



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 05:02 PM GMT

PDB ID : 4GXP  
Title : Chimeric Family 1 beta-glucosidase made with non-contiguous SCHEMA  
Authors : Smith, M.A.; Romero, P.A.; Wu, T.; Brustad, E.M.; Arnold, F.H.  
Deposited on : 2012-09-04  
Resolution : 3.00 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  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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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

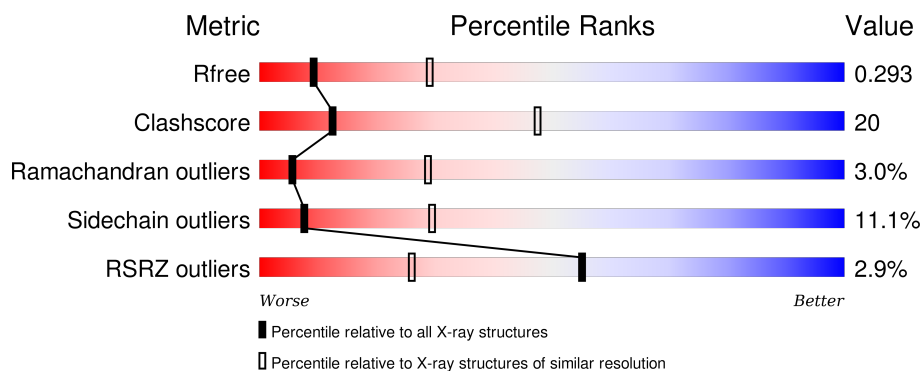
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 3.00 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	1578 (3.00-3.00)
Clashscore	102246	1912 (3.00-3.00)
Ramachandran outliers	100387	1853 (3.00-3.00)
Sidechain outliers	100360	1856 (3.00-3.00)
RSRZ outliers	91569	1592 (3.00-3.00)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	467	<div> <div>7%</div> <div>65% 28% . .</div> </div>
1	B	467	<div> <div>62% 30% 5% .</div> </div>
1	C	467	<div> <div>7%</div> <div>60% 30% 7% .</div> </div>

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 9869 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 Chimeric protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	456	Total	C	N	O	S	0	0	0
			3451	2206	592	644	9			
1	B	456	Total	C	N	O	S	0	0	0
			3288	2084	577	618	9			
1	C	454	Total	C	N	O	S	0	0	0
			3128	1957	554	609	8			

There are 39 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	EXPRESSION TAG	UNP Q08638
A	2	HIS	-	EXPRESSION TAG	UNP Q08638
A	3	HIS	-	EXPRESSION TAG	UNP Q08638
A	4	HIS	-	EXPRESSION TAG	UNP Q08638
A	5	HIS	-	EXPRESSION TAG	UNP Q08638
A	6	HIS	-	EXPRESSION TAG	UNP Q08638
A	7	HIS	-	EXPRESSION TAG	UNP Q08638
A	127	PHE	TYR	ENGINEERED MUTATION	UNP Q08638
A	141	LEU	TRP	ENGINEERED MUTATION	UNP Q08638
A	142	LEU	ALA	ENGINEERED MUTATION	UNP Q08638
A	398	TYR	HIS	ENGINEERED MUTATION	UNP Q08638
A	340	ALA	GLN	ENGINEERED MUTATION	UNP O93785
A	341	MET	SER	ENGINEERED MUTATION	UNP O93785
B	1	MET	-	EXPRESSION TAG	UNP Q08638
B	2	HIS	-	EXPRESSION TAG	UNP Q08638
B	3	HIS	-	EXPRESSION TAG	UNP Q08638
B	4	HIS	-	EXPRESSION TAG	UNP Q08638
B	5	HIS	-	EXPRESSION TAG	UNP Q08638
B	6	HIS	-	EXPRESSION TAG	UNP Q08638
B	7	HIS	-	EXPRESSION TAG	UNP Q08638
B	127	PHE	TYR	ENGINEERED MUTATION	UNP Q08638
B	141	LEU	TRP	ENGINEERED MUTATION	UNP Q08638
B	142	LEU	ALA	ENGINEERED MUTATION	UNP Q08638

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Chain	Residue	Modelled	Actual	Comment	Reference
B	398	TYR	HIS	ENGINEERED MUTATION	UNP Q08638
B	340	ALA	GLN	ENGINEERED MUTATION	UNP O93785
B	341	MET	SER	ENGINEERED MUTATION	UNP O93785
C	1	MET	-	EXPRESSION TAG	UNP Q08638
C	2	HIS	-	EXPRESSION TAG	UNP Q08638
C	3	HIS	-	EXPRESSION TAG	UNP Q08638
C	4	HIS	-	EXPRESSION TAG	UNP Q08638
C	5	HIS	-	EXPRESSION TAG	UNP Q08638
C	6	HIS	-	EXPRESSION TAG	UNP Q08638
C	7	HIS	-	EXPRESSION TAG	UNP Q08638
C	127	PHE	TYR	ENGINEERED MUTATION	UNP Q08638
C	141	LEU	TRP	ENGINEERED MUTATION	UNP Q08638
C	142	LEU	ALA	ENGINEERED MUTATION	UNP Q08638
C	398	TYR	HIS	ENGINEERED MUTATION	UNP Q08638
C	340	ALA	GLN	ENGINEERED MUTATION	UNP O93785
C	341	MET	SER	ENGINEERED MUTATION	UNP O93785

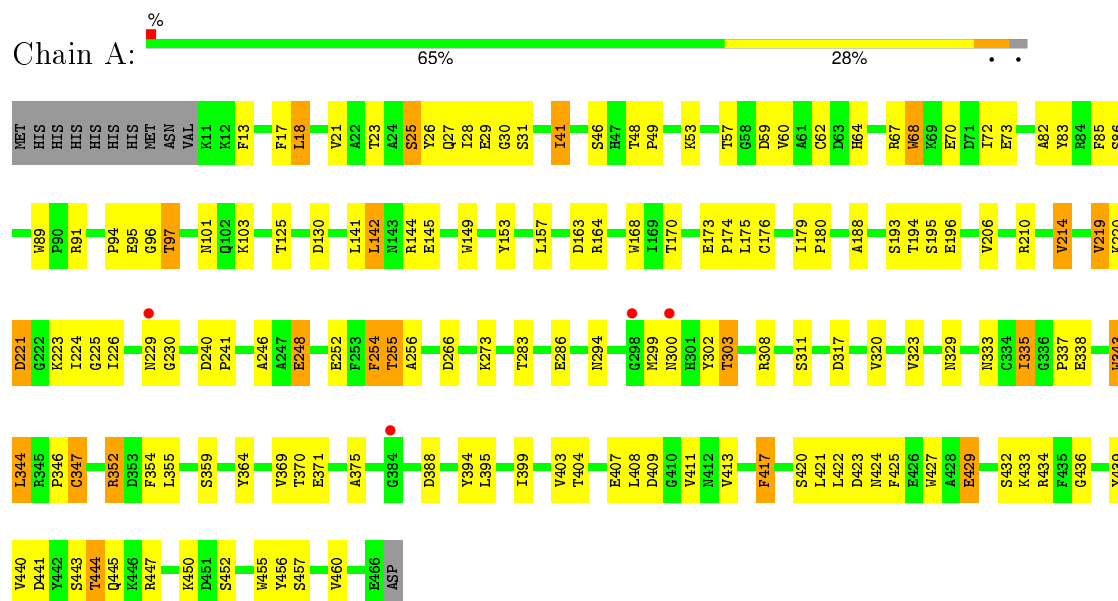
- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total O 1 1	0	0
2	B	1	Total O 1 1	0	0

