



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 10:05 PM GMT

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](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

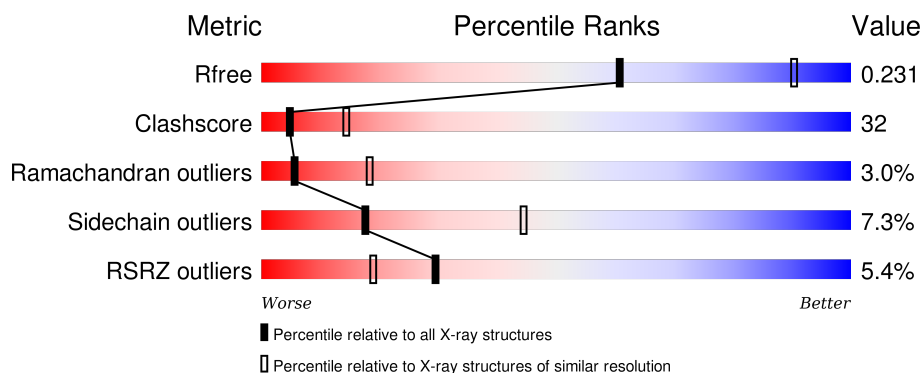
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 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))
$R_{free}$	91344	2393 (2.80-2.80)
Clashscore	102246	2827 (2.80-2.80)
Ramachandran outliers	100387	2782 (2.80-2.80)
Sidechain outliers	100360	2784 (2.80-2.80)
RSRZ outliers	91569	2404 (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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	560	<div> <div>5%</div> <div>43%</div> <div>48%</div> <div>7%</div> <div>.</div> </div>
2	B	440	<div> <div>5%</div> <div>45%</div> <div>41%</div> <div>5%</div> <div>10%</div> </div>

## 2 Entry composition

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
1	A	546	Total	C	N	O	S	0	0	0
			4459	2883	743	825	8			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	108	ILE	VAL	ENGINEERED	UNP P04585
A	280	CSD	CYS	MODIFIED RESIDUE	UNP P04585

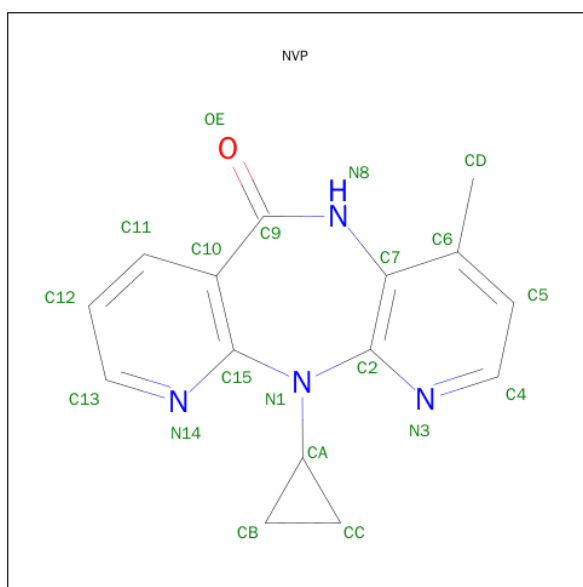
- Molecule 2 is a protein called Reverse transcriptase.

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

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	108	ILE	VAL	ENGINEERED	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: C<sub>15</sub>H<sub>14</sub>N<sub>4</sub>O).



