



Full wwPDB X-ray Structure Validation Report ⓘ

Dec 10, 2022 – 02:28 PM EST

PDB ID : 1JLF
Title : CRYSTAL STRUCTURE OF Y188C MUTANT HIV-1 REVERSE TRANSCRIPTASE IN COMPLEX WITH NEVIRAPINE
Authors : Ren, J.; Nichols, C.; Bird, L.; Chamberlain, P.; Weaver, K.; Short, S.; Stuart, D.I.; Stammers, D.K.
Deposited on : 2001-07-16
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

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 : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.31.2
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

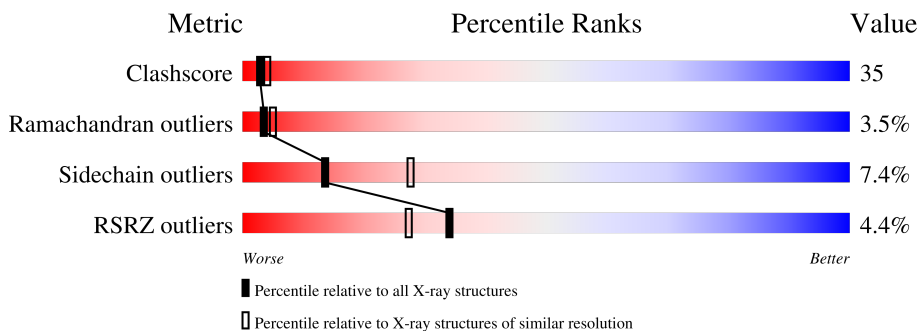
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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))
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (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 ≥ 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	560	 4% 38% 51% 7%
2	B	440	 4% 40% 47% 8%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 7829 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 HIV-1 RT A-chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	539	4404	2847	734	814	9	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	188	CYS	TYR	engineered mutation	UNP P04585
A	280	CSD	CYS	modified residue	UNP P04585

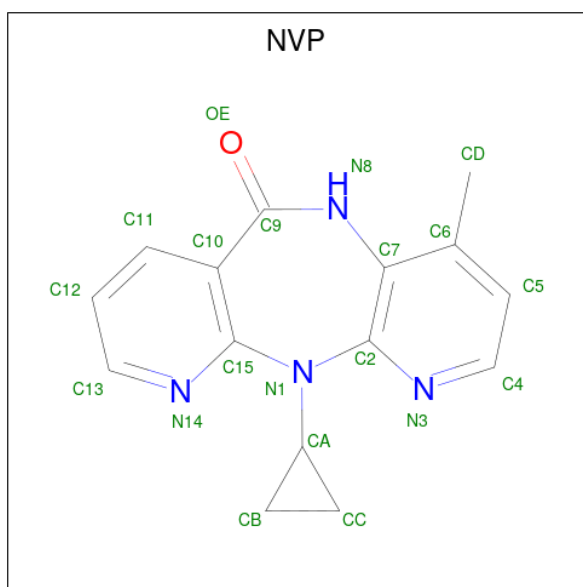
- Molecule 2 is a protein called HIV-1 RT B-chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	404	3345	2173	557	607	8	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	188	CYS	TYR	engineered mutation	UNP P04585

- Molecule 3 is 11-CYCLOPROPYL-5,11-DIHYDRO-4-METHYL-6H-DIPYRIDO[3,2-B:2',3'-E][1,4]DIAZEPIN-6-ONE (three-letter code: NVP) (formula: C₁₅H₁₄N₄O).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
3	A	1	20	15	4	1	0	0

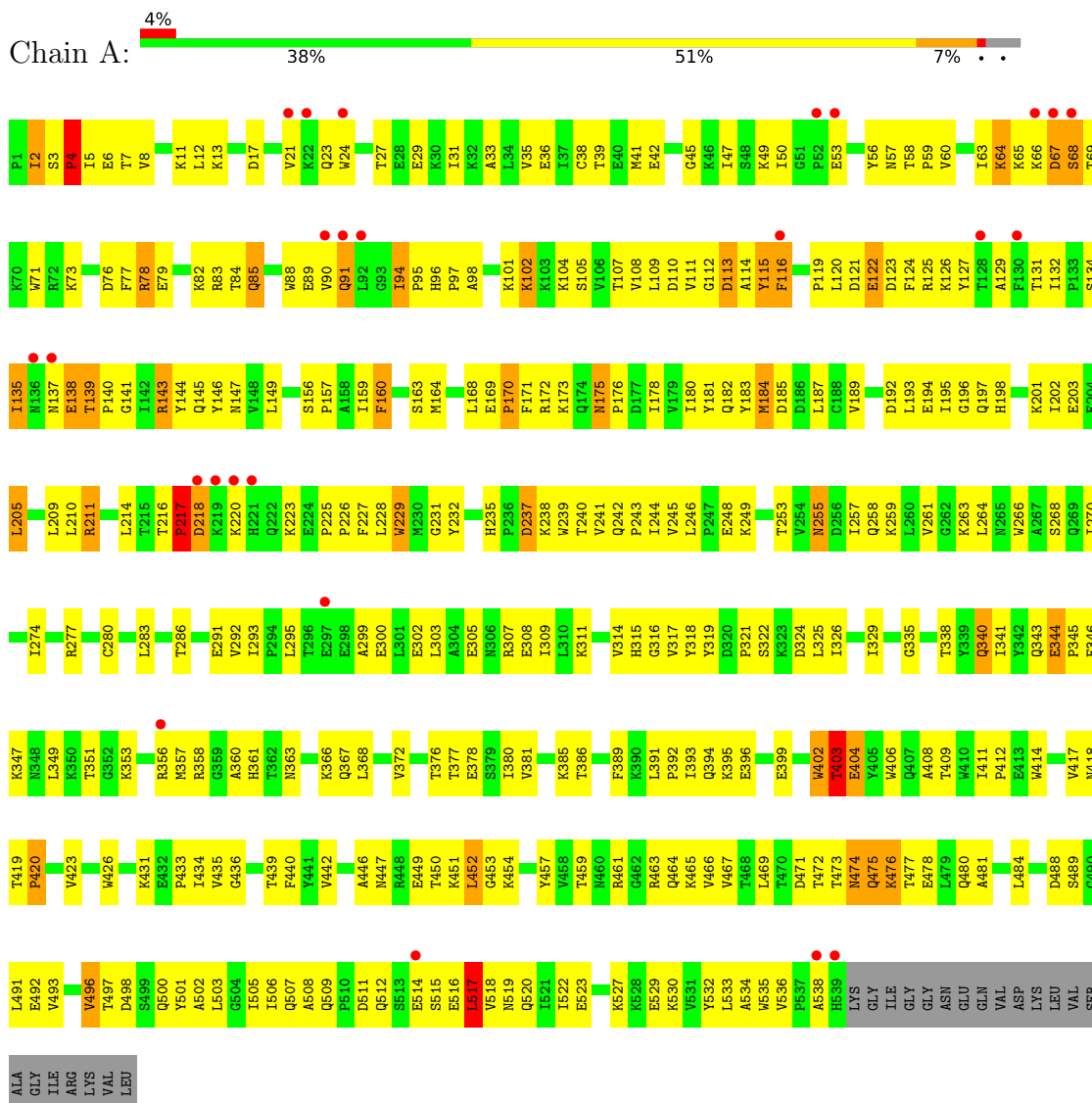
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	34	Total	O	0	0
			34	34		
4	B	26	Total	O	0	0
			26	26		

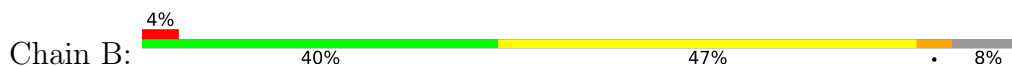
3 Residue-property plots i

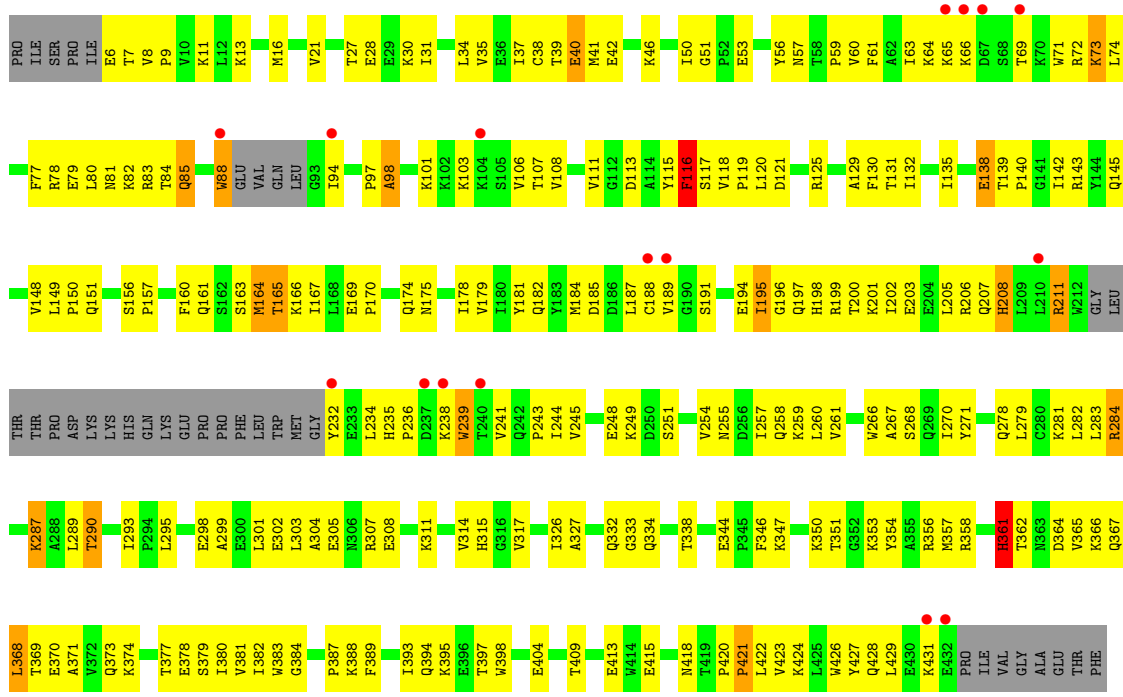
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: HIV-1 RT A-chain



