



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 07:07 PM UTC

PDB ID : 3RCE / pdb_00003rce
Title : Bacterial oligosaccharyltransferase PglB
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Deposited on : 2011-03-31
Resolution : 3.40 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

<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>.

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (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

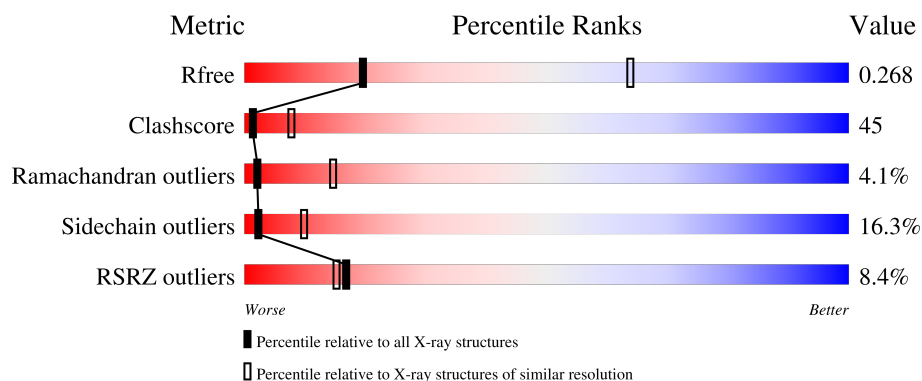
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.40 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	1001 (3.44-3.36)
Clashscore	190562	1022 (3.44-3.36)
Ramachandran outliers	187476	1012 (3.44-3.36)
Sidechain outliers	187428	1012 (3.44-3.36)
RSRZ outliers	180081	1001 (3.44-3.36)

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 ≥ 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	724	
2	B	8	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 5668 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 Oligosaccharide transferase to N-glycosylate proteins.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	683	Total	C	N	O	S	0	0	0
			5606	3730	857	990	29			

There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	2	GLU	LYS	engineered mutation	UNP B9KDD4
A	108	THR	ALA	SEE REMARK 999	UNP B9KDD4
A	187	ILE	VAL	SEE REMARK 999	UNP B9KDD4
A	227	ALA	THR	SEE REMARK 999	UNP B9KDD4
A	275	SER	LEU	SEE REMARK 999	UNP B9KDD4
A	536	GLN	LYS	SEE REMARK 999	UNP B9KDD4
A	550	ASN	ASP	SEE REMARK 999	UNP B9KDD4
A	681	ALA	SER	SEE REMARK 999	UNP B9KDD4
A	699	VAL	ILE	SEE REMARK 999	UNP B9KDD4
A	713	GLU	-	expression tag	UNP B9KDD4
A	714	PHE	-	expression tag	UNP B9KDD4
A	715	HIS	-	expression tag	UNP B9KDD4
A	716	HIS	-	expression tag	UNP B9KDD4
A	717	HIS	-	expression tag	UNP B9KDD4
A	718	HIS	-	expression tag	UNP B9KDD4
A	719	HIS	-	expression tag	UNP B9KDD4
A	720	HIS	-	expression tag	UNP B9KDD4
A	721	HIS	-	expression tag	UNP B9KDD4
A	722	HIS	-	expression tag	UNP B9KDD4
A	723	HIS	-	expression tag	UNP B9KDD4
A	724	HIS	-	expression tag	UNP B9KDD4

- Molecule 2 is a protein called Substrate Mimic Peptide.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	B	8	Total	C	N	O	5	0	0
			59	33	11	15			

- Molecule 3 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total	Mg	0	0
			2	2		

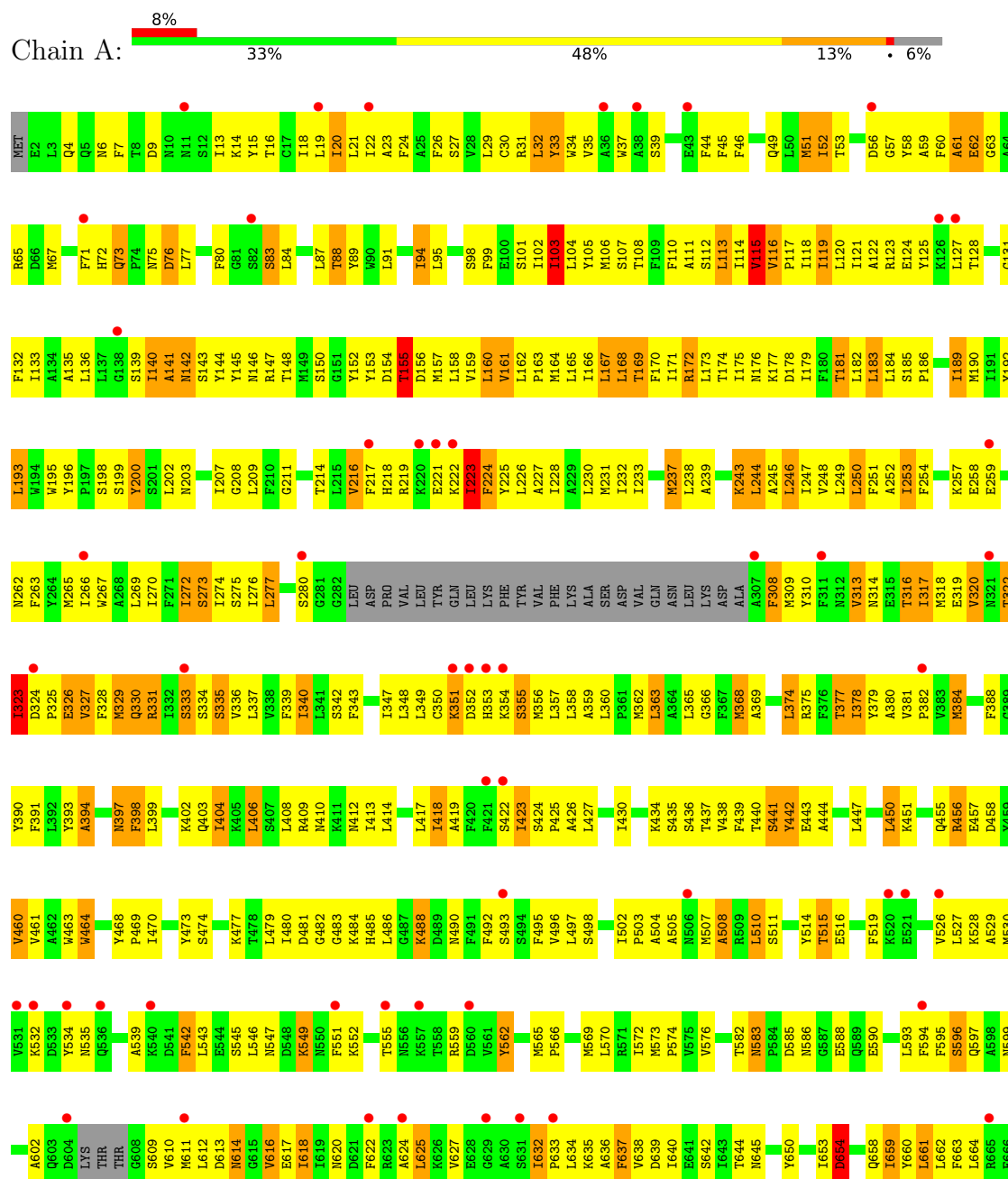
- Molecule 4 is water.

