:D:335:LEU:HD21	2:D:442:ILE:HD12	2.03	0.40
2:C:288:ILE:HD12	2:C:346:GLU:O	2.22	0.40
2:A:224:TYR:HD2	2:A:305:LYS:HZ2	1.70	0.40
2:A:343:TYR:CE2	2:B:289:ARG:HD3	2.57	0.40
2:C:334:GLU:HA	2:C:334:GLU:OE1	2.20	0.40
2:A:540:GLU:HB3	2:A:552:ARG:HH12	1.85	0.40
1:F:4:DT:O2	2:B:65:PHE:HB2	2.22	0.40
2:D:557:LYS:HA	2:D:558:PRO:HD3	1.88	0.40
2:B:128:PHE:HB2	2:B:133:ILE:HG13	2.03	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	
2	A	569/575 (99%)	506 (89%)	47 (8%)	16 (3%)	6	15
2	B	569/575 (99%)	513 (90%)	51 (9%)	5 (1%)	21	49

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	C	569/575 (99%)	518 (91%)	39 (7%)	12 (2%)	9	23
2	D	569/575 (99%)	519 (91%)	39 (7%)	11 (2%)	10	25
All	All	2276/2300 (99%)	2056 (90%)	176 (8%)	44 (2%)	10	25

All (44) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	62	ASN
2	A	85	GLY
2	A	309	PHE
2	A	408	GLU
2	A	185	LEU
2	A	306	ARG
2	A	409	ASN
2	A	418	GLU
2	B	306	ARG
2	B	408	GLU
2	C	85	GLY
2	C	182	LYS
2	D	312	GLY
2	D	395	SER
2	D	539	LYS
2	A	426	TYR
2	A	569	ASP
2	C	117	THR
2	C	305	LYS
2	C	397	PRO
2	D	62	ASN
2	D	97	MET
2	D	310	TYR
2	A	550	PHE
2	C	203	THR
2	C	401	GLY
2	C	426	TYR
2	C	457	THR
2	D	203	THR
2	D	306	ARG
2	D	457	THR
2	A	127	PRO
2	A	457	THR
2	B	127	PRO

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Mol	Chain	Res	Type
2	B	405	TYR
2	C	539	LYS
2	A	102	MET
2	A	112	LYS
2	A	203	THR
2	C	127	PRO
2	D	425	VAL
2	D	321	GLY
2	C	87	PRO
2	B	424	PRO

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	
2	A	502/506 (99%)	487 (97%)	15 (3%)	48	79
2	B	502/506 (99%)	486 (97%)	16 (3%)	46	77
2	C	502/506 (99%)	479 (95%)	23 (5%)	33	64
2	D	502/506 (99%)	492 (98%)	10 (2%)	63	87
All	All	2008/2024 (99%)	1944 (97%)	64 (3%)	46	77

All (64) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	A	16	THR
2	A	22	CYS
2	A	31	ASN
2	A	87	PRO
2	A	89	THR
2	A	145	ASP
2	A	149	HIS
2	A	168	ASN
2	A	268	PRO
2	A	282	PRO
2	A	335	LEU

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Mol	Chain	Res	Type
2	A	390	TYR
2	A	396	ASN
2	A	397	PRO
2	A	398	ASP
2	B	16	THR
2	B	31	ASN
2	B	43	SER
2	B	72	ASN
2	B	116	HIS
2	B	131	LYS
2	B	145	ASP
2	B	185	LEU
2	B	194	SER
2	B	223	ARG
2	B	249	ASP
2	B	260	SER
2	B	313	ASN
2	B	318	SER
2	B	545	ASN
2	B	552	ARG
2	C	16	THR
2	C	31	ASN
2	C	87	PRO
2	C	89	THR
2	C	96	ARG
2	C	109	TYR
2	C	116	HIS
2	C	127	PRO
2	C	128	PHE
2	C	145	ASP
2	C	186	ASP
2	C	264	PRO
2	C	265	TYR
2	C	268	PRO
2	C	282	PRO
2	C	314	GLU
2	C	353	PHE
2	C	397	PRO
2	C	404	PRO
2	C	409	ASN
2	C	412	LEU
2	C	485	HIS

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Mol	Chain	Res	Type
2	C	552	ARG
2	D	31	ASN
2	D	45	ASP
2	D	54	VAL
2	D	97	MET
2	D	187	ARG
2	D	188	MET
2	D	260	SER
2	D	310	TYR
2	D	384	LEU
2	D	409	ASN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (31) such sidechains are listed below:

