



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 21, 2018 – 05:59 AM EST

PDB ID : 1TKT  
Title : CRYSTAL STRUCTURE OF HIV-1 REVERSE TRANSCRIPTASE IN  
COMPLEX WITH GW426318  
Authors : Hopkins, A.L.; Ren, J.; Stuart, D.I.; Stammers, D.K.  
Deposited on : 2004-06-09  
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](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 : 1.7.2 (RC1), CSD as538be (2017)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20030736  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
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) : rb-20030736

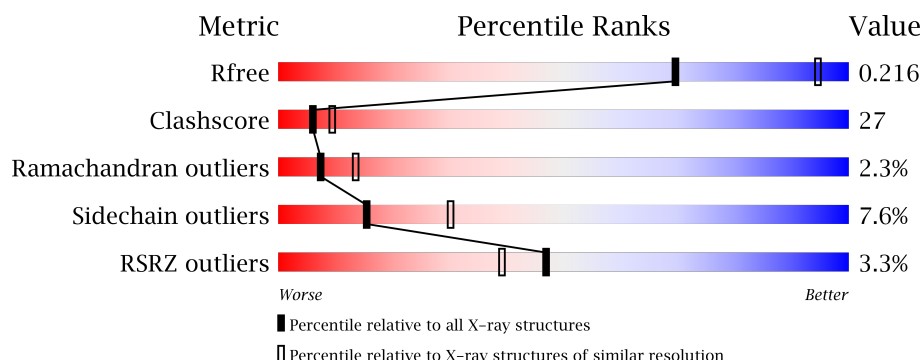
# 1 Overall quality at a glance

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))
$R_{free}$	100719	2542 (2.60-2.60)
Clashscore	112137	2895 (2.60-2.60)
Ramachandran outliers	110173	2848 (2.60-2.60)
Sidechain outliers	110143	2848 (2.60-2.60)
RSRZ outliers	101464	2550 (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 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	
2	B	440	

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 7624 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 Pol polyproteins [Reverse transcriptase], Chain A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	516	Total	C	N	O	S	0	0	0
			4238	2748	699	783	8			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	280	CSD	CYS	MODIFIED RESIDUE	UNP P04585

- Molecule 2 is a protein called Pol polyproteins [Reverse transcriptase], Chain B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	399	Total	C	N	O	S	0	0	0
			3311	2162	546	596	7			

- Molecule 3 is PHOSPHATE ION (three-letter code: PO4) (formula: O<sub>4</sub>P).

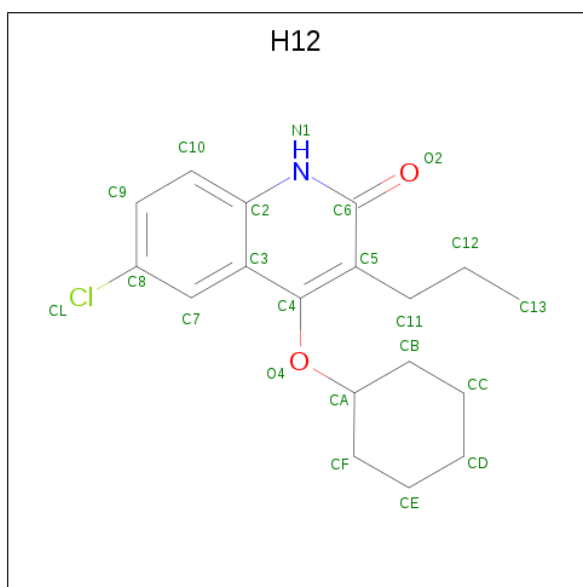


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O P 5 4 1	0	0
3	A	1	Total O P 5 4 1	0	0
3	A	1	Total O P 5 4 1	0	0

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

- Molecule 5 is 6-CHLORO-4-(CYCLOHEXYLOXY)-3-PROPYLQUINOLIN-2(1H)-ONE (three-letter code: H12) (formula: C<sub>18</sub>H<sub>22</sub>ClNO<sub>2</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C Cl N O 22 18 1 1 2	0	0

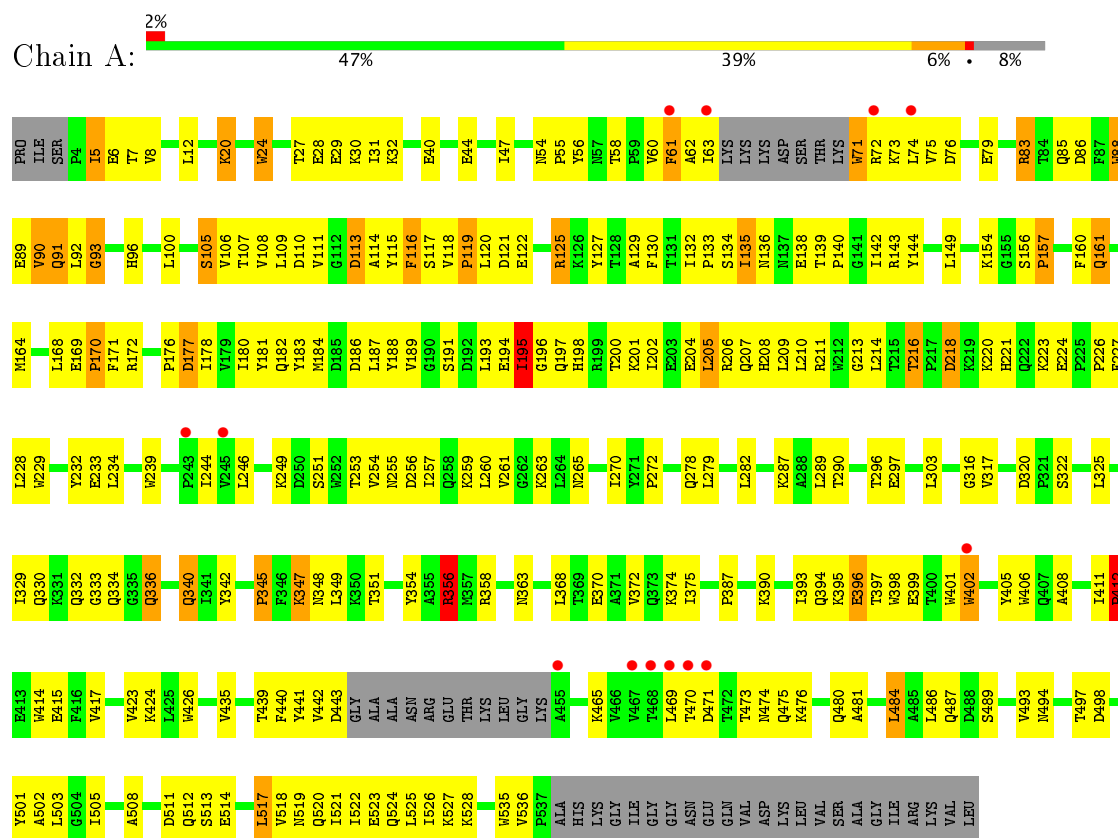
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	23	Total O 23 23	0	0
6	B	14	Total O 14 14	0	0