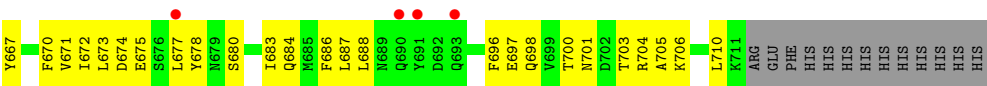
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	O	0	0
			1	1		

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: Oligosaccharide transferase to N-glycosylate proteins





● Molecule 2: Substrate Mimic Peptide



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	85.06Å 116.10Å 175.04Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.98 – 3.40 29.98 – 3.40	Depositor EDS
% Data completeness (in resolution range)	(Not available) (29.98-3.40) 97.2 (29.98-3.40)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.70 (at 3.39Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.6.4_486)	Depositor
R, R_{free}	0.238 , 0.271 (Not available) , 0.268	Depositor DCC
R_{free} test set	2000 reflections (8.39%)	wwPDB-VP
Wilson B-factor (Å ²)	112.7	Xtriage
Anisotropy	0.015	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.26 , 92.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	5668	wwPDB-VP
Average B, all atoms (Å ²)	129.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.07% 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, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

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

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	0.68	0/5752	1.03	17/7791 (0.2%)
2	B	0.56	0/43	1.06	0/55
All	All	0.68	0/5795	1.03	17/7846 (0.2%)

There are no bond length outliers.

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	565	MET	CA-C-N	8.13	130.75	120.51
1	A	565	MET	C-N-CA	8.13	130.75	120.51
1	A	224	PHE	N-CA-C	6.26	117.77	111.07
1	A	323	ILE	N-CA-C	6.21	117.29	108.42
1	A	632	ILE	CA-C-N	5.80	125.99	119.90
1	A	632	ILE	C-N-CA	5.80	125.99	119.90
1	A	73	GLN	N-CA-C	5.61	118.26	110.07
1	A	510	LEU	N-CA-C	5.58	117.36	111.28
1	A	94	ILE	N-CA-C	-5.56	107.85	113.47
1	A	464	TRP	N-CA-C	5.40	118.08	111.82
1	A	659	ILE	N-CA-C	5.37	115.58	107.80
1	A	253	ILE	N-CA-CB	5.33	117.13	110.47
1	A	422	SER	N-CA-C	5.25	117.75	111.71
1	A	116	VAL	CA-C-N	-5.24	113.52	119.28
1	A	116	VAL	C-N-CA	-5.24	113.52	119.28
1	A	368	MET	N-CA-C	-5.19	105.75	111.71
1	A	616	VAL	CB-CA-C	-5.12	103.88	110.84

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	A	5606	0	5628	509	0
2	B	59	0	43	3	0
3	A	2	0	0	0	0
4	A	1	0	0	0	0
All	All	5668	0	5671	510	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 45.

