



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 06:37 PM GMT

PDB ID : 1BQN
Title : TYR 188 LEU HIV-1 RT/HBY 097
Authors : Hsiou, Y.; Das, K.; Ding, J.; Arnold, E.
Deposited on : 1998-08-17
Resolution : 3.30 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

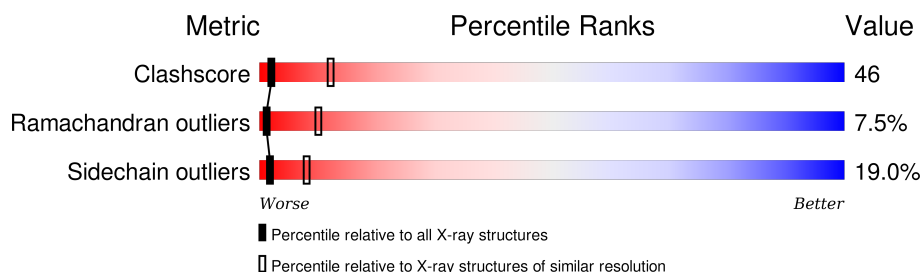
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.30 Å.

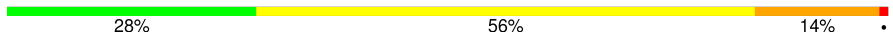
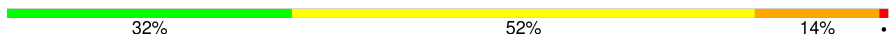
Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	102246	1058 (3.38-3.22)
Ramachandran outliers	100387	1038 (3.38-3.22)
Sidechain outliers	100360	1037 (3.38-3.22)

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 ≥ 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.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	558	 28% 56% 14% •
2	B	430	 32% 52% 14% •

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 7834 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	558	Total	C	N	O	S	0	0	0
			4372	2825	729	811	7			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	188	LEU	TYR	ENGINEERED	UNP P03366
A	248	GLN	GLU	CONFLICT	UNP P03366
A	280	SER	CYS	ENGINEERED	UNP P03366
A	546	GLN	GLU	CONFLICT	UNP P03366

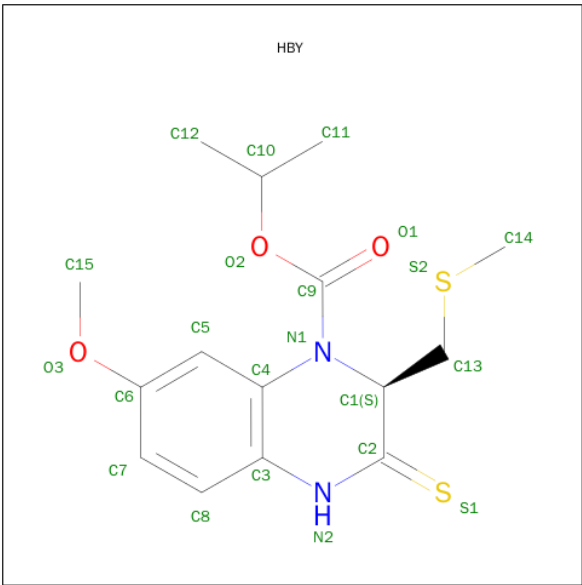
- Molecule 2 is a protein called REVERSE TRANSCRIPTASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	430	Total	C	N	O	S	0	0	0
			3440	2239	568	628	5			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	188	LEU	TYR	ENGINEERED	UNP P03366
B	242	GLU	GLN	CONFLICT	UNP P03366
B	278	ALA	GLN	CONFLICT	UNP P03366
B	280	SER	CYS	ENGINEERED	UNP P03366

- Molecule 3 is (S)-4-ISOPROPOXYCARBONYL-6-METHOXY-3-METHYLTHIOMETHYL-3,4-DIHYDROQUINOXALIN-2(1H)-THIONE (three-letter code: HBY) (formula: C₁₅H₂₀N₂O₃S₂).



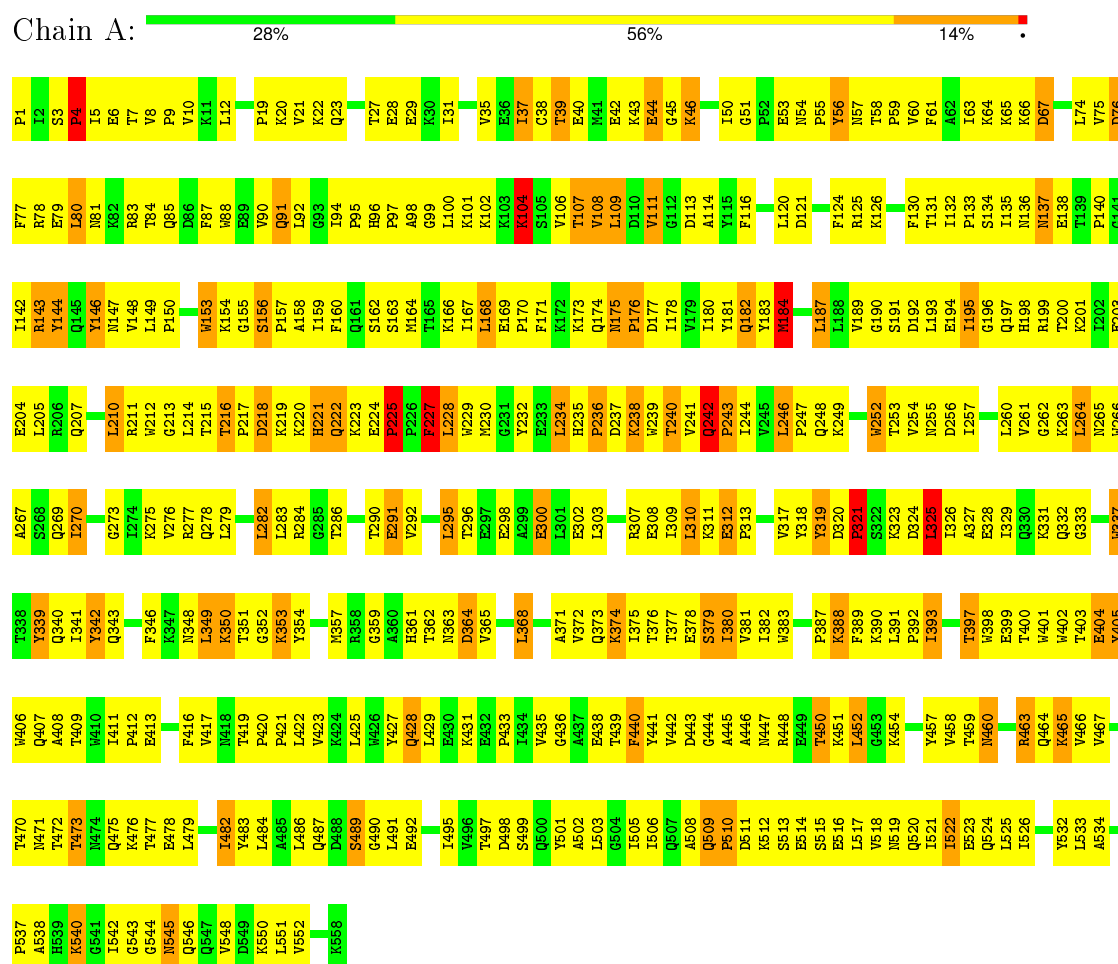
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			22	15	2	3	2		

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.

Note EDS was not executed.

• Molecule 1: REVERSE TRANSCRIPTASE





4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section will therefore be incomplete.

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	224.80 Å 69.30 Å 105.30 Å 90.00° 105.80° 90.00°	Depositor
Resolution (Å)	10.00 – 3.30	Depositor
% Data completeness (in resolution range)	95.1 (10.00-3.30)	Depositor
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR 3.85	Depositor
R, R_{free}	0.245 , 0.362	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	7834	wwPDB-VP
Average B, all atoms (Å ²)	47.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: HBY

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	0.80	2/4487 (0.0%)	1.01	11/6118 (0.2%)
2	B	0.85	1/3539 (0.0%)	1.05	8/4825 (0.2%)
All	All	0.82	3/8026 (0.0%)	1.03	19/10943 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
2	B	0	3
All	All	0	4

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	514	GLU	CG-CD	6.06	1.61	1.51
1	A	337	TRP	CB-CG	-5.40	1.40	1.50
2	B	153	TRP	CB-CG	-5.09	1.41	1.50

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	316	GLY	N-CA-C	-11.27	84.93	113.10
1	A	225	PRO	N-CA-C	7.76	132.26	112.10
2	B	215	THR	N-CA-C	-7.05	91.95	111.00
2	B	94	ILE	N-CA-C	-6.68	92.97	111.00
2	B	64	LYS	N-CA-C	-6.51	93.42	111.00
1	A	184	MET	CG-SD-CE	5.95	109.72	100.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	344	GLU	N-CA-C	-5.67	95.69	111.00
1	A	264	LEU	CA-CB-CG	-5.61	102.39	115.30
2	B	388	LYS	N-CA-C	-5.47	96.23	111.00
2	B	426	TRP	N-CA-C	-5.43	96.33	111.00
1	A	388	LYS	N-CA-C	-5.43	96.33	111.00
1	A	80	LEU	CA-CB-CG	5.41	127.73	115.30
1	A	227	PHE	N-CA-C	5.35	125.45	111.00
1	A	295	LEU	CA-CB-CG	-5.28	103.15	115.30
2	B	7	THR	N-CA-C	5.22	125.10	111.00
1	A	64	LYS	CB-CA-C	-5.15	100.09	110.40
1	A	109	LEU	CB-CG-CD2	-5.10	102.33	111.00
1	A	310	LEU	CA-CB-CG	5.09	127.00	115.30
1	A	325	LEU	N-CA-C	-5.05	97.36	111.00

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	319	TYR	Sidechain
2	B	183	TYR	Sidechain
2	B	316	GLY	Mainchain
2	B	346	PHE	Sidechain

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	4372	0	4271	410	0
2	B	3440	0	3400	313	0
3	A	22	0	20	8	0
All	All	7834	0	7691	711	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 46.

