Full wwPDB X-ray Structure Validation Report ⓘ

Aug 27, 2023 – 05:01 PM EDT

PDB ID	:	3I0S
Title	:	crystal structure of HIV reverse transcriptase in complex with inhibitor 7
Authors	:	Yan, Y.; Prasad, S.
Deposited on	:	2009-06-25
Resolution	:	2.70 Å(reported)

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

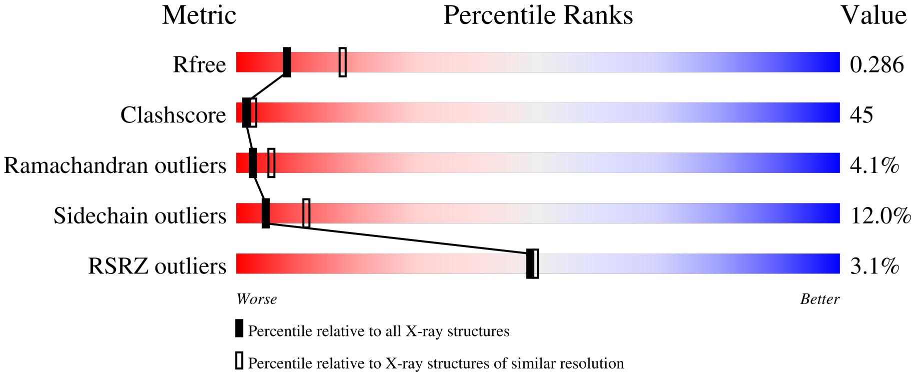
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

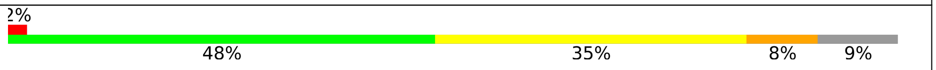
The reported resolution of this entry is 2.70 Å.

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	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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 <=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	563	
2	B	443	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	RT7	A	601	-	-	X	-

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 7923 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/ribonuclease H.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	558	4541	2934	760	839	8	0	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	MET	-	expression tag	UNP P04585
A	-1	ASN	-	expression tag	UNP P04585
A	0	SER	-	expression tag	UNP P04585

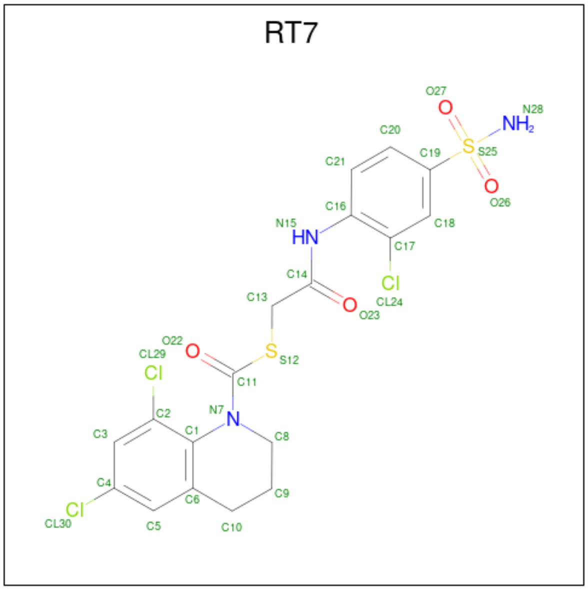
- Molecule 2 is a protein called p51 RT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	405	3352	2182	555	609	6	0	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-2	MET	-	expression tag	UNP P04585
B	-1	ASN	-	expression tag	UNP P04585
B	0	SER	-	expression tag	UNP P04585

- Molecule 3 is S-{2-[(2-chloro-4-sulfamoylphenyl)amino]-2-oxoethyl} 6,8-dichloro-3,4-dihydro quinoline-1(2H)-carbothioate (three-letter code: RT7) (formula: $C_{18}H_{16}Cl_3N_3O_4S_2$).

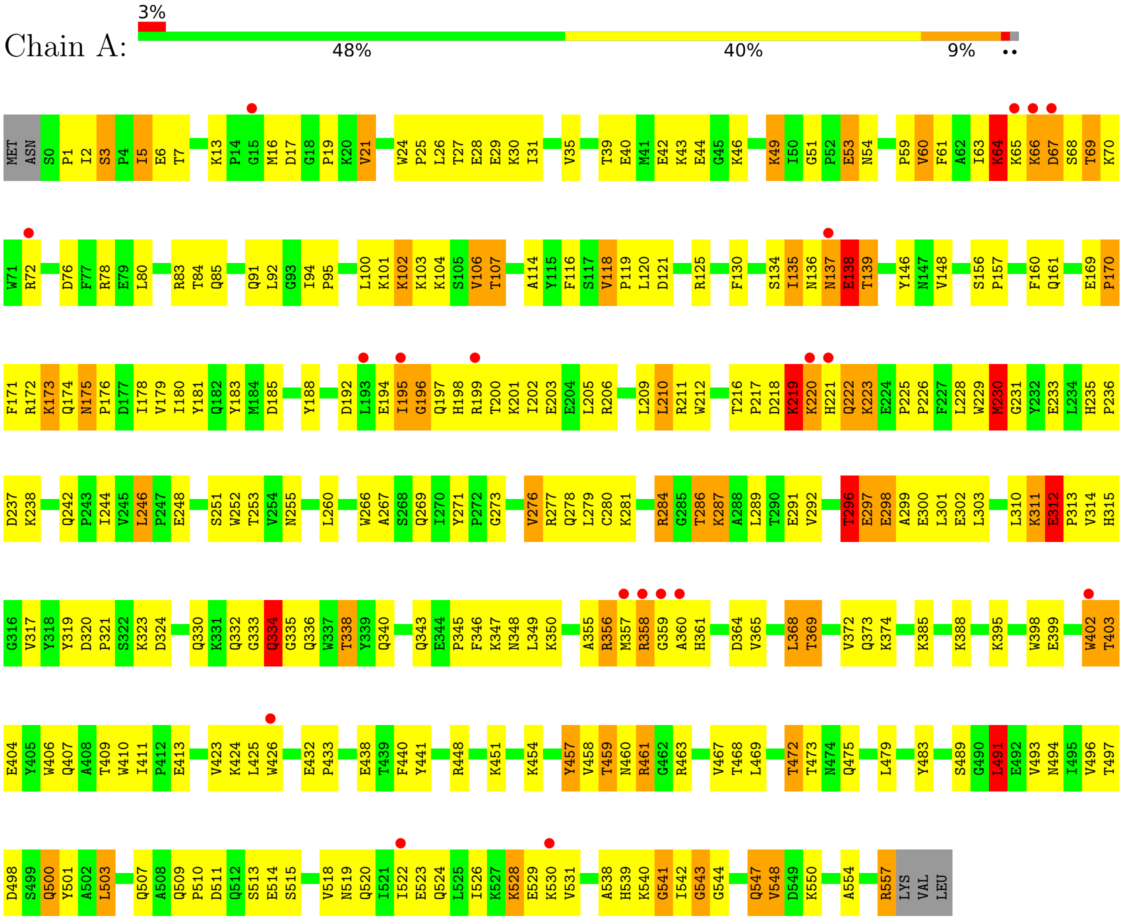


Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
			Total	C	Cl	N	O	S		
3	A	1	30	18	3	3	4	2	0	0

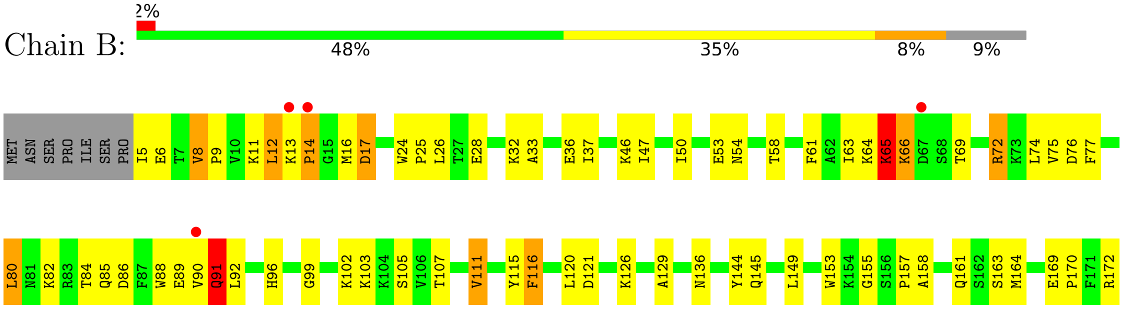
3 Residue-property plots ⓘ

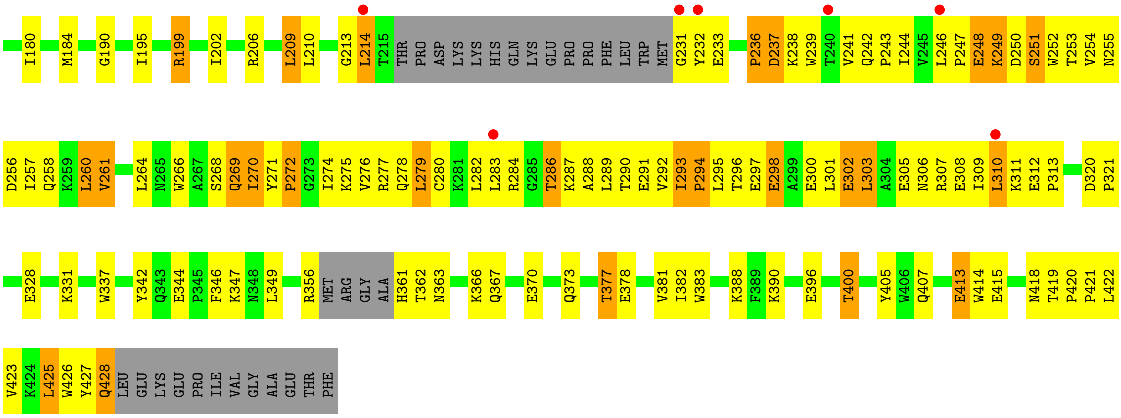
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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



- Molecule 2: p51 RT




I180
M184
G190
I195
R199
I202
R206
L209
L210
G213
L214
T215
THR
PRO
ASP
LYS
LYS
HIS
GLN
LYS
GLU
PRO
PRO
PHE
LEU
TRP
MET
G231
Y232
E233
P236
D237
K238
W239
T240
V241
Q242
P243
I244
V245
L246
P247
E248
K249
D250
S251
W252
T253
V254
N255
D256
I257
Q258
K259
L260
V261
L264
N265
W266
A267
S268
Q269
I270
Y271
P272
G273
I274
K275
V276
R277
Q278
L279
C280
K281
L282
L283
R284
G285
T286
K287
A288
L289
T290
E291
V292
I293
P294
L295
T296
E297
E298
A299
E300
L301
E302
L303
A304
E305
N306
R307
E308
I309
L310
K311
E312
P313
D320
P321
E328
K331
W337
Y342
Q343
E344
P345
F346
K347
N348
L349
R356
MET
ARG
GLY
ALA
H361
T362
N363
K366
Q367
E370
Q373
T377
E378
V381
I382
W383
K388
F389
K390
E396
T400
Y405
W406
Q407
E413
W414
E415
N418
T419
P420
P421
L422
V423
K424
L425
W426
Y427
Q428
LEU
GLU
LYS
GLU
PRO
ILE
VAL
GLY
ALA
GLU
THR
PHE