- Molecule 2: HIV-1 RT B-chain





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	137.30Å 109.20Å 72.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.99 – 2.60 19.99 – 2.60	Depositor EDS
% Data completeness (in resolution range)	99.3 (19.99-2.60) 99.3 (19.99-2.60)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.46 (at 2.59Å)	Xtrriage
Refinement program	CNS	Depositor
R, R_{free}	0.237 , 0.303 0.219 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	70.0	Xtrriage
Anisotropy	0.370	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 93.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	7829	wwPDB-VP
Average B, all atoms (Å ²)	81.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.36% 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: CSD, NVP

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	0.47	0/4512	0.69	0/6133
2	B	0.45	0/3438	0.70	0/4667
All	All	0.46	0/7950	0.69	0/10800

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	4404	0	4450	314	0
2	B	3345	0	3373	242	0
3	A	20	0	14	0	0
4	A	34	0	0	5	0
4	B	26	0	0	4	0
All	All	7829	0	7837	545	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 35.

All (545) 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:502:ALA:HA	1:A:505:ILE:HD12	1.42	1.01
2:B:195:ILE:HG23	2:B:196:GLY:H	1.30	0.94
1:A:2:ILE:HG22	1:A:3:SER:H	1.33	0.91
1:A:380:ILE:HD11	1:A:386:THR:HG22	1.52	0.89
1:A:238:LYS:HB2	1:A:316:GLY:O	1.72	0.88
1:A:317:VAL:HG21	1:A:347:LYS:HB3	1.54	0.88
1:A:335:GLY:HA2	1:A:367:GLN:OE1	1.72	0.88
1:A:393:ILE:HB	1:A:423:VAL:HG22	1.56	0.85
2:B:420:PRO:HB2	2:B:423:VAL:HG23	1.58	0.85
1:A:169:GLU:HB3	1:A:170:PRO:HD3	1.59	0.84
1:A:475:GLN:HE21	1:A:475:GLN:N	1.76	0.84
2:B:164:MET:O	2:B:167:ILE:HG12	1.77	0.83
1:A:226:PRO:HB3	1:A:235:HIS:ND1	1.93	0.83
2:B:178:ILE:HG12	2:B:191:SER:HB3	1.58	0.82
2:B:31:ILE:O	2:B:35:VAL:HG23	1.80	0.82
1:A:503:LEU:HA	1:A:506:ILE:HD12	1.60	0.81
2:B:195:ILE:HG23	2:B:196:GLY:N	1.96	0.81
1:A:195:ILE:HG13	1:A:196:GLY:N	1.96	0.81
2:B:79:GLU:O	2:B:83:ARG:HG3	1.81	0.81
1:A:17:ASP:O	1:A:83:ARG:HD3	1.79	0.80
2:B:169:GLU:HB2	2:B:170:PRO:HD3	1.64	0.80
1:A:516:GLU:O	1:A:520:GLN:HG3	1.83	0.78
2:B:241:VAL:CG1	2:B:350:LYS:HA	2.14	0.77
2:B:366:LYS:O	2:B:370:GLU:HB2	1.83	0.77
1:A:141:GLY:HA2	4:A:1035:HOH:O	1.84	0.77
1:A:65:LYS:HG2	1:A:66:LYS:H	1.50	0.77
1:A:2:ILE:HG22	1:A:3:SER:N	1.99	0.76
1:A:66:LYS:H	1:A:66:LYS:HD2	1.50	0.76
1:A:515:SER:OG	1:A:518:VAL:HG23	1.86	0.76
1:A:469:LEU:HD12	1:A:477:THR:HG22	1.69	0.75
1:A:516:GLU:O	1:A:519:ASN:HB2	1.85	0.75
1:A:94:ILE:HD13	1:A:94:ILE:H	1.50	0.75
1:A:110:ASP:O	1:A:217:PRO:HD2	1.87	0.75
2:B:241:VAL:HG12	2:B:350:LYS:HA	1.67	0.74
2:B:206:ARG:HB3	2:B:206:ARG:NH1	2.01	0.74
1:A:239:TRP:CE2	1:A:316:GLY:HA3	2.21	0.74
1:A:211:ARG:NH1	1:A:211:ARG:HB3	2.01	0.74
2:B:245:VAL:HG11	2:B:431:LYS:HB2	1.71	0.73
1:A:64:LYS:H	1:A:64:LYS:HD2	1.51	0.73
1:A:116:PHE:HE1	1:A:146:TYR:HE1	1.36	0.73
1:A:446:ALA:HB2	1:A:453:GLY:HA3	1.71	0.73
1:A:393:ILE:HB	1:A:423:VAL:CG2	2.18	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:7:THR:HG22	1:A:119:PRO:HB2	1.69	0.72
1:A:2:ILE:HD11	1:A:45:GLY:HA3	1.71	0.72
1:A:27:THR:O	1:A:31:ILE:HG13	1.90	0.72
1:A:442:VAL:HG12	1:A:457:TYR:HB3	1.71	0.72
2:B:161:GLN:HA	2:B:161:GLN:NE2	2.05	0.71
1:A:23:GLN:HG2	1:A:131:THR:O	1.89	0.71
2:B:420:PRO:HG3	4:B:1024:HOH:O	1.90	0.71
1:A:480:GLN:HE21	1:A:484:LEU:HG	1.54	0.71
2:B:107:THR:HA	2:B:232:TYR:O	1.91	0.71
2:B:365:VAL:O	2:B:369:THR:HG23	1.91	0.71
2:B:61:PHE:CE1	2:B:74:LEU:HD23	2.25	0.71
1:A:175:ASN:HB2	1:A:178:ILE:HD13	1.71	0.70
1:A:523:GLU:O	1:A:527:LYS:HG3	1.91	0.70
1:A:96:HIS:HD2	1:A:98:ALA:H	1.40	0.70
2:B:426:TRP:O	2:B:429:LEU:HB2	1.90	0.70
2:B:78:ARG:O	2:B:82:LYS:HG3	1.92	0.70
2:B:98:ALA:O	2:B:101:LYS:HG2	1.92	0.69
2:B:191:SER:HG	2:B:198:HIS:HD1	1.37	0.69
1:A:109:LEU:HG	1:A:216:THR:HG21	1.74	0.69
2:B:379:SER:CB	2:B:387:PRO:HD3	2.23	0.69
1:A:3:SER:HB3	1:A:5:ILE:HG13	1.74	0.68
1:A:135:ILE:O	1:A:138:GLU:HG3	1.93	0.68
2:B:139:THR:HG22	2:B:140:PRO:O	1.93	0.68
2:B:369:THR:HG22	2:B:398:TRP:CZ3	2.29	0.67
2:B:108:VAL:HA	2:B:187:LEU:O	1.93	0.67
2:B:160:PHE:O	2:B:160:PHE:CD1	2.47	0.67
1:A:65:LYS:HD3	1:A:67:ASP:OD2	1.92	0.67
2:B:205:LEU:O	2:B:208:HIS:HB2	1.95	0.67
1:A:211:ARG:HB3	1:A:211:ARG:HH11	1.57	0.67
2:B:281:LYS:NZ	2:B:284:ARG:HH22	1.93	0.67
1:A:180:ILE:HG23	1:A:189:VAL:HG22	1.76	0.66
2:B:195:ILE:HG13	2:B:199:ARG:NE	2.10	0.66
2:B:239:TRP:CZ2	2:B:378:GLU:HG2	2.30	0.66
2:B:254:VAL:O	2:B:258:GLN:HG3	1.95	0.66
2:B:195:ILE:CG2	2:B:196:GLY:H	2.06	0.66
1:A:171:PHE:O	1:A:175:ASN:ND2	2.29	0.65
2:B:161:GLN:O	2:B:165:THR:HG22	1.97	0.65
1:A:94:ILE:HB	1:A:229:TRP:HH2	1.60	0.65
1:A:110:ASP:OD1	1:A:217:PRO:HG2	1.97	0.65
1:A:104:LYS:HB2	1:A:192:ASP:HA	1.79	0.65
1:A:357:MET:HB3	1:A:367:GLN:NE2	2.12	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:492:GLU:HA	1:A:530:LYS:O	1.97	0.65
1:A:3:SER:HB3	1:A:4:PRO:HD2	1.78	0.65
1:A:64:LYS:HE3	1:A:71:TRP:CZ3	2.31	0.65
1:A:395:LYS:HD3	1:A:414:TRP:CZ2	2.32	0.64
2:B:118:VAL:HG13	2:B:119:PRO:HD2	1.79	0.64
2:B:161:GLN:HB3	4:B:1052:HOH:O	1.97	0.64
1:A:356:ARG:HG3	1:A:356:ARG:HH11	1.63	0.64
1:A:435:VAL:HG22	2:B:290:THR:HG21	1.80	0.64
2:B:131:THR:OG1	2:B:143:ARG:HD2	1.98	0.64
1:A:164:MET:O	1:A:168:LEU:HG	1.97	0.64
2:B:125:ARG:HB3	2:B:145:GLN:HE21	1.61	0.64
1:A:255:ASN:O	1:A:259:LYS:HG2	1.97	0.64
1:A:31:ILE:HD12	1:A:135:ILE:HD12	1.79	0.64
1:A:135:ILE:O	1:A:135:ILE:HG22	1.98	0.64
2:B:88:TRP:HE3	2:B:88:TRP:C	2.02	0.64
1:A:377:THR:O	1:A:381:VAL:HG23	1.99	0.63
2:B:163:SER:O	2:B:167:ILE:HG23	1.98	0.63
2:B:356:ARG:HB2	2:B:367:GLN:HG2	1.80	0.62
1:A:143:ARG:HH11	1:A:143:ARG:HG2	1.62	0.62
1:A:293:ILE:N	1:A:293:ILE:HD12	2.14	0.62
1:A:95:PRO:O	1:A:229:TRP:HZ3	1.80	0.62
1:A:418:ASN:C	1:A:420:PRO:HD3	2.20	0.62
1:A:248:GLU:O	1:A:249:LYS:HD3	1.99	0.61
2:B:427:TYR:C	2:B:429:LEU:H	2.03	0.61
1:A:2:ILE:CG2	1:A:3:SER:H	2.11	0.61
2:B:115:TYR:HB3	2:B:149:LEU:HB2	1.81	0.61
1:A:2:ILE:HD11	1:A:45:GLY:CA	2.30	0.61
1:A:175:ASN:HB2	1:A:178:ILE:CD1	2.30	0.61
1:A:261:VAL:HA	1:A:264:LEU:HD12	1.80	0.61
1:A:408:ALA:HB2	2:B:368:LEU:HD12	1.81	0.61
2:B:380:ILE:O	2:B:384:GLY:HA2	2.00	0.61
1:A:268:SER:HB3	1:A:353:LYS:HE2	1.82	0.61
1:A:246:LEU:HD12	1:A:307:ARG:HA	1.83	0.61
