



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 09:41 PM GMT

PDB ID : 1Q3R
Title : Crystal structure of the chaperonin from Thermococcus strain KS-1
(nucleotide-free form of single mutant)
Authors : Shomura, Y.; Yoshida, T.; Iizuka, R.; Maruyama, T.; Yohda, M.; Miki, K.
Deposited on : 2003-07-31
Resolution : 2.90 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) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

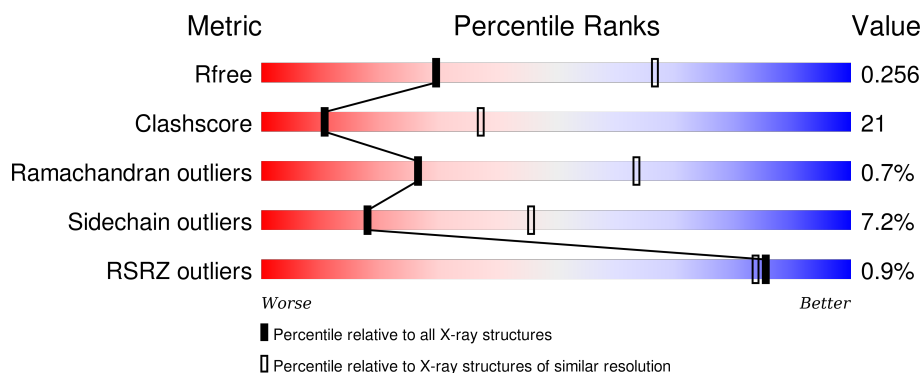
1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.90 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	91344	1451 (2.90-2.90)
Clashscore	102246	1668 (2.90-2.90)
Ramachandran outliers	100387	1630 (2.90-2.90)
Sidechain outliers	100360	1632 (2.90-2.90)
RSRZ outliers	91569	1456 (2.90-2.90)

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.

Mol	Chain	Length	Quality of chain
1	A	548	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red 5%, orange 5%, yellow 35%, green 56%);"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> % 56% 35% • 5% </div> </div>
1	B	548	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red 5%, orange 5%, yellow 32%, green 59%);"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> % 59% 32% • 5% </div> </div>
1	C	548	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red 5%, orange 5%, yellow 31%, green 59%);"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> % 59% 31% • 5% </div> </div>
1	D	548	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red 5%, orange 5%, yellow 35%, green 55%);"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> % 55% 35% • • 5% </div> </div>

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
2	SO4	A	1527	-	-	-	X
2	SO4	C	3527	-	-	-	X
2	SO4	D	4527	-	-	X	X

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 15800 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 Thermosome alpha subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	518	Total	C	N	O	S	0	0	0
			3945	2484	673	772	16			
1	B	518	Total	C	N	O	S	0	0	0
			3945	2484	673	772	16			
1	C	518	Total	C	N	O	S	0	0	0
			3945	2484	673	772	16			
1	D	518	Total	C	N	O	S	0	0	0
			3945	2484	673	772	16			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	125	THR	ILE	ENGINEERED	UNP O24729
B	125	THR	ILE	ENGINEERED	UNP O24729
C	125	THR	ILE	ENGINEERED	UNP O24729
D	125	THR	ILE	ENGINEERED	UNP O24729

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O₄S).

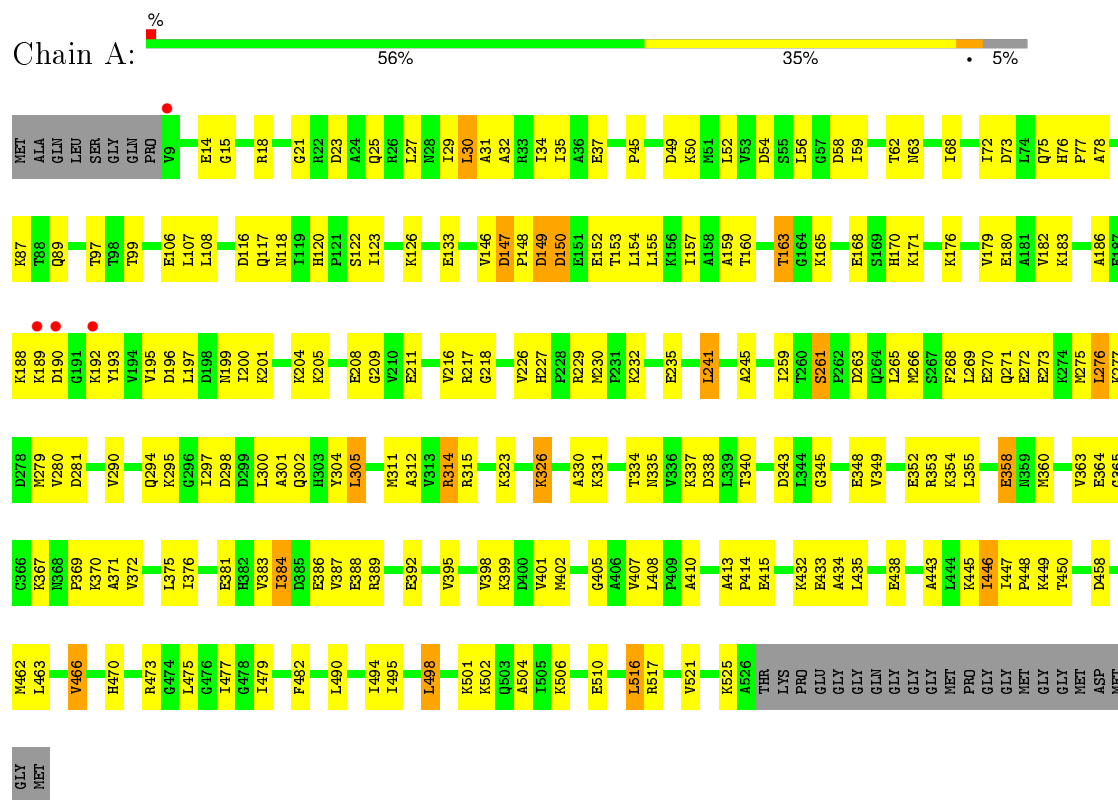


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		

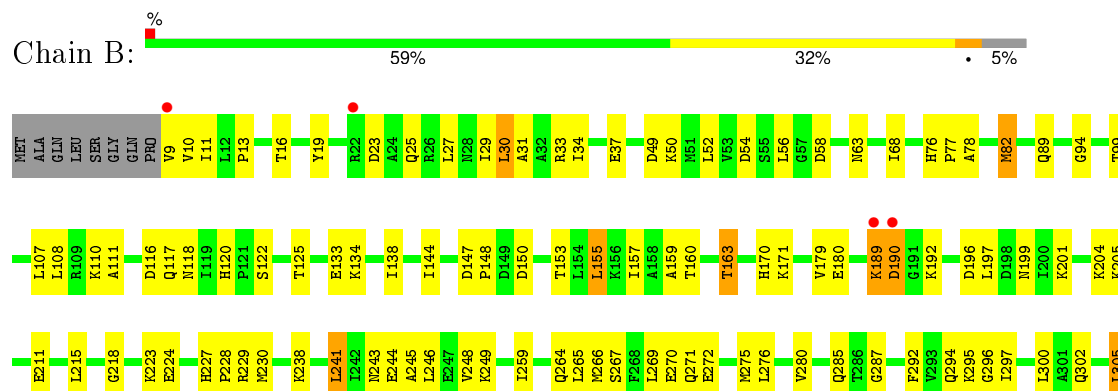
3 Residue-property plots

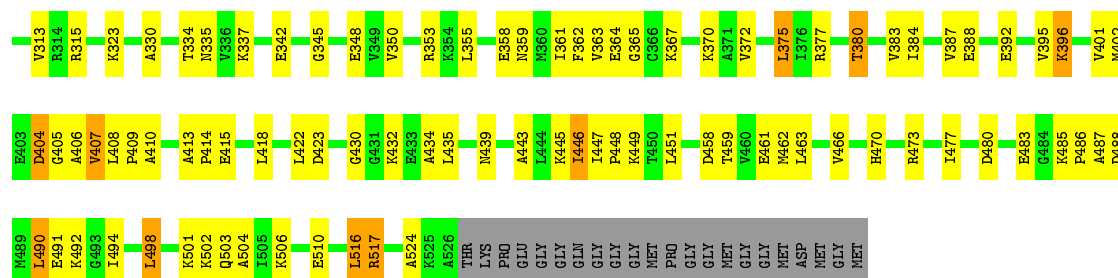
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according 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 ($\text{RSRZ} > 2$). 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: Thermosome alpha subunit