4 Data and refinement statistics ⓘ

Property	**Value**	**Source**
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	119.61Å 154.69Å 155.82Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.70 47.31 – 2.70	Depositor EDS
% Data completeness (in resolution range)	99.8 (50.00-2.70) 99.8 (47.31-2.70)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.27 (at 2.69Å)	Xtriage
Refinement program	REFMAC 5.5.0066	Depositor
R, R_{free}	0.232 , 0.285 0.232 , 0.286	Depositor DCC
R_{free} test set	2003 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	60.7	Xtriage
Anisotropy	0.052	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 45.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	7923	wwPDB-VP
Average B, all atoms (Å^2)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.82% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: RT7

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	0.52	0/4658	0.64	0/6329
2	B	0.54	0/3446	0.65	0/4682
All	All	0.53	0/8104	0.65	0/11011

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4541	0	4592	452	0
2	B	3352	0	3380	276	0
3	A	30	0	16	15	0
All	All	7923	0	7988	712	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 45.

All (712) 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:66:LYS:HG3	2:B:407:GLN:NE2	1.24	1.43
2:B:66:LYS:CG	2:B:407:GLN:HE22	1.41	1.32
2:B:13:LYS:HB2	2:B:16:MET:CE	1.58	1.32
1:A:107:THR:HG21	1:A:202:ILE:CD1	1.59	1.29
1:A:298:GLU:OE2	1:A:298:GLU:N	1.65	1.26
2:B:13:LYS:CB	2:B:16:MET:HE3	1.66	1.24
1:A:219:LYS:O	1:A:220:LYS:CD	1.91	1.19
1:A:219:LYS:O	1:A:220:LYS:HD2	1.07	1.19
2:B:308:GLU:CA	2:B:311:LYS:HE2	1.75	1.16
1:A:173:LYS:HE3	1:A:173:LYS:HA	1.30	1.14
2:B:396:GLU:O	2:B:400:THR:CG2	1.96	1.13
1:A:211:ARG:O	1:A:211:ARG:HD3	1.47	1.12
1:A:540:LYS:O	1:A:542:ILE:HG13	1.46	1.12
1:A:175:ASN:HD21	1:A:201:LYS:NZ	1.48	1.11
1:A:557:ARG:O	1:A:557:ARG:HG2	1.43	1.11
1:A:399:GLU:OE1	1:A:402:TRP:CZ3	2.04	1.11
1:A:542:ILE:O	1:A:543:GLY:O	1.67	1.11
1:A:399:GLU:OE1	1:A:402:TRP:HZ3	1.32	1.09
1:A:65:LYS:HE2	1:A:72:ARG:HH11	0.94	1.09
1:A:220:LYS:HD3	1:A:220:LYS:C	1.70	1.09
1:A:64:LYS:NZ	1:A:69:THR:HA	1.69	1.08
2:B:308:GLU:HA	2:B:311:LYS:CE	1.83	1.08
2:B:244:ILE:HD13	2:B:266:TRP:HZ3	1.19	1.08
1:A:65:LYS:HG2	1:A:68:SER:HB3	1.37	1.07
1:A:171:PHE:HA	1:A:174:GLN:HE21	0.96	1.07
1:A:65:LYS:HE2	1:A:72:ARG:NH1	1.69	1.07
1:A:357:MET:HE1	1:A:360:ALA:O	1.52	1.07
2:B:298:GLU:HA	2:B:301:LEU:HG	1.33	1.07
1:A:107:THR:HG21	1:A:202:ILE:HD11	1.22	1.05
1:A:171:PHE:HA	1:A:174:GLN:NE2	1.71	1.05
1:A:220:LYS:HE3	1:A:221:HIS:CD2	1.92	1.05
2:B:214:LEU:H	2:B:214:LEU:HD23	1.19	1.05
1:A:64:LYS:HZ3	1:A:69:THR:HA	1.16	1.04
1:A:220:LYS:CE	1:A:221:HIS:CD2	2.41	1.03
1:A:220:LYS:HD3	1:A:221:HIS:N	1.73	1.03
2:B:206:ARG:HH22	2:B:231:GLY:N	1.57	1.02
2:B:268:SER:O	2:B:269:GLN:HB2	1.57	1.02
1:A:21:VAL:HG22	1:A:59:PRO:HD3	1.40	1.02
1:A:43:LYS:HE2	1:A:43:LYS:HA	1.42	1.01
1:A:107:THR:HG22	1:A:198:HIS:HE1	1.23	1.01
2:B:308:GLU:HA	2:B:311:LYS:HE2	1.04	1.00
1:A:406:TRP:CZ3	1:A:407:GLN:HB2	1.95	1.00

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:210:LEU:HD22	1:A:210:LEU:O	1.62	0.99
1:A:5:ILE:HG22	1:A:212:TRP:CE3	1.97	0.99
1:A:107:THR:HG21	1:A:202:ILE:HD13	1.45	0.98
1:A:424:LYS:NZ	1:A:426:TRP:CZ3	2.31	0.98
1:A:195:ILE:HG23	1:A:199:ARG:NE	1.79	0.98
1:A:40:GLU:HG3	1:A:44:GLU:OE1	1.63	0.97
1:A:330:GLN:NE2	1:A:338:THR:CG2	2.26	0.97
1:A:298:GLU:H	1:A:298:GLU:CD	1.63	0.97
1:A:107:THR:CG2	1:A:202:ILE:HD11	1.92	0.97
1:A:357:MET:CE	1:A:360:ALA:O	2.12	0.97
2:B:13:LYS:CB	2:B:16:MET:CE	2.32	0.97
2:B:85:GLN:NE2	2:B:89:GLU:OE2	1.95	0.97
2:B:260:LEU:O	2:B:260:LEU:HD22	1.65	0.97
1:A:296:THR:HG22	1:A:299:ALA:H	1.28	0.97
1:A:395:LYS:O	1:A:399:GLU:HG2	1.64	0.97
2:B:253:THR:HG22	2:B:256:ASP:CG	1.85	0.96
1:A:330:GLN:HE21	1:A:338:THR:CG2	1.79	0.95
2:B:425:LEU:HD23	2:B:425:LEU:H	1.29	0.95
1:A:233:GLU:HG2	1:A:235:HIS:CE1	2.01	0.95
2:B:274:ILE:HG23	2:B:306:ASN:ND2	1.82	0.95
2:B:396:GLU:O	2:B:400:THR:HG23	1.64	0.94
2:B:236:PRO:O	2:B:238:LYS:N	1.99	0.94
1:A:233:GLU:HG2	1:A:235:HIS:HE1	1.32	0.94
1:A:171:PHE:CA	1:A:174:GLN:HE21	1.80	0.94
1:A:107:THR:CG2	1:A:202:ILE:CD1	2.45	0.93
2:B:271:TYR:HB3	2:B:274:ILE:HD11	1.49	0.93
2:B:206:ARG:NH2	2:B:231:GLY:N	2.16	0.92
2:B:298:GLU:HA	2:B:301:LEU:CG	1.99	0.92
1:A:448:ARG:HH11	1:A:448:ARG:CG	1.83	0.92
2:B:396:GLU:O	2:B:400:THR:HG22	1.67	0.92
2:B:66:LYS:CG	2:B:407:GLN:NE2	2.12	0.92
1:A:65:LYS:CE	1:A:72:ARG:HH11	1.83	0.92
1:A:500:GLN:HG3	2:B:422:LEU:CD1	1.99	0.92
2:B:300:GLU:HA	2:B:303:LEU:HD12	1.51	0.91
1:A:424:LYS:CE	1:A:426:TRP:CZ2	2.54	0.91
1:A:424:LYS:HE3	1:A:426:TRP:CE2	2.06	0.90
2:B:298:GLU:N	2:B:298:GLU:OE2	2.05	0.90
1:A:343:GLN:HG3	1:A:349:LEU:HD11	1.54	0.90
1:A:230:MET:HA	1:A:230:MET:HE2	1.52	0.90
1:A:1:PRO:C	1:A:2:ILE:HD13	1.92	0.89
1:A:373:GLN:OE1	2:B:400:THR:HG21	1.71	0.89