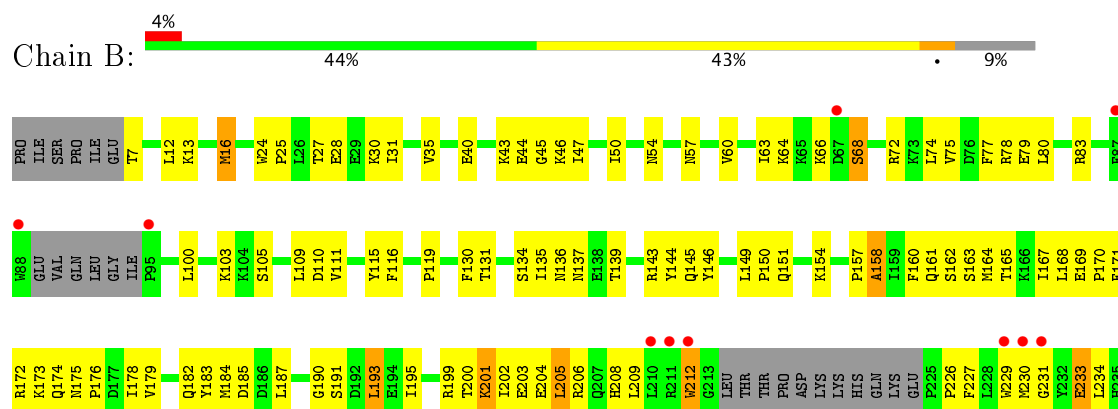
### 3 Residue-property plots

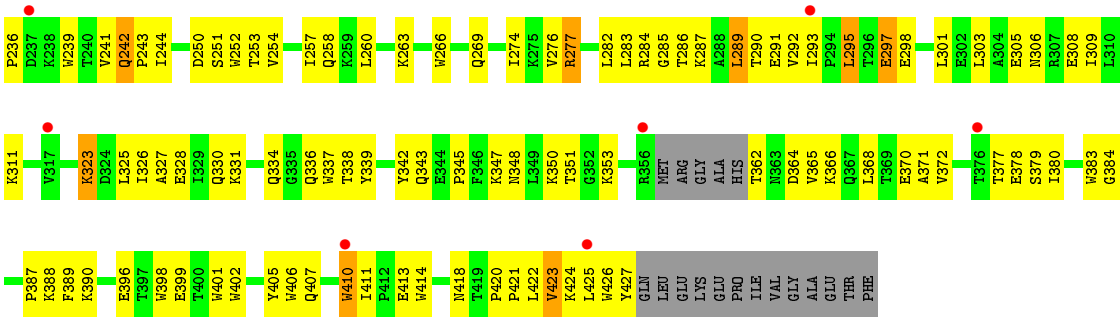
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are 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: Pol polyproteins [Reverse transcriptase], Chain A



- Molecule 2: Pol polyproteins [Reverse transcriptase], Chain B





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	138.20 Å   115.10 Å   65.20 Å 90.00°   90.00°   90.00°	Depositor
Resolution (Å)	29.83 – 2.60 29.83 – 2.60	Depositor EDS
% Data completeness (in resolution range)	86.7 (29.83-2.60) 86.7 (29.83-2.60)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.38 (at 2.61 Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.208   ,   0.282 0.200   ,   0.216	Depositor DCC
$R_{free}$ test set	1380 reflections (4.86%)	DCC
Wilson B-factor (Å <sup>2</sup> )	55.1	Xtriage
Anisotropy	0.125	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 73.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	7624	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	65.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.50% 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, 0.333 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: PO4, CSD, MG, H12

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	0.57	0/4343	0.76	2/5907 (0.0%)
2	B	0.53	0/3408	0.74	0/4629
All	All	0.56	0/7751	0.75	2/10536 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	93	GLY	N-CA-C	-7.51	94.32	113.10
1	A	88	TRP	N-CA-C	-5.15	97.08	111.00

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	4238	0	4262	235	1
2	B	3311	0	3336	193	0
3	A	15	0	0	0	0
4	A	1	0	0	0	0
5	A	22	0	22	2	0
6	A	23	0	0	0	0
6	B	14	0	0	1	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	7624	0	7620	416	1

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 27.