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

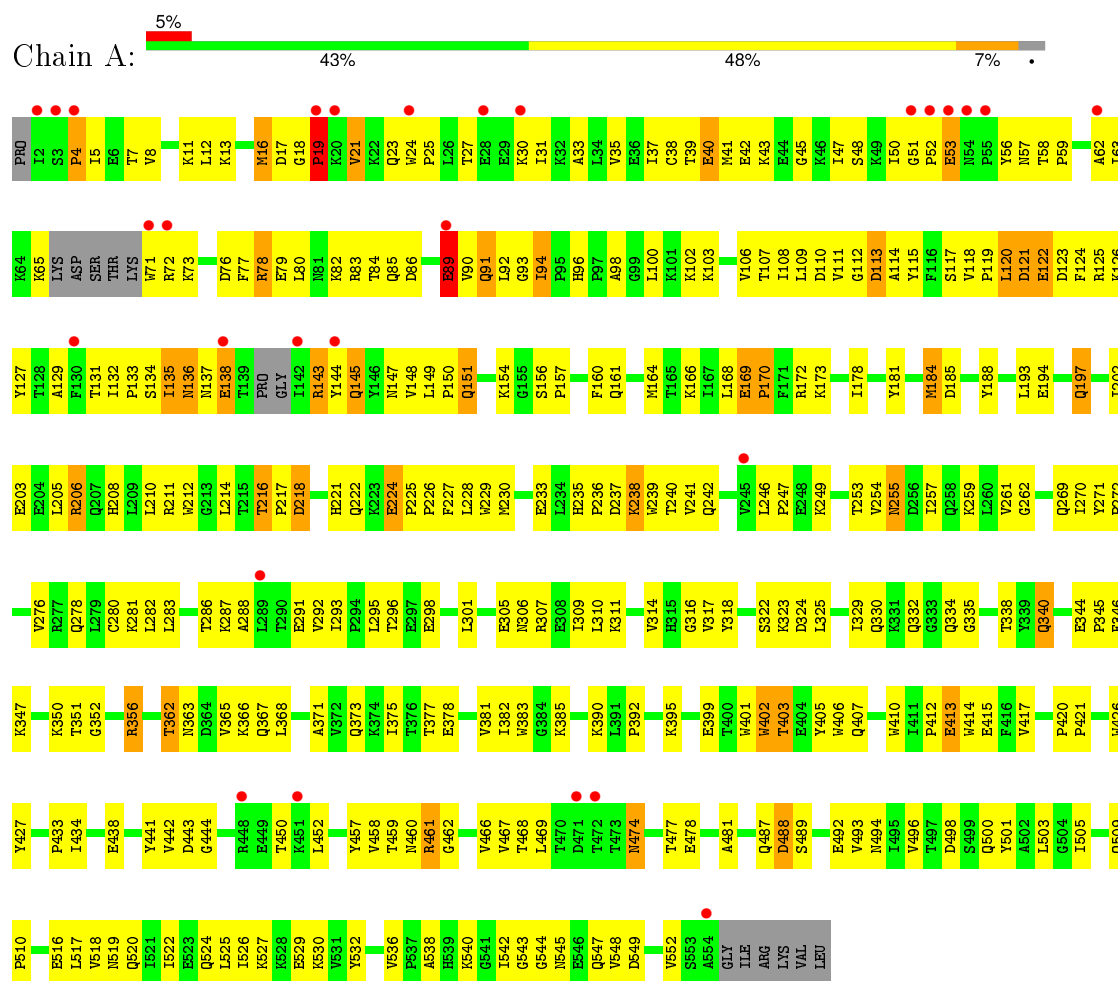
- Molecule 4 is water.

