



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 31, 2021 – 04:23 AM EDT

PDB ID : 1S1X
Title : Crystal structure of V108I mutant HIV-1 reverse transcriptase in complex with nevirapine
Authors : Ren, J.; Nichols, C.E.; Chamberlain, P.P.; Stammers, D.K.
Deposited on : 2004-01-07
Resolution : 2.80 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 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)
Xtrriage (Phenix) : 1.13
EDS : 2.23.2
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) : 2.23.2

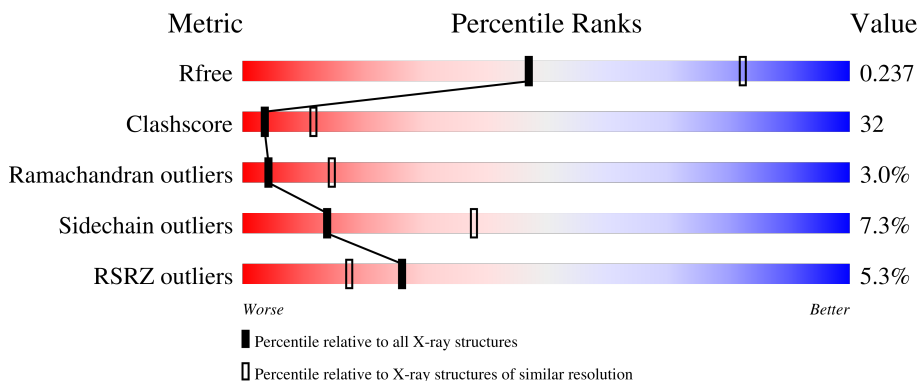
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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}	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	
2	B	440	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 7790 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 Reverse transcriptase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	546	4459	2883	743	825	8	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	108	ILE	VAL	engineered mutation	UNP P04585
A	280	CSD	CYS	modified residue	UNP P04585

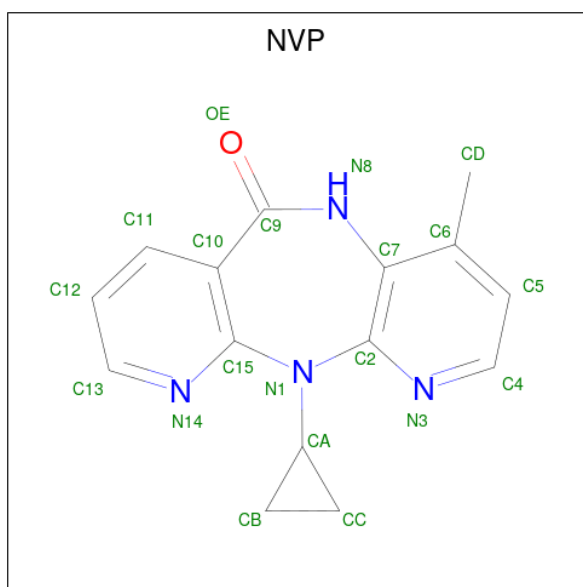
- Molecule 2 is a protein called Reverse transcriptase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	397	3290	2139	547	597	7	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	108	ILE	VAL	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

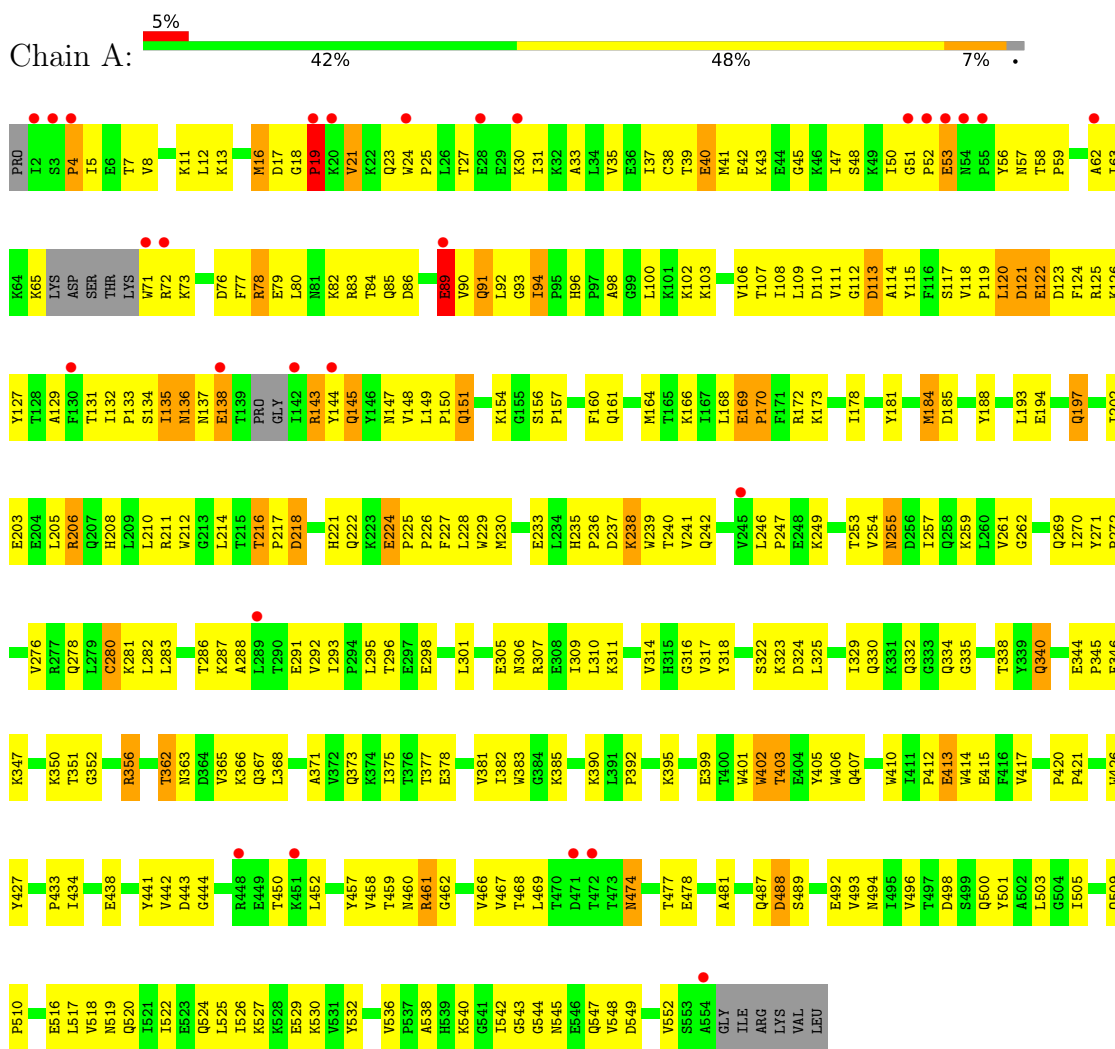
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
4	A	14	14	14	0	0
4	B	7	7	7	0	0

