



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 02:42 PM UTC

PDB ID : 4B3K / pdb\_00004b3k  
Title : Family 1 6-phospho-beta-D glycosidase from Streptococcus pyogenes  
Authors : Stepper, J.; Dabin, J.; Ekloef, J.M.; Thongpoo, P.; Kongsaree, P.T.; Taylor, E.J.; Turkenburg, J.P.; Brumer, H.; Davies, G.J.  
Deposited on : 2012-07-24  
Resolution : 2.60 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

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

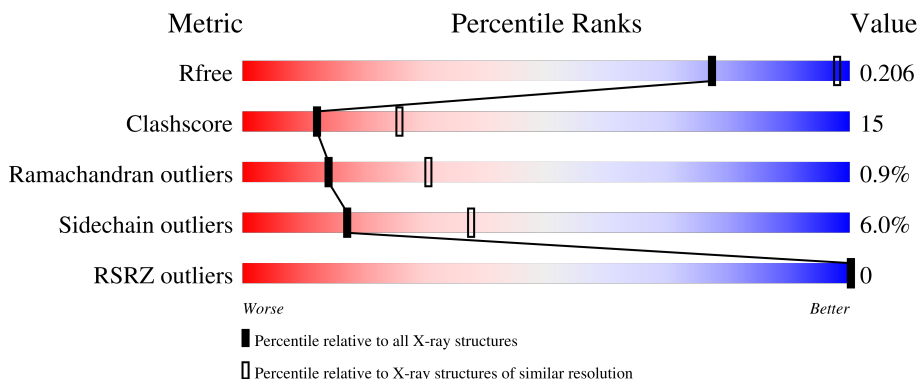
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.60 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.




Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	180053	4008 (2.60-2.60)
Clashscore	190562	4347 (2.60-2.60)
Ramachandran outliers	187476	4277 (2.60-2.60)
Sidechain outliers	187428	4277 (2.60-2.60)
RSRZ outliers	180081	4008 (2.60-2.60)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	479	 69% 23% . .
1	B	479	 67% 25% . .
1	C	479	 63% 30% . .
1	D	479	 64% 28% . .
1	E	479	 61% 33% . . .

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Mol	Chain	Length	Quality of chain
1	F	479	 59% 33% . .

## 2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 22669 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 BETA-GLUCOSIDASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	461	3767	2435	636	686	10	0	0	0
1	B	461	3767	2435	636	686	10	0	0	0
1	C	461	3767	2435	636	686	10	0	0	0
1	D	461	3767	2435	636	686	10	0	0	0
1	E	461	3767	2435	636	686	10	0	0	0
1	F	461	3767	2435	636	686	10	0	0	0

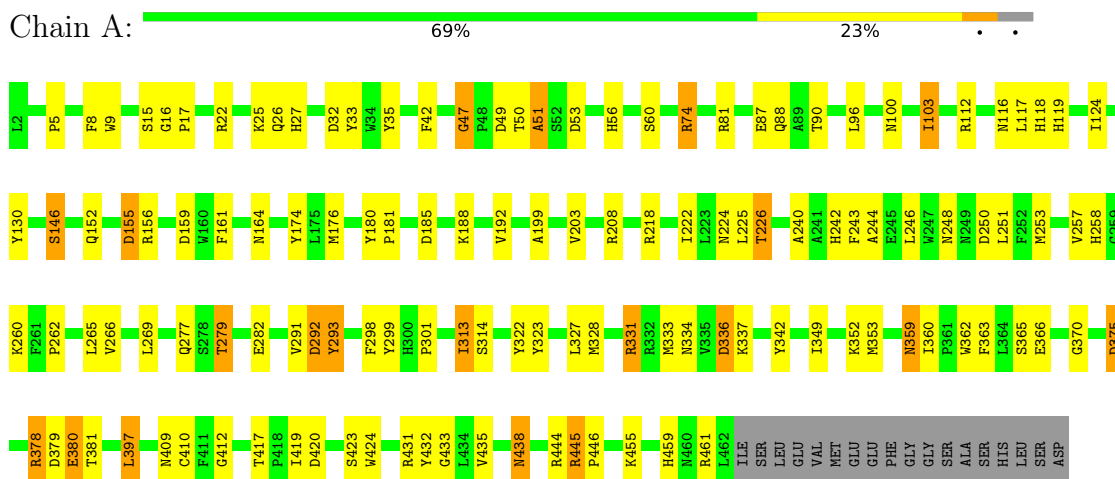
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	13	Total 13	O 13	0	0
2	B	17	Total 17	O 17	0	0
2	C	10	Total 10	O 10	0	0
2	D	14	Total 14	O 14	0	0
2	E	9	Total 9	O 9	0	0
2	F	4	Total 4	O 4	0	0