All (711) 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:41:MET:CE	2:B:41:MET:SD	2.01	1.48
1:A:97:PRO:HG2	1:A:232:TYR:CE2	1.66	1.29
1:A:27:THR:O	1:A:31:ILE:HG13	1.41	1.15
2:B:38:CYS:HB3	2:B:144:TYR:CE2	1.84	1.11
2:B:38:CYS:HB3	2:B:144:TYR:HE2	0.93	1.05
1:A:242:GLN:HB3	1:A:243:PRO:HD3	1.39	1.00
1:A:183:TYR:CE2	1:A:184:MET:HG2	1.97	1.00
1:A:229:TRP:HB3	1:A:234:LEU:HD11	1.43	0.99
1:A:191:SER:OG	1:A:198:HIS:HD2	1.47	0.98
2:B:400:THR:HG22	2:B:401:TRP:CD1	1.99	0.98
1:A:329:ILE:HD12	1:A:391:LEU:HD21	1.42	0.98
2:B:400:THR:HG22	2:B:401:TRP:HD1	1.24	0.97
1:A:108:VAL:HA	1:A:187:LEU:O	1.65	0.96
1:A:97:PRO:CG	1:A:232:TYR:CE2	2.49	0.95
1:A:40:GLU:HA	1:A:43:LYS:HB2	1.49	0.94
1:A:240:THR:HG22	1:A:241:VAL:H	1.26	0.94
2:B:125:ARG:HG2	2:B:146:TYR:O	1.71	0.91
1:A:229:TRP:HB3	1:A:234:LEU:CD1	2.00	0.90
2:B:368:LEU:O	2:B:372:VAL:HG23	1.73	0.88
2:B:104:LYS:HB2	2:B:192:ASP:HA	1.57	0.87
2:B:242:GLU:N	2:B:243:PRO:HD3	1.90	0.86
2:B:198:HIS:O	2:B:202:ILE:HG12	1.76	0.85
1:A:10:VAL:HG12	1:A:124:PHE:HE2	1.43	0.84
1:A:459:THR:HG23	1:A:463:ARG:HB3	1.58	0.84
1:A:278:GLN:O	1:A:282:LEU:HD23	1.76	0.84
2:B:358:ARG:HH11	2:B:358:ARG:HB3	1.41	0.83
1:A:224:GLU:CB	1:A:225:PRO:HD2	2.09	0.83
1:A:107:THR:HG21	1:A:221:HIS:O	1.79	0.82
1:A:10:VAL:HG12	1:A:124:PHE:CE2	2.14	0.82
2:B:319:TYR:HD1	2:B:343:GLN:HE22	1.25	0.81
1:A:21:VAL:HG12	1:A:22:LYS:H	1.44	0.81
1:A:377:THR:O	1:A:381:VAL:HG23	1.81	0.81
1:A:242:GLN:HB3	1:A:243:PRO:CD	2.11	0.80
2:B:23:GLN:NE2	2:B:26:LEU:HD21	1.97	0.80
1:A:183:TYR:CD2	1:A:184:MET:HG2	2.16	0.79
1:A:66:LYS:O	1:A:67:ASP:CB	2.30	0.79
1:A:3:SER:HA	1:A:213:GLY:HA3	1.64	0.79
2:B:303:LEU:O	2:B:307:ARG:HB2	1.84	0.78
1:A:438:GLU:HB3	1:A:440:PHE:HE1	1.48	0.78
2:B:423:VAL:O	2:B:425:LEU:HG	1.84	0.78
1:A:253:THR:HA	1:A:292:VAL:HA	1.65	0.78
1:A:3:SER:OG	1:A:5:ILE:HG22	1.84	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:74:LEU:HD12	1:A:75:VAL:H	1.49	0.78
1:A:459:THR:CG2	1:A:463:ARG:HB3	2.13	0.78
1:A:9:PRO:HG2	2:B:53:GLU:HG2	1.64	0.78
1:A:331:LYS:HG2	1:A:333:GLY:H	1.46	0.77
1:A:156:SER:HB2	1:A:157:PRO:HD3	1.64	0.77
2:B:266:TRP:CE3	2:B:266:TRP:HA	2.19	0.77
1:A:97:PRO:CG	1:A:232:TYR:CD2	2.68	0.77
2:B:275:LYS:HB3	2:B:302:GLU:OE2	1.85	0.77
1:A:131:THR:HG22	1:A:143:ARG:HB3	1.67	0.76
1:A:58:THR:HG22	1:A:59:PRO:HD2	1.65	0.76
2:B:109:LEU:HD12	2:B:187:LEU:HD23	1.69	0.75
1:A:19:PRO:O	1:A:56:TYR:HB3	1.85	0.75
2:B:341:ILE:HD12	2:B:350:LYS:HB3	1.66	0.75
2:B:167:ILE:O	2:B:208:HIS:HE1	1.70	0.75
1:A:240:THR:HG22	1:A:241:VAL:N	2.00	0.74
2:B:210:LEU:HD11	2:B:216:THR:HG23	1.69	0.74
3:A:559:HBY:C9	3:A:559:HBY:S2	2.75	0.74
2:B:254:VAL:HG12	2:B:258:GLN:HE21	1.51	0.74
1:A:27:THR:O	1:A:31:ILE:CG1	2.31	0.74
2:B:275:LYS:O	2:B:302:GLU:HB3	1.88	0.74
2:B:271:TYR:O	2:B:274:ILE:HG13	1.88	0.73
2:B:78:ARG:HD3	2:B:411:ILE:O	1.88	0.73
1:A:260:LEU:HD21	1:A:279:LEU:HD22	1.69	0.72
1:A:483:TYR:HE1	1:A:524:GLN:NE2	1.86	0.72
1:A:326:ILE:HG23	1:A:342:TYR:CE1	2.24	0.72
1:A:253:THR:OG1	1:A:255:ASN:HB3	1.90	0.72
1:A:195:ILE:O	1:A:199:ARG:HG3	1.89	0.72
1:A:325:LEU:HD11	1:A:383:TRP:CE3	2.24	0.72
1:A:478:GLU:HG2	1:A:499:SER:HB2	1.70	0.72
1:A:482:ILE:HG22	1:A:495:ILE:HD13	1.70	0.71
1:A:132:ILE:O	1:A:142:ILE:HB	1.90	0.71
1:A:131:THR:HG22	1:A:143:ARG:HD2	1.71	0.71
1:A:401:TRP:CZ3	1:A:404:GLU:HG2	2.25	0.71
2:B:111:VAL:HG21	2:B:187:LEU:HD22	1.73	0.70
1:A:240:THR:CG2	1:A:241:VAL:H	2.04	0.70
1:A:365:VAL:O	1:A:368:LEU:HB3	1.92	0.70
2:B:375:ILE:HG13	2:B:389:PHE:CE1	2.26	0.70
1:A:382:ILE:HG23	2:B:136:ASN:OD1	1.91	0.69
1:A:454:LYS:HB2	1:A:552:VAL:HG13	1.73	0.69
1:A:518:VAL:HA	1:A:521:ILE:HD12	1.75	0.69
1:A:328:GLU:HA	1:A:390:LYS:O	1.92	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:329:ILE:HD12	1:A:391:LEU:CD2	2.20	0.69
1:A:97:PRO:HG3	1:A:232:TYR:CD2	2.28	0.68
2:B:27:THR:O	2:B:31:ILE:HG13	1.94	0.68
1:A:339:TYR:CE1	1:A:352:GLY:N	2.61	0.68
2:B:79:GLU:O	2:B:83:ARG:HG2	1.92	0.68
1:A:246:LEU:CD1	1:A:264:LEU:HD21	2.24	0.68
2:B:63:ILE:HG22	2:B:64:LYS:H	1.59	0.68
2:B:266:TRP:HE3	2:B:266:TRP:HA	1.58	0.68
1:A:257:ILE:O	1:A:261:VAL:HG23	1.95	0.67
2:B:375:ILE:HG13	2:B:389:PHE:HE1	1.57	0.67
2:B:243:PRO:O	2:B:245:VAL:HG23	1.95	0.67
2:B:107:THR:OG1	2:B:198:HIS:HE1	1.77	0.67
1:A:457:TYR:HE1	1:A:465:LYS:HD3	1.59	0.67
2:B:258:GLN:NE2	2:B:289:LEU:HD21	2.10	0.67
2:B:239:TRP:HE3	2:B:239:TRP:N	1.92	0.67
2:B:38:CYS:CB	2:B:144:TYR:HE2	1.88	0.66
2:B:169:GLU:HB3	2:B:170:PRO:HD3	1.77	0.66
2:B:158:ALA:O	2:B:161:GLN:HB2	1.95	0.66
2:B:132:ILE:HG13	2:B:142:ILE:O	1.95	0.66
1:A:502:ALA:O	1:A:506:ILE:HD12	1.95	0.66
2:B:37:ILE:HG22	2:B:38:CYS:N	2.10	0.66
1:A:182:GLN:HE21	1:A:183:TYR:N	1.92	0.66
1:A:326:ILE:HG23	1:A:342:TYR:CD1	2.30	0.66
2:B:337:TRP:CZ3	2:B:368:LEU:HD13	2.31	0.66
1:A:445:ALA:O	1:A:477:THR:HG21	1.95	0.66
2:B:369:THR:HA	2:B:398:TRP:HH2	1.61	0.66
1:A:544:GLY:HA3	2:B:286:THR:HG23	1.77	0.66
1:A:483:TYR:O	1:A:486:LEU:HB2	1.95	0.65
1:A:300:GLU:HA	1:A:303:LEU:HB3	1.79	0.65
1:A:241:VAL:HG23	1:A:270:ILE:HD11	1.77	0.65
2:B:63:ILE:HG22	2:B:64:LYS:N	2.11	0.65
1:A:31:ILE:O	1:A:35:VAL:HG23	1.97	0.65
1:A:4:PRO:HD2	1:A:212:TRP:O	1.97	0.65
2:B:41:MET:SD	2:B:47:ILE:HD13	2.37	0.65
1:A:408:ALA:HB1	2:B:364:ASP:HB3	1.79	0.65
1:A:57:ASN:OD1	1:A:130:PHE:HA	1.97	0.64
2:B:356:ARG:NE	2:B:356:ARG:HA	2.11	0.64
2:B:128:THR:HB	2:B:146:TYR:HB2	1.78	0.64
2:B:13:LYS:CB	2:B:14:PRO:HD2	2.26	0.64
2:B:97:PRO:O	2:B:100:LEU:HB2	1.97	0.64
1:A:97:PRO:HG2	1:A:232:TYR:CD2	2.25	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:183:TYR:O	2:B:186:ASP:HB2	1.96	0.64
1:A:419:THR:HG22	1:A:421:PRO:HD2	1.79	0.64
1:A:191:SER:OG	1:A:198:HIS:CD2	2.39	0.64
1:A:324:ASP:O	1:A:343:GLN:HG2	1.98	0.63
2:B:65:LYS:HG3	2:B:66:LYS:N	2.13	0.63
1:A:53:GLU:O	1:A:55:PRO:HD3	1.97	0.63
2:B:239:TRP:N	2:B:239:TRP:CE3	2.67	0.63
2:B:21:VAL:HG12	2:B:22:LYS:N	2.14	0.63
1:A:248:GLN:HG3	1:A:249:LYS:N	2.14	0.63
1:A:248:GLN:HG3	1:A:249:LYS:H	1.63	0.63
2:B:410:TRP:HE3	2:B:410:TRP:O	1.82	0.63
2:B:65:LYS:HG3	2:B:66:LYS:H	1.63	0.63
1:A:341:ILE:O	1:A:349:LEU:HB3	1.99	0.62
2:B:116:PHE:HD1	2:B:148:VAL:HG21	1.63	0.62
1:A:515:SER:OG	1:A:518:VAL:HG23	2.00	0.62
1:A:100:LEU:HD11	3:A:559:HBV:H111	1.81	0.62
1:A:99:GLY:HA2	1:A:383:TRP:HE1	1.63	0.62