2:B:41:MET:HB3	2:B:46:LYS:HB2	1.83	0.61
1:A:418:ASN:O	1:A:420:PRO:HD3	2.01	0.61
1:A:2:ILE:HD11	1:A:45:GLY:C	2.21	0.60
1:A:3:SER:CB	1:A:5:ILE:HG13	2.31	0.60
1:A:108:VAL:HG11	1:A:223:LYS:HB2	1.83	0.60
2:B:332:GLN:NE2	2:B:428:GLN:HB2	2.16	0.60
2:B:94:ILE:HD11	2:B:182:GLN:H	1.67	0.60
2:B:194:GLU:OE2	2:B:195:ILE:HG22	2.01	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:257:ILE:O	1:A:261:VAL:HG23	2.02	0.60
1:A:108:VAL:HG13	1:A:108:VAL:O	2.01	0.60
1:A:451:LYS:O	1:A:472:THR:N	2.35	0.60
1:A:440:PHE:CE1	1:A:489:SER:HB3	2.36	0.59
2:B:35:VAL:O	2:B:39:THR:HG23	2.02	0.59
1:A:66:LYS:HD2	1:A:66:LYS:N	2.16	0.59
1:A:195:ILE:HG13	1:A:196:GLY:H	1.65	0.59
1:A:17:ASP:OD1	1:A:56:TYR:HE1	1.85	0.59
2:B:108:VAL:H	2:B:232:TYR:N	2.00	0.59
1:A:329:ILE:HD12	1:A:391:LEU:HD22	1.83	0.59
2:B:278:GLN:HG3	2:B:298:GLU:HB3	1.84	0.59
2:B:103:LYS:HE2	2:B:179:VAL:HG23	1.84	0.59
2:B:248:GLU:HG2	2:B:307:ARG:NH2	2.17	0.59
1:A:57:ASN:HA	1:A:129:ALA:O	2.03	0.59
1:A:475:GLN:HA	1:A:478:GLU:OE2	2.03	0.58
2:B:175:ASN:ND2	2:B:201:LYS:HD2	2.18	0.58
2:B:266:TRP:HZ3	2:B:426:TRP:CD1	2.21	0.58
1:A:474:ASN:O	1:A:478:GLU:HG3	2.02	0.58
1:A:465:LYS:HG2	1:A:466:VAL:N	2.17	0.58
1:A:64:LYS:H	1:A:64:LYS:CD	2.16	0.58
1:A:111:VAL:HG22	1:A:185:ASP:HB3	1.86	0.58
1:A:112:GLY:O	1:A:114:ALA:N	2.32	0.58
2:B:63:ILE:HG22	2:B:65:LYS:H	1.68	0.58
2:B:64:LYS:HE2	2:B:71:TRP:CZ2	2.38	0.58
2:B:50:ILE:HG21	2:B:145:GLN:HB3	1.85	0.58
2:B:61:PHE:CZ	2:B:74:LEU:HD23	2.39	0.58
2:B:379:SER:OG	2:B:387:PRO:HD3	2.03	0.58
1:A:307:ARG:O	1:A:311:LYS:HG3	2.03	0.58
1:A:475:GLN:HE21	1:A:475:GLN:H	1.49	0.57
2:B:77:PHE:CD2	2:B:80:LEU:HD23	2.39	0.57
1:A:42:GLU:HA	1:A:47:ILE:HG13	1.87	0.57
1:A:94:ILE:H	1:A:94:ILE:CD1	2.16	0.57
1:A:376:THR:O	1:A:380:ILE:HG12	2.04	0.57
2:B:350:LYS:HE2	2:B:378:GLU:OE1	2.05	0.57
1:A:360:ALA:HA	1:A:514:GLU:OE2	2.03	0.57
1:A:380:ILE:CD1	1:A:386:THR:HG22	2.30	0.57
2:B:64:LYS:HG2	2:B:71:TRP:CE3	2.40	0.57
1:A:63:ILE:C	1:A:63:ILE:HD12	2.25	0.57
1:A:180:ILE:HG12	1:A:189:VAL:HG13	1.86	0.57
2:B:281:LYS:HZ3	2:B:284:ARG:HH22	1.53	0.57
1:A:58:THR:CG2	1:A:59:PRO:HD2	2.33	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:239:TRP:HH2	2:B:378:GLU:HA	1.69	0.57
1:A:49:LYS:HB2	1:A:144:TYR:CE2	2.40	0.57
1:A:102:LYS:HB2	1:A:102:LYS:NZ	2.18	0.57
1:A:295:LEU:HB2	1:A:300:GLU:OE1	2.04	0.57
2:B:178:ILE:HG12	2:B:191:SER:CB	2.31	0.57
1:A:302:GLU:HA	4:A:1006:HOH:O	2.05	0.56
2:B:236:PRO:O	2:B:239:TRP:HB2	2.05	0.56
2:B:332:GLN:HE22	2:B:428:GLN:HB2	1.69	0.56
1:A:253:THR:HG22	1:A:292:VAL:HG22	1.87	0.56
2:B:57:ASN:HD22	2:B:143:ARG:NH1	2.03	0.56
1:A:21:VAL:HG11	1:A:59:PRO:HD3	1.87	0.56
1:A:108:VAL:HG11	1:A:227:PHE:CE1	2.40	0.56
2:B:27:THR:O	2:B:31:ILE:HG13	2.06	0.56
2:B:245:VAL:O	2:B:245:VAL:HG23	2.04	0.56
2:B:387:PRO:HG2	2:B:389:PHE:CE1	2.40	0.56
2:B:393:ILE:HG12	2:B:394:GLN:N	2.20	0.56
1:A:41:MET:SD	1:A:73:LYS:HE3	2.46	0.56
1:A:228:LEU:HD22	1:A:242:GLN:OE1	2.05	0.56
2:B:151:GLN:HB3	2:B:185:ASP:OD1	2.05	0.56
2:B:206:ARG:HB3	2:B:206:ARG:CZ	2.35	0.56
2:B:332:GLN:HE22	2:B:424:LYS:HD3	1.69	0.56
2:B:9:PRO:HA	2:B:121:ASP:OD2	2.06	0.56
2:B:241:VAL:HG12	2:B:351:THR:H	1.71	0.56
1:A:169:GLU:CB	1:A:170:PRO:HD3	2.34	0.56
1:A:241:VAL:O	1:A:243:PRO:HD3	2.05	0.56
1:A:402:TRP:CH2	2:B:362:THR:HA	2.41	0.56
2:B:373:GLN:O	2:B:377:THR:HG23	2.06	0.55
1:A:110:ASP:O	1:A:216:THR:HG23	2.07	0.55
2:B:38:CYS:SG	2:B:132:ILE:HD11	2.46	0.55
2:B:125:ARG:CB	2:B:145:GLN:HE21	2.19	0.55
1:A:33:ALA:O	1:A:36:GLU:HB3	2.07	0.55
1:A:88:TRP:HA	1:A:88:TRP:CE3	2.41	0.55
1:A:122:GLU:H	1:A:122:GLU:CD	2.09	0.55
2:B:197:GLN:O	2:B:201:LYS:HB2	2.05	0.55
2:B:301:LEU:O	2:B:304:ALA:N	2.39	0.55
1:A:134:SER:OG	1:A:138:GLU:HB2	2.06	0.55
1:A:65:LYS:HG2	1:A:66:LYS:N	2.21	0.55
1:A:396:GLU:H	1:A:396:GLU:CD	2.10	0.55
2:B:369:THR:HG22	2:B:398:TRP:CH2	2.41	0.55
1:A:497:THR:O	1:A:535:TRP:HA	2.07	0.55
2:B:235:HIS:N	2:B:236:PRO:HD3	2.21	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:442:VAL:HB	1:A:481:ALA:HB1	1.89	0.55
2:B:88:TRP:C	2:B:88:TRP:CE3	2.80	0.55
2:B:244:ILE:HG13	2:B:426:TRP:CZ2	2.42	0.55
1:A:475:GLN:N	1:A:475:GLN:NE2	2.52	0.55
1:A:317:VAL:HG12	1:A:318:TYR:N	2.22	0.55
1:A:474:ASN:O	1:A:477:THR:OG1	2.24	0.55
1:A:122:GLU:C	1:A:124:PHE:H	2.10	0.54
1:A:59:PRO:HG2	1:A:76:ASP:HB3	1.89	0.54
1:A:102:LYS:HB3	1:A:318:TYR:HB2	1.88	0.54
1:A:111:VAL:HG22	1:A:185:ASP:CA	2.38	0.54
2:B:245:VAL:CG1	2:B:431:LYS:HB2	2.37	0.54
1:A:125:ARG:NE	1:A:147:ASN:HA	2.23	0.54
1:A:139:THR:HB	1:A:140:PRO:CD	2.38	0.54
2:B:255:ASN:OD1	2:B:259:LYS:HE2	2.07	0.54
1:A:111:VAL:HG23	1:A:114:ALA:HB2	1.90	0.54
2:B:308:GLU:OE1	2:B:311:LYS:HD2	2.07	0.54
1:A:418:ASN:OD1	1:A:420:PRO:HD3	2.07	0.53
1:A:436:GLY:O	1:A:461:ARG:NH2	2.40	0.53
1:A:168:LEU:O	1:A:172:ARG:HB2	2.09	0.53
1:A:389:PHE:HB2	1:A:414:TRP:HB3	1.91	0.53
2:B:28:GLU:HG3	2:B:135:ILE:HD11	1.89	0.53
2:B:125:ARG:CB	2:B:145:GLN:NE2	2.71	0.53
1:A:65:LYS:CG	1:A:66:LYS:H	2.19	0.53
1:A:125:ARG:HG2	1:A:146:TYR:O	2.08	0.53
2:B:39:THR:O	2:B:42:GLU:HB3	2.08	0.53
2:B:57:ASN:HA	2:B:129:ALA:O	2.09	0.53
2:B:57:ASN:HB2	2:B:143:ARG:HH12	1.72	0.53
2:B:244:ILE:HG23	2:B:429:LEU:HB3	1.90	0.53
1:A:419:THR:HG22	1:A:419:THR:O	2.07	0.53
1:A:143:ARG:HG2	1:A:143:ARG:NH1	2.23	0.53
1:A:440:PHE:CZ	1:A:489:SER:HB3	2.44	0.53
1:A:473:THR:CG2	1:A:476:LYS:HG3	2.39	0.53
1:A:434:ILE:HD13	1:A:530:LYS:HB3	1.91	0.53
2:B:161:GLN:HA	2:B:161:GLN:HE21	1.72	0.53
2:B:27:THR:HG22	2:B:28:GLU:N	2.24	0.53
2:B:63:ILE:HG22	2:B:65:LYS:N	2.23	0.53
2:B:267:ALA:HB2	2:B:426:TRP:CZ3	2.43	0.53
1:A:433:PRO:HA	1:A:532:TYR:CD2	2.44	0.53
1:A:228:LEU:HA	1:A:232:TYR:O	2.09	0.53
2:B:115:TYR:O	2:B:117:SER:N	2.42	0.53
1:A:454:LYS:HA	1:A:467:VAL:O	2.08	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:451:LYS:HD3	1:A:471:ASP:OD2	2.08	0.52
2:B:106:VAL:HA	2:B:189:VAL:O	2.09	0.52
2:B:374:LYS:O	2:B:378:GLU:HG3	2.09	0.52
1:A:11:LYS:O	1:A:85:GLN:HB3	2.10	0.52
1:A:248:GLU:HB2	1:A:307:ARG:NH2	2.25	0.52
2:B:156:SER:HB2	2:B:157:PRO:CD	2.40	0.52
2:B:427:TYR:C	2:B:429:LEU:N	2.63	0.52
1:A:408:ALA:HB3	2:B:393:ILE:HB	1.92	0.52
2:B:315:HIS:O	2:B:317:VAL:HG23	2.10	0.52
1:A:451:LYS:HB3	1:A:471:ASP:HA	1.91	0.52
2:B:169:GLU:HB2	2:B:170:PRO:CD	2.37	0.52
1:A:23:GLN:OE1	1:A:60:VAL:HG12	2.10	0.51