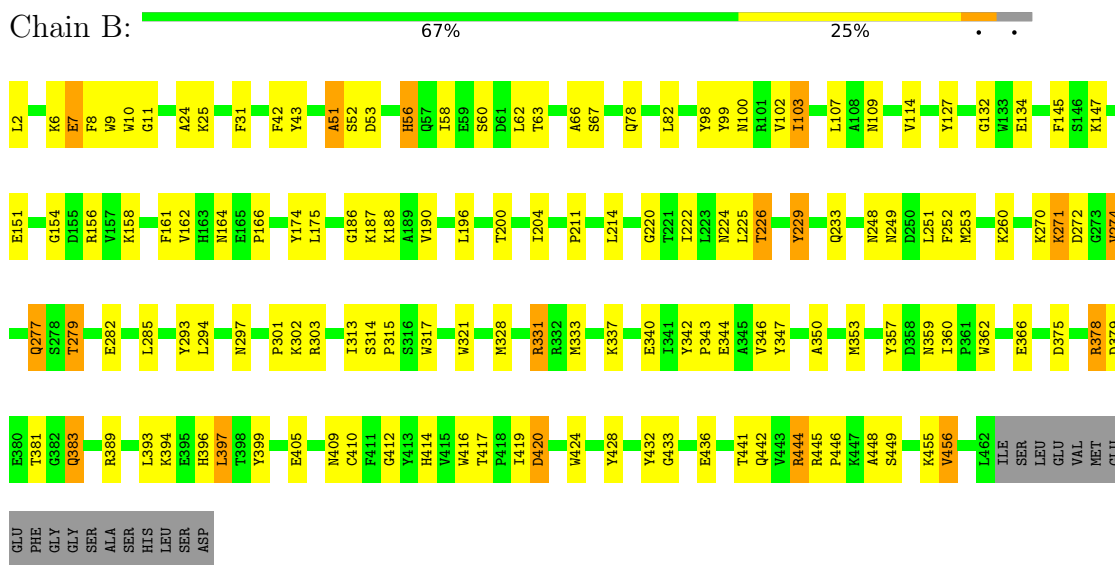
### 3 Residue-property plots

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

#### • Molecule 1: BETA-GLUCOSIDASE

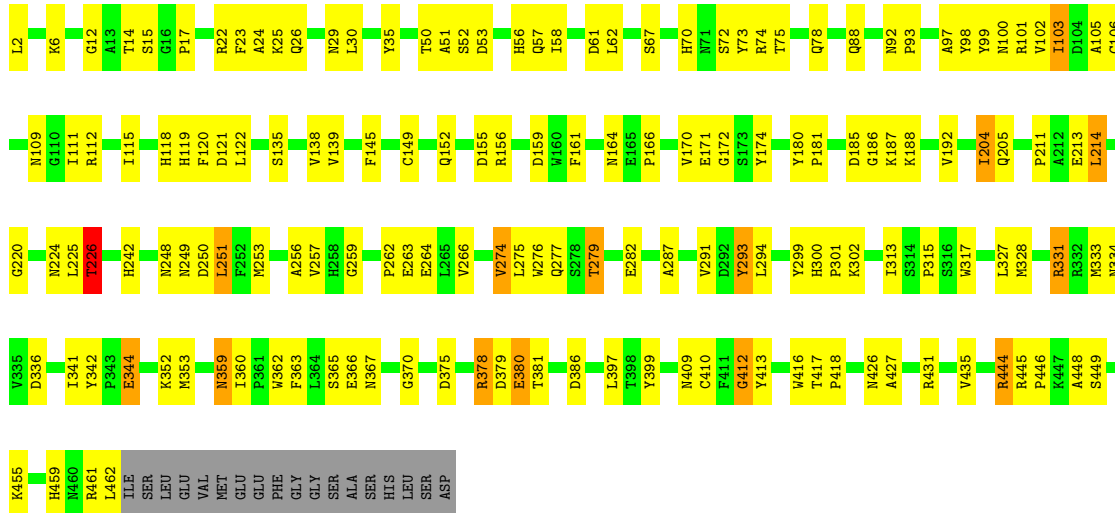


#### • Molecule 1: BETA-GLUCOSIDASE



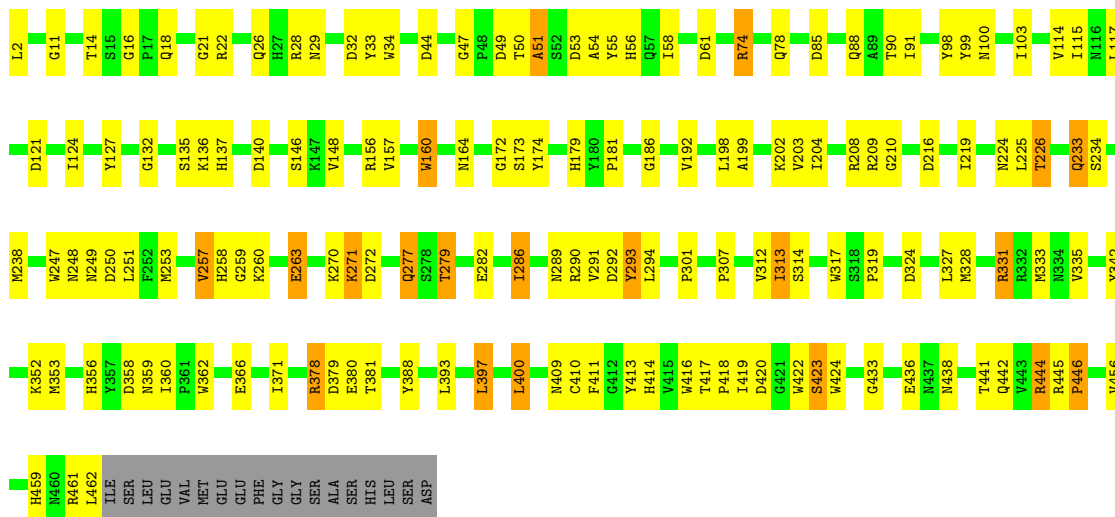
#### • Molecule 1: BETA-GLUCOSIDASE





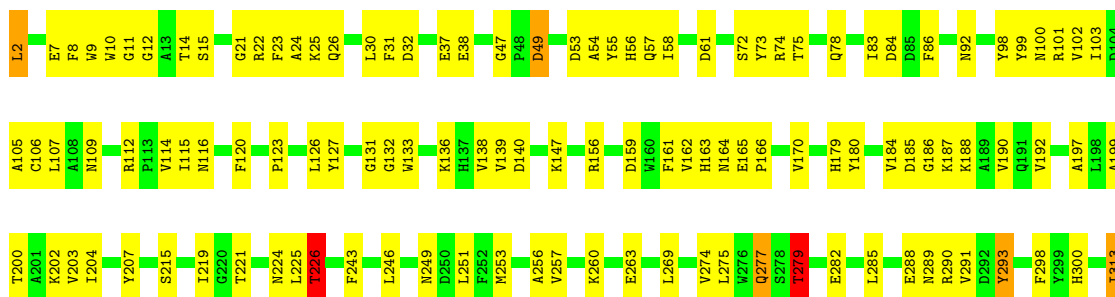
- Molecule 1: BETA-GLUCOSIDASE

Chain D: 64% 28%



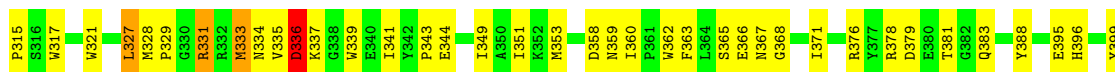
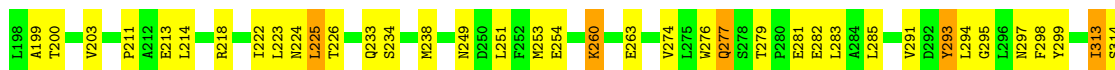
- Molecule 1: BETA-GLUCOSIDASE

Chain E: 61% 33%





• Molecule 1: BETA-GLUCOSIDASE



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	106.42Å 190.20Å 106.17Å 90.00° 118.88° 90.00°	Depositor
Resolution (Å)	66.56 – 2.60 66.56 – 2.60	Depositor EDS
% Data completeness (in resolution range)	93.7 (66.56-2.60) 93.0 (66.56-2.60)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.94 (at 2.62Å)	Xtrriage
Refinement program	REFMAC 5.7.0025	Depositor
R, $R_{free}$	0.223 , 0.286 0.182 , 0.206	Depositor DCC
$R_{free}$ test set	5282 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	41.5	Xtrriage
Anisotropy	0.066	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 10.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.40$ , $\langle L^2 \rangle = 0.23$	Xtrriage
Estimated twinning fraction	0.069 for l,k,-h-l 0.069 for -h-l,k,h 0.074 for -h-l,-k,l 0.074 for h,-k,-h-l 0.348 for l,-k,h	Xtrriage
Reported twinning fraction	0.677 for H, K, L 0.323 for L, -K, H	Depositor
Outliers	0 of 105767 reflections	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	22669	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	39.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.41% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality i

### 5.1 Standard geometry i

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	1.03	2/3891 (0.1%)	1.14	10/5304 (0.2%)
1	B	1.03	2/3891 (0.1%)	1.13	6/5304 (0.1%)
1	C	0.97	3/3891 (0.1%)	1.09	12/5304 (0.2%)
1	D	0.99	1/3891 (0.0%)	1.12	13/5304 (0.2%)
1	E	0.97	0/3891	1.09	14/5304 (0.3%)
1	F	0.92	0/3891	1.07	8/5304 (0.2%)
All	All	0.99	8/23346 (0.0%)	1.11	63/31824 (0.2%)

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	14	THR	C-O	6.79	1.29	1.24
1	C	14	THR	C-O	6.47	1.29	1.24
1	A	118	HIS	CG-CD2	6.02	1.42	1.35
1	C	70	HIS	CG-CD2	5.22	1.41	1.35
1	C	118	HIS	CG-CD2	5.20	1.41	1.35
1	A	27	HIS	CG-CD2	5.18	1.41	1.35
1	B	56	HIS	CG-CD2	5.09	1.41	1.35
1	B	56	HIS	CE1-NE2	5.00	1.37	1.32

All (63) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	21	GLY	N-CA-C	-11.41	101.11	111.95
1	E	21	GLY	N-CA-C	-8.21	102.19	111.63
1	A	226	THR	CA-C-N	-7.85	111.82	120.14
1	A	226	THR	C-N-CA	-7.85	111.82	120.14
1	E	197	ALA	N-CA-C	-7.09	103.24	110.97
1	E	360	ILE	CA-C-N	-7.00	113.10	120.03
1	E	360	ILE	C-N-CA	-7.00	113.10	120.03
1	C	302	LYS	N-CA-C	-6.57	99.33	109.52
1	D	32	ASP	N-CA-C	-6.57	104.05	111.07
1	A	47	GLY	CA-C-N	6.56	128.61	121.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	47	GLY	C-N-CA	6.56	128.61	121.00
1	D	47	GLY	CA-C-N	6.56	126.26	119.64
1	D	47	GLY	C-N-CA	6.56	126.26	119.64
1	E	47	GLY	CA-C-N	6.51	126.64	119.87
1	E	47	GLY	C-N-CA	6.51	126.64	119.87
1	F	47	GLY	CA-C-N	6.18	125.80	119.56
1	F	47	GLY	C-N-CA	6.18	125.80	119.56
1	C	103	ILE	CB-CA-C	-6.17	104.10	111.81
1	C	352	LYS	N-CA-C	-6.11	103.96	112.45
1	F	368	GLY	N-CA-C	6.05	119.58	110.75
1	D	121	ASP	N-CA-C	6.02	119.86	111.56
1	E	57	GLN	N-CA-C	5.97	120.18	113.02
1	C	412	GLY	N-CA-C	5.91	119.13	110.38
1	C	152	GLN	N-CA-C	5.86	118.61	111.82
1	B	229	TYR	CA-C-N	5.80	125.70	119.85
1	B	229	TYR	C-N-CA	5.80	125.70	119.85
1	D	257	VAL	N-CA-C	5.77	116.42	110.82
1	A	292	ASP	N-CA-C	-5.67	105.62	112.54
1	A	360	ILE	CA-C-N	-5.67	114.12	119.85
1	A	360	ILE	C-N-CA	-5.67	114.12	119.85
1	F	115	ILE	N-CA-C	5.63	116.23	108.12
1	F	360	ILE	CA-C-N	-5.63	113.98	119.78
1	F	360	ILE	C-N-CA	-5.63	113.98	119.78
1	E	49	ASP	N-CA-C	5.57	117.79	111.11
1	B	346	VAL	N-CA-C	-5.55	104.96	110.62
1	A	298	PHE	N-CA-C	5.47	117.34	108.26
1	F	103	ILE	CB-CA-C	-5.45	104.78	112.14
1	D	115	ILE	N-CA-C	5.44	115.69	107.75
1	C	73	TYR	CA-C-N	-5.43	115.22	122.72
1	C	73	TYR	C-N-CA	-5.43	115.22	122.72
1	D	26	GLN	N-CA-C	5.39	117.24	111.36
1	E	365	SER	N-CA-C	5.35	117.11	111.28
1	D	16	GLY	CA-C-N	5.34	125.67	119.47
1	D	16	GLY	C-N-CA	5.34	125.67	119.47
1	E	131	GLY	N-CA-C	-5.34	106.85	115.08
1	E	226	THR	CA-C-N	-5.34	115.09	120.85
1	E	226	THR	C-N-CA	-5.34	115.09	120.85
1	C	115	ILE	N-CA-C	5.32	115.78	108.12
1	B	51	ALA	CB-CA-C	-5.31	110.43	116.54
1	C	121	ASP	N-CA-C	5.30	116.81	110.44
1	C	226	THR	CA-C-N	-5.26	114.82	120.03
1	C	226	THR	C-N-CA	-5.26	114.82	120.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	424	TRP	CB-CA-C	-5.25	110.54	116.63
1	D	160	TRP	N-CA-C	5.21	118.31	109.76
1	B	58	ILE	N-CA-C	5.20	115.93	110.62
1	A	26	GLN	N-CA-C	5.18	117.34	111.02
1	D	250	ASP	N-CA-C	5.12	116.95	111.36
1	B	10	TRP	N-CA-C	-5.11	101.55	109.72
1	E	314	SER	CA-C-N	5.09	124.54	119.24
1	E	314	SER	C-N-CA	5.09	124.54	119.24
1	C	344	GLU	N-CA-C	-5.06	105.95	111.82
1	F	121	ASP	N-CA-C	5.05	118.47	111.71
1	D	400	LEU	N-CA-C	-5.01	105.82	111.28

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	3767	0	3574	97	0
1	B	3767	0	3574	96	0
1	C	3767	0	3574	114	0
1	D	3767	0	3574	115	0
1	E	3767	0	3574	130	0
1	F	3767	0	3574	136	0
2	A	13	0	0	2	0
2	B	17	0	0	0	0
2	C	10	0	0	0	0
2	D	14	0	0	2	0
2	E	9	0	0	0	0
2	F	4	0	0	0	0
All	All	22669	0	21444	682	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 15.