1:A:483:TYR:CE1	1:A:524:GLN:NE2	2.67	0.62
1:A:246:LEU:HD12	1:A:264:LEU:HD21	1.80	0.62
1:A:77:PHE:CD1	1:A:80:LEU:HD23	2.33	0.62
1:A:216:THR:HG22	1:A:218:ASP:OD2	2.00	0.62
1:A:254:VAL:HG13	1:A:283:LEU:HD11	1.81	0.61
1:A:164:MET:CE	1:A:168:LEU:HD21	2.30	0.61
1:A:58:THR:CG2	1:A:59:PRO:HD2	2.30	0.61
1:A:435:VAL:HG12	2:B:290:THR:HG21	1.81	0.61
1:A:244:ILE:CD1	1:A:267:ALA:HB2	2.31	0.61
1:A:428:GLN:C	1:A:429:LEU:HD23	2.21	0.61
1:A:96:HIS:CE1	1:A:98:ALA:H	2.18	0.61
2:B:425:LEU:HD12	2:B:426:TRP:H	1.64	0.61
1:A:109:LEU:HB2	1:A:187:LEU:HB3	1.83	0.61
1:A:326:ILE:HG13	1:A:388:LYS:O	1.99	0.61
2:B:164:MET:HG3	2:B:168:LEU:HD11	1.81	0.61
1:A:327:ALA:HB2	1:A:341:ILE:HG23	1.82	0.61
1:A:228:LEU:CD2	1:A:228:LEU:H	2.14	0.61
1:A:50:ILE:HG13	1:A:51:GLY:H	1.66	0.61
1:A:40:GLU:CA	1:A:43:LYS:HB2	2.28	0.60
1:A:479:LEU:O	1:A:482:ILE:HG13	2.01	0.60
1:A:46:LYS:HG3	1:A:148:VAL:HG21	1.83	0.60
1:A:433:PRO:HD3	2:B:255:ASN:ND2	2.16	0.60
2:B:330:GLN:HG2	2:B:338:THR:OG1	2.01	0.60
1:A:164:MET:HE1	1:A:168:LEU:HD21	1.82	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:12:LEU:HD23	1:A:84:THR:HA	1.83	0.60
1:A:5:ILE:HD12	1:A:6:GLU:HG3	1.84	0.60
2:B:78:ARG:NH1	2:B:411:ILE:HG22	2.16	0.60
2:B:164:MET:HE3	2:B:168:LEU:HG	1.84	0.60
1:A:194:GLU:O	1:A:196:GLY:N	2.35	0.60
1:A:1:PRO:HD2	1:A:44:GLU:HB3	1.82	0.60
1:A:181:TYR:OH	1:A:183:TYR:HB2	2.02	0.60
2:B:37:ILE:CG2	2:B:38:CYS:N	2.65	0.60
1:A:372:VAL:O	1:A:375:ILE:HB	2.01	0.60
2:B:50:ILE:HD11	2:B:144:TYR:C	2.22	0.60
2:B:107:THR:HG22	2:B:108:VAL:N	2.17	0.60
1:A:429:LEU:HD13	1:A:533:LEU:HD13	1.83	0.60
2:B:329:ILE:HG22	2:B:330:GLN:N	2.16	0.60
2:B:78:ARG:NH1	2:B:412:PRO:O	2.35	0.60
1:A:375:ILE:HG21	1:A:389:PHE:CZ	2.37	0.59
1:A:146:TYR:CD1	1:A:150:PRO:HG3	2.37	0.59
1:A:513:SER:HB2	1:A:519:ASN:OD1	2.02	0.59
2:B:160:PHE:CD1	2:B:160:PHE:O	2.56	0.59
1:A:244:ILE:HD11	1:A:267:ALA:HB2	1.84	0.59
2:B:319:TYR:CD2	2:B:383:TRP:HD1	2.20	0.59
1:A:265:ASN:HD21	1:A:353:LYS:NZ	2.01	0.59
1:A:516:GLU:HA	1:A:519:ASN:HD22	1.68	0.59
1:A:460:ASN:HD22	1:A:460:ASN:H	1.49	0.59
2:B:126:LYS:HG3	2:B:127:TYR:CE1	2.37	0.59
2:B:242:GLU:H	2:B:243:PRO:HD3	1.68	0.59
2:B:344:GLU:O	2:B:347:LYS:HB2	2.03	0.58
2:B:303:LEU:HD21	2:B:307:ARG:NH1	2.18	0.58
1:A:153:TRP:HZ3	1:A:159:ILE:HD12	1.68	0.58
1:A:114:ALA:O	1:A:160:PHE:HE2	1.86	0.58
1:A:166:LYS:O	1:A:169:GLU:HB3	2.03	0.58
1:A:484:LEU:HA	1:A:487:GLN:OE1	2.04	0.58
2:B:391:LEU:HD12	2:B:414:TRP:HB2	1.85	0.58
2:B:375:ILE:HG21	2:B:389:PHE:CZ	2.38	0.58
2:B:329:ILE:HG23	2:B:338:THR:O	2.04	0.58
2:B:132:ILE:HG22	2:B:133:PRO:HD2	1.85	0.58
1:A:254:VAL:CG1	1:A:283:LEU:HD11	2.34	0.58
1:A:254:VAL:HG13	1:A:283:LEU:CD1	2.34	0.58
2:B:319:TYR:CD2	2:B:383:TRP:CD1	2.92	0.58
2:B:257:ILE:HD13	2:B:282:LEU:HD23	1.85	0.58
1:A:96:HIS:CD2	1:A:232:TYR:OH	2.57	0.57
1:A:483:TYR:HE1	1:A:524:GLN:HE21	1.49	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:238:LYS:C	2:B:239:TRP:HE3	2.08	0.57
2:B:260:LEU:O	2:B:264:LEU:HG	2.03	0.57
2:B:244:ILE:HG22	2:B:244:ILE:O	2.04	0.57
2:B:268:SER:O	2:B:272:PRO:HA	2.05	0.57
1:A:106:VAL:HG13	1:A:189:VAL:O	2.05	0.57
1:A:56:TYR:N	1:A:56:TYR:CD1	2.69	0.57
1:A:46:LYS:HG2	1:A:116:PHE:HD2	1.68	0.57
1:A:253:THR:O	1:A:257:ILE:HG13	2.04	0.57
2:B:115:TYR:CD1	2:B:115:TYR:N	2.72	0.57
2:B:410:TRP:CE3	2:B:410:TRP:O	2.58	0.56
1:A:171:PHE:CD1	1:A:175:ASN:OD1	2.58	0.56
1:A:266:TRP:CH2	1:A:269:GLN:NE2	2.73	0.56
1:A:235:HIS:ND1	1:A:238:LYS:HG3	2.20	0.56
2:B:61:PHE:HD2	2:B:74:LEU:HD23	1.69	0.56
1:A:131:THR:HG22	1:A:143:ARG:CD	2.35	0.56
1:A:483:TYR:HE1	1:A:524:GLN:CG	2.18	0.56
2:B:10:VAL:HA	2:B:88:TRP:CZ2	2.39	0.56
2:B:254:VAL:HB	2:B:289:LEU:HD23	1.87	0.56
2:B:79:GLU:HG3	2:B:83:ARG:NH1	2.20	0.56
1:A:254:VAL:HA	1:A:257:ILE:HD12	1.86	0.56
1:A:116:PHE:O	1:A:148:VAL:HG21	2.06	0.56
1:A:100:LEU:HD11	3:A:559:HBV:C11	2.35	0.56
2:B:329:ILE:HA	2:B:338:THR:O	2.06	0.56
2:B:264:LEU:HD13	2:B:276:VAL:CG1	2.36	0.56
1:A:363:ASN:OD1	1:A:364:ASP:N	2.39	0.56
1:A:114:ALA:O	1:A:160:PHE:CE2	2.59	0.56
1:A:131:THR:CG2	1:A:143:ARG:HD2	2.35	0.55
1:A:375:ILE:CG2	1:A:389:PHE:HZ	2.20	0.55
1:A:21:VAL:HG12	1:A:22:LYS:N	2.17	0.55
1:A:501:TYR:O	1:A:505:ILE:HG13	2.06	0.55
2:B:247:PRO:HB2	2:B:250:ASP:CB	2.36	0.55
2:B:125:ARG:HE	2:B:147:ASN:HA	1.71	0.55
2:B:17:ASP:O	2:B:83:ARG:NE	2.39	0.55
2:B:131:THR:HG22	2:B:132:ILE:N	2.21	0.55
1:A:341:ILE:HD12	1:A:350:LYS:HB3	1.88	0.55
1:A:108:VAL:CA	1:A:187:LEU:O	2.46	0.55
2:B:377:THR:O	2:B:381:VAL:HG23	2.06	0.55
2:B:225:PRO:N	2:B:226:PRO:HD2	2.20	0.55
1:A:319:TYR:CD1	1:A:320:ASP:N	2.74	0.55
1:A:422:LEU:HG	1:A:423:VAL:N	2.21	0.55
1:A:372:VAL:HA	1:A:375:ILE:HD12	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:319:TYR:HE1	1:A:343:GLN:NE2	2.04	0.55
3:A:559:HBYS:O1	3:A:559:HBYS:S2	2.65	0.55
2:B:191:SER:OG	2:B:198:HIS:HD2	1.89	0.55
1:A:427:TYR:OH	1:A:509:GLN:HA	2.07	0.55
1:A:144:TYR:N	1:A:144:TYR:CD1	2.75	0.55
2:B:354:TYR:CD2	2:B:371:ALA:HB2	2.42	0.54
1:A:398:TRP:O	1:A:400:THR:N	2.39	0.54
1:A:508:ALA:O	1:A:509:GLN:HG2	2.07	0.54
1:A:337:TRP:CD1	1:A:337:TRP:N	2.76	0.54
2:B:12:LEU:HD13	2:B:16:MET:O	2.07	0.54
2:B:136:ASN:ND2	2:B:136:ASN:O	2.41	0.54
1:A:23:GLN:OE1	1:A:59:PRO:HA	2.07	0.54
1:A:420:PRO:HG2	1:A:421:PRO:HD2	1.89	0.54
2:B:26:LEU:HG	2:B:133:PRO:HG3	1.90	0.54
1:A:509:GLN:N	1:A:510:PRO:HD3	2.22	0.54
2:B:23:GLN:HE22	2:B:26:LEU:HD21	1.72	0.54
1:A:464:GLN:O	1:A:465:LYS:HB2	2.07	0.54
1:A:228:LEU:HD23	1:A:228:LEU:H	1.72	0.54
2:B:81:ASN:OD1	2:B:81:ASN:N	2.38	0.54
2:B:109:LEU:HB2	2:B:111:VAL:HG23	1.89	0.54
1:A:373:GLN:O	1:A:375:ILE:N	2.41	0.54
2:B:367:GLN:O	2:B:371:ALA:N	2.40	0.54
2:B:59:PRO:HB2	2:B:76:ASP:CB	2.37	0.54
2:B:394:GLN:HB3	2:B:397:THR:HB	1.88	0.54
1:A:340:GLN:HG3	1:A:351:THR:HG22	1.90	0.54
1:A:1:PRO:CD	1:A:44:GLU:HG2	2.37	0.54
1:A:521:ILE:HG22	1:A:525:LEU:HD12	1.89	0.54
1:A:38:CYS:HB3	1:A:144:TYR:CE2	2.43	0.53
1:A:375:ILE:HD13	1:A:389:PHE:HE1	1.74	0.53
1:A:319:TYR:CD2	1:A:383:TRP:HD1	2.26	0.53
1:A:200:THR:OG1	1:A:201:LYS:N	2.41	0.53
2:B:10:VAL:HG22	2:B:88:TRP:CH2	2.43	0.53
1:A:170:PRO:O	1:A:173:LYS:HB3	2.08	0.53
1:A:131:THR:C	1:A:133:PRO:HD3	2.28	0.53
2:B:40:GLU:O	2:B:43:LYS:HB2	2.08	0.53
1:A:405:TYR:CE2	1:A:407:GLN:HB3	2.44	0.53
1:A:109:LEU:N	1:A:187:LEU:O	2.41	0.53