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

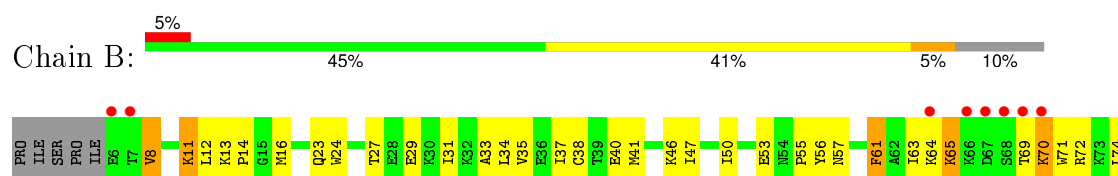
### 3 Residue-property plots

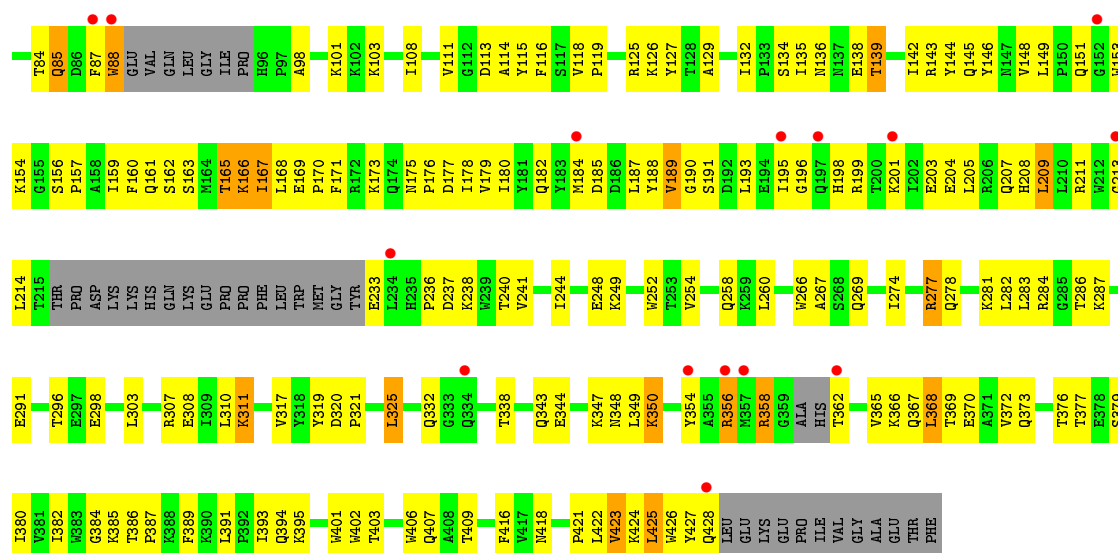
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according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

#### • Molecule 1: 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, $\alpha$ , $\beta$ , $\gamma$	138.40 Å   109.00 Å   72.80 Å 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
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.69 (at 2.80 Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, $R_{free}$	0.235   ,   0.295 0.231   ,   0.231	Depositor DCC
$R_{free}$ test set	1313 reflections (5.11%)	DCC
Wilson B-factor (Å <sup>2</sup> )	74.6	Xtriage
Anisotropy	0.542	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 78.2	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	0 of 27001 reflections	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	7790	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	84.0	wwPDB-VP