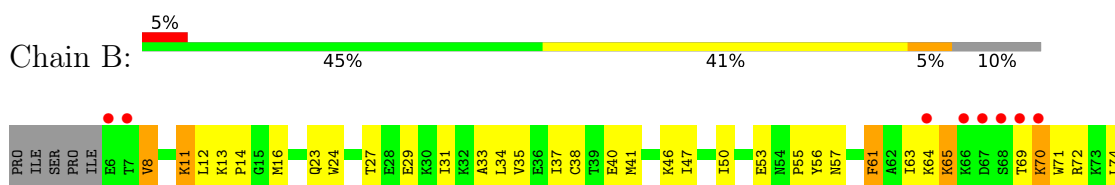
3 Residue-property plots

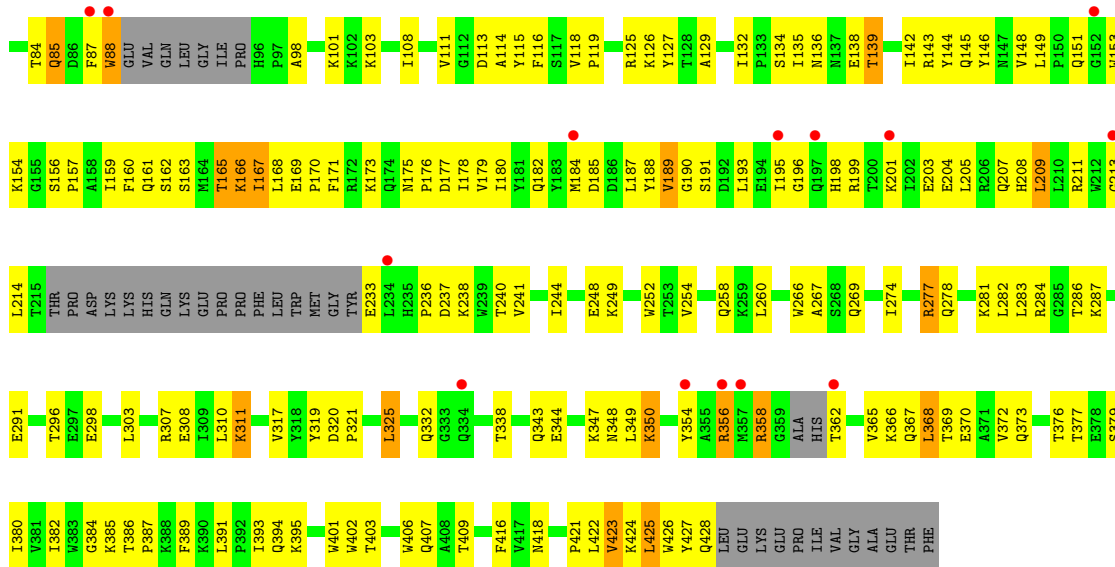
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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

- Molecule 1: Reverse transcriptase



- Molecule 2: Reverse transcriptase





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	138.40Å 109.00Å 72.80Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.57 – 2.80 29.57 – 2.82	Depositor EDS
% Data completeness (in resolution range)	98.6 (29.57-2.80) 98.7 (29.57-2.82)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.69 (at 2.80Å)	Xtrriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.235 , 0.295 0.231 , 0.237	Depositor DCC
R_{free} test set	1313 reflections (4.86%)	wwPDB-VP
Wilson B-factor (Å ²)	74.6	Xtrriage
Anisotropy	0.542	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 78.2	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	0.93	EDS
Total number of atoms	7790	wwPDB-VP
Average B, all atoms (Å ²)	84.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.47% 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 [i](#)

5.1 Standard geometry [i](#)

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	0.51	0/4564	0.73	2/6199 (0.0%)
2	B	0.49	0/3380	0.69	2/4587 (0.0%)
All	All	0.50	0/7944	0.71	4/10786 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	356	ARG	N-CA-C	5.74	126.50	111.00
1	A	19	PRO	N-CA-C	5.59	126.65	112.10
1	A	93	GLY	N-CA-C	-5.36	99.70	113.10
2	B	401	TRP	N-CA-C	5.34	125.42	111.00

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4459	0	4501	283	0
2	B	3290	0	3321	217	0
3	A	20	0	14	0	0
4	A	14	0	0	1	0
4	B	7	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	7790	0	7836	492	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 32.