1:A:521:ILE:HG22	1:A:525:LEU:CD1	2.39	0.53
1:A:275:LYS:HE2	1:A:332:GLN:HE21	1.73	0.53
1:A:482:ILE:CG2	1:A:495:ILE:HD13	2.39	0.53
2:B:124:PHE:O	2:B:126:LYS:N	2.42	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:96:HIS:N	2:B:136:ASN:HD21	2.06	0.53
2:B:193:LEU:HD13	2:B:197:GLN:HB3	1.89	0.53
2:B:356:ARG:HA	2:B:356:ARG:HE	1.73	0.53
1:A:1:PRO:HD2	1:A:44:GLU:HG2	1.90	0.53
1:A:354:TYR:CD2	1:A:371:ALA:HB2	2.44	0.53
2:B:85:GLN:O	2:B:89:GLU:HB2	2.09	0.53
1:A:429:LEU:HD23	1:A:429:LEU:N	2.24	0.53
1:A:178:ILE:HD11	1:A:189:VAL:HG12	1.89	0.52
1:A:153:TRP:HE3	1:A:156:SER:H	1.56	0.52
1:A:342:TYR:HD1	1:A:342:TYR:O	1.92	0.52
2:B:126:LYS:HG3	2:B:127:TYR:CD1	2.44	0.52
1:A:261:VAL:HG13	1:A:276:VAL:CG1	2.39	0.52
2:B:234:LEU:O	2:B:236:PRO:HD3	2.09	0.52
2:B:282:LEU:HD13	2:B:296:THR:HG22	1.92	0.52
2:B:78:ARG:CZ	2:B:411:ILE:HG22	2.39	0.52
1:A:111:VAL:O	1:A:114:ALA:HB3	2.08	0.52
1:A:101:LYS:NZ	1:A:321:PRO:HG3	2.25	0.52
1:A:193:LEU:O	1:A:198:HIS:HB2	2.09	0.52
1:A:279:LEU:HD12	1:A:302:GLU:OE1	2.10	0.52
1:A:100:LEU:CD1	3:A:559:HBY:H111	2.40	0.52
1:A:109:LEU:HD23	1:A:218:ASP:OD2	2.09	0.52
1:A:131:THR:O	1:A:133:PRO:HD3	2.10	0.52
1:A:393:ILE:HD13	1:A:398:TRP:HE3	1.75	0.52
1:A:96:HIS:HD2	1:A:232:TYR:OH	1.93	0.52
2:B:122:GLU:HA	2:B:125:ARG:HD2	1.92	0.52
2:B:28:GLU:CB	2:B:135:ILE:HD11	2.39	0.52
2:B:278:ALA:O	2:B:299:ALA:HB2	2.10	0.52
1:A:261:VAL:HG13	1:A:276:VAL:HG11	1.92	0.52
1:A:420:PRO:HG2	1:A:421:PRO:CD	2.39	0.52
2:B:179:VAL:HG12	2:B:180:ILE:N	2.25	0.52
1:A:393:ILE:CD1	1:A:398:TRP:HE3	2.23	0.51
2:B:6:GLU:HA	2:B:6:GLU:OE1	2.10	0.51
2:B:107:THR:HG22	2:B:108:VAL:H	1.75	0.51
1:A:466:VAL:HG12	1:A:467:VAL:N	2.24	0.51
1:A:339:TYR:O	1:A:339:TYR:HD1	1.91	0.51
1:A:196:GLY:O	1:A:200:THR:HG23	2.11	0.51
2:B:28:GLU:HB2	2:B:135:ILE:HD11	1.93	0.51
2:B:277:ARG:O	2:B:279:LEU:N	2.43	0.51
1:A:12:LEU:HA	1:A:84:THR:HA	1.92	0.51
2:B:424:LYS:O	2:B:425:LEU:C	2.49	0.51
1:A:244:ILE:O	1:A:244:ILE:HG23	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:189:VAL:HG21	1:A:205:LEU:HD23	1.92	0.51
2:B:191:SER:OG	2:B:198:HIS:CD2	2.63	0.51
1:A:5:ILE:HD12	1:A:6:GLU:H	1.76	0.51
1:A:252:TRP:CD1	1:A:252:TRP:N	2.78	0.51
2:B:79:GLU:CG	2:B:83:ARG:NH1	2.74	0.51
1:A:511:ASP:O	1:A:522:ILE:HD13	2.10	0.51
1:A:354:TYR:HD2	1:A:371:ALA:HB2	1.75	0.51
2:B:68:SER:O	2:B:69:THR:HG23	2.11	0.51
1:A:447:ASN:CB	1:A:450:THR:OG1	2.59	0.51
1:A:381:VAL:HG12	1:A:381:VAL:O	2.11	0.51
1:A:342:TYR:O	1:A:342:TYR:CD1	2.64	0.50
1:A:490:GLY:O	1:A:491:LEU:HD23	2.11	0.50
1:A:42:GLU:O	1:A:45:GLY:HA2	2.11	0.50
2:B:128:THR:CB	2:B:146:TYR:HB2	2.41	0.50
1:A:224:GLU:CB	1:A:225:PRO:CD	2.87	0.50
1:A:419:THR:HG23	1:A:420:PRO:HD2	1.93	0.50
1:A:375:ILE:HG21	1:A:389:PHE:HZ	1.74	0.50
1:A:116:PHE:O	1:A:148:VAL:HG11	2.11	0.50
1:A:121:ASP:O	1:A:125:ARG:HG3	2.11	0.50
2:B:164:MET:HE2	2:B:168:LEU:HD21	1.92	0.50
1:A:397:THR:HG21	1:A:425:LEU:H	1.77	0.50
1:A:59:PRO:O	1:A:75:VAL:HG13	2.11	0.50
2:B:364:ASP:O	2:B:367:GLN:HB2	2.12	0.50
2:B:354:TYR:OH	2:B:370:GLU:HB3	2.10	0.50
2:B:193:LEU:HD11	2:B:201:LYS:HG2	1.93	0.50
2:B:258:GLN:HE22	2:B:289:LEU:HD21	1.72	0.50
1:A:544:GLY:HA2	2:B:284:ARG:O	2.11	0.50
1:A:340:GLN:HA	1:A:351:THR:HG22	1.92	0.50
1:A:153:TRP:O	1:A:155:GLY:N	2.45	0.50
2:B:54:ASN:HD21	2:B:129:ALA:HB2	1.77	0.50
2:B:282:LEU:HD22	2:B:295:LEU:HA	1.93	0.50
1:A:373:GLN:O	1:A:376:THR:N	2.44	0.50
2:B:200:THR:O	2:B:202:ILE:N	2.44	0.50
1:A:339:TYR:CD1	1:A:339:TYR:C	2.86	0.50
2:B:376:THR:O	2:B:380:ILE:HG12	2.11	0.50
2:B:224:GLU:HB3	2:B:226:PRO:HD2	1.94	0.50
2:B:326:ILE:HG12	2:B:388:LYS:HB3	1.93	0.50
2:B:130:PHE:CZ	2:B:144:TYR:HB2	2.47	0.49
2:B:398:TRP:C	2:B:400:THR:H	2.14	0.49
1:A:326:ILE:HG22	1:A:342:TYR:O	2.12	0.49
1:A:373:GLN:O	1:A:374:LYS:C	2.50	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:9:PRO:CG	2:B:53:GLU:HG2	2.40	0.49
1:A:458:VAL:HA	1:A:463:ARG:O	2.11	0.49
1:A:365:VAL:HG11	1:A:401:TRP:HB3	1.94	0.49
1:A:391:LEU:CD2	1:A:392:PRO:HD2	2.43	0.49
2:B:270:ILE:HG22	2:B:271:TYR:CD1	2.47	0.49
1:A:241:VAL:HG11	1:A:266:TRP:HE1	1.77	0.49
1:A:501:TYR:CE1	1:A:505:ILE:HD11	2.48	0.49
1:A:207:GLN:OE1	1:A:207:GLN:HA	2.11	0.49
1:A:219:LYS:O	1:A:221:HIS:N	2.45	0.49
1:A:56:TYR:HD1	1:A:56:TYR:H	1.58	0.49
1:A:46:LYS:CG	1:A:148:VAL:HG21	2.42	0.49
2:B:102:LYS:HA	2:B:102:LYS:HE2	1.94	0.49
1:A:476:LYS:O	1:A:479:LEU:HB3	2.12	0.49
1:A:339:TYR:HD1	1:A:339:TYR:C	2.16	0.49
2:B:34:LEU:HD21	2:B:62:ALA:HB2	1.95	0.49
1:A:373:GLN:OE1	2:B:400:THR:HG21	2.12	0.49
1:A:225:PRO:HG3	1:A:236:PRO:HG3	1.94	0.49
1:A:37:ILE:HG22	1:A:38:CYS:N	2.28	0.49
2:B:277:ARG:O	2:B:280:SER:N	2.45	0.49
2:B:120:LEU:HD23	2:B:125:ARG:HG2	1.95	0.48
1:A:120:LEU:HD23	1:A:125:ARG:HG2	1.94	0.48
1:A:517:LEU:O	1:A:521:ILE:HG13	2.13	0.48
1:A:132:ILE:O	1:A:142:ILE:HD12	2.12	0.48
1:A:379:SER:CB	1:A:387:PRO:HD3	2.43	0.48
1:A:96:HIS:CE1	1:A:98:ALA:HB3	2.47	0.48
2:B:202:ILE:O	2:B:205:LEU:N	2.45	0.48
1:A:457:TYR:O	1:A:458:VAL:HG23	2.13	0.48
1:A:19:PRO:HD3	1:A:83:ARG:HD3	1.94	0.48
1:A:483:TYR:HE2	1:A:520:GLN:NE2	2.12	0.48
1:A:326:ILE:HG12	1:A:327:ALA:N	2.27	0.48
2:B:234:LEU:HD12	2:B:381:VAL:HG21	1.95	0.48
2:B:41:MET:HG3	2:B:46:LYS:HD2	1.95	0.48
1:A:43:LYS:C	1:A:45:GLY:H	2.16	0.48
2:B:79:GLU:OE2	2:B:83:ARG:NH1	2.47	0.48
1:A:120:LEU:HD13	1:A:149:LEU:HD23	1.95	0.48
2:B:210:LEU:HD12	2:B:215:THR:O	2.13	0.48
1:A:398:TRP:C	1:A:400:THR:N	2.65	0.48
2:B:236:PRO:HA	2:B:239:TRP:CE2	2.48	0.48
1:A:95:PRO:HB2	2:B:136:ASN:ND2	2.28	0.48
2:B:125:ARG:NE	2:B:147:ASN:HA	2.28	0.48
1:A:144:TYR:N	1:A:144:TYR:HD1	2.11	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:39:THR:HG22	1:A:40:GLU:N	2.28	0.48
2:B:126:LYS:HE3	2:B:127:TYR:CE1	2.48	0.48
2:B:193:LEU:HB3	2:B:197:GLN:HB2	1.96	0.48
1:A:265:ASN:ND2	1:A:353:LYS:NZ	2.60	0.48
2:B:32:LYS:O	2:B:35:VAL:HG23	2.14	0.48
2:B:382:ILE:HG22	2:B:383:TRP:CD2	2.49	0.48
2:B:264:LEU:HD13	2:B:276:VAL:HG12	1.94	0.48
1:A:379:SER:OG	1:A:387:PRO:CG	2.62	0.48
2:B:59:PRO:O	2:B:75:VAL:HG12	2.14	0.48
2:B:319:TYR:CE2	2:B:383:TRP:HD1	2.31	0.48
2:B:131:THR:CG2	2:B:132:ILE:N	2.77	0.48
2:B:31:ILE:HG12	2:B:133:PRO:HG2	1.96	0.48
2:B:59:PRO:HB2	2:B:76:ASP:HB2	1.94	0.48
1:A:252:TRP:HD1	1:A:252:TRP:H	1.62	0.48
1:A:298:GLU:HA	1:A:298:GLU:OE1	2.14	0.48