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:199:ARG:HD3	2:B:233:GLU:OE1	1.72	0.89
1:A:424:LYS:NZ	1:A:426:TRP:CH2	2.39	0.89
2:B:244:ILE:HD13	2:B:266:TRP:CZ3	2.08	0.89
2:B:422:LEU:HA	2:B:425:LEU:HD21	1.53	0.89
1:A:406:TRP:CH2	2:B:418:ASN:HA	2.07	0.88
1:A:424:LYS:HE3	1:A:426:TRP:CZ2	2.08	0.88
1:A:433:PRO:HG3	2:B:255:ASN:ND2	1.89	0.88
1:A:458:VAL:HG22	1:A:548:VAL:HG22	1.54	0.88
1:A:171:PHE:CA	1:A:174:GLN:NE2	2.35	0.88
1:A:220:LYS:HE2	1:A:221:HIS:CG	2.09	0.88
1:A:539:HIS:O	1:A:540:LYS:HD3	1.74	0.88
2:B:266:TRP:NE1	2:B:346:PHE:HE2	1.72	0.88
1:A:66:LYS:O	1:A:67:ASP:HB3	1.74	0.87
1:A:228:LEU:HB3	1:A:242:GLN:NE2	1.90	0.87
2:B:270:ILE:O	2:B:272:PRO:HD3	1.75	0.87
2:B:373:GLN:NE2	2:B:407:GLN:H	1.71	0.87
1:A:547:GLN:N	1:A:547:GLN:HE21	1.73	0.87
2:B:420:PRO:HB2	2:B:423:VAL:HG23	1.56	0.86
1:A:69:THR:CG2	1:A:69:THR:O	2.24	0.86
1:A:433:PRO:HG3	2:B:255:ASN:HD22	1.40	0.86
2:B:373:GLN:HE22	2:B:407:GLN:H	1.21	0.86
1:A:3:SER:OG	1:A:5:ILE:HD12	1.75	0.86
2:B:199:ARG:NH1	2:B:233:GLU:OE2	2.09	0.86
1:A:206:ARG:HH22	1:A:218:ASP:HB3	1.37	0.85
2:B:266:TRP:HE1	2:B:346:PHE:HE2	1.23	0.85
2:B:337:TRP:HE1	2:B:367:GLN:HE21	1.25	0.85
1:A:30:LYS:HE3	1:A:61:PHE:CE1	2.11	0.85
1:A:498:ASP:CG	1:A:538:ALA:HB2	1.96	0.84
1:A:175:ASN:HD21	1:A:201:LYS:CE	1.90	0.84
2:B:253:THR:CG2	2:B:256:ASP:H	1.90	0.84
1:A:175:ASN:ND2	1:A:201:LYS:HE2	1.91	0.84
2:B:214:LEU:HD23	2:B:214:LEU:N	1.92	0.84
1:A:489:SER:OG	1:A:493:VAL:HG21	1.77	0.84
1:A:540:LYS:O	1:A:542:ILE:CG1	2.25	0.84
1:A:220:LYS:HE2	1:A:221:HIS:CE1	2.13	0.83
1:A:175:ASN:HD21	1:A:201:LYS:HZ3	1.23	0.83
2:B:13:LYS:HB2	2:B:16:MET:HE3	0.86	0.83
1:A:220:LYS:CD	1:A:220:LYS:C	2.47	0.83
1:A:540:LYS:O	1:A:541:GLY:C	2.14	0.82
2:B:282:LEU:HB3	2:B:293:ILE:HD11	1.61	0.82
1:A:220:LYS:HE3	1:A:221:HIS:NE2	1.95	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:220:LYS:HE2	1:A:221:HIS:CD2	2.14	0.81
2:B:388:LYS:HE2	2:B:415:GLU:HG3	1.60	0.81
2:B:270:ILE:HB	2:B:346:PHE:O	1.80	0.81
1:A:557:ARG:O	1:A:557:ARG:CG	2.26	0.81
1:A:27:THR:O	1:A:31:ILE:HG13	1.81	0.81
2:B:362:THR:HG22	2:B:367:GLN:HG3	1.63	0.81
2:B:428:GLN:NE2	2:B:428:GLN:HA	1.95	0.81
1:A:63:ILE:CD1	1:A:72:ARG:HB2	2.11	0.80
1:A:65:LYS:CG	1:A:68:SER:HB3	2.11	0.80
2:B:366:LYS:HD2	2:B:405:TYR:CD1	2.16	0.80
2:B:298:GLU:HA	2:B:301:LEU:CD1	2.12	0.80
1:A:500:GLN:HG3	2:B:422:LEU:HD11	1.61	0.80
2:B:244:ILE:CD1	2:B:266:TRP:HZ3	1.93	0.80
1:A:107:THR:HG22	1:A:198:HIS:CE1	2.15	0.79
1:A:175:ASN:ND2	1:A:201:LYS:CE	2.46	0.79
1:A:356:ARG:NH2	1:A:358:ARG:HD2	1.97	0.79
1:A:63:ILE:HD12	1:A:72:ARG:HB2	1.65	0.79
1:A:220:LYS:CE	1:A:221:HIS:NE2	2.46	0.79
1:A:198:HIS:O	1:A:202:ILE:HG13	1.82	0.78
2:B:244:ILE:CD1	2:B:266:TRP:CZ3	2.67	0.78
1:A:409:THR:CG2	1:A:410:TRP:N	2.47	0.77
2:B:254:VAL:HG23	2:B:291:GLU:O	1.83	0.77
2:B:50:ILE:HD12	2:B:54:ASN:HB3	1.66	0.77
1:A:195:ILE:HG23	1:A:199:ARG:CD	2.15	0.77
1:A:171:PHE:N	1:A:174:GLN:NE2	2.32	0.77
1:A:206:ARG:NH2	1:A:218:ASP:HB3	1.99	0.77
1:A:195:ILE:O	1:A:196:GLY:O	2.03	0.77
2:B:6:GLU:OE1	2:B:6:GLU:N	2.19	0.76
2:B:298:GLU:CA	2:B:301:LEU:HG	2.12	0.76
1:A:230:MET:HA	1:A:230:MET:CE	2.16	0.76
1:A:197:GLN:O	1:A:201:LYS:HB2	1.86	0.76
1:A:1:PRO:O	1:A:2:ILE:HD13	1.85	0.76
1:A:333:GLY:O	1:A:335:GLY:N	2.20	0.75
2:B:13:LYS:CE	2:B:86:ASP:H	1.98	0.75
1:A:330:GLN:HE22	1:A:340:GLN:HE22	1.32	0.75
2:B:337:TRP:HE1	2:B:367:GLN:NE2	1.84	0.75
1:A:330:GLN:NE2	1:A:338:THR:HG23	2.01	0.75
1:A:134:SER:OG	1:A:139:THR:HB	1.87	0.74
1:A:279:LEU:HD23	1:A:302:GLU:OE1	1.86	0.74
1:A:246:LEU:HD11	1:A:310:LEU:HD12	1.68	0.74
2:B:271:TYR:O	2:B:274:ILE:HG12	1.88	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:308:GLU:C	2:B:311:LYS:HE2	2.07	0.73
2:B:5:ILE:N	2:B:5:ILE:HD12	2.04	0.73
1:A:175:ASN:ND2	1:A:201:LYS:NZ	2.32	0.73
2:B:66:LYS:HG2	2:B:407:GLN:HE22	1.47	0.73
1:A:475:GLN:HG2	1:A:501:TYR:CD2	2.23	0.73
1:A:21:VAL:HG22	1:A:59:PRO:CD	2.16	0.73
1:A:424:LYS:CE	1:A:426:TRP:CH2	2.72	0.72
2:B:268:SER:O	2:B:269:GLN:CB	2.33	0.72
1:A:266:TRP:O	1:A:269:GLN:HG3	1.90	0.72
1:A:106:VAL:HG12	3:A:601:RT7:C20	2.20	0.72
2:B:210:LEU:HD12	2:B:210:LEU:O	1.89	0.72
2:B:373:GLN:HE22	2:B:407:GLN:N	1.88	0.72
1:A:448:ARG:HH11	1:A:448:ARG:HG3	1.54	0.71
2:B:13:LYS:HE2	2:B:86:ASP:H	1.54	0.71
1:A:228:LEU:H	1:A:228:LEU:HD22	1.54	0.71
2:B:428:GLN:HA	2:B:428:GLN:HE21	1.56	0.71
1:A:330:GLN:HE21	1:A:338:THR:HG21	1.54	0.71
1:A:356:ARG:HH21	1:A:358:ARG:HD2	1.55	0.71
3:A:601:RT7:H21	3:A:601:RT7:O23	1.90	0.71
2:B:209:LEU:HG	2:B:214:LEU:HD12	1.71	0.70
1:A:220:LYS:HE2	1:A:221:HIS:ND1	2.07	0.70
1:A:53:GLU:H	1:A:53:GLU:CD	1.95	0.70
1:A:69:THR:O	1:A:69:THR:HG23	1.90	0.70
1:A:211:ARG:O	1:A:211:ARG:CD	2.36	0.70
2:B:257:ILE:O	2:B:261:VAL:HG12	1.91	0.70
1:A:406:TRP:CE3	1:A:407:GLN:HB2	2.26	0.69
1:A:65:LYS:HE2	1:A:70:LYS:HE2	1.72	0.69
1:A:205:LEU:CD1	1:A:209:LEU:HD11	2.22	0.69
2:B:253:THR:HG22	2:B:256:ASP:H	1.56	0.69
2:B:13:LYS:HE2	2:B:86:ASP:N	2.08	0.69
1:A:230:MET:HE2	1:A:230:MET:CA	2.21	0.69
1:A:410:TRP:CZ3	2:B:363:ASN:HB3	2.28	0.69
2:B:362:THR:HG23	2:B:366:LYS:HG2	1.73	0.69
1:A:297:GLU:O	1:A:301:LEU:HG	1.92	0.69
1:A:5:ILE:HG22	1:A:212:TRP:CZ3	2.27	0.69
1:A:106:VAL:HG12	3:A:601:RT7:C21	2.23	0.69
1:A:489:SER:HB2	1:A:493:VAL:CG2	2.23	0.69
1:A:500:GLN:HG3	2:B:422:LEU:HD12	1.75	0.68
2:B:253:THR:HG23	2:B:256:ASP:H	1.58	0.68
2:B:107:THR:CB	2:B:202:ILE:HD13	2.23	0.68
2:B:236:PRO:C	2:B:238:LYS:H	1.96	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:241:VAL:CG2	2:B:243:PRO:HG3	2.24	0.68
1:A:66:LYS:O	1:A:67:ASP:CB	2.41	0.68
1:A:107:THR:CG2	1:A:202:ILE:HD13	2.19	0.68
1:A:228:LEU:HB3	1:A:242:GLN:HE22	1.57	0.68
2:B:199:ARG:HH11	2:B:233:GLU:CD	1.97	0.68
2:B:362:THR:CG2	2:B:367:GLN:HG3	2.23	0.68
2:B:308:GLU:O	2:B:311:LYS:CE	2.41	0.68
1:A:402:TRP:CD1	1:A:402:TRP:C	2.66	0.67
2:B:241:VAL:HG23	2:B:243:PRO:HD3	1.76	0.67
1:A:448:ARG:HH11	1:A:448:ARG:HG2	1.58	0.67
1:A:409:THR:HG22	1:A:410:TRP:N	2.09	0.67
1:A:438:GLU:HG3	1:A:461:ARG:HG3	1.77	0.67
2:B:89:GLU:HG2	2:B:90:VAL:HG13	1.77	0.67
2:B:12:LEU:HD23	2:B:17:ASP:HA	1.75	0.67
2:B:126:LYS:HA	2:B:145:GLN:OE1	1.95	0.67
1:A:365:VAL:O	1:A:369:THR:HG23	1.95	0.67
1:A:489:SER:CB	1:A:493:VAL:HG21	2.26	0.66
1:A:64:LYS:HZ1	1:A:69:THR:HA	1.61	0.66
1:A:524:GLN:HA	1:A:524:GLN:HE21	1.59	0.66
2:B:13:LYS:HE3	2:B:85:GLN:HB3	1.75	0.66
2:B:195:ILE:O	2:B:199:ARG:HG3	1.96	0.66
2:B:268:SER:HB3	2:B:274:ILE:HB	1.78	0.66
2:B:425:LEU:H	2:B:425:LEU:CD2	2.07	0.66
1:A:475:GLN:HG2	1:A:501:TYR:CE2	2.30	0.66
2:B:13:LYS:HE2	2:B:86:ASP:HB2	1.78	0.66
2:B:241:VAL:C	2:B:243:PRO:HD3	2.16	0.66
1:A:218:ASP:OD2	1:A:220:LYS:HE2	1.95	0.66
1:A:399:GLU:OE1	1:A:402:TRP:CE3	2.48	0.66
1:A:255:ASN:HB2	1:A:289:LEU:HD22	1.76	0.66
1:A:218:ASP:O	1:A:219:LYS:O	2.13	0.66
1:A:406:TRP:CH2	1:A:407:GLN:HB2	2.31	0.66
1:A:448:ARG:HG3	1:A:448:ARG:NH1	2.09	0.65
1:A:489:SER:HB2	1:A:493:VAL:HG22	1.77	0.65
1:A:70:LYS:HE3	1:A:72:ARG:HG2	1.78	0.65