1:A:340:GLN:HB3	1:A:351:THR:HG22	1.92	0.51
2:B:53:GLU:OE1	2:B:53:GLU:N	2.42	0.51
2:B:344:GLU:HB3	2:B:347:LYS:NZ	2.25	0.51
2:B:97:PRO:O	2:B:98:ALA:C	2.48	0.51
2:B:303:LEU:O	2:B:307:ARG:HG3	2.11	0.51
2:B:428:GLN:HG2	2:B:428:GLN:O	2.10	0.51
1:A:240:THR:HG22	1:A:241:VAL:N	2.26	0.51
1:A:446:ALA:CB	1:A:453:GLY:HA3	2.39	0.51
1:A:465:LYS:HG2	1:A:466:VAL:H	1.76	0.51
1:A:156:SER:HB2	1:A:157:PRO:HD3	1.93	0.51
2:B:232:TYR:HB3	2:B:234:LEU:HD11	1.92	0.51
1:A:58:THR:HG22	1:A:59:PRO:HD2	1.93	0.51
2:B:11:LYS:N	2:B:85:GLN:OE1	2.32	0.50
2:B:281:LYS:HG2	2:B:284:ARG:NH2	2.25	0.50
1:A:183:TYR:CD1	1:A:184:MET:HB2	2.45	0.50
1:A:283:LEU:O	1:A:286:THR:HG23	2.10	0.50
1:A:21:VAL:CG1	1:A:59:PRO:HD3	2.41	0.50
1:A:98:ALA:HB2	1:A:349:LEU:O	2.10	0.50
1:A:181:TYR:HB2	2:B:138:GLU:OE1	2.11	0.50
2:B:37:ILE:O	2:B:40:GLU:HB2	2.12	0.50
1:A:319:TYR:OH	1:A:385:LYS:HD3	2.10	0.50
1:A:346:PHE:N	1:A:346:PHE:CD2	2.77	0.50
2:B:6:GLU:HG2	2:B:7:THR:H	1.77	0.50
2:B:98:ALA:HA	2:B:101:LYS:NZ	2.27	0.50
2:B:120:LEU:HD23	2:B:125:ARG:HG2	1.93	0.50
1:A:96:HIS:CD2	1:A:97:PRO:HD2	2.47	0.50
1:A:517:LEU:O	1:A:518:VAL:C	2.49	0.50
1:A:2:ILE:CD1	1:A:45:GLY:HA3	2.39	0.50
1:A:357:MET:HE2	4:A:1041:HOH:O	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:496:VAL:HA	1:A:534:ALA:O	2.12	0.50
2:B:195:ILE:O	2:B:198:HIS:HB3	2.12	0.50
1:A:39:THR:O	1:A:42:GLU:HB3	2.12	0.50
1:A:268:SER:CB	1:A:353:LYS:HE2	2.42	0.50
2:B:64:LYS:HE2	2:B:71:TRP:CE2	2.47	0.50
2:B:118:VAL:CG1	2:B:119:PRO:HD2	2.41	0.50
1:A:357:MET:HB3	1:A:367:GLN:HE22	1.76	0.49
1:A:94:ILE:HB	1:A:229:TRP:CH2	2.45	0.49
2:B:13:LYS:HB2	2:B:16:MET:HG3	1.94	0.49
2:B:46:LYS:HE2	2:B:116:PHE:HD1	1.77	0.49
2:B:125:ARG:HB2	2:B:145:GLN:NE2	2.27	0.49
2:B:266:TRP:CZ3	2:B:426:TRP:CG	3.00	0.49
1:A:7:THR:CG2	1:A:119:PRO:HB2	2.41	0.49
2:B:107:THR:O	2:B:188:CYS:HA	2.12	0.49
1:A:465:LYS:NZ	1:A:488:ASP:OD1	2.43	0.49
1:A:50:ILE:HG23	1:A:145:GLN:HG2	1.93	0.49
1:A:129:ALA:HA	1:A:144:TYR:O	2.13	0.48
1:A:402:TRP:CG	1:A:403:THR:N	2.80	0.48
1:A:498:ASP:HA	1:A:536:VAL:O	2.13	0.48
2:B:244:ILE:CG2	2:B:429:LEU:HD23	2.42	0.48
1:A:107:THR:HG22	1:A:108:VAL:N	2.29	0.48
2:B:77:PHE:HD2	2:B:80:LEU:HD23	1.78	0.48
1:A:340:GLN:CB	1:A:351:THR:HG22	2.43	0.48
1:A:77:PHE:O	1:A:79:GLU:N	2.47	0.48
1:A:218:ASP:HB3	1:A:220:LYS:H	1.78	0.48
2:B:206:ARG:HH11	2:B:206:ARG:CB	2.27	0.48
1:A:164:MET:HE1	1:A:214:LEU:HD13	1.94	0.48
2:B:170:PRO:O	2:B:174:GLN:HG3	2.14	0.48
2:B:354:TYR:OH	2:B:370:GLU:HB3	2.14	0.48
1:A:244:ILE:HD11	1:A:263:LYS:HB3	1.96	0.48
2:B:165:THR:HG23	2:B:166:LYS:H	1.77	0.48
1:A:95:PRO:O	1:A:229:TRP:CZ3	2.65	0.48
1:A:108:VAL:CG1	1:A:223:LYS:HB2	2.42	0.48
1:A:164:MET:CE	1:A:214:LEU:HD13	2.44	0.48
2:B:64:LYS:HG2	2:B:71:TRP:CZ3	2.49	0.48
2:B:344:GLU:CB	2:B:347:LYS:HE3	2.44	0.48
2:B:356:ARG:HG3	2:B:356:ARG:HH11	1.78	0.48
2:B:423:VAL:O	2:B:427:TYR:CD2	2.67	0.48
1:A:394:GLN:HB3	1:A:396:GLU:OE1	2.13	0.47
2:B:98:ALA:C	2:B:101:LYS:HZ3	2.18	0.47
2:B:175:ASN:HD21	2:B:201:LYS:HD2	1.77	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:160:PHE:O	2:B:160:PHE:HD1	1.95	0.47
2:B:191:SER:OG	2:B:198:HIS:ND1	2.38	0.47
2:B:195:ILE:HG13	2:B:199:ARG:HE	1.79	0.47
1:A:508:ALA:O	1:A:509:GLN:C	2.52	0.47
2:B:56:TYR:O	2:B:57:ASN:HB2	2.14	0.47
2:B:301:LEU:HD11	2:B:305:GLU:HG3	1.97	0.47
1:A:102:LYS:NZ	1:A:237:ASP:HA	2.29	0.47
1:A:198:HIS:O	1:A:201:LYS:N	2.47	0.47
1:A:102:LYS:HZ3	1:A:237:ASP:HA	1.79	0.47
1:A:135:ILE:O	1:A:135:ILE:CG2	2.63	0.47
1:A:88:TRP:HA	1:A:88:TRP:HE3	1.80	0.47
1:A:160:PHE:C	1:A:160:PHE:CD2	2.88	0.47
2:B:202:ILE:O	2:B:205:LEU:HB3	2.15	0.47
2:B:232:TYR:HB3	2:B:234:LEU:CD1	2.45	0.47
2:B:259:LYS:O	2:B:260:LEU:C	2.51	0.47
1:A:17:ASP:OD1	1:A:56:TYR:CE1	2.67	0.47
1:A:345:PRO:O	1:A:346:PHE:HB2	2.14	0.47
1:A:439:THR:O	1:A:459:THR:HA	2.15	0.47
1:A:475:GLN:NE2	1:A:475:GLN:CA	2.78	0.47
1:A:501:TYR:C	1:A:501:TYR:CD2	2.89	0.47
2:B:115:TYR:OH	2:B:157:PRO:HB3	2.14	0.47
1:A:463:ARG:HG2	1:A:464:GLN:N	2.30	0.46
1:A:108:VAL:O	1:A:108:VAL:CG1	2.64	0.46
1:A:308:GLU:O	1:A:311:LYS:N	2.46	0.46
2:B:282:LEU:HD13	2:B:295:LEU:CD2	2.45	0.46
1:A:66:LYS:O	1:A:68:SER:N	2.48	0.46
1:A:518:VAL:O	1:A:522:ILE:HG13	2.15	0.46
2:B:94:ILE:HG13	2:B:181:TYR:HE2	1.80	0.46
1:A:473:THR:HG23	1:A:476:LYS:H	1.79	0.46
1:A:2:ILE:CG2	1:A:3:SER:N	2.71	0.46
1:A:194:GLU:O	1:A:195:ILE:C	2.54	0.46
1:A:356:ARG:HG3	1:A:356:ARG:NH1	2.31	0.46
2:B:308:GLU:OE1	2:B:308:GLU:HA	2.15	0.46
1:A:111:VAL:HG22	1:A:185:ASP:CB	2.46	0.46
1:A:363:ASN:O	1:A:366:LYS:HB3	2.16	0.46
1:A:406:TRP:CH2	2:B:418:ASN:HA	2.51	0.46
2:B:198:HIS:O	2:B:201:LYS:HB3	2.16	0.46
2:B:115:TYR:C	2:B:117:SER:N	2.69	0.46
1:A:253:THR:HA	1:A:291:GLU:O	2.16	0.46
1:A:434:ILE:CD1	1:A:530:LYS:HB3	2.46	0.46
2:B:121:ASP:N	4:B:1049:HOH:O	2.35	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:333:GLY:O	2:B:334:GLN:HB2	2.16	0.46
1:A:238:LYS:HG3	1:A:239:TRP:N	2.30	0.45
2:B:165:THR:HG23	2:B:166:LYS:N	2.30	0.45
1:A:12:LEU:HD11	1:A:127:TYR:CE1	2.51	0.45
1:A:53:GLU:HG3	1:A:53:GLU:O	2.17	0.45
1:A:184:MET:HB3	1:A:185:ASP:H	1.43	0.45
1:A:241:VAL:CG2	1:A:314:VAL:HG23	2.47	0.45
1:A:411:ILE:HG22	1:A:412:PRO:O	2.16	0.45
1:A:507:GLN:OE1	2:B:421:PRO:HG3	2.14	0.45
2:B:63:ILE:HG22	2:B:64:LYS:N	2.31	0.45
2:B:268:SER:HA	2:B:271:TYR:O	2.17	0.45
1:A:59:PRO:HG2	1:A:76:ASP:CB	2.45	0.45
1:A:408:ALA:CB	2:B:368:LEU:HD12	2.44	0.45
1:A:475:GLN:HE21	1:A:475:GLN:CA	2.25	0.45
1:A:399:GLU:O	1:A:403:THR:HG22	2.17	0.45
2:B:94:ILE:HG13	2:B:94:ILE:O	2.16	0.45
2:B:270:ILE:HG12	2:B:346:PHE:HB3	1.99	0.45
1:A:299:ALA:O	1:A:303:LEU:HB3	2.16	0.45
1:A:409:THR:O	2:B:364:ASP:HB2	2.16	0.45
1:A:452:LEU:HD23	1:A:469:LEU:O	2.16	0.45
2:B:195:ILE:CG1	2:B:199:ARG:NE	2.79	0.45
1:A:90:VAL:O	1:A:91:GLN:C	2.55	0.45
1:A:115:TYR:OH	1:A:157:PRO:HG3	2.16	0.45
1:A:501:TYR:CD2	1:A:501:TYR:O	2.70	0.45
1:A:402:TRP:CD1	1:A:402:TRP:C	2.89	0.45
2:B:356:ARG:NH2	2:B:361:HIS:HB3	2.32	0.45
1:A:511:ASP:O	1:A:512:GLN:HB3	2.17	0.45
2:B:125:ARG:HB3	2:B:145:GLN:NE2	2.29	0.45
2:B:249:LYS:HD2	2:B:251:SER:O	2.17	0.45
2:B:338:THR:CG2	2:B:353:LYS:HE2	2.47	0.45
1:A:69:THR:O	1:A:69:THR:HG22	2.17	0.44
1:A:277:ARG:HD2	4:A:1038:HOH:O	2.18	0.44
2:B:377:THR:O	2:B:381:VAL:HG23	2.16	0.44
1:A:109:LEU:HG	1:A:216:THR:CG2	2.44	0.44
1:A:149:LEU:HD11	1:A:159:ILE:HG21	1.99	0.44