All (416) 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:164:MET:O	1:A:168:LEU:HD23	1.52	1.10
2:B:66:LYS:HE3	2:B:230:MET:HG3	1.35	1.06
1:A:195:ILE:H	1:A:195:ILE:HD12	1.22	1.04
1:A:206:ARG:HH12	1:A:218:ASP:HA	1.28	0.98
1:A:28:GLU:HG3	1:A:135:ILE:CG2	1.98	0.92
1:A:517:LEU:HA	1:A:520:GLN:HE21	1.35	0.91
2:B:66:LYS:CE	2:B:230:MET:HG3	2.01	0.91
1:A:28:GLU:HG3	1:A:135:ILE:HG21	1.55	0.88
2:B:227:PHE:HB3	2:B:231:GLY:HA2	1.53	0.88
2:B:40:GLU:HG3	2:B:44:GLU:OE2	1.76	0.86
1:A:5:ILE:H	1:A:5:ILE:HD12	1.39	0.84
2:B:169:GLU:HG2	2:B:170:PRO:HD3	1.60	0.84
1:A:469:LEU:HD21	1:A:480:GLN:HG3	1.60	0.84
2:B:323:LYS:HE3	2:B:323:LYS:HA	1.58	0.83
1:A:161:GLN:HA	1:A:182:GLN:HE22	1.46	0.80
1:A:206:ARG:NH1	1:A:218:ASP:HA	1.97	0.79
2:B:175:ASN:ND2	2:B:201:LYS:HD3	1.98	0.79
1:A:191:SER:HB2	1:A:193:LEU:HG	1.64	0.78
2:B:295:LEU:HD12	2:B:295:LEU:H	1.49	0.78
2:B:178:ILE:HD11	2:B:201:LYS:HG2	1.65	0.78
2:B:13:LYS:HD2	2:B:16:MET:CE	2.16	0.75
2:B:295:LEU:HD12	2:B:295:LEU:N	2.02	0.75
2:B:234:LEU:HD21	2:B:377:THR:CG2	2.15	0.75
2:B:239:TRP:CH2	2:B:378:GLU:HG2	2.22	0.75
1:A:5:ILE:HD13	1:A:119:PRO:HD2	1.70	0.73
1:A:61:PHE:CE2	1:A:74:LEU:HG	2.24	0.73
1:A:253:THR:HG22	1:A:289:LEU:O	1.90	0.72
1:A:393:ILE:HB	1:A:423:VAL:HG22	1.72	0.72
2:B:13:LYS:HD2	2:B:16:MET:HE3	1.73	0.71
1:A:195:ILE:HD12	1:A:195:ILE:N	2.03	0.71
2:B:362:THR:HG22	2:B:366:LYS:HD3	1.71	0.71
1:A:412:PRO:HG3	2:B:401:TRP:CZ2	2.25	0.71
1:A:246:LEU:HD22	1:A:260:LEU:HD11	1.73	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:517:LEU:HA	1:A:520:GLN:NE2	2.06	0.71
1:A:358:ARG:HD3	1:A:370:GLU:CD	2.11	0.70
1:A:412:PRO:HG3	2:B:401:TRP:HZ2	1.56	0.70
2:B:252:TRP:CZ3	2:B:260:LEU:HD22	2.27	0.70
1:A:116:PHE:H	1:A:116:PHE:HD2	1.37	0.70
2:B:151:GLN:HB3	2:B:185:ASP:OD1	1.93	0.69
1:A:354:TYR:CZ	1:A:356:ARG:HB3	2.28	0.69
1:A:406:TRP:CH2	2:B:418:ASN:HA	2.28	0.69
2:B:163:SER:O	2:B:167:ILE:HG13	1.93	0.69
2:B:57:ASN:HD22	2:B:143:ARG:NH1	1.90	0.69
2:B:297:GLU:O	2:B:301:LEU:HG	1.93	0.68
2:B:234:LEU:HD21	2:B:377:THR:HG21	1.74	0.68
1:A:228:LEU:HD21	1:A:233:GLU:HG3	1.76	0.68
1:A:5:ILE:HD12	1:A:5:ILE:N	2.08	0.68
1:A:194:GLU:HA	1:A:194:GLU:OE1	1.92	0.67
1:A:442:VAL:HB	1:A:481:ALA:HB1	1.76	0.67
2:B:227:PHE:CB	2:B:231:GLY:HA2	2.26	0.66
2:B:331:LYS:O	2:B:424:LYS:HE2	1.95	0.66
2:B:345:PRO:O	2:B:347:LYS:HG3	1.96	0.66
1:A:27:THR:HG22	1:A:29:GLU:H	1.60	0.65
2:B:242:GLN:HG2	2:B:353:LYS:NZ	2.11	0.65
1:A:105:SER:HB2	1:A:198:HIS:CD2	2.32	0.65
2:B:13:LYS:HB2	2:B:16:MET:CE	2.27	0.65
1:A:395:LYS:HD3	1:A:414:TRP:CZ2	2.31	0.65
2:B:79:GLU:O	2:B:83:ARG:HG3	1.96	0.65
2:B:111:VAL:HG11	2:B:187:LEU:HD22	1.78	0.65
2:B:131:THR:OG1	2:B:143:ARG:HD2	1.95	0.65
1:A:30:LYS:HE3	1:A:71:TRP:CH2	2.32	0.64
2:B:7:THR:HG22	2:B:119:PRO:HG2	1.79	0.64
2:B:66:LYS:HB2	2:B:407:GLN:HE22	1.62	0.64
1:A:114:ALA:HB1	1:A:160:PHE:CE2	2.33	0.63
1:A:108:VAL:C	1:A:109:LEU:HD23	2.19	0.63
1:A:296:THR:HG22	1:A:297:GLU:N	2.13	0.63
1:A:253:THR:CG2	1:A:289:LEU:O	2.46	0.63
2:B:103:LYS:HE3	2:B:191:SER:HA	1.79	0.63
1:A:96:HIS:H	2:B:136:ASN:HD21	1.47	0.63
1:A:30:LYS:HD3	1:A:62:ALA:HB3	1.80	0.62
1:A:469:LEU:CD2	1:A:480:GLN:HG3	2.29	0.62
1:A:411:ILE:O	1:A:412:PRO:O	2.17	0.62
1:A:62:ALA:C	1:A:63:ILE:HD12	2.19	0.62
2:B:227:PHE:HB3	2:B:231:GLY:CA	2.25	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:47:ILE:HD12	1:A:144:TYR:CD2	2.34	0.62
1:A:12:LEU:HD11	1:A:127:TYR:CE1	2.34	0.62
1:A:340:GLN:HB3	1:A:351:THR:HG22	1.82	0.62
1:A:503:LEU:HD13	1:A:535:TRP:HB2	1.80	0.62
1:A:116:PHE:CD2	1:A:116:PHE:N	2.63	0.62
2:B:366:LYS:O	2:B:370:GLU:HG3	1.99	0.62
1:A:72:ARG:HG2	1:A:73:LYS:N	2.14	0.62
2:B:167:ILE:O	2:B:208:HIS:HE1	1.81	0.62