2:B:13:LYS:CE	2:B:86:ASP:N	2.59	0.65
1:A:529:GLU:O	1:A:530:LYS:HG2	1.96	0.65
1:A:171:PHE:CE2	1:A:205:LEU:HD23	2.32	0.65
1:A:448:ARG:CG	1:A:448:ARG:NH1	2.52	0.65
1:A:106:VAL:H	3:A:601:RT7:H128	1.44	0.65
1:A:175:ASN:HB3	1:A:178:ILE:HD12	1.78	0.65
1:A:220:LYS:CE	1:A:221:HIS:CG	2.76	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:102:LYS:O	2:B:237:ASP:HB3	1.97	0.65
2:B:308:GLU:O	2:B:311:LYS:HE2	1.97	0.64
1:A:205:LEU:HD13	1:A:209:LEU:HD11	1.79	0.64
1:A:343:GLN:HG3	1:A:349:LEU:CD1	2.27	0.64
1:A:195:ILE:CG2	1:A:199:ARG:NE	2.58	0.64
1:A:524:GLN:HA	1:A:524:GLN:NE2	2.12	0.64
1:A:35:VAL:O	1:A:39:THR:HG23	1.97	0.64
1:A:195:ILE:HG23	1:A:199:ARG:HD2	1.79	0.64
2:B:241:VAL:HG23	2:B:243:PRO:CG	2.28	0.64
1:A:468:THR:C	1:A:469:LEU:HG	2.17	0.64
2:B:85:GLN:HA	2:B:88:TRP:NE1	2.12	0.64
2:B:422:LEU:HB3	2:B:426:TRP:CZ2	2.33	0.64
1:A:457:TYR:HA	1:A:548:VAL:HG11	1.79	0.64
2:B:419:THR:HG22	2:B:420:PRO:O	1.98	0.64
1:A:311:LYS:O	1:A:312:GLU:HB3	1.98	0.63
1:A:542:ILE:O	1:A:543:GLY:C	2.37	0.63
1:A:175:ASN:N	1:A:176:PRO:HD3	2.13	0.63
2:B:13:LYS:CB	2:B:16:MET:HE1	2.26	0.63
2:B:243:PRO:HB3	2:B:311:LYS:HA	1.78	0.63
1:A:69:THR:O	1:A:69:THR:HG22	1.99	0.63
1:A:522:ILE:O	1:A:526:ILE:HG13	1.98	0.63
1:A:220:LYS:CE	1:A:221:HIS:CE1	2.82	0.62
1:A:279:LEU:CD2	1:A:302:GLU:OE1	2.46	0.62
2:B:246:LEU:HD22	2:B:260:LEU:HD21	1.80	0.62
1:A:3:SER:OG	1:A:5:ILE:HG23	1.99	0.62
2:B:344:GLU:HB2	2:B:347:LYS:HD2	1.82	0.62
1:A:312:GLU:OE2	1:A:312:GLU:O	2.17	0.62
1:A:171:PHE:N	1:A:174:GLN:HE22	1.95	0.62
1:A:218:ASP:O	1:A:221:HIS:HB2	1.99	0.62
1:A:104:LYS:HD3	1:A:192:ASP:O	1.99	0.62
1:A:228:LEU:HD22	1:A:228:LEU:N	2.15	0.62
1:A:5:ILE:CG2	1:A:212:TRP:CE3	2.81	0.62
1:A:173:LYS:HA	1:A:173:LYS:CE	2.14	0.61
1:A:491:LEU:CD1	1:A:491:LEU:N	2.62	0.61
2:B:278:GLN:HE21	2:B:278:GLN:HA	1.65	0.61
1:A:369:THR:HG21	1:A:398:TRP:CZ3	2.36	0.61
1:A:205:LEU:HD13	1:A:209:LEU:CD1	2.30	0.61
2:B:66:LYS:NZ	2:B:66:LYS:HB3	2.15	0.61
2:B:278:GLN:HA	2:B:278:GLN:NE2	2.15	0.61
2:B:13:LYS:HB2	2:B:16:MET:HE1	1.73	0.61
2:B:107:THR:HB	2:B:202:ILE:CD1	2.31	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:254:VAL:O	2:B:258:GLN:HG3	2.00	0.61
1:A:277:ARG:HB2	1:A:336:GLN:NE2	2.16	0.60
2:B:250:ASP:O	2:B:251:SER:CB	2.48	0.60
1:A:183:TYR:OH	1:A:230:MET:HE1	2.02	0.60
1:A:357:MET:HG2	1:A:514:GLU:OE2	2.01	0.60
1:A:503:LEU:HD22	1:A:507:GLN:HG3	1.84	0.60
2:B:241:VAL:HG23	2:B:243:PRO:HG3	1.84	0.60
2:B:422:LEU:HA	2:B:425:LEU:CD2	2.29	0.60
2:B:305:GLU:O	2:B:309:ILE:N	2.30	0.60
2:B:274:ILE:CG2	2:B:306:ASN:ND2	2.62	0.60
1:A:441:TYR:O	1:A:548:VAL:HG21	2.02	0.60
1:A:296:THR:HG22	1:A:299:ALA:N	2.09	0.59
1:A:406:TRP:CE3	1:A:407:GLN:CA	2.85	0.59
2:B:246:LEU:HD12	2:B:307:ARG:HG2	1.84	0.59
2:B:305:GLU:HA	2:B:308:GLU:HB3	1.84	0.59
1:A:197:GLN:HA	1:A:200:THR:HB	1.84	0.59
1:A:170:PRO:C	1:A:174:GLN:NE2	2.55	0.59
1:A:216:THR:HB	1:A:217:PRO:HD2	1.84	0.59
1:A:238:LYS:HD2	1:A:315:HIS:CD2	2.37	0.59
1:A:13:LYS:O	1:A:16:MET:HB2	2.02	0.59
1:A:206:ARG:HH12	1:A:218:ASP:CB	2.16	0.59
2:B:65:LYS:HZ1	2:B:72:ARG:NE	2.00	0.59
1:A:106:VAL:CG1	3:A:601:RT7:C16	2.81	0.59
1:A:233:GLU:CG	1:A:235:HIS:HE1	2.10	0.59
2:B:24:TRP:CE3	2:B:61:PHE:HZ	2.21	0.59
1:A:106:VAL:CG1	3:A:601:RT7:C17	2.81	0.58
1:A:106:VAL:HG11	3:A:601:RT7:C16	2.33	0.58
2:B:242:GLN:O	2:B:242:GLN:HG3	2.01	0.58
2:B:260:LEU:HD13	2:B:264:LEU:HD12	1.85	0.58
1:A:457:TYR:CD1	1:A:457:TYR:C	2.77	0.58
1:A:539:HIS:C	1:A:540:LYS:HD3	2.22	0.58
2:B:283:LEU:O	2:B:284:ARG:HG3	2.02	0.58
1:A:63:ILE:HD11	1:A:72:ARG:HB2	1.85	0.58
1:A:286:THR:HG23	1:A:287:LYS:O	2.04	0.58
1:A:355:ALA:O	1:A:356:ARG:O	2.21	0.58
2:B:241:VAL:HG23	2:B:243:PRO:CD	2.34	0.58
1:A:230:MET:CE	1:A:230:MET:CA	2.79	0.58
1:A:498:ASP:OD2	1:A:538:ALA:HB2	2.02	0.58
1:A:24:TRP:CD1	1:A:25:PRO:HD2	2.39	0.58
1:A:218:ASP:O	1:A:219:LYS:C	2.41	0.58
2:B:420:PRO:HB2	2:B:423:VAL:CG2	2.33	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:5:ILE:N	2:B:5:ILE:CD1	2.67	0.57
1:A:46:LYS:HE3	1:A:116:PHE:HB3	1.84	0.57
2:B:13:LYS:O	2:B:16:MET:CE	2.53	0.57
2:B:302:GLU:O	2:B:303:LEU:C	2.43	0.57
1:A:195:ILE:HD13	1:A:199:ARG:NH2	2.19	0.57
1:A:43:LYS:HA	1:A:43:LYS:CE	2.23	0.57
2:B:13:LYS:HB3	2:B:16:MET:CE	2.30	0.57
2:B:195:ILE:O	2:B:199:ARG:CG	2.52	0.57
1:A:244:ILE:CD1	1:A:267:ALA:HB2	2.34	0.57
1:A:529:GLU:O	1:A:530:LYS:CG	2.51	0.57
2:B:65:LYS:NZ	2:B:72:ARG:HE	2.02	0.57
2:B:214:LEU:H	2:B:214:LEU:CD2	1.97	0.57
1:A:330:GLN:NE2	1:A:338:THR:HG22	2.18	0.57
2:B:266:TRP:CD1	2:B:426:TRP:CE3	2.93	0.57
2:B:266:TRP:NE1	2:B:346:PHE:CE2	2.64	0.57
1:A:253:THR:HA	1:A:291:GLU:O	2.05	0.57
1:A:410:TRP:CZ3	2:B:363:ASN:CB	2.88	0.57
2:B:28:GLU:HG2	2:B:32:LYS:HE2	1.87	0.57
1:A:171:PHE:CZ	1:A:205:LEU:HD23	2.40	0.56
1:A:355:ALA:O	1:A:356:ARG:C	2.44	0.56
1:A:406:TRP:CH2	1:A:407:GLN:OE1	2.58	0.56
2:B:75:VAL:HG11	2:B:77:PHE:CZ	2.40	0.56
1:A:319:TYR:OH	1:A:385:LYS:HE2	2.06	0.56
2:B:253:THR:HG23	2:B:255:ASN:N	2.20	0.56
2:B:428:GLN:NE2	2:B:428:GLN:CA	2.68	0.56
1:A:106:VAL:HG13	3:A:601:RT7:C18	2.34	0.56
1:A:118:VAL:HG23	1:A:119:PRO:HD2	1.87	0.56
2:B:107:THR:HB	2:B:202:ILE:HD13	1.86	0.56
1:A:440:PHE:CE1	1:A:489:SER:HB3	2.40	0.56
2:B:169:GLU:HB3	2:B:170:PRO:HD3	1.86	0.56
2:B:244:ILE:HD11	2:B:266:TRP:CH2	2.41	0.56
1:A:24:TRP:CG	1:A:25:PRO:HD2	2.41	0.56
1:A:171:PHE:O	1:A:175:ASN:HB2	2.06	0.56
1:A:194:GLU:CD	1:A:194:GLU:H	2.09	0.56
1:A:364:ASP:HB3	1:A:423:VAL:HG13	1.88	0.56
2:B:13:LYS:HE3	2:B:86:ASP:H	1.67	0.56
1:A:246:LEU:N	1:A:246:LEU:HD23	2.21	0.56
1:A:287:LYS:HG2	1:A:291:GLU:OE1	2.05	0.56
2:B:246:LEU:HD22	2:B:260:LEU:CD2	2.36	0.56
2:B:111:VAL:O	2:B:111:VAL:HG13	2.05	0.55
1:A:398:TRP:CZ2	1:A:411:ILE:HD12	2.40	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:457:TYR:HA	1:A:548:VAL:CG1	2.36	0.55
1:A:425:LEU:N	1:A:425:LEU:HD22	2.22	0.55
2:B:66:LYS:HB3	2:B:66:LYS:HZ3	1.71	0.55
1:A:542:ILE:C	1:A:543:GLY:O	2.44	0.55
1:A:3:SER:OG	1:A:5:ILE:CD1	2.53	0.55
1:A:424:LYS:HE2	1:A:426:TRP:CZ2	2.41	0.55
2:B:46:LYS:HD3	2:B:116:PHE:HB2	1.88	0.55
1:A:220:LYS:HE2	1:A:221:HIS:NE2	2.17	0.55
1:A:65:LYS:CE	1:A:70:LYS:HE2	2.36	0.55
1:A:410:TRP:CE3	2:B:363:ASN:HB2	2.41	0.55
1:A:458:VAL:HG22	1:A:548:VAL:CG2	2.33	0.55
1:A:278:GLN:HB3	1:A:299:ALA:HA	1.89	0.55
1:A:388:LYS:HD2	1:A:413:GLU:OE1	2.06	0.55
1:A:171:PHE:CD2	1:A:205:LEU:HD23	2.42	0.54
2:B:24:TRP:CE3	2:B:61:PHE:CZ	2.94	0.54
2:B:107:THR:CB	2:B:202:ILE:CD1	2.85	0.54
1:A:65:LYS:O	1:A:67:ASP:N	2.40	0.54
1:A:95:PRO:HA	2:B:136:ASN:O	2.07	0.54
1:A:206:ARG:NH1	1:A:218:ASP:CB	2.70	0.54
1:A:229:TRP:CD2	1:A:230:MET:HB2	2.42	0.54
1:A:229:TRP:O	1:A:231:GLY:N	2.39	0.54
1:A:489:SER:CB	1:A:493:VAL:CG2	2.85	0.54
1:A:273:GLY:HA2	1:A:332:GLN:NE2	2.21	0.54
1:A:284:ARG:HH11	1:A:284:ARG:HB2	1.73	0.54
1:A:271:TYR:CE1	1:A:314:VAL:HG23	2.42	0.54
2:B:286:THR:O	2:B:286:THR:OG1	2.25	0.54
2:B:13:LYS:HZ1	2:B:85:GLN:HG2	1.72	0.54
2:B:65:LYS:NZ	2:B:72:ARG:NE	2.56	0.54