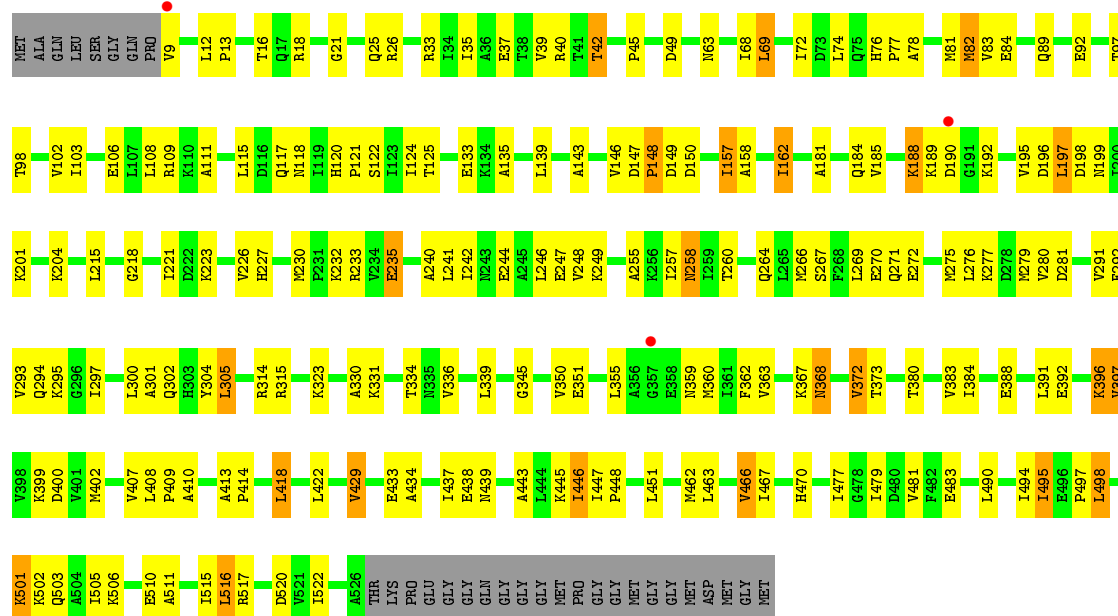


• Molecule 1: Thermosome alpha subunit

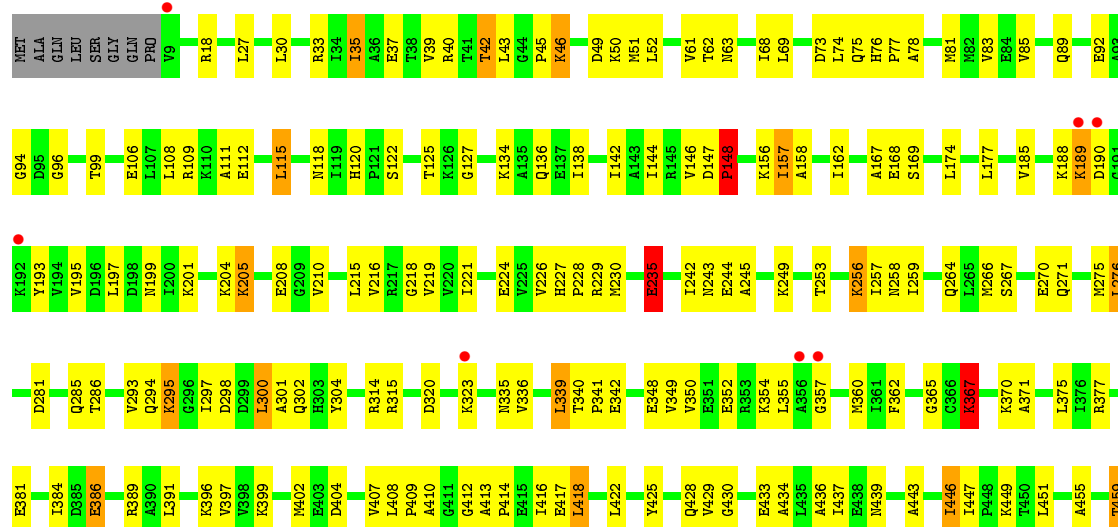




• Molecule 1: Thermosome alpha subunit



• Molecule 1: Thermosome alpha subunit



GLY	V460
GLY	E461
MET	M462
PRO	L463
GLY	V464
GLY	K465
MET	V466
GLY	L467
GLY	H470
ASP	
MET	L475
GLY	G476
MET	L477
MET	G478
	L479
	D480
	V481
	F482
	E483
	D488
	M489
	L490
	E491
	K492
	G493
	I494
	I495
	E496
	P497
	L498
	R499
	V500
	K501
	K502
	Q503
	A504
	S507
	A508
	S509
	A512
	I513
	M514
	I515
	L516
	I522
	A526
	THR
	LVS
	PRO
	GLU
	GLY
	GLY
	GLN
	GLY

4 Data and refinement statistics

Property	Value	Source
Space group	P 4 21 2	Depositor
Cell constants a, b, c, α , β , γ	210.06Å 210.06Å 157.17Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	93.94 – 2.90 93.94 – 2.90	Depositor EDS
% Data completeness (in resolution range)	97.5 (93.94-2.90) 97.5 (93.94-2.90)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.17 (at 2.91Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.212 , 0.257 0.212 , 0.256	Depositor DCC
R_{free} test set	3835 reflections (5.04%)	DCC
Wilson B-factor (Å ²)	30.7	Xtriage
Anisotropy	0.064	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 41.7	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 76139 reflections	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	15800	wwPDB-VP
Average B, all atoms (Å ²)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.47% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SO4

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	0.37	0/3980	0.62	0/5364
1	B	0.36	0/3980	0.61	0/5364
1	C	0.38	0/3980	0.63	0/5364
1	D	0.36	0/3980	0.62	0/5364
All	All	0.37	0/15920	0.62	0/21456

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	3945	0	4125	173	0
1	B	3945	0	4125	168	0
1	C	3945	0	4125	182	0
1	D	3945	0	4125	194	0
2	A	5	0	0	0	0
2	B	5	0	0	0	0
2	C	5	0	0	0	0
2	D	5	0	0	2	0
All	All	15800	0	16500	684	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 21.