Xtriage'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.*

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

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

## 5 Model quality [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:HD2	2:B:358:ARG:H	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:CD	2:B:358:ARG:H	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:HB3	1:A:206:ARG:NH1	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
2:B:56:TYR:HE2	2:B:126:LYS:HE2	1.46	0.78
1:A:77:PHE:CD2	1:A:80:LEU:HD23	2.18	0.78
1:A:94:ILE:H	1:A:94:ILE:HD13	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:52:PRO:C	1:A:53:GLU:HG3	2.07	0.74
1:A:23:GLN:O	1:A:25:PRO:HD3	1.88	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:77:PHE:HD2	1:A:80:LEU:HD23	1.52	0.72
1:A:31:ILE:O	1:A:35:VAL:HG23	1.90	0.72
1:A:385:LYS:HB3	1:A:385:LYS:NZ	2.04	0.71
1:A:50:ILE:HB	1:A:145:GLN:HG2	1.73	0.71
1:A:50:ILE:HG13	1:A:51:GLY:N	2.05	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:NH1	1:A:143:ARG:HG2	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:239:TRP:CE2	1:A:316:GLY:HA3	2.27	0.68
1:A:12:LEU:HD13	1:A:17:ASP:HA	1.76	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
2:B:163:SER:HA	2:B:166:LYS:HD3	1.78	0.64
1:A:501:TYR:CZ	1:A:505:ILE:HD11	2.32	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:138:GLU:HG2	1:A:138:GLU:O	1.96	0.64
1:A:84:THR:O	1:A:154:LYS:NZ	2.31	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
2:B:65:LYS:O	2:B:407:GLN:NE2	2.31	0.63
1:A:441:TYR:CD2	1:A:544:GLY:HA3	2.33	0.63
2:B:191:SER:CB	2:B:193:LEU:HD13	2.23	0.63
1:A:122:GLU:HG2	1:A:123:ASP:H	1.62	0.63
1:A:30:LYS:HD3	1:A:62:ALA:HB3	1.80	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
1:A:5:ILE:HD11	1:A:166:LYS:NZ	2.13	0.63
2:B:298:GLU:N	2:B:298:GLU:OE1	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
2:B:195:ILE:HG23	2:B:196:GLY:H	1.63	0.62
1:A:37:ILE:O	1:A:40:GLU:HB3	1.99	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
2:B:240:THR:O	2:B:350:LYS:HG2	2.02	0.60
1:A:170:PRO:HA	1:A:173:LYS:HD3	1.82	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
2:B:65:LYS:NZ	2:B:409:THR:HG22	2.18	0.59
2:B:57:ASN:HB2	2:B:143:ARG:HH12	1.67	0.59
1:A:522:ILE:O	1:A:526:ILE:HG13	2.03	0.59
1:A:169:GLU:HB3	1:A:170:PRO:HD3	1.84	0.58
1:A:72:ARG:HD3	1:A:73:LYS:H	1.68	0.58
2:B:422:LEU:O	2:B:424:LYS:N	2.36	0.58
2:B:64:LYS:HE3	2:B:71:TRP:CE2	2.37	0.58
1:A:434:ILE:HD13	1:A:530:LYS:HB3	1.84	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
2:B:113:ASP:O	2:B:116:PHE:HD2	1.87	0.57
1:A:111:VAL:HG21	1:A:114:ALA:HB2	1.86	0.57
1:A:493:VAL:HG12	1:A:494:ASN:N	2.19	0.57
2:B:249:LYS:NZ	2:B:249:LYS:HB2	2.15	0.57
2:B:162:SER:O	2:B:165:THR:HG23	2.04	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
2:B:57:ASN:HD22	2:B:143:ARG:HH12	1.53	0.57
1:A:111:VAL:HG22	1:A:185:ASP:HB3	1.87	0.57
1:A:31:ILE:CG1	1:A:133:PRO:HB2	2.33	0.57
1:A:98:ALA:CB	1:A:350:LYS:HB2	2.35	0.57
2:B:350:LYS:NZ	2:B:382:ILE:CD1	2.67	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:269:GLN:HB3	1:A:352:GLY:HA2	1.86	0.57
1:A:122:GLU:HG2	1:A:123:ASP:N	2.20	0.56
1:A:65:LYS:HB2	1:A:71:TRP:N	2.20	0.56
1:A:335:GLY:HA2	1:A:367:GLN:HE21	1.70	0.56