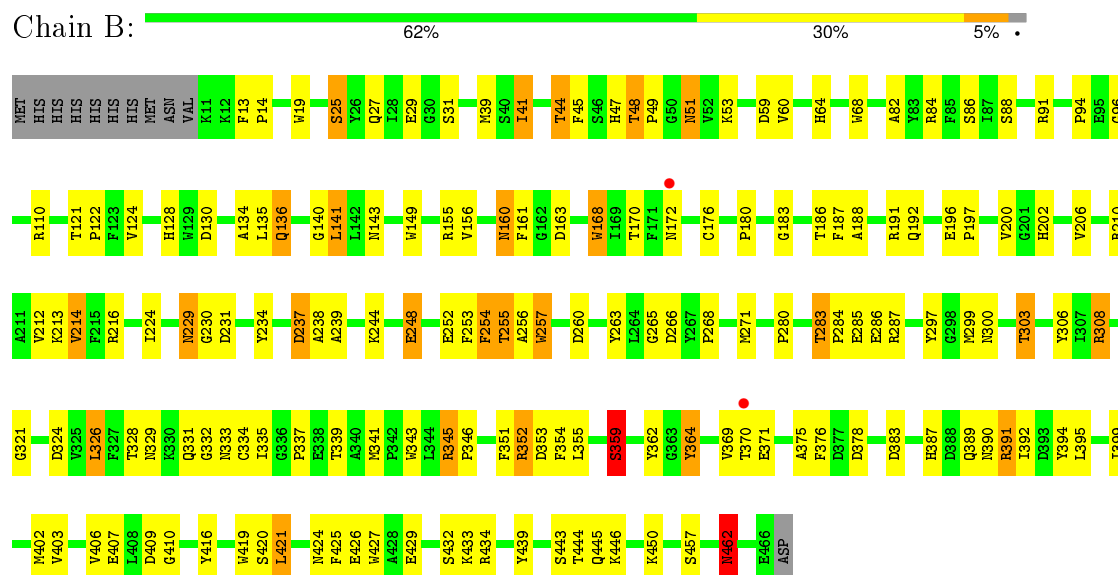
### 3 Residue-property plots

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

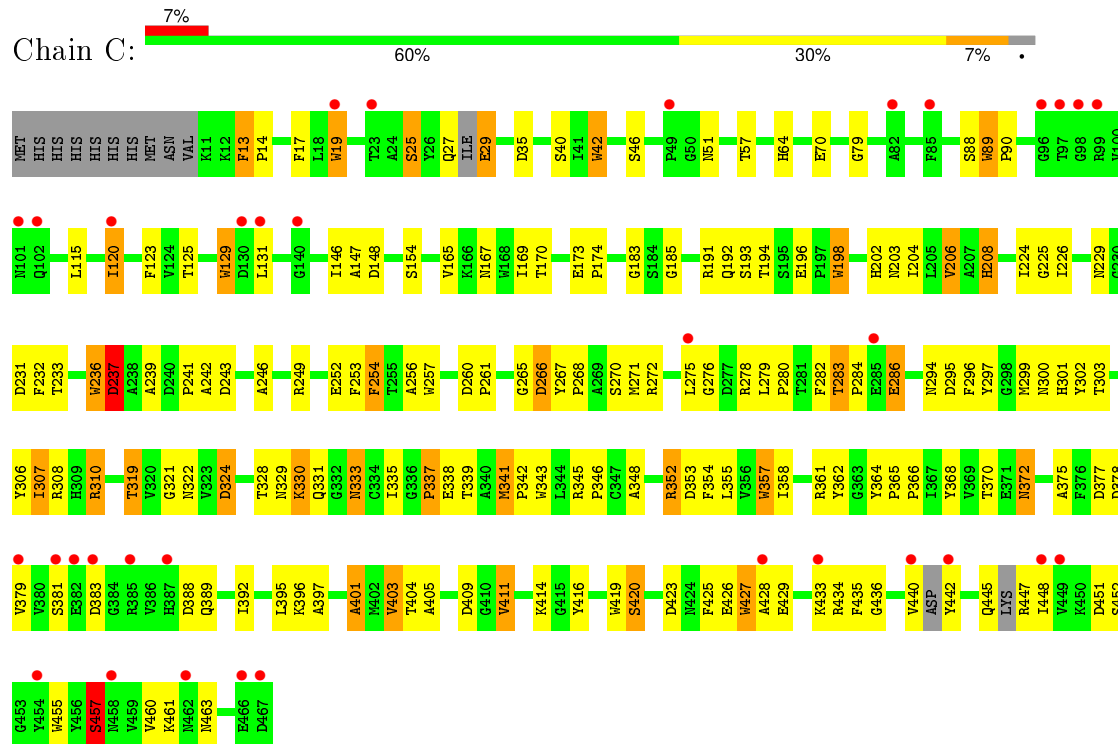
#### • Molecule 1: Beta-glucosidase Chimeric protein



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● Molecule 1: Beta-glucosidase Chimeric protein



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 31 1 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	115.38Å 115.38Å 282.54Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	37.43 – 3.00 37.43 – 3.00	Depositor EDS
% Data completeness (in resolution range)	99.5 (37.43-3.00) 99.5 (37.43-3.00)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.05	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.90 (at 3.01Å)	Xtriage
Refinement program	REFMAC 5.6.0117	Depositor
R, $R_{free}$	0.239 , 0.294 0.238 , 0.293	Depositor DCC
$R_{free}$ test set	2188 reflections (5.32%)	DCC
Wilson B-factor (Å <sup>2</sup> )	92.2	Xtriage
Anisotropy	0.075	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 113.7	EDS
Estimated twinning fraction	0.037 for -h,-k,l	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 43315 reflections	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	9869	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	130.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.87% 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, 0.375 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	A	0.74	3/3563 (0.1%)	0.84	2/4871 (0.0%)
1	B	0.91	6/3398 (0.2%)	0.89	5/4665 (0.1%)
1	C	0.96	14/3220 (0.4%)	0.80	2/4418 (0.0%)
All	All	0.87	23/10181 (0.2%)	0.85	9/13954 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1