All (684) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:201:LYS:HE3	1:D:323:LYS:HD2	1.41	1.02
1:C:503:GLN:HE22	1:D:208:GLU:H	1.05	1.02
1:D:33:ARG:HD3	1:D:109:ARG:HB2	1.43	0.99
1:D:157:ILE:HD12	1:D:495:ILE:HG23	1.46	0.98
1:D:370:LYS:HA	1:D:370:LYS:HE2	1.46	0.96
1:D:45:PRO:HG2	1:D:481:VAL:HG21	1.48	0.96
1:D:99:THR:HG23	2:D:4527:SO4:O1	1.67	0.94
1:C:188:LYS:H	1:C:188:LYS:HD3	1.31	0.94
1:B:189:LYS:NZ	1:B:192:LYS:HB2	1.86	0.91
1:A:447:ILE:HB	1:A:448:PRO:HD3	1.53	0.89
1:C:396:LYS:HE3	1:C:399:LYS:HD3	1.54	0.88
1:C:157:ILE:HD12	1:C:495:ILE:HG23	1.57	0.87
1:C:92:GLU:HG2	1:C:503:GLN:HE21	1.39	0.86
1:C:503:GLN:HE22	1:D:208:GLU:N	1.73	0.85
1:B:159:ALA:O	1:B:163:THR:HG22	1.75	0.85
1:C:503:GLN:NE2	1:D:208:GLU:H	1.74	0.84
1:D:120:HIS:HD2	1:D:122:SER:H	1.24	0.84
1:A:23:ASP:O	1:A:27:LEU:HD23	1.77	0.84
1:C:157:ILE:HD12	1:C:495:ILE:CG2	2.09	0.83
1:C:68:ILE:O	1:C:72:ILE:HG22	1.79	0.83
1:D:112:GLU:HA	1:D:115:LEU:HD23	1.61	0.82
1:D:286:THR:HG21	1:D:339:LEU:HD13	1.61	0.81
1:B:189:LYS:HD3	1:B:189:LYS:H	1.46	0.81
1:A:188:LYS:HB2	1:A:193:TYR:CE2	2.16	0.81
1:A:462:MET:O	1:A:466:VAL:HG23	1.81	0.81
1:D:157:ILE:HG23	1:D:397:VAL:HG12	1.62	0.80
1:B:294:GLN:HE21	1:B:295:LYS:NZ	1.79	0.80
1:C:157:ILE:HG23	1:C:397:VAL:HG13	1.63	0.80
1:D:227:HIS:HB3	1:D:230:MET:HG3	1.64	0.80
1:B:204:LYS:HB2	1:B:384:ILE:HD12	1.64	0.79
1:C:272:GLU:HA	1:C:275:MET:HE2	1.64	0.79
1:D:201:LYS:CE	1:D:323:LYS:HD2	2.13	0.78
1:D:189:LYS:HE3	1:D:189:LYS:HA	1.65	0.78
1:B:380:THR:HG22	1:B:383:VAL:H	1.47	0.78
1:A:62:THR:HG22	1:A:386:GLU:OE2	1.84	0.77
1:B:462:MET:O	1:B:466:VAL:HG23	1.84	0.77
1:B:157:ILE:HD11	1:B:407:VAL:CG2	2.14	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:204:LYS:O	1:D:205:LYS:HE3	1.85	0.77
1:D:219:VAL:HG22	1:D:323:LYS:HE2	1.65	0.76
1:B:227:HIS:HB3	1:B:230:MET:HG3	1.68	0.76
1:A:150:ASP:OD1	1:A:153:THR:HG23	1.84	0.76
1:B:409:PRO:HB3	1:B:490:LEU:HD13	1.68	0.76
1:A:259:ILE:HD13	1:A:265:LEU:HD23	1.68	0.75
1:D:204:LYS:HB3	1:D:384:ILE:HD12	1.69	0.75
1:C:280:VAL:HG13	1:C:305:LEU:HD13	1.68	0.74
1:C:84:GLU:CD	1:D:381:GLU:HG2	2.08	0.74
1:B:335:ASN:HB3	1:B:337:LYS:HG2	1.69	0.74
1:D:43:LEU:HD11	1:D:99:THR:HG22	1.70	0.73
1:A:280:VAL:HG13	1:A:305:LEU:HD13	1.69	0.73
1:C:45:PRO:HG2	1:C:481:VAL:HG21	1.69	0.73
1:B:447:ILE:HB	1:B:448:PRO:HD3	1.69	0.73
1:A:201:LYS:HB2	1:A:323:LYS:HE2	1.71	0.72
1:C:397:VAL:HG22	1:C:497:PRO:HG2	1.70	0.72
1:A:76:HIS:HD2	1:A:78:ALA:H	1.35	0.72
1:B:150:ASP:OD1	1:B:153:THR:HG23	1.90	0.71
1:A:227:HIS:HB3	1:A:230:MET:HG3	1.71	0.71
1:A:15:GLY:HA3	1:A:525:LYS:HD2	1.71	0.71
1:C:331:LYS:HD3	1:D:229:ARG:HE	1.54	0.71
1:C:443:ALA:O	1:C:446:ILE:HG13	1.90	0.71
1:C:408:LEU:HD11	1:C:498:LEU:HD23	1.73	0.70
1:D:201:LYS:HE3	1:D:323:LYS:CD	2.19	0.70
1:B:144:ILE:HD11	1:B:490:LEU:HD21	1.73	0.70
1:D:413:ALA:HB3	1:D:414:PRO:HD3	1.73	0.70
1:A:410:ALA:HB3	1:A:494:ILE:HG22	1.71	0.70
1:B:16:THR:HG22	1:B:524:ALA:HA	1.73	0.70
1:C:49:ASP:OD1	1:C:63:ASN:HB2	1.91	0.70
1:D:462:MET:O	1:D:466:VAL:HG22	1.92	0.69
1:D:340:THR:HG23	1:D:341:PRO:HD2	1.74	0.69
1:C:413:ALA:HB3	1:C:414:PRO:HD3	1.74	0.69
1:D:201:LYS:HB2	1:D:323:LYS:HZ2	1.57	0.69
1:C:247:GLU:HA	1:C:276:LEU:HD11	1.75	0.69
1:C:227:HIS:HB3	1:C:230:MET:HG3	1.74	0.68
1:D:410:ALA:HB3	1:D:494:ILE:HG22	1.75	0.68
1:B:449:LYS:HG3	1:B:459:THR:HG23	1.75	0.68
1:C:388:GLU:O	1:C:392:GLU:HG3	1.93	0.68
1:D:39:VAL:O	1:D:42:THR:HG22	1.94	0.68
1:A:189:LYS:HG3	1:A:190:ASP:H	1.57	0.68
1:A:273:GLU:OE2	1:B:337:LYS:HE3	1.91	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:120:HIS:CD2	1:D:122:SER:H	2.08	0.68
1:A:159:ALA:O	1:A:163:THR:HG22	1.93	0.68
1:B:111:ALA:HB1	1:B:516:LEU:HD21	1.75	0.67
1:C:162:ILE:O	1:C:162:ILE:HG22	1.94	0.67
1:B:483:GLU:HG3	1:B:485:LYS:HE2	1.75	0.67
1:D:49:ASP:HB3	1:D:62:THR:O	1.95	0.67
1:D:409:PRO:HA	1:D:495:ILE:HD12	1.75	0.66
1:D:340:THR:HG22	1:D:342:GLU:H	1.61	0.66
1:B:483:GLU:CG	1:B:485:LYS:HE2	2.25	0.66
1:A:49:ASP:OD1	1:A:63:ASN:HB2	1.94	0.66
1:A:326:LYS:HB3	1:A:371:ALA:HB2	1.75	0.66
1:D:266:MET:O	1:D:270:GLU:HG3	1.96	0.66
1:C:120:HIS:CD2	1:C:122:SER:H	2.12	0.66
1:B:517:ARG:HH11	1:B:517:ARG:HB3	1.61	0.66
1:B:498:LEU:HD13	1:B:502:LYS:HD2	1.77	0.66
1:A:73:ASP:O	1:B:13:PRO:HD3	1.95	0.66
1:A:87:LYS:O	1:A:87:LYS:HD3	1.96	0.66
1:A:261:SER:HB2	1:A:263:ASP:OD2	1.96	0.66
1:B:241:LEU:HD22	1:B:330:ALA:HB3	1.78	0.65
1:D:286:THR:HG21	1:D:339:LEU:CD1	2.26	0.65
1:B:111:ALA:CB	1:B:516:LEU:HD21	2.26	0.65
1:D:50:LYS:HD2	1:D:68:ILE:HD13	1.79	0.65
1:B:413:ALA:HB3	1:B:414:PRO:HD3	1.79	0.65
1:C:409:PRO:HA	1:C:495:ILE:HD12	1.79	0.65
1:C:120:HIS:HD2	1:C:122:SER:H	1.44	0.65
1:C:92:GLU:HG2	1:C:503:GLN:NE2	2.09	0.65
1:B:264:GLN:HA	1:B:267:SER:HB3	1.78	0.65
1:A:241:LEU:HD22	1:A:330:ALA:HB3	1.79	0.65
1:C:271:GLN:O	1:C:275:MET:HG3	1.97	0.65
1:A:208:GLU:H	1:B:503:GLN:HE22	1.43	0.65
1:B:23:ASP:O	1:B:27:LEU:HD23	1.97	0.65
1:C:266:MET:HE1	1:C:269:LEU:HD12	1.78	0.65
1:A:266:MET:O	1:A:270:GLU:HG3	1.96	0.64
1:C:198:ASP:O	1:C:323:LYS:HE3	1.97	0.64
1:D:49:ASP:OD1	1:D:63:ASN:HB2	1.98	0.64
1:C:410:ALA:HB3	1:C:494:ILE:HG22	1.78	0.64
1:D:408:LEU:HD11	1:D:498:LEU:HD23	1.80	0.64
1:A:335:ASN:HB3	1:A:337:LYS:HG2	1.79	0.64
1:A:276:LEU:HD23	1:A:300:LEU:HB3	1.79	0.63
1:A:355:LEU:O	1:A:358:GLU:HG2	1.98	0.63
1:A:197:LEU:HD22	1:A:395:VAL:CG1	2.28	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:243:ASN:O	1:B:295:LYS:HG2	1.99	0.63
1:A:434:ALA:O	1:A:438:GLU:HG3	1.99	0.63
1:C:359:ASN:O	1:C:360:MET:HG2	1.99	0.63
1:D:397:VAL:HG13	1:D:497:PRO:CG	2.29	0.63
1:C:13:PRO:HG3	1:D:75:GLN:NE2	2.13	0.62
1:B:49:ASP:OD1	1:B:63:ASN:HB2	1.98	0.62
1:B:445:LYS:O	1:B:448:PRO:HD2	1.99	0.62
1:D:407:VAL:HG22	1:D:495:ILE:HG13	1.80	0.62
1:A:330:ALA:HB2	1:A:345:GLY:HA3	1.82	0.62
1:A:498:LEU:HD22	1:A:502:LYS:HG3	1.80	0.62
1:D:43:LEU:CD1	1:D:99:THR:HG22	2.30	0.62
1:B:170:HIS:CD2	1:B:211:GLU:HG2	2.35	0.62
1:A:160:THR:HG21	1:A:494:ILE:HA	1.82	0.62
1:D:157:ILE:CG2	1:D:397:VAL:HG12	2.30	0.61
1:B:197:LEU:HD22	1:B:395:VAL:HG12	1.82	0.61
1:B:388:GLU:O	1:B:392:GLU:HG3	2.00	0.61
1:D:177:LEU:HD22	1:D:215:LEU:HB2	1.81	0.61
1:A:76:HIS:CD2	1:A:78:ALA:H	2.16	0.61
1:A:68:ILE:O	1:A:72:ILE:HG13	2.01	0.61
1:A:353:ARG:NH2	1:A:364:GLU:OE1	2.33	0.61
1:B:238:LYS:HD2	1:B:287:GLY:O	1.99	0.61
1:C:45:PRO:HG2	1:C:481:VAL:CG2	2.30	0.61
1:A:334:THR:HG22	1:A:335:ASN:ND2	2.16	0.61
1:C:506:LYS:O	1:C:510:GLU:HG3	2.01	0.61
1:B:259:ILE:HD13	1:B:265:LEU:HD23	1.82	0.61
1:B:197:LEU:HD22	1:B:395:VAL:CG1	2.31	0.61
1:B:266:MET:O	1:B:270:GLU:HG3	2.00	0.61
1:A:148:PRO:O	1:A:402:MET:HG2	2.01	0.61
1:C:102:VAL:HG12	1:C:446:ILE:HD13	1.82	0.61
1:A:408:LEU:HD11	1:A:498:LEU:HD23	1.82	0.61
1:C:409:PRO:HB3	1:C:490:LEU:HD13	1.82	0.60
1:A:294:GLN:HE21	1:A:295:LYS:NZ	1.98	0.60
1:D:157:ILE:CD1	1:D:495:ILE:HG23	2.27	0.60
1:D:466:VAL:HG11	1:D:479:ILE:HG13	1.82	0.60
1:C:81:MET:CE	1:C:515:ILE:HG12	2.31	0.60
1:D:271:GLN:HG3	1:D:275:MET:CE	2.32	0.60
1:D:271:GLN:HG3	1:D:275:MET:HE2	1.83	0.60
1:D:78:ALA:HA	1:D:81:MET:HG3	1.83	0.60
1:B:480:ASP:OD1	1:B:492:LYS:HE2	2.02	0.60
1:C:272:GLU:HA	1:C:275:MET:CE	2.30	0.60
1:B:458:ASP:OD2	1:B:461:GLU:HG3	2.01	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:297:ILE:HG22	1:B:302:GLN:HG3	1.84	0.60
1:A:227:HIS:HD2	1:A:229:ARG:H	1.49	0.59
1:D:498:LEU:HD22	1:D:502:LYS:CG	2.32	0.59
1:D:205:LYS:HG2	1:D:355:LEU:HB3	1.84	0.59
1:D:76:HIS:CD2	1:D:78:ALA:HB3	2.38	0.59
1:A:189:LYS:HG3	1:A:190:ASP:OD2	2.03	0.59
1:D:89:GLN:HE22	1:D:503:GLN:HB3	1.67	0.59
1:C:248:VAL:HG13	1:C:275:MET:HE1	1.83	0.59
1:B:201:LYS:HB2	1:B:323:LYS:HE2	1.85	0.59
1:C:380:THR:OG1	1:C:383:VAL:HG23	2.03	0.59