2:B:96:HIS:HE1	2:B:381:VAL:O	1.91	0.54
1:A:287:LYS:HE3	1:A:291:GLU:OE2	2.07	0.54
2:B:297:GLU:N	2:B:298:GLU:OE2	2.41	0.54
1:A:211:ARG:HD3	1:A:211:ARG:C	2.24	0.54
1:A:406:TRP:CE3	1:A:407:GLN:N	2.76	0.54
1:A:503:LEU:CD2	1:A:507:GLN:HG3	2.38	0.54
1:A:547:GLN:N	1:A:547:GLN:NE2	2.51	0.54
2:B:13:LYS:NZ	2:B:85:GLN:HG2	2.23	0.54
1:A:330:GLN:HE22	1:A:338:THR:HG23	1.70	0.53
1:A:458:VAL:HG23	1:A:458:VAL:O	2.08	0.53
1:A:197:GLN:HA	1:A:200:THR:CB	2.38	0.53
1:A:218:ASP:OD2	1:A:220:LYS:CE	2.56	0.53
1:A:244:ILE:HD13	1:A:267:ALA:HB2	1.89	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:275:LYS:H	2:B:306:ASN:HD21	1.55	0.53
2:B:13:LYS:CE	2:B:85:GLN:HB3	2.38	0.53
2:B:312:GLU:OE2	2:B:312:GLU:HA	2.08	0.53
2:B:91:GLN:O	2:B:92:LEU:HD23	2.09	0.53
2:B:305:GLU:O	2:B:309:ILE:HG13	2.09	0.53
2:B:428:GLN:HE21	2:B:428:GLN:CA	2.19	0.53
1:A:311:LYS:O	1:A:312:GLU:CB	2.56	0.53
1:A:49:LYS:HB2	1:A:49:LYS:NZ	2.24	0.53
1:A:134:SER:OG	1:A:138:GLU:O	2.25	0.53
1:A:357:MET:HE1	1:A:360:ALA:C	2.28	0.53
1:A:520:GLN:O	1:A:523:GLU:HG2	2.08	0.53
2:B:105:SER:O	2:B:190:GLY:HA2	2.08	0.53
1:A:406:TRP:CE3	1:A:407:GLN:CB	2.92	0.52
1:A:491:LEU:HD13	1:A:491:LEU:H	1.74	0.52
2:B:50:ILE:HD12	2:B:54:ASN:CB	2.38	0.52
2:B:85:GLN:HA	2:B:88:TRP:CE2	2.44	0.52
1:A:287:LYS:CD	1:A:291:GLU:OE2	2.57	0.52
1:A:197:GLN:HB2	1:A:200:THR:HB	1.91	0.52
1:A:51:GLY:HA3	1:A:53:GLU:OE2	2.09	0.52
1:A:2:ILE:HD13	1:A:2:ILE:N	2.22	0.52
1:A:106:VAL:CG1	3:A:601:RT7:C21	2.88	0.52
1:A:458:VAL:CG2	1:A:548:VAL:HG22	2.33	0.52
2:B:241:VAL:O	2:B:243:PRO:HD3	2.10	0.52
1:A:24:TRP:CG	1:A:25:PRO:CD	2.93	0.52
1:A:170:PRO:O	1:A:173:LYS:N	2.42	0.52
1:A:540:LYS:O	1:A:541:GLY:O	2.27	0.52
1:A:206:ARG:HH12	1:A:218:ASP:HB2	1.75	0.51
2:B:297:GLU:O	2:B:301:LEU:HG	2.10	0.51
2:B:309:ILE:O	2:B:311:LYS:N	2.43	0.51
1:A:42:GLU:OE2	1:A:49:LYS:NZ	2.42	0.51
1:A:369:THR:HG21	1:A:398:TRP:HZ3	1.75	0.51
1:A:65:LYS:CE	1:A:72:ARG:NH1	2.56	0.51
1:A:195:ILE:O	1:A:196:GLY:C	2.48	0.51
1:A:547:GLN:O	1:A:550:LYS:HG3	2.09	0.51
2:B:153:TRP:CZ2	2:B:155:GLY:HA3	2.45	0.51
1:A:114:ALA:HB1	1:A:160:PHE:CE1	2.45	0.51
1:A:399:GLU:O	1:A:403:THR:HB	2.10	0.51
1:A:509:GLN:N	1:A:510:PRO:CD	2.74	0.51
2:B:13:LYS:HE3	2:B:85:GLN:CB	2.40	0.51
2:B:261:VAL:HA	2:B:264:LEU:HB2	1.92	0.51
2:B:421:PRO:O	2:B:425:LEU:CD2	2.58	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:406:TRP:O	2:B:331:LYS:HB3	2.10	0.51
1:A:170:PRO:O	1:A:171:PHE:C	2.48	0.51
2:B:308:GLU:O	2:B:311:LYS:HE3	2.09	0.51
2:B:328:GLU:HG3	2:B:390:LYS:HD3	1.93	0.51
1:A:406:TRP:CZ2	2:B:418:ASN:OD1	2.64	0.51
1:A:433:PRO:HB2	2:B:290:THR:HG22	1.93	0.51
2:B:213:GLY:O	2:B:214:LEU:C	2.49	0.51
2:B:292:VAL:HG12	2:B:293:ILE:N	2.25	0.51
1:A:228:LEU:HD12	1:A:242:GLN:HE21	1.76	0.51
2:B:308:GLU:HA	2:B:311:LYS:NZ	2.25	0.51
1:A:296:THR:HG23	1:A:297:GLU:N	2.26	0.51
1:A:297:GLU:C	1:A:298:GLU:OE2	2.42	0.51
1:A:409:THR:HG23	1:A:410:TRP:N	2.25	0.51
2:B:274:ILE:HG23	2:B:306:ASN:HD22	1.68	0.51
1:A:542:ILE:CG2	1:A:543:GLY:N	2.74	0.50
1:A:409:THR:HG23	1:A:410:TRP:H	1.76	0.50
2:B:361:HIS:O	2:B:361:HIS:CG	2.65	0.50
1:A:91:GLN:HE21	1:A:92:LEU:N	2.09	0.50
1:A:491:LEU:N	1:A:491:LEU:HD13	2.26	0.50
2:B:121:ASP:OD2	2:B:121:ASP:C	2.50	0.50
1:A:541:GLY:O	1:A:542:ILE:HG13	2.12	0.50
1:A:195:ILE:CG2	1:A:199:ARG:CZ	2.90	0.50
1:A:197:GLN:CA	1:A:200:THR:HB	2.42	0.50
1:A:296:THR:CG2	1:A:299:ALA:H	2.12	0.50
2:B:425:LEU:HD23	2:B:425:LEU:N	2.12	0.50
1:A:467:VAL:CG1	1:A:468:THR:N	2.75	0.50
2:B:13:LYS:O	2:B:16:MET:HE3	2.11	0.50
2:B:47:ILE:HD12	2:B:144:TYR:CD1	2.46	0.49
2:B:320:ASP:OD1	2:B:320:ASP:C	2.49	0.49
2:B:13:LYS:HE3	2:B:86:ASP:N	2.27	0.49
1:A:28:GLU:HG2	1:A:135:ILE:HG23	1.92	0.49
1:A:235:HIS:HB3	1:A:236:PRO:HD2	1.94	0.49
2:B:253:THR:HG22	2:B:256:ASP:OD1	2.12	0.49
1:A:70:LYS:HE2	1:A:72:ARG:NH1	2.27	0.49
2:B:13:LYS:HE2	2:B:86:ASP:CB	2.41	0.49
2:B:13:LYS:CA	2:B:16:MET:HE3	2.36	0.49
2:B:305:GLU:O	2:B:308:GLU:HB3	2.12	0.49
1:A:438:GLU:OE1	1:A:459:THR:HG21	2.13	0.49
2:B:239:TRP:CH2	2:B:378:GLU:HG2	2.48	0.49
2:B:248:GLU:O	2:B:249:LYS:HB3	2.13	0.49
3:A:601:RT7:CL29	3:A:601:RT7:S12	3.08	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:241:VAL:HG21	2:B:243:PRO:HG3	1.92	0.49
2:B:279:LEU:HD13	2:B:282:LEU:HD12	1.95	0.49
1:A:91:GLN:NE2	1:A:92:LEU:N	2.61	0.48
2:B:9:PRO:HA	2:B:121:ASP:OD1	2.13	0.48
1:A:3:SER:CB	1:A:5:ILE:HD12	2.43	0.48
1:A:30:LYS:HE3	1:A:61:PHE:HE1	1.73	0.48
2:B:153:TRP:CH2	2:B:155:GLY:HA3	2.48	0.48
2:B:247:PRO:HB2	2:B:249:LYS:HE3	1.95	0.48
1:A:53:GLU:CD	1:A:53:GLU:N	2.65	0.48
1:A:76:ASP:OD2	1:A:78:ARG:HG3	2.13	0.48
1:A:106:VAL:CG1	3:A:601:RT7:C18	2.91	0.48
1:A:468:THR:HG22	1:A:469:LEU:N	2.28	0.48
1:A:544:GLY:HA2	2:B:286:THR:HG22	1.96	0.48
2:B:366:LYS:O	2:B:370:GLU:HG3	2.14	0.48
2:B:382:ILE:HG22	2:B:383:TRP:CD1	2.48	0.48
2:B:260:LEU:HD22	2:B:264:LEU:HG	1.96	0.48
2:B:422:LEU:O	2:B:425:LEU:HD23	2.14	0.48
1:A:64:LYS:HB3	1:A:65:LYS:H	1.55	0.48
1:A:107:THR:CG2	1:A:198:HIS:HE1	2.10	0.48
1:A:173:LYS:HE3	1:A:173:LYS:CA	2.22	0.48
1:A:457:TYR:C	1:A:457:TYR:HD1	2.17	0.48
2:B:260:LEU:HD22	2:B:260:LEU:C	2.24	0.48
1:A:406:TRP:CZ3	1:A:407:GLN:CB	2.85	0.47
2:B:13:LYS:HZ2	2:B:85:GLN:HB3	1.78	0.47
1:A:43:LYS:HE2	1:A:43:LYS:CA	2.28	0.47
1:A:218:ASP:C	1:A:219:LYS:O	2.52	0.47
1:A:372:VAL:HG11	1:A:411:ILE:HG23	1.96	0.47
1:A:458:VAL:O	1:A:458:VAL:CG2	2.62	0.47
1:A:5:ILE:HG22	1:A:212:TRP:HE3	1.71	0.47
1:A:21:VAL:CG2	1:A:59:PRO:HD3	2.29	0.47
1:A:229:TRP:CE2	1:A:230:MET:HB2	2.49	0.47
1:A:238:LYS:HD2	1:A:315:HIS:CG	2.49	0.47
1:A:280:CYS:O	1:A:281:LYS:C	2.53	0.47
1:A:296:THR:HG23	1:A:298:GLU:CD	2.34	0.47
1:A:356:ARG:HH21	1:A:358:ARG:CD	2.23	0.47
1:A:298:GLU:HA	1:A:301:LEU:HD12	1.97	0.47
1:A:114:ALA:HB1	1:A:160:PHE:CZ	2.50	0.47
1:A:195:ILE:HG21	1:A:199:ARG:CZ	2.45	0.47
1:A:296:THR:O	1:A:300:GLU:HG2	2.14	0.47
1:A:365:VAL:O	1:A:369:THR:CG2	2.62	0.47
2:B:382:ILE:HG22	2:B:383:TRP:CG	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:382:ILE:HG21	2:B:383:TRP:CE2	2.49	0.47
2:B:382:ILE:CG2	2:B:383:TRP:CE2	2.97	0.47
1:A:17:ASP:O	1:A:83:ARG:HD3	2.14	0.47
1:A:181:TYR:CE2	1:A:183:TYR:HB2	2.49	0.47
2:B:214:LEU:N	2:B:214:LEU:CD2	2.64	0.47
2:B:58:THR:HG23	2:B:76:ASP:O	2.15	0.47
2:B:115:TYR:HB3	2:B:149:LEU:HB2	1.96	0.47
2:B:12:LEU:HD12	2:B:84:THR:HG22	1.97	0.47
1:A:137:ASN:C	1:A:137:ASN:ND2	2.68	0.46
1:A:277:ARG:NH1	1:A:278:GLN:NE2	2.63	0.46
1:A:296:THR:CG2	1:A:297:GLU:N	2.74	0.46
1:A:311:LYS:O	1:A:312:GLU:CD	2.54	0.46
1:A:410:TRP:O	1:A:411:ILE:HG13	2.15	0.46
2:B:82:LYS:NZ	2:B:413:GLU:OE2	2.48	0.46
1:A:369:THR:CG2	1:A:398:TRP:CZ3	2.99	0.46
2:B:8:VAL:O	2:B:121:ASP:HB2	2.16	0.46
1:A:197:GLN:CB	1:A:200:THR:HB	2.46	0.46
2:B:254:VAL:HG21	2:B:288:ALA:O	2.15	0.46
2:B:308:GLU:O	2:B:311:LYS:HG2	2.16	0.46
1:A:13:LYS:HE3	1:A:84:THR:O	2.15	0.46
1:A:273:GLY:HA2	1:A:332:GLN:HE22	1.81	0.46
2:B:13:LYS:O	2:B:16:MET:HE2	2.15	0.46
2:B:172:ARG:HH21	2:B:180:ILE:HB	1.79	0.46