2:B:196:GLY:O	2:B:200:THR:HG23	2.18	0.44
2:B:254:VAL:HG21	2:B:287:LYS:HG2	1.99	0.44
1:A:193:LEU:HD13	1:A:197:GLN:HB3	2.00	0.44
2:B:211:ARG:HG3	2:B:211:ARG:O	2.18	0.44
2:B:234:LEU:C	2:B:236:PRO:HD3	2.38	0.44
2:B:239:TRP:CH2	2:B:378:GLU:HG2	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:101:LYS:HA	1:A:319:TYR:O	2.17	0.44
2:B:164:MET:HG2	2:B:182:GLN:NE2	2.33	0.44
2:B:303:LEU:HD22	2:B:307:ARG:NE	2.32	0.44
1:A:232:TYR:HE2	1:A:239:TRP:CZ3	2.36	0.44
2:B:195:ILE:HD11	2:B:199:ARG:HD3	1.99	0.44
2:B:255:ASN:HB2	2:B:289:LEU:HG	1.99	0.44
2:B:279:LEU:O	2:B:282:LEU:HB2	2.17	0.44
1:A:122:GLU:OE1	1:A:122:GLU:N	2.46	0.44
2:B:30:LYS:NZ	2:B:404:GLU:OE2	2.46	0.44
2:B:34:LEU:CD2	2:B:73:LYS:HG2	2.48	0.44
2:B:257:ILE:O	2:B:261:VAL:HG23	2.17	0.44
2:B:279:LEU:HD23	2:B:299:ALA:HB1	2.00	0.44
2:B:308:GLU:O	2:B:311:LYS:HB2	2.18	0.44
2:B:314:VAL:HG13	2:B:317:VAL:CG2	2.47	0.44
1:A:402:TRP:O	1:A:404:GLU:N	2.51	0.44
1:A:457:TYR:CD1	1:A:457:TYR:C	2.91	0.44
2:B:115:TYR:CD1	2:B:156:SER:HB3	2.52	0.44
2:B:195:ILE:CG2	2:B:196:GLY:N	2.67	0.44
2:B:266:TRP:CZ3	2:B:426:TRP:CD1	3.04	0.44
1:A:517:LEU:O	1:A:520:GLN:N	2.51	0.43
1:A:489:SER:HB2	1:A:493:VAL:HG22	2.00	0.43
2:B:357:MET:O	2:B:358:ARG:C	2.56	0.43
1:A:344:GLU:O	1:A:345:PRO:C	2.57	0.43
2:B:21:VAL:HB	2:B:59:PRO:HD3	2.00	0.43
2:B:72:ARG:CZ	2:B:409:THR:HG22	2.48	0.43
1:A:60:VAL:O	1:A:60:VAL:HG13	2.17	0.43
1:A:226:PRO:HB3	1:A:235:HIS:CE1	2.50	0.43
2:B:367:GLN:O	2:B:371:ALA:N	2.46	0.43
1:A:38:CYS:O	1:A:42:GLU:HB2	2.18	0.43
1:A:64:LYS:CD	1:A:64:LYS:N	2.82	0.43
1:A:426:TRP:CD1	1:A:426:TRP:N	2.87	0.43
2:B:60:VAL:O	2:B:61:PHE:HB3	2.18	0.43
2:B:132:ILE:HB	2:B:142:ILE:HD12	2.00	0.43
1:A:66:LYS:C	1:A:68:SER:H	2.22	0.43
1:A:314:VAL:HG23	1:A:314:VAL:O	2.18	0.43
1:A:338:THR:HG22	1:A:353:LYS:HB3	2.01	0.43
2:B:203:GLU:OE2	2:B:206:ARG:NH1	2.52	0.43
1:A:77:PHE:C	1:A:79:GLU:N	2.72	0.43
1:A:149:LEU:HG	1:A:156:SER:HA	2.01	0.43
1:A:402:TRP:CZ2	2:B:362:THR:HA	2.54	0.43
2:B:8:VAL:HG23	2:B:9:PRO:HD2	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:382:ILE:HB	2:B:383:TRP:CE3	2.54	0.43
1:A:319:TYR:O	1:A:321:PRO:HD3	2.18	0.43
2:B:301:LEU:HG	2:B:302:GLU:N	2.32	0.43
1:A:170:PRO:O	1:A:171:PHE:C	2.57	0.43
1:A:3:SER:HB3	1:A:4:PRO:CD	2.48	0.42
2:B:282:LEU:HD22	2:B:293:ILE:CG2	2.49	0.42
1:A:211:ARG:HH11	1:A:211:ARG:CB	2.31	0.42
1:A:84:THR:O	1:A:85:GLN:O	2.36	0.42
1:A:132:ILE:O	1:A:141:GLY:HA3	2.18	0.42
2:B:182:GLN:HB2	2:B:187:LEU:HD12	1.99	0.42
1:A:65:LYS:CG	1:A:66:LYS:N	2.82	0.42
1:A:111:VAL:HG22	1:A:185:ASP:HA	2.02	0.42
1:A:132:ILE:O	1:A:132:ILE:HG22	2.19	0.42
2:B:239:TRP:CH2	2:B:378:GLU:HA	2.51	0.42
1:A:169:GLU:O	1:A:173:LYS:HD3	2.20	0.42
2:B:279:LEU:HG	2:B:302:GLU:OE2	2.19	0.42
2:B:422:LEU:C	2:B:424:LYS:N	2.71	0.42
1:A:308:GLU:O	1:A:309:ILE:C	2.57	0.42
2:B:211:ARG:O	2:B:211:ARG:CG	2.67	0.42
1:A:35:VAL:O	1:A:39:THR:OG1	2.38	0.42
1:A:293:ILE:N	1:A:293:ILE:CD1	2.81	0.42
1:A:433:PRO:HG3	1:A:532:TYR:CE2	2.53	0.42
1:A:33:ALA:HB2	1:A:71:TRP:CD1	2.55	0.42
1:A:137:ASN:OD1	1:A:137:ASN:O	2.38	0.42
1:A:202:ILE:HG22	1:A:203:GLU:N	2.35	0.42
1:A:225:PRO:HG3	1:A:227:PHE:CZ	2.55	0.42
1:A:402:TRP:C	1:A:404:GLU:H	2.22	0.42
2:B:41:MET:HG2	2:B:46:LYS:HD2	2.02	0.42
2:B:182:GLN:HB2	2:B:187:LEU:CD1	2.50	0.42
2:B:206:ARG:NH1	2:B:206:ARG:CB	2.74	0.42
2:B:356:ARG:HG3	2:B:356:ARG:NH1	2.34	0.42
1:A:163:SER:O	1:A:164:MET:C	2.57	0.42
1:A:205:LEU:O	1:A:209:LEU:HG	2.19	0.42
1:A:258:GLN:O	1:A:259:LYS:C	2.57	0.42
1:A:419:THR:O	1:A:420:PRO:C	2.56	0.42
1:A:484:LEU:HA	1:A:484:LEU:HD23	1.84	0.42
1:A:338:THR:HG22	1:A:353:LYS:CB	2.49	0.41
1:A:447:ASN:HB3	1:A:450:THR:OG1	2.20	0.41
2:B:157:PRO:HG3	2:B:184:MET:HA	2.02	0.41
2:B:388:LYS:HE2	2:B:415:GLU:HB3	2.02	0.41
1:A:235:HIS:O	1:A:238:LYS:O	2.38	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:274:ILE:HD13	1:A:309:ILE:HD12	2.02	0.41
1:A:29:GLU:HG2	1:A:71:TRP:HE1	1.85	0.41
1:A:149:LEU:HD21	1:A:160:PHE:N	2.35	0.41
1:A:245:VAL:O	1:A:245:VAL:HG23	2.19	0.41
1:A:255:ASN:HD22	1:A:255:ASN:HA	1.58	0.41
2:B:197:GLN:H	2:B:197:GLN:HG3	1.72	0.41
1:A:13:LYS:HG2	1:A:85:GLN:HA	2.03	0.41
2:B:61:PHE:HE1	2:B:63:ILE:HD11	1.85	0.41
2:B:82:LYS:HD3	2:B:413:GLU:OE1	2.20	0.41
2:B:278:GLN:HA	2:B:278:GLN:NE2	2.35	0.41
2:B:395:LYS:NZ	4:B:1060:HOH:O	2.47	0.41
1:A:8:VAL:O	1:A:121:ASP:HB2	2.19	0.41
1:A:134:SER:CB	1:A:138:GLU:HB2	2.49	0.41
1:A:231:GLY:C	1:A:242:GLN:HB3	2.41	0.41
1:A:368:LEU:O	1:A:372:VAL:HG23	2.20	0.41
2:B:206:ARG:O	2:B:207:GLN:C	2.59	0.41
2:B:332:GLN:NE2	2:B:424:LYS:HE2	2.36	0.41
1:A:41:MET:HB2	1:A:47:ILE:CD1	2.51	0.41
1:A:225:PRO:HA	1:A:226:PRO:C	2.40	0.41
1:A:324:ASP:O	1:A:343:GLN:HG2	2.19	0.41
1:A:58:THR:CG2	1:A:76:ASP:O	2.69	0.41
2:B:80:LEU:O	2:B:81:ASN:C	2.58	0.41
2:B:393:ILE:HD11	2:B:397:THR:HG22	2.03	0.41
1:A:64:LYS:HE3	1:A:71:TRP:HZ3	1.81	0.41
1:A:225:PRO:HG3	1:A:227:PHE:CE2	2.56	0.41
1:A:378:GLU:HG3	4:A:1010:HOH:O	2.20	0.41
1:A:96:HIS:CD2	1:A:98:ALA:H	2.29	0.41
1:A:326:ILE:O	1:A:341:ILE:HA	2.21	0.41
1:A:498:ASP:CG	1:A:538:ALA:HB2	2.41	0.41
2:B:28:GLU:CG	2:B:135:ILE:HD11	2.50	0.41
2:B:51:GLY:HA3	2:B:53:GLU:OE1	2.21	0.41
1:A:78:ARG:O	1:A:82:LYS:HG2	2.20	0.41
1:A:270:ILE:CG2	1:A:314:VAL:HG21	2.51	0.41
2:B:281:LYS:HZ2	2:B:284:ARG:HH22	1.68	0.41
2:B:314:VAL:HG13	2:B:317:VAL:HG21	2.03	0.41
2:B:393:ILE:HG12	2:B:394:GLN:H	1.86	0.41
2:B:422:LEU:O	2:B:423:VAL:C	2.59	0.41
2:B:111:VAL:HG22	2:B:185:ASP:O	2.20	0.40
2:B:130:PHE:CD1	2:B:130:PHE:C	2.94	0.40
2:B:149:LEU:HA	2:B:150:PRO:HD3	1.80	0.40
2:B:361:HIS:CD2	2:B:361:HIS:N	2.88	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:344:GLU:HB3	2:B:347:LYS:HE3	2.03	0.40
1:A:124:PHE:O	1:A:127:TYR:CD2	2.74	0.40
1:A:329:ILE:O	1:A:392:PRO:HD3	2.21	0.40
1:A:491:LEU:HB3	1:A:529:GLU:HB2	2.02	0.40
1:A:84:THR:HG22	1:A:85:GLN:O	2.21	0.40
1:A:175:ASN:CB	1:A:178:ILE:HD13	2.46	0.40
2:B:13:LYS:HE3	2:B:84:THR:O	2.20	0.40
2:B:116:PHE:HA	2:B:148:VAL:HG21	2.03	0.40
2:B:326:ILE:HG22	2:B:327:ALA:N	2.35	0.40
1:A:408:ALA:HB3	2:B:393:ILE:CB	2.51	0.40
2:B:195:ILE:O	2:B:196:GLY:C	2.60	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	536/560 (96%)	439 (82%)	72 (13%)	25 (5%)	2 2
2	B	398/440 (90%)	343 (86%)	47 (12%)	8 (2%)	7 14
All	All	934/1000 (93%)	782 (84%)	119 (13%)	33 (4%)	3 5