1:A:31:ILE:HD13	1:A:134:SER:HA	1.95	0.47
2:B:242:GLU:N	2:B:243:PRO:CD	2.70	0.47
1:A:178:ILE:HD11	1:A:189:VAL:CG1	2.44	0.47
2:B:256:ASP:O	2:B:259:LYS:HB2	2.14	0.47
2:B:107:THR:OG1	2:B:198:HIS:CE1	2.64	0.47
2:B:159:ILE:O	2:B:161:GLN:N	2.48	0.47
2:B:368:LEU:HD23	2:B:398:TRP:CZ3	2.48	0.47
1:A:483:TYR:CE1	1:A:524:GLN:CG	2.97	0.47
2:B:328:GLU:O	2:B:339:TYR:HA	2.14	0.47
2:B:354:TYR:CE1	2:B:374:LYS:HD2	2.49	0.47
1:A:21:VAL:CG1	1:A:22:LYS:H	2.22	0.47
1:A:522:ILE:HG22	1:A:523:GLU:N	2.30	0.47
1:A:181:TYR:CD1	1:A:181:TYR:C	2.88	0.47
1:A:248:GLN:CG	1:A:249:LYS:N	2.77	0.47
1:A:532:TYR:CE1	1:A:533:LEU:O	2.67	0.47
2:B:325:LEU:HD21	2:B:349:LEU:HD13	1.96	0.47
1:A:101:LYS:HE2	1:A:321:PRO:HD3	1.95	0.47
2:B:266:TRP:CA	2:B:266:TRP:CE3	2.96	0.47
1:A:473:THR:OG1	1:A:476:LYS:HB2	2.15	0.47
1:A:246:LEU:HB3	1:A:263:LYS:HD2	1.96	0.47
1:A:227:PHE:O	1:A:234:LEU:HD12	2.15	0.47
2:B:329:ILE:HG22	2:B:330:GLN:H	1.78	0.47
1:A:391:LEU:HD23	1:A:392:PRO:HD2	1.97	0.47
1:A:239:TRP:HZ2	1:A:349:LEU:O	1.98	0.47
2:B:375:ILE:O	2:B:378:GLU:HB2	2.15	0.47
1:A:552:VAL:O	1:A:552:VAL:HG12	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:224:GLU:HB2	2:B:228:LEU:HD12	1.96	0.47
2:B:369:THR:HA	2:B:398:TRP:CH2	2.47	0.47
1:A:522:ILE:O	1:A:525:LEU:HB2	2.15	0.47
2:B:43:LYS:O	2:B:45:GLY:N	2.47	0.47
2:B:148:VAL:HG23	2:B:149:LEU:N	2.30	0.46
2:B:59:PRO:HB2	2:B:76:ASP:HB3	1.97	0.46
2:B:167:ILE:O	2:B:208:HIS:CE1	2.59	0.46
2:B:28:GLU:HA	2:B:135:ILE:HD11	1.97	0.46
1:A:153:TRP:HE3	1:A:156:SER:N	2.14	0.46
1:A:87:PHE:CE2	1:A:155:GLY:CA	2.98	0.46
2:B:161:GLN:O	2:B:164:MET:N	2.48	0.46
2:B:21:VAL:CG1	2:B:22:LYS:N	2.79	0.46
2:B:282:LEU:HD13	2:B:296:THR:CG2	2.45	0.46
1:A:542:ILE:HG12	1:A:545:ASN:CG	2.35	0.46
1:A:106:VAL:CG1	1:A:107:THR:N	2.78	0.46
1:A:155:GLY:O	1:A:156:SER:C	2.54	0.46
2:B:13:LYS:O	2:B:15:GLY:N	2.49	0.46
2:B:325:LEU:O	2:B:387:PRO:HA	2.16	0.46
2:B:424:LYS:O	2:B:426:TRP:N	2.48	0.46
1:A:74:LEU:CD1	1:A:75:VAL:H	2.25	0.46
1:A:486:LEU:HD11	1:A:521:ILE:HG23	1.97	0.46
2:B:184:MET:HG2	2:B:410:TRP:HD1	1.80	0.46
1:A:543:GLY:C	1:A:545:ASN:H	2.19	0.46
2:B:369:THR:HG23	2:B:398:TRP:CH2	2.51	0.46
1:A:8:VAL:O	1:A:121:ASP:HB2	2.16	0.46
1:A:342:TYR:C	1:A:342:TYR:CD1	2.89	0.46
1:A:323:LYS:O	1:A:343:GLN:NE2	2.49	0.46
1:A:400:THR:O	1:A:404:GLU:N	2.48	0.46
2:B:260:LEU:O	2:B:260:LEU:HD12	2.16	0.46
2:B:392:PRO:O	2:B:393:ILE:HB	2.15	0.46
2:B:5:ILE:HG22	2:B:6:GLU:N	2.31	0.46
1:A:90:VAL:O	1:A:92:LEU:N	2.48	0.46
2:B:124:PHE:CE2	2:B:153:TRP:CH2	3.03	0.46
2:B:27:THR:HG22	2:B:29:GLU:H	1.81	0.46
1:A:483:TYR:HA	1:A:486:LEU:HD12	1.97	0.46
1:A:201:LYS:HA	1:A:204:GLU:HB2	1.98	0.46
2:B:216:THR:HA	2:B:217:PRO:HD3	1.86	0.46
2:B:159:ILE:C	2:B:161:GLN:H	2.20	0.46
2:B:115:TYR:HD1	2:B:115:TYR:N	2.14	0.46
2:B:120:LEU:HD11	2:B:124:PHE:CD2	2.51	0.46
1:A:326:ILE:HD11	1:A:390:LYS:HG2	1.97	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:183:TYR:CE2	2:B:380:ILE:HD12	2.51	0.45
1:A:363:ASN:HA	1:A:510:PRO:HA	1.98	0.45
2:B:346:PHE:HA	2:B:430:GLU:OXT	2.17	0.45
2:B:105:SER:O	2:B:198:HIS:NE2	2.49	0.45
2:B:31:ILE:CG2	2:B:133:PRO:O	2.65	0.45
1:A:307:ARG:O	1:A:311:LYS:N	2.49	0.45
1:A:87:PHE:C	2:B:55:PRO:HB3	2.37	0.45
1:A:79:GLU:O	1:A:83:ARG:HD2	2.15	0.45
1:A:79:GLU:HG2	1:A:83:ARG:NH1	2.31	0.45
2:B:116:PHE:HD1	2:B:148:VAL:CG2	2.30	0.45
1:A:153:TRP:HB3	1:A:156:SER:OG	2.16	0.45
2:B:54:ASN:C	2:B:54:ASN:OD1	2.55	0.45
2:B:238:LYS:HB2	2:B:239:TRP:CZ3	2.51	0.45
2:B:100:LEU:HG	2:B:381:VAL:O	2.16	0.45
2:B:405:TYR:N	2:B:405:TYR:CD1	2.83	0.45
1:A:180:ILE:CG2	1:A:187:LEU:HD11	2.47	0.45
3:A:559:HBY:O2	3:A:559:HBY:H5	2.17	0.45
1:A:339:TYR:O	1:A:339:TYR:CD1	2.69	0.45
2:B:23:GLN:HE21	2:B:26:LEU:HD21	1.76	0.45
1:A:343:GLN:HG3	1:A:349:LEU:CD2	2.47	0.45
1:A:513:SER:O	1:A:519:ASN:ND2	2.49	0.45
2:B:115:TYR:OH	2:B:185:ASP:HA	2.17	0.45
1:A:235:HIS:O	1:A:237:ASP:N	2.49	0.45
1:A:508:ALA:C	1:A:509:GLN:HG2	2.37	0.45
2:B:402:TRP:C	2:B:404:GLU:N	2.70	0.45
2:B:73:LYS:NZ	2:B:130:PHE:CE2	2.79	0.45
1:A:465:LYS:O	1:A:466:VAL:HG23	2.17	0.45
1:A:466:VAL:CG1	1:A:467:VAL:N	2.79	0.45
2:B:425:LEU:CD1	2:B:426:TRP:H	2.30	0.45
2:B:184:MET:HG2	2:B:410:TRP:CD1	2.51	0.45
2:B:264:LEU:HB3	2:B:276:VAL:HG11	1.99	0.45
2:B:99:GLY:O	2:B:102:LYS:HB2	2.17	0.45
2:B:37:ILE:HG22	2:B:38:CYS:H	1.80	0.45
1:A:483:TYR:HE1	1:A:524:GLN:CD	2.18	0.45
1:A:190:GLY:HA3	3:A:559:HBY:C14	2.47	0.45
1:A:43:LYS:C	1:A:45:GLY:N	2.71	0.45
2:B:200:THR:C	2:B:202:ILE:N	2.68	0.45
1:A:76:ASP:O	1:A:78:ARG:HG2	2.17	0.45
1:A:218:ASP:HB3	1:A:222:GLN:CB	2.47	0.44
2:B:330:GLN:CG	2:B:338:THR:OG1	2.63	0.44
2:B:210:LEU:HA	2:B:210:LEU:HD12	1.60	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:444:GLY:O	1:A:445:ALA:HB2	2.17	0.44
1:A:379:SER:HB3	1:A:387:PRO:HD3	1.99	0.44
1:A:176:PRO:HG2	1:A:177:ASP:H	1.81	0.44
1:A:326:ILE:CG2	1:A:342:TYR:O	2.65	0.44
2:B:34:LEU:HD21	2:B:61:PHE:O	2.18	0.44
2:B:80:LEU:HD23	2:B:153:TRP:CD1	2.52	0.44
1:A:153:TRP:CE3	1:A:156:SER:N	2.85	0.44
1:A:492:GLU:HG3	1:A:492:GLU:O	2.17	0.44
2:B:420:PRO:HA	2:B:421:PRO:HD3	1.72	0.44
1:A:96:HIS:ND1	1:A:98:ALA:HB3	2.33	0.44
2:B:21:VAL:HG12	2:B:22:LYS:H	1.82	0.44
1:A:160:PHE:C	1:A:160:PHE:CD1	2.91	0.44
1:A:320:ASP:HA	1:A:321:PRO:HD2	1.60	0.44
1:A:440:PHE:CD1	1:A:440:PHE:N	2.86	0.44
2:B:160:PHE:O	2:B:161:GLN:C	2.55	0.44
1:A:210:LEU:HD22	1:A:215:THR:HA	2.00	0.44
2:B:60:VAL:CG1	2:B:73:LYS:HE3	2.48	0.44
1:A:447:ASN:N	1:A:452:LEU:O	2.50	0.44
1:A:229:TRP:CB	1:A:234:LEU:CD1	2.86	0.44
2:B:210:LEU:O	2:B:214:LEU:N	2.50	0.44
1:A:181:TYR:CD1	1:A:182:GLN:N	2.86	0.43
2:B:329:ILE:CG2	2:B:330:GLN:N	2.80	0.43
1:A:522:ILE:CG2	1:A:523:GLU:N	2.81	0.43
2:B:235:HIS:O	2:B:239:TRP:CZ3	2.71	0.43
2:B:179:VAL:O	2:B:180:ILE:HG13	2.18	0.43
1:A:312:GLU:HA	1:A:313:PRO:HD2	1.45	0.43
2:B:87:PHE:CZ	2:B:91:GLN:NE2	2.86	0.43
1:A:170:PRO:O	1:A:174:GLN:N	2.49	0.43
1:A:373:GLN:C	1:A:375:ILE:N	2.68	0.43
2:B:343:GLN:HE21	2:B:349:LEU:CD1	2.30	0.43
1:A:486:LEU:O	1:A:489:SER:OG	2.28	0.43
1:A:99:GLY:CA	1:A:383:TRP:HE1	2.31	0.43
1:A:265:ASN:HD21	1:A:353:LYS:HZ1	1.64	0.43
1:A:470:THR:O	1:A:472:THR:HG23	2.18	0.43
1:A:439:THR:HG22	1:A:441:TYR:CE1	2.53	0.43
1:A:181:TYR:HH	1:A:229:TRP:HH2	1.65	0.43
2:B:201:LYS:HD3	2:B:201:LYS:HA	1.83	0.43
1:A:8:VAL:HG11	2:B:52:PRO:HG2	1.99	0.43