All (492) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:358:ARG:H	2:B:358:ARG:HD2	1.16	1.07
2:B:191:SER:HB2	2:B:193:LEU:HD13	1.38	1.04
2:B:180:ILE:HG12	2:B:189:VAL:HG13	1.45	0.96
1:A:50:ILE:HG13	1:A:51:GLY:H	1.30	0.96
1:A:57:ASN:HB2	1:A:143:ARG:HH22	1.32	0.95
2:B:113:ASP:HB2	2:B:214:LEU:HD23	1.50	0.92
1:A:7:THR:HG22	1:A:119:PRO:HB2	1.49	0.91
1:A:206:ARG:NH1	1:A:216:THR:HG23	1.88	0.89
2:B:358:ARG:H	2:B:358:ARG:CD	1.86	0.88
1:A:48:SER:HB2	1:A:147:ASN:HD21	1.39	0.88
2:B:387:PRO:HG2	2:B:389:PHE:CE1	2.09	0.87
2:B:358:ARG:HD2	2:B:358:ARG:N	1.87	0.86
2:B:65:LYS:HE2	2:B:72:ARG:CD	2.06	0.86
2:B:135:ILE:O	2:B:138:GLU:HG3	1.76	0.85
2:B:278:GLN:HE21	2:B:298:GLU:CB	1.90	0.84
2:B:111:VAL:HA	2:B:214:LEU:HD22	1.60	0.84
2:B:57:ASN:HD22	2:B:143:ARG:NH1	1.76	0.84
1:A:206:ARG:HH11	1:A:216:THR:HG23	1.39	0.83
1:A:143:ARG:HH11	1:A:143:ARG:HG2	1.44	0.83
2:B:278:GLN:HE21	2:B:298:GLU:HB3	1.44	0.82
2:B:195:ILE:HD11	2:B:199:ARG:HE	1.41	0.82
2:B:98:ALA:HB1	2:B:101:LYS:HE3	1.62	0.81
1:A:50:ILE:HD12	1:A:52:PRO:HD2	1.63	0.81
1:A:206:ARG:NH1	1:A:206:ARG:HB3	1.96	0.80
1:A:114:ALA:HB1	1:A:160:PHE:CE2	2.16	0.80
1:A:206:ARG:O	1:A:210:LEU:HD23	1.82	0.79
1:A:106:VAL:HG23	1:A:236:PRO:HB3	1.64	0.79
1:A:241:VAL:HG21	1:A:270:ILE:HG21	1.63	0.79
1:A:254:VAL:HG13	1:A:283:LEU:HD12	1.64	0.79
1:A:239:TRP:CZ2	1:A:316:GLY:HA3	2.18	0.79
1:A:77:PHE:CD2	1:A:80:LEU:HD23	2.18	0.78
2:B:56:TYR:HE2	2:B:126:LYS:HE2	1.46	0.78
1:A:94:ILE:HD13	1:A:94:ILE:H	1.47	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:163:SER:O	2:B:167:ILE:HG23	1.84	0.77
1:A:390:LYS:HB3	1:A:417:VAL:HG21	1.67	0.77
1:A:96:HIS:HB2	4:A:1004:HOH:O	1.85	0.76
1:A:31:ILE:HG12	1:A:133:PRO:HB2	1.68	0.76
1:A:469:LEU:HD12	1:A:477:THR:HG22	1.68	0.76
2:B:98:ALA:O	2:B:101:LYS:HG2	1.86	0.76
2:B:136:ASN:HB3	2:B:138:GLU:HG3	1.69	0.75
1:A:58:THR:HG23	1:A:76:ASP:O	1.85	0.75
1:A:395:LYS:HD3	1:A:414:TRP:CZ2	2.22	0.75
2:B:13:LYS:HB2	2:B:16:MET:HG3	1.69	0.74
2:B:350:LYS:NZ	2:B:382:ILE:HD12	2.02	0.74
1:A:23:GLN:O	1:A:25:PRO:HD3	1.88	0.74
1:A:52:PRO:C	1:A:53:GLU:HG3	2.07	0.74
2:B:84:THR:HB	2:B:154:LYS:HE2	1.70	0.73
1:A:50:ILE:CG1	1:A:51:GLY:H	2.01	0.72
2:B:282:LEU:HD21	2:B:296:THR:HG23	1.69	0.72
1:A:94:ILE:H	1:A:94:ILE:CD1	2.03	0.72
2:B:350:LYS:HZ1	2:B:382:ILE:HD12	1.55	0.72
1:A:31:ILE:O	1:A:35:VAL:HG23	1.90	0.72
1:A:77:PHE:HD2	1:A:80:LEU:HD23	1.52	0.72
1:A:385:LYS:NZ	1:A:385:LYS:HB3	2.04	0.71
1:A:50:ILE:HG13	1:A:51:GLY:N	2.05	0.71
1:A:50:ILE:HB	1:A:145:GLN:HG2	1.73	0.71
1:A:399:GLU:O	1:A:403:THR:HB	1.90	0.71
1:A:7:THR:CG2	1:A:119:PRO:HB2	2.21	0.70
2:B:195:ILE:HG23	2:B:196:GLY:N	2.06	0.70
2:B:114:ALA:HB1	2:B:160:PHE:CZ	2.26	0.70
1:A:143:ARG:HG2	1:A:143:ARG:NH1	2.06	0.70
1:A:125:ARG:HD3	1:A:147:ASN:HA	1.74	0.69
2:B:319:TYR:HE1	2:B:321:PRO:HG3	1.57	0.69
2:B:65:LYS:HE2	2:B:72:ARG:HD2	1.73	0.69
1:A:110:ASP:O	1:A:217:PRO:HD3	1.92	0.69
2:B:249:LYS:HB2	2:B:249:LYS:HZ3	1.57	0.69
2:B:31:ILE:O	2:B:35:VAL:HG23	1.93	0.69
2:B:136:ASN:HB3	2:B:138:GLU:CG	2.23	0.68
2:B:344:GLU:HB2	2:B:347:LYS:HE3	1.75	0.68
1:A:12:LEU:HD13	1:A:17:ASP:HA	1.76	0.68
1:A:239:TRP:CE2	1:A:316:GLY:HA3	2.27	0.68
2:B:56:TYR:CE2	2:B:126:LYS:HE2	2.28	0.68
2:B:47:ILE:HG22	2:B:146:TYR:HA	1.75	0.67
1:A:335:GLY:HA3	1:A:356:ARG:HD3	1.76	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:254:VAL:O	2:B:258:GLN:HG3	1.94	0.67
1:A:293:ILE:N	1:A:293:ILE:HD12	2.10	0.66
2:B:13:LYS:HE3	2:B:84:THR:O	1.94	0.66
1:A:57:ASN:HA	1:A:129:ALA:O	1.96	0.66
1:A:270:ILE:HG22	1:A:314:VAL:HG21	1.77	0.65
1:A:406:TRP:CH2	2:B:418:ASN:HA	2.31	0.65
2:B:118:VAL:HB	2:B:149:LEU:HG	1.77	0.65
1:A:135:ILE:HG22	1:A:136:ASN:N	2.10	0.65
2:B:376:THR:CG2	2:B:386:THR:HG22	2.26	0.65
2:B:319:TYR:CE1	2:B:321:PRO:HG3	2.32	0.65
2:B:195:ILE:CD1	2:B:199:ARG:HE	2.10	0.65
1:A:100:LEU:O	1:A:318:TYR:HB3	1.96	0.64
1:A:441:TYR:O	1:A:548:VAL:HG11	1.97	0.64
1:A:501:TYR:CZ	1:A:505:ILE:HD11	2.32	0.64
2:B:163:SER:HA	2:B:166:LYS:HD3	1.78	0.64
1:A:282:LEU:HD11	1:A:296:THR:HG23	1.79	0.64
2:B:87:PHE:O	2:B:88:TRP:HB2	1.97	0.64
2:B:389:PHE:HB3	2:B:391:LEU:HD21	1.78	0.64
1:A:84:THR:O	1:A:154:LYS:NZ	2.31	0.64
1:A:138:GLU:O	1:A:138:GLU:HG2	1.96	0.64
2:B:169:GLU:HB2	2:B:170:PRO:HD3	1.79	0.64
2:B:380:ILE:O	2:B:384:GLY:HA2	1.98	0.64
1:A:441:TYR:CD2	1:A:544:GLY:HA3	2.33	0.63
2:B:65:LYS:O	2:B:407:GLN:NE2	2.31	0.63
2:B:191:SER:CB	2:B:193:LEU:HD13	2.23	0.63
1:A:30:LYS:HD3	1:A:62:ALA:HB3	1.80	0.63
1:A:122:GLU:HG2	1:A:123:ASP:H	1.62	0.63
1:A:5:ILE:HD11	1:A:166:LYS:NZ	2.13	0.63
1:A:94:ILE:CD1	1:A:94:ILE:N	2.61	0.63
1:A:306:ASN:O	1:A:310:LEU:HG	1.98	0.63
2:B:298:GLU:OE1	2:B:298:GLU:N	2.31	0.62
1:A:206:ARG:HB3	1:A:206:ARG:CZ	2.26	0.62
2:B:31:ILE:HA	2:B:34:LEU:HD12	1.80	0.62
2:B:421:PRO:O	2:B:425:LEU:HD13	1.98	0.62
1:A:8:VAL:O	1:A:121:ASP:HB2	1.99	0.62
1:A:37:ILE:O	1:A:40:GLU:HB3	1.99	0.62
2:B:195:ILE:HG23	2:B:196:GLY:H	1.63	0.62
1:A:129:ALA:HA	1:A:144:TYR:O	2.00	0.61
2:B:195:ILE:CD1	2:B:199:ARG:HG3	2.30	0.61
2:B:178:ILE:HG12	2:B:191:SER:HB3	1.82	0.61
1:A:91:GLN:OE1	1:A:91:GLN:HA	2.00	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:330:GLN:HB2	1:A:338:THR:OG1	2.01	0.61
1:A:118:VAL:HB	1:A:149:LEU:HD22	1.83	0.61
1:A:226:PRO:HB3	1:A:235:HIS:CE1	2.36	0.61
1:A:59:PRO:HG2	1:A:76:ASP:HB2	1.82	0.60
1:A:458:VAL:HG23	1:A:548:VAL:HG12	1.83	0.60
2:B:173:LYS:O	2:B:176:PRO:HD3	2.01	0.60
1:A:246:LEU:O	1:A:307:ARG:NH1	2.26	0.60