1:B:404:ASP:O	1:B:406:ALA:N	2.34	0.59
1:B:33:ARG:O	1:B:37:GLU:HG3	2.03	0.58
1:A:117:GLN:O	1:A:118:ASN:HB2	2.02	0.58
1:D:460:VAL:O	1:D:464:VAL:HG23	2.02	0.58
1:B:330:ALA:HB2	1:B:345:GLY:HA3	1.85	0.58
1:B:157:ILE:HG13	1:B:401:VAL:HG21	1.85	0.58
1:B:54:ASP:OD2	1:B:58:ASP:HB3	2.03	0.58
1:B:241:LEU:HD12	1:B:292:PHE:HB2	1.86	0.58
1:C:277:LYS:HE2	1:C:281:ASP:OD2	2.03	0.58
1:C:197:LEU:CD1	1:C:399:LYS:HD2	2.34	0.58
1:A:21:GLY:O	1:A:25:GLN:HG3	2.04	0.58
1:B:271:GLN:HG3	1:B:275:MET:CE	2.34	0.58
1:C:397:VAL:HG22	1:C:497:PRO:CG	2.33	0.57
1:A:193:TYR:HB2	1:A:402:MET:O	2.04	0.57
1:C:157:ILE:CD1	1:C:495:ILE:HG23	2.31	0.57
1:A:157:ILE:HD11	1:A:407:VAL:HG22	1.85	0.57
1:D:136:GLN:NE2	1:D:502:LYS:HD2	2.19	0.57
1:C:433:GLU:O	1:C:437:ILE:HG13	2.05	0.57
1:A:30:LEU:HD13	1:B:9:VAL:HG13	1.86	0.57
1:B:52:LEU:HD11	1:B:68:ILE:HA	1.85	0.57
1:D:224:GLU:HB2	1:D:352:GLU:OE1	2.04	0.57
1:C:197:LEU:HD13	1:C:399:LYS:HD2	1.85	0.57
1:A:189:LYS:HG3	1:A:190:ASP:N	2.19	0.57
1:D:136:GLN:HE22	1:D:502:LYS:HD2	1.68	0.57
1:B:276:LEU:HD23	1:B:300:LEU:HB3	1.86	0.57
1:C:84:GLU:OE1	1:D:381:GLU:HG2	2.04	0.57
1:D:281:ASP:O	1:D:285:GLN:HG3	2.04	0.57
1:A:383:VAL:O	1:A:387:VAL:HG23	2.05	0.57
1:A:381:GLU:OE2	1:A:381:GLU:N	2.38	0.57
1:B:223:LYS:HE3	1:B:315:ARG:O	2.05	0.57
1:A:160:THR:O	1:A:163:THR:HG23	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:106:GLU:HB2	1:D:446:ILE:HG12	1.86	0.56
1:C:18:ARG:HG3	1:C:522:ILE:HG12	1.87	0.56
1:D:245:ALA:HB2	1:D:295:LYS:HB3	1.87	0.56
1:A:163:THR:HB	1:A:171:LYS:NZ	2.20	0.56
1:B:449:LYS:HG3	1:B:459:THR:CG2	2.35	0.56
1:B:498:LEU:HD22	1:B:502:LYS:HG3	1.86	0.56
1:C:76:HIS:CD2	1:C:78:ALA:H	2.23	0.56
1:A:348:GLU:HB3	1:A:365:GLY:HA3	1.87	0.56
1:A:146:VAL:HG22	1:A:147:ASP:N	2.20	0.56
1:C:463:LEU:O	1:C:467:ILE:HG12	2.04	0.56
1:C:258:ASN:HB2	1:D:258:ASN:HD21	1.69	0.56
1:D:480:ASP:OD2	1:D:483:GLU:HB2	2.04	0.56
1:C:490:LEU:HD12	1:C:495:ILE:HD11	1.87	0.56
1:D:219:VAL:HG13	1:D:323:LYS:HD3	1.87	0.56
1:C:196:ASP:HB3	1:C:199:ASN:ND2	2.20	0.56
1:D:276:LEU:CD1	1:D:301:ALA:HB2	2.35	0.56
1:D:157:ILE:HG23	1:D:397:VAL:CG1	2.32	0.56
1:A:157:ILE:HD13	1:A:495:ILE:HG13	1.87	0.56
1:C:157:ILE:CG2	1:C:397:VAL:HG13	2.36	0.56
1:C:271:GLN:HA	1:C:271:GLN:HE21	1.69	0.55
1:B:25:GLN:O	1:B:29:ILE:HG12	2.06	0.55
1:C:266:MET:O	1:C:270:GLU:HG3	2.06	0.55
1:A:415:GLU:HG3	1:A:447:ILE:HB	1.88	0.55
1:B:271:GLN:HG3	1:B:275:MET:HE2	1.88	0.55
1:B:248:VAL:HG21	1:B:272:GLU:HB3	1.88	0.55
1:C:232:LYS:O	1:C:351:GLU:HB2	2.06	0.55
1:A:462:MET:HE3	1:A:466:VAL:HG22	1.88	0.55
1:C:271:GLN:HA	1:C:271:GLN:NE2	2.22	0.55
1:B:56:LEU:O	1:B:56:LEU:HD23	2.06	0.55
1:D:76:HIS:CD2	1:D:78:ALA:H	2.25	0.55
1:A:470:HIS:HA	1:A:477:ILE:HB	1.89	0.55
1:D:470:HIS:HA	1:D:477:ILE:HB	1.89	0.55
1:A:32:ALA:O	1:A:35:ILE:HG22	2.07	0.55
1:D:446:ILE:HD12	1:D:446:ILE:H	1.73	0.54
1:B:196:ASP:HB3	1:B:199:ASN:ND2	2.22	0.54
1:B:443:ALA:O	1:B:446:ILE:HG13	2.06	0.54
1:D:461:GLU:O	1:D:465:LYS:HD3	2.06	0.54
1:C:258:ASN:HD22	1:D:258:ASN:ND2	2.05	0.54
1:A:176:LYS:O	1:A:180:GLU:HB2	2.08	0.54
1:A:445:LYS:O	1:A:448:PRO:HD2	2.07	0.54
1:D:127:GLY:HA3	1:D:436:ALA:HB3	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:195:VAL:HB	1:C:399:LYS:HG3	1.89	0.54
1:B:160:THR:O	1:B:163:THR:HG23	2.08	0.54
1:D:111:ALA:CB	1:D:516:LEU:HD21	2.38	0.54
1:B:243:ASN:OD1	1:B:334:THR:HA	2.07	0.54
1:A:190:ASP:C	1:A:192:LYS:H	2.11	0.54
1:D:397:VAL:HG13	1:D:497:PRO:HG2	1.89	0.54
1:D:227:HIS:HB3	1:D:230:MET:CG	2.37	0.54
1:A:75:GLN:NE2	1:B:13:PRO:HG3	2.23	0.54
1:D:157:ILE:HG22	1:D:158:ALA:N	2.23	0.53
1:A:386:GLU:OE2	1:A:386:GLU:HA	2.08	0.53
1:B:498:LEU:CD1	1:B:502:LYS:HD2	2.37	0.53
1:C:111:ALA:CB	1:C:516:LEU:HD21	2.38	0.53
1:C:255:ALA:CB	1:D:257:ILE:HB	2.39	0.53
1:C:255:ALA:HB2	1:D:257:ILE:HB	1.89	0.53
1:B:30:LEU:HD22	1:B:34:ILE:HD11	1.90	0.53
1:C:396:LYS:O	1:C:396:LYS:HD3	2.08	0.53
1:C:201:LYS:HG2	1:C:323:LYS:HE2	1.89	0.53
1:C:42:THR:HG22	1:C:98:THR:HG21	1.90	0.53
1:D:386:GLU:OE2	1:D:389:ARG:HD2	2.07	0.53
1:A:76:HIS:HD2	1:A:78:ALA:N	2.05	0.53
1:D:300:LEU:HD22	1:D:304:TYR:CE2	2.42	0.53
1:C:188:LYS:CD	1:C:188:LYS:H	2.13	0.53
1:D:111:ALA:HB1	1:D:516:LEU:HD21	1.90	0.53
1:C:498:LEU:HD22	1:C:502:LYS:HG2	1.90	0.53
1:C:115:LEU:HD13	1:C:124:ILE:HD12	1.89	0.53
1:B:94:GLY:CA	1:B:396:LYS:HG2	2.39	0.53
1:A:170:HIS:CD2	1:A:211:GLU:HG2	2.43	0.53
1:D:297:ILE:HG22	1:D:302:GLN:HG3	1.91	0.53
1:A:123:ILE:HG23	1:A:433:GLU:OE2	2.08	0.53
1:D:195:VAL:HB	1:D:399:LYS:HG3	1.91	0.53
1:A:446:ILE:O	1:A:450:THR:HG23	2.08	0.53
1:D:51:MET:HG3	1:D:61:VAL:HG22	1.91	0.53
1:C:189:LYS:O	1:C:190:ASP:HB2	2.09	0.53
1:B:415:GLU:HG3	1:B:447:ILE:HB	1.91	0.52
1:D:350:VAL:HA	1:D:362:PHE:O	2.09	0.52
1:D:46:LYS:HG2	1:D:455:ALA:HA	1.92	0.52
1:B:409:PRO:HB3	1:B:490:LEU:CD1	2.39	0.52
1:B:144:ILE:CD1	1:B:490:LEU:HD21	2.38	0.52
1:D:496:GLU:OE2	1:D:501:LYS:HE2	2.09	0.52
1:C:204:LYS:HB2	1:C:384:ILE:HD12	1.91	0.52
1:D:449:LYS:HE2	1:D:459:THR:HG21	1.90	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:432:LYS:HA	1:B:435:LEU:HD13	1.90	0.52
1:B:355:LEU:HD11	1:B:375:LEU:HD11	1.91	0.52
1:B:296:GLY:HA2	1:B:315:ARG:HD2	1.92	0.52
1:A:146:VAL:HG22	1:A:147:ASP:H	1.75	0.52
1:C:241:LEU:HD23	1:C:292:PHE:HB2	1.91	0.52
1:D:201:LYS:CD	1:D:323:LYS:HD2	2.40	0.52
1:D:92:GLU:HG2	1:D:503:GLN:NE2	2.25	0.52
1:A:99:THR:HG23	1:A:447:ILE:CD1	2.40	0.52
1:C:135:ALA:O	1:C:139:LEU:HG	2.10	0.52
1:C:264:GLN:HA	1:C:267:SER:OG	2.09	0.52
1:C:33:ARG:CZ	1:C:109:ARG:HG3	2.39	0.52
1:D:33:ARG:CD	1:D:109:ARG:HB2	2.29	0.52
1:C:157:ILE:HG22	1:C:158:ALA:N	2.25	0.52
1:A:227:HIS:CD2	1:A:229:ARG:H	2.27	0.52
1:C:143:ALA:HA	1:C:408:LEU:HD23	1.91	0.52
1:D:446:ILE:N	1:D:446:ILE:HD12	2.25	0.52
1:C:188:LYS:N	1:C:188:LYS:HD3	2.13	0.51
1:C:81:MET:HE3	1:C:515:ILE:HG12	1.91	0.51
1:A:208:GLU:N	1:B:503:GLN:HE22	2.07	0.51
1:A:123:ILE:HG21	1:A:432:LYS:HB2	1.91	0.51
1:A:56:LEU:HD12	1:A:56:LEU:N	2.26	0.51
1:B:410:ALA:HB3	1:B:494:ILE:HG22	1.92	0.51
1:D:490:LEU:CD1	1:D:495:ILE:HD13	2.41	0.51
1:A:277:LYS:HE3	1:A:281:ASP:OD2	2.10	0.51
1:D:418:LEU:O	1:D:422:LEU:HG	2.11	0.51
1:A:209:GLY:N	1:B:506:LYS:HD3	2.25	0.51
1:A:354:LYS:HE3	1:B:196:ASP:OD1	2.10	0.51
1:A:54:ASP:OD2	1:A:58:ASP:HB3	2.11	0.50
1:B:280:VAL:HG13	1:B:305:LEU:HD13	1.92	0.50
1:B:82:MET:HA	1:B:82:MET:CE	2.41	0.50
1:C:466:VAL:HG11	1:C:479:ILE:HG12	1.93	0.50
1:D:45:PRO:CG	1:D:481:VAL:HG21	2.31	0.50
1:C:409:PRO:HB3	1:C:490:LEU:CD1	2.40	0.50
1:B:404:ASP:C	1:B:406:ALA:H	2.14	0.50
1:D:443:ALA:O	1:D:446:ILE:HG13	2.11	0.50
1:D:242:ILE:O	1:D:293:VAL:HA	2.10	0.50
1:A:227:HIS:HB3	1:A:230:MET:CG	2.41	0.50
1:C:462:MET:O	1:C:466:VAL:HG22	2.11	0.50
1:C:82:MET:CE	1:C:82:MET:HA	2.41	0.50
1:C:501:LYS:O	1:C:505:ILE:HG12	2.11	0.50
1:B:108:LEU:CD2	1:B:516:LEU:HD13	2.42	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:226:VAL:HG22	1:A:302:GLN:OE1	2.12	0.50
1:C:148:PRO:O	1:C:402:MET:HG2	2.12	0.50
1:B:155:LEU:HD13	1:B:179:VAL:HG21	1.94	0.50
1:C:81:MET:HE1	1:C:515:ILE:HG12	1.94	0.50
1:C:223:LYS:HE3	1:C:315:ARG:O	2.11	0.50
1:A:337:LYS:HG3	1:A:338:ASP:OD2	2.11	0.50
1:A:45:PRO:HB3	1:A:482:PHE:CE2	2.47	0.50
1:C:511:ALA:O	1:C:515:ILE:HG13	2.12	0.50
1:B:488:ASP:CG	1:B:491:GLU:HG3	2.32	0.50
1:B:264:GLN:HA	1:B:267:SER:CB	2.41	0.49
1:B:488:ASP:O	1:B:492:LYS:HG3	2.11	0.49
1:A:297:ILE:HG13	1:A:314:ARG:HB3	1.94	0.49
1:C:215:LEU:HD21	1:C:372:VAL:HG11	1.94	0.49
1:C:147:ASP:O	1:C:149:ASP:N	2.45	0.49
1:C:106:GLU:HB2	1:C:446:ILE:HG12	1.93	0.49
1:A:208:GLU:H	1:B:503:GLN:NE2	2.09	0.49
1:B:218:GLY:HA3	1:B:363:VAL:O	2.12	0.49
1:B:439:ASN:HD22	1:B:439:ASN:N	2.09	0.49
1:A:462:MET:CE	1:A:479:ILE:HG12	2.42	0.49
1:A:201:LYS:HB2	1:A:323:LYS:CE	2.41	0.49