1:A:89:GLU:C	1:A:91:GLN:H	2.03	0.62
1:A:12:LEU:HD11	1:A:127:TYR:CZ	2.35	0.61
2:B:182:GLN:HB2	2:B:187:LEU:CD1	2.30	0.61
2:B:208:HIS:CE1	2:B:212:TRP:HZ3	2.18	0.61
2:B:308:GLU:OE1	2:B:311:LYS:HD2	2.01	0.61
1:A:164:MET:SD	1:A:168:LEU:HD21	2.40	0.61
2:B:66:LYS:HE3	2:B:230:MET:CG	2.22	0.61
2:B:200:THR:O	2:B:204:GLU:HG3	1.99	0.61
2:B:372:VAL:HG13	2:B:389:PHE:CZ	2.36	0.61
2:B:66:LYS:HB2	2:B:407:GLN:NE2	2.16	0.61
1:A:195:ILE:H	1:A:195:ILE:CD1	1.99	0.61
2:B:175:ASN:N	2:B:176:PRO:HD3	2.16	0.61
1:A:469:LEU:HD21	1:A:480:GLN:CG	2.31	0.61
2:B:284:ARG:O	2:B:287:LYS:NZ	2.31	0.60
1:A:171:PHE:CE2	1:A:205:LEU:HG	2.37	0.60
1:A:24:TRP:HZ3	1:A:61:PHE:HB3	1.65	0.60
1:A:60:VAL:HG22	1:A:75:VAL:HG13	1.82	0.60
1:A:498:ASP:HA	1:A:536:VAL:O	2.00	0.60
1:A:61:PHE:HE2	1:A:74:LEU:HG	1.66	0.60
1:A:72:ARG:HG2	1:A:73:LYS:H	1.67	0.60
1:A:56:TYR:O	1:A:143:ARG:NH2	2.28	0.60
2:B:282:LEU:HB3	2:B:293:ILE:HG21	1.83	0.60
1:A:111:VAL:CG1	1:A:114:ALA:HB2	2.31	0.60
1:A:129:ALA:HA	1:A:144:TYR:O	2.02	0.59
1:A:399:GLU:HG3	1:A:402:TRP:CE3	2.37	0.59
1:A:40:GLU:HG3	1:A:44:GLU:OE1	2.01	0.59
2:B:239:TRP:CZ2	2:B:378:GLU:HG2	2.37	0.59
2:B:274:ILE:HG23	2:B:306:ASN:OD1	2.03	0.59
2:B:169:GLU:N	2:B:170:PRO:HD2	2.17	0.59
1:A:136:ASN:OD1	1:A:139:THR:HG23	2.03	0.59
1:A:194:GLU:O	1:A:198:HIS:N	2.34	0.59
2:B:236:PRO:HA	2:B:239:TRP:CD2	2.38	0.58
1:A:398:TRP:CE2	1:A:411:ILE:HD12	2.37	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:73:LYS:HE2	1:A:75:VAL:CG2	2.33	0.58
2:B:169:GLU:HG2	2:B:170:PRO:CD	2.33	0.58
2:B:172:ARG:O	2:B:176:PRO:HG3	2.03	0.58
2:B:236:PRO:HA	2:B:239:TRP:CE2	2.39	0.58
1:A:393:ILE:HD12	1:A:423:VAL:CG2	2.34	0.58
1:A:115:TYR:O	1:A:149:LEU:HB2	2.03	0.58
1:A:142:ILE:HD12	1:A:144:TYR:OH	2.04	0.57
2:B:45:GLY:HA2	6:B:1020:HOH:O	2.02	0.57
1:A:347:LYS:O	1:A:347:LYS:HG2	2.05	0.57
1:A:61:PHE:N	1:A:61:PHE:HD2	2.01	0.57
1:A:24:TRP:HZ3	1:A:61:PHE:CG	2.22	0.57
2:B:105:SER:O	2:B:190:GLY:HA2	2.04	0.57
1:A:279:LEU:HD23	1:A:282:LEU:HD11	1.85	0.57
2:B:103:LYS:HE2	2:B:179:VAL:HG23	1.86	0.57
1:A:89:GLU:OE1	1:A:90:VAL:HG23	2.05	0.57
2:B:28:GLU:HA	2:B:135:ILE:HD11	1.87	0.56
1:A:113:ASP:HB2	1:A:116:PHE:CD2	2.41	0.56
2:B:167:ILE:HG23	2:B:212:TRP:CE3	2.40	0.56
1:A:239:TRP:NE1	1:A:316:GLY:HA3	2.21	0.56
1:A:439:THR:HG22	1:A:441:TYR:CE1	2.41	0.56
2:B:266:TRP:O	2:B:269:GLN:HG2	2.06	0.56
2:B:154:LYS:O	2:B:157:PRO:HD2	2.06	0.55
1:A:164:MET:CE	1:A:168:LEU:HD21	2.36	0.55
1:A:27:THR:HG22	1:A:29:GLU:N	2.20	0.55
1:A:332:GLN:HG2	1:A:332:GLN:O	2.06	0.55
1:A:108:VAL:HG13	1:A:223:LYS:HB2	1.88	0.55
1:A:24:TRP:CZ3	1:A:61:PHE:HB3	2.40	0.55
1:A:27:THR:O	1:A:30:LYS:N	2.39	0.55
2:B:254:VAL:O	2:B:258:GLN:HG3	2.07	0.55
1:A:111:VAL:HG13	1:A:214:LEU:HD22	1.88	0.55
1:A:61:PHE:N	1:A:61:PHE:CD2	2.73	0.55
2:B:330:GLN:HB2	2:B:338:THR:OG1	2.06	0.55
1:A:28:GLU:HG3	1:A:135:ILE:HG22	1.89	0.55
2:B:368:LEU:O	2:B:372:VAL:HG23	2.07	0.54
1:A:435:VAL:HG22	2:B:290:THR:HG21	1.89	0.54
1:A:501:TYR:CZ	1:A:505:ILE:HD11	2.43	0.54
2:B:372:VAL:HG13	2:B:389:PHE:CE2	2.42	0.54
1:A:122:GLU:HA	1:A:125:ARG:HD2	1.88	0.54
1:A:475:GLN:HB3	1:A:501:TYR:CE2	2.42	0.54
2:B:13:LYS:HB2	2:B:16:MET:HE2	1.89	0.54
1:A:228:LEU:CD2	1:A:233:GLU:HG3	2.38	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:201:LYS:O	1:A:204:GLU:HB3	2.07	0.54
2:B:201:LYS:HA	2:B:201:LYS:HE3	1.88	0.54
2:B:60:VAL:HG12	2:B:75:VAL:HG22	1.87	0.54
1:A:169:GLU:HB2	1:A:170:PRO:CD	2.38	0.54
1:A:177:ASP:O	1:A:178:ILE:HD13	2.08	0.54
2:B:178:ILE:CD1	2:B:201:LYS:HG2	2.35	0.54
1:A:74:LEU:HD12	1:A:75:VAL:N	2.24	0.53
2:B:295:LEU:H	2:B:295:LEU:CD1	2.20	0.53
2:B:171:PHE:CE1	2:B:205:LEU:HA	2.44	0.53
1:A:106:VAL:HA	1:A:189:VAL:O	2.08	0.53