All (23) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	457	SER	CB-OG	11.23	1.56	1.42
1	C	401	ALA	C-O	10.15	1.42	1.23
1	C	404	THR	CB-OG1	9.56	1.62	1.43
1	A	343	TRP	CD2-CE2	6.80	1.49	1.41
1	B	19	TRP	CD2-CE2	5.85	1.48	1.41
1	A	89	TRP	CD2-CE2	5.82	1.48	1.41
1	C	343	TRP	CD2-CE2	5.82	1.48	1.41
1	C	257	TRP	CD2-CE2	5.78	1.48	1.41
1	B	359	SER	CB-OG	5.68	1.49	1.42
1	C	357	TRP	CD2-CE2	5.65	1.48	1.41
1	C	42	TRP	CD2-CE2	5.63	1.48	1.41
1	B	68	TRP	CD2-CE2	5.58	1.48	1.41
1	C	29	GLU	CD-OE1	5.58	1.31	1.25
1	B	343	TRP	CD2-CE2	5.49	1.48	1.41
1	B	168	TRP	CD2-CE2	5.46	1.48	1.41
1	C	198	TRP	CD2-CE2	5.45	1.47	1.41
1	A	68	TRP	CD2-CE2	5.40	1.47	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	236	TRP	CD2-CE2	5.32	1.47	1.41
1	C	129	TRP	CD2-CE2	5.22	1.47	1.41
1	C	70	GLU	CD-OE1	5.18	1.31	1.25
1	B	257	TRP	CD2-CE2	5.10	1.47	1.41
1	C	455	TRP	CD2-CE2	5.10	1.47	1.41
1	C	89	TRP	CD2-CE2	5.07	1.47	1.41

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	317	ASP	CB-CG-OD1	-7.11	111.90	118.30
1	C	237	ASP	CB-CG-OD1	6.43	124.09	118.30
1	B	130	ASP	CB-CG-OD1	6.20	123.88	118.30
1	B	39	MET	CG-SD-CE	-5.88	90.79	100.20
1	B	130	ASP	CB-CG-OD2	-5.81	113.07	118.30
1	C	404	THR	CA-CB-CG2	5.65	120.31	112.40
1	B	326	LEU	CA-CB-CG	5.49	127.94	115.30
1	B	231	ASP	CB-CG-OD1	-5.43	113.42	118.30
1	A	344	LEU	CA-CB-CG	5.38	127.66	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	364	TYR	Sidechain

## 5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3451	0	3027	100	0
1	B	3288	0	2645	128	0
1	C	3128	0	2393	125	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
All	All	9869	0	8065	350	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 20.