All (510) 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:A:169:THR:HG21	1:A:185:SER:HB3	1.22	1.14
1:A:329:MET:HE2	1:A:336:VAL:HG13	1.23	1.12
1:A:488:LYS:O	1:A:488:LYS:HD3	1.47	1.09
1:A:20:ILE:HG13	1:A:119:ILE:HD11	1.25	1.06
1:A:173:LEU:HB2	1:A:181:THR:HG21	1.41	0.98
1:A:572:ILE:HG22	1:A:576:VAL:HG23	1.47	0.96
1:A:140:ILE:HG22	1:A:426:ALA:HB1	1.48	0.95
1:A:169:THR:CG2	1:A:185:SER:HB3	1.96	0.95
1:A:456:ARG:HA	1:A:456:ARG:HH11	1.34	0.92
1:A:442:TYR:HD1	1:A:442:TYR:H	1.18	0.92
1:A:237:MET:HG3	1:A:280:SER:HB3	1.51	0.91
1:A:343:PHE:HA	1:A:384:MET:HE1	1.52	0.90
1:A:125:TYR:HE1	1:A:356:MET:HE3	1.37	0.90
1:A:144:TYR:HA	1:A:378:ILE:HD11	1.53	0.89
1:A:323:ILE:HD11	1:A:374:LEU:HD12	1.56	0.87
1:A:329:MET:CE	1:A:336:VAL:HG13	2.06	0.86
1:A:488:LYS:HD3	1:A:488:LYS:C	2.00	0.85
1:A:46:PHE:HB2	1:A:51:MET:HE3	1.58	0.83
1:A:325:PRO:O	1:A:329:MET:HG2	1.79	0.83
1:A:664:LEU:HD21	1:A:687:LEU:HD22	1.61	0.82
1:A:67:MET:HA	1:A:80:PHE:HE1	1.44	0.82
1:A:67:MET:HG2	1:A:80:PHE:CD1	2.13	0.82
1:A:336:VAL:O	1:A:340:ILE:HG12	1.81	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:31:ARG:NH2	1:A:139:SER:O	2.14	0.81
1:A:186:PRO:O	1:A:190:MET:HG3	1.80	0.80
1:A:31:ARG:HB2	1:A:108:THR:HG23	1.63	0.80
1:A:663:PHE:CD1	1:A:670:PHE:CE2	2.70	0.79
1:A:488:LYS:NZ	1:A:526:VAL:N	2.30	0.79
1:A:51:MET:HE2	1:A:473:TYR:OH	1.83	0.79
1:A:583:ASN:HD21	1:A:585:ASP:HB2	1.48	0.79
1:A:317:ILE:HD11	1:A:485:HIS:CE1	2.17	0.78
1:A:460:VAL:HG11	1:A:470:ILE:HG21	1.65	0.78
1:A:125:TYR:OH	1:A:171:ILE:HD13	1.85	0.77
1:A:510:LEU:HB3	1:A:530:MET:HE3	1.67	0.77
1:A:329:MET:HE2	1:A:336:VAL:CG1	2.12	0.77
1:A:460:VAL:HG23	1:A:562:TYR:HB2	1.67	0.77
1:A:270:ILE:O	1:A:274:ILE:HG13	1.84	0.77
1:A:169:THR:HG21	1:A:185:SER:CB	2.08	0.76
1:A:207:ILE:HG23	1:A:231:MET:HE2	1.67	0.76
1:A:698:GLN:HE22	1:A:701:ASN:HD22	1.30	0.76
1:A:33:TYR:C	1:A:33:TYR:CD2	2.63	0.75
1:A:20:ILE:CG1	1:A:119:ILE:HD11	2.11	0.75
1:A:334:SER:O	1:A:335:SER:HB2	1.84	0.75
1:A:53:THR:HG22	1:A:53:THR:O	1.85	0.75
1:A:147:ARG:NH2	1:A:319:GLU:HG3	2.02	0.74
1:A:263:PHE:HB3	1:A:267:TRP:HE1	1.52	0.74
1:A:179:ILE:HG23	1:A:182:LEU:HD12	1.68	0.74
1:A:322:THR:C	1:A:323:ILE:HG12	2.13	0.74
1:A:322:THR:O	1:A:323:ILE:HG12	1.88	0.74
1:A:313:VAL:HG21	1:A:485:HIS:O	1.88	0.74
1:A:67:MET:HA	1:A:80:PHE:CE1	2.23	0.73
1:A:18:ILE:O	1:A:22:ILE:HG13	1.88	0.73
1:A:317:ILE:HD11	1:A:485:HIS:HE1	1.52	0.73
1:A:663:PHE:HD1	1:A:670:PHE:CD2	2.07	0.73
1:A:88:THR:HG23	1:A:106:MET:SD	2.28	0.72
1:A:507:MET:CE	1:A:511:SER:HB3	2.19	0.72
1:A:663:PHE:HD1	1:A:670:PHE:CE2	2.08	0.72
1:A:507:MET:O	1:A:508:ALA:C	2.31	0.72
1:A:83:SER:HB3	1:A:195:TRP:HA	1.71	0.71
1:A:60:PHE:CD1	1:A:84:LEU:HD23	2.25	0.71
1:A:91:LEU:O	1:A:95:LEU:HD12	1.89	0.71
1:A:507:MET:HE3	1:A:511:SER:HB3	1.72	0.71
1:A:145:TYR:CZ	1:A:430:ILE:HG23	2.25	0.71
1:A:409:ARG:O	1:A:413:ILE:HG13	1.91	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:73:GLN:NE2	1:A:456:ARG:HB3	2.07	0.70
1:A:595:PHE:CD2	1:A:596:SER:N	2.60	0.69
1:A:661:LEU:HD12	1:A:662:LEU:N	2.07	0.69
1:A:488:LYS:NZ	1:A:526:VAL:H	1.90	0.69
1:A:437:THR:HB	1:A:439:PHE:O	1.93	0.69
1:A:246:LEU:HD12	1:A:250:LEU:HD12	1.75	0.69
1:A:26:PHE:CD2	1:A:136:LEU:HD22	2.28	0.68
1:A:119:ILE:HG22	1:A:131:GLY:C	2.18	0.68
1:A:125:TYR:HE1	1:A:356:MET:CE	2.06	0.68
1:A:20:ILE:HG13	1:A:119:ILE:CD1	2.13	0.68
1:A:207:ILE:HG12	1:A:231:MET:HE3	1.76	0.68
1:A:637:PHE:HE2	1:A:639:ASP:HB2	1.58	0.68
1:A:158:LEU:HB2	1:A:195:TRP:CH2	2.28	0.68
1:A:618:ILE:HD13	1:A:661:LEU:HD21	1.76	0.68
1:A:323:ILE:CG2	1:A:327:VAL:HB	2.24	0.67
1:A:394:ALA:O	1:A:397:ASN:HB2	1.94	0.67
1:A:124:GLU:HA	1:A:124:GLU:OE1	1.95	0.67
1:A:262:ASN:O	1:A:265:MET:HG2	1.95	0.67
1:A:542:PHE:C	1:A:542:PHE:CD2	2.73	0.67
1:A:147:ARG:HH21	1:A:319:GLU:HG3	1.60	0.67
1:A:528:LYS:HE2	1:A:532:LYS:HE3	1.77	0.67
1:A:642:SER:HB3	1:A:645:ASN:HD22	1.59	0.67
1:A:172:ARG:HH11	1:A:172:ARG:HB3	1.60	0.66
1:A:39:SER:HA	1:A:45:PHE:CZ	2.30	0.66
1:A:323:ILE:HG21	1:A:327:VAL:HB	1.78	0.66
1:A:75:ASN:ND2	1:A:519:PHE:HB3	2.10	0.66
1:A:140:ILE:HG22	1:A:426:ALA:CB	2.25	0.66
1:A:111:ALA:CB	1:A:148:THR:CG2	2.73	0.66
1:A:461:VAL:HG22	1:A:479:LEU:HD12	1.78	0.66
1:A:569:MET:O	1:A:569:MET:HG2	1.95	0.66
1:A:148:THR:O	1:A:148:THR:HG22	1.95	0.65
1:A:262:ASN:H	1:A:265:MET:HE3	1.62	0.65
1:A:111:ALA:HB3	1:A:148:THR:CG2	2.27	0.65
1:A:488:LYS:HZ3	1:A:527:LEU:H	1.43	0.65
1:A:624:ALA:HA	1:A:632:ILE:O	1.97	0.65
1:A:698:GLN:NE2	1:A:701:ASN:HB2	2.11	0.65
1:A:640:ILE:CD1	1:A:688:LEU:HD23	2.27	0.65
1:A:442:TYR:CD1	1:A:442:TYR:N	2.66	0.64
1:A:530:MET:HE2	1:A:542:PHE:HZ	1.62	0.64
1:A:349:LEU:CD2	1:A:356:MET:HG2	2.27	0.64
1:A:413:ILE:HG22	1:A:417:LEU:CD1	2.28	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:195:TRP:CD2	1:A:195:TRP:O	2.51	0.64
1:A:503:PRO:HA	1:A:546:LEU:O	1.97	0.64
1:A:190:MET:HE3	1:A:243:LYS:NZ	2.13	0.64
1:A:4:GLN:O	1:A:4:GLN:HG2	1.98	0.64
1:A:193:LEU:HD13	1:A:203:ASN:ND2	2.13	0.64
1:A:514:TYR:HE1	1:A:555:THR:HG21	1.63	0.64
1:A:514:TYR:CE1	1:A:555:THR:HG21	2.32	0.64
1:A:355:SER:O	1:A:358:LEU:HB2	1.97	0.63
1:A:640:ILE:HD11	1:A:688:LEU:HD23	1.79	0.63
1:A:664:LEU:HD21	1:A:687:LEU:CD2	2.27	0.63
1:A:595:PHE:CD2	1:A:595:PHE:C	2.76	0.63
1:A:37:TRP:CE2	1:A:434:LYS:HD3	2.34	0.63
1:A:71:PHE:CD2	1:A:72:HIS:O	2.52	0.63
1:A:488:LYS:HZ2	1:A:526:VAL:H	1.46	0.63
1:A:354:LYS:O	1:A:357:LEU:HB2	1.99	0.63
1:A:413:ILE:O	1:A:417:LEU:HD12	1.99	0.62
1:A:111:ALA:CB	1:A:148:THR:HG21	2.30	0.62
1:A:543:LEU:C	1:A:545:SER:H	2.07	0.62
1:A:195:TRP:O	1:A:195:TRP:CE3	2.52	0.62
1:A:530:MET:HE2	1:A:542:PHE:CZ	2.35	0.62
1:A:230:LEU:HD22	1:A:247:ILE:HD13	1.80	0.61