1:A:176:PRO:C	1:A:178:ILE:H	2.12	0.53
2:B:195:ILE:HD11	2:B:233:GLU:HG3	1.91	0.53
2:B:380:ILE:O	2:B:384:GLY:N	2.38	0.53
1:A:325:LEU:HB3	1:A:387:PRO:HB3	1.90	0.53
2:B:57:ASN:HD22	2:B:143:ARG:HH12	1.57	0.53
1:A:518:VAL:O	1:A:522:ILE:HG13	2.09	0.52
1:A:89:GLU:C	1:A:91:GLN:N	2.63	0.52
2:B:244:ILE:HD13	2:B:266:TRP:CZ3	2.45	0.52
2:B:63:ILE:HG21	2:B:74:LEU:HD22	1.92	0.52
2:B:379:SER:CB	2:B:387:PRO:HD3	2.40	0.52
2:B:242:GLN:HG2	2:B:353:LYS:HZ3	1.72	0.52
1:A:417:VAL:O	1:A:417:VAL:HG13	2.09	0.52
2:B:193:LEU:HD12	2:B:193:LEU:H	1.74	0.52
1:A:399:GLU:OE1	1:A:402:TRP:HZ3	1.93	0.52
2:B:423:VAL:HA	2:B:426:TRP:CE3	2.45	0.52
1:A:111:VAL:HG11	1:A:114:ALA:HB2	1.92	0.51
2:B:168:LEU:O	2:B:172:ARG:HG3	2.10	0.51
2:B:191:SER:HB2	2:B:193:LEU:HD13	1.92	0.51
1:A:168:LEU:O	1:A:172:ARG:HB2	2.09	0.51
1:A:111:VAL:HG12	1:A:114:ALA:HB2	1.93	0.51
1:A:31:ILE:HG12	1:A:133:PRO:HG2	1.93	0.51
2:B:258:GLN:HG2	2:B:283:LEU:HD21	1.91	0.51
1:A:330:GLN:NE2	1:A:340:GLN:OE1	2.39	0.51
2:B:64:LYS:HE2	2:B:68:SER:O	2.10	0.51
2:B:325:LEU:HD21	2:B:383:TRP:CE3	2.45	0.51
1:A:278:GLN:HA	1:A:278:GLN:NE2	2.25	0.50
2:B:193:LEU:N	2:B:193:LEU:HD12	2.26	0.50
1:A:329:ILE:HG22	1:A:330:GLN:N	2.26	0.50
1:A:523:GLU:O	1:A:527:LYS:HG2	2.11	0.50
2:B:326:ILE:HG22	2:B:327:ALA:N	2.26	0.50
1:A:28:GLU:O	1:A:32:LYS:HG3	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:522:ILE:HA	1:A:525:LEU:HD12	1.93	0.50
1:A:188:TYR:CD2	5:A:999:H12:HF1	2.45	0.50
1:A:368:LEU:O	1:A:372:VAL:HG23	2.12	0.50
2:B:202:ILE:HG21	2:B:227:PHE:HE1	1.77	0.50
1:A:88:TRP:HB2	2:B:54:ASN:O	2.11	0.50
2:B:161:GLN:O	2:B:164:MET:HB3	2.12	0.50
1:A:396:GLU:HG3	1:A:397:THR:N	2.26	0.49
1:A:73:LYS:HE2	1:A:75:VAL:HG22	1.94	0.49
2:B:27:THR:OG1	2:B:30:LYS:HG2	2.12	0.49
2:B:254:VAL:HG23	2:B:291:GLU:O	2.12	0.49
1:A:29:GLU:OE1	1:A:71:TRP:CZ2	2.65	0.49
2:B:160:PHE:CD1	2:B:164:MET:HB2	2.47	0.49
1:A:5:ILE:CD1	1:A:5:ILE:H	2.16	0.49
1:A:93:GLY:O	2:B:137:ASN:HB3	2.12	0.49
2:B:234:LEU:HD21	2:B:377:THR:HG22	1.92	0.49
2:B:398:TRP:O	2:B:402:TRP:HD1	1.95	0.49
1:A:226:PRO:HA	1:A:234:LEU:O	2.13	0.49
2:B:229:TRP:CE3	2:B:229:TRP:HA	2.48	0.49
2:B:44:GLU:O	2:B:46:LYS:HE3	2.13	0.49
2:B:420:PRO:HA	2:B:421:PRO:HD3	1.69	0.49
1:A:210:LEU:O	1:A:213:GLY:N	2.41	0.49
1:A:246:LEU:HD22	1:A:260:LEU:CD1	2.41	0.49
2:B:323:LYS:HB2	2:B:343:GLN:NE2	2.28	0.49
1:A:86:ASP:HA	1:A:154:LYS:HZ1	1.78	0.48
1:A:398:TRP:NE1	1:A:411:ILE:HD12	2.27	0.48
2:B:193:LEU:H	2:B:193:LEU:CD1	2.24	0.48
2:B:253:THR:HA	2:B:292:VAL:HA	1.93	0.48
2:B:13:LYS:HB2	2:B:16:MET:HE3	1.96	0.48
1:A:340:GLN:HA	1:A:351:THR:HA	1.95	0.48
2:B:174:GLN:C	2:B:176:PRO:HD3	2.34	0.48
2:B:183:TYR:CD1	2:B:184:MET:HG2	2.49	0.48
2:B:342:TYR:HB3	2:B:348:ASN:HA	1.95	0.48
1:A:253:THR:HG22	1:A:254:VAL:N	2.29	0.48
1:A:408:ALA:HB2	2:B:337:TRP:HH2	1.78	0.48
1:A:79:GLU:OE2	1:A:83:ARG:NH1	2.47	0.48
1:A:408:ALA:HB1	2:B:364:ASP:HB3	1.96	0.48
1:A:329:ILE:HD11	1:A:375:ILE:HD12	1.96	0.48
2:B:257:ILE:HG21	2:B:283:LEU:HD13	1.95	0.48
1:A:393:ILE:CB	1:A:423:VAL:HG22	2.42	0.48
2:B:136:ASN:O	2:B:137:ASN:HB2	2.14	0.48
2:B:40:GLU:OE2	2:B:43:LYS:HD2	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:120:LEU:HD12	1:A:121:ASP:N	2.29	0.47
2:B:110:ASP:HB3	2:B:226:PRO:HG2	1.96	0.47
1:A:390:LYS:HD2	1:A:415:GLU:OE2	2.13	0.47
1:A:90:VAL:HG12	1:A:90:VAL:O	2.14	0.47
2:B:57:ASN:ND2	2:B:143:ARG:NH1	2.60	0.47
2:B:63:ILE:HD11	2:B:72:ARG:HD3	1.95	0.47
1:A:24:TRP:HZ3	1:A:61:PHE:CB	2.27	0.47
2:B:285:GLY:O	2:B:287:LYS:HG3	2.14	0.47
1:A:218:ASP:O	1:A:221:HIS:N	2.45	0.47
1:A:393:ILE:HD12	1:A:423:VAL:HG21	1.96	0.47
2:B:205:LEU:HD22	2:B:209:LEU:HG	1.95	0.47
1:A:108:VAL:O	1:A:109:LEU:HD23	2.14	0.47