All (350) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:303:THR:HG21	1:B:345:ARG:H	1.26	1.00
1:B:303:THR:HG22	1:B:345:ARG:O	1.66	0.95
1:B:283:THR:HG22	1:B:286:GLU:H	1.32	0.93
1:B:186:THR:O	1:B:187:PHE:HD1	1.55	0.90
1:B:303:THR:HG21	1:B:345:ARG:N	1.86	0.90
1:C:123:PHE:HA	1:C:167:ASN:O	1.72	0.89
1:B:41:ILE:HG12	1:B:136:GLN:HG3	1.57	0.87
1:C:202:HIS:HD2	1:C:267:TYR:OH	1.55	0.87
1:B:299:MET:CE	1:B:355:LEU:HD21	2.05	0.86
1:C:375:ALA:HA	1:C:434:ARG:O	1.77	0.85
1:B:41:ILE:HG12	1:B:136:GLN:CG	2.07	0.85
1:B:84:ARG:HH22	1:B:172:ASN:ND2	1.74	0.85
1:A:41:ILE:HG13	1:A:188:ALA:HB1	1.60	0.83
1:C:378:ASP:HB2	1:C:434:ARG:HD2	1.60	0.82
1:B:96:GLY:HA3	1:B:135:LEU:HD21	1.61	0.82
1:B:299:MET:HE1	1:B:355:LEU:HD21	1.60	0.82
1:C:252:GLU:HA	1:C:256:ALA:HB3	1.61	0.80
1:A:41:ILE:HD12	1:A:41:ILE:O	1.82	0.80
1:B:444:THR:O	1:B:446:LYS:N	2.14	0.80
1:B:253:PHE:CE2	1:B:321:GLY:HA2	2.16	0.80
1:C:202:HIS:CD2	1:C:267:TYR:OH	2.36	0.79
1:B:389:GLN:O	1:B:392:ILE:HG13	1.84	0.78
1:A:337:PRO:HD2	1:A:346:PRO:HD2	1.65	0.78
1:C:366:PRO:HB3	1:C:414:LYS:HE2	1.66	0.77
1:A:225:GLY:HA2	1:A:294:ASN:HB2	1.65	0.76
1:B:248:GLU:OE2	1:B:248:GLU:HA	1.85	0.76
1:C:19:TRP:HE1	1:C:463:ASN:HA	1.51	0.75
1:C:310:ARG:HG3	1:C:322:ASN:O	1.86	0.75
1:A:219:VAL:O	1:A:221:ASP:N	2.19	0.74
1:C:13:PHE:HB3	1:C:14:PRO:CD	2.18	0.74
1:A:299:MET:HE1	1:A:355:LEU:HD23	1.69	0.74
1:B:253:PHE:CD1	1:B:271:MET:HG2	2.22	0.74
1:B:253:PHE:CE1	1:B:271:MET:HG2	2.23	0.73
1:B:44:THR:O	1:B:48:THR:HG22	1.88	0.73
1:C:173:GLU:HG2	1:C:229:ASN:HB3	1.69	0.73
1:C:310:ARG:CG	1:C:322:ASN:O	2.38	0.71
1:B:300:ASN:CG	1:B:371:GLU:HB2	2.10	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:306:TYR:CD1	1:B:329:ASN:HB3	2.25	0.71
1:C:231:ASP:HB3	1:C:303:THR:O	1.91	0.70
1:C:13:PHE:HB3	1:C:14:PRO:HD2	1.74	0.70
1:A:29:GLU:OE1	1:A:91:ARG:NH1	2.25	0.69
1:B:25:SER:H	1:B:86:SER:HB3	1.58	0.69
1:C:335:ILE:HG22	1:C:335:ILE:O	1.93	0.69
1:C:339:THR:HB	1:C:375:ALA:O	1.94	0.68
1:A:399:ILE:O	1:A:403:VAL:HG23	1.94	0.68
1:C:389:GLN:HA	1:C:392:ILE:HG12	1.76	0.68
1:B:84:ARG:HH22	1:B:172:ASN:HD22	1.41	0.67
1:C:308:ARG:HG2	1:C:324:ASP:OD2	1.94	0.67
1:A:441:ASP:O	1:A:444:THR:O	2.12	0.67
1:B:210:ARG:O	1:B:214:VAL:HG13	1.93	0.67
1:A:173:GLU:OE1	1:A:300:ASN:ND2	2.27	0.67
1:A:226:ILE:H	1:A:294:ASN:HD22	1.43	0.67
1:B:462:ASN:H	1:B:462:ASN:HD22	1.41	0.66
1:B:299:MET:HE2	1:B:355:LEU:HD21	1.78	0.66
1:B:300:ASN:OD1	1:B:371:GLU:HB2	1.96	0.66
1:C:420:SER:O	1:C:436:GLY:HA2	1.95	0.66
1:A:225:GLY:CA	1:A:294:ASN:HB2	2.26	0.66
1:A:210:ARG:HG3	1:A:210:ARG:HH11	1.60	0.65
1:C:265:GLY:O	1:C:266:ASP:HB2	1.95	0.65
1:A:163:ASP:OD2	1:A:164:ARG:HG3	1.95	0.65
1:C:392:ILE:HG22	1:C:452:SER:HA	1.79	0.65
1:C:232:PHE:CE2	1:C:353:ASP:HB3	2.32	0.65
1:B:13:PHE:CZ	1:B:403:VAL:HG13	2.32	0.65
1:C:352:ARG:NH1	1:C:409:ASP:OD2	2.29	0.65
1:B:257:TRP:HB2	1:B:271:MET:SD	2.37	0.65
1:A:153:TYR:HE1	1:A:157:LEU:HD21	1.62	0.64
1:B:27:GLN:HB3	1:B:424:ASN:HD22	1.62	0.64
1:C:296:PHE:CD1	1:C:368:TYR:HD2	2.16	0.64
1:C:426:GLU:HA	1:C:426:GLU:OE1	1.96	0.64
1:B:29:GLU:HA	1:B:64:HIS:HB3	1.79	0.64
1:C:225:GLY:HA2	1:C:294:ASN:HB2	1.79	0.63
1:A:255:THR:HG21	1:A:354:PHE:HZ	1.63	0.63
1:C:261:PRO:HA	1:C:266:ASP:H	1.64	0.63
1:A:283:THR:HG22	1:A:286:GLU:H	1.64	0.63
1:A:13:PHE:CZ	1:A:403:VAL:HG22	2.34	0.62
1:A:153:TYR:CE1	1:A:157:LEU:HD21	2.35	0.62
1:A:421:LEU:HD23	1:A:422:LEU:HG	1.82	0.62
1:B:41:ILE:HG12	1:B:136:GLN:HG2	1.80	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:427:TRP:C	1:B:429:GLU:H	2.03	0.62
1:C:429:GLU:HG2	1:C:433:LYS:HE3	1.82	0.61
1:C:377:ASP:OD1	1:C:379:VAL:HG23	2.00	0.61
1:A:329:ASN:HD21	1:A:333:ASN:HB2	1.66	0.61
1:B:299:MET:CE	1:B:355:LEU:CD2	2.78	0.60
1:B:253:PHE:CD2	1:B:321:GLY:CA	2.84	0.60
1:B:352:ARG:NH1	1:B:409:ASP:OD2	2.34	0.60
1:C:362:TYR:O	1:C:365:PRO:HD3	2.01	0.60
1:B:329:ASN:OD1	1:B:331:GLN:N	2.35	0.60
1:B:375:ALA:HA	1:B:434:ARG:O	2.02	0.60
1:C:310:ARG:HD2	1:C:322:ASN:O	2.02	0.60
1:B:212:VAL:O	1:B:216:ARG:HG2	2.02	0.60
1:A:179:ILE:HB	1:A:180:PRO:HD3	1.84	0.59
1:A:252:GLU:HA	1:A:256:ALA:HB3	1.84	0.59
1:C:392:ILE:O	1:C:396:LYS:HB2	2.03	0.59
1:C:239:ALA:O	1:C:241:PRO:HD3	2.03	0.59
1:B:255:THR:HG21	1:B:354:PHE:HZ	1.67	0.59
1:C:388:ASP:OD2	1:C:452:SER:HB3	2.01	0.59
1:B:432:SER:OG	1:B:433:LYS:HG2	2.02	0.59
1:C:299:MET:HE3	1:C:301:HIS:HB2	1.85	0.59
1:B:283:THR:HG22	1:B:283:THR:O	2.03	0.58
1:C:260:ASP:HB2	1:C:268:PRO:HD3	1.85	0.58
1:B:329:ASN:HD21	1:B:333:ASN:HB2	1.68	0.58
1:C:306:TYR:CE1	1:C:329:ASN:HB3	2.37	0.58
1:A:248:GLU:O	1:A:252:GLU:HG3	2.04	0.58
1:B:196:GLU:O	1:B:200:VAL:HG23	2.02	0.58
1:C:231:ASP:CB	1:C:303:THR:O	2.51	0.58
1:C:249:ARG:HA	1:C:252:GLU:OE1	2.03	0.58
1:A:225:GLY:HA2	1:A:294:ASN:CB	2.33	0.58
1:B:439:TYR:HB2	1:B:450:LYS:HE3	1.84	0.58
1:A:427:TRP:C	1:A:429:GLU:H	2.07	0.57
1:A:176:CYS:O	1:A:180:PRO:HD2	2.05	0.56
1:B:254:PHE:HB3	1:B:255:THR:HG22	1.87	0.56
1:B:186:THR:O	1:B:187:PHE:CD1	2.47	0.56
1:C:13:PHE:CE1	1:C:403:VAL:HG13	2.40	0.56
1:C:310:ARG:CD	1:C:322:ASN:O	2.54	0.56
1:B:306:TYR:CE1	1:B:329:ASN:HB3	2.41	0.56
1:B:351:PHE:HZ	1:B:369:VAL:HG21	1.71	0.56
1:A:18:LEU:HD23	1:A:82:ALA:HB2	1.87	0.56