2:B:201:LYS:O	2:B:204:GLU:HB3	2.01	0.60
1:A:122:GLU:N	1:A:122:GLU:OE1	2.34	0.60
1:A:170:PRO:HA	1:A:173:LYS:HD3	1.82	0.60
2:B:240:THR:O	2:B:350:LYS:HG2	2.02	0.60
1:A:17:ASP:C	1:A:19:PRO:HD3	2.22	0.59
1:A:378:GLU:O	1:A:382:ILE:HG12	2.02	0.59
1:A:307:ARG:O	1:A:311:LYS:HG3	2.03	0.59
1:A:450:THR:OG1	1:A:452:LEU:HB2	2.02	0.59
1:A:228:LEU:HD22	1:A:242:GLN:OE1	2.03	0.59
1:A:522:ILE:O	1:A:526:ILE:HG13	2.03	0.59
2:B:57:ASN:HB2	2:B:143:ARG:HH12	1.67	0.59
2:B:65:LYS:NZ	2:B:409:THR:HG22	2.18	0.59
1:A:72:ARG:HD3	1:A:73:LYS:H	1.68	0.58
1:A:169:GLU:HB3	1:A:170:PRO:HD3	1.84	0.58
1:A:434:ILE:HD13	1:A:530:LYS:HB3	1.84	0.58
2:B:64:LYS:HE3	2:B:71:TRP:CE2	2.37	0.58
2:B:422:LEU:O	2:B:424:LYS:N	2.36	0.58
2:B:195:ILE:HA	2:B:198:HIS:HB3	1.85	0.58
2:B:57:ASN:ND2	2:B:143:ARG:NH1	2.50	0.58
1:A:31:ILE:HD12	1:A:135:ILE:HD12	1.85	0.58
2:B:236:PRO:C	2:B:238:LYS:H	2.07	0.58
1:A:111:VAL:HG21	1:A:114:ALA:HB2	1.86	0.57
2:B:113:ASP:O	2:B:116:PHE:HD2	1.87	0.57
1:A:493:VAL:HG12	1:A:494:ASN:N	2.19	0.57
2:B:162:SER:O	2:B:165:THR:HG23	2.04	0.57
2:B:249:LYS:HB2	2:B:249:LYS:NZ	2.15	0.57
2:B:179:VAL:O	2:B:189:VAL:HA	2.05	0.57
2:B:182:GLN:HB2	2:B:187:LEU:HD12	1.86	0.57
2:B:376:THR:O	2:B:380:ILE:HG13	2.05	0.57
1:A:31:ILE:CG1	1:A:133:PRO:HB2	2.33	0.57
1:A:111:VAL:HG22	1:A:185:ASP:HB3	1.87	0.57
2:B:57:ASN:HD22	2:B:143:ARG:HH12	1.53	0.57
1:A:98:ALA:CB	1:A:350:LYS:HB2	2.35	0.57
1:A:269:GLN:HB3	1:A:352:GLY:HA2	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:350:LYS:NZ	2:B:382:ILE:CD1	2.67	0.57
1:A:65:LYS:HB2	1:A:71:TRP:N	2.20	0.56
1:A:122:GLU:HG2	1:A:123:ASP:N	2.20	0.56
1:A:181:TYR:HB3	1:A:188:TYR:HB2	1.88	0.56
1:A:335:GLY:HA2	1:A:367:GLN:HE21	1.70	0.56
2:B:425:LEU:HD13	2:B:425:LEU:H	1.69	0.56
1:A:21:VAL:HG13	1:A:59:PRO:HD3	1.88	0.56
1:A:210:LEU:HD22	1:A:214:LEU:O	2.04	0.56
2:B:53:GLU:O	2:B:55:PRO:HD3	2.06	0.56
1:A:518:VAL:O	1:A:522:ILE:HG13	2.04	0.56
1:A:413:GLU:HA	1:A:413:GLU:OE1	2.06	0.56
2:B:27:THR:O	2:B:31:ILE:HG13	2.05	0.56
1:A:51:GLY:N	1:A:52:PRO:CD	2.69	0.56
2:B:317:VAL:HG11	2:B:348:ASN:O	2.05	0.56
1:A:11:LYS:O	1:A:85:GLN:HB3	2.07	0.55
1:A:168:LEU:HD13	1:A:172:ARG:HH21	1.71	0.55
1:A:122:GLU:HA	1:A:125:ARG:NE	2.22	0.55
1:A:278:GLN:O	1:A:282:LEU:HD13	2.07	0.55
1:A:426:TRP:O	1:A:526:ILE:HG23	2.07	0.55
2:B:161:GLN:O	2:B:165:THR:HG22	2.05	0.55
1:A:134:SER:O	1:A:135:ILE:O	2.25	0.55
2:B:156:SER:N	2:B:157:PRO:HD2	2.21	0.55
2:B:38:CYS:SG	2:B:132:ILE:HD11	2.46	0.55
2:B:114:ALA:H	2:B:214:LEU:HD21	1.72	0.55
2:B:372:VAL:HG13	2:B:389:PHE:CE2	2.42	0.55
2:B:8:VAL:HG11	2:B:159:ILE:HG23	1.89	0.55
2:B:195:ILE:HD11	2:B:199:ARG:NE	2.16	0.55
2:B:308:GLU:HA	2:B:311:LYS:HD2	1.88	0.55
1:A:241:VAL:HG21	1:A:270:ILE:CG2	2.36	0.54
1:A:50:ILE:CG1	1:A:51:GLY:N	2.68	0.54
1:A:114:ALA:HB1	1:A:160:PHE:HE2	1.70	0.54
2:B:103:LYS:HE2	2:B:190:GLY:O	2.07	0.54
1:A:39:THR:O	1:A:42:GLU:HB3	2.06	0.54
1:A:224:GLU:HG3	1:A:225:PRO:HD2	1.89	0.54
1:A:335:GLY:HA3	1:A:356:ARG:CD	2.37	0.54
2:B:366:LYS:O	2:B:370:GLU:HG3	2.06	0.54
2:B:29:GLU:HG2	2:B:71:TRP:CZ2	2.42	0.54
1:A:12:LEU:O	1:A:13:LYS:C	2.46	0.54
2:B:87:PHE:O	2:B:88:TRP:CB	2.56	0.54
1:A:31:ILE:HD13	1:A:134:SER:N	2.23	0.54
1:A:30:LYS:HE2	1:A:71:TRP:CZ3	2.43	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:500:GLN:OE1	2:B:422:LEU:HD22	2.08	0.53
2:B:64:LYS:HE3	2:B:71:TRP:CD2	2.43	0.53
1:A:63:ILE:N	1:A:63:ILE:HD12	2.23	0.53
2:B:178:ILE:CG2	2:B:189:VAL:HG12	2.38	0.53
1:A:108:ILE:C	1:A:109:LEU:HD12	2.29	0.53
1:A:287:LYS:HG2	1:A:291:GLU:OE2	2.09	0.53
2:B:153:TRP:O	2:B:157:PRO:HD2	2.08	0.53
2:B:195:ILE:HD11	2:B:199:ARG:HG3	1.89	0.53
1:A:77:PHE:O	1:A:80:LEU:N	2.41	0.53
1:A:322:SER:O	1:A:323:LYS:HG2	2.08	0.53
2:B:402:TRP:HZ3	2:B:406:TRP:CG	2.26	0.53
1:A:390:LYS:HB3	1:A:417:VAL:CG2	2.38	0.53
1:A:522:ILE:O	1:A:525:LEU:HB2	2.09	0.52
1:A:58:THR:HG23	1:A:59:PRO:HD2	1.90	0.52
1:A:119:PRO:HA	1:A:148:VAL:HG12	1.91	0.52
2:B:180:ILE:HG12	2:B:189:VAL:CG1	2.30	0.52
2:B:65:LYS:HZ3	2:B:409:THR:HG22	1.73	0.52
1:A:402:TRP:CD1	1:A:402:TRP:C	2.83	0.52
2:B:136:ASN:C	2:B:138:GLU:N	2.62	0.52
2:B:266:TRP:O	2:B:269:GLN:HG3	2.09	0.52
1:A:38:CYS:O	1:A:47:ILE:HD11	2.09	0.52
1:A:156:SER:HB2	1:A:157:PRO:HD3	1.92	0.52
2:B:205:LEU:HD13	2:B:205:LEU:O	2.09	0.52
2:B:283:LEU:O	2:B:284:ARG:C	2.49	0.52
1:A:31:ILE:HD13	1:A:134:SER:CA	2.40	0.52
1:A:121:ASP:O	1:A:122:GLU:C	2.47	0.51
1:A:211:ARG:HG2	1:A:211:ARG:HH11	1.75	0.51
1:A:305:GLU:O	1:A:309:ILE:HG13	2.10	0.51
1:A:377:THR:O	1:A:381:VAL:HG23	2.11	0.51
2:B:132:ILE:HB	2:B:142:ILE:HB	1.92	0.51
2:B:376:THR:HG23	2:B:386:THR:HG22	1.92	0.51
1:A:385:LYS:HB3	1:A:385:LYS:HZ3	1.76	0.51
1:A:17:ASP:O	1:A:83:ARG:HD3	2.11	0.51
1:A:18:GLY:HA2	1:A:83:ARG:HD2	1.92	0.51
1:A:218:ASP:O	1:A:222:GLN:HG3	2.10	0.51
1:A:442:VAL:HB	1:A:481:ALA:HB1	1.92	0.51
2:B:344:GLU:CB	2:B:347:LYS:HE3	2.39	0.51
1:A:134:SER:O	1:A:135:ILE:C	2.47	0.51
1:A:332:GLN:O	1:A:332:GLN:HG2	2.11	0.51
1:A:405:TYR:CE2	1:A:407:GLN:HB3	2.46	0.51
1:A:23:GLN:NE2	1:A:24:TRP:H	2.09	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:77:PHE:HD2	1:A:80:LEU:CD2	2.20	0.51
1:A:325:LEU:HD11	1:A:383:TRP:CD2	2.45	0.51
2:B:278:GLN:HG3	2:B:298:GLU:HB3	1.93	0.51
1:A:270:ILE:HG23	1:A:314:VAL:HG11	1.93	0.50
2:B:134:SER:HB3	2:B:139:THR:HG22	1.94	0.50
2:B:177:ASP:OD1	2:B:178:ILE:HG13	2.11	0.50
2:B:205:LEU:HD13	2:B:205:LEU:C	2.30	0.50
1:A:131:THR:HG22	1:A:132:ILE:N	2.26	0.50
1:A:253:THR:O	1:A:257:ILE:HG13	2.10	0.50