All (682) 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:224:ASN:OD1	1:D:226:THR:HG23	1.40	1.20
1:A:224:ASN:OD1	1:A:226:THR:HG23	1.44	1.15
1:E:331:ARG:HG2	1:E:331:ARG:HH11	1.05	1.13
1:C:331:ARG:HG2	1:C:331:ARG:HH11	1.13	1.11
1:D:253:MET:HE1	1:D:353:MET:HE1	1.12	1.09
1:B:253:MET:HE1	1:B:353:MET:HE1	1.36	1.04
1:A:225:LEU:HD22	1:A:353:MET:CE	1.86	1.04
1:A:331:ARG:HH11	1:A:331:ARG:CG	1.72	1.03
1:C:225:LEU:HD22	1:C:353:MET:HE3	1.40	1.01
1:D:225:LEU:HD22	1:D:353:MET:CE	1.91	1.01
1:E:353:MET:HE2	1:E:353:MET:HA	1.42	1.01
1:D:225:LEU:HD22	1:D:353:MET:HE2	1.42	1.00
1:A:331:ARG:HH11	1:A:331:ARG:HG3	1.22	0.99
1:A:199:ALA:O	1:A:203:VAL:HG23	1.62	0.99
1:B:224:ASN:OD1	1:B:226:THR:HG23	1.61	0.98
1:A:53:ASP:OD1	1:A:56:HIS:HD2	1.48	0.97
1:F:331:ARG:HH11	1:F:331:ARG:CG	1.78	0.96
1:E:331:ARG:HH11	1:E:331:ARG:CG	1.79	0.96
1:C:331:ARG:HH11	1:C:331:ARG:CG	1.78	0.95
1:D:253:MET:CE	1:D:353:MET:HE1	1.96	0.95
1:D:225:LEU:CD2	1:D:353:MET:HE2	1.98	0.94
1:F:331:ARG:HD3	1:F:331:ARG:H	1.32	0.93
1:B:301:PRO:HG3	1:B:342:TYR:HB3	1.49	0.93
1:E:433:GLY:O	1:E:447:LYS:HD2	1.69	0.92
1:D:253:MET:HE1	1:D:353:MET:CE	1.99	0.92
1:B:331:ARG:CG	1:B:331:ARG:HH11	1.80	0.92
1:C:224:ASN:OD1	1:C:226:THR:HG23	1.68	0.92
1:B:379:ASP:OD1	1:B:381:THR:HG22	1.69	0.91
1:F:224:ASN:OD1	1:F:226:THR:HG23	1.70	0.91
1:E:359:ASN:HD21	1:E:409:ASN:H	1.17	0.91
1:F:114:VAL:O	1:F:115:ILE:HD13	1.69	0.90
1:D:379:ASP:OD1	1:D:381:THR:HG22	1.72	0.89
1:D:301:PRO:HG3	1:D:342:TYR:HB3	1.51	0.89
1:E:56:HIS:CD2	1:F:56:HIS:CD2	2.62	0.87
1:F:331:ARG:HH11	1:F:331:ARG:HG3	1.40	0.86
1:E:105:ALA:O	1:E:109:ASN:ND2	2.08	0.86
1:D:291:VAL:HG21	1:D:294:LEU:HD21	1.58	0.86
1:B:331:ARG:HH11	1:B:331:ARG:HG2	1.41	0.84
1:C:253:MET:HE2	1:C:353:MET:HE1	1.59	0.84
1:A:225:LEU:HD22	1:A:353:MET:HE3	1.56	0.84
1:E:99:TYR:O	1:E:103:ILE:HG12	1.76	0.84
1:E:381:THR:O	1:E:445:ARG:NH2	2.12	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:328:MET:O	1:C:331:ARG:HD2	1.78	0.83
1:A:53:ASP:OD1	1:A:56:HIS:CD2	2.33	0.82
1:F:328:MET:O	1:F:331:ARG:HD2	1.79	0.82
1:C:53:ASP:OD1	1:C:56:HIS:HD2	1.63	0.81
1:F:199:ALA:O	1:F:203:VAL:HG23	1.81	0.81
1:A:253:MET:CE	1:A:353:MET:HE1	2.11	0.81
1:D:379:ASP:CG	1:D:381:THR:HG22	2.05	0.81
1:D:418:PRO:HD2	2:D:2012:HOH:O	1.81	0.81
1:B:359:ASN:HD21	1:B:409:ASN:H	1.28	0.81
1:F:22:ARG:NH2	1:F:28:ARG:HG2	1.98	0.79
1:E:328:MET:O	1:E:331:ARG:HD2	1.83	0.79
1:D:291:VAL:HG21	1:D:294:LEU:CD2	2.13	0.78
1:E:331:ARG:HG2	1:E:331:ARG:NH1	1.86	0.78
1:C:100:ASN:HD22	1:C:156:ARG:HH12	1.30	0.78
1:F:105:ALA:O	1:F:109:ASN:ND2	2.15	0.78
1:E:56:HIS:HD2	1:F:56:HIS:NE2	1.82	0.77
1:B:248:ASN:C	1:B:249:ASN:HD22	1.92	0.77
1:E:256:ALA:O	1:E:291:VAL:HG22	1.84	0.77
1:A:328:MET:O	1:A:331:ARG:HD3	1.86	0.76
1:C:331:ARG:HG2	1:C:331:ARG:NH1	1.94	0.76
1:F:159:ASP:OD1	1:F:218:ARG:HD3	1.87	0.75
1:F:328:MET:O	1:F:331:ARG:CD	2.35	0.75
1:C:299:TYR:OH	1:C:366:GLU:OE1	2.04	0.74
1:C:225:LEU:HD13	1:C:253:MET:HG3	1.70	0.74
1:A:359:ASN:HD21	1:A:409:ASN:H	1.35	0.73
1:B:6:LYS:O	1:B:7:GLU:HB2	1.85	0.73
1:C:328:MET:O	1:C:331:ARG:CD	2.35	0.73
1:F:223:LEU:HD12	1:F:253:MET:SD	2.28	0.73
1:C:291:VAL:HB	1:C:293:TYR:O	1.89	0.73
1:A:225:LEU:HD13	1:A:253:MET:HG3	1.70	0.73
1:F:379:ASP:OD1	1:F:381:THR:HG22	1.89	0.73
1:A:225:LEU:CD2	1:A:353:MET:CE	2.66	0.73
1:F:281:GLU:O	1:F:285:LEU:HG	1.89	0.72
1:A:375:ASP:O	1:A:378:ARG:HG2	1.88	0.72
1:E:22:ARG:HD3	1:E:49:ASP:OD1	1.90	0.72
1:B:253:MET:HE1	1:B:353:MET:CE	2.15	0.72
1:F:331:ARG:CG	1:F:331:ARG:NH1	2.48	0.71
1:E:140:ASP:OD1	1:E:202:LYS:NZ	2.21	0.71
1:D:127:TYR:CZ	1:D:181:PRO:HG3	2.25	0.71
1:E:56:HIS:HD2	1:F:56:HIS:CD2	2.08	0.71
1:E:224:ASN:OD1	1:E:226:THR:HG23	1.90	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:103:ILE:HD13	1:A:103:ILE:N	2.06	0.70
1:A:301:PRO:HG3	1:A:342:TYR:HB3	1.73	0.70
1:A:279:THR:HG22	1:A:282:GLU:H	1.56	0.70
1:F:331:ARG:HD3	1:F:331:ARG:N	2.04	0.70
1:A:331:ARG:CG	1:A:331:ARG:NH1	2.40	0.70
1:F:359:ASN:HD21	1:F:409:ASN:H	1.39	0.70
1:C:25:LYS:NZ	1:C:78:GLN:HE22	1.90	0.69
1:A:253:MET:HE2	1:A:353:MET:HE1	1.72	0.69
1:E:26:GLN:OE1	1:E:92:ASN:ND2	2.24	0.69
1:B:331:ARG:HH11	1:B:331:ARG:HG3	1.58	0.69
1:E:225:LEU:HD22	1:E:353:MET:HE3	1.73	0.69
1:C:459:HIS:O	1:C:461:ARG:HG3	1.93	0.69
1:F:379:ASP:CG	1:F:381:THR:HG22	2.17	0.68
1:F:13:ALA:HB1	1:F:74:ARG:NH1	2.09	0.67
1:E:204:ILE:HA	1:E:219:ILE:HD13	1.77	0.67
1:A:225:LEU:HD21	1:A:352:LYS:HG2	1.77	0.67
1:F:99:TYR:O	1:F:103:ILE:HG12	1.95	0.67
1:D:225:LEU:HD22	1:D:353:MET:HE3	1.76	0.67
1:F:78:GLN:HB2	1:F:99:TYR:OH	1.93	0.67
1:B:389:ARG:O	1:B:393:LEU:HG	1.95	0.67
1:A:253:MET:HE1	1:A:353:MET:HE1	1.77	0.67
1:B:53:ASP:OD1	1:B:56:HIS:HD2	1.78	0.66
1:E:279:THR:HG22	1:E:282:GLU:H	1.60	0.66
1:C:30:LEU:HD21	1:C:122:LEU:HD23	1.77	0.66
1:E:269:LEU:HB2	1:E:275:LEU:CD1	2.25	0.66
1:E:207:TYR:O	1:E:215:SER:HB3	1.95	0.66
1:D:99:TYR:O	1:D:103:ILE:HG12	1.95	0.66
1:B:253:MET:CE	1:B:353:MET:HE1	2.20	0.66
1:E:257:VAL:O	1:E:290:ARG:HD3	1.95	0.65
1:D:225:LEU:CD2	1:D:353:MET:CE	2.68	0.65
1:E:98:TYR:O	1:E:102:VAL:HG23	1.97	0.65
1:A:100:ASN:HD22	1:A:156:ARG:HH12	1.42	0.65
1:B:417:THR:O	1:B:433:GLY:HA2	1.97	0.65
1:B:441:THR:O	1:B:442:GLN:HB2	1.95	0.65
1:A:225:LEU:O	1:A:349:ILE:HG12	1.97	0.64
1:D:378:ARG:HH22	1:D:436:GLU:CD	2.05	0.64
1:D:127:TYR:CE1	1:D:181:PRO:HG3	2.32	0.64
1:E:199:ALA:O	1:E:203:VAL:HG23	1.97	0.64
1:D:136:LYS:NZ	1:D:282:GLU:OE1	2.31	0.64
1:F:381:THR:O	1:F:445:ARG:NH2	2.30	0.64
1:A:188:LYS:O	1:A:192:VAL:HG23	1.98	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:253:MET:CE	1:C:353:MET:HE1	2.28	0.64
1:A:301:PRO:HG3	1:A:342:TYR:CB	2.28	0.64
1:C:242:HIS:HE2	1:C:264:GLU:CD	2.06	0.64
1:E:186:GLY:O	1:E:190:VAL:HG23	1.98	0.64
1:E:188:LYS:O	1:E:192:VAL:HG23	1.97	0.64
1:E:253:MET:HE1	1:E:353:MET:HE1	1.79	0.63
1:A:417:THR:O	1:A:433:GLY:HA2	1.97	0.63
1:B:416:TRP:CD1	1:B:417:THR:HB	2.33	0.63
1:A:337:LYS:HE3	1:A:432:TYR:OH	1.98	0.63
1:D:53:ASP:OD1	1:D:56:HIS:HD2	1.82	0.63
1:B:331:ARG:HG2	1:B:331:ARG:NH1	2.03	0.63
1:C:100:ASN:ND2	1:C:156:ARG:HH12	1.97	0.63
1:F:331:ARG:HH11	1:F:331:ARG:HG2	1.62	0.63
1:D:233:GLN:NE2	1:D:238:MET:HE1	2.14	0.62
1:D:359:ASN:HD21	1:D:409:ASN:H	1.48	0.62
1:C:256:ALA:O	1:C:291:VAL:HG22	2.00	0.62
1:A:100:ASN:HD21	1:A:156:ARG:HH22	1.48	0.62
1:D:279:THR:HG22	1:D:282:GLU:H	1.65	0.62
1:A:15:SER:HB3	1:A:119:HIS:CD2	2.35	0.61
1:D:85:ASP:OD2	1:D:88:GLN:HG2	1.99	0.61
1:E:353:MET:HA	1:E:353:MET:CE	2.23	0.61
1:E:9:TRP:HB2	1:E:412:GLY:HA3	1.82	0.61
1:A:331:ARG:HH11	1:A:331:ARG:HG2	1.65	0.61
1:E:185:ASP:HB3	1:E:188:LYS:HD2	1.81	0.61
1:E:26:GLN:HE22	1:E:84:ASP:HA	1.66	0.61
1:F:279:THR:HB	1:F:282:GLU:HG3	1.83	0.61
1:A:328:MET:O	1:A:331:ARG:CD	2.48	0.61
1:F:253:MET:HE2	1:F:353:MET:HE1	1.82	0.61
1:F:149:CYS:O	1:F:153:PHE:HD2	1.83	0.61
1:B:279:THR:HG22	1:B:282:GLU:H	1.64	0.61
1:E:393:LEU:HD22	1:E:413:TYR:OH	1.99	0.61
1:C:26:GLN:OE1	1:C:92:ASN:ND2	2.30	0.61
1:E:100:ASN:ND2	1:E:156:ARG:HH22	1.99	0.61
1:C:331:ARG:CG	1:C:331:ARG:NH1	2.45	0.61
1:E:221:THR:HG22	1:E:291:VAL:HG11	1.82	0.61
1:E:433:GLY:O	1:E:447:LYS:CD	2.47	0.60
1:F:25:LYS:HE3	1:F:80:THR:OG1	2.01	0.60
1:F:103:ILE:HD12	1:F:157:VAL:CG2	2.32	0.60
1:C:359:ASN:HD21	1:C:409:ASN:H	1.47	0.60
1:A:25:LYS:HG3	1:A:81:ARG:HB2	1.82	0.60
1:D:293:TYR:O	1:D:294:LEU:HD23	2.02	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:331:ARG:CG	1:B:331:ARG:NH1	2.49	0.60
1:D:251:LEU:C	1:D:251:LEU:HD23	2.27	0.59
1:E:107:LEU:HD11	1:E:156:ARG:HB3	1.82	0.59
1:E:225:LEU:HD21	1:E:352:LYS:HG2	1.84	0.59
1:F:107:LEU:HD11	1:F:156:ARG:HB3	1.84	0.59
1:A:224:ASN:OD1	1:A:226:THR:CG2	2.35	0.59
1:C:100:ASN:ND2	1:C:156:ARG:HH22	2.00	0.59
1:F:112:ARG:HD3	1:F:159:ASP:OD2	2.03	0.59
1:F:149:CYS:O	1:F:153:PHE:CD2	2.55	0.59
1:E:331:ARG:CG	1:E:331:ARG:NH1	2.44	0.59
1:E:451:TYR:O	1:E:454:LYS:HB3	2.03	0.59
1:B:98:TYR:O	1:B:102:VAL:HG23	2.03	0.59
1:C:225:LEU:CD2	1:C:353:MET:HE3	2.25	0.59
1:F:291:VAL:HB	1:F:293:TYR:O	2.03	0.59
1:A:116:ASN:HA	1:A:161:PHE:O	2.03	0.58
1:C:279:THR:HG22	1:C:282:GLU:H	1.68	0.58
1:E:8:PHE:HD2	1:E:10:TRP:CZ2	2.21	0.58
1:D:172:GLY:C	1:D:179:HIS:HB2	2.29	0.58
1:E:225:LEU:HD21	1:E:352:LYS:HB3	1.85	0.58
1:F:254:GLU:HB3	1:F:260:LYS:O	2.03	0.58
1:D:22:ARG:NH2	1:D:28:ARG:HG2	2.18	0.58
1:E:269:LEU:HB2	1:E:275:LEU:HD13	1.85	0.58
1:E:185:ASP:CB	1:E:188:LYS:HD2	2.34	0.58
1:B:328:MET:O	1:B:331:ARG:HD3	2.04	0.58
1:D:411:PHE:O	1:D:411:PHE:HD1	1.87	0.58
1:B:154:GLY:O	1:B:158:LYS:NZ	2.33	0.58
1:C:105:ALA:O	1:C:109:ASN:ND2	2.35	0.58
1:C:435:VAL:HA	1:C:446:PRO:HA	1.86	0.58
1:A:250:ASP:O	1:A:251:LEU:C	2.45	0.57
1:F:378:ARG:NH2	1:F:436:GLU:OE1	2.37	0.57
1:B:225:LEU:HD22	1:B:353:MET:HE3	1.86	0.57
1:C:100:ASN:HD22	1:C:156:ARG:NH1	1.99	0.57
1:E:371:ILE:HG13	1:E:388:TYR:CE1	2.38	0.57
1:F:180:TYR:CG	1:F:181:PRO:HA	2.38	0.57
1:A:88:GLN:HB2	1:A:90:THR:HG23	1.86	0.57
1:A:174:TYR:CE2	1:A:192:VAL:HG21	2.39	0.57
1:B:379:ASP:CG	1:B:381:THR:HG22	2.28	0.57
1:A:331:ARG:HG3	1:A:331:ARG:NH1	2.02	0.57
1:F:371:ILE:HG13	1:F:388:TYR:CE1	2.40	0.57
1:D:301:PRO:CG	1:D:342:TYR:HB3	2.30	0.57
1:F:13:ALA:CB	1:F:74:ARG:NH1	2.68	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:359:ASN:ND2	1:A:409:ASN:H	2.02	0.57
1:C:248:ASN:C	1:C:249:ASN:HD22	2.13	0.57
1:A:103:ILE:HD13	1:A:103:ILE:H	1.69	0.56
1:E:344:GLU:HG3	1:E:399:TYR:CZ	2.41	0.56
1:D:417:THR:O	1:D:433:GLY:HA2	2.05	0.56
1:E:400:LEU:HD11	1:E:410:CYS:SG	2.45	0.56
1:B:25:LYS:NZ	1:B:78:GLN:HE22	2.03	0.56
1:F:378:ARG:HA	1:F:383:GLN:O	2.06	0.56
1:A:96:LEU:HD11	1:A:152:GLN:HE21	1.69	0.56
1:D:257:VAL:HG22	1:D:360:ILE:HD13	1.87	0.56
1:F:155:ASP:OD2	1:F:156:ARG:NE	2.35	0.56
1:A:155:ASP:HB3	1:D:459:HIS:CE1	2.41	0.56
1:B:301:PRO:HG3	1:B:342:TYR:CB	2.30	0.56
1:F:417:THR:O	1:F:433:GLY:HA2	2.06	0.56
1:B:82:LEU:HD23	1:B:145:PHE:HE1	1.71	0.56
1:C:98:TYR:O	1:C:101:ARG:HB2	2.05	0.56
1:E:362:TRP:O	1:E:410:CYS:HA	2.06	0.56
1:B:375:ASP:O	1:B:378:ARG:HG2	2.06	0.56
1:B:297:ASN:ND2	1:B:366:GLU:HB2	2.21	0.55
1:C:97:ALA:O	1:C:101:ARG:HG3	2.05	0.55
1:E:53:ASP:C	1:E:55:TYR:H	2.14	0.55
1:E:366:GLU:HG2	1:E:416:TRP:HE3	1.72	0.55
1:C:334:ASN:HB2	1:C:341:ILE:HD11	1.88	0.55
1:D:411:PHE:O	1:D:411:PHE:CD1	2.59	0.55
1:A:199:ALA:O	1:A:203:VAL:CG2	2.47	0.55
1:C:185:ASP:CG	1:C:188:LYS:HG3	2.31	0.55
1:C:362:TRP:CE2	1:C:410:CYS:HB2	2.42	0.55
1:B:162:VAL:HG11	1:B:200:THR:HA	1.88	0.55
1:C:100:ASN:HD21	1:C:156:ARG:HH22	1.54	0.55
1:A:331:ARG:NH1	1:A:331:ARG:HG2	2.19	0.55
1:D:257:VAL:O	1:D:290:ARG:HD3	2.07	0.55
1:A:363:PHE:CZ	1:A:365:SER:HB3	2.42	0.55
1:C:98:TYR:HA	1:C:101:ARG:HD3	1.88	0.55
1:F:234:SER:O	1:F:238:MET:HB2	2.06	0.55
1:C:362:TRP:O	1:C:410:CYS:HA	2.05	0.55
1:F:222:ILE:HG12	1:F:295:GLY:HA3	1.89	0.55
1:A:459:HIS:HB3	1:A:461:ARG:HE	1.72	0.54
1:D:253:MET:CE	1:D:353:MET:CE	2.72	0.54
1:E:100:ASN:HD21	1:E:156:ARG:HH22	1.55	0.54
1:F:233:GLN:HE22	1:F:238:MET:HE1	1.72	0.54
1:F:363:PHE:HB2	1:F:412:GLY:O	2.07	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:100:ASN:ND2	1:A:156:ARG:HH12	2.05	0.54
1:E:359:ASN:ND2	1:E:409:ASN:H	1.95	0.54
1:F:82:LEU:O	1:F:92:ASN:HB3	2.07	0.54
1:B:6:LYS:O	1:B:7:GLU:CB	2.53	0.54
1:B:211:PRO:HG2	1:B:214:LEU:HD12	1.89	0.54
1:B:419:ILE:O	1:B:420:ASP:C	2.49	0.54
1:E:114:VAL:O	1:E:115:ILE:HD13	2.08	0.54
1:A:22:ARG:N	1:A:49:ASP:O	2.28	0.54
1:A:225:LEU:CD2	1:A:353:MET:HE2	2.37	0.54
1:F:98:TYR:O	1:F:102:VAL:HG23	2.07	0.54
1:F:251:LEU:HD23	1:F:251:LEU:C	2.33	0.54
1:E:112:ARG:HD3	1:E:159:ASP:OD2	2.08	0.54
1:F:12:GLY:HA3	1:F:418:PRO:HG3	1.89	0.54
1:E:225:LEU:O	1:E:225:LEU:HG	2.07	0.54
1:F:114:VAL:CG1	1:F:161:PHE:HE2	2.20	0.54
1:F:233:GLN:NE2	1:F:238:MET:HE1	2.22	0.54
1:D:74:ARG:HB2	1:D:114:VAL:HB	1.89	0.54
1:A:379:ASP:OD1	1:A:381:THR:HG22	2.07	0.54
1:A:362:TRP:O	1:A:410:CYS:HA	2.08	0.53
1:B:100:ASN:HD22	1:B:156:ARG:HH12	1.56	0.53
1:A:9:TRP:HB2	1:A:412:GLY:HA3	1.90	0.53
1:E:8:PHE:CD2	1:E:10:TRP:CZ2	2.95	0.53
1:B:174:TYR:O	1:B:175:LEU:HD23	2.08	0.53
1:F:451:TYR:O	1:F:454:LYS:HB3	2.08	0.53
1:A:35:TYR:CD2	1:A:47:GLY:HA3	2.43	0.53
1:E:362:TRP:CZ2	1:E:410:CYS:HB2	2.44	0.53
1:F:94:ASP:O	1:F:97:ALA:HB3	2.09	0.53
1:A:379:ASP:O	1:A:380:GLU:C	2.52	0.53
1:B:134:GLU:OE1	1:B:188:LYS:HE2	2.09	0.53
1:C:253:MET:HE1	1:C:294:LEU:CD1	2.38	0.53
1:C:225:LEU:HD22	1:C:353:MET:CE	2.26	0.53
1:D:88:GLN:HB2	1:D:90:THR:HG23	1.90	0.53
1:D:379:ASP:OD2	1:D:381:THR:HG22	2.08	0.53
1:A:240:ALA:HB1	1:A:323:TYR:HB3	1.90	0.52
1:C:23:PHE:O	1:C:25:LYS:N	2.42	0.52
1:D:74:ARG:NH2	1:D:164:ASN:OD1	2.40	0.52
1:E:136:LYS:NZ	1:E:277:GLN:O	2.41	0.52
1:B:166:PRO:HB2	1:B:252:PHE:CZ	2.44	0.52
1:E:11:GLY:O	1:E:414:HIS:HA	2.09	0.52
1:A:33:TYR:CG	1:A:124:ILE:HG12	2.44	0.52
1:E:98:TYR:O	1:E:101:ARG:HB2	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:100:ASN:HD21	1:F:156:ARG:HH22	1.58	0.52
1:F:81:ARG:HG3	1:F:81:ARG:HH11	1.73	0.52
1:C:112:ARG:HD3	1:C:159:ASP:OD2	2.09	0.52
1:F:53:ASP:OD1	1:F:56:HIS:HD2	1.93	0.52
1:C:262:PRO:O	1:C:266:VAL:HG23	2.10	0.52
1:A:225:LEU:HD22	1:A:353:MET:HE2	1.85	0.52
1:D:259:GLY:O	1:D:286:ILE:HG22	2.09	0.52
1:F:335:VAL:O	1:F:337:LYS:N	2.43	0.52
1:F:459:HIS:O	1:F:461:ARG:HG3	2.10	0.52
1:A:117:LEU:HD13	1:A:146:SER:HB3	1.92	0.52
1:A:225:LEU:CD2	1:A:353:MET:HE3	2.33	0.52
1:C:99:TYR:O	1:C:102:VAL:HB	2.10	0.52
1:C:426:ASN:O	1:C:427:ALA:C	2.53	0.52
1:E:300:HIS:O	1:E:300:HIS:ND1	2.43	0.52
1:C:22:ARG:O	1:D:441:THR:HA	2.09	0.51
1:C:362:TRP:CZ2	1:C:410:CYS:HB2	2.45	0.51
1:C:379:ASP:OD1	1:C:381:THR:HG22	2.10	0.51
1:F:97:ALA:O	1:F:101:ARG:HG3	2.10	0.51
1:E:226:THR:HA	1:E:349:ILE:HD11	1.93	0.51
1:F:297:ASN:ND2	1:F:366:GLU:HG3	2.24	0.51
1:F:416:TRP:CD1	1:F:417:THR:HB	2.45	0.51
1:F:434:LEU:HB3	1:F:450:ALA:HB2	1.93	0.51
1:B:445:ARG:O	1:B:446:PRO:C	2.54	0.51
1:E:378:ARG:NH2	1:E:436:GLU:OE2	2.40	0.51
1:F:225:LEU:HB3	1:F:349:ILE:HG12	1.93	0.51
1:B:381:THR:HG23	1:B:383:GLN:HB2	1.93	0.51
1:C:187:LYS:HA	1:C:274:VAL:HG22	1.92	0.51
1:C:448:ALA:O	1:C:449:SER:C	2.51	0.51
1:D:174:TYR:CE2	1:D:192:VAL:HG21	2.46	0.51
1:E:416:TRP:CD1	1:E:417:THR:HB	2.45	0.51
1:F:331:ARG:NH1	1:F:331:ARG:HG2	2.23	0.51
1:B:11:GLY:O	1:B:414:HIS:HA	2.11	0.51
1:B:337:LYS:HE3	1:B:432:TYR:OH	2.10	0.51
1:D:225:LEU:HD21	1:D:353:MET:HE2	1.91	0.51
1:F:29:ASN:ND2	1:F:78:GLN:HE21	2.09	0.51
1:C:25:LYS:HZ1	1:C:78:GLN:HE22	1.57	0.50
1:C:88:GLN:OE1	1:C:88:GLN:HA	2.11	0.50
1:D:419:ILE:O	1:D:420:ASP:C	2.53	0.50
1:F:194:TYR:HB2	1:F:276:TRP:CE3	2.46	0.50
1:F:211:PRO:HD2	1:F:214:LEU:HD12	1.93	0.50
1:A:242:HIS:CE1	2:A:2008:HOH:O	2.64	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:106:CYS:HB3	1:C:111:ILE:O	2.11	0.50
1:C:213:GLU:HG2	1:C:214:LEU:HG	1.93	0.50
1:C:367:ASN:ND2	1:C:413:TYR:OH	2.38	0.50
1:E:2:LEU:HG	1:E:401:HIS:ND1	2.26	0.50
1:E:162:VAL:HG11	1:E:200:THR:HA	1.92	0.50
1:C:99:TYR:O	1:C:103:ILE:HG12	2.11	0.50
1:A:246:LEU:HA	1:A:250:ASP:HB2	1.94	0.50
1:B:381:THR:O	1:B:445:ARG:NH2	2.43	0.50
1:C:211:PRO:HG2	1:C:214:LEU:HD12	1.93	0.50