All (33) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	2	ILE
1	A	217	PRO
1	A	218	ASP
2	B	98	ALA
2	B	195	ILE
2	B	361	HIS
1	A	67	ASP

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Mol	Chain	Res	Type
1	A	85	GLN
1	A	91	GLN
1	A	113	ASP
1	A	138	GLU
2	B	66	LYS
2	B	116	PHE
2	B	208	HIS
1	A	68	SER
1	A	78	ARG
1	A	126	LYS
1	A	170	PRO
1	A	315	HIS
1	A	361	HIS
1	A	517	LEU
1	A	115	TYR
1	A	116	PHE
1	A	403	THR
1	A	4	PRO
1	A	135	ILE
1	A	476	LYS
2	B	85	GLN
1	A	123	ASP
2	B	421	PRO
1	A	139	THR
1	A	176	PRO
1	A	420	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	483/499 (97%)	439 (91%)	44 (9%)	9	18
2	B	368/400 (92%)	349 (95%)	19 (5%)	23	46
All	All	851/899 (95%)	788 (93%)	63 (7%)	13	28

All (63) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	PRO
1	A	6	GLU
1	A	24	TRP
1	A	64	LYS
1	A	89	GLU
1	A	94	ILE
1	A	102	LYS
1	A	105	SER
1	A	113	ASP
1	A	120	LEU
1	A	122	GLU
1	A	143	ARG
1	A	160	PHE
1	A	175	ASN
1	A	182	GLN
1	A	184	MET
1	A	187	LEU
1	A	205	LEU
1	A	210	LEU
1	A	211	ARG
1	A	217	PRO
1	A	229	TRP
1	A	237	ASP
1	A	255	ASN
1	A	266	TRP
1	A	305	GLU
1	A	322	SER
1	A	325	LEU
1	A	340	GLN
1	A	344	GLU
1	A	358	ARG
1	A	402	TRP
1	A	403	THR
1	A	404	GLU
1	A	417	VAL
1	A	431	LYS
1	A	449	GLU
1	A	452	LEU
1	A	474	ASN
1	A	475	GLN
1	A	496	VAL
1	A	500	GLN
1	A	517	LEU