1:B:246:LEU:N	1:B:246:LEU:HD12	2.27	0.49
1:C:181:ALA:HB2	1:C:215:LEU:HD21	1.94	0.49
1:B:50:LYS:HD2	1:B:68:ILE:HD13	1.93	0.49
1:A:443:ALA:O	1:A:446:ILE:HG13	2.12	0.49
1:D:185:VAL:CG1	1:D:199:ASN:HB2	2.43	0.49
1:C:248:VAL:HG13	1:C:275:MET:CE	2.42	0.49
1:D:466:VAL:HG11	1:D:479:ILE:CG1	2.42	0.49
1:A:126:LYS:HZ2	1:A:433:GLU:HG2	1.77	0.49
1:B:353:ARG:NH2	1:B:364:GLU:OE1	2.42	0.49
1:B:94:GLY:HA3	1:B:396:LYS:HG2	1.93	0.49
1:A:432:LYS:HA	1:A:435:LEU:HD13	1.95	0.49
1:C:190:ASP:C	1:C:192:LYS:H	2.16	0.49
1:A:232:LYS:HD2	1:A:352:GLU:OE2	2.12	0.49
1:B:189:LYS:HZ3	1:B:192:LYS:HB2	1.74	0.49
1:A:376:ILE:HG22	1:A:384:ILE:HG12	1.95	0.49
1:D:340:THR:HG23	1:D:341:PRO:CD	2.40	0.48
1:A:272:GLU:HA	1:A:275:MET:HE3	1.95	0.48
1:D:188:LYS:HB3	1:D:193:TYR:CE2	2.48	0.48
1:C:242:ILE:HD13	1:C:336:VAL:HG22	1.95	0.48
1:D:430:GLY:CA	1:D:434:ALA:HB2	2.43	0.48
1:B:76:HIS:HD2	1:B:78:ALA:HB3	1.78	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:294:GLN:HE21	1:B:295:LYS:HZ3	1.60	0.48
1:A:269:LEU:HD21	1:B:249:LYS:HB2	1.95	0.48
1:A:294:GLN:HE21	1:A:295:LYS:HZ3	1.61	0.48
1:A:106:GLU:HB2	1:A:446:ILE:HG12	1.95	0.48
1:A:218:GLY:HA3	1:A:363:VAL:O	2.12	0.48
1:A:196:ASP:HB3	1:A:199:ASN:ND2	2.29	0.48
1:D:433:GLU:O	1:D:437:ILE:HG13	2.12	0.48
1:D:120:HIS:HD2	1:D:122:SER:N	2.02	0.48
1:B:243:ASN:HA	1:B:294:GLN:HB3	1.94	0.48
1:A:30:LEU:HD22	1:A:34:ILE:HD11	1.96	0.48
1:A:348:GLU:O	1:A:349:VAL:HG23	2.14	0.48
1:B:408:LEU:HD11	1:B:498:LEU:HD23	1.94	0.48
1:C:201:LYS:CG	1:C:323:LYS:HD2	2.43	0.48
1:C:201:LYS:HG2	1:C:323:LYS:CE	2.44	0.48
1:A:204:LYS:HD2	1:A:384:ILE:HG23	1.95	0.48
1:A:186:ALA:HA	1:A:195:VAL:HG22	1.96	0.48
1:C:470:HIS:HA	1:C:477:ILE:HB	1.96	0.48
1:D:157:ILE:HD11	1:D:407:VAL:HG23	1.96	0.47
1:B:294:GLN:HE21	1:B:295:LYS:HZ1	1.57	0.47
1:C:108:LEU:CD2	1:C:516:LEU:HD13	2.44	0.47
1:B:148:PRO:O	1:B:402:MET:HG2	2.14	0.47
1:C:35:ILE:HD11	1:C:74:LEU:HD22	1.97	0.47
1:D:108:LEU:CD2	1:D:516:LEU:HD13	2.44	0.47
1:B:13:PRO:HD2	1:B:16:THR:HG21	1.96	0.47
1:D:77:PRO:O	1:D:81:MET:HG2	2.13	0.47
1:D:294:GLN:NE2	1:D:295:LYS:HE3	2.29	0.47
1:C:244:GLU:OE1	1:C:336:VAL:HG23	2.14	0.47
1:B:201:LYS:HB2	1:B:323:LYS:CE	2.44	0.47
1:B:120:HIS:CE1	1:B:122:SER:HB2	2.49	0.47
1:B:459:THR:O	1:B:463:LEU:HD23	2.15	0.47
1:C:221:ILE:HG22	1:C:223:LYS:HB2	1.96	0.47
1:D:462:MET:CE	1:D:479:ILE:HG23	2.45	0.47
1:B:76:HIS:CD2	1:B:78:ALA:HB3	2.49	0.47
1:B:348:GLU:HB3	1:B:365:GLY:HA3	1.95	0.47
1:D:447:ILE:O	1:D:451:LEU:HG	2.15	0.47
1:D:201:LYS:HG2	1:D:323:LYS:HD2	1.97	0.47
1:D:512:ALA:O	1:D:516:LEU:HB2	2.15	0.47
1:A:50:LYS:HD2	1:A:68:ILE:HD13	1.96	0.47
1:D:294:GLN:O	1:D:315:ARG:HA	2.14	0.47
1:D:210:VAL:HA	1:D:377:ARG:O	2.14	0.47
1:B:89:GLN:HE22	1:B:504:ALA:N	2.12	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:257:ILE:HA	1:D:259:ILE:HB	1.95	0.47
1:C:294:GLN:HE21	1:C:295:LYS:NZ	2.13	0.47
1:A:301:ALA:O	1:A:305:LEU:HD22	2.15	0.47
1:A:330:ALA:HB2	1:A:345:GLY:CA	2.44	0.47
1:D:89:GLN:NE2	1:D:504:ALA:N	2.62	0.47
1:C:240:ALA:HB3	1:C:291:VAL:HG13	1.96	0.47
1:D:37:GLU:O	1:D:40:ARG:HG2	2.15	0.47
1:A:190:ASP:C	1:A:192:LYS:N	2.68	0.47
1:D:242:ILE:HD13	1:D:336:VAL:HG22	1.95	0.47
1:A:18:ARG:HA	1:A:521:VAL:O	2.15	0.47
1:B:227:HIS:HB3	1:B:230:MET:CG	2.43	0.47
1:B:99:THR:HG23	1:B:447:ILE:CD1	2.45	0.47
1:C:201:LYS:HG3	1:C:323:LYS:HD2	1.95	0.47
1:D:463:LEU:O	1:D:467:ILE:HG13	2.15	0.47
1:D:157:ILE:HD11	1:D:407:VAL:CG2	2.44	0.46
1:C:396:LYS:C	1:C:396:LYS:HD3	2.36	0.46
1:D:148:PRO:O	1:D:402:MET:HG2	2.15	0.46
1:A:99:THR:HG23	1:A:447:ILE:HD12	1.96	0.46
1:A:197:LEU:HD22	1:A:395:VAL:HG12	1.95	0.46
1:A:498:LEU:HD13	1:A:502:LYS:HD2	1.97	0.46
1:D:221:ILE:HD12	1:D:320:ASP:HB3	1.97	0.46
1:A:245:ALA:HB2	1:A:295:LYS:HB3	1.97	0.46
1:A:37:GLU:CD	1:C:26:ARG:HH22	2.17	0.46
1:D:157:ILE:CG2	1:D:158:ALA:N	2.79	0.46
1:B:227:HIS:CD2	1:B:229:ARG:H	2.34	0.46
1:A:266:MET:HE1	1:A:269:LEU:HD23	1.97	0.46
1:A:297:ILE:HD12	1:A:314:ARG:HB3	1.97	0.46
1:C:233:ARG:NE	1:C:235:GLU:OE2	2.49	0.46
1:C:350:VAL:HA	1:C:362:PHE:O	2.16	0.46
1:C:117:GLN:O	1:C:118:ASN:HB2	2.14	0.46
1:A:335:ASN:CB	1:A:337:LYS:HG2	2.44	0.46
1:C:447:ILE:O	1:C:451:LEU:HG	2.15	0.46
1:B:163:THR:HB	1:B:171:LYS:CE	2.46	0.46
1:A:297:ILE:CG1	1:A:314:ARG:HB3	2.45	0.46
1:A:275:MET:O	1:A:279:MET:HG3	2.16	0.46
1:D:256:LYS:NZ	1:D:256:LYS:HB3	2.31	0.46
1:B:29:ILE:HG23	1:B:108:LEU:HB3	1.96	0.46
1:C:429:VAL:HG21	1:C:437:ILE:CD1	2.45	0.46
1:C:190:ASP:O	1:C:192:LYS:N	2.49	0.46
1:B:189:LYS:HD3	1:B:189:LYS:N	2.24	0.46
1:C:157:ILE:HG23	1:C:397:VAL:CG1	2.41	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:108:LEU:HD22	1:D:516:LEU:HD13	1.98	0.46
1:D:227:HIS:CG	1:D:228:PRO:HD2	2.51	0.46
1:B:446:ILE:HD12	1:B:447:ILE:H	1.81	0.46
1:B:458:ASP:CG	1:B:461:GLU:HG3	2.36	0.46
1:C:429:VAL:HG21	1:C:437:ILE:HD12	1.98	0.46
1:D:243:ASN:O	1:D:295:LYS:HD3	2.16	0.46
1:C:115:LEU:HD11	1:C:121:PRO:HG3	1.97	0.46
1:D:226:VAL:HG12	1:D:314:ARG:HG2	1.96	0.46
1:A:29:ILE:HG23	1:A:108:LEU:HB3	1.97	0.46
1:A:155:LEU:HA	1:A:179:VAL:HG21	1.97	0.46
1:D:76:HIS:HD2	1:D:78:ALA:HB3	1.78	0.46
1:C:117:GLN:O	1:C:117:GLN:HG2	2.16	0.46
1:B:215:LEU:HD11	1:B:372:VAL:CG2	2.45	0.46
1:D:111:ALA:O	1:D:115:LEU:HD22	2.15	0.46
1:C:13:PRO:HG3	1:D:75:GLN:CD	2.36	0.46
1:C:258:ASN:HD22	1:D:258:ASN:HD21	1.63	0.46
1:C:190:ASP:C	1:C:192:LYS:N	2.69	0.46
1:A:297:ILE:HG22	1:A:302:GLN:HG3	1.96	0.46
1:C:69:LEU:HB3	1:C:83:VAL:HG13	1.98	0.46
1:D:45:PRO:HG2	1:D:481:VAL:CG2	2.31	0.45
1:C:301:ALA:O	1:C:305:LEU:HD22	2.15	0.45
1:A:506:LYS:O	1:A:510:GLU:HG3	2.16	0.45
1:A:204:LYS:HD3	1:A:388:GLU:CD	2.36	0.45
1:D:94:GLY:CA	1:D:396:LYS:HD2	2.46	0.45
1:A:62:THR:CG2	1:A:389:ARG:NE	2.79	0.45
1:C:33:ARG:HD3	1:C:109:ARG:HB2	1.98	0.45
1:B:19:TYR:N	1:B:19:TYR:CD1	2.85	0.45
1:B:245:ALA:HB2	1:B:295:LYS:HB2	1.98	0.45
1:D:146:VAL:HG22	1:D:147:ASP:N	2.30	0.45
1:D:509:SER:O	1:D:513:ILE:HG13	2.17	0.45
1:D:409:PRO:HB3	1:D:490:LEU:HD22	1.98	0.45
1:B:243:ASN:HA	1:B:294:GLN:CB	2.47	0.45
1:C:106:GLU:CB	1:C:446:ILE:HG12	2.45	0.45
1:B:110:LYS:HB3	1:B:439:ASN:HB3	1.97	0.45
1:D:162:ILE:HD13	1:D:174:LEU:HB2	1.98	0.45
1:B:445:LYS:C	1:B:448:PRO:HD2	2.37	0.45
1:C:33:ARG:NE	1:C:109:ARG:HG3	2.32	0.45
1:B:76:HIS:HD2	1:B:78:ALA:H	1.65	0.45
1:D:33:ARG:HD3	1:D:109:ARG:CB	2.30	0.45
1:C:275:MET:O	1:C:279:MET:HG3	2.17	0.45
1:C:280:VAL:HG11	1:C:304:TYR:HB2	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:447:ILE:O	1:B:451:LEU:HG	2.17	0.45
1:D:340:THR:CG2	1:D:341:PRO:N	2.79	0.45
1:C:227:HIS:HB3	1:C:230:MET:CG	2.43	0.45
1:B:483:GLU:HG3	1:B:485:LYS:CE	2.46	0.45
1:C:76:HIS:HD2	1:C:78:ALA:H	1.63	0.45
1:B:117:GLN:O	1:B:118:ASN:HB2	2.17	0.45
1:D:216:VAL:O	1:D:218:GLY:N	2.47	0.45
1:A:120:HIS:CE1	1:A:122:SER:HB2	2.52	0.45
1:D:85:VAL:HG13	1:D:507:SER:HB3	1.99	0.45
1:D:18:ARG:HG3	1:D:522:ILE:HG12	1.98	0.45
1:C:517:ARG:HG2	1:C:517:ARG:HH11	1.81	0.45
1:C:280:VAL:HG11	1:C:304:TYR:CB	2.47	0.45
1:A:447:ILE:HB	1:A:448:PRO:CD	2.36	0.44
1:A:502:LYS:O	1:A:506:LYS:HG3	2.17	0.44
1:C:76:HIS:CD2	1:C:78:ALA:HB3	2.52	0.44
1:D:244:GLU:HG3	1:D:249:LYS:NZ	2.32	0.44
1:B:9:VAL:O	1:B:11:ILE:HG12	2.18	0.44
1:A:297:ILE:CD1	1:A:314:ARG:HB3	2.48	0.44
1:B:76:HIS:CD2	1:B:78:ALA:H	2.34	0.44
1:D:488:ASP:O	1:D:492:LYS:HG3	2.18	0.44
1:D:340:THR:HG22	1:D:341:PRO:N	2.31	0.44
1:C:372:VAL:CG1	1:C:373:THR:N	2.80	0.44
1:D:348:GLU:O	1:D:349:VAL:HG23	2.18	0.44
1:A:163:THR:HB	1:A:171:LYS:HZ3	1.80	0.44
1:C:410:ALA:HB3	1:C:494:ILE:CG2	2.45	0.44
1:D:314:ARG:HG3	1:D:314:ARG:HH11	1.83	0.44
1:C:226:VAL:CG1	1:C:314:ARG:HG2	2.48	0.44
1:C:226:VAL:HG12	1:C:314:ARG:HG2	1.98	0.44
1:B:342:GLU:N	1:B:342:GLU:OE2	2.49	0.44