1:A:181:TYR:HB3	1:A:188:TYR:HB2	1.88	0.56
2:B:425:LEU:H	2:B:425:LEU:HD13	1.69	0.56
1:A:210:LEU:HD22	1:A:214:LEU:O	2.04	0.56
1:A:21:VAL:HG13	1:A:59:PRO:HD3	1.88	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: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:38:CYS:SG	2:B:132:ILE:HD11	2.46	0.55
2:B:195:ILE:HD11	2:B:199:ARG:NE	2.16	0.55
2:B:8:VAL:HG11	2:B:159:ILE:HG23	1.89	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
2:B:178:ILE:CG2	2:B:189:VAL:HG12	2.38	0.53
1:A:63:ILE:N	1:A:63:ILE:HD12	2.23	0.53
1:A:108:ILE:C	1:A:109:LEU:HD12	2.29	0.53
2:B:153:TRP:O	2:B:157:PRO:HD2	2.08	0.53
1:A:287:LYS:HG2	1:A:291:GLU:OE2	2.09	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
2:B:180:ILE:HG12	2:B:189:VAL:CG1	2.30	0.52
1:A:119:PRO:HA	1:A:148:VAL:HG12	1.91	0.52
1:A:58:THR:HG23	1:A:59:PRO:HD2	1.90	0.52
2:B:65:LYS:HZ3	2:B:409:THR:HG22	1.73	0.52
2:B:136:ASN:C	2:B:138:GLU:N	2.62	0.52
1:A:402:TRP:CD1	1:A:402:TRP:C	2.83	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:283:LEU:O	2:B:284:ARG:C	2.49	0.52
2:B:205:LEU:O	2:B:205:LEU:HD13	2.09	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
2:B:132:ILE:HB	2:B:142:ILE:HB	1.92	0.51
1:A:377:THR:O	1:A:381:VAL:HG23	2.11	0.51
1:A:305:GLU:O	1:A:309:ILE:HG13	2.10	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
2:B:344:GLU:CB	2:B:347:LYS:HE3	2.39	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
1:A:134:SER:O	1:A:135:ILE:C	2.47	0.51
1:A:405:TYR:CE2	1:A:407:GLN:HB3	2.46	0.51
1:A:332:GLN:HG2	1:A:332:GLN:O	2.11	0.51
1:A:77:PHE:HD2	1:A:80:LEU:CD2	2.20	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:23:GLN:NE2	1:A:24:TRP:H	2.09	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:C	2:B:205:LEU:HD13	2.30	0.50
1:A:254:VAL:HG22	1:A:286:THR:HG21	1.94	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:545:ASN:O	1:A:549:ASP:HB2	2.12	0.50
1:A:334:GLN:O	1:A:356:ARG:HD3	2.12	0.50
2:B:115:TYR:HB3	2:B:149:LEU:HB2	1.92	0.50
1:A:441:TYR:HA	1:A:496:VAL:HG22	1.94	0.50
1:A:246:LEU:HB2	1:A:307:ARG:NH1	2.27	0.50
1:A:474:ASN:O	1:A:478:GLU:HG2	2.12	0.50
1:A:18:GLY:N	1:A:19:PRO:HD3	2.27	0.50
1:A:402:TRP:CZ2	2:B:362:THR:HA	2.47	0.50
1:A:90:VAL:HG23	1:A:90:VAL:O	2.11	0.50
2:B:195:ILE:CG2	2:B:196:GLY:N	2.74	0.50
2:B:266:TRP:CH2	2:B:426:TRP:HB3	2.47	0.50
1:A:229:TRP:CD1	1:A:230:MET:HG2	2.47	0.50
2:B:278:GLN:OE1	2:B:278:GLN:HA	2.10	0.49
1:A:108:ILE:HD12	1:A:188:TYR:CZ	2.47	0.49
2:B:379:SER:CB	2:B:387:PRO:HD3	2.42	0.49
1:A:254:VAL:HG13	1:A:283:LEU:CD1	2.38	0.49
1:A:329:ILE:O	1:A:392:PRO:HD3	2.12	0.49
2:B:136:ASN:C	2:B:138:GLU:H	2.15	0.49
1:A:317:VAL:HG12	1:A:318:TYR:H	1.77	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:277:ARG:H	2:B:277:ARG:HD2	1.78	0.49
2:B:108:ILE:HG12	2:B:188:TYR:CE2	2.47	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
2:B:425:LEU:N	2:B:425:LEU:CD1	2.76	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:332:GLN:HG3	2:B:338:THR:HG23	1.93	0.49
2:B:248:GLU:HG2	2:B:307:ARG:NH2	2.28	0.49
2:B:389:PHE:HB3	2:B:391:LEU:CD2	2.42	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:356:ARG:CZ	2:B:362:THR:N	2.76	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: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:211:ARG:HG2	1:A:211:ARG:NH1	2.27	0.48