1:A:254:VAL:HG22	1:A:286:THR:HG21	1.94	0.50
1:A:545:ASN:O	1:A:549:ASP:HB2	2.12	0.50
1:A:246:LEU:HB2	1:A:307:ARG:NH1	2.27	0.50
1:A:334:GLN:O	1:A:356:ARG:HD3	2.12	0.50
1:A:441:TYR:HA	1:A:496:VAL:HG22	1.94	0.50
1:A:474:ASN:O	1:A:478:GLU:HG2	2.12	0.50
2:B:115:TYR:HB3	2:B:149:LEU:HB2	1.92	0.50
1:A:18:GLY:N	1:A:19:PRO:HD3	2.27	0.50
1:A:90:VAL:HG23	1:A:90:VAL:O	2.11	0.50
1:A:402:TRP:CZ2	2:B:362:THR:HA	2.47	0.50
2:B:195:ILE:CG2	2:B:196:GLY:N	2.74	0.50
1:A:229:TRP:CD1	1:A:230:MET:HG2	2.47	0.50
2:B:266:TRP:CH2	2:B:426:TRP:HB3	2.47	0.50
1:A:108:ILE:HD12	1:A:188:TYR:CZ	2.47	0.49
2:B:278:GLN:HA	2:B:278:GLN:OE1	2.10	0.49
1:A:254:VAL:HG13	1:A:283:LEU:CD1	2.38	0.49
2:B:379:SER:CB	2:B:387:PRO:HD3	2.42	0.49
1:A:329:ILE:O	1:A:392:PRO:HD3	2.12	0.49
1:A:317:VAL:HG12	1:A:318:TYR:H	1.77	0.49
2:B:136:ASN:C	2:B:138:GLU:H	2.15	0.49
1:A:31:ILE:CD1	1:A:133:PRO:HB2	2.42	0.49
1:A:50:ILE:CD1	1:A:52:PRO:HD2	2.37	0.49
2:B:108:ILE:HG12	2:B:188:TYR:CE2	2.47	0.49
2:B:277:ARG:H	2:B:277:ARG:HD2	1.78	0.49
1:A:292:VAL:C	1:A:293:ILE:HD12	2.32	0.49
1:A:235:HIS:HB2	1:A:238:LYS:O	2.12	0.49
1:A:329:ILE:HG22	1:A:330:GLN:N	2.27	0.49
2:B:61:PHE:CE1	2:B:403:THR:HG22	2.48	0.49
2:B:248:GLU:HG2	2:B:307:ARG:NH2	2.28	0.49
2:B:332:GLN:HG3	2:B:338:THR:HG23	1.93	0.49
2:B:425:LEU:N	2:B:425:LEU:CD1	2.76	0.49
2:B:356:ARG:CZ	2:B:362:THR:N	2.76	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:389:PHE:HB3	2:B:391:LEU:CD2	2.42	0.49
1:A:202:ILE:HG22	1:A:203:GLU:N	2.27	0.49
1:A:443:ASP:OD1	1:A:444:GLY:N	2.45	0.49
1:A:458:VAL:HG23	1:A:548:VAL:CG1	2.43	0.49
2:B:402:TRP:CE2	2:B:403:THR:HG23	2.48	0.49
1:A:124:PHE:O	1:A:127:TYR:HD2	1.94	0.48
1:A:211:ARG:HG2	1:A:211:ARG:NH1	2.27	0.48
2:B:365:VAL:O	2:B:369:THR:HG23	2.12	0.48
1:A:298:GLU:O	1:A:301:LEU:HB3	2.13	0.48
2:B:178:ILE:HG22	2:B:179:VAL:N	2.27	0.48
1:A:524:GLN:HA	1:A:524:GLN:OE1	2.14	0.48
1:A:115:TYR:OH	1:A:157:PRO:HG3	2.13	0.48
2:B:195:ILE:HD11	2:B:199:ARG:CG	2.44	0.48
2:B:356:ARG:NH2	2:B:362:THR:N	2.61	0.48
1:A:206:ARG:HH11	1:A:206:ARG:HB3	1.75	0.48
1:A:350:LYS:HE2	1:A:378:GLU:CD	2.34	0.48
2:B:12:LEU:HD11	2:B:127:TYR:CZ	2.48	0.48
2:B:426:TRP:HE3	2:B:426:TRP:HA	1.78	0.48
1:A:466:VAL:O	1:A:467:VAL:HG23	2.14	0.48
1:A:406:TRP:CZ3	2:B:418:ASN:HA	2.49	0.48
1:A:48:SER:HB2	1:A:147:ASN:ND2	2.18	0.48
1:A:52:PRO:O	1:A:53:GLU:HG3	2.12	0.48
1:A:94:ILE:HD13	1:A:94:ILE:N	2.17	0.48
1:A:121:ASP:O	1:A:123:ASP:N	2.47	0.48
2:B:132:ILE:HB	2:B:142:ILE:HD12	1.96	0.48
1:A:16:MET:HE1	1:A:82:LYS:HE2	1.95	0.47
1:A:33:ALA:HB1	1:A:71:TRP:HB2	1.95	0.47
2:B:11:LYS:N	2:B:85:GLN:OE1	2.44	0.47
2:B:356:ARG:CG	2:B:367:GLN:HG2	2.45	0.47
1:A:346:PHE:N	1:A:346:PHE:CD2	2.81	0.47
1:A:407:GLN:CG	2:B:393:ILE:HA	2.44	0.47
1:A:110:ASP:O	1:A:217:PRO:CD	2.62	0.47
1:A:41:MET:HB2	1:A:47:ILE:CD1	2.44	0.47
2:B:63:ILE:HD13	2:B:74:LEU:HD22	1.97	0.47
2:B:320:ASP:O	2:B:343:GLN:NE2	2.45	0.47
1:A:111:VAL:CG2	1:A:114:ALA:HB2	2.44	0.47
2:B:162:SER:O	2:B:165:THR:CG2	2.63	0.47
2:B:428:GLN:HE21	2:B:428:GLN:HB3	1.54	0.47
1:A:111:VAL:CG2	1:A:112:GLY:N	2.78	0.47
1:A:270:ILE:CG2	1:A:314:VAL:HG21	2.43	0.47
2:B:426:TRP:HA	2:B:426:TRP:CE3	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:270:ILE:CG2	1:A:314:VAL:HG11	2.45	0.47
1:A:282:LEU:HD21	1:A:295:LEU:HA	1.97	0.47
2:B:136:ASN:O	2:B:138:GLU:N	2.48	0.47
1:A:19:PRO:O	1:A:56:TYR:HA	2.15	0.46
1:A:237:ASP:OD1	1:A:237:ASP:C	2.52	0.46
2:B:129:ALA:HA	2:B:144:TYR:O	2.16	0.46
2:B:266:TRP:CZ3	2:B:426:TRP:HB3	2.51	0.46
2:B:317:VAL:HG12	2:B:349:LEU:HD23	1.97	0.46
1:A:77:PHE:HB3	1:A:80:LEU:HB3	1.97	0.46
1:A:468:THR:O	1:A:469:LEU:HD23	2.14	0.46
2:B:241:VAL:HG22	2:B:350:LYS:HA	1.97	0.46
2:B:64:LYS:HE2	2:B:69:THR:O	2.16	0.46
2:B:278:GLN:NE2	2:B:298:GLU:HB3	2.22	0.46
1:A:18:GLY:O	1:A:56:TYR:HD1	1.97	0.46
1:A:21:VAL:CG1	1:A:59:PRO:HD3	2.46	0.46
2:B:422:LEU:HD23	2:B:426:TRP:HE1	1.81	0.46
1:A:161:GLN:O	1:A:164:MET:HB3	2.15	0.46
1:A:208:HIS:O	1:A:212:TRP:HD1	1.99	0.46
1:A:487:GLN:C	1:A:489:SER:H	2.19	0.46
2:B:281:LYS:C	2:B:283:LEU:N	2.68	0.46
1:A:335:GLY:HA2	1:A:367:GLN:NE2	2.30	0.46
1:A:438:GLU:CD	1:A:461:ARG:HD2	2.36	0.46
1:A:390:LYS:HA	1:A:415:GLU:O	2.16	0.45
2:B:195:ILE:CG1	2:B:199:ARG:HE	2.30	0.45
1:A:114:ALA:O	1:A:117:SER:HB2	2.16	0.45
1:A:259:LYS:N	1:A:259:LYS:HD3	2.31	0.45
2:B:125:ARG:HB3	2:B:145:GLN:NE2	2.31	0.45
2:B:151:GLN:HB3	2:B:185:ASP:OD1	2.16	0.45
2:B:356:ARG:HG3	2:B:367:GLN:HG2	1.98	0.45
2:B:393:ILE:HG12	2:B:394:GLN:N	2.32	0.45
1:A:51:GLY:N	1:A:52:PRO:HD2	2.31	0.45
1:A:427:TYR:OH	1:A:509:GLN:HA	2.16	0.45
2:B:207:GLN:HA	2:B:207:GLN:OE1	2.17	0.45
2:B:236:PRO:C	2:B:238:LYS:N	2.69	0.45
1:A:229:TRP:O	1:A:230:MET:C	2.53	0.45
1:A:237:ASP:OD1	1:A:238:LYS:HB3	2.17	0.45
1:A:340:GLN:HB3	1:A:351:THR:HG22	1.98	0.45
2:B:203:GLU:O	2:B:207:GLN:HG2	2.16	0.45
1:A:62:ALA:C	1:A:63:ILE:HD12	2.37	0.45
1:A:98:ALA:HB2	1:A:350:LYS:HB2	1.98	0.45
1:A:365:VAL:HG11	1:A:401:TRP:CG	2.52	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:524:GLN:HA	1:A:527:LYS:HD2	1.98	0.45
1:A:247:PRO:O	1:A:307:ARG:NH2	2.49	0.45
1:A:460:ASN:C	1:A:462:GLY:H	2.20	0.45
1:A:548:VAL:O	1:A:552:VAL:HG22	2.16	0.45
2:B:252:TRP:CZ3	2:B:260:LEU:HD22	2.52	0.45
2:B:278:GLN:HE21	2:B:298:GLU:HB2	1.79	0.45
2:B:70:LYS:H	2:B:70:LYS:HG3	1.59	0.44
2:B:98:ALA:CB	2:B:101:LYS:HE3	2.40	0.44
1:A:340:GLN:CB	1:A:351:THR:HG22	2.46	0.44
1:A:509:GLN:N	1:A:510:PRO:HD3	2.32	0.44
1:A:233:GLU:O	1:A:239:TRP:HA	2.17	0.44