1:C:79:GLY:O	1:C:460:VAL:HG11	2.05	0.56
1:A:210:ARG:HG3	1:A:210:ARG:NH1	2.18	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:303:THR:HG22	1:C:345:ARG:O	2.05	0.55
1:B:376:PHE:HD2	1:B:391:ARG:HH11	1.54	0.55
1:C:260:ASP:HB2	1:C:261:PRO:HD3	1.88	0.55
1:C:225:GLY:CA	1:C:294:ASN:HB2	2.36	0.55
1:C:299:MET:CE	1:C:301:HIS:HB2	2.37	0.55
1:C:115:LEU:O	1:C:120:ILE:HG13	2.07	0.55
1:C:335:ILE:CG2	1:C:335:ILE:O	2.54	0.55
1:C:348:ALA:HB2	1:C:397:ALA:HB1	1.88	0.54
1:B:353:ASP:OD1	1:C:352:ARG:NH2	2.38	0.54
1:C:352:ARG:O	1:C:355:LEU:N	2.39	0.54
1:B:82:ALA:HA	1:B:121:THR:O	2.07	0.54
1:A:101:ASN:OD1	1:A:103:LYS:N	2.40	0.54
1:B:45:PHE:O	1:B:51:ASN:ND2	2.41	0.54
1:A:28:ILE:HG22	1:A:424:ASN:HB3	1.87	0.54
1:C:27:GLN:O	1:C:425:PHE:HB3	2.08	0.54
1:B:44:THR:HG22	1:B:45:PHE:N	2.23	0.53
1:A:193:SER:HB3	1:A:196:GLU:HB2	1.89	0.53
1:A:404:THR:HG23	1:A:408:LEU:HD12	1.90	0.53
1:C:256:ALA:HB1	1:C:260:ASP:OD1	2.08	0.53
1:A:299:MET:HE1	1:A:355:LEU:CD2	2.38	0.53
1:A:83:TYR:CE2	1:A:85:PHE:HB3	2.44	0.53
1:C:146:ILE:C	1:C:148:ASP:H	2.12	0.53
1:B:253:PHE:CE1	1:B:271:MET:HA	2.43	0.53
1:C:268:PRO:HB2	1:C:271:MET:HG3	1.89	0.53
1:A:68:TRP:O	1:A:72:ILE:HG13	2.09	0.53
1:B:202:HIS:ND1	1:B:280:PRO:HB2	2.24	0.53
1:C:260:ASP:HB2	1:C:261:PRO:CD	2.40	0.52
1:B:253:PHE:CD2	1:B:321:GLY:HA2	2.45	0.52
1:A:370:THR:O	1:A:371:GLU:HG3	2.09	0.52
1:A:404:THR:CG2	1:A:408:LEU:HD12	2.40	0.52
1:C:242:ALA:O	1:C:246:ALA:N	2.43	0.52
1:C:265:GLY:O	1:C:266:ASP:CB	2.57	0.52
1:C:427:TRP:O	1:C:429:GLU:N	2.43	0.51
1:C:329:ASN:O	1:C:331:GLN:N	2.44	0.51
1:A:352:ARG:NH1	1:A:409:ASP:OD2	2.42	0.51
1:B:263:TYR:HB2	1:B:362:TYR:HD1	1.75	0.51
1:B:303:THR:CG2	1:B:345:ARG:N	2.68	0.51
1:C:254:PHE:HD1	1:C:254:PHE:O	1.93	0.51
1:B:299:MET:HE2	1:B:355:LEU:CD2	2.40	0.51
1:C:198:TRP:CH2	1:C:319:THR:HG22	2.46	0.51
1:A:359:SER:HB3	1:A:364:TYR:CE2	2.46	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:351:PHE:O	1:B:355:LEU:HD12	2.12	0.50
1:C:275:LEU:HA	1:C:278:ARG:HH21	1.76	0.50
1:C:237:ASP:OD1	1:C:239:ALA:HB3	2.11	0.50
1:A:417:PHE:CD1	1:A:417:PHE:N	2.80	0.50
1:A:456:TYR:O	1:A:460:VAL:HG23	2.11	0.50
1:C:185:GLY:HA3	1:C:192:GLN:HG2	1.94	0.50
1:C:429:GLU:HG2	1:C:433:LYS:CE	2.42	0.50
1:B:141:LEU:O	1:B:200:VAL:HG13	2.12	0.50
1:B:168:TRP:O	1:B:224:ILE:HA	2.11	0.50
1:C:337:PRO:O	1:C:346:PRO:HD2	2.11	0.49
1:B:84:ARG:NH2	1:B:172:ASN:HD22	2.08	0.49
1:C:306:TYR:CZ	1:C:329:ASN:HB3	2.47	0.49
1:A:441:ASP:OD1	1:A:443:SER:HB2	2.12	0.49
1:C:183:GLY:O	1:C:192:GLN:HA	2.11	0.49
1:B:27:GLN:O	1:B:424:ASN:HB2	2.12	0.49
1:C:89:TRP:N	1:C:90:PRO:HD2	2.28	0.49
1:B:334:CYS:SG	1:B:335:ILE:N	2.84	0.49
1:B:253:PHE:CE2	1:B:321:GLY:CA	2.94	0.49
1:C:392:ILE:CG2	1:C:452:SER:HA	2.42	0.49
1:A:210:ARG:O	1:A:214:VAL:HG13	2.13	0.49
1:B:303:THR:CG2	1:B:345:ARG:O	2.51	0.49
1:C:193:SER:OG	1:C:196:GLU:HB2	2.12	0.49
1:A:62:CYS:SG	1:A:423:ASP:O	2.71	0.49
1:B:394:TYR:HD1	1:B:395:LEU:HD23	1.78	0.48
1:C:328:THR:HA	1:C:333:ASN:O	2.13	0.48
1:C:14:PRO:HD2	1:C:17:PHE:HB2	1.95	0.48
1:A:436:GLY:O	1:A:450:LYS:HD2	2.13	0.48
1:C:226:ILE:H	1:C:294:ASN:HD22	1.61	0.48
1:A:18:LEU:HD23	1:A:82:ALA:CB	2.44	0.48
1:A:302:TYR:C	1:A:303:THR:HG22	2.33	0.48
1:A:299:MET:CE	1:A:355:LEU:CD2	2.91	0.48
1:A:299:MET:HE2	1:A:369:VAL:HG22	1.95	0.48
1:B:329:ASN:ND2	1:B:333:ASN:HB2	2.29	0.48
1:A:359:SER:HB3	1:A:364:TYR:CD2	2.48	0.48
1:A:174:PRO:O	1:A:175:LEU:C	2.52	0.48
1:B:156:VAL:O	1:B:160:ASN:HB2	2.13	0.48
1:B:303:THR:CG2	1:B:345:ARG:H	2.12	0.48
1:B:299:MET:O	1:B:370:THR:N	2.46	0.48
1:B:176:CYS:HA	1:B:180:PRO:HG2	1.96	0.48
1:C:208:HIS:C	1:C:208:HIS:CD2	2.85	0.48
1:A:230:GLY:HA2	1:A:254:PHE:CE1	2.49	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:302:TYR:C	1:A:303:THR:CG2	2.82	0.48
1:C:329:ASN:O	1:C:330:LYS:C	2.52	0.48
1:A:206:VAL:HG11	1:A:286:GLU:HG2	1.95	0.47
1:B:406:VAL:O	1:B:410:GLY:HA2	2.14	0.47
1:B:253:PHE:CD2	1:B:321:GLY:HA3	2.49	0.47
1:C:261:PRO:HA	1:C:266:ASP:N	2.28	0.47
1:B:238:ALA:HB1	1:C:364:TYR:OH	2.14	0.47
1:C:433:LYS:HA	1:C:433:LYS:HD3	1.73	0.47
1:A:70:GLU:O	1:A:73:GLU:HB2	2.15	0.47
1:B:88:SER:O	1:B:91:ARG:HB2	2.14	0.47
1:C:282:PHE:CB	1:C:286:GLU:OE1	2.62	0.47
1:C:354:PHE:O	1:C:357:TRP:N	2.47	0.47
1:C:405:ALA:HB1	1:C:411:VAL:CG2	2.44	0.47
1:C:203:ASN:HA	1:C:206:VAL:CG2	2.45	0.47
1:A:283:THR:HB	1:A:286:GLU:HB2	1.96	0.47
1:A:427:TRP:O	1:A:429:GLU:N	2.47	0.47
1:B:265:GLY:O	1:B:287:ARG:NH1	2.48	0.47
1:A:403:VAL:HG12	1:A:407:GLU:HG3	1.96	0.46
1:A:347:CYS:O	1:A:347:CYS:SG	2.72	0.46
1:A:299:MET:CE	1:A:369:VAL:HG22	2.46	0.46
1:A:254:PHE:HB3	1:A:255:THR:HG22	1.96	0.46
1:B:378:ASP:OD2	1:B:450:LYS:HE2	2.15	0.46
1:A:142:LEU:HD11	1:A:196:GLU:HG2	1.97	0.46
1:B:328:THR:HG22	1:B:334:CYS:HA	1.96	0.46
1:C:253:PHE:CD2	1:C:321:GLY:HA3	2.50	0.46
1:B:183:GLY:O	1:B:192:GLN:HG2	2.15	0.46
1:C:29:GLU:HA	1:C:64:HIS:HB3	1.97	0.46
1:C:341:MET:HE1	1:C:435:PHE:HE1	1.80	0.46
1:A:29:GLU:HA	1:A:64:HIS:HB3	1.97	0.46
1:C:272:ARG:NH1	1:C:280:PRO:O	2.40	0.46
1:A:25:SER:HB3	1:A:86:SER:HB2	1.97	0.46
1:C:303:THR:HG21	1:C:345:ARG:N	2.29	0.46
1:C:372:ASN:HD22	1:C:416:TYR:HE1	1.64	0.46
1:B:420:SER:OG	1:B:421:LEU:N	2.49	0.46
1:A:145:GLU:HB3	1:A:149:TRP:CZ2	2.51	0.46