1:B:313:VAL:HG21	1:B:361:ILE:CD1	2.48	0.44
1:D:498:LEU:HD22	1:D:502:LYS:HG3	1.99	0.44
1:A:498:LEU:HD13	1:A:502:LYS:CD	2.48	0.44
1:B:367:LYS:HD3	1:B:367:LYS:C	2.38	0.44
1:C:185:VAL:CG1	1:C:199:ASN:HB2	2.48	0.44
1:B:506:LYS:O	1:B:510:GLU:HG3	2.18	0.44
1:C:466:VAL:HG11	1:C:479:ILE:CG1	2.47	0.44
1:C:242:ILE:HG22	1:C:244:GLU:H	1.83	0.44
1:D:348:GLU:HB3	1:D:365:GLY:HA3	2.00	0.44
1:C:89:GLN:HG2	1:C:97:THR:HA	1.99	0.44
1:C:37:GLU:HA	1:C:40:ARG:HG2	2.00	0.44
1:A:370:LYS:HA	1:A:370:LYS:HE3	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:52:LEU:HD11	1:A:68:ILE:HA	2.00	0.44
1:C:77:PRO:HG2	1:D:51:MET:HE1	1.99	0.44
1:B:117:GLN:O	1:B:117:GLN:HG2	2.18	0.44
1:C:330:ALA:HB2	1:C:345:GLY:HA3	2.00	0.44
1:A:108:LEU:HD23	1:A:516:LEU:HD13	2.00	0.44
1:A:208:GLU:HA	1:B:503:GLN:HE22	1.83	0.43
1:A:498:LEU:CD1	1:A:502:LYS:HD2	2.47	0.43
1:D:446:ILE:CD1	1:D:446:ILE:H	2.28	0.43
1:D:404:ASP:OD1	1:D:499:ARG:HB2	2.18	0.43
1:B:498:LEU:HD13	1:B:502:LYS:CD	2.46	0.43
1:D:106:GLU:CB	1:D:446:ILE:HG12	2.49	0.43
1:C:516:LEU:HA	1:C:516:LEU:HD12	1.86	0.43
1:C:368:ASN:HD22	1:C:368:ASN:C	2.21	0.43
1:D:320:ASP:HA	1:D:323:LYS:HG2	2.01	0.43
1:B:470:HIS:HA	1:B:477:ILE:HB	2.00	0.43
1:C:115:LEU:HD13	1:C:124:ILE:CD1	2.48	0.43
1:A:388:GLU:O	1:A:392:GLU:HG3	2.18	0.43
1:C:297:ILE:HG22	1:C:302:GLN:HG3	2.01	0.43
1:B:383:VAL:O	1:B:387:VAL:HG23	2.18	0.43
1:A:280:VAL:HG11	1:A:304:TYR:HB3	2.00	0.43
1:D:243:ASN:HA	1:D:294:GLN:HB3	1.99	0.43
1:B:355:LEU:HD22	1:B:377:ARG:CZ	2.48	0.43
1:A:217:ARG:HB3	1:A:369:PRO:HG3	2.00	0.43
1:C:434:ALA:O	1:C:438:GLU:HG2	2.18	0.43
1:A:160:THR:HA	1:A:163:THR:CG2	2.49	0.43
1:B:244:GLU:HB3	1:B:334:THR:O	2.18	0.43
1:A:31:ALA:HB3	1:A:78:ALA:HB3	2.00	0.43
1:C:21:GLY:O	1:C:25:GLN:HG3	2.19	0.43
1:C:143:ALA:HA	1:C:408:LEU:CD2	2.47	0.43
1:A:146:VAL:N	1:A:405:GLY:O	2.50	0.43
1:C:33:ARG:CD	1:C:109:ARG:HG3	2.49	0.43
1:D:235:GLU:O	1:D:348:GLU:O	2.36	0.43
1:B:370:LYS:HE3	1:B:370:LYS:HA	2.01	0.43
1:B:189:LYS:HE2	1:B:189:LYS:HB2	1.77	0.43
1:D:354:LYS:O	1:D:355:LEU:HD12	2.18	0.43
1:B:294:GLN:HE21	1:B:295:LYS:CE	2.32	0.43
1:B:380:THR:HG22	1:B:383:VAL:N	2.24	0.43
1:C:355:LEU:HD22	1:C:360:MET:CE	2.49	0.43
1:A:446:ILE:HA	1:A:449:LYS:HB3	2.00	0.43
1:C:446:ILE:H	1:C:446:ILE:HG13	1.54	0.42
1:D:52:LEU:HD11	1:D:68:ILE:HA	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:241:LEU:HD22	1:A:330:ALA:CB	2.48	0.42
1:D:459:THR:HG22	1:D:460:VAL:N	2.33	0.42
1:B:418:LEU:O	1:B:422:LEU:HG	2.18	0.42
1:A:30:LEU:HD21	1:C:26:ARG:HD3	2.00	0.42
1:D:465:LYS:N	1:D:465:LYS:HD2	2.34	0.42
1:D:412:GLY:O	1:D:416:ILE:HG13	2.19	0.42
1:C:108:LEU:HD23	1:C:516:LEU:HD13	2.01	0.42
1:A:165:LYS:O	1:A:168:GLU:HG2	2.20	0.42
1:D:106:GLU:HG2	1:D:446:ILE:HG13	2.01	0.42
1:C:39:VAL:O	1:C:42:THR:HG22	2.20	0.42
1:A:227:HIS:HB3	1:A:230:MET:SD	2.60	0.42
1:A:245:ALA:HB2	1:A:295:LYS:CB	2.49	0.42
1:A:106:GLU:OE2	1:A:446:ILE:HG23	2.20	0.42
1:A:268:PHE:O	1:A:272:GLU:HG3	2.19	0.42
1:A:182:VAL:HA	1:A:200:ILE:HD11	2.01	0.42
1:D:134:LYS:O	1:D:138:ILE:HG13	2.20	0.42
1:B:269:LEU:HD12	1:B:269:LEU:HA	1.89	0.42
1:A:89:GLN:HG2	1:A:97:THR:HA	2.02	0.42
1:B:227:HIS:HA	1:B:228:PRO:HD3	1.90	0.42
1:A:76:HIS:CD2	1:A:77:PRO:HD2	2.54	0.42
1:C:407:VAL:CG1	1:C:408:LEU:N	2.83	0.42
1:A:197:LEU:HG	1:A:399:LYS:HD2	2.01	0.42
1:D:89:GLN:NE2	1:D:503:GLN:C	2.73	0.42
1:D:142:ILE:HD13	1:D:417:GLU:HG2	2.02	0.42
1:A:458:ASP:OD2	1:A:458:ASP:C	2.58	0.42
1:C:103:ILE:HA	1:C:446:ILE:HD11	2.02	0.42
1:C:244:GLU:CB	1:C:334:THR:O	2.68	0.42
1:D:249:LYS:HD3	1:D:249:LYS:HA	1.92	0.42
1:C:520:ASP:HB3	1:D:50:LYS:HG2	2.02	0.42
1:C:355:LEU:HD22	1:C:360:MET:HE2	2.02	0.42
1:A:30:LEU:HD22	1:A:34:ILE:CD1	2.49	0.42
1:A:226:VAL:HG12	1:A:312:ALA:O	2.20	0.42
1:A:59:ILE:HD11	1:B:77:PRO:HA	2.02	0.42
1:B:29:ILE:HD12	1:B:108:LEU:HB3	2.02	0.42
1:C:13:PRO:HD3	1:D:73:ASP:O	2.20	0.42
1:D:215:LEU:HD13	1:D:215:LEU:C	2.40	0.42
1:D:156:LYS:HD3	1:D:493:GLY:HA2	2.01	0.42
1:A:413:ALA:HB3	1:A:414:PRO:HD3	2.02	0.42
1:D:108:LEU:HD11	1:D:515:ILE:HD12	2.00	0.41
1:A:87:LYS:C	1:A:87:LYS:HD3	2.40	0.41
1:A:334:THR:HG22	1:A:335:ASN:HD22	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:170:HIS:HD2	1:B:211:GLU:OE1	2.03	0.41
1:D:264:GLN:HA	1:D:267:SER:OG	2.20	0.41
1:D:340:THR:CG2	1:D:341:PRO:CD	2.98	0.41
1:B:197:LEU:CD2	1:B:395:VAL:HG12	2.50	0.41
1:D:352:GLU:HA	1:D:360:MET:O	2.20	0.41
1:B:473:ARG:HB2	1:B:477:ILE:HG13	2.02	0.41
1:A:182:VAL:HG11	1:A:398:VAL:HG12	2.01	0.41
1:D:476:GLY:HA2	1:D:490:LEU:CD2	2.50	0.41
1:B:189:LYS:HD3	1:B:192:LYS:O	2.20	0.41
1:D:340:THR:CG2	1:D:341:PRO:HD2	2.48	0.41
1:C:33:ARG:HD3	1:C:109:ARG:CB	2.50	0.41
1:C:372:VAL:HG13	1:C:373:THR:N	2.35	0.41
1:B:189:LYS:HE2	1:B:190:ASP:OD1	2.21	0.41
1:C:201:LYS:HZ2	1:C:323:LYS:HZ3	1.68	0.41
1:C:293:VAL:HG12	1:C:295:LYS:H	1.85	0.41
1:D:226:VAL:CG1	1:D:314:ARG:HG2	2.50	0.41
1:B:430:GLY:CA	1:B:434:ALA:HB2	2.50	0.41
1:B:486:PRO:O	1:B:487:ALA:HB2	2.20	0.41
1:C:201:LYS:NZ	1:C:323:LYS:NZ	2.68	0.41
1:A:157:ILE:HD11	1:A:407:VAL:CG2	2.50	0.41
1:B:355:LEU:HD23	1:B:355:LEU:HA	1.88	0.41
1:A:271:GLN:HG3	1:A:275:MET:HE2	2.03	0.41
1:B:134:LYS:O	1:B:138:ILE:HG13	2.20	0.41
1:C:331:LYS:HD3	1:D:229:ARG:NE	2.27	0.41
1:D:199:ASN:O	1:D:371:ALA:HA	2.21	0.41
1:B:31:ALA:HB3	1:B:78:ALA:HB3	2.03	0.41
1:A:216:VAL:O	1:A:218:GLY:N	2.51	0.41
1:D:425:TYR:O	1:D:428:GLN:HB2	2.20	0.41
1:C:195:VAL:O	1:C:399:LYS:HE2	2.20	0.41
1:A:149:ASP:OD2	1:A:193:TYR:HE1	2.03	0.41
1:A:190:ASP:O	1:A:192:LYS:N	2.54	0.41
1:C:189:LYS:HG3	1:C:190:ASP:OD1	2.21	0.41
1:B:205:LYS:O	1:B:377:ARG:HD2	2.21	0.41
1:C:147:ASP:HB3	1:C:150:ASP:HB2	2.01	0.41
1:D:430:GLY:HA2	1:D:434:ALA:HB2	2.03	0.41
1:A:179:VAL:O	1:A:183:LYS:HB2	2.21	0.41
1:A:89:GLN:HE22	1:A:504:ALA:N	2.19	0.41
1:A:290:VAL:HA	1:A:311:MET:O	2.21	0.41
1:A:205:LYS:HE3	1:A:360:MET:SD	2.61	0.41
1:C:9:VAL:HG12	1:D:27:LEU:HD22	2.02	0.41
1:D:74:LEU:HD12	1:D:83:VAL:CG2	2.51	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:350:VAL:HA	1:B:362:PHE:O	2.21	0.41
1:D:96:GLY:HA2	2:D:4527:SO4:O1	2.21	0.41
1:B:30:LEU:HD22	1:B:34:ILE:CD1	2.51	0.41
1:B:180:GLU:OE2	1:B:215:LEU:HD23	2.21	0.41
1:B:224:GLU:HG2	1:B:359:ASN:HB3	2.03	0.41
1:D:118:ASN:HA	1:D:118:ASN:HD22	1.67	0.41
1:A:462:MET:O	1:A:466:VAL:CG2	2.61	0.40
1:D:189:LYS:O	1:D:190:ASP:HB2	2.20	0.40
1:A:157:ILE:HG13	1:A:401:VAL:HG21	2.03	0.40
1:D:35:ILE:HD11	1:D:74:LEU:HD22	2.03	0.40
1:C:218:GLY:HA3	1:C:363:VAL:O	2.21	0.40
1:D:367:LYS:HE2	1:D:367:LYS:C	2.42	0.40
1:D:490:LEU:HD13	1:D:495:ILE:HD13	2.02	0.40
1:A:447:ILE:CB	1:A:448:PRO:HD3	2.37	0.40
1:C:396:LYS:HE2	1:C:400:ASP:OD1	2.22	0.40
1:C:498:LEU:HD22	1:C:502:LYS:CG	2.51	0.40
1:B:108:LEU:HD23	1:B:516:LEU:HD13	2.02	0.40
1:B:330:ALA:HB2	1:B:345:GLY:CA	2.51	0.40
1:A:473:ARG:HB2	1:A:477:ILE:HG13	2.03	0.40
1:A:340:THR:O	1:A:343:ASP:HB2	2.22	0.40
1:C:418:LEU:O	1:C:422:LEU:HG	2.21	0.40
1:D:144:ILE:CD1	1:D:490:LEU:HD11	2.50	0.40
1:A:68:ILE:CG2	1:A:72:ILE:HD11	2.52	0.40
1:D:185:VAL:HG13	1:D:199:ASN:HB2	2.03	0.40
1:B:189:LYS:HZ1	1:B:192:LYS:HB2	1.78	0.40
1:C:76:HIS:HD2	1:C:78:ALA:N	2.19	0.40
1:D:167:ALA:O	1:D:169:SER:N	2.54	0.40
1:D:354:LYS:HE3	1:D:357:GLY:O	2.22	0.40
1:B:205:LYS:NZ	1:B:358:GLU:HB2	2.37	0.40
1:B:76:HIS:HA	1:B:77:PRO:HD3	1.93	0.40
1:C:12:LEU:HD13	1:C:16:THR:HG21	2.04	0.40
1:C:445:LYS:O	1:C:448:PRO:HG2	2.22	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	516/548 (94%)	497 (96%)	15 (3%)	4 (1%)	24	60
1	B	516/548 (94%)	502 (97%)	12 (2%)	2 (0%)	39	74
1	C	516/548 (94%)	489 (95%)	23 (4%)	4 (1%)	24	60
1	D	516/548 (94%)	492 (95%)	19 (4%)	5 (1%)	19	54
All	All	2064/2192 (94%)	1980 (96%)	69 (3%)	15 (1%)	26	63