2:B:109:LEU:HD22	2:B:206:ARG:HE	1.84	0.43
2:B:63:ILE:CG2	2:B:64:LYS:N	2.80	0.43
1:A:546:GLN:O	1:A:550:LYS:CB	2.66	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:482:ILE:HG22	1:A:495:ILE:CD1	2.41	0.43
2:B:330:GLN:HB3	2:B:330:GLN:HE21	1.63	0.43
2:B:120:LEU:HD23	2:B:125:ARG:CG	2.48	0.43
1:A:498:ASP:OD1	1:A:542:ILE:HG21	2.19	0.43
1:A:273:GLY:O	1:A:309:ILE:HD13	2.19	0.43
2:B:57:ASN:OD1	2:B:58:THR:N	2.47	0.43
1:A:442:VAL:CG2	1:A:495:ILE:HG23	2.48	0.43
2:B:39:THR:O	2:B:42:GLU:HB3	2.19	0.43
2:B:343:GLN:NE2	2:B:349:LEU:HD11	2.33	0.43
2:B:156:SER:O	2:B:158:ALA:N	2.50	0.43
2:B:94:ILE:HD11	2:B:158:ALA:HA	2.01	0.43
2:B:227:PHE:CG	2:B:227:PHE:O	2.72	0.43
1:A:136:ASN:O	1:A:138:GLU:N	2.52	0.43
2:B:422:LEU:O	2:B:425:LEU:HD23	2.18	0.43
2:B:90:VAL:HB	2:B:91:GLN:H	1.54	0.43
2:B:354:TYR:CD1	2:B:374:LYS:HD2	2.53	0.43
1:A:473:THR:C	1:A:475:GLN:N	2.71	0.43
1:A:446:ALA:HA	1:A:452:LEU:O	2.19	0.43
1:A:470:THR:HG22	1:A:471:ASN:N	2.34	0.43
1:A:229:TRP:NE1	3:A:559:HBY:H113	2.34	0.42
1:A:400:THR:C	1:A:402:TRP:H	2.23	0.42
1:A:262:GLY:O	1:A:265:ASN:HB2	2.19	0.42
2:B:402:TRP:C	2:B:404:GLU:H	2.22	0.42
2:B:337:TRP:O	2:B:338:THR:HG23	2.19	0.42
2:B:343:GLN:HE21	2:B:349:LEU:HD11	1.83	0.42
2:B:264:LEU:HD13	2:B:276:VAL:HG11	2.01	0.42
2:B:26:LEU:CD1	2:B:133:PRO:HG3	2.49	0.42
2:B:28:GLU:HB2	2:B:135:ILE:CD1	2.49	0.42
2:B:205:LEU:O	2:B:205:LEU:HD12	2.18	0.42
1:A:457:TYR:CE1	1:A:465:LYS:HB3	2.54	0.42
1:A:317:VAL:HG22	1:A:318:TYR:H	1.84	0.42
1:A:391:LEU:HD23	1:A:391:LEU:HA	1.87	0.42
2:B:193:LEU:HB2	2:B:198:HIS:HB2	2.01	0.42
1:A:74:LEU:HD12	1:A:75:VAL:N	2.27	0.42
1:A:265:ASN:HD21	1:A:353:LYS:HZ2	1.68	0.42
2:B:391:LEU:HB2	2:B:415:GLU:O	2.19	0.42
1:A:10:VAL:HG13	1:A:85:GLN:HG2	2.02	0.42
1:A:264:LEU:HD23	1:A:264:LEU:HA	1.77	0.42
2:B:82:LYS:HD2	2:B:413:GLU:OE2	2.20	0.42
1:A:106:VAL:HG12	1:A:107:THR:N	2.33	0.42
1:A:156:SER:CB	1:A:157:PRO:HD3	2.36	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:342:TYR:HD1	1:A:342:TYR:C	2.23	0.42
1:A:533:LEU:N	1:A:533:LEU:HD12	2.35	0.42
1:A:406:TRP:CG	1:A:407:GLN:N	2.87	0.42
2:B:42:GLU:O	2:B:42:GLU:HG2	2.20	0.42
1:A:380:ILE:HG22	1:A:381:VAL:N	2.35	0.42
1:A:149:LEU:HD11	1:A:159:ILE:HG21	2.01	0.42
2:B:225:PRO:C	2:B:227:PHE:H	2.22	0.42
2:B:60:VAL:HG13	2:B:73:LYS:HE3	2.02	0.42
2:B:75:VAL:HG21	2:B:77:PHE:CE2	2.54	0.42
2:B:76:ASP:C	2:B:78:ARG:H	2.24	0.42
2:B:291:GLU:O	2:B:293:ILE:N	2.53	0.42
2:B:195:ILE:HD13	2:B:195:ILE:H	1.85	0.42
1:A:229:TRP:O	1:A:230:MET:C	2.58	0.42
1:A:42:GLU:O	1:A:45:GLY:N	2.53	0.42
1:A:7:THR:HG21	1:A:121:ASP:HA	2.02	0.42
1:A:108:VAL:HG21	1:A:227:PHE:CZ	2.55	0.41
1:A:159:ILE:O	1:A:162:SER:N	2.53	0.41
2:B:197:GLN:O	2:B:201:LYS:HE2	2.20	0.41
2:B:23:GLN:NE2	2:B:26:LEU:CD2	2.75	0.41
2:B:77:PHE:CE2	2:B:150:PRO:HB3	2.54	0.41
1:A:442:VAL:HG12	1:A:443:ASP:H	1.85	0.41
1:A:88:TRP:HA	1:A:88:TRP:CE3	2.55	0.41
1:A:96:HIS:CE1	1:A:98:ALA:CB	3.03	0.41
1:A:374:LYS:O	1:A:378:GLU:HB2	2.21	0.41
2:B:79:GLU:HG3	2:B:83:ARG:HH11	1.86	0.41
1:A:427:TYR:CE2	1:A:509:GLN:HB3	2.54	0.41
1:A:37:ILE:CG2	1:A:38:CYS:N	2.81	0.41
1:A:102:LYS:HG2	1:A:318:TYR:HB2	2.02	0.41
2:B:200:THR:C	2:B:202:ILE:H	2.23	0.41
1:A:125:ARG:NH1	1:A:147:ASN:HD22	2.18	0.41
2:B:52:PRO:C	2:B:54:ASN:H	2.23	0.41
2:B:63:ILE:CG2	2:B:64:LYS:H	2.29	0.41
1:A:182:GLN:HG3	1:A:182:GLN:O	2.18	0.41
1:A:225:PRO:HB3	1:A:236:PRO:CD	2.50	0.41
2:B:28:GLU:O	2:B:29:GLU:C	2.59	0.41
2:B:300:GLU:OE1	2:B:303:LEU:HD23	2.20	0.41
1:A:532:TYR:HE1	1:A:534:ALA:HB2	1.84	0.41
1:A:491:LEU:HA	1:A:491:LEU:HD23	1.51	0.41
1:A:163:SER:O	1:A:167:ILE:HG13	2.19	0.41
2:B:31:ILE:HD13	2:B:133:PRO:O	2.20	0.41
2:B:425:LEU:CG	2:B:426:TRP:H	2.33	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:23:GLN:CD	1:A:60:VAL:H	2.24	0.41
1:A:54:ASN:O	1:A:143:ARG:NH2	2.53	0.41
1:A:132:ILE:HB	1:A:142:ILE:O	2.21	0.41
1:A:543:GLY:C	1:A:545:ASN:N	2.74	0.41
1:A:90:VAL:HG23	1:A:91:GLN:N	2.36	0.41
2:B:346:PHE:CD1	2:B:346:PHE:N	2.88	0.41
1:A:416:PHE:CE1	1:A:417:VAL:O	2.74	0.41
1:A:96:HIS:HA	1:A:97:PRO:HD2	1.76	0.41
2:B:73:LYS:HG2	2:B:74:LEU:N	2.36	0.41
1:A:440:PHE:HD1	1:A:440:PHE:N	2.19	0.41
1:A:149:LEU:HD11	1:A:159:ILE:CG2	2.51	0.41
1:A:486:LEU:CD1	1:A:521:ILE:HG23	2.51	0.41
1:A:523:GLU:HA	1:A:526:ILE:HB	2.02	0.41
1:A:99:GLY:HA2	1:A:319:TYR:HB2	2.03	0.41
2:B:161:GLN:O	2:B:164:MET:HB3	2.20	0.41
1:A:203:GLU:OE1	1:A:203:GLU:HA	2.19	0.41
1:A:87:PHE:CE2	1:A:155:GLY:HA3	2.56	0.41
1:A:537:PRO:O	1:A:542:ILE:HG23	2.20	0.41
2:B:171:PHE:HE1	2:B:204:GLU:HG2	1.86	0.41
2:B:337:TRP:HB2	2:B:354:TYR:HB3	2.02	0.41
2:B:367:GLN:O	2:B:371:ALA:HB2	2.21	0.41
2:B:398:TRP:C	2:B:400:THR:N	2.75	0.41
1:A:266:TRP:CZ2	1:A:269:GLN:NE2	2.86	0.41
2:B:31:ILE:O	2:B:31:ILE:HG22	2.20	0.41
2:B:206:ARG:O	2:B:209:LEU:HB2	2.20	0.41
1:A:452:LEU:HG	1:A:452:LEU:H	1.63	0.41
1:A:104:LYS:N	1:A:192:ASP:OD1	2.54	0.41
2:B:193:LEU:HB3	2:B:197:GLN:CB	2.51	0.41
1:A:1:PRO:HD3	1:A:44:GLU:HG2	2.01	0.41
1:A:39:THR:O	1:A:43:LYS:HD3	2.19	0.40
1:A:8:VAL:HG13	2:B:53:GLU:CG	2.51	0.40
1:A:379:SER:OG	1:A:387:PRO:HG3	2.20	0.40
2:B:386:THR:HA	2:B:387:PRO:HD3	1.82	0.40
2:B:24:TRP:O	2:B:26:LEU:HD23	2.22	0.40
1:A:515:SER:CB	1:A:518:VAL:HG23	2.51	0.40
2:B:236:PRO:HA	2:B:239:TRP:CZ2	2.57	0.40
1:A:407:GLN:HG3	2:B:393:ILE:HA	2.02	0.40
2:B:402:TRP:O	2:B:404:GLU:N	2.54	0.40
1:A:291:GLU:HG3	1:A:291:GLU:O	2.20	0.40
2:B:110:ASP:O	2:B:112:GLY:N	2.52	0.40
1:A:137:ASN:O	1:A:140:PRO:HD3	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:156:SER:HB2	1:A:157:PRO:CD	2.43	0.40
1:A:246:LEU:HD11	1:A:264:LEU:HD21	2.02	0.40
2:B:80:LEU:O	2:B:83:ARG:HB2	2.21	0.40
2:B:149:LEU:HA	2:B:150:PRO:HD3	1.95	0.40
2:B:380:ILE:O	2:B:384:GLY:N	2.55	0.40
2:B:394:GLN:HB3	2:B:397:THR:CB	2.51	0.40
1:A:411:ILE:HA	1:A:412:PRO:HD2	1.81	0.40
2:B:132:ILE:CG2	2:B:133:PRO:HD2	2.51	0.40
1:A:155:GLY:O	1:A:158:ALA:N	2.52	0.40
2:B:258:GLN:NE2	2:B:289:LEU:CD2	2.81	0.40
2:B:235:HIS:HD1	2:B:235:HIS:N	2.19	0.40
2:B:40:GLU:O	2:B:44:GLU:HG3	2.20	0.40
1:A:76:ASP:C	1:A:78:ARG:H	2.25	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	556/558 (100%)	407 (73%)	110 (20%)	39 (7%)	1	11
2	B	428/430 (100%)	324 (76%)	69 (16%)	35 (8%)	1	8
All	All	984/988 (100%)	731 (74%)	179 (18%)	74 (8%)	1	10