1:A:124:PHE:O	1:A:127:TYR:HD2	1.94	0.48
2:B:365:VAL:O	2:B:369:THR:HG23	2.12	0.48
2:B:178:ILE:HG22	2:B:179:VAL:N	2.27	0.48
1:A:298:GLU:O	1:A:301:LEU:HB3	2.13	0.48
1:A:524:GLN:HA	1:A:524:GLN:OE1	2.14	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:115:TYR:OH	1:A:157:PRO:HG3	2.13	0.48
1:A:206:ARG:HB3	1:A:206:ARG:HH11	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:HA	2:B:426:TRP:HE3	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:52:PRO:O	1:A:53:GLU:HG3	2.12	0.48
1:A:121:ASP:O	1:A:123:ASP:N	2.47	0.48
1:A:48:SER:HB2	1:A:147:ASN:ND2	2.18	0.48
1:A:94:ILE:HD13	1:A:94:ILE:N	2.17	0.48
2:B:132:ILE:HB	2:B:142:ILE:HD12	1.96	0.48
1:A:33:ALA:HB1	1:A:71:TRP:HB2	1.95	0.47
1:A:16:MET:HE1	1:A:82:LYS:HE2	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:407:GLN:CG	2:B:393:ILE:HA	2.44	0.47
1:A:346:PHE:N	1:A:346:PHE:CD2	2.81	0.47
1:A:110:ASP:O	1:A:217:PRO:CD	2.62	0.47
2:B:63:ILE:HD13	2:B:74:LEU:HD22	1.97	0.47
1:A:41:MET:HB2	1:A:47:ILE:CD1	2.44	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:HB3	2:B:428:GLN:HE21	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)
2:B:136:ASN:O	2:B:138:GLU:N	2.48	0.47
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
1:A:237:ASP:C	1:A:237:ASP:OD1	2.52	0.46
1:A:19:PRO:O	1:A:56:TYR:HA	2.15	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
2:B:241:VAL:HG22	2:B:350:LYS:HA	1.97	0.46
1:A:468:THR:O	1:A:469:LEU:HD23	2.14	0.46
2:B:278:GLN:NE2	2:B:298:GLU:HB3	2.22	0.46
2:B:64:LYS:HE2	2:B:69:THR:O	2.16	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:208:HIS:O	1:A:212:TRP:HD1	1.99	0.46
1:A:161:GLN:O	1:A:164:MET:HB3	2.15	0.46
2:B:281:LYS:C	2:B:283:LEU:N	2.68	0.46
1:A:487:GLN:C	1:A:489:SER:H	2.19	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:HD3	1:A:259:LYS:N	2.31	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
2:B:151:GLN:HB3	2:B:185:ASP:OD1	2.16	0.45
2:B:125:ARG:HB3	2:B:145:GLN:NE2	2.31	0.45
1:A:51:GLY:N	1:A:52:PRO:HD2	2.31	0.45
2:B:236:PRO:C	2:B:238:LYS:N	2.69	0.45
2:B:207:GLN:HA	2:B:207:GLN:OE1	2.17	0.45
1:A:427:TYR:OH	1:A:509:GLN:HA	2.16	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
1:A:229:TRP:O	1:A:230:MET:C	2.53	0.45
2:B:203:GLU:O	2:B:207:GLN:HG2	2.16	0.45
1:A:98:ALA:HB2	1:A:350:LYS:HB2	1.98	0.45
1:A:62:ALA:C	1:A:63:ILE:HD12	2.37	0.45
1:A:524:GLN:HA	1:A:527:LYS:HD2	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:365:VAL:HG11	1:A:401:TRP:CG	2.52	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:98:ALA:CB	2:B:101:LYS:HE3	2.40	0.44
2:B:70:LYS:HG3	2:B:70:LYS:H	1.59	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:382:ILE:O	2:B:135:ILE:CG2	2.65	0.44
1:A:233:GLU:O	1:A:239:TRP:HA	2.17	0.44
2:B:23:GLN:NE2	2:B:24:TRP:O	2.27	0.44
1:A:178:ILE:HD12	1:A:178:ILE:N	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
2:B:65:LYS:HE2	2:B:72:ARG:NE	2.33	0.44
2:B:425:LEU:H	2:B:425:LEU:CD1	2.31	0.44
2:B:422:LEU:HG	2:B:426:TRP:CZ2	2.53	0.44
1:A:193:LEU:HB3	1:A:197:GLN:HB3	1.99	0.44
2:B:380:ILE:O	2:B:384:GLY:CA	2.64	0.44
1:A:329:ILE:CG2	1:A:330:GLN:N	2.81	0.44
2:B:332:GLN:NE2	2:B:428:GLN:HG2	2.33	0.44
1:A:420:PRO:HA	1:A:421:PRO:C	2.38	0.44
2:B:395:LYS:HG3	2:B:416:PHE:CE1	2.53	0.44
2:B:98:ALA:O	2:B:101:LYS:CG	2.62	0.43