1:B:47:HIS:CE1	1:B:59:ASP:OD2	2.69	0.45
1:A:67:ARG:CZ	1:A:445:GLN:HB2	2.46	0.45
1:B:260:ASP:HB2	1:B:268:PRO:HD3	1.98	0.45
1:B:257:TRP:CD1	1:B:257:TRP:O	2.69	0.45
1:C:42:TRP:CH2	1:C:427:TRP:HB3	2.52	0.45
1:A:452:SER:HA	1:A:455:TRP:HB3	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:352:ARG:HG2	1:C:353:ASP:N	2.31	0.45
1:A:27:GLN:HB3	1:A:424:ASN:HB2	1.99	0.45
1:C:13:PHE:HB2	1:C:463:ASN:OD1	2.17	0.45
1:C:337:PRO:HG2	1:C:346:PRO:CG	2.47	0.45
1:B:260:ASP:HB3	1:B:266:ASP:O	2.17	0.45
1:A:394:TYR:HD1	1:A:395:LEU:HD23	1.81	0.44
1:B:427:TRP:C	1:B:429:GLU:N	2.69	0.44
1:A:31:SER:N	1:A:59:ASP:O	2.46	0.44
1:A:30:GLY:HA3	1:A:60:VAL:O	2.17	0.44
1:B:44:THR:O	1:B:48:THR:CG2	2.63	0.44
1:B:329:ASN:C	1:B:329:ASN:OD1	2.56	0.44
1:C:457:SER:O	1:C:461:LYS:HG3	2.17	0.44
1:C:440:VAL:HG12	1:C:442:TYR:CE1	2.53	0.44
1:B:308:ARG:HG2	1:B:324:ASP:OD2	2.17	0.44
1:C:381:SER:OG	1:C:383:ASP:OD1	2.36	0.44
1:B:390:ASN:N	1:B:390:ASN:OD1	2.48	0.44
1:C:300:ASN:HD22	1:C:302:TYR:HE2	1.66	0.44
1:B:283:THR:HG23	1:B:285:GLU:H	1.82	0.44
1:C:303:THR:CG2	1:C:345:ARG:O	2.66	0.44
1:C:405:ALA:HB1	1:C:411:VAL:HG21	1.99	0.44
1:C:261:PRO:O	1:C:265:GLY:N	2.48	0.44
1:B:27:GLN:HA	1:B:425:PHE:HB3	1.99	0.44
1:C:194:THR:O	1:C:278:ARG:HD2	2.17	0.44
1:B:297:TYR:CD1	1:B:297:TYR:C	2.91	0.44
1:A:246:ALA:HB1	1:A:323:VAL:HG12	2.00	0.44
1:A:206:VAL:CG1	1:A:286:GLU:HG2	2.48	0.43
1:A:168:TRP:O	1:A:224:ILE:HA	2.18	0.43
1:B:96:GLY:HA3	1:B:135:LEU:CD2	2.40	0.43
1:C:397:ALA:O	1:C:401:ALA:N	2.48	0.43
1:C:40:SER:HA	1:C:131:LEU:O	2.18	0.43
1:B:427:TRP:O	1:B:429:GLU:N	2.52	0.43
1:B:86:SER:HB2	1:B:128:HIS:HB2	2.01	0.43
1:B:339:THR:HB	1:B:375:ALA:O	2.19	0.43
1:B:230:GLY:HA2	1:B:254:PHE:CZ	2.54	0.43
1:A:23:THR:HB	1:A:28:ILE:HD13	1.99	0.43
1:B:419:TRP:HA	1:B:420:SER:HA	1.82	0.43
1:A:94:PRO:C	1:A:96:GLY:H	2.20	0.43
1:B:283:THR:O	1:B:284:PRO:C	2.57	0.43
1:A:27:GLN:HA	1:A:425:PHE:HB3	2.00	0.43
1:B:383:ASP:OD2	1:B:387:HIS:NE2	2.49	0.43
1:B:403:VAL:O	1:B:407:GLU:N	2.37	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:352:ARG:HB2	1:C:401:ALA:O	2.19	0.43
1:C:243:ASP:HA	1:C:246:ALA:HB3	2.00	0.43
1:A:343:TRP:CE3	1:A:344:LEU:HB2	2.54	0.43
1:B:237:ASP:OD2	1:B:239:ALA:HB3	2.19	0.42
1:B:229:ASN:HD22	1:B:230:GLY:N	2.17	0.42
1:C:283:THR:HG23	1:C:286:GLU:OE2	2.18	0.42
1:A:429:GLU:HG3	1:A:433:LYS:HG3	2.01	0.42
1:B:41:ILE:O	1:B:44:THR:HB	2.20	0.42
1:C:231:ASP:O	1:C:354:PHE:HE2	2.02	0.42
1:A:173:GLU:HG2	1:A:229:ASN:ND2	2.33	0.42
1:B:426:GLU:O	1:B:429:GLU:CB	2.67	0.42
1:C:306:TYR:CD1	1:C:329:ASN:HB3	2.53	0.42
1:C:337:PRO:HG2	1:C:346:PRO:HG3	2.02	0.42
1:A:439:TYR:N	1:A:450:LYS:HG3	2.34	0.42
1:C:174:PRO:HB3	1:C:204:ILE:HG21	2.01	0.42
1:A:335:ILE:HD13	1:A:335:ILE:HA	1.74	0.42
1:B:41:ILE:HD12	1:B:188:ALA:HB1	2.02	0.42
1:C:249:ARG:O	1:C:252:GLU:N	2.53	0.42
1:C:232:PHE:CG	1:C:233:THR:N	2.88	0.42
1:A:175:LEU:HD23	1:A:175:LEU:C	2.40	0.42
1:C:169:ILE:HG22	1:C:170:THR:N	2.35	0.42
1:C:236:TRP:N	1:C:307:ILE:O	2.40	0.42
1:C:25:SER:O	1:C:29:GLU:N	2.52	0.42
1:A:240:ASP:HA	1:A:241:PRO:HD3	1.83	0.42
1:B:341:MET:HE1	1:B:429:GLU:HG2	2.01	0.42
1:C:416:TYR:O	1:C:416:TYR:CD2	2.73	0.42
1:B:47:HIS:NE2	1:B:59:ASP:OD2	2.53	0.42
1:C:46:SER:HB2	1:C:57:THR:HA	2.01	0.42
1:A:17:PHE:HE1	1:A:413:VAL:HG12	1.85	0.41
1:B:234:TYR:O	1:B:306:TYR:HA	2.20	0.41
1:C:419:TRP:HA	1:C:420:SER:HA	1.70	0.41
1:B:376:PHE:HD2	1:B:391:ARG:NH1	2.18	0.41
1:A:440:VAL:HG22	1:A:447:ARG:HD3	2.02	0.41
1:A:164:ARG:HH11	1:A:164:ARG:HG3	1.85	0.41
1:A:420:SER:O	1:A:436:GLY:HA2	2.20	0.41
1:C:341:MET:HA	1:C:342:PRO:HD3	1.89	0.41
1:A:95:GLU:C	1:A:97:THR:H	2.24	0.41
1:B:252:GLU:HA	1:B:256:ALA:HB3	2.03	0.41
1:B:352:ARG:HH22	1:C:353:ASP:CG	2.24	0.41
1:B:429:GLU:HG2	1:B:433:LYS:HG3	2.02	0.41
1:B:402:MET:CE	1:B:416:TYR:CD1	3.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:246:ALA:HB1	1:A:323:VAL:CG1	2.51	0.41
1:A:46:SER:HB2	1:A:57:THR:HA	2.01	0.41
1:B:47:HIS:HE2	1:B:59:ASP:CG	2.24	0.41
1:B:359:SER:HB3	1:B:364:TYR:CD2	2.56	0.41
1:C:88:SER:O	1:C:89:TRP:C	2.58	0.41
1:C:279:LEU:HA	1:C:280:PRO:HD3	1.75	0.41
1:B:399:ILE:HG23	1:B:402:MET:CE	2.51	0.41
1:C:224:ILE:O	1:C:295:ASP:HB2	2.21	0.41
1:A:48:THR:HG23	1:A:49:PRO:HD2	2.02	0.41
1:B:283:THR:O	1:B:286:GLU:N	2.54	0.40
1:B:389:GLN:O	1:B:392:ILE:N	2.55	0.40
1:A:21:VAL:HG21	1:A:421:LEU:HD13	2.03	0.40
1:B:229:ASN:C	1:B:229:ASN:HD22	2.25	0.40
1:B:337:PRO:HG2	1:B:346:PRO:HD2	2.03	0.40
1:B:196:GLU:O	1:B:197:PRO:C	2.57	0.40
1:A:375:ALA:HA	1:A:434:ARG:O	2.21	0.40
1:A:144:ARG:HH11	1:A:144:ARG:HG3	1.87	0.40
1:A:388:ASP:N	1:A:388:ASP:OD1	2.54	0.40
1:B:13:PHE:HB3	1:B:14:PRO:HD2	2.02	0.40
1:B:229:ASN:C	1:B:229:ASN:ND2	2.75	0.40
1:C:329:ASN:OD1	1:C:329:ASN:O	2.39	0.40
1:B:332:GLY:O	1:B:333:ASN:C	2.60	0.40
1:A:343:TRP:CZ3	1:A:344:LEU:HB2	2.57	0.40
1:B:143:ASN:OD1	1:B:143:ASN:C	2.59	0.40
1:A:329:ASN:ND2	1:A:333:ASN:HB2	2.34	0.40
1:A:25:SER:OG	1:A:26:TYR:N	2.55	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	454/467 (97%)	393 (87%)	56 (12%)	5 (1%)	17	58
1	B	454/467 (97%)	390 (86%)	48 (11%)	16 (4%)	4	24
1	C	446/467 (96%)	338 (76%)	88 (20%)	20 (4%)	3	18
All	All	1354/1401 (97%)	1121 (83%)	192 (14%)	41 (3%)	5	29