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Mol	Chain	Res	Type
1	A	533	LEU
2	B	40	GLU
2	B	69	THR
2	B	73	LYS
2	B	88	TRP
2	B	113	ASP
2	B	116	PHE
2	B	138	GLU
2	B	164	MET
2	B	165	THR
2	B	211	ARG
2	B	238	LYS
2	B	239	TRP
2	B	243	PRO
2	B	283	LEU
2	B	284	ARG
2	B	287	LYS
2	B	290	THR
2	B	361	HIS
2	B	368	LEU

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

Mol	Chain	Res	Type
1	A	57	ASN
1	A	96	HIS
1	A	137	ASN
1	A	174	GLN
1	A	175	ASN
1	A	255	ASN
1	A	278	GLN
1	A	332	GLN
1	A	336	GLN
1	A	474	ASN
1	A	475	GLN
1	A	480	GLN
1	A	500	GLN
1	A	512	GLN
2	B	57	ASN
2	B	145	GLN
2	B	147	ASN
2	B	161	GLN

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Mol	Chain	Res	Type
2	B	182	GLN
2	B	197	GLN
2	B	278	GLN
2	B	332	GLN
2	B	361	HIS
2	B	394	GLN
2	B	428	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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
1	CSD	A	280	1	3,7,8	1.06	0	1,8,10	4.62	1 (100%)

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
1	CSD	A	280	1	-	2/2/6/8	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	280	CSD	OD1-SG-CB	4.62	114.34	105.54

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	280	CSD	N-CA-CB-SG
1	A	280	CSD	CA-CB-SG-OD1

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

1 ligand 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
3	NVP	A	999	-	23,23,23	2.51	6 (26%)	34,34,34	2.03	8 (23%)

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
3	NVP	A	999	-	-	2/4/6/6	0/4/4/4

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	999	NVP	C15-N1	7.64	1.47	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	999	NVP	C10-C9	5.31	1.54	1.49
3	A	999	NVP	C2-N1	5.03	1.45	1.42
3	A	999	NVP	C7-N8	2.71	1.44	1.41
3	A	999	NVP	C5-C4	2.21	1.43	1.38
3	A	999	NVP	CA-N1	2.15	1.50	1.46

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	999	NVP	C7-N8-C9	6.49	133.90	128.40
3	A	999	NVP	C7-C2-N1	-5.00	118.15	120.09
3	A	999	NVP	N3-C2-N1	4.10	119.72	116.62
3	A	999	NVP	N14-C15-N1	3.21	119.05	116.62
3	A	999	NVP	CC-CA-N1	3.09	117.99	116.10
3	A	999	NVP	C2-N1-CA	-2.20	114.49	116.29
3	A	999	NVP	C10-C15-N1	-2.19	118.99	120.72
3	A	999	NVP	C15-C10-C9	-2.10	122.29	123.85

There are no chirality outliers.