1:A:547:GLN:HG3	2:B:286:THR:HG22	1.99	0.43
1:A:410:TRP:CZ2	1:A:412:PRO:HA	2.53	0.43
1:A:238:LYS:HG2	1:A:239:TRP:N	2.33	0.43
2:B:426:TRP:CE3	2:B:426:TRP:CA	3.02	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
2:B:50:ILE:CG2	2:B:145:GLN:HG2	2.47	0.43
1:A:43:LYS:C	1:A:45:GLY:N	2.71	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:524:GLN:O	1:A:527:LYS:HB2	2.17	0.43
1:A:102:LYS:HB3	1:A:102:LYS:HE2	1.79	0.43
2:B:178:ILE:HG21	2:B:189:VAL:HG12	1.99	0.43
2:B:354:TYR:OH	2:B:370:GLU:HB3	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:442:VAL:HG12	1:A:457:TYR:HB3	2.00	0.43
1:A:298:GLU:H	1:A:298:GLU:CD	2.21	0.43
2:B:41:MET:HB3	2:B:46:LYS:HB2	2.00	0.43
2:B:274:ILE:HD11	2:B:310:LEU:HD21	2.00	0.43
1:A:271:TYR:HA	1:A:272:PRO:HD3	1.64	0.43
2:B:418:ASN:ND2	4:B:1021:HOH:O	2.51	0.43
2:B:61:PHE:CD2	2:B:61:PHE:N	2.86	0.43
1:A:366:LYS:HD2	1:A:366:LYS:HA	1.80	0.43
2:B:372:VAL:HG13	2:B:389:PHE:CD2	2.54	0.43
2:B:88:TRP:HA	2:B:88:TRP:CE3	2.53	0.43
1:A:107:THR:HG22	1:A:108:ILE:N	2.33	0.43
1:A:58:THR:CG2	1:A:76:ASP:O	2.63	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:433:PRO:HG3	1:A:532:TYR:CE2	2.54	0.43
1:A:18:GLY:HA2	1:A:83:ARG:CD	2.48	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
1:A:488:ASP:N	1:A:488:ASP:OD2	2.49	0.43
2:B:175:ASN:HD21	2:B:201:LYS:NZ	2.17	0.43
2:B:61:PHE:CE1	2:B:74:LEU:HD23	2.54	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: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
2:B:119:PRO:HA	2:B:148:VAL:HA	2.00	0.42
1:A:89:GLU:OE1	1:A:89:GLU:O	2.36	0.42
2:B:101:LYS:HB3	2:B:382:ILE:HA	2.01	0.42
1:A:77:PHE:C	1:A:79:GLU:N	2.72	0.42
2:B:319:TYR:OH	2:B:321:PRO:HA	2.19	0.42
1:A:516:GLU:O	1:A:520:GLN:HG3	2.19	0.42
1:A:282:LEU:CD1	1:A:282:LEU:N	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:255:ASN:HD22	1:A:255:ASN:HA	1.58	0.42
2:B:368:LEU:O	2:B:372:VAL:HG23	2.20	0.42
1:A:218:ASP:OD1	1:A:221:HIS:HD2	2.03	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:271:TYR:CE1	1:A:314:VAL:HG23	2.55	0.42
1:A:255:ASN:O	1:A:259:LYS:HG2	2.19	0.42
2:B:379:SER:OG	2:B:387:PRO:HD3	2.20	0.42
2:B:53:GLU:OE1	2:B:53:GLU:N	2.35	0.42
2:B:33:ALA:O	2:B:37:ILE:HG13	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
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:278:GLN:NE2	1:A:281:LYS:HD2	2.35	0.42
1:A:41:MET:CB	1:A:47:ILE:HG12	2.50	0.42
1:A:103:LYS:HA	1:A:103:LYS:HD3	1.80	0.42
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:169:GLU:O	1:A:173:LYS:HD3	2.19	0.41
2:B:178:ILE:HG12	2:B:191:SER:CB	2.47	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: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
2:B:373:GLN:O	2:B:377:THR:HG23	2.21	0.41
1:A:276:VAL:O	1:A:280:CSD:HB3	2.20	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
2:B:182:GLN:HB2	2:B:187:LEU:CD1	2.49	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:114:ALA:N	2:B:214:LEU:HD21	2.34	0.41
1:A:239:TRP:HD1	1:A:318:TYR:CE1	2.39	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:344:GLU:HB2	1:A:347:LYS:HD2	2.02	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: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
2:B:191:SER:C	2:B:193:LEU:H	2.24	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