All (15) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	235	GLU
1	A	367	LYS
1	A	475	LEU
1	D	235	GLU
1	C	235	GLU
1	D	148	PRO
1	D	367	LYS
1	A	150	ASP
1	C	367	LYS
1	D	475	LEU
1	B	405	GLY
1	C	162	ILE
1	D	168	GLU
1	B	10	VAL
1	C	148	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	422/440 (96%)	391 (93%)	31 (7%)	17	45
1	B	422/440 (96%)	396 (94%)	26 (6%)	23	55

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	422/440 (96%)	390 (92%)	32 (8%)	16	43
1	D	422/440 (96%)	389 (92%)	33 (8%)	16	41
All	All	1688/1760 (96%)	1566 (93%)	122 (7%)	18	46

All (122) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	GLU
1	A	30	LEU
1	A	107	LEU
1	A	116	ASP
1	A	133	GLU
1	A	147	ASP
1	A	149	ASP
1	A	152	GLU
1	A	154	LEU
1	A	163	THR
1	A	241	LEU
1	A	261	SER
1	A	276	LEU
1	A	298	ASP
1	A	305	LEU
1	A	314	ARG
1	A	315	ARG
1	A	326	LYS
1	A	331	LYS
1	A	358	GLU
1	A	372	VAL
1	A	375	LEU
1	A	384	ILE
1	A	446	ILE
1	A	463	LEU
1	A	466	VAL
1	A	490	LEU
1	A	498	LEU
1	A	501	LYS
1	A	516	LEU
1	A	517	ARG
1	B	30	LEU
1	B	82	MET
1	B	107	LEU