1:A:382:ILE:O	2:B:135:ILE:CG2	2.65	0.44
2:B:23:GLN:NE2	2:B:24:TRP:O	2.27	0.44
1:A:178:ILE:N	1:A:178:ILE:HD12	2.32	0.44
2:B:111:VAL:HG11	2:B:187:LEU:HD22	1.98	0.44
1:A:371:ALA:O	1:A:375:ILE:HG13	2.18	0.44
1:A:498:ASP:HA	1:A:536:VAL:O	2.17	0.44
1:A:193:LEU:HB3	1:A:197:GLN:HB3	1.99	0.44
2:B:65:LYS:HE2	2:B:72:ARG:NE	2.33	0.44
2:B:422:LEU:HG	2:B:426:TRP:CZ2	2.53	0.44
2:B:425:LEU:H	2:B:425:LEU:CD1	2.31	0.44
1:A:329:ILE:CG2	1:A:330:GLN:N	2.81	0.44
1:A:420:PRO:HA	1:A:421:PRO:C	2.38	0.44
2:B:332:GLN:NE2	2:B:428:GLN:HG2	2.33	0.44
2:B:380:ILE:O	2:B:384:GLY:CA	2.64	0.44
2:B:395:LYS:HG3	2:B:416:PHE:CE1	2.53	0.44
1:A:410:TRP:CZ2	1:A:412:PRO:HA	2.53	0.43
1:A:547:GLN:HG3	2:B:286:THR:HG22	1.99	0.43
2:B:98:ALA:O	2:B:101:LYS:CG	2.62	0.43
1:A:43:LYS:C	1:A:45:GLY:N	2.71	0.43
1:A:108:ILE:HD12	1:A:188:TYR:CE2	2.53	0.43
1:A:126:LYS:HE3	1:A:127:TYR:CE2	2.53	0.43
1:A:238:LYS:HG2	1:A:239:TRP:N	2.33	0.43
2:B:50:ILE:CG2	2:B:145:GLN:HG2	2.47	0.43
2:B:426:TRP:CE3	2:B:426:TRP:CA	3.02	0.43
1:A:102:LYS:HE2	1:A:102:LYS:HB3	1.79	0.43
1:A:524:GLN:O	1:A:527:LYS:HB2	2.17	0.43
2:B:168:LEU:O	2:B:169:GLU:C	2.55	0.43
2:B:402:TRP:HZ3	2:B:406:TRP:CD2	2.36	0.43
1:A:298:GLU:H	1:A:298:GLU:CD	2.21	0.43
1:A:442:VAL:HG12	1:A:457:TYR:HB3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:41:MET:HB3	2:B:46:LYS:HB2	2.00	0.43
2:B:178:ILE:HG21	2:B:189:VAL:HG12	1.99	0.43
2:B:274:ILE:HD11	2:B:310:LEU:HD21	2.00	0.43
2:B:354:TYR:OH	2:B:370:GLU:HB3	2.18	0.43
1:A:271:TYR:HA	1:A:272:PRO:HD3	1.64	0.43
1:A:366:LYS:HA	1:A:366:LYS:HD2	1.80	0.43
2:B:61:PHE:CD2	2:B:61:PHE:N	2.86	0.43
2:B:418:ASN:ND2	4:B:1021:HOH:O	2.51	0.43
1:A:107:THR:HG22	1:A:108:ILE:N	2.33	0.43
2:B:88:TRP:CE3	2:B:88:TRP:HA	2.53	0.43
2:B:372:VAL:HG13	2:B:389:PHE:CD2	2.54	0.43
1:A:58:THR:CG2	1:A:76:ASP:O	2.63	0.43
1:A:433:PRO:HG3	1:A:532:TYR:CE2	2.54	0.43
2:B:11:LYS:O	2:B:85:GLN:HB3	2.19	0.43
2:B:325:LEU:HD22	2:B:385:LYS:HG3	2.00	0.43
1:A:18:GLY:HA2	1:A:83:ARG:CD	2.48	0.43
1:A:488:ASP:OD2	1:A:488:ASP:N	2.49	0.43
1:A:492:GLU:OE2	1:A:530:LYS:HD2	2.19	0.43
2:B:236:PRO:O	2:B:238:LYS:N	2.51	0.43
2:B:61:PHE:CE1	2:B:74:LEU:HD23	2.54	0.43
2:B:175:ASN:HD21	2:B:201:LYS:NZ	2.17	0.43
1:A:241:VAL:CG2	1:A:314:VAL:HB	2.49	0.43
2:B:282:LEU:CD2	2:B:296:THR:HG23	2.45	0.43
1:A:77:PHE:O	1:A:79:GLU:N	2.51	0.42
2:B:119:PRO:HA	2:B:148:VAL:HA	2.00	0.42
2:B:205:LEU:CD1	2:B:209:LEU:HD22	2.49	0.42
2:B:369:THR:O	2:B:373:GLN:HG3	2.19	0.42
1:A:89:GLU:O	1:A:89:GLU:OE1	2.36	0.42
1:A:77:PHE:C	1:A:79:GLU:N	2.72	0.42
1:A:516:GLU:O	1:A:520:GLN:HG3	2.19	0.42
2:B:101:LYS:HB3	2:B:382:ILE:HA	2.01	0.42
2:B:319:TYR:OH	2:B:321:PRO:HA	2.19	0.42
1:A:255:ASN:HD22	1:A:255:ASN:HA	1.58	0.42
1:A:282:LEU:N	1:A:282:LEU:CD1	2.82	0.42
1:A:519:ASN:HA	1:A:522:ILE:HD12	2.02	0.42
2:B:108:ILE:HG12	2:B:188:TYR:CD2	2.54	0.42
1:A:218:ASP:OD1	1:A:221:HIS:HD2	2.03	0.42
2:B:368:LEU:O	2:B:372:VAL:HG23	2.20	0.42
1:A:77:PHE:O	1:A:78:ARG:C	2.57	0.42
1:A:493:VAL:CG1	1:A:494:ASN:N	2.83	0.42
1:A:210:LEU:C	1:A:212:TRP:H	2.22	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:255:ASN:O	1:A:259:LYS:HG2	2.19	0.42
1:A:271:TYR:CE1	1:A:314:VAL:HG23	2.55	0.42
2:B:33:ALA:O	2:B:37:ILE:HG13	2.20	0.42
2:B:53:GLU:OE1	2:B:53:GLU:N	2.35	0.42
2:B:379:SER:OG	2:B:387:PRO:HD3	2.20	0.42
1:A:330:GLN:NE2	1:A:340:GLN:OE1	2.52	0.42
1:A:540:LYS:C	1:A:542:ILE:H	2.23	0.42
1:A:41:MET:CB	1:A:47:ILE:HG12	2.50	0.42
1:A:103:LYS:HD3	1:A:103:LYS:HA	1.80	0.42
1:A:278:GLN:NE2	1:A:281:LYS:HD2	2.35	0.42
2:B:65:LYS:HE2	2:B:72:ARG:HD3	1.96	0.42
2:B:154:LYS:HA	2:B:184:MET:CE	2.49	0.42
1:A:169:GLU:O	1:A:173:LYS:HD3	2.19	0.41
1:A:206:ARG:HH11	1:A:216:THR:CG2	2.22	0.41
1:A:271:TYR:CZ	1:A:314:VAL:HG23	2.55	0.41
1:A:120:LEU:O	1:A:122:GLU:N	2.53	0.41
2:B:166:LYS:O	2:B:168:LEU:N	2.53	0.41
2:B:178:ILE:HG12	2:B:191:SER:CB	2.47	0.41
2:B:208:HIS:O	2:B:211:ARG:HG3	2.20	0.41
1:A:149:LEU:HA	1:A:150:PRO:HD3	1.81	0.41
2:B:423:VAL:O	2:B:427:TYR:HD2	2.03	0.41
1:A:276:VAL:O	1:A:280:CSD:HB3	2.20	0.41
2:B:373:GLN:O	2:B:377:THR:HG23	2.21	0.41
1:A:288:ALA:O	1:A:291:GLU:HB3	2.21	0.41
1:A:362:THR:HB	1:A:363:ASN:H	1.37	0.41
1:A:210:LEU:C	1:A:212:TRP:N	2.73	0.41
1:A:402:TRP:CH2	2:B:362:THR:HA	2.55	0.41
2:B:182:GLN:HB2	2:B:187:LEU:CD1	2.49	0.41
1:A:239:TRP:HD1	1:A:318:TYR:CE1	2.39	0.41
1:A:344:GLU:HB2	1:A:347:LYS:HD2	2.02	0.41
2:B:114:ALA:N	2:B:214:LEU:HD21	2.34	0.41
2:B:244:ILE:HD13	2:B:266:TRP:HZ3	1.85	0.41
2:B:260:LEU:HD21	2:B:303:LEU:HD21	2.03	0.41
1:A:43:LYS:C	1:A:45:GLY:H	2.24	0.41
1:A:261:VAL:O	1:A:262:GLY:C	2.58	0.41
1:A:317:VAL:HG12	1:A:318:TYR:N	2.36	0.41
1:A:522:ILE:HG22	1:A:526:ILE:HD11	2.02	0.41
1:A:118:VAL:O	1:A:148:VAL:HB	2.20	0.41
1:A:168:LEU:O	1:A:169:GLU:C	2.59	0.41
1:A:225:PRO:HG3	1:A:227:PHE:CE2	2.56	0.41
2:B:191:SER:C	2:B:193:LEU:H	2.24	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:356:ARG:HG3	2:B:367:GLN:CD	2.41	0.41
2:B:171:PHE:CG	2:B:205:LEU:HD23	2.55	0.41
2:B:208:HIS:O	2:B:211:ARG:CG	2.69	0.40
1:A:131:THR:CG2	1:A:132:ILE:N	2.84	0.40
1:A:241:VAL:CG2	1:A:270:ILE:HD13	2.52	0.40
1:A:184:MET:HB3	1:A:185:ASP:H	1.40	0.40
2:B:195:ILE:CG2	2:B:196:GLY:H	2.29	0.40
2:B:244:ILE:HD13	2:B:266:TRP:CZ3	2.57	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	539/560 (96%)	446 (83%)	74 (14%)	19 (4%)	3	12
2	B	389/440 (88%)	335 (86%)	45 (12%)	9 (2%)	6	21
All	All	928/1000 (93%)	781 (84%)	119 (13%)	28 (3%)	4	15