All (74) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	4	PRO
1	A	67	ASP
1	A	104	LYS
1	A	137	ASN
1	A	154	LYS

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Mol	Chain	Res	Type
1	A	195	ILE
1	A	220	LYS
1	A	225	PRO
1	A	242	GLN
1	A	277	ARG
1	A	538	ALA
1	A	545	ASN
2	B	14	PRO
2	B	44	GLU
2	B	85	GLN
2	B	125	ARG
2	B	153	TRP
2	B	212	TRP
2	B	244	ILE
2	B	311	LYS
2	B	317	VAL
2	B	425	LEU
1	A	153	TRP
1	A	284	ARG
1	A	286	THR
1	A	413	GLU
1	A	448	ARG
1	A	540	LYS
2	B	67	ASP
2	B	98	ALA
2	B	243	PRO
2	B	278	ALA
2	B	292	VAL
2	B	315	HIS
2	B	345	PRO
2	B	356	ARG
2	B	421	PRO
2	B	427	TYR
1	A	184	MET
1	A	217	PRO
1	A	218	ASP
1	A	240	THR
1	A	321	PRO
1	A	399	GLU
2	B	78	ARG
2	B	211	ARG
1	A	222	GLN

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Mol	Chain	Res	Type
1	A	236	PRO
1	A	247	PRO
1	A	510	PRO
2	B	69	THR
2	B	260	LEU
2	B	316	GLY
2	B	362	THR
2	B	423	VAL
1	A	243	PRO
1	A	374	LYS
1	A	436	GLY
2	B	138	GLU
2	B	160	PHE
2	B	213	GLY
1	A	63	ILE
1	A	91	GLN
1	A	156	SER
1	A	405	TYR
1	A	465	LYS
2	B	403	THR
1	A	548	VAL
2	B	381	VAL
1	A	359	GLY
2	B	169	GLU
2	B	242	GLU
1	A	176	PRO
2	B	159	ILE