1:A:515:SER:OG	1:A:518:VAL:HG23	2.16	0.46
2:B:250:ASP:O	2:B:251:SER:HB3	2.15	0.46
1:A:54:ASN:OD1	1:A:54:ASN:C	2.53	0.46
1:A:102:LYS:HE3	1:A:237:ASP:OD1	2.16	0.46
1:A:104:LYS:HD3	1:A:192:ASP:C	2.36	0.46
1:A:180:ILE:HA	1:A:188:TYR:O	2.16	0.46
1:A:248:GLU:OE1	1:A:248:GLU:HA	2.15	0.46
1:A:496:VAL:HG22	1:A:496:VAL:O	2.15	0.46
1:A:2:ILE:HD11	1:A:46:LYS:NZ	2.30	0.45
1:A:483:TYR:CE2	1:A:520:GLN:NE2	2.84	0.45
1:A:206:ARG:CZ	1:A:218:ASP:HB3	2.47	0.45
2:B:111:VAL:HG22	2:B:214:LEU:HD13	1.98	0.45
1:A:333:GLY:O	1:A:334:GLN:C	2.54	0.45
1:A:433:PRO:HB2	2:B:290:THR:CG2	2.46	0.45
2:B:63:ILE:HD13	2:B:74:LEU:HD22	1.98	0.45
2:B:297:GLU:O	2:B:301:LEU:CD2	2.65	0.45
1:A:169:GLU:N	1:A:170:PRO:HD2	2.31	0.45
1:A:438:GLU:OE1	1:A:459:THR:OG1	2.27	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:312:GLU:OE2	2:B:313:PRO:HD2	2.15	0.45
1:A:39:THR:O	1:A:43:LYS:HG2	2.17	0.45
1:A:210:LEU:O	1:A:210:LEU:CD2	2.50	0.45
1:A:16:MET:CE	1:A:83:ARG:HG2	2.46	0.45
1:A:125:ARG:HB3	1:A:146:TYR:O	2.16	0.45
2:B:46:LYS:NZ	2:B:116:PHE:O	2.39	0.45
2:B:90:VAL:HG23	2:B:90:VAL:O	2.17	0.45
1:A:101:LYS:HD3	1:A:321:PRO:HG3	1.99	0.45
1:A:498:ASP:CB	1:A:538:ALA:HB2	2.46	0.45
2:B:33:ALA:O	2:B:37:ILE:HD12	2.16	0.45
2:B:107:THR:HB	2:B:202:ILE:HD11	1.98	0.45
1:A:194:GLU:O	1:A:195:ILE:C	2.56	0.45
1:A:406:TRP:HZ2	2:B:418:ASN:OD1	2.00	0.45
1:A:170:PRO:C	1:A:174:GLN:HE22	2.19	0.44
1:A:459:THR:OG1	1:A:460:ASN:N	2.48	0.44
1:A:542:ILE:HG22	1:A:543:GLY:N	2.32	0.44
1:A:156:SER:HB2	1:A:157:PRO:HD3	1.98	0.44
1:A:357:MET:HG3	1:A:359:GLY:O	2.17	0.44
1:A:369:THR:CG2	1:A:398:TRP:HZ3	2.30	0.44
1:A:46:LYS:HE3	1:A:116:PHE:CB	2.47	0.44
1:A:200:THR:O	1:A:203:GLU:HB2	2.17	0.44
2:B:99:GLY:O	2:B:102:LYS:HB2	2.17	0.44
2:B:266:TRP:CH2	2:B:427:TYR:CZ	3.05	0.44
1:A:120:LEU:O	1:A:121:ASP:C	2.54	0.44
2:B:158:ALA:O	2:B:161:GLN:HB2	2.18	0.44
1:A:403:THR:HG22	1:A:404:GLU:HG3	2.00	0.44
2:B:157:PRO:HG3	2:B:184:MET:HA	1.98	0.44
2:B:253:THR:CG2	2:B:255:ASN:HB3	2.48	0.44
1:A:64:LYS:NZ	1:A:69:THR:CA	2.60	0.44
1:A:222:GLN:H	1:A:222:GLN:HG2	1.58	0.44
1:A:252:TRP:O	1:A:292:VAL:HA	2.18	0.44
1:A:528:LYS:HG2	1:A:531:VAL:CG2	2.47	0.44
2:B:13:LYS:NZ	2:B:85:GLN:HB3	2.33	0.44
2:B:266:TRP:CG	2:B:426:TRP:CE3	3.06	0.44
2:B:309:ILE:C	2:B:311:LYS:H	2.21	0.44
2:B:252:TRP:CD1	2:B:295:LEU:HD21	2.52	0.44
1:A:513:SER:H	1:A:519:ASN:HD21	1.65	0.44
2:B:278:GLN:HE21	2:B:278:GLN:CA	2.26	0.44
1:A:19:PRO:HG3	1:A:80:LEU:HB2	1.99	0.44
1:A:101:LYS:CE	1:A:321:PRO:HG3	2.48	0.44
1:A:287:LYS:CD	1:A:287:LYS:N	2.81	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:373:GLN:O	2:B:377:THR:HG23	2.18	0.44
1:A:369:THR:HG21	1:A:398:TRP:CH2	2.52	0.43
1:A:467:VAL:HG12	1:A:468:THR:N	2.33	0.43
3:A:601:RT7:O23	3:A:601:RT7:C21	2.59	0.43
2:B:282:LEU:HB3	2:B:293:ILE:CD1	2.39	0.43
1:A:60:VAL:HG21	1:A:130:PHE:HD2	1.83	0.43
1:A:2:ILE:O	1:A:3:SER:C	2.57	0.43
1:A:194:GLU:O	1:A:196:GLY:N	2.51	0.43
1:A:229:TRP:C	1:A:231:GLY:H	2.21	0.43
1:A:229:TRP:C	1:A:231:GLY:N	2.71	0.43
1:A:540:LYS:HB2	1:A:542:ILE:HD12	1.99	0.43
1:A:27:THR:OG1	1:A:30:LYS:HD2	2.17	0.43
2:B:296:THR:C	2:B:298:GLU:OE2	2.57	0.43
1:A:225:PRO:HA	1:A:226:PRO:C	2.38	0.43
1:A:297:GLU:CA	1:A:298:GLU:OE2	2.67	0.43
1:A:440:PHE:CZ	1:A:489:SER:HB3	2.54	0.43
2:B:342:TYR:CD2	2:B:342:TYR:C	2.91	0.43
2:B:129:ALA:HA	2:B:144:TYR:O	2.17	0.43
1:A:21:VAL:CG2	1:A:59:PRO:CD	2.91	0.43
1:A:175:ASN:N	1:A:176:PRO:CD	2.81	0.43
2:B:36:GLU:O	2:B:37:ILE:C	2.56	0.43
2:B:292:VAL:O	2:B:293:ILE:HG22	2.18	0.43
1:A:3:SER:CB	1:A:5:ILE:CD1	2.97	0.43
1:A:94:ILE:O	1:A:95:PRO:C	2.55	0.43
1:A:278:GLN:HB2	1:A:302:GLU:CD	2.40	0.43
2:B:422:LEU:HB3	2:B:426:TRP:CE2	2.54	0.43
1:A:425:LEU:HD22	1:A:425:LEU:H	1.83	0.43
2:B:53:GLU:OE1	2:B:53:GLU:N	2.44	0.43
1:A:3:SER:HB3	1:A:5:ILE:CD1	2.49	0.42
1:A:195:ILE:O	1:A:199:ARG:HD2	2.19	0.42
2:B:421:PRO:HG2	2:B:422:LEU:HG	2.00	0.42
1:A:100:LEU:HD22	3:A:601:RT7:H210	2.01	0.42
1:A:320:ASP:HA	1:A:321:PRO:HD2	1.94	0.42
2:B:236:PRO:O	2:B:239:TRP:N	2.53	0.42
2:B:293:ILE:HB	2:B:294:PRO:HD2	2.01	0.42
1:A:222:GLN:O	1:A:223:LYS:C	2.57	0.42
1:A:402:TRP:CG	1:A:403:THR:N	2.86	0.42
2:B:382:ILE:HG22	2:B:383:TRP:CD2	2.55	0.42
1:A:106:VAL:HG11	3:A:601:RT7:C17	2.48	0.42
1:A:219:LYS:C	1:A:221:HIS:H	2.22	0.42
2:B:80:LEU:HD23	2:B:80:LEU:HA	1.79	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:210:LEU:HD22	1:A:210:LEU:C	2.25	0.42
1:A:406:TRP:CE3	1:A:407:GLN:HA	2.54	0.42
1:A:454:LYS:NZ	1:A:554:ALA:O	2.52	0.42
2:B:103:LYS:HA	2:B:103:LYS:HD3	1.89	0.42
1:A:169:GLU:O	1:A:172:ARG:HB2	2.18	0.42
1:A:211:ARG:CD	1:A:211:ARG:C	2.85	0.42
2:B:13:LYS:HA	2:B:14:PRO:HD2	1.75	0.42
1:A:410:TRP:CG	1:A:411:ILE:N	2.88	0.42
1:A:103:LYS:HE3	1:A:179:VAL:CG1	2.50	0.42
1:A:135:ILE:O	1:A:136:ASN:HB2	2.20	0.42
1:A:183:TYR:OH	1:A:230:MET:CE	2.67	0.42
1:A:398:TRP:CZ2	1:A:411:ILE:CD1	3.03	0.42
1:A:544:GLY:O	1:A:548:VAL:HG23	2.20	0.42
2:B:362:THR:CG2	2:B:367:GLN:CG	2.96	0.42
1:A:228:LEU:CB	1:A:242:GLN:NE2	2.75	0.42
2:B:287:LYS:HE3	2:B:291:GLU:OE2	2.20	0.42
1:A:368:LEU:HD23	1:A:368:LEU:HA	1.80	0.41
2:B:254:VAL:HG13	2:B:283:LEU:HD22	2.01	0.41
2:B:305:GLU:O	2:B:306:ASN:C	2.59	0.41
1:A:312:GLU:HA	1:A:313:PRO:HD3	1.73	0.41
1:A:16:MET:HE1	1:A:83:ARG:HG2	2.01	0.41
1:A:317:VAL:HG22	1:A:348:ASN:O	2.21	0.41
2:B:388:LYS:HE2	2:B:415:GLU:CG	2.41	0.41
1:A:201:LYS:HA	1:A:201:LYS:HD2	1.83	0.41
1:A:491:LEU:HA	1:A:491:LEU:HD12	1.89	0.41
2:B:163:SER:O	2:B:164:MET:C	2.59	0.41
2:B:153:TRP:CE2	2:B:155:GLY:HA3	2.55	0.41
1:A:228:LEU:H	1:A:228:LEU:CD2	2.28	0.41
1:A:398:TRP:CH2	1:A:411:ILE:HD11	2.56	0.41
1:A:438:GLU:OE1	1:A:459:THR:CB	2.68	0.41
1:A:524:GLN:HE21	1:A:524:GLN:CA	2.20	0.41
1:A:287:LYS:CE	1:A:291:GLU:OE2	2.69	0.41
1:A:410:TRP:CE3	2:B:363:ASN:CB	3.04	0.41
2:B:107:THR:OG1	2:B:202:ILE:CD1	2.69	0.41
1:A:116:PHE:HA	1:A:148:VAL:HG21	2.03	0.41
1:A:255:ASN:CB	1:A:289:LEU:HD22	2.46	0.41
1:A:198:HIS:CE1	1:A:202:ILE:HD11	2.55	0.41
1:A:511:ASP:OD2	1:A:511:ASP:C	2.59	0.41
2:B:8:VAL:HG23	2:B:9:PRO:HD2	2.03	0.41
2:B:298:GLU:HA	2:B:301:LEU:HD12	2.00	0.41
1:A:137:ASN:O	1:A:138:GLU:O	2.39	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:170:PRO:O	1:A:173:LYS:HB2	2.21	0.40
2:B:5:ILE:O	2:B:6:GLU:C	2.58	0.40
1:A:287:LYS:N	1:A:287:LYS:HD2	2.36	0.40
2:B:320:ASP:HA	2:B:321:PRO:HD3	1.74	0.40
1:A:64:LYS:HD3	1:A:64:LYS:HA	1.87	0.40
1:A:106:VAL:CG1	3:A:601:RT7:C19	3.00	0.40
1:A:323:LYS:HE3	1:A:323:LYS:HB2	1.61	0.40
1:A:432:GLU:OE1	1:A:432:GLU:HA	2.21	0.40
2:B:260:LEU:O	2:B:264:LEU:HG	2.22	0.40
1:A:101:LYS:HE2	1:A:321:PRO:HG3	2.03	0.40
1:A:472:THR:HB	1:A:473:THR:H	1.66	0.40
1:A:494:ASN:HB3	2:B:289:LEU:HD12	2.03	0.40
2:B:46:LYS:HE2	2:B:46:LYS:HA	2.04	0.40
2:B:287:LYS:CE	2:B:291:GLU:OE2	2.70	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	556/563 (99%)	486 (87%)	45 (8%)	25 (4%)	2 5
2	B	399/443 (90%)	350 (88%)	35 (9%)	14 (4%)	3 8
All	All	955/1006 (95%)	836 (88%)	80 (8%)	39 (4%)	3 6