1:F:25:LYS:HB2	1:F:81:ARG:HH12	1.76	0.50
1:B:366:GLU:HG2	1:B:416:TRP:HE3	1.76	0.50
1:D:328:MET:HE2	1:D:331:ARG:HB2	1.94	0.50
1:C:50:THR:O	1:C:51:ALA:C	2.55	0.50
1:C:53:ASP:OD1	1:C:56:HIS:CD2	2.54	0.50
1:C:72:SER:HA	1:C:112:ARG:O	2.11	0.50
1:E:61:ASP:OD1	1:E:444:ARG:HD2	2.12	0.50
1:A:380:GLU:HG2	1:A:381:THR:N	2.26	0.50
1:D:74:ARG:HA	1:D:114:VAL:O	2.12	0.50
1:D:199:ALA:O	1:D:203:VAL:HG23	2.12	0.50
1:D:29:ASN:HD22	1:D:78:GLN:NE2	2.10	0.49
1:E:243:PHE:HA	1:E:246:LEU:HD12	1.94	0.49
1:C:61:ASP:OD1	1:C:444:ARG:HD2	2.12	0.49
1:C:353:MET:HE2	1:C:353:MET:HA	1.95	0.49
1:A:100:ASN:ND2	1:A:156:ARG:HH22	2.10	0.49
1:D:117:LEU:HD13	1:D:146:SER:HB2	1.93	0.49
1:D:393:LEU:O	1:D:397:LEU:HB2	2.12	0.49
1:B:82:LEU:HD23	1:B:145:PHE:CE1	2.48	0.49
1:B:103:ILE:N	1:B:103:ILE:HD13	2.26	0.49
1:D:371:ILE:HG13	1:D:388:TYR:CE2	2.47	0.49
1:E:402:LYS:O	1:E:405:GLU:HB3	2.12	0.49
1:F:249:ASN:O	1:F:253:MET:HB2	2.12	0.49
1:D:333:MET:HE3	1:D:335:VAL:HG22	1.94	0.49
1:E:73:TYR:CE2	1:E:75:THR:HB	2.48	0.49
1:C:23:PHE:C	1:C:25:LYS:H	2.21	0.49
1:C:250:ASP:O	1:C:251:LEU:C	2.53	0.49
1:F:433:GLY:O	1:F:447:LYS:HD2	2.13	0.49
1:B:147:LYS:NZ	1:B:151:GLU:OE2	2.45	0.49
1:D:2:LEU:HD23	1:D:462:LEU:HD12	1.94	0.49
1:F:253:MET:CE	1:F:353:MET:HE1	2.41	0.49
1:A:265:LEU:O	1:A:269:LEU:HG	2.12	0.49
1:D:157:VAL:HB	1:D:160:TRP:CZ2	2.47	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:294:LEU:O	1:B:362:TRP:HA	2.13	0.49
1:C:15:SER:HB2	1:C:17:PRO:HD2	1.95	0.49
1:C:166:PRO:O	1:C:170:VAL:HG23	2.13	0.49
1:B:31:PHE:CE2	1:B:424:TRP:CE3	3.00	0.48
1:C:328:MET:O	1:C:331:ARG:HD3	2.12	0.48
1:E:136:LYS:O	1:E:139:VAL:HB	2.13	0.48
1:C:359:ASN:ND2	1:C:409:ASN:H	2.11	0.48
1:E:372:SER:HB3	1:E:430:ASN:HD22	1.77	0.48
1:C:331:ARG:HH12	1:C:333:MET:HB2	1.79	0.48
1:D:445:ARG:O	1:D:446:PRO:C	2.56	0.48
1:E:417:THR:O	1:E:433:GLY:HA2	2.13	0.48
1:E:55:TYR:HD2	1:E:56:HIS:ND1	2.12	0.48
1:E:74:ARG:NH1	1:E:366:GLU:HG3	2.28	0.48
1:E:74:ARG:HH12	1:E:366:GLU:HG3	1.79	0.48
1:E:313:ILE:HD13	1:E:313:ILE:C	2.39	0.48
1:F:344:GLU:HG3	1:F:399:TYR:CZ	2.48	0.48
1:F:367:ASN:ND2	1:F:413:TYR:OH	2.44	0.48
1:A:363:PHE:HB2	1:A:412:GLY:O	2.14	0.48
1:C:29:ASN:HD22	1:C:78:GLN:NE2	2.12	0.48
1:A:208:ARG:HH21	1:A:292:ASP:CG	2.22	0.48
1:F:213:GLU:CD	1:F:213:GLU:H	2.21	0.48
1:D:208:ARG:HH21	1:D:292:ASP:CG	2.21	0.47
1:F:331:ARG:HG3	1:F:331:ARG:NH1	2.20	0.47
1:A:112:ARG:HD3	1:A:159:ASP:OD2	2.14	0.47
1:C:171:GLU:O	1:C:172:GLY:C	2.55	0.47
1:D:362:TRP:O	1:D:410:CYS:HA	2.15	0.47
1:C:29:ASN:HD22	1:C:78:GLN:HE21	1.60	0.47
1:C:301:PRO:HG3	1:C:342:TYR:HB3	1.95	0.47
1:D:61:ASP:OD1	1:D:444:ARG:HD2	2.13	0.47
1:E:300:HIS:O	1:E:300:HIS:CG	2.68	0.47
1:F:136:LYS:NZ	1:F:282:GLU:OE1	2.46	0.47
1:F:328:MET:O	1:F:331:ARG:HD3	2.13	0.47
1:A:333:MET:HG3	1:A:334:ASN:N	2.29	0.47
1:D:248:ASN:C	1:D:249:ASN:HD22	2.21	0.47
1:B:331:ARG:NH2	1:B:333:MET:SD	2.77	0.47
1:B:344:GLU:HG3	1:B:399:TYR:CE1	2.50	0.47
1:D:352:LYS:HE3	1:D:356:HIS:HB2	1.96	0.47
1:D:379:ASP:OD1	1:D:381:THR:CG2	2.54	0.47
1:E:54:ALA:O	1:E:58:ILE:HB	2.14	0.47
1:F:379:ASP:OD1	1:F:381:THR:CG2	2.60	0.47
1:D:204:ILE:CG2	1:D:289:ASN:HB3	2.44	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:204:ILE:HG22	1:D:289:ASN:HB3	1.95	0.47
1:E:313:ILE:HD13	1:E:314:SER:N	2.30	0.47
1:B:343:PRO:HB3	1:B:396:HIS:CE1	2.49	0.47
1:E:269:LEU:HB2	1:E:275:LEU:HD12	1.96	0.47
1:F:106:CYS:HB3	1:F:111:ILE:O	2.14	0.47
1:F:135:SER:HB3	1:F:138:VAL:HG23	1.97	0.47
1:F:313:ILE:HD13	1:F:313:ILE:HA	1.67	0.47
1:A:370:GLY:HA2	1:A:431:ARG:O	2.15	0.47
1:C:35:TYR:CD1	1:C:35:TYR:C	2.93	0.47
1:F:327:LEU:N	1:F:327:LEU:HD22	2.29	0.47
1:A:438:ASN:C	1:A:438:ASN:OD1	2.58	0.47
1:B:455:LYS:O	1:B:456:VAL:C	2.58	0.47
1:F:317:TRP:HA	1:F:321:TRP:CZ2	2.50	0.47
1:B:42:PHE:O	1:B:43:TYR:C	2.58	0.46
1:C:2:LEU:HD23	1:C:462:LEU:HD12	1.97	0.46
1:C:174:TYR:CE2	1:C:192:VAL:HG21	2.51	0.46
1:C:363:PHE:HB2	1:C:412:GLY:O	2.15	0.46
1:B:328:MET:HE2	1:B:331:ARG:HB3	1.96	0.46
1:E:225:LEU:HD13	1:E:253:MET:HE2	1.97	0.46
1:F:85:ASP:O	1:F:89:ALA:N	2.40	0.46
1:D:74:ARG:HH12	1:D:366:GLU:HG3	1.79	0.46
1:E:25:LYS:NZ	1:E:32:ASP:OD2	2.48	0.46
1:F:136:LYS:NZ	1:F:277:GLN:O	2.47	0.46
1:B:51:ALA:C	1:B:428:TYR:OH	2.58	0.46
1:A:299:TYR:OH	1:A:366:GLU:OE1	2.31	0.46
1:D:91:ILE:HD11	1:D:148:VAL:HG13	1.98	0.46
1:B:100:ASN:ND2	1:B:156:ARG:HH12	2.13	0.46
1:E:419:ILE:O	1:E:420:ASP:C	2.58	0.46
1:A:103:ILE:N	1:A:103:ILE:CD1	2.76	0.46
1:A:419:ILE:O	1:A:420:ASP:C	2.59	0.46
1:E:37:GLU:C	1:E:38:GLU:HG3	2.40	0.46
1:F:226:THR:O	1:F:226:THR:OG1	2.33	0.46
1:A:262:PRO:O	1:A:266:VAL:HG23	2.15	0.46
1:B:200:THR:O	1:B:204:ILE:HG13	2.16	0.46
1:B:393:LEU:O	1:B:397:LEU:HB2	2.16	0.46
1:D:400:LEU:HD11	1:D:410:CYS:SG	2.56	0.46
1:E:249:ASN:O	1:E:253:MET:HB2	2.15	0.46
1:F:362:TRP:O	1:F:410:CYS:HA	2.16	0.46
1:B:357:TYR:O	1:B:360:ILE:HG23	2.16	0.46
1:D:54:ALA:O	1:D:58:ILE:HB	2.15	0.46
1:D:55:TYR:HA	1:D:98:TYR:CE1	2.50	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:137:HIS:O	1:D:140:ASP:HB2	2.16	0.46
1:D:257:VAL:HG12	1:D:258:HIS:CD2	2.51	0.46
1:A:435:VAL:HA	1:A:446:PRO:HA	1.97	0.45
1:D:251:LEU:HD23	1:D:251:LEU:O	2.16	0.45
1:E:334:ASN:ND2	1:E:337:LYS:HB2	2.31	0.45
1:F:188:LYS:O	1:F:192:VAL:HG23	2.16	0.45
1:C:25:LYS:HZ2	1:C:78:GLN:NE2	2.14	0.45
1:F:14:THR:HG23	1:F:15:SER:N	2.30	0.45
1:A:455:LYS:HB2	1:A:455:LYS:HE3	1.80	0.45
1:B:186:GLY:O	1:B:190:VAL:HG23	2.17	0.45
1:C:74:ARG:HH12	1:C:366:GLU:HG3	1.81	0.45
1:C:145:PHE:CE1	1:C:149:CYS:SG	3.10	0.45
1:C:259:GLY:HA3	1:C:287:ALA:HA	1.98	0.45
1:A:381:THR:O	1:A:445:ARG:NH2	2.49	0.45
1:C:57:GLN:O	1:C:58:ILE:C	2.59	0.45
1:F:78:GLN:C	1:F:80:THR:N	2.71	0.45
1:F:186:GLY:O	1:F:187:LYS:C	2.60	0.45
1:C:416:TRP:CD1	1:C:417:THR:HB	2.52	0.45
1:D:100:ASN:HD22	1:D:156:ARG:HH12	1.64	0.45
1:D:253:MET:HE3	1:D:253:MET:HB3	1.87	0.45
1:D:378:ARG:NH2	1:D:436:GLU:OE1	2.50	0.45
1:E:31:PHE:CZ	1:E:179:HIS:CD2	3.05	0.45
1:E:53:ASP:C	1:E:55:TYR:N	2.75	0.45
1:E:114:VAL:CG1	1:E:161:PHE:HE2	2.30	0.45
1:F:197:ALA:O	1:F:200:THR:HB	2.16	0.45
1:D:18:GLN:HG2	1:D:422:TRP:O	2.17	0.45
1:E:365:SER:O	1:E:414:HIS:HB2	2.17	0.45
1:E:379:ASP:OD2	1:E:381:THR:HG22	2.16	0.45
1:B:187:LYS:HA	1:B:274:VAL:HG22	1.99	0.45
1:D:291:VAL:HB	1:D:293:TYR:O	2.17	0.45
1:B:331:ARG:HG3	1:B:340:GLU:HG3	1.98	0.45
1:D:233:GLN:HE21	1:D:238:MET:HE1	1.82	0.45
1:D:418:PRO:CD	2:D:2012:HOH:O	2.53	0.45
1:B:52:SER:O	1:B:444:ARG:NH2	2.35	0.45
1:B:114:VAL:CG1	1:B:161:PHE:HE2	2.30	0.45
1:C:25:LYS:NZ	1:C:78:GLN:NE2	2.63	0.45
1:C:52:SER:O	1:C:444:ARG:NH2	2.38	0.45
1:C:180:TYR:CG	1:C:181:PRO:HA	2.52	0.45
1:D:208:ARG:C	1:D:210:GLY:H	2.24	0.45
1:A:185:ASP:OD2	1:A:188:LYS:HD2	2.17	0.45
1:B:301:PRO:HD2	1:B:340:GLU:HB3	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:103:ILE:HD12	1:F:157:VAL:HG22	1.99	0.45
1:B:270:LYS:C	1:B:272:ASP:N	2.75	0.44
1:D:312:VAL:HG23	1:D:313:ILE:H	1.81	0.44
1:F:35:TYR:OH	1:F:45:TYR:O	2.22	0.44
1:B:270:LYS:O	1:B:272:ASP:N	2.50	0.44
1:D:53:ASP:HB2	1:D:442:GLN:HG3	1.98	0.44
1:F:88:GLN:O	1:F:89:ALA:HB3	2.16	0.44
1:A:22:ARG:HD2	1:A:32:ASP:OD1	2.16	0.44
1:B:107:LEU:HD11	1:B:156:ARG:HB3	2.00	0.44
1:E:56:HIS:NE2	1:F:56:HIS:CD2	2.85	0.44
1:F:87:GLU:HA	1:F:141:LEU:HD21	1.99	0.44
1:B:251:LEU:C	1:B:251:LEU:HD23	2.42	0.44
1:D:100:ASN:ND2	1:D:156:ARG:HH12	2.15	0.44
1:D:234:SER:O	1:D:238:MET:HB2	2.18	0.44
1:B:9:TRP:HB2	1:B:412:GLY:HA3	1.99	0.44
1:B:161:PHE:HA	1:B:220:GLY:O	2.17	0.44
1:C:344:GLU:HG3	1:C:399:TYR:CZ	2.53	0.44
1:C:375:ASP:O	1:C:378:ARG:CG	2.66	0.44
1:E:83:ILE:HG21	1:E:86:PHE:HA	2.00	0.44
1:E:120:PHE:CD1	1:E:120:PHE:N	2.84	0.44
1:E:225:LEU:HD21	1:E:352:LYS:CG	2.46	0.44
1:A:164:ASN:HA	1:A:222:ILE:HB	2.00	0.44
1:B:8:PHE:CE1	1:B:412:GLY:N	2.85	0.44
1:B:381:THR:CG2	1:B:383:GLN:HB2	2.48	0.44
1:C:12:GLY:HA3	1:C:418:PRO:HG3	2.00	0.44
1:D:247:TRP:NE1	1:D:319:PRO:HG3	2.33	0.44
1:F:335:VAL:O	1:F:336:ASP:C	2.60	0.44
1:C:300:HIS:HB2	1:C:301:PRO:HD2	2.00	0.44
1:D:270:LYS:O	1:D:272:ASP:N	2.50	0.44
1:E:285:LEU:O	1:E:289:ASN:OD1	2.36	0.44
1:F:314:SER:O	1:F:315:PRO:C	2.61	0.44
1:F:461:ARG:HE	1:F:461:ARG:HB2	1.59	0.44
1:D:22:ARG:HD3	1:D:49:ASP:OD1	2.17	0.44
1:F:334:ASN:HB2	1:F:341:ILE:HD11	2.00	0.44
1:D:33:TYR:O	1:D:34:TRP:C	2.61	0.43
1:D:270:LYS:C	1:D:272:ASP:N	2.76	0.43
1:E:12:GLY:HA3	1:E:418:PRO:HG3	2.00	0.43
1:E:251:LEU:C	1:E:251:LEU:HD23	2.43	0.43
1:F:100:ASN:HD22	1:F:100:ASN:HA	1.61	0.43
1:E:164:ASN:O	1:E:165:GLU:HB2	2.18	0.43
1:B:362:TRP:CZ2	1:B:410:CYS:HB2	2.53	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:10:TRP:O	1:E:72:SER:OG	2.21	0.43
1:D:136:LYS:HZ3	1:D:282:GLU:CD	2.26	0.43
1:E:226:THR:HG22	1:E:298:PHE:HD1	1.83	0.43
1:B:186:GLY:HA3	1:B:317:TRP:HB3	2.00	0.43
1:D:216:ASP:OD1	1:D:216:ASP:N	2.46	0.43
1:D:277:GLN:HE21	1:D:277:GLN:HA	1.84	0.43
1:E:163:HIS:HB2	1:E:166:PRO:HD3	2.01	0.43
1:F:174:TYR:O	1:F:175:LEU:HD23	2.18	0.43
1:F:297:ASN:HD21	1:F:366:GLU:HG3	1.84	0.43
1:F:299:TYR:OH	1:F:366:GLU:OE1	2.25	0.43
1:F:333:MET:HE2	1:F:333:MET:HB3	1.83	0.43
1:B:62:LEU:HA	1:B:62:LEU:HD23	1.73	0.43
1:B:99:TYR:HA	1:B:102:VAL:HG23	2.01	0.43
1:E:249:ASN:O	1:E:253:MET:CG	2.66	0.43
1:F:22:ARG:HB2	1:F:49:ASP:HA	2.00	0.43
1:C:253:MET:HE1	1:C:294:LEU:HD11	2.00	0.43
1:E:30:LEU:HB3	1:E:180:TYR:HB3	2.01	0.43
1:F:55:TYR:HD2	1:F:56:HIS:CE1	2.37	0.43
1:F:426:ASN:O	1:F:427:ALA:C	2.62	0.43
1:A:365:SER:O	1:A:366:GLU:HG3	2.19	0.43
1:B:347:TYR:O	1:B:350:ALA:HB3	2.19	0.43
1:C:74:ARG:NH2	1:C:164:ASN:OD1	2.50	0.43
1:E:185:ASP:CG	1:E:188:LYS:HD2	2.43	0.43
1:E:225:LEU:HD23	1:E:349:ILE:HG23	2.00	0.43
1:B:127:TYR:HA	1:B:132:GLY:N	2.33	0.43
1:B:436:GLU:O	1:B:444:ARG:HA	2.19	0.43
1:F:437:ASN:OD1	1:F:444:ARG:NH2	2.46	0.43
1:B:166:PRO:CB	1:B:196:LEU:HD13	2.49	0.43
1:E:353:MET:HE2	1:E:353:MET:CA	2.31	0.43
1:C:186:GLY:HA3	1:C:317:TRP:HB3	2.00	0.42
1:E:363:PHE:HB2	1:E:412:GLY:O	2.19	0.42
1:F:22:ARG:O	1:F:23:PHE:C	2.61	0.42
1:F:87:GLU:HA	1:F:141:LEU:CD2	2.48	0.42
1:A:244:ALA:O	1:A:248:ASN:HB2	2.19	0.42
1:C:257:VAL:HG13	1:C:360:ILE:HD13	2.01	0.42
1:D:416:TRP:CD1	1:D:417:THR:HB	2.53	0.42
1:E:8:PHE:HD2	1:E:10:TRP:CE2	2.37	0.42
1:C:275:LEU:HG	1:C:276:TRP:N	2.34	0.42
1:C:370:GLY:HA2	1:C:431:ARG:O	2.19	0.42
1:D:294:LEU:O	1:D:362:TRP:HA	2.20	0.42
1:E:274:VAL:O	1:E:274:VAL:HG22	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:331:ARG:H	1:F:331:ARG:CD	2.18	0.42
1:C:366:GLU:HG2	1:C:416:TRP:HE3	1.84	0.42
1:D:11:GLY:C	1:D:414:HIS:CD2	2.98	0.42
1:A:218:ARG:HB3	1:A:293:TYR:CE1	2.55	0.42
1:B:444:ARG:H	1:B:444:ARG:HG2	1.65	0.42
1:D:456:VAL:HA	1:D:461:ARG:O	2.19	0.42
1:B:317:TRP:HA	1:B:321:TRP:CZ2	2.54	0.42
1:D:251:LEU:C	1:D:251:LEU:CD2	2.93	0.42
1:D:257:VAL:HG22	1:D:360:ILE:CD1	2.48	0.42
1:E:31:PHE:HZ	1:E:179:HIS:CD2	2.38	0.42
1:F:17:PRO:HD3	1:F:78:GLN:HG3	2.00	0.42
1:A:112:ARG:NH2	2:A:2005:HOH:O	2.51	0.42
1:A:397:LEU:HD12	1:A:397:LEU:HA	1.89	0.42
1:B:362:TRP:O	1:B:410:CYS:HA	2.20	0.42
1:E:166:PRO:O	1:E:170:VAL:HG23	2.19	0.42
1:E:293:TYR:CD1	1:E:293:TYR:C	2.97	0.42
1:F:114:VAL:HG11	1:F:161:PHE:HE2	1.85	0.42
1:E:14:THR:HG23	1:E:15:SER:N	2.35	0.42
1:A:87:GLU:OE2	1:A:130:TYR:OH	2.15	0.42
1:B:314:SER:HA	1:B:315:PRO:HD2	1.92	0.42
1:C:379:ASP:O	1:C:380:GLU:C	2.62	0.42
1:E:103:ILE:O	1:E:106:CYS:HB2	2.20	0.42
1:F:62:LEU:HD23	1:F:62:LEU:HA	1.91	0.42
1:B:164:ASN:HA	1:B:222:ILE:HB	2.02	0.42
1:D:270:LYS:O	1:D:271:LYS:C	2.63	0.42
1:D:423:SER:O	1:D:424:TRP:C	2.60	0.42
1:F:25:LYS:HB2	1:F:81:ARG:NH1	2.35	0.42
1:B:229:TYR:HB2	1:B:303:ARG:HG2	2.02	0.41
1:D:312:VAL:HG23	1:D:313:ILE:N	2.35	0.41
1:D:352:LYS:HE3	1:D:356:HIS:CB	2.50	0.41
1:C:138:VAL:O	1:C:139:VAL:C	2.62	0.41
1:D:411:PHE:CD1	1:D:411:PHE:C	2.98	0.41
1:F:74:ARG:HG2	1:F:75:THR:N	2.35	0.41
1:F:253:MET:HE1	1:F:294:LEU:HD11	2.01	0.41
1:F:343:PRO:HG3	1:F:395:GLU:OE1	2.20	0.41
1:A:180:TYR:CG	1:A:181:PRO:HA	2.55	0.41
1:C:29:ASN:O	1:C:30:LEU:C	2.62	0.41
1:C:249:ASN:HD22	1:C:249:ASN:N	2.16	0.41
1:D:33:TYR:CD2	1:D:124:ILE:HG12	2.55	0.41
1:D:263:GLU:H	1:D:263:GLU:HG2	1.64	0.41
1:E:133:TRP:HB3	1:E:192:VAL:HG13	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:12:GLY:HA2	1:F:415:VAL:O	2.21	0.41
1:A:50:THR:O	1:A:51:ALA:C	2.63	0.41
1:B:448:ALA:O	1:B:449:SER:C	2.64	0.41
1:C:92:ASN:HA	1:C:93:PRO:HD3	1.93	0.41
1:D:307:PRO:HA	1:D:324:ASP:CG	2.45	0.41
1:D:397:LEU:HD13	1:D:413:TYR:CD1	2.55	0.41
1:F:378:ARG:HH22	1:F:436:GLU:CD	2.28	0.41
1:A:16:GLY:N	1:A:17:PRO:CD	2.84	0.41
1:A:291:VAL:HB	1:A:293:TYR:O	2.20	0.41
1:C:204:ILE:O	1:C:205:GLN:C	2.63	0.41
1:D:198:LEU:O	1:D:202:LYS:HG3	2.20	0.41
1:F:291:VAL:HG21	1:F:294:LEU:HD21	2.02	0.41
1:C:62:LEU:HD23	1:C:62:LEU:HA	1.85	0.41
1:F:83:ILE:HG21	1:F:86:PHE:HA	2.02	0.41
1:F:328:MET:O	1:F:329:PRO:C	2.60	0.41
1:A:42:PHE:CD1	1:A:42:PHE:N	2.88	0.41
1:B:100:ASN:ND2	1:B:156:ARG:HH22	2.18	0.41
1:C:15:SER:HB3	1:C:119:HIS:CD2	2.56	0.41
1:C:386:ASP:OD2	1:C:449:SER:OG	2.38	0.41
1:E:328:MET:HA	1:E:329:PRO:HD2	1.90	0.41
1:F:180:TYR:CD1	1:F:181:PRO:HA	2.55	0.41
1:A:5:PRO:HD2	1:A:8:PHE:CD1	2.56	0.41
1:A:74:ARG:HH12	1:A:366:GLU:HG3	1.86	0.41
1:B:190:VAL:HG21	1:B:274:VAL:HG13	2.02	0.41
1:B:270:LYS:O	1:B:271:LYS:C	2.64	0.41
1:C:61:ASP:CG	1:C:444:ARG:HH11	2.29	0.41
1:D:173:SER:N	1:D:179:HIS:HB2	2.35	0.41
1:E:54:ALA:O	1:E:98:TYR:OH	2.35	0.41
1:E:116:ASN:HA	1:E:161:PHE:O	2.21	0.41
1:E:363:PHE:HE2	1:E:414:HIS:ND1	2.18	0.41
1:A:243:PHE:CD2	1:A:322:TYR:HB2	2.55	0.41
1:B:66:ALA:HB2	1:B:109:ASN:HB3	2.02	0.41
1:B:277:GLN:N	1:B:277:GLN:HE21	2.19	0.41
1:B:328:MET:O	1:B:331:ARG:CD	2.67	0.41
1:C:120:PHE:N	1:C:120:PHE:CD1	2.89	0.41
1:C:251:LEU:C	1:C:251:LEU:HD23	2.45	0.41
1:D:74:ARG:NH1	1:D:366:GLU:HG3	2.36	0.41
1:F:263:GLU:H	1:F:263:GLU:HG2	1.62	0.41
1:F:298:PHE:HE2	1:F:396:HIS:CD2	2.38	0.41
1:F:337:LYS:HG2	1:F:339:TRP:CE3	2.56	0.41
1:A:25:LYS:NZ	1:A:32:ASP:OD2	2.54	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:444:ARG:H	1:C:444:ARG:HG2	1.37	0.41
1:E:207:TYR:O	1:E:215:SER:CB	2.67	0.41
1:E:389:ARG:NH2	1:E:431:ARG:O	2.54	0.41
1:A:257:VAL:HG12	1:A:258:HIS:CD2	2.55	0.40
1:A:313:ILE:HD13	1:A:313:ILE:HA	1.92	0.40
1:B:285:LEU:HD23	1:B:285:LEU:HA	1.90	0.40
1:C:25:LYS:HZ2	1:C:78:GLN:HE22	1.62	0.40
1:C:161:PHE:HA	1:C:220:GLY:O	2.21	0.40
1:C:253:MET:HE2	1:C:353:MET:CE	2.42	0.40
1:E:25:LYS:HZ2	1:E:78:GLN:HE22	1.68	0.40
1:F:65:LEU:O	1:F:68:LEU:N	2.54	0.40
1:F:225:LEU:CD2	1:F:353:MET:HE3	2.51	0.40
1:C:29:ASN:ND2	1:C:78:GLN:NE2	2.68	0.40
1:D:50:THR:O	1:D:51:ALA:C	2.64	0.40
1:D:127:TYR:HA	1:D:132:GLY:N	2.36	0.40
1:D:186:GLY:HA3	1:D:317:TRP:HB3	2.02	0.40
1:E:369:VAL:O	1:E:389:ARG:NH2	2.50	0.40
1:F:223:LEU:HB3	1:F:224:ASN:H	1.80	0.40
1:D:438:ASN:O	1:D:442:GLN:N	2.53	0.40
1:E:123:PRO:HD2	1:E:126:LEU:HD12	2.02	0.40
1:E:127:TYR:HA	1:E:132:GLY:N	2.36	0.40
1:E:187:LYS:HA	1:E:274:VAL:CG2	2.51	0.40
1:E:436:GLU:O	1:E:444:ARG:HA	2.21	0.40
1:F:78:GLN:O	1:F:79:TRP:C	2.64	0.40
1:F:353:MET:HA	1:F:353:MET:HE2	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
1	A	459/479 (96%)	423 (92%)	32 (7%)	4 (1%)	14 30