1:A:272:ILE:HG22	1:A:273:SER:N	2.14	0.61
1:A:350:CYS:C	1:A:352:ASP:H	2.08	0.61
1:A:57:GLY:HA2	1:A:153:TYR:O	2.01	0.60
1:A:118:ILE:HB	1:A:135:ALA:HB2	1.83	0.60
1:A:616:VAL:HG13	1:A:627:VAL:HG22	1.83	0.60
1:A:203:ASN:O	1:A:207:ILE:HG13	2.01	0.60
1:A:155:THR:HG23	1:A:155:THR:O	2.02	0.60
1:A:158:LEU:H	1:A:195:TRP:HH2	1.49	0.60
1:A:198:SER:C	1:A:200:TYR:H	2.09	0.60
1:A:202:LEU:HD23	1:A:365:LEU:HD12	1.84	0.60
1:A:698:GLN:NE2	1:A:701:ASN:HD22	2.00	0.60
1:A:632:ILE:HG21	1:A:659:ILE:HD12	1.84	0.59
1:A:37:TRP:CH2	1:A:434:LYS:HB3	2.37	0.59
1:A:450:LEU:O	1:A:450:LEU:HD22	2.02	0.59
1:A:622:PHE:O	1:A:622:PHE:CD1	2.55	0.59
1:A:37:TRP:CD1	1:A:434:LYS:HZ2	2.21	0.59
1:A:526:VAL:O	1:A:529:ALA:HB3	2.03	0.59
1:A:582:THR:HG22	1:A:582:THR:O	2.01	0.59
1:A:632:ILE:HG23	1:A:633:PRO:HD2	1.84	0.59
1:A:179:ILE:HG22	1:A:251:PHE:CE1	2.38	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:167:LEU:O	1:A:171:ILE:HG13	2.03	0.58
1:A:640:ILE:HD11	1:A:688:LEU:CD2	2.33	0.58
1:A:33:TYR:C	1:A:33:TYR:HD2	2.07	0.58
1:A:625:LEU:HD21	1:A:634:LEU:HD21	1.84	0.58
1:A:637:PHE:C	1:A:637:PHE:CD2	2.81	0.58
1:A:75:ASN:HD21	1:A:519:PHE:HB3	1.67	0.58
1:A:263:PHE:HB3	1:A:267:TRP:NE1	2.18	0.58
1:A:330:GLN:O	1:A:334:SER:N	2.31	0.58
1:A:238:LEU:O	1:A:239:ALA:C	2.47	0.58
1:A:104:LEU:HD23	1:A:105:TYR:CE1	2.39	0.57
1:A:31:ARG:CB	1:A:108:THR:HG23	2.32	0.57
1:A:365:LEU:HD13	1:A:379:TYR:CD1	2.40	0.57
1:A:468:TYR:HB2	1:A:469:PRO:HD3	1.87	0.57
1:A:88:THR:CG2	1:A:106:MET:SD	2.93	0.57
1:A:331:ARG:NH1	1:A:377:THR:OG1	2.38	0.57
1:A:53:THR:O	1:A:53:THR:CG2	2.52	0.56
1:A:342:SER:OG	1:A:388:PHE:HB2	2.06	0.56
1:A:348:LEU:O	1:A:352:ASP:HB2	2.06	0.56
1:A:638:VAL:HB	1:A:662:LEU:CD2	2.35	0.56
1:A:460:VAL:CG2	1:A:562:TYR:HB2	2.35	0.56
1:A:125:TYR:CE1	1:A:356:MET:HE3	2.28	0.56
1:A:154:ASP:C	1:A:156:ASP:H	2.14	0.56
1:A:238:LEU:HD11	1:A:276:ILE:HG21	1.88	0.56
1:A:464:TRP:CE3	1:A:482:GLY:HA2	2.39	0.56
1:A:595:PHE:HB2	1:A:677:LEU:CD1	2.36	0.56
1:A:15:TYR:CZ	1:A:19:LEU:HD11	2.41	0.56
1:A:123:ARG:HB2	1:A:128:THR:OG1	2.05	0.56
1:A:44:PHE:HE2	1:A:436:SER:HB2	1.71	0.56
1:A:614:ASN:OD1	1:A:614:ASN:N	2.37	0.56
1:A:488:LYS:HZ3	1:A:526:VAL:N	2.03	0.55
1:A:133:ILE:HD13	1:A:419:ALA:HB2	1.86	0.55
1:A:121:ILE:CG1	1:A:168:LEU:HB2	2.37	0.55
1:A:61:ALA:CB	1:A:103:ILE:HD11	2.36	0.55
1:A:635:LYS:HD3	1:A:660:TYR:CZ	2.41	0.55
1:A:207:ILE:HD13	1:A:231:MET:HB3	1.88	0.55
1:A:451:LYS:HG3	1:A:474:SER:O	2.06	0.55
1:A:479:LEU:HD11	1:A:511:SER:OG	2.05	0.55
1:A:329:MET:HE3	1:A:339:PHE:HB3	1.89	0.55
1:A:185:SER:O	1:A:189:ILE:HB	2.07	0.55
1:A:196:TYR:CE2	1:A:198:SER:HB2	2.42	0.55
1:A:168:LEU:O	1:A:168:LEU:HG	2.07	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:510:LEU:HB3	1:A:530:MET:CE	2.36	0.55
1:A:146:ASN:N	1:A:146:ASN:HD22	2.03	0.54
1:A:313:VAL:HG21	1:A:486:LEU:HA	1.89	0.54
1:A:67:MET:HG2	1:A:80:PHE:CE1	2.41	0.54
1:A:51:MET:SD	1:A:437:THR:HG21	2.48	0.54
1:A:61:ALA:H	1:A:153:TYR:HE2	1.55	0.54
1:A:686:PHE:HD1	1:A:706:LYS:HG3	1.72	0.54
1:A:406:LEU:HD22	1:A:410:ASN:HB2	1.89	0.54
1:A:31:ARG:NH1	1:A:148:THR:HB	2.23	0.54
1:A:155:THR:O	1:A:195:TRP:CH2	2.60	0.54
1:A:198:SER:C	1:A:200:TYR:N	2.65	0.54
1:A:334:SER:O	1:A:335:SER:CB	2.53	0.54
1:A:653:ILE:HG22	1:A:654:ASP:N	2.22	0.54
1:A:542:PHE:C	1:A:542:PHE:HD2	2.14	0.54
2:B:16:PPN:CD1	2:B:16:PPN:C	2.78	0.54
1:A:140:ILE:CG2	1:A:426:ALA:HB1	2.31	0.54
1:A:166:ILE:HD13	1:A:189:ILE:HG12	1.88	0.54
1:A:6:ASN:ND2	1:A:9:ASP:HB2	2.23	0.54
1:A:257:LYS:O	1:A:259:GLU:N	2.41	0.54
1:A:352:ASP:O	1:A:353:HIS:CD2	2.61	0.54
1:A:121:ILE:HG12	1:A:168:LEU:HB2	1.89	0.53
1:A:190:MET:HE3	1:A:243:LYS:HZ3	1.73	0.53
1:A:634:LEU:O	1:A:653:ILE:HB	2.07	0.53
1:A:269:LEU:O	1:A:273:SER:HB3	2.08	0.53
1:A:350:CYS:O	1:A:352:ASP:N	2.39	0.53
1:A:653:ILE:O	1:A:654:ASP:C	2.51	0.53
1:A:61:ALA:N	1:A:153:TYR:HE2	2.06	0.53
1:A:516:GLU:HG2	1:A:559:ARG:NH1	2.23	0.53
1:A:160:LEU:HD21	1:A:379:TYR:HD2	1.74	0.53
1:A:184:LEU:HD23	1:A:184:LEU:N	2.22	0.53
1:A:398:PHE:O	1:A:402:LYS:HB2	2.08	0.53
1:A:625:LEU:HD21	1:A:634:LEU:HD11	1.91	0.53
1:A:23:ALA:HB1	1:A:115:VAL:CG2	2.39	0.53
1:A:87:LEU:HD21	1:A:110:PHE:CZ	2.44	0.53
1:A:460:VAL:CG1	1:A:470:ILE:HG21	2.36	0.53
1:A:457:GLU:CG	1:A:559:ARG:HH21	2.22	0.52
1:A:542:PHE:CE2	1:A:546:LEU:HD21	2.44	0.52
1:A:273:SER:HA	1:A:276:ILE:HG13	1.91	0.52
1:A:442:TYR:CB	1:A:704:ARG:HD2	2.39	0.52
1:A:463:TRP:CE2	1:A:576:VAL:HG22	2.44	0.52
1:A:397:ASN:O	1:A:398:PHE:C	2.52	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:505:ALA:HB2	1:A:696:PHE:CZ	2.45	0.52
1:A:20:ILE:HA	1:A:119:ILE:HD11	1.92	0.52
1:A:23:ALA:HB1	1:A:115:VAL:HG22	1.92	0.52
1:A:209:LEU:HD23	1:A:358:LEU:HA	1.91	0.52
1:A:30:CYS:C	1:A:32:LEU:H	2.17	0.51
1:A:173:LEU:HD11	1:A:223:ILE:HG21	1.92	0.51
1:A:263:PHE:O	1:A:267:TRP:CD1	2.63	0.51
1:A:393:TYR:O	1:A:394:ALA:C	2.52	0.51
1:A:354:LYS:O	1:A:357:LEU:CB	2.58	0.51
1:A:366:GLY:O	1:A:369:ALA:CB	2.57	0.51
1:A:413:ILE:HG22	1:A:417:LEU:HD12	1.91	0.51
1:A:542:PHE:O	1:A:545:SER:HB3	2.10	0.51
1:A:58:TYR:CE2	1:A:473:TYR:CE1	2.98	0.51
1:A:88:THR:HG21	1:A:153:TYR:CE1	2.46	0.51
1:A:172:ARG:HH11	1:A:172:ARG:CB	2.23	0.51
1:A:308:PHE:CE2	1:A:527:LEU:HD23	2.45	0.51
1:A:331:ARG:NH2	2:B:11:ASP:OD2	2.43	0.51
1:A:482:GLY:C	1:A:485:HIS:HD2	2.19	0.51
1:A:15:TYR:CE2	1:A:19:LEU:HD11	2.45	0.51
1:A:158:LEU:HB2	1:A:195:TRP:CZ3	2.46	0.51
1:A:399:LEU:N	1:A:399:LEU:HD23	2.24	0.51
1:A:128:THR:O	1:A:131:GLY:N	2.44	0.51
1:A:108:THR:OG1	1:A:150:SER:HA	2.11	0.51
1:A:366:GLY:HA3	1:A:380:ALA:HB2	1.91	0.51
1:A:442:TYR:CD2	1:A:704:ARG:HD2	2.46	0.51
1:A:39:SER:HA	1:A:45:PHE:HZ	1.73	0.51
1:A:46:PHE:CB	1:A:51:MET:HE3	2.36	0.50