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	455/498 (91%)	362 (80%)	93 (20%)	1	6
2	B	365/391 (93%)	302 (83%)	63 (17%)	2	11
All	All	820/889 (92%)	664 (81%)	156 (19%)	2	8

All (156) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	PRO
1	A	20	LYS
1	A	28	GLU
1	A	29	GLU
1	A	37	ILE
1	A	39	THR
1	A	44	GLU
1	A	46	LYS
1	A	56	TYR
1	A	61	PHE
1	A	65	LYS
1	A	76	ASP
1	A	81	ASN
1	A	94	ILE
1	A	104	LYS
1	A	107	THR
1	A	108	VAL
1	A	111	VAL
1	A	113	ASP
1	A	126	LYS
1	A	135	ILE
1	A	143	ARG
1	A	144	TYR
1	A	146	TYR
1	A	168	LEU
1	A	175	ASN
1	A	182	GLN
1	A	187	LEU
1	A	197	GLN
1	A	210	LEU
1	A	211	ARG
1	A	214	LEU
1	A	216	THR
1	A	221	HIS
1	A	223	LYS
1	A	225	PRO
1	A	227	PHE
1	A	228	LEU
1	A	234	LEU
1	A	238	LYS
1	A	242	GLN
1	A	246	LEU

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Mol	Chain	Res	Type
1	A	252	TRP
1	A	256	ASP
1	A	270	ILE
1	A	282	LEU
1	A	290	THR
1	A	291	GLU
1	A	295	LEU
1	A	296	THR
1	A	300	GLU
1	A	308	GLU
1	A	310	LEU
1	A	312	GLU
1	A	321	PRO
1	A	325	LEU
1	A	339	TYR
1	A	342	TYR
1	A	346	PHE
1	A	348	ASN
1	A	349	LEU
1	A	350	LYS
1	A	353	LYS
1	A	357	MET
1	A	361	HIS
1	A	362	THR
1	A	364	ASP
1	A	368	LEU
1	A	379	SER
1	A	380	ILE
1	A	393	ILE
1	A	397	THR
1	A	403	THR
1	A	404	GLU
1	A	409	THR
1	A	428	GLN
1	A	431	LYS
1	A	440	PHE
1	A	450	THR
1	A	451	LYS
1	A	452	LEU
1	A	460	ASN
1	A	463	ARG
1	A	473	THR

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Mol	Chain	Res	Type
1	A	482	ILE
1	A	489	SER
1	A	497	THR
1	A	503	LEU
1	A	509	GLN
1	A	512	LYS
1	A	522	ILE
1	A	540	LYS
1	A	551	LEU
2	B	11	LYS
2	B	16	MET
2	B	26	LEU
2	B	35	VAL
2	B	37	ILE
2	B	47	ILE
2	B	50	ILE
2	B	53	GLU
2	B	59	PRO
2	B	65	LYS
2	B	67	ASP
2	B	74	LEU
2	B	86	ASP
2	B	87	PHE
2	B	92	LEU
2	B	100	LEU
2	B	104	LYS
2	B	105	SER
2	B	109	LEU
2	B	115	TYR
2	B	132	ILE
2	B	139	THR
2	B	143	ARG
2	B	146	TYR
2	B	163	SER
2	B	165	THR
2	B	166	LYS
2	B	175	ASN
2	B	189	VAL
2	B	195	ILE
2	B	201	LYS
2	B	203	GLU
2	B	207	GLN

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Mol	Chain	Res	Type
2	B	210	LEU
2	B	227	PHE
2	B	233	GLU
2	B	234	LEU
2	B	235	HIS
2	B	239	TRP
2	B	240	THR
2	B	242	GLU
2	B	253	THR
2	B	260	LEU
2	B	266	TRP
2	B	290	THR
2	B	296	THR
2	B	311	LYS
2	B	318	TYR
2	B	324	ASP
2	B	330	GLN
2	B	332	GLN
2	B	345	PRO
2	B	356	ARG
2	B	358	ARG
2	B	367	GLN
2	B	369	THR
2	B	403	THR
2	B	405	TYR
2	B	409	THR
2	B	410	TRP
2	B	414	TRP
2	B	425	LEU
2	B	429	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	96	HIS
1	A	182	GLN
1	A	197	GLN
1	A	198	HIS
1	A	265	ASN
1	A	332	GLN
1	A	460	ASN
1	A	475	GLN

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Mol	Chain	Res	Type
1	A	520	GLN
1	A	524	GLN
2	B	145	GLN
2	B	197	GLN
2	B	198	HIS
2	B	208	HIS
2	B	255	ASN
2	B	258	GLN
2	B	343	GLN
2	B	348	ASN

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 carbohydrates 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	HBY	A	559	-	21,23,23	4.59	16 (76%)	24,32,32	1.64	4 (16%)

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	HBY	A	559	-	-	0/13/29/29	0/1/2/2

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	559	HBY	O3-C15	2.08	1.49	1.42
3	A	559	HBY	C3-N2	2.27	1.43	1.39
3	A	559	HBY	C4-N1	2.42	1.46	1.42
3	A	559	HBY	C8-C7	2.98	1.44	1.38
3	A	559	HBY	C13-C1	3.03	1.58	1.53
3	A	559	HBY	C7-C6	3.10	1.44	1.38
3	A	559	HBY	C5-C6	3.12	1.44	1.38
3	A	559	HBY	O2-C10	3.13	1.55	1.47
3	A	559	HBY	O3-C6	4.73	1.48	1.37
3	A	559	HBY	C2-N2	4.89	1.42	1.36
3	A	559	HBY	O2-C9	5.14	1.45	1.34
3	A	559	HBY	O1-C9	5.14	1.29	1.21
3	A	559	HBY	C2-S1	6.81	1.76	1.66
3	A	559	HBY	C3-C4	7.65	1.48	1.40
3	A	559	HBY	C9-N1	9.14	1.51	1.37
3	A	559	HBY	C13-S2	9.44	1.91	1.80

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	559	HBY	C3-N2-C2	-3.55	121.34	124.70
3	A	559	HBY	O1-C9-N1	-2.38	119.50	124.13
3	A	559	HBY	C10-O2-C9	2.80	121.33	116.77
3	A	559	HBY	O2-C9-N1	4.62	116.34	110.67

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	559	HBY	8	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

EDS was not executed - this section will therefore be empty.

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

EDS was not executed - this section will therefore be empty.

6.3 Carbohydrates [i](#)

EDS was not executed - this section will therefore be empty.

6.4 Ligands [i](#)

EDS was not executed - this section will therefore be empty.

6.5 Other polymers [i](#)

EDS was not executed - this section will therefore be empty.