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	459/479 (96%)	420 (92%)	34 (7%)	5 (1%)	11	25
1	C	459/479 (96%)	420 (92%)	37 (8%)	2 (0%)	30	51
1	D	459/479 (96%)	416 (91%)	38 (8%)	5 (1%)	11	25
1	E	459/479 (96%)	404 (88%)	51 (11%)	4 (1%)	14	30
1	F	459/479 (96%)	408 (89%)	47 (10%)	4 (1%)	14	30
All	All	2754/2874 (96%)	2491 (90%)	239 (9%)	24 (1%)	14	30

All (24) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	24	ALA
1	B	271	LYS
1	D	209	ARG
1	E	344	GLU
1	F	24	ALA
1	F	336	ASP
1	B	7	GLU
1	B	420	ASP
1	C	24	ALA
1	D	51	ALA
1	D	271	LYS
1	E	23	PHE
1	F	358	ASP
1	A	51	ALA
1	A	375	ASP
1	A	380	GLU
1	B	24	ALA
1	F	23	PHE
1	A	336	ASP
1	D	358	ASP
1	B	456	VAL
1	D	446	PRO
1	E	279	THR
1	C	315	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	
1	A	389/404 (96%)	367 (94%)	22 (6%)	18	40
1	B	389/404 (96%)	368 (95%)	21 (5%)	20	42
1	C	389/404 (96%)	363 (93%)	26 (7%)	15	33
1	D	389/404 (96%)	368 (95%)	21 (5%)	20	42
1	E	389/404 (96%)	368 (95%)	21 (5%)	20	42
1	F	389/404 (96%)	361 (93%)	28 (7%)	13	30
All	All	2334/2424 (96%)	2195 (94%)	139 (6%)	17	37