All (28) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	122	GLU
1	A	135	ILE
1	A	538	ALA
2	B	65	LYS
2	B	423	VAL
1	A	113	ASP
1	A	121	ASP
1	A	543	GLY
2	B	85	GLN
2	B	213	GLY

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Mol	Chain	Res	Type
1	A	4	PRO
1	A	89	GLU
1	A	461	ARG
1	A	503	LEU
2	B	237	ASP
2	B	267	ALA
1	A	16	MET
1	A	27	THR
1	A	345	PRO
1	A	40	GLU
1	A	78	ARG
1	A	170	PRO
2	B	311	LYS
1	A	151	GLN
2	B	166	LYS
1	A	169	GLU
2	B	14	PRO
1	A	19	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	487/499 (98%)	445 (91%)	42 (9%)	10	30
2	B	362/400 (90%)	342 (94%)	20 (6%)	21	52
All	All	849/899 (94%)	787 (93%)	62 (7%)	14	38

All (62) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	PRO
1	A	21	VAL
1	A	53	GLU
1	A	86	ASP
1	A	89	GLU

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Mol	Chain	Res	Type
1	A	91	GLN
1	A	92	LEU
1	A	94	ILE
1	A	113	ASP
1	A	120	LEU
1	A	136	ASN
1	A	137	ASN
1	A	138	GLU
1	A	143	ARG
1	A	145	GLN
1	A	151	GLN
1	A	184	MET
1	A	194	GLU
1	A	197	GLN
1	A	205	LEU
1	A	206	ARG
1	A	216	THR
1	A	218	ASP
1	A	224	GLU
1	A	238	LYS
1	A	240	THR
1	A	249	LYS
1	A	255	ASN
1	A	324	ASP
1	A	340	GLN
1	A	356	ARG
1	A	362	THR
1	A	368	LEU
1	A	373	GLN
1	A	402	TRP
1	A	403	THR
1	A	413	GLU
1	A	459	THR
1	A	474	ASN
1	A	488	ASP
1	A	517	LEU
1	A	529	GLU
2	B	8	VAL
2	B	11	LYS
2	B	40	GLU
2	B	61	PHE
2	B	70	LYS

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Mol	Chain	Res	Type
2	B	88	TRP
2	B	139	THR
2	B	165	THR
2	B	167	ILE
2	B	189	VAL
2	B	209	LEU
2	B	233	GLU
2	B	277	ARG
2	B	287	LYS
2	B	291	GLU
2	B	325	LEU
2	B	350	LYS
2	B	358	ARG
2	B	368	LEU
2	B	425	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (28) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	57	ASN
1	A	136	ASN
1	A	137	ASN
1	A	145	GLN
1	A	147	ASN
1	A	151	GLN
1	A	174	GLN
1	A	221	HIS
1	A	222	GLN
1	A	235	HIS
1	A	255	ASN
1	A	265	ASN
1	A	278	GLN
1	A	336	GLN
1	A	367	GLN
1	A	474	ASN
1	A	500	GLN
1	A	547	GLN
2	B	57	ASN
2	B	147	ASN
2	B	161	GLN
2	B	175	ASN
2	B	197	GLN

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Mol	Chain	Res	Type
2	B	208	HIS
2	B	278	GLN
2	B	332	GLN
2	B	336	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	0.99	0	1,8,10	7.07	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	7.07	118.99	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.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	280	CSD	1	0

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	-	15,23,23	1.56	6 (40%)	13,34,34	1.08	0

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	-	-	0/0/6/6	0/3/4/4

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	999	NVP	C13-N14	2.31	1.37	1.32
3	A	999	NVP	C7-C2	2.27	1.41	1.38
3	A	999	NVP	C10-C15	2.24	1.43	1.41
3	A	999	NVP	C12-C11	2.16	1.41	1.36
3	A	999	NVP	C4-N3	2.11	1.36	1.32
3	A	999	NVP	C5-C4	2.03	1.42	1.38

There are no bond angle outliers.