1:A:206:ARG:HG2	1:A:216:THR:OG1	2.14	0.47
1:A:253:THR:CG2	1:A:290:THR:HA	2.45	0.47
1:A:169:GLU:N	1:A:170:PRO:HD2	2.30	0.47
1:A:342:TYR:HA	1:A:349:LEU:CD1	2.44	0.47
1:A:494:ASN:HB3	2:B:289:LEU:HD22	1.96	0.47
1:A:255:ASN:O	1:A:259:LYS:HG3	2.15	0.47
2:B:420:PRO:HB2	2:B:423:VAL:HG23	1.97	0.47
1:A:29:GLU:OE1	1:A:71:TRP:HZ2	1.97	0.47
1:A:399:GLU:HA	1:A:402:TRP:HE3	1.80	0.47
2:B:28:GLU:CA	2:B:135:ILE:HD11	2.45	0.47
1:A:253:THR:HG22	1:A:255:ASN:H	1.80	0.47
1:A:296:THR:CG2	1:A:297:GLU:N	2.78	0.47
1:A:469:LEU:HD11	1:A:480:GLN:HE21	1.80	0.47
2:B:146:TYR:CG	2:B:150:PRO:HB3	2.50	0.47
1:A:107:THR:HG23	1:A:198:HIS:NE2	2.30	0.46
1:A:270:ILE:O	1:A:272:PRO:HD3	2.15	0.46
1:A:401:TRP:CH2	1:A:508:ALA:O	2.68	0.46
1:A:522:ILE:O	1:A:526:ILE:HG13	2.15	0.46
2:B:103:LYS:CE	2:B:191:SER:HA	2.45	0.46
1:A:426:TRP:N	1:A:426:TRP:CD1	2.83	0.46
1:A:465:LYS:HD2	1:A:484:LEU:HD21	1.97	0.46
2:B:388:LYS:HE2	2:B:413:GLU:OE1	2.15	0.46
2:B:12:LEU:O	2:B:13:LYS:C	2.53	0.46
1:A:401:TRP:HH2	1:A:508:ALA:O	1.97	0.46
1:A:517:LEU:CA	1:A:520:GLN:HE21	2.18	0.46
1:A:90:VAL:O	1:A:91:GLN:C	2.54	0.46
2:B:103:LYS:HE3	2:B:191:SER:CA	2.45	0.46
2:B:47:ILE:HD12	2:B:144:TYR:CD1	2.50	0.46
2:B:28:GLU:CB	2:B:135:ILE:HD11	2.46	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:203:GLU:O	2:B:206:ARG:HB2	2.16	0.46
1:A:134:SER:OG	1:A:139:THR:O	2.28	0.45
1:A:363:ASN:ND2	1:A:401:TRP:CH2	2.84	0.45
2:B:60:VAL:HG11	2:B:130:PHE:CD1	2.51	0.45
1:A:114:ALA:HA	1:A:117:SER:OG	2.16	0.45
1:A:180:ILE:HA	1:A:188:TYR:O	2.16	0.45
2:B:208:HIS:CE1	2:B:212:TRP:CZ3	3.02	0.45
1:A:107:THR:OG1	1:A:202:ILE:HD12	2.16	0.45
1:A:195:ILE:CD1	1:A:195:ILE:N	2.73	0.45
1:A:405:TYR:O	2:B:331:LYS:HD3	2.16	0.45
2:B:227:PHE:CG	2:B:231:GLY:HA2	2.52	0.45
2:B:77:PHE:CD2	2:B:80:LEU:HD23	2.51	0.45
1:A:349:LEU:N	1:A:349:LEU:HD12	2.32	0.45
1:A:502:ALA:O	1:A:505:ILE:HB	2.17	0.45
2:B:276:VAL:O	2:B:277:ARG:C	2.53	0.45
1:A:71:TRP:HA	1:A:71:TRP:CE3	2.52	0.45
1:A:406:TRP:CZ3	2:B:418:ASN:HA	2.51	0.45
1:A:183:TYR:O	1:A:184:MET:HB2	2.17	0.45
1:A:279:LEU:HA	1:A:282:LEU:CD1	2.46	0.45
2:B:100:LEU:O	2:B:103:LYS:HG2	2.16	0.45
2:B:328:GLU:O	2:B:339:TYR:HA	2.17	0.45
2:B:31:ILE:O	2:B:35:VAL:HG23	2.16	0.45
1:A:106:VAL:HG12	1:A:227:PHE:HE2	1.82	0.45
1:A:228:LEU:HA	1:A:232:TYR:O	2.17	0.45
1:A:363:ASN:HA	1:A:511:ASP:OD1	2.16	0.45
1:A:156:SER:HB2	1:A:157:PRO:HD3	1.99	0.45
1:A:108:VAL:HA	1:A:187:LEU:O	2.16	0.45
1:A:85:GLN:C	1:A:154:LYS:HZ3	2.20	0.45
1:A:186:ASP:HB3	1:A:188:TYR:CE1	2.52	0.44
1:A:261:VAL:O	1:A:265:ASN:OD1	2.35	0.44
1:A:486:LEU:O	1:A:528:LYS:NZ	2.49	0.44
2:B:28:GLU:HB2	2:B:135:ILE:CD1	2.47	0.44
2:B:285:GLY:O	2:B:287:LYS:N	2.50	0.44
2:B:366:LYS:HG3	2:B:405:TYR:CD2	2.51	0.44
1:A:332:GLN:HB3	1:A:336:GLN:HB3	1.98	0.44
2:B:208:HIS:NE2	2:B:212:TRP:HZ3	2.14	0.44
1:A:194:GLU:HB2	1:A:197:GLN:HB3	1.99	0.44
1:A:333:GLY:O	1:A:334:GLN:C	2.55	0.44
2:B:206:ARG:NH2	2:B:227:PHE:CG	2.86	0.44
1:A:20:LYS:HD2	1:A:55:PRO:HB2	1.99	0.44
1:A:63:ILE:N	1:A:63:ILE:HD12	2.33	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:208:HIS:O	1:A:211:ARG:HB2	2.18	0.44
2:B:229:TRP:HA	2:B:229:TRP:HE3	1.82	0.44
1:A:497:THR:O	1:A:535:TRP:HA	2.18	0.44
2:B:146:TYR:CD2	2:B:150:PRO:HB3	2.53	0.44
1:A:320:ASP:OD2	1:A:322:SER:OG	2.32	0.43
2:B:348:ASN:HD22	2:B:351:THR:CG2	2.31	0.43
2:B:325:LEU:O	2:B:387:PRO:HA	2.18	0.43
1:A:132:ILE:HB	1:A:142:ILE:HG13	2.01	0.43
1:A:111:VAL:CG1	1:A:214:LEU:HD22	2.49	0.43
2:B:170:PRO:HG2	2:B:208:HIS:NE2	2.33	0.43
2:B:242:GLN:HG2	2:B:353:LYS:HZ2	1.80	0.43
2:B:406:TRP:HZ2	2:B:410:TRP:O	2.00	0.43
1:A:249:LYS:HZ3	1:A:256:ASP:CG	2.22	0.43
1:A:473:THR:O	1:A:474:ASN:C	2.56	0.43