All (139) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	60	SER
1	A	74	ARG
1	A	103	ILE
1	A	146	SER
1	A	155	ASP
1	A	176	MET
1	A	260	LYS
1	A	277	GLN
1	A	279	THR
1	A	293	TYR
1	A	313	ILE
1	A	314	SER
1	A	327	LEU
1	A	331	ARG
1	A	336	ASP
1	A	359	ASN
1	A	378	ARG
1	A	397	LEU
1	A	423	SER
1	A	438	ASN
1	A	444	ARG
1	A	445	ARG
1	B	2	LEU
1	B	60	SER
1	B	63	THR
1	B	67	SER
1	B	103	ILE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B	226	THR
1	B	233	GLN
1	B	260	LYS
1	B	274	VAL
1	B	277	GLN
1	B	279	THR
1	B	293	TYR
1	B	302	LYS
1	B	313	ILE
1	B	331	ARG
1	B	378	ARG
1	B	383	GLN
1	B	394	LYS
1	B	397	LEU
1	B	405	GLU
1	B	444	ARG
1	C	6	LYS
1	C	67	SER
1	C	75	THR
1	C	135	SER
1	C	155	ASP
1	C	204	ILE
1	C	214	LEU
1	C	226	THR
1	C	251	LEU
1	C	263	GLU
1	C	274	VAL
1	C	277	GLN
1	C	279	THR
1	C	293	TYR
1	C	313	ILE
1	C	327	LEU
1	C	331	ARG
1	C	336	ASP
1	C	359	ASN
1	C	365	SER
1	C	378	ARG
1	C	380	GLU
1	C	397	LEU
1	C	444	ARG
1	C	445	ARG
1	C	455	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	D	44	ASP
1	D	74	ARG
1	D	135	SER
1	D	219	ILE
1	D	226	THR
1	D	233	GLN
1	D	260	LYS
1	D	263	GLU
1	D	277	GLN
1	D	279	THR
1	D	286	ILE
1	D	293	TYR
1	D	313	ILE
1	D	314	SER
1	D	327	LEU
1	D	331	ARG
1	D	378	ARG
1	D	380	GLU
1	D	397	LEU
1	D	423	SER
1	D	444	ARG
1	E	2	LEU
1	E	7	GLU
1	E	138	VAL
1	E	147	LYS
1	E	184	VAL
1	E	226	THR
1	E	260	LYS
1	E	263	GLU
1	E	277	GLN
1	E	279	THR
1	E	288	GLU
1	E	293	TYR
1	E	313	ILE
1	E	327	LEU
1	E	331	ARG
1	E	337	LYS
1	E	365	SER
1	E	444	ARG
1	E	454	LYS
1	E	461	ARG
1	E	462	LEU