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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:241:VAL:CG2	1:A:270:ILE:HD13	2.52	0.40
1:A:131:THR:CG2	1:A:132:ILE:N	2.84	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

### 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	539/560 (96%)	446 (83%)	74 (14%)	19 (4%)	4	15
2	B	389/440 (88%)	335 (86%)	45 (12%)	9 (2%)	8	26
All	All	928/1000 (93%)	781 (84%)	119 (13%)	28 (3%)	5	18

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 ⓘ

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%)	13	36
2	B	362/400 (90%)	342 (94%)	20 (6%)	27	59
All	All	849/899 (94%)	787 (93%)	62 (7%)	17	44

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

Some 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 ⓘ

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	$\# Z  > 2$
1	CSD	A	280	1	3,7,8	0.92	0	3,8,10	4.84	1 (33%)

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	-	1/2/6/8	0/0/0/0

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	8.15	118.99	105.40

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
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 carbohydrates 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	-	18,23,23	1.34	4 (22%)	18,34,34	1.12	1 (5%)

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	0/2/4/4

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	999	NVP	C4-N3	2.11	1.36	1.32

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	999	NVP	C12-C11	2.16	1.41	1.36
3	A	999	NVP	C13-N14	2.31	1.37	1.32
3	A	999	NVP	C10-C15	2.67	1.43	1.40

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	999	NVP	CB-CA-N1	-2.07	116.12	118.25

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, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å <sup>2</sup> )	Q<0.9
1	A	545/560 (97%)	0.02	28 (5%)	32	21	31, 79, 133, 150	0
2	B	397/440 (90%)	0.05	23 (5%)	26	16	39, 81, 130, 150	0
All	All	942/1000 (94%)	0.03	51 (5%)	29	19	31, 80, 132, 150	0

All (51) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	54	ASN	4.8
1	A	3	SER	4.7
1	A	245	VAL	4.6
1	A	19	PRO	4.4
1	A	448	ARG	4.4
1	A	52	PRO	4.3
1	A	62	ALA	4.2
2	B	213	GLY	4.1
2	B	69	THR	3.7
1	A	55	PRO	3.7
1	A	472	THR	3.4
2	B	334	GLN	3.4
1	A	451	LYS	3.4
1	A	20	LYS	3.3
2	B	184	MET	3.3
2	B	66	LYS	3.2
2	B	356	ARG	3.1
2	B	87	PHE	3.1
1	A	51	GLY	2.9
1	A	53	GLU	2.9
2	B	67	ASP	2.9
1	A	130	PHE	2.9
2	B	362	THR	2.9
2	B	88	TRP	2.9

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Mol	Chain	Res	Type	RSRZ
1	A	28	GLU	2.8
1	A	4	PRO	2.8
1	A	2	ILE	2.8
1	A	30	LYS	2.7
1	A	24	TRP	2.7
1	A	144	TYR	2.7
2	B	357	MET	2.7
2	B	64	LYS	2.6
2	B	195	ILE	2.5
2	B	197	GLN	2.4
2	B	68	SER	2.4
2	B	201	LYS	2.4
2	B	354	TYR	2.3
2	B	7	THR	2.3
1	A	89	GLU	2.3
2	B	70	LYS	2.3
2	B	6	GLU	2.3
1	A	142	ILE	2.2
1	A	471	ASP	2.2
1	A	72	ARG	2.2
1	A	71	TRP	2.2
1	A	289	LEU	2.1
2	B	234	LEU	2.1
1	A	138	GLU	2.1
2	B	152	GLY	2.1
1	A	554	ALA	2.1
2	B	428	GLN	2.1

## 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> 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	LLDF	B-factors(Å <sup>2</sup> )	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> 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	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
3	NVP	A	999	20/20	0.97	0.16	-0.03	47,55,61,67	0

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

There are no such residues in this entry.