1:A:365:LEU:HD13	1:A:379:TYR:CE1	2.46	0.50
1:A:551:PHE:CD2	1:A:552:LYS:O	2.64	0.50
1:A:381:VAL:HG12	1:A:382:PRO:N	2.26	0.50
1:A:660:TYR:HE1	1:A:675:GLU:HG2	1.76	0.50
1:A:662:LEU:HB2	1:A:671:VAL:HB	1.92	0.50
1:A:314:ASN:C	1:A:316:THR:H	2.19	0.50
1:A:7:PHE:HD1	1:A:412:ASN:HD21	1.59	0.50
1:A:323:ILE:CD1	1:A:374:LEU:HD12	2.36	0.50
1:A:502:ILE:HD12	1:A:502:ILE:H	1.77	0.50
1:A:595:PHE:HB2	1:A:677:LEU:HD12	1.93	0.50
1:A:638:VAL:HB	1:A:662:LEU:HD23	1.93	0.50
1:A:320:VAL:HG13	1:A:320:VAL:O	2.10	0.50
1:A:404:ILE:O	1:A:404:ILE:HG22	2.11	0.50
1:A:440:THR:O	1:A:441:SER:C	2.53	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:142:ASN:HB2	1:A:331:ARG:HA	1.94	0.50
1:A:634:LEU:HD13	1:A:661:LEU:HB3	1.93	0.49
1:A:147:ARG:HA	1:A:152:TYR:CE1	2.47	0.49
1:A:310:TYR:CZ	1:A:488:LYS:HE3	2.47	0.49
1:A:653:ILE:N	1:A:653:ILE:HD12	2.28	0.49
1:A:172:ARG:NH2	1:A:178:ASP:OD2	2.46	0.49
1:A:182:LEU:HD22	1:A:230:LEU:HD12	1.94	0.49
1:A:225:TYR:HB2	1:A:266:ILE:HG21	1.94	0.49
1:A:451:LYS:O	1:A:456:ARG:NH2	2.46	0.49
1:A:468:TYR:HB2	1:A:469:PRO:CD	2.42	0.49
1:A:37:TRP:CZ2	1:A:434:LYS:HD3	2.48	0.49
1:A:497:LEU:HD22	1:A:569:MET:HE1	1.93	0.49
1:A:166:ILE:HD11	1:A:189:ILE:HA	1.93	0.49
1:A:424:SER:HA	1:A:427:LEU:HD12	1.94	0.49
1:A:457:GLU:HG2	1:A:559:ARG:HH21	1.77	0.49
1:A:617:GLU:O	1:A:625:LEU:HA	2.13	0.49
1:A:175:ILE:HG22	1:A:176:ASN:ND2	2.28	0.49
1:A:329:MET:HG3	1:A:336:VAL:HG22	1.95	0.49
1:A:572:ILE:CG2	1:A:576:VAL:HG23	2.31	0.49
1:A:664:LEU:CD2	1:A:687:LEU:HD22	2.36	0.49
1:A:328:PHE:O	1:A:329:MET:C	2.56	0.49
1:A:464:TRP:HB3	1:A:480:ILE:HG13	1.95	0.49
1:A:362:MET:HE2	1:A:362:MET:HB3	1.73	0.49
1:A:156:ASP:HA	1:A:159:VAL:CG2	2.43	0.49
1:A:272:ILE:O	1:A:275:SER:HB2	2.13	0.49
1:A:570:LEU:HB3	1:A:597:GLN:OE1	2.13	0.49
1:A:599:ASN:O	1:A:612:LEU:HD22	2.13	0.49
1:A:308:PHE:CZ	1:A:539:ALA:HB2	2.48	0.48
1:A:172:ARG:HH11	1:A:172:ARG:CG	2.26	0.48
1:A:61:ALA:O	1:A:62:GLU:C	2.55	0.48
1:A:113:LEU:HD12	1:A:113:LEU:HA	1.62	0.48
1:A:217:PHE:N	1:A:217:PHE:CD1	2.81	0.48
1:A:317:ILE:CD1	1:A:485:HIS:CE1	2.94	0.48
1:A:508:ALA:HB3	1:A:710:LEU:HD11	1.95	0.48
1:A:661:LEU:HD12	1:A:661:LEU:C	2.38	0.48
1:A:169:THR:HG22	1:A:170:PHE:N	2.28	0.48
1:A:51:MET:HE1	1:A:444:ALA:HB2	1.95	0.48
1:A:99:PHE:CE2	1:A:103:ILE:HD12	2.48	0.48
1:A:122:ALA:CB	1:A:131:GLY:HA3	2.44	0.48
1:A:125:TYR:OH	1:A:355:SER:HB2	2.13	0.48
1:A:223:ILE:HG12	1:A:254:PHE:CZ	2.48	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:349:LEU:HD23	1:A:356:MET:HG2	1.96	0.48
1:A:457:GLU:HG3	1:A:559:ARG:HE	1.78	0.48
1:A:594:PHE:C	1:A:594:PHE:CD2	2.92	0.48
1:A:638:VAL:HG22	1:A:650:TYR:HD1	1.79	0.48
1:A:329:MET:HG2	1:A:329:MET:H	1.50	0.48
1:A:667:TYR:OH	1:A:703:THR:HG22	2.14	0.48
1:A:322:THR:HG22	1:A:323:ILE:H	1.79	0.48
1:A:103:ILE:HG22	1:A:104:LEU:N	2.29	0.48
1:A:161:VAL:HG12	1:A:162:LEU:N	2.28	0.47
1:A:450:LEU:HD21	1:A:562:TYR:CE2	2.49	0.47
1:A:417:LEU:O	1:A:418:ILE:C	2.57	0.47
1:A:441:SER:O	1:A:442:TYR:C	2.58	0.47
1:A:424:SER:OG	1:A:425:PRO:HD3	2.15	0.47
1:A:496:VAL:HG23	1:A:507:MET:HB3	1.96	0.47
1:A:686:PHE:CD1	1:A:706:LYS:HG3	2.48	0.47
1:A:143:SER:OG	1:A:331:ARG:HB3	2.13	0.47
1:A:437:THR:HG22	1:A:438:VAL:N	2.29	0.47
1:A:562:TYR:N	1:A:562:TYR:CD1	2.83	0.47
1:A:583:ASN:ND2	1:A:585:ASP:HB2	2.24	0.47
1:A:33:TYR:HD2	1:A:34:TRP:N	2.11	0.47
1:A:98:SER:O	1:A:99:PHE:C	2.57	0.47
1:A:154:ASP:O	1:A:156:ASP:N	2.48	0.47
1:A:222:LYS:O	1:A:223:ILE:C	2.57	0.47
1:A:543:LEU:C	1:A:545:SER:N	2.72	0.47
1:A:111:ALA:CB	1:A:148:THR:HG23	2.44	0.47
1:A:125:TYR:CE1	1:A:356:MET:CE	2.93	0.47
1:A:323:ILE:HG22	1:A:324:ASP:N	2.30	0.47
1:A:594:PHE:HD2	1:A:595:PHE:N	2.13	0.47
1:A:160:LEU:HD11	1:A:378:ILE:O	2.15	0.46
1:A:162:LEU:HD13	1:A:192:TYR:HA	1.97	0.46
1:A:595:PHE:HA	1:A:672:ILE:O	2.16	0.46
1:A:104:LEU:HD23	1:A:105:TYR:CD1	2.50	0.46
1:A:60:PHE:O	1:A:61:ALA:C	2.59	0.46
1:A:20:ILE:HG12	1:A:116:VAL:HG22	1.97	0.46
1:A:67:MET:HE2	1:A:67:MET:HB3	1.54	0.46
1:A:111:ALA:HB1	1:A:148:THR:HG21	1.96	0.46
1:A:460:VAL:HG11	1:A:470:ILE:CG2	2.40	0.46
1:A:87:LEU:HG	1:A:91:LEU:HD12	1.98	0.46
1:A:308:PHE:HE2	1:A:527:LEU:HD23	1.80	0.46
1:A:324:ASP:O	1:A:326:GLU:N	2.48	0.46
1:A:216:VAL:HG12	1:A:217:PHE:N	2.31	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:495:PHE:CD2	1:A:507:MET:HG2	2.51	0.46
1:A:636:ALA:HA	1:A:653:ILE:HD12	1.97	0.46
1:A:104:LEU:O	1:A:150:SER:O	2.33	0.46
1:A:594:PHE:C	1:A:594:PHE:HD2	2.24	0.46
1:A:444:ALA:O	1:A:447:LEU:N	2.50	0.45
1:A:58:TYR:HE2	1:A:473:TYR:CE1	2.34	0.45
1:A:144:TYR:HA	1:A:378:ILE:CD1	2.36	0.45
1:A:193:LEU:HD13	1:A:203:ASN:HD22	1.79	0.45
1:A:566:PRO:HA	1:A:705:ALA:HA	1.97	0.45
1:A:27:SER:O	1:A:31:ARG:HG2	2.15	0.45
1:A:58:TYR:HA	1:A:61:ALA:HB3	1.99	0.45
1:A:437:THR:O	1:A:438:VAL:C	2.59	0.45
1:A:246:LEU:CD1	1:A:250:LEU:HD12	2.44	0.45
1:A:496:VAL:HG22	1:A:508:ALA:H	1.81	0.45
1:A:363:LEU:HD21	1:A:384:MET:HG2	1.98	0.45
1:A:94:ILE:O	1:A:94:ILE:HG22	2.16	0.45
1:A:211:GLY:HA2	1:A:228:ILE:HD11	1.98	0.45
1:A:698:GLN:HE22	1:A:701:ASN:ND2	2.07	0.45
1:A:121:ILE:O	1:A:122:ALA:C	2.58	0.45
1:A:217:PHE:CE2	1:A:354:LYS:HD3	2.52	0.45
1:A:61:ALA:HB2	1:A:103:ILE:HD11	1.99	0.44
1:A:222:LYS:O	1:A:224:PHE:N	2.51	0.44
1:A:237:MET:CG	1:A:280:SER:HB3	2.36	0.44
1:A:333:SER:O	1:A:334:SER:HB2	2.16	0.44
1:A:495:PHE:CD2	1:A:507:MET:CG	3.00	0.44
1:A:99:PHE:CE2	1:A:103:ILE:CD1	3.01	0.44
1:A:323:ILE:CD1	1:A:331:ARG:HD2	2.47	0.44
1:A:636:ALA:HA	1:A:653:ILE:CD1	2.46	0.44
1:A:30:CYS:C	1:A:32:LEU:N	2.74	0.44
1:A:120:LEU:HB3	1:A:168:LEU:CD1	2.47	0.44
1:A:253:ILE:O	1:A:257:LYS:HB2	2.17	0.44
1:A:440:THR:OG1	1:A:443:GLU:HG3	2.17	0.44
1:A:350:CYS:C	1:A:352:ASP:N	2.76	0.44