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Mol	Chain	Res	Type
1	B	116	ASP
1	B	125	THR
1	B	133	GLU
1	B	147	ASP
1	B	155	LEU
1	B	163	THR
1	B	189	LYS
1	B	190	ASP
1	B	241	LEU
1	B	285	GLN
1	B	305	LEU
1	B	375	LEU
1	B	380	THR
1	B	396	LYS
1	B	404	ASP
1	B	407	VAL
1	B	423	ASP
1	B	446	ILE
1	B	490	LEU
1	B	498	LEU
1	B	501	LYS
1	B	516	LEU
1	B	517	ARG
1	C	42	THR
1	C	69	LEU
1	C	82	MET
1	C	125	THR
1	C	133	GLU
1	C	146	VAL
1	C	157	ILE
1	C	184	GLN
1	C	188	LYS
1	C	197	LEU
1	C	246	LEU
1	C	249	LYS
1	C	258	ASN
1	C	260	THR
1	C	300	LEU
1	C	305	LEU
1	C	339	LEU
1	C	368	ASN
1	C	372	VAL

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Mol	Chain	Res	Type
1	C	391	LEU
1	C	396	LYS
1	C	397	VAL
1	C	418	LEU
1	C	429	VAL
1	C	439	ASN
1	C	446	ILE
1	C	466	VAL
1	C	483	GLU
1	C	495	ILE
1	C	498	LEU
1	C	501	LYS
1	C	516	LEU
1	D	30	LEU
1	D	35	ILE
1	D	42	THR
1	D	46	LYS
1	D	69	LEU
1	D	115	LEU
1	D	125	THR
1	D	148	PRO
1	D	157	ILE
1	D	189	LYS
1	D	197	LEU
1	D	205	LYS
1	D	235	GLU
1	D	253	THR
1	D	256	LYS
1	D	276	LEU
1	D	295	LYS
1	D	298	ASP
1	D	300	LEU
1	D	335	ASN
1	D	339	LEU
1	D	367	LYS
1	D	375	LEU
1	D	386	GLU
1	D	391	LEU
1	D	418	LEU
1	D	429	VAL
1	D	439	ASN
1	D	446	ILE

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Mol	Chain	Res	Type
1	D	459	THR
1	D	463	LEU
1	D	466	VAL
1	D	498	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (55) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	28	ASN
1	A	75	GLN
1	A	76	HIS
1	A	89	GLN
1	A	170	HIS
1	A	199	ASN
1	A	227	HIS
1	A	285	GLN
1	A	294	GLN
1	A	335	ASN
1	A	472	ASN
1	A	503	GLN
1	B	28	ASN
1	B	75	GLN
1	B	76	HIS
1	B	89	GLN
1	B	117	GLN
1	B	118	ASN
1	B	170	HIS
1	B	184	GLN
1	B	199	ASN
1	B	227	HIS
1	B	294	GLN
1	B	439	ASN
1	B	503	GLN
1	C	28	ASN
1	C	76	HIS
1	C	89	GLN
1	C	118	ASN
1	C	120	HIS
1	C	136	GLN
1	C	271	GLN
1	C	285	GLN
1	C	294	GLN

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Mol	Chain	Res	Type
1	C	335	ASN
1	C	368	ASN
1	C	382	HIS
1	C	439	ASN
1	C	503	GLN
1	D	28	ASN
1	D	75	GLN
1	D	76	HIS
1	D	89	GLN
1	D	117	GLN
1	D	118	ASN
1	D	120	HIS
1	D	136	GLN
1	D	258	ASN
1	D	271	GLN
1	D	285	GLN
1	D	335	ASN
1	D	382	HIS
1	D	439	ASN
1	D	472	ASN
1	D	503	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

4 ligands are 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	$\# Z > 2$
2	SO4	A	1527	-	4,4,4	0.26	0	6,6,6	0.09	0
2	SO4	B	2527	-	4,4,4	0.30	0	6,6,6	0.19	0
2	SO4	C	3527	-	4,4,4	0.25	0	6,6,6	0.11	0
2	SO4	D	4527	-	4,4,4	0.31	0	6,6,6	0.14	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	SO4	A	1527	-	-	0/0/0/0	0/0/0/0
2	SO4	B	2527	-	-	0/0/0/0	0/0/0/0
2	SO4	C	3527	-	-	0/0/0/0	0/0/0/0
2	SO4	D	4527	-	-	0/0/0/0	0/0/0/0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	4527	SO4	2	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	518/548 (94%)	0.02	4 (0%) 87 86	7, 21, 37, 74	0
1	B	518/548 (94%)	-0.07	4 (0%) 87 86	8, 21, 37, 82	0
1	C	518/548 (94%)	-0.11	3 (0%) 90 89	5, 19, 37, 70	0
1	D	518/548 (94%)	0.02	7 (1%) 78 76	5, 21, 37, 68	0
All	All	2072/2192 (94%)	-0.03	18 (0%) 85 84	5, 20, 37, 82	0

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	189	LYS	3.3
1	A	189	LYS	3.3
1	A	190	ASP	3.2
1	D	356	ALA	3.1
1	D	192	LYS	3.0
1	D	190	ASP	2.9
1	C	357	GLY	2.9
1	D	357	GLY	2.8
1	D	189	LYS	2.6
1	B	190	ASP	2.5
1	C	9	VAL	2.5
1	D	9	VAL	2.5
1	C	190	ASP	2.4
1	A	9	VAL	2.2
1	D	323	LYS	2.1
1	B	22	ARG	2.1
1	A	192	LYS	2.0
1	B	9	VAL	2.0

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

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

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
2	SO4	C	3527	5/5	0.93	0.24	5.14	41,42,42,42	0
2	SO4	A	1527	5/5	0.94	0.23	3.96	42,43,43,43	0
2	SO4	D	4527	5/5	0.88	0.29	3.14	37,37,37,37	0
2	SO4	B	2527	5/5	0.95	0.19	1.02	36,37,38,38	0

6.5 Other polymers [i](#)

There are no such residues in this entry.