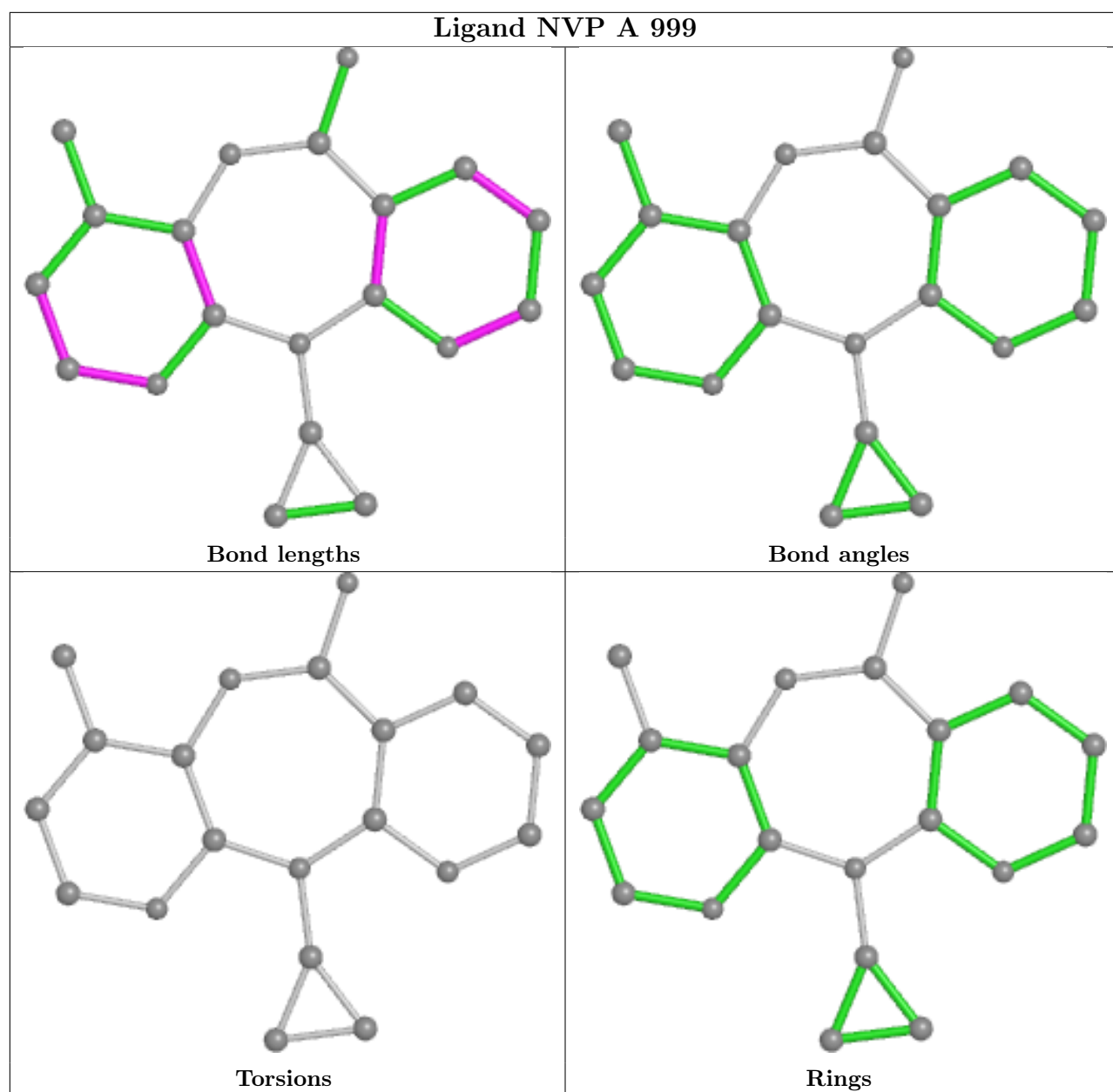
There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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	545/560 (97%)	0.00	28 (5%) 28 19	31, 79, 133, 150	0
2	B	397/440 (90%)	0.04	22 (5%) 25 16	39, 81, 130, 150	0
All	All	942/1000 (94%)	0.02	50 (5%) 26 17	31, 80, 132, 150	0

All (50) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	54	ASN	4.6
1	A	3	SER	4.6
1	A	448	ARG	4.5
1	A	245	VAL	4.5
1	A	19	PRO	4.3
1	A	62	ALA	4.2
1	A	52	PRO	4.1
2	B	213	GLY	4.0
2	B	69	THR	3.6
1	A	55	PRO	3.6
1	A	472	THR	3.4
1	A	451	LYS	3.3
2	B	356	ARG	3.3
2	B	334	GLN	3.3
2	B	184	MET	3.2
1	A	20	LYS	3.2
2	B	66	LYS	3.1
2	B	87	PHE	3.0
1	A	130	PHE	2.9
1	A	51	GLY	2.9
1	A	53	GLU	2.9
2	B	362	THR	2.8
2	B	67	ASP	2.8
2	B	88	TRP	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	4	PRO	2.8
1	A	2	ILE	2.7
1	A	28	GLU	2.7
2	B	357	MET	2.7
1	A	30	LYS	2.6
1	A	144	TYR	2.6
1	A	24	TRP	2.6
2	B	64	LYS	2.6
2	B	195	ILE	2.4
2	B	197	GLN	2.4
2	B	201	LYS	2.3
2	B	68	SER	2.3
2	B	354	TYR	2.3
1	A	72	ARG	2.3
2	B	7	THR	2.2
1	A	142	ILE	2.2
2	B	70	LYS	2.2
1	A	89	GLU	2.2
2	B	6	GLU	2.2
1	A	471	ASP	2.1
1	A	289	LEU	2.1
2	B	234	LEU	2.1
1	A	71	TRP	2.1
1	A	554	ALA	2.0
1	A	138	GLU	2.0
2	B	152	GLY	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	0.87	0.15	71,79,95,99	0

6.3 Carbohydrates [i](#)

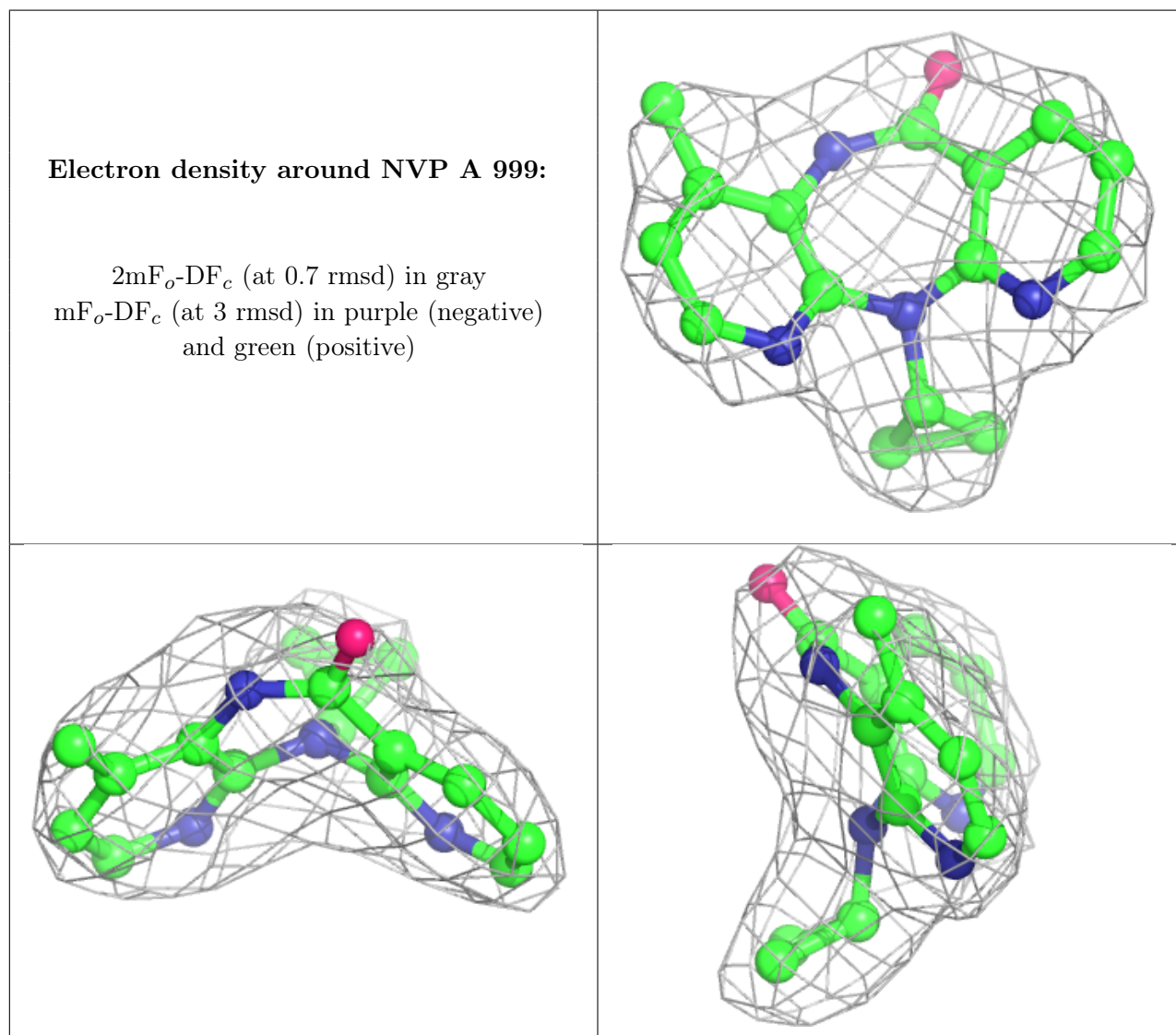
There are no monosaccharides in this entry.

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(Å ²)	Q<0.9
3	NVP	A	999	20/20	0.97	0.16	47,55,61,67	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.