1:A:481:ASP:C	1:A:483:GLY:H	2.25	0.44
1:A:498:SER:HA	1:A:680:SER:HB2	1.98	0.44
1:A:632:ILE:CG2	1:A:633:PRO:HD2	2.46	0.44
1:A:673:LEU:HD11	1:A:683:ILE:HD12	1.98	0.44
1:A:122:ALA:HB1	1:A:127:LEU:O	2.17	0.44
1:A:209:LEU:HD12	1:A:209:LEU:HA	1.82	0.44
1:A:455:GLN:O	1:A:458:ASP:HB2	2.17	0.44
1:A:492:PHE:HD2	1:A:507:MET:HE2	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:177:LYS:NZ	1:A:221:GLU:HG2	2.33	0.44
1:A:634:LEU:C	1:A:636:ALA:N	2.75	0.44
1:A:195:TRP:O	1:A:195:TRP:CG	2.70	0.44
1:A:437:THR:HG22	1:A:439:PHE:H	1.82	0.44
1:A:511:SER:O	1:A:515:THR:HB	2.17	0.44
1:A:640:ILE:HD13	1:A:687:LEU:O	2.17	0.44
1:A:52:ILE:HD11	1:A:153:TYR:CD2	2.53	0.44
1:A:214:THR:O	1:A:218:HIS:C	2.61	0.44
1:A:219:ARG:HA	1:A:225:TYR:OH	2.18	0.44
1:A:232:ILE:HG22	1:A:273:SER:OG	2.18	0.44
1:A:243:LYS:O	1:A:244:LEU:C	2.60	0.44
1:A:356:MET:HA	1:A:356:MET:HE2	2.00	0.44
1:A:549:LYS:HB2	1:A:549:LYS:HE3	1.76	0.44
1:A:160:LEU:HA	1:A:160:LEU:HD23	1.53	0.43
1:A:24:PHE:N	1:A:115:VAL:HG11	2.33	0.43
1:A:192:TYR:CE2	1:A:199:SER:HB2	2.54	0.43
1:A:163:PRO:HG3	1:A:192:TYR:CE2	2.53	0.43
1:A:179:ILE:HG22	1:A:251:PHE:HE1	1.81	0.43
1:A:207:ILE:HG23	1:A:231:MET:CE	2.40	0.43
1:A:316:THR:HG23	2:B:15:THR:HG23	1.98	0.43
1:A:566:PRO:HA	1:A:705:ALA:CB	2.48	0.43
1:A:624:ALA:C	1:A:625:LEU:HD23	2.43	0.43
1:A:160:LEU:HD13	1:A:382:PRO:HG3	2.00	0.43
1:A:249:LEU:C	1:A:251:PHE:H	2.25	0.43
1:A:276:ILE:O	1:A:277:LEU:C	2.60	0.43
1:A:456:ARG:HH11	1:A:456:ARG:CA	2.19	0.43
1:A:366:GLY:O	1:A:369:ALA:HB3	2.18	0.43
1:A:595:PHE:HD1	1:A:677:LEU:HD13	1.84	0.43
1:A:612:LEU:O	1:A:613:ASP:C	2.61	0.43
1:A:140:ILE:O	1:A:141:ALA:C	2.62	0.43
1:A:154:ASP:C	1:A:156:ASP:N	2.76	0.43
1:A:347:ILE:O	1:A:351:LYS:HG2	2.19	0.43
1:A:49:GLN:NE2	1:A:104:LEU:HD22	2.34	0.43
1:A:625:LEU:HD23	1:A:625:LEU:N	2.33	0.43
1:A:673:LEU:HD22	1:A:677:LEU:HB3	2.00	0.43
1:A:51:MET:HE2	1:A:473:TYR:HH	1.81	0.43
1:A:62:GLU:HG3	1:A:65:ARG:NH2	2.34	0.43
1:A:562:TYR:N	1:A:562:TYR:HD1	2.17	0.43
1:A:44:PHE:CZ	1:A:436:SER:HA	2.54	0.43
1:A:35:VAL:O	1:A:39:SER:OG	2.34	0.43
1:A:117:PRO:O	1:A:118:ILE:C	2.59	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:368:MET:O	1:A:369:ALA:C	2.61	0.43
1:A:378:ILE:HG22	1:A:379:TYR:N	2.33	0.42
1:A:469:PRO:O	1:A:470:ILE:C	2.62	0.42
1:A:76:ASP:HB3	1:A:477:LYS:HE2	2.00	0.42
1:A:310:TYR:OH	1:A:488:LYS:HE3	2.20	0.42
1:A:674:ASP:O	1:A:675:GLU:C	2.62	0.42
1:A:76:ASP:OD1	1:A:76:ASP:O	2.37	0.42
1:A:156:ASP:HA	1:A:159:VAL:HG23	2.00	0.42
1:A:516:GLU:HG2	1:A:559:ARG:HH12	1.85	0.42
1:A:318:MET:HE2	1:A:318:MET:HB3	1.77	0.42
1:A:658:GLN:O	1:A:658:GLN:HG2	2.20	0.42
1:A:62:GLU:O	1:A:63:GLY:C	2.63	0.42
1:A:327:VAL:HA	1:A:330:GLN:HB2	2.02	0.42
1:A:347:ILE:HD13	1:A:347:ILE:HA	1.87	0.42
1:A:424:SER:N	1:A:425:PRO:CD	2.82	0.42
1:A:684:GLN:NE2	1:A:688:LEU:HD12	2.34	0.42
1:A:208:GLY:O	1:A:209:LEU:C	2.63	0.42
1:A:218:HIS:HA	1:A:221:GLU:OE1	2.19	0.42
1:A:640:ILE:HD13	1:A:688:LEU:HD23	2.01	0.42
1:A:155:THR:O	1:A:159:VAL:HG23	2.20	0.42
1:A:534:TYR:O	1:A:535:ASN:C	2.63	0.42
1:A:611:MET:O	1:A:612:LEU:HD23	2.20	0.42
1:A:44:PHE:CE2	1:A:436:SER:HB2	2.53	0.42
1:A:142:ASN:O	1:A:143:SER:C	2.62	0.42
1:A:398:PHE:O	1:A:402:LYS:CB	2.68	0.42
1:A:340:ILE:HG12	1:A:340:ILE:H	1.54	0.41
1:A:365:LEU:HD23	1:A:368:MET:HE2	2.02	0.41
1:A:457:GLU:O	1:A:559:ARG:HD3	2.20	0.41
1:A:165:LEU:HD23	1:A:165:LEU:HA	1.82	0.41
1:A:698:GLN:O	1:A:698:GLN:HG2	2.19	0.41
1:A:119:ILE:CG2	1:A:132:PHE:HA	2.51	0.41
1:A:183:LEU:HA	1:A:183:LEU:HD23	1.57	0.41
1:A:262:ASN:H	1:A:265:MET:CE	2.31	0.41
1:A:625:LEU:CD2	1:A:634:LEU:HD21	2.50	0.41
1:A:158:LEU:HD12	1:A:195:TRP:CE2	2.56	0.41
1:A:329:MET:HE3	1:A:329:MET:HB3	1.86	0.41
1:A:488:LYS:C	1:A:488:LYS:CD	2.77	0.41
1:A:508:ALA:CB	1:A:710:LEU:HD11	2.51	0.41
1:A:20:ILE:CA	1:A:119:ILE:HD11	2.49	0.41
1:A:24:PHE:CD2	1:A:24:PHE:C	2.99	0.41
1:A:116:VAL:HG12	1:A:117:PRO:N	2.35	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:252:ALA:O	1:A:253:ILE:C	2.62	0.41
1:A:359:ALA:O	1:A:360:LEU:C	2.63	0.41
1:A:595:PHE:CD1	1:A:673:LEU:HD23	2.56	0.41
1:A:71:PHE:HD2	1:A:72:HIS:O	2.01	0.41
1:A:163:PRO:HG3	1:A:192:TYR:CZ	2.56	0.41
1:A:486:LEU:O	1:A:490:ASN:ND2	2.53	0.41
1:A:493:SER:O	1:A:497:LEU:HD12	2.20	0.41
1:A:496:VAL:O	1:A:504:ALA:HB1	2.20	0.41
1:A:119:ILE:HG22	1:A:132:PHE:N	2.36	0.41
1:A:602:ALA:O	1:A:610:VAL:HA	2.20	0.41
1:A:343:PHE:HD1	1:A:384:MET:HE1	1.85	0.41
1:A:14:LYS:HB2	1:A:14:LYS:HE3	1.95	0.41
1:A:190:MET:HE3	1:A:243:LYS:HZ2	1.82	0.41
1:A:573:MET:HE3	1:A:573:MET:HB3	1.86	0.41
1:A:586:ASN:C	1:A:588:GLU:H	2.29	0.41
1:A:698:GLN:NE2	1:A:701:ASN:ND2	2.67	0.41
1:A:127:LEU:HD11	1:A:390:TYR:CE1	2.56	0.41
1:A:249:LEU:C	1:A:251:PHE:N	2.79	0.41
1:A:574:PRO:HG3	1:A:595:PHE:CD2	2.56	0.41
1:A:49:GLN:HE21	1:A:104:LEU:HD22	1.85	0.40
1:A:227:ALA:O	1:A:228:ILE:C	2.61	0.40
1:A:423:ILE:C	1:A:425:PRO:HD2	2.46	0.40
1:A:464:TRP:HB3	1:A:480:ILE:CD1	2.51	0.40
1:A:468:TYR:CB	1:A:469:PRO:CD	3.00	0.40
1:A:56:ASP:O	1:A:59:ALA:HB3	2.21	0.40
1:A:115:VAL:HG22	1:A:135:ALA:HB1	2.02	0.40
1:A:391:PHE:HA	1:A:394:ALA:HB3	2.02	0.40
1:A:673:LEU:HD13	1:A:678:TYR:HA	2.02	0.40
1:A:164:MET:HE3	1:A:164:MET:HB3	1.84	0.40
1:A:667:TYR:OH	1:A:703:THR:O	2.31	0.40
1:A:76:ASP:OD1	1:A:76:ASP:C	2.64	0.40
1:A:77:LEU:HD11	1:A:484:LYS:HD2	2.03	0.40
1:A:87:LEU:O	1:A:91:LEU:HD12	2.21	0.40
1:A:349:LEU:HG	1:A:356:MET:HG2	2.04	0.40
1:A:118:ILE:CB	1:A:135:ALA:HB2	2.50	0.40
1:A:136:LEU:HB3	1:A:423:ILE:CD1	2.52	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	677/724 (94%)	533 (79%)	117 (17%)	27 (4%)	2	15
2	B	5/8 (62%)	3 (60%)	1 (20%)	1 (20%)	0	0
All	All	682/732 (93%)	536 (79%)	118 (17%)	28 (4%)	2	15