Mol	Chain	Res	Type
2	A	31	ASN
2	A	171	GLN
2	A	180	GLN
2	A	287	HIS
2	A	380	GLN
2	A	485	HIS
2	B	31	ASN
2	B	171	GLN
2	B	287	HIS
2	B	303	GLN
2	B	313	ASN
2	B	396	ASN
2	B	545	ASN
2	C	31	ASN
2	C	35	HIS
2	C	55	GLN
2	C	62	ASN
2	C	171	GLN
2	C	313	ASN
2	C	380	GLN
2	C	409	ASN
2	C	502	GLN
2	D	31	ASN
2	D	35	HIS
2	D	171	GLN
2	D	180	GLN
2	D	287	HIS

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Mol	Chain	Res	Type
2	D	396	ASN
2	D	409	ASN
2	D	485	HIS
2	D	545	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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	E	5/5 (100%)	11.62	5 (100%) 0 0	98, 113, 125, 129	0
1	F	2/5 (40%)	8.38	2 (100%) 0 0	128, 128, 128, 130	0
1	G	5/5 (100%)	9.43	5 (100%) 0 0	72, 77, 81, 98	0
1	H	5/5 (100%)	8.91	5 (100%) 0 0	65, 76, 100, 112	0
2	A	571/575 (99%)	0.82	62 (10%) 7 5	31, 65, 116, 130	0
2	B	571/575 (99%)	0.75	35 (6%) 25 23	29, 56, 96, 130	0
2	C	571/575 (99%)	0.69	47 (8%) 14 11	25, 54, 110, 130	0
2	D	571/575 (99%)	0.67	46 (8%) 15 12	28, 51, 86, 130	0
All	All	2301/2320 (99%)	0.80	207 (8%) 12 9	25, 56, 111, 130	0

All (207) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	5	DT	15.4
1	E	2	DT	12.5
1	E	3	DT	12.3
1	E	4	DT	10.1
1	G	1	DT	10.0
1	H	3	DT	10.0
2	D	310	TYR	10.0
1	G	3	DT	9.9
1	G	2	DT	9.8
1	H	1	DT	9.8
1	H	2	DT	9.7
1	F	4	DT	9.4
1	G	4	DT	9.3
2	B	309	PHE	8.2
1	G	5	DT	8.1
1	E	1	DT	7.9

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Mol	Chain	Res	Type	RSRZ
1	H	4	DT	7.8
1	F	5	DT	7.4
2	A	510	ASP	7.4
1	H	5	DT	7.3
2	A	311	LYS	6.9
2	D	307	SER	6.5
2	C	535	ASP	6.1
2	A	85	GLY	6.1
2	C	304	ILE	5.9
2	A	149	HIS	5.9
2	A	399	VAL	5.6
2	A	308	ARG	5.6
2	A	508	GLU	5.6
2	D	308	ARG	5.5
2	C	309	PHE	5.5
2	C	419	GLU	5.4
2	C	310	TYR	5.3
2	A	306	ARG	5.2
2	A	533	MET	5.2
2	D	570	ASP	5.2
2	C	533	MET	5.1
2	C	572	PHE	5.1
2	C	421	THR	4.9
2	C	423	ASP	4.9
2	C	418	GLU	4.8
2	C	420	GLU	4.8
2	C	114	LYS	4.7
2	B	310	TYR	4.7
2	A	310	TYR	4.7
2	D	558	PRO	4.6
2	C	5	PRO	4.6
2	D	535	ASP	4.5
2	B	106	CYS	4.5
2	D	572	PHE	4.5
2	A	396	ASN	4.4
2	C	398	ASP	4.3
2	A	305	LYS	4.3
2	A	154	VAL	4.2
2	B	306	ARG	4.2
2	D	533	MET	4.2
2	A	112	LYS	4.2
2	A	148	TYR	4.2

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Mol	Chain	Res	Type	RSRZ
2	B	512	LYS	4.1
2	A	416	LEU	4.1
2	A	564	GLY	4.1
2	B	107	LEU	4.0
2	C	148	TYR	4.0
2	C	536	LYS	4.0
2	A	405	TYR	3.9
2	D	532	GLY	3.9
2	B	113	ARG	3.9
2	D	157	LYS	3.9
2	A	418	GLU	3.9
2	B	311	LYS	3.9
2	C	400	THR	3.9
2	D	512	LYS	3.8
2	D	522	THR	3.8
2	A	412	LEU	3.8
2	B	308	ARG	3.7
2	D	19	VAL	3.7
2	D	509	VAL	3.6
2	B	115	ILE	3.6
2	A	572	PHE	3.6
2	D	309	PHE	3.6
2	A	562	PRO	3.6
2	B	108	GLY	3.6
2	C	149	HIS	3.6
2	C	532	GLY	3.5
2	C	539	LYS	3.5
2	A	309	PHE	3.5
2	A	512	LYS	3.5
2	D	575	LYS	3.5
2	C	115	ILE	3.4
2	B	419	GLU	3.4
2	D	510	ASP	3.4
2	B	307	SER	3.3
2	A	307	SER	3.3
2	A	407	LYS	3.2
2	C	104	ASP	3.2
2	D	312	GLY	3.2
2	B	86	LEU	3.2
2	B	561	VAL	3.2
2	A	560	GLN	3.2
2	A	410	GLY	3.2