All (41) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	220	LYS
1	B	445	GLN
1	B	462	ASN
1	C	35	ASP
1	C	266	ASP
1	C	270	SER
1	C	428	ALA
1	B	53	LYS
1	C	276	GLY
1	C	330	LYS
1	C	333	ASN
1	A	25	SER
1	A	53	LYS
1	A	170	THR
1	B	122	PRO
1	B	161	PHE
1	B	163	ASP
1	B	213	LYS
1	B	244	LYS
1	B	421	LEU
1	C	147	ALA
1	C	165	VAL
1	C	337	PRO
1	C	427	TRP
1	A	432	SER
1	B	25	SER
1	B	141	LEU
1	C	19	TRP
1	C	154	SER
1	C	372	ASN
1	B	44	THR
1	B	110	ARG
1	B	134	ALA
1	B	149	TRP

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Mol	Chain	Res	Type
1	C	370	THR
1	C	411	VAL
1	C	423	ASP
1	B	140	GLY
1	C	13	PHE
1	C	284	PRO
1	C	358	ILE

### 5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	321/391 (82%)	290 (90%)	31 (10%)	10	37
1	B	268/391 (68%)	237 (88%)	31 (12%)	7	27
1	C	232/391 (59%)	203 (88%)	29 (12%)	6	24
All	All	821/1173 (70%)	730 (89%)	91 (11%)	8	29