All (28) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	335	SER
1	A	549	LYS
1	A	590	GLU
1	A	103	ILE
1	A	142	ASN
1	A	155	THR
1	A	308	PHE
1	A	403	GLN
1	A	620	ASN
1	A	654	ASP
1	A	200	TYR
1	A	245	ALA
1	A	258	GLU
1	A	394	ALA
2	B	11	ASP
1	A	61	ALA
1	A	216	VAL
1	A	250	LEU
1	A	330	GLN
1	A	331	ARG
1	A	351	LYS
1	A	508	ALA
1	A	62	GLU
1	A	223	ILE
1	A	141	ALA

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Mol	Chain	Res	Type
1	A	404	ILE
1	A	102	ILE
1	A	115	VAL

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	590/646 (91%)	493 (84%)	97 (16%)	2	10
2	B	4/4 (100%)	4 (100%)	0	100	100
All	All	594/650 (91%)	497 (84%)	97 (16%)	2	10

All (97) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	13	ILE
1	A	16	THR
1	A	20	ILE
1	A	21	LEU
1	A	29	LEU
1	A	32	LEU
1	A	33	TYR
1	A	51	MET
1	A	52	ILE
1	A	76	ASP
1	A	83	SER
1	A	88	THR
1	A	89	TYR
1	A	101	SER
1	A	103	ILE
1	A	107	SER
1	A	112	SER
1	A	113	LEU
1	A	114	ILE
1	A	115	VAL