2:B:160:PHE:HD1	2:B:164:MET:HB2	1.82	0.43
2:B:24:TRP:CD1	2:B:25:PRO:HD2	2.53	0.43
1:A:194:GLU:O	1:A:195:ILE:C	2.57	0.43
2:B:50:ILE:CG2	2:B:145:GLN:HG2	2.48	0.43
2:B:169:GLU:N	2:B:170:PRO:CD	2.82	0.43
2:B:205:LEU:O	2:B:209:LEU:HG	2.18	0.43
2:B:328:GLU:HG2	2:B:390:LYS:HD2	1.99	0.43
1:A:89:GLU:O	1:A:91:GLN:N	2.51	0.43
1:A:100:LEU:HB3	5:A:999:H12:C6	2.48	0.43
2:B:66:LYS:HG2	2:B:230:MET:SD	2.59	0.43
2:B:396:GLU:CD	2:B:396:GLU:H	2.22	0.43
1:A:118:VAL:HA	1:A:119:PRO:HD2	1.86	0.43
2:B:134:SER:HB2	2:B:139:THR:OG1	2.19	0.43
2:B:173:LYS:HA	2:B:176:PRO:HG3	2.00	0.43
1:A:196:GLY:O	1:A:200:THR:OG1	2.27	0.43
1:A:198:HIS:C	1:A:200:THR:N	2.72	0.43
2:B:239:TRP:CZ3	2:B:378:GLU:HG2	2.53	0.43
2:B:227:PHE:CB	2:B:231:GLY:CA	2.93	0.43
2:B:241:VAL:O	2:B:243:PRO:HD3	2.18	0.43
1:A:139:THR:HA	1:A:140:PRO:HD3	1.82	0.42
1:A:181:TYR:CE1	1:A:183:TYR:HB2	2.54	0.42
1:A:440:PHE:CZ	1:A:489:SER:HB3	2.54	0.42
1:A:440:PHE:CE1	1:A:489:SER:HB3	2.54	0.42
2:B:157:PRO:O	2:B:161:GLN:N	2.51	0.42
2:B:242:GLN:CG	2:B:353:LYS:NZ	2.80	0.42
2:B:115:TYR:HB3	2:B:149:LEU:HB2	2.01	0.42
1:A:513:SER:HB3	1:A:519:ASN:ND2	2.33	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:521:ILE:HG22	1:A:525:LEU:HD11	2.01	0.42
1:A:227:PHE:HB2	1:A:234:LEU:HB2	2.02	0.42
1:A:90:VAL:O	1:A:92:LEU:N	2.53	0.42
2:B:175:ASN:HD21	2:B:201:LYS:NZ	2.17	0.42
2:B:158:ALA:O	2:B:161:GLN:N	2.50	0.42
2:B:168:LEU:C	2:B:170:PRO:HD2	2.40	0.42
1:A:194:GLU:O	1:A:197:GLN:N	2.53	0.42
1:A:395:LYS:H	1:A:395:LYS:HG2	1.65	0.42
2:B:371:ALA:O	2:B:372:VAL:C	2.57	0.42
2:B:24:TRP:CE2	2:B:399:GLU:HB3	2.54	0.42
2:B:423:VAL:O	2:B:427:TYR:HD2	2.03	0.42
2:B:239:TRP:HB3	2:B:350:LYS:HZ1	1.85	0.42
2:B:305:GLU:O	2:B:309:ILE:HG13	2.19	0.42
2:B:365:VAL:HG11	2:B:401:TRP:HB2	2.02	0.42
1:A:187:LEU:HA	1:A:187:LEU:HD12	1.85	0.42
1:A:197:GLN:HA	1:A:197:GLN:OE1	2.19	0.42
2:B:233:GLU:HG2	2:B:233:GLU:H	1.65	0.42
1:A:239:TRP:CE2	1:A:316:GLY:HA3	2.55	0.42
1:A:239:TRP:HZ2	1:A:349:LEU:O	2.03	0.42
2:B:175:ASN:HB3	2:B:178:ILE:HD12	2.02	0.42
2:B:422:LEU:HB3	2:B:426:TRP:CZ2	2.55	0.42
1:A:253:THR:HG21	1:A:290:THR:HA	2.01	0.41
1:A:417:VAL:O	1:A:417:VAL:CG1	2.68	0.41
2:B:187:LEU:HA	2:B:187:LEU:HD12	1.83	0.41
1:A:253:THR:O	1:A:257:ILE:HG13	2.20	0.41
1:A:399:GLU:HA	1:A:402:TRP:HB3	2.03	0.41
2:B:44:GLU:O	2:B:46:LYS:CE	2.68	0.41
2:B:387:PRO:HG2	2:B:389:PHE:CE1	2.54	0.41
1:A:120:LEU:O	1:A:125:ARG:NE	2.54	0.41
1:A:107:THR:HG22	1:A:224:GLU:OE1	2.20	0.41
1:A:342:TYR:HA	1:A:349:LEU:HD13	2.02	0.41
1:A:514:GLU:HG3	1:A:514:GLU:H	1.66	0.41
2:B:160:PHE:O	2:B:161:GLN:C	2.58	0.41
2:B:239:TRP:HB3	2:B:350:LYS:NZ	2.36	0.41
1:A:130:PHE:CZ	1:A:144:TYR:HB2	2.55	0.41
1:A:263:LYS:HD3	1:A:263:LYS:HA	1.83	0.41
1:A:58:THR:CG2	1:A:76:ASP:O	2.69	0.41
1:A:354:TYR:HD2	1:A:374:LYS:HD3	1.86	0.41
2:B:28:GLU:HB2	2:B:135:ILE:HD11	2.03	0.41
2:B:263:LYS:HE3	2:B:426:TRP:HA	2.03	0.41
2:B:336:GLN:HB2	2:B:336:GLN:HE21	1.64	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:320:ASP:CG	1:A:322:SER:OG	2.59	0.40
1:A:521:ILE:O	1:A:524:GLN:HB2	2.20	0.40
2:B:199:ARG:CZ	2:B:233:GLU:OE1	2.69	0.40
1:A:60:VAL:HG12	1:A:61:PHE:N	2.36	0.40
1:A:8:VAL:O	1:A:121:ASP:HB2	2.21	0.40
1:A:205:LEU:HD22	1:A:209:LEU:HG	2.03	0.40
1:A:279:LEU:HA	1:A:282:LEU:HD11	2.03	0.40
2:B:379:SER:OG	2:B:387:PRO:HD3	2.21	0.40
2:B:425:LEU:HD23	2:B:425:LEU:C	2.42	0.40
2:B:78:ARG:HD3	2:B:411:ILE:O	2.21	0.40
1:A:120:LEU:O	1:A:121:ASP:C	2.60	0.40
1:A:320:ASP:C	1:A:322:SER:N	2.74	0.40
1:A:54:ASN:HA	1:A:55:PRO:HD2	1.99	0.40
2:B:350:LYS:CG	2:B:351:THR:N	2.84	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:471:ASP:OD1	6:B:1035:HOH:O[2_555]	1.97	0.23