All (39) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	66	LYS
1	A	196	GLY
1	A	219	LYS
1	A	334	GLN

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Mol	Chain	Res	Type
1	A	543	GLY
2	B	237	ASP
1	A	67	ASP
1	A	223	LYS
1	A	356	ARG
1	A	541	GLY
2	B	14	PRO
2	B	91	GLN
2	B	251	SER
2	B	269	GLN
2	B	310	LEU
1	A	296	THR
1	A	345	PRO
1	A	491	LEU
1	A	528	LYS
2	B	66	LYS
2	B	249	LYS
2	B	303	LEU
1	A	64	LYS
1	A	85	GLN
1	A	138	GLU
1	A	230	MET
1	A	139	THR
1	A	312	GLU
2	B	272	PRO
1	A	3	SER
1	A	170	PRO
1	A	175	ASN
1	A	346	PHE
2	B	65	LYS
2	B	294	PRO
2	B	302	GLU
1	A	195	ILE
1	A	276	VAL
2	B	236	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	497/503 (99%)	432 (87%)	65 (13%)	4	10
2	B	369/403 (92%)	330 (89%)	39 (11%)	6	15
All	All	866/906 (96%)	762 (88%)	104 (12%)	5	11

All (104) 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
1	A	21	VAL
1	A	26	LEU
1	A	29	GLU
1	A	49	LYS
1	A	53	GLU
1	A	60	VAL
1	A	64	LYS
1	A	69	THR
1	A	102	LYS
1	A	106	VAL
1	A	107	THR
1	A	118	VAL
1	A	135	ILE
1	A	137	ASN
1	A	138	GLU
1	A	161	GLN
1	A	173	LYS
1	A	185	ASP
1	A	210	LEU
1	A	219	LYS
1	A	220	LYS
1	A	222	GLN
1	A	230	MET
1	A	246	LEU
1	A	251	SER
1	A	260	LEU
1	A	276	VAL
1	A	284	ARG
1	A	286	THR
1	A	287	LYS
1	A	296	THR