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Mol	Chain	Res	Type
1	A	119	ILE
1	A	140	ILE
1	A	155	THR
1	A	157	MET
1	A	160	LEU
1	A	161	VAL
1	A	167	LEU
1	A	168	LEU
1	A	169	THR
1	A	172	ARG
1	A	174	THR
1	A	181	THR
1	A	183	LEU
1	A	189	ILE
1	A	193	LEU
1	A	223	ILE
1	A	226	LEU
1	A	233	ILE
1	A	237	MET
1	A	243	LYS
1	A	244	LEU
1	A	246	LEU
1	A	248	VAL
1	A	272	ILE
1	A	273	SER
1	A	277	LEU
1	A	309	MET
1	A	313	VAL
1	A	316	THR
1	A	317	ILE
1	A	320	VAL
1	A	322	THR
1	A	323	ILE
1	A	326	GLU
1	A	327	VAL
1	A	329	MET
1	A	333	SER
1	A	337	LEU
1	A	340	ILE
1	A	355	SER
1	A	363	LEU
1	A	374	LEU

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Mol	Chain	Res	Type
1	A	375	ARG
1	A	377	THR
1	A	378	ILE
1	A	384	MET
1	A	397	ASN
1	A	398	PHE
1	A	406	LEU
1	A	408	LEU
1	A	414	LEU
1	A	418	ILE
1	A	423	ILE
1	A	435	SER
1	A	441	SER
1	A	442	TYR
1	A	450	LEU
1	A	456	ARG
1	A	460	VAL
1	A	488	LYS
1	A	515	THR
1	A	542	PHE
1	A	547	ASN
1	A	562	TYR
1	A	583	ASN
1	A	593	LEU
1	A	596	SER
1	A	609	SER
1	A	614	ASN
1	A	618	ILE
1	A	625	LEU
1	A	637	PHE
1	A	644	THR
1	A	654	ASP
1	A	661	LEU
1	A	697	GLU
1	A	700	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	11	ASN
1	A	142	ASN
1	A	146	ASN

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Mol	Chain	Res	Type
1	A	176	ASN
1	A	353	HIS
1	A	410	ASN
1	A	485	HIS
1	A	583	ASN
1	A	645	ASN
1	A	698	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

1 non-standard protein/DNA/RNA residue is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	PPN	B	16	2	13,14,15	0.98	1 (7%)	11,18,20	1.16	1 (9%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PPN	B	16	2	-	1/7/10/12	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	16	PPN	CB-CA	-2.51	1.48	1.53

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	16	PPN	CE1-CZ-N1	3.15	122.09	119.34

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	16	PPN	C-CA-CB-CG

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	16	PPN	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	683/724 (94%)	0.46	58 (8%) 16 15	73, 119, 191, 321	0
2	B	7/8 (87%)	0.78	0 100 100	29, 88, 122, 133	2 (28%)
All	All	690/732 (94%)	0.46	58 (8%) 17 15	29, 119, 191, 321	2 (0%)

All (58) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	259	GLU	5.7
1	A	690	GLN	4.8
1	A	11	ASN	4.4
1	A	560	ASP	4.3
1	A	56	ASP	4.2
1	A	493	SER	4.2
1	A	622	PHE	4.2
1	A	352	ASP	4.1
1	A	693	GLN	4.1
1	A	307	ALA	4.0
1	A	624	ALA	3.8
1	A	633	PRO	3.8
1	A	534	TYR	3.6
1	A	532	LYS	3.6
1	A	217	PHE	3.3
1	A	691	TYR	3.3
1	A	126	LYS	3.3
1	A	351	LYS	3.3
1	A	677	LEU	3.2
1	A	551	PHE	3.2
1	A	631	SER	3.2
1	A	222	LYS	3.1
1	A	43	GLU	3.1
1	A	221	GLU	3.1

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Mol	Chain	Res	Type	RSRZ
1	A	531	VAL	3.1
1	A	629	GLY	3.1
1	A	382	PRO	3.0
1	A	36	ALA	3.0
1	A	421	PHE	3.0
1	A	19	LEU	2.9
1	A	555	THR	2.8
1	A	138	GLY	2.8
1	A	22	ILE	2.8
1	A	611	MET	2.7
1	A	526	VAL	2.6
1	A	540	LYS	2.6
1	A	354	LYS	2.6
1	A	82	SER	2.5
1	A	520	LYS	2.5
1	A	71	PHE	2.4
1	A	324	ASP	2.4
1	A	220	LYS	2.4
1	A	536	GLN	2.4
1	A	604	ASP	2.3
1	A	506	ASN	2.3
1	A	665	ARG	2.3
1	A	521	GLU	2.3
1	A	127	LEU	2.2
1	A	311	PHE	2.2
1	A	422	SER	2.2
1	A	594	PHE	2.2
1	A	321	ASN	2.2
1	A	266	ILE	2.2
1	A	38	ALA	2.2
1	A	557	LYS	2.1
1	A	280	SER	2.0
1	A	333	SER	2.0
1	A	353	HIS	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	PPN	B	16	14/15	0.86	0.13	111,118,131,135	0

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	MG	A	725	1/1	0.86	0.33	78,78,78,78	0
3	MG	A	726	1/1	0.94	0.21	65,65,65,65	0

6.5 Other polymers [i](#)

There are no such residues in this entry.