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Mol	Chain	Res	Type
1	F	7	GLU
1	F	17	PRO
1	F	78	GLN
1	F	100	ASN
1	F	114	VAL
1	F	124	ILE
1	F	146	SER
1	F	184	VAL
1	F	225	LEU
1	F	260	LYS
1	F	274	VAL
1	F	277	GLN
1	F	283	LEU
1	F	293	TYR
1	F	313	ILE
1	F	327	LEU
1	F	331	ARG
1	F	333	MET
1	F	336	ASP
1	F	351	ILE
1	F	365	SER
1	F	376	ARG
1	F	423	SER
1	F	444	ARG
1	F	445	ARG
1	F	458	THR
1	F	461	ARG
1	F	462	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (81) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	56	HIS
1	A	78	GLN
1	A	100	ASN
1	A	119	HIS
1	A	152	GLN
1	A	205	GLN
1	A	249	ASN
1	A	258	HIS
1	A	277	GLN
1	A	297	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	359	ASN
1	A	383	GLN
1	A	426	ASN
1	A	430	ASN
1	B	56	HIS
1	B	57	GLN
1	B	78	GLN
1	B	100	ASN
1	B	249	ASN
1	B	258	HIS
1	B	277	GLN
1	B	297	ASN
1	B	359	ASN
1	B	385	GLN
1	B	396	HIS
1	B	426	ASN
1	C	56	HIS
1	C	78	GLN
1	C	100	ASN
1	C	119	HIS
1	C	152	GLN
1	C	205	GLN
1	C	249	ASN
1	C	277	GLN
1	C	289	ASN
1	C	359	ASN
1	C	367	ASN
1	C	383	GLN
1	C	430	ASN
1	C	437	ASN
1	D	56	HIS
1	D	57	GLN
1	D	78	GLN
1	D	100	ASN
1	D	233	GLN
1	D	249	ASN
1	D	258	HIS
1	D	277	GLN
1	D	289	ASN
1	D	297	ASN
1	D	359	ASN
1	D	459	HIS