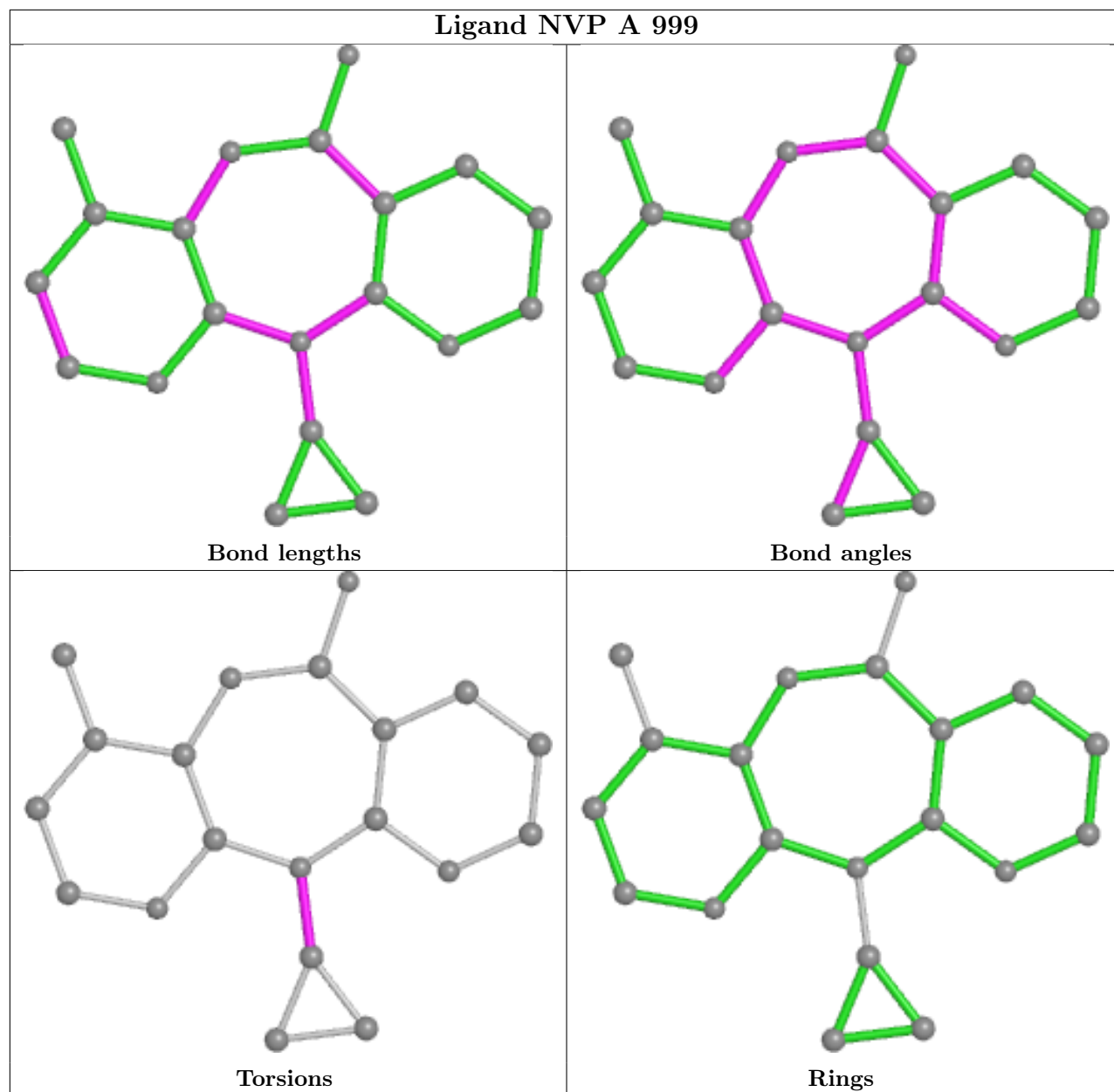
All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	999	NVP	CC-CA-N1-C2
3	A	999	NVP	CB-CA-N1-C2

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



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	538/560 (96%)	0.02	25 (4%) 32 26	18, 79, 126, 150	0
2	B	404/440 (91%)	-0.11	16 (3%) 38 31	29, 73, 119, 150	0
All	All	942/1000 (94%)	-0.04	41 (4%) 34 27	18, 76, 123, 150	0

All (41) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	68	SER	7.1
2	B	67	ASP	5.5
2	B	232	TYR	5.3
1	A	91	GLN	5.2
1	A	66	LYS	5.0
1	A	53	GLU	4.8
2	B	88	TRP	4.5
2	B	65	LYS	4.0
2	B	69	THR	4.0
1	A	221	HIS	4.0
1	A	219	LYS	3.7
1	A	514	GLU	3.7
1	A	67	ASP	3.7
2	B	66	LYS	3.7
1	A	356	ARG	3.6
2	B	94	ILE	3.4
1	A	21	VAL	3.1
1	A	137	ASN	3.1
1	A	220	LYS	3.1
1	A	92	LEU	3.0
1	A	52	PRO	3.0
2	B	210	LEU	2.9
2	B	431	LYS	2.8
1	A	539	HIS	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	22	LYS	2.7
2	B	189	VAL	2.7
1	A	136	ASN	2.7
2	B	237	ASP	2.6
2	B	432	GLU	2.6
2	B	104	LYS	2.5
2	B	238	LYS	2.4
1	A	218	ASP	2.4
2	B	240	THR	2.3
1	A	130	PHE	2.3
1	A	24	TRP	2.2
1	A	538	ALA	2.2
1	A	128	THR	2.2
1	A	297	GLU	2.2
2	B	188	CYS	2.1
1	A	90	VAL	2.0
1	A	116	PHE	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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(Å ²)	Q<0.9
1	CSD	A	280	8/9	0.96	0.15	76,87,108,126	0

6.3 Carbohydrates [i](#)

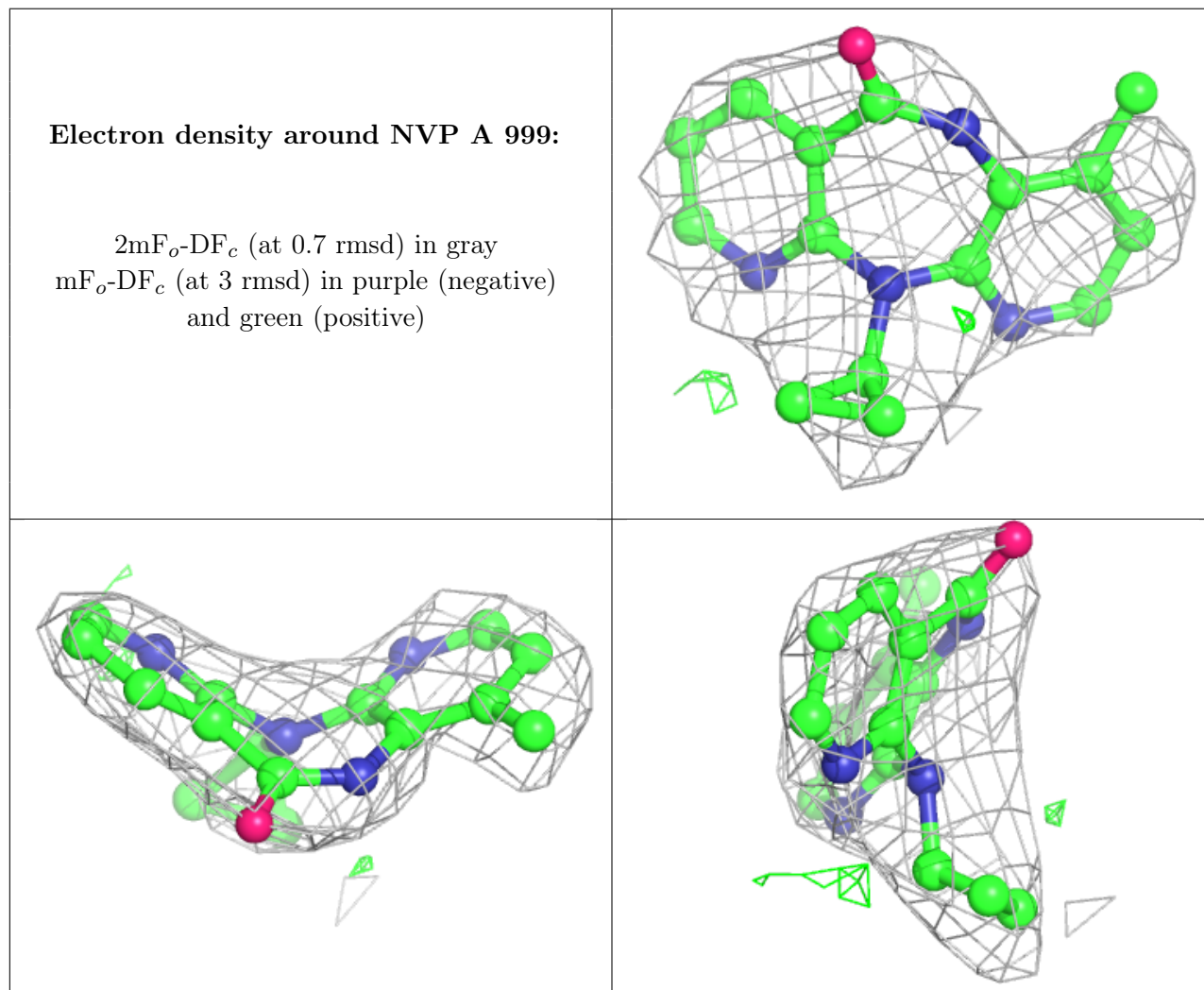
There are no monosaccharides in this entry.

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(\AA^2)	Q<0.9
3	NVP	A	999	20/20	0.90	0.29	80,99,112,116	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



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

There are no such residues in this entry.