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Mol	Chain	Res	Type
1	A	297	GLU
1	A	298	GLU
1	A	303	LEU
1	A	311	LYS
1	A	312	GLU
1	A	324	ASP
1	A	334	GLN
1	A	338	THR
1	A	347	LYS
1	A	350	LYS
1	A	358	ARG
1	A	361	HIS
1	A	368	LEU
1	A	369	THR
1	A	374	LYS
1	A	402	TRP
1	A	403	THR
1	A	451	LYS
1	A	457	TYR
1	A	459	THR
1	A	461	ARG
1	A	463	ARG
1	A	472	THR
1	A	479	LEU
1	A	491	LEU
1	A	497	THR
1	A	500	GLN
1	A	503	LEU
1	A	547	GLN
1	A	548	VAL
1	A	557	ARG
2	B	8	VAL
2	B	11	LYS
2	B	12	LEU
2	B	17	ASP
2	B	25	PRO
2	B	26	LEU
2	B	64	LYS
2	B	65	LYS
2	B	69	THR
2	B	72	ARG
2	B	80	LEU

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Mol	Chain	Res	Type
2	B	91	GLN
2	B	111	VAL
2	B	116	PHE
2	B	120	LEU
2	B	199	ARG
2	B	209	LEU
2	B	214	LEU
2	B	232	TYR
2	B	248	GLU
2	B	260	LEU
2	B	261	VAL
2	B	270	ILE
2	B	276	VAL
2	B	277	ARG
2	B	279	LEU
2	B	280	CYS
2	B	286	THR
2	B	293	ILE
2	B	298	GLU
2	B	310	LEU
2	B	349	LEU
2	B	356	ARG
2	B	377	THR
2	B	400	THR
2	B	413	GLU
2	B	414	TRP
2	B	425	LEU
2	B	428	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	57	ASN
1	A	91	GLN
1	A	137	ASN
1	A	147	ASN
1	A	161	GLN
1	A	174	GLN
1	A	175	ASN
1	A	198	HIS
1	A	235	HIS
1	A	242	GLN

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Mol	Chain	Res	Type
1	A	258	GLN
1	A	278	GLN
1	A	315	HIS
1	A	330	GLN
1	A	334	GLN
1	A	336	GLN
1	A	407	GLN
1	A	428	GLN
1	A	509	GLN
1	A	519	ASN
1	A	524	GLN
1	A	547	GLN
2	B	96	HIS
2	B	137	ASN
2	B	147	ASN
2	B	161	GLN
2	B	175	ASN
2	B	208	HIS
2	B	258	GLN
2	B	278	GLN
2	B	306	ASN
2	B	367	GLN
2	B	373	GLN
2	B	394	GLN
2	B	407	GLN
2	B	418	ASN
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 ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

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	RT7	A	601	-	30,32,32	2.45	7 (23%)	40,47,47	1.88	15 (37%)

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	RT7	A	601	-	-	7/18/29/29	0/3/3/3

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	601	RT7	C19-S25	-8.77	1.63	1.77
3	A	601	RT7	C1-C2	5.62	1.48	1.39
3	A	601	RT7	C1-C6	4.48	1.48	1.41
3	A	601	RT7	C16-C17	3.75	1.48	1.39
3	A	601	RT7	C2-CL29	2.99	1.80	1.73
3	A	601	RT7	C16-N15	-2.78	1.36	1.41
3	A	601	RT7	C17-CL24	2.47	1.79	1.73

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	601	RT7	O26-S25-O27	-4.84	110.81	118.76
3	A	601	RT7	C13-C14-N15	3.61	119.36	114.41
3	A	601	RT7	C1-C2-CL29	3.32	125.46	120.22
3	A	601	RT7	O26-S25-C19	3.08	110.78	107.35
3	A	601	RT7	C17-C18-C19	3.00	120.71	118.80
3	A	601	RT7	C21-C20-C19	2.93	122.48	119.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	601	RT7	O27-S25-N28	2.66	111.30	107.36
3	A	601	RT7	C3-C2-C1	-2.49	117.73	120.88
3	A	601	RT7	O23-C14-C13	-2.48	117.30	121.58
3	A	601	RT7	C18-C17-C16	-2.45	119.71	121.72
3	A	601	RT7	C3-C4-CL30	-2.32	116.25	119.15
3	A	601	RT7	C5-C4-C3	2.30	124.52	121.66
3	A	601	RT7	C9-C8-N7	-2.07	106.21	109.93
3	A	601	RT7	O27-S25-C19	2.02	109.61	107.35
3	A	601	RT7	C10-C6-C1	2.01	122.76	119.47

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	601	RT7	S12-C11-N7-C8
3	A	601	RT7	S12-C13-C14-N15
3	A	601	RT7	S12-C13-C14-O23
3	A	601	RT7	O23-C14-N15-C16
3	A	601	RT7	O22-C11-N7-C1
3	A	601	RT7	O22-C11-S12-C13
3	A	601	RT7	C13-C14-N15-C16

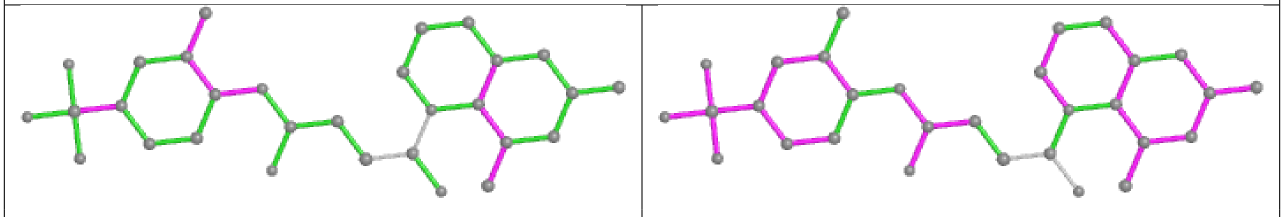
There are no ring outliers.

1 monomer is involved in 15 short contacts:

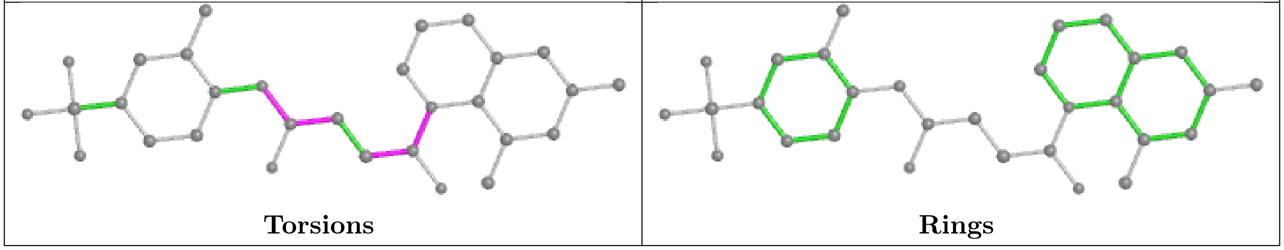
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	601	RT7	15	0

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 then 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.

Ligand RT7 A 601



Bond lengths **Bond angles**



Torsions **Rings**

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 (i)

6.1 Protein, DNA and RNA chains (i)

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	558/563 (99%)	0.30	19 (3%)	45	45	34, 61, 83, 97	0
2	B	405/443 (91%)	0.19	11 (2%)	54	55	36, 54, 95, 105	0
All	All	963/1006 (95%)	0.25	30 (3%)	49	49	34, 59, 91, 105	0

All (30) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	231	GLY	5.2
1	A	402	TRP	3.9
1	A	426	TRP	3.6
2	B	240	THR	3.5
1	A	66	LYS	3.5
2	B	232	TYR	3.2
1	A	193	LEU	3.0
1	A	195	ILE	3.0
2	B	67	ASP	2.9
1	A	65	LYS	2.9
1	A	358	ARG	2.7
1	A	359	GLY	2.6
2	B	214	LEU	2.5
1	A	220	LYS	2.5
1	A	67	ASP	2.4
1	A	137	ASN	2.3
1	A	357	MET	2.3
1	A	522	ILE	2.3
1	A	530	LYS	2.3
2	B	14	PRO	2.2
2	B	283	LEU	2.2
2	B	13	LYS	2.2
1	A	199	ARG	2.1
1	A	221	HIS	2.1

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Mol	Chain	Res	Type	RSRZ
2	B	310	LEU	2.1
2	B	246	LEU	2.1
1	A	15	GLY	2.1
1	A	72	ARG	2.1
1	A	360	ALA	2.1
2	B	90	VAL	2.0

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

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

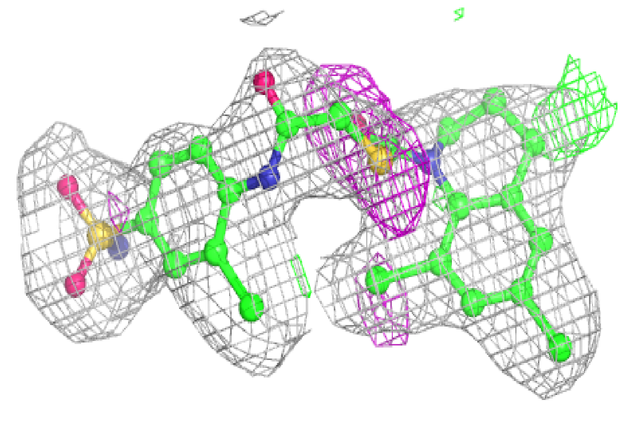
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

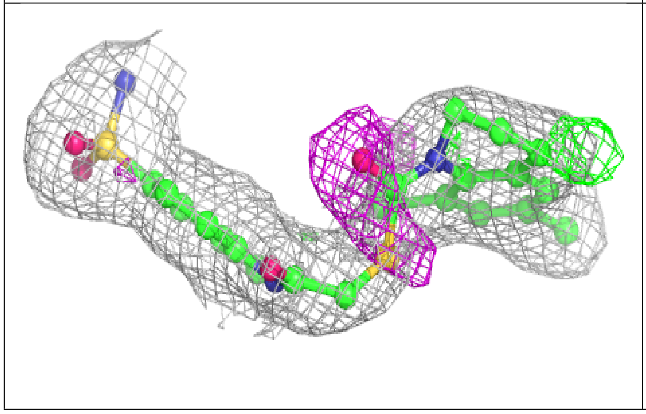
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	RT7	A	601	30/30	0.85	0.24	61,69,72,73	0

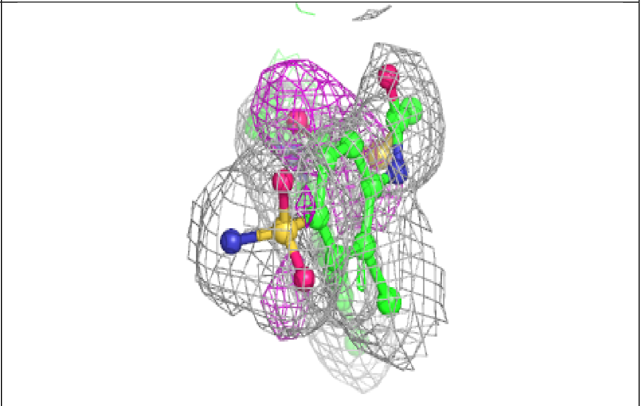
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around RT7 A 601:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)







6.5 Other polymers ⓘ

There are no such residues in this entry.