## 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	509/560 (91%)	457 (90%)	39 (8%)	13 (3%)	6	10
2	B	391/440 (89%)	342 (88%)	41 (10%)	8 (2%)	9	17
All	All	900/1000 (90%)	799 (89%)	80 (9%)	21 (2%)	7	13

All (21) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	356	ARG
1	A	412	PRO
2	B	250	ASP
2	B	334	GLN
1	A	91	GLN
1	A	195	ILE
2	B	277	ARG
2	B	286	THR
2	B	116	PHE
2	B	162	SER
1	A	113	ASP
1	A	177	ASP
2	B	193	LEU
1	A	90	VAL
1	A	125	ARG
1	A	170	PRO
1	A	345	PRO
1	A	402	TRP
2	B	158	ALA
1	A	119	PRO
1	A	157	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	465/499 (93%)	421 (90%)	44 (10%)	10	19
2	B	364/400 (91%)	345 (95%)	19 (5%)	27	52
All	All	829/899 (92%)	766 (92%)	63 (8%)	15	30

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

Mol	Chain	Res	Type
1	A	5	ILE
1	A	6	GLU
1	A	7	THR

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Mol	Chain	Res	Type
1	A	20	LYS
1	A	24	TRP
1	A	61	PHE
1	A	71	TRP
1	A	83	ARG
1	A	105	SER
1	A	110	ASP
1	A	116	PHE
1	A	135	ILE
1	A	138	GLU
1	A	161	GLN
1	A	195	ILE
1	A	205	LEU
1	A	207	GLN
1	A	216	THR
1	A	218	ASP
1	A	220	LYS
1	A	229	TRP
1	A	244	ILE
1	A	251	SER
1	A	287	LYS
1	A	303	LEU
1	A	317	VAL
1	A	336	GLN
1	A	340	GLN
1	A	345	PRO
1	A	347	LYS
1	A	348	ASN
1	A	356	ARG
1	A	394	GLN
1	A	396	GLU
1	A	412	PRO
1	A	424	LYS
1	A	443	ASP
1	A	470	THR
1	A	476	LYS
1	A	484	LEU
1	A	487	GLN
1	A	493	VAL
1	A	512	GLN
1	A	517	LEU
2	B	16	MET

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Mol	Chain	Res	Type
2	B	68	SER
2	B	109	LEU
2	B	165	THR
2	B	201	LYS
2	B	205	LEU
2	B	212	TRP
2	B	233	GLU
2	B	242	GLN
2	B	251	SER
2	B	289	LEU
2	B	295	LEU
2	B	297	GLU
2	B	298	GLU
2	B	303	LEU
2	B	323	LYS
2	B	410	TRP
2	B	414	TRP
2	B	423	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (29) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	91	GLN
1	A	161	GLN
1	A	182	GLN
1	A	207	GLN
1	A	208	HIS
1	A	222	GLN
1	A	242	GLN
1	A	265	ASN
1	A	278	GLN
1	A	334	GLN
1	A	336	GLN
1	A	373	GLN
1	A	394	GLN
1	A	407	GLN
1	A	428	GLN
1	A	475	GLN
1	A	480	GLN
1	A	507	GLN
1	A	509	GLN
1	A	512	GLN

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Mol	Chain	Res	Type
1	A	520	GLN
2	B	57	ASN
2	B	175	ASN
2	B	269	GLN
2	B	278	GLN
2	B	336	GLN
2	B	348	ASN
2	B	394	GLN
2	B	407	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	4,7,8	1.47	1 (25%)	2,8,10	3.77	1 (50%)

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

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	280	CSD	CA-C	2.58	1.53	1.50

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	280	CSD	OD1-SG-CB	5.19	115.33	105.61

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.

No monomer is involved in short contacts.

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 5 ligands modelled in this entry, 1 is monoatomic - leaving 4 for Mogul analysis.

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	PO4	A	1300	-	4,4,4	1.36	0	6,6,6	0.39	0
3	PO4	A	1301	-	4,4,4	1.30	0	6,6,6	0.40	0
3	PO4	A	1302	-	4,4,4	1.36	0	6,6,6	0.40	0
5	H12	A	999	-	23,24,24	1.95	5 (21%)	28,33,33	1.78	6 (21%)

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	PO4	A	1300	-	-	0/0/0/0	0/0/0/0
3	PO4	A	1301	-	-	0/0/0/0	0/0/0/0
3	PO4	A	1302	-	-	0/0/0/0	0/0/0/0
5	H12	A	999	-	-	0/7/15/15	0/3/3/3

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	999	H12	C2-N1	2.16	1.38	1.35
5	A	999	H12	C10-C9	3.26	1.43	1.36
5	A	999	H12	CB-CA	3.75	1.60	1.51
5	A	999	H12	C6-N1	4.11	1.40	1.33
5	A	999	H12	CF-CA	4.55	1.62	1.51

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	999	H12	C3-C2-N1	-2.89	120.65	123.38
5	A	999	H12	O4-C4-C3	2.12	121.18	117.46
5	A	999	H12	O4-CA-CF	2.23	113.26	108.34
5	A	999	H12	CE-CF-CA	2.23	116.24	110.56
5	A	999	H12	O4-CA-CB	4.25	117.71	108.34
5	A	999	H12	C6-N1-C2	5.61	120.81	116.42

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	999	H12	2	0

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues ⓘ

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	515/560 (91%)	-0.28	13 (2%) 58 50	26, 62, 100, 143	0
2	B	399/440 (90%)	-0.04	17 (4%) 36 28	25, 60, 113, 139	0
All	All	914/1000 (91%)	-0.18	30 (3%) 47 39	25, 62, 104, 143	0

All (30) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	469	LEU	9.6
1	A	63	ILE	5.1
2	B	210	LEU	3.8
1	A	245	VAL	3.6
1	A	72	ARG	3.6
1	A	468	THR	3.5
2	B	87	PHE	3.4
2	B	356	ARG	3.4
2	B	88	TRP	3.3
2	B	317	VAL	3.3
2	B	237	ASP	3.3
1	A	470	THR	3.2
1	A	467	VAL	3.2
2	B	212	TRP	3.0
2	B	231	GLY	3.0
2	B	410	TRP	3.0
2	B	67	ASP	2.5
1	A	402	TRP	2.5
2	B	293	ILE	2.5
1	A	243	PRO	2.4
2	B	376	THR	2.4
1	A	74	LEU	2.3
2	B	95	PRO	2.3
1	A	61	PHE	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	455	ALA	2.1
2	B	229	TRP	2.1
2	B	230	MET	2.1
2	B	211	ARG	2.1
1	A	471	ASP	2.1
2	B	425	LEU	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. 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	0.97	0.14	-	56,60,74,84	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(Å <sup>2</sup> )	Q<0.9
3	PO4	A	1302	5/5	0.89	0.24	1.60	146,149,150,150	0
5	H12	A	999	22/22	0.96	0.17	0.71	26,41,49,51	0
3	PO4	A	1300	5/5	0.90	0.14	0.11	127,128,130,131	0
3	PO4	A	1301	5/5	0.90	0.14	-0.06	120,123,129,129	0
4	MG	A	1303	1/1	0.89	0.09	-	62,62,62,62	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.