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Mol	Chain	Res	Type	RSRZ
2	C	184	GLY	3.2
2	A	84	ASP	3.2
2	D	306	ARG	3.1
2	A	409	ASN	3.1
2	B	568	VAL	3.1
2	B	421	THR	3.1
2	B	304	ILE	3.1
2	A	216	LEU	3.0
2	D	574	ILE	3.0
2	C	116	HIS	3.0
2	A	395	SER	2.9
2	D	413	GLY	2.9
2	B	5	PRO	2.9
2	A	113	ARG	2.9
2	C	112	LYS	2.9
2	C	75	GLU	2.9
2	C	109	TYR	2.9
2	A	75	GLU	2.9
2	A	155	GLY	2.9
2	D	523	ASP	2.9
2	A	150	LYS	2.9
2	C	113	ARG	2.8
2	D	513	LEU	2.8
2	D	530	CYS	2.8
2	C	111	GLY	2.8
2	A	408	GLU	2.7
2	C	377	ALA	2.7
2	D	536	LYS	2.7
2	D	554	MET	2.7
2	A	413	GLY	2.7
2	D	149	HIS	2.6
2	A	397	PRO	2.6
2	D	508	GLU	2.6
2	A	406	LEU	2.6
2	A	539	LYS	2.6
2	C	83	ALA	2.6
2	A	559	VAL	2.6
2	A	313	ASN	2.6
2	A	532	GLY	2.6
2	B	53	LYS	2.6
2	D	311	LYS	2.6
2	A	541	VAL	2.6

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Mol	Chain	Res	Type	RSRZ
2	A	16	THR	2.6
2	D	313	ASN	2.6
2	C	55	GLN	2.5
2	B	84	ASP	2.5
2	D	66	ALA	2.5
2	D	565	VAL	2.5
2	C	424	PRO	2.5
2	B	410	GLY	2.5
2	A	158	ILE	2.5
2	B	103	ILE	2.5
2	A	509	VAL	2.4
2	D	534	THR	2.4
2	D	97	MET	2.4
2	D	314	GLU	2.4
2	D	571	THR	2.4
2	C	107	LEU	2.4
2	A	402	LYS	2.4
2	A	83	ALA	2.4
2	B	117	THR	2.4
2	B	97	MET	2.3
2	C	108	GLY	2.3
2	A	411	ALA	2.3
2	D	148	TYR	2.3
2	A	555	LYS	2.3
2	C	53	LYS	2.3
2	B	190	ALA	2.3
2	A	424	PRO	2.2
2	C	84	ASP	2.2
2	C	403	VAL	2.2
2	A	147	ASP	2.2
2	C	106	CYS	2.2
2	B	477	PRO	2.2
2	C	87	PRO	2.2
2	B	166	ILE	2.2
2	A	575	LYS	2.2
2	D	85	GLY	2.2
2	D	226	TYR	2.2
2	C	90	TYR	2.2
2	B	142	LEU	2.2
2	D	105	ILE	2.1
2	C	160	PRO	2.1
2	A	240	LYS	2.1

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Mol	Chain	Res	Type	RSRZ
2	C	311	LYS	2.1
2	B	404	PRO	2.1
2	B	151	GLU	2.1
2	C	511	GLY	2.1
2	A	419	GLU	2.1
2	A	95	SER	2.1
2	D	79	PHE	2.1
2	A	166	ILE	2.1
2	A	535	ASP	2.1
2	A	111	GLY	2.1
2	B	513	LEU	2.1
2	D	414	PHE	2.1
2	A	135	LYS	2.1
2	C	186	ASP	2.1
2	C	81	TRP	2.0
2	B	165	TYR	2.0
2	B	478	LYS	2.0
2	C	89	THR	2.0
2	D	550	PHE	2.0
2	D	412	LEU	2.0
2	D	567	LEU	2.0
2	D	573	THR	2.0
2	B	22	CYS	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](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.