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Mol	Chain	Res	Type
1	E	56	HIS
1	E	78	GLN
1	E	100	ASN
1	E	119	HIS
1	E	179	HIS
1	E	248	ASN
1	E	249	ASN
1	E	289	ASN
1	E	297	ASN
1	E	334	ASN
1	E	359	ASN
1	E	367	ASN
1	E	385	GLN
1	E	401	HIS
1	E	430	ASN
1	F	56	HIS
1	F	78	GLN
1	F	100	ASN
1	F	233	GLN
1	F	242	HIS
1	F	249	ASN
1	F	289	ASN
1	F	297	ASN
1	F	359	ASN
1	F	367	ASN
1	F	385	GLN
1	F	414	HIS
1	F	426	ASN
1	F	459	HIS

### 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 oligosaccharides 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 [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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	461/479 (96%)	-1.54	0 100 100	17, 32, 49, 65	1 (0%)
1	B	461/479 (96%)	-1.54	0 100 100	16, 31, 50, 68	1 (0%)
1	C	461/479 (96%)	-1.49	0 100 100	21, 36, 56, 81	1 (0%)
1	D	461/479 (96%)	-1.54	0 100 100	19, 34, 56, 70	1 (0%)
1	E	461/479 (96%)	-1.36	0 100 100	23, 46, 65, 89	1 (0%)
1	F	461/479 (96%)	-1.30	0 100 100	28, 49, 74, 91	1 (0%)
All	All	2766/2874 (96%)	-1.46	0 100 100	16, 37, 62, 91	6 (0%)

There are no RSRZ outliers to report.

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

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

### 6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

### 6.4 Ligands [i](#)

There are no ligands in this entry.

### 6.5 Other polymers [i](#)

There are no such residues in this entry.