All (91) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	18	LEU
1	A	41	ILE
1	A	97	THR
1	A	125	THR
1	A	130	ASP
1	A	141	LEU
1	A	142	LEU
1	A	194	THR
1	A	195	SER
1	A	214	VAL
1	A	219	VAL
1	A	221	ASP
1	A	223	LYS
1	A	248	GLU
1	A	254	PHE

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Mol	Chain	Res	Type
1	A	255	THR
1	A	266	ASP
1	A	273	LYS
1	A	303	THR
1	A	308	ARG
1	A	311	SER
1	A	320	VAL
1	A	335	ILE
1	A	338	GLU
1	A	347	CYS
1	A	352	ARG
1	A	411	VAL
1	A	417	PHE
1	A	429	GLU
1	A	444	THR
1	A	457	SER
1	B	31	SER
1	B	41	ILE
1	B	48	THR
1	B	49	PRO
1	B	51	ASN
1	B	60	VAL
1	B	94	PRO
1	B	124	VAL
1	B	136	GLN
1	B	155	ARG
1	B	160	ASN
1	B	170	THR
1	B	191	ARG
1	B	206	VAL
1	B	214	VAL
1	B	229	ASN
1	B	237	ASP
1	B	248	GLU
1	B	254	PHE
1	B	255	THR
1	B	283	THR
1	B	303	THR
1	B	308	ARG
1	B	326	LEU
1	B	345	ARG
1	B	352	ARG

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Mol	Chain	Res	Type
1	B	359	SER
1	B	391	ARG
1	B	443	SER
1	B	457	SER
1	B	462	ASN
1	C	25	SER
1	C	51	ASN
1	C	120	ILE
1	C	125	THR
1	C	129	TRP
1	C	191	ARG
1	C	206	VAL
1	C	208	HIS
1	C	237	ASP
1	C	254	PHE
1	C	283	THR
1	C	286	GLU
1	C	297	TYR
1	C	307	ILE
1	C	310	ARG
1	C	319	THR
1	C	324	ASP
1	C	338	GLU
1	C	341	MET
1	C	352	ARG
1	C	361	ARG
1	C	395	LEU
1	C	403	VAL
1	C	420	SER
1	C	445	GLN
1	C	447	ARG
1	C	448	ILE
1	C	451	ASP
1	C	457	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (25) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	43	HIS
1	A	128	HIS
1	A	229	ASN
1	A	291	HIS

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Mol	Chain	Res	Type
1	A	294	ASN
1	A	458	ASN
1	B	128	HIS
1	B	172	ASN
1	B	229	ASN
1	B	300	ASN
1	B	305	ASN
1	B	372	ASN
1	B	412	ASN
1	B	424	ASN
1	B	462	ASN
1	C	43	HIS
1	C	172	ASN
1	C	202	HIS
1	C	291	HIS
1	C	294	ASN
1	C	300	ASN
1	C	301	HIS
1	C	372	ASN
1	C	412	ASN
1	C	462	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, 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	456/467 (97%)	-0.19	4 (0%)	85 64	104, 112, 124, 136	6 (1%)
1	B	456/467 (97%)	-0.31	2 (0%)	93 80	104, 112, 130, 150	2 (0%)
1	C	454/467 (97%)	0.32	34 (7%)	17 6	102, 171, 225, 249	1 (0%)
All	All	1366/1401 (97%)	-0.06	40 (2%)	55 26	102, 116, 208, 249	9 (0%)

All (40) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	467	ASP	4.9
1	C	130	ASP	4.8
1	C	442	TYR	3.9
1	C	23	THR	3.8
1	C	96	GLY	3.6
1	C	385	ARG	3.4
1	C	448	ILE	3.3
1	C	82	ALA	3.3
1	C	381	SER	3.1
1	C	433	LYS	3.1
1	C	120	ILE	3.1
1	C	379	VAL	3.0
1	C	19	TRP	3.0
1	C	383	ASP	3.0
1	C	285	GLU	2.9
1	C	428	ALA	2.9
1	C	275	LEU	2.7
1	C	462	ASN	2.7
1	A	298	GLY	2.7
1	C	382	GLU	2.7
1	C	440	VAL	2.7
1	C	454	TYR	2.6
1	A	300	ASN	2.6

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Mol	Chain	Res	Type	RSRZ
1	C	98	GLY	2.5
1	B	370	THR	2.4
1	A	229	ASN	2.4
1	C	387	HIS	2.4
1	A	384	GLY	2.4
1	C	49	PRO	2.4
1	C	466	GLU	2.3
1	C	99	ARG	2.3
1	C	131	LEU	2.2
1	C	101	ASN	2.2
1	C	97	THR	2.1
1	C	85	PHE	2.1
1	C	140	GLY	2.1
1	C	449	VAL	2.1
1	C	458	ASN	2.0
1	B	172	ASN	2.0
1	C	102	GLN	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.