Full wwPDB X-ray Structure Validation Report ⓘ

Apr 8, 2025 – 12:08 PM JST

PDB ID	:	8XYG / pdb_00008xyg
Title	:	Crystal structure of SARS-CoV-2 BQ.1.1 RBD and human ACE2
Authors	:	Lan, J.; Wang, C.H.
Deposited on	:	2024-01-19
Resolution	:	3.64 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
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

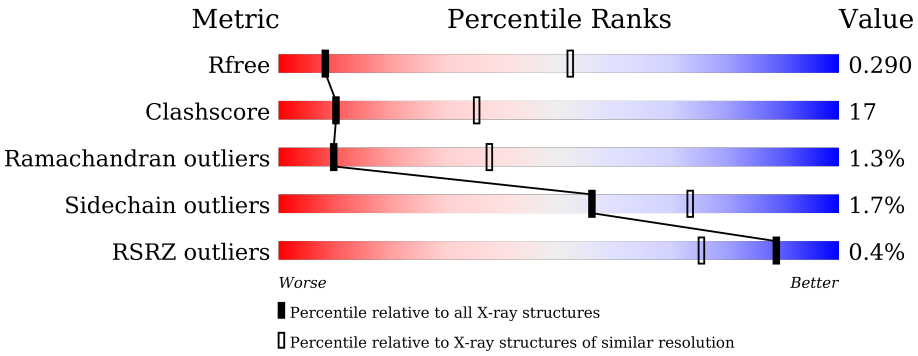
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.42

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.64 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}	164625	1000 (3.76-3.52)
Clashscore	180529	1046 (3.76-3.52)
Ramachandran outliers	177936	1031 (3.76-3.52)
Sidechain outliers	177891	1029 (3.76-3.52)
RSRZ outliers	164620	1682 (3.78-3.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	596	68% 32%
1	C	596	72% 27%
2	B	192	% 51% 43% 6%
2	D	192	2% 44% 48% 7%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 12793 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 Processed angiotensin-converting enzyme 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	596	Total	C	N	O	S	0	1	0
			4871	3118	807	917	29			
1	C	595	Total	C	N	O	S	0	1	0
			4864	3113	806	916	29			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	18	PRO	-	expression tag	UNP Q9BYF1
C	18	PRO	-	expression tag	UNP Q9BYF1

- Molecule 2 is a protein called Spike protein S1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	192	Total	C	N	O	S	0	0	0
			1533	989	256	280	8			
2	D	191	Total	C	N	O	S	0	0	0
			1525	985	254	278	8			

There are 38 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	339	ASP	GLY	variant	UNP P0DTC2
B	346	THR	ARG	variant	UNP P0DTC2
B	371	PHE	SER	variant	UNP P0DTC2
B	373	PRO	SER	variant	UNP P0DTC2
B	375	PHE	SER	variant	UNP P0DTC2
B	405	ASN	ASP	variant	UNP P0DTC2
B	408	SER	ARG	variant	UNP P0DTC2
B	417	ASN	LYS	variant	UNP P0DTC2
B	440	LYS	ASN	variant	UNP P0DTC2
B	444	THR	LYS	variant	UNP P0DTC2

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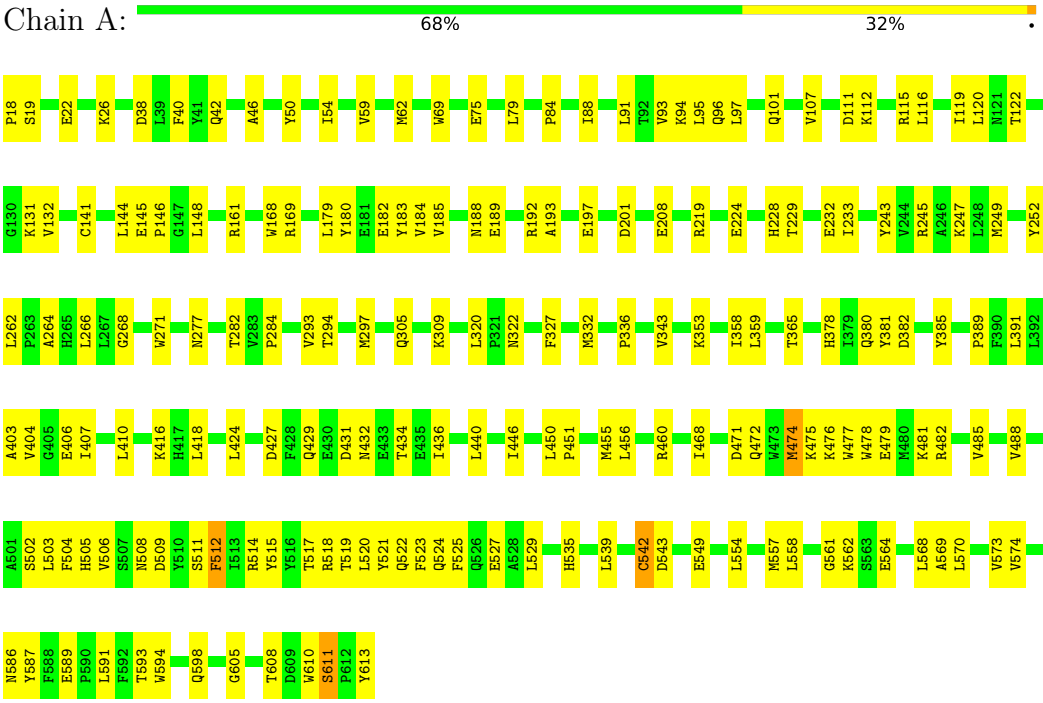
Chain	Residue	Modelled	Actual	Comment	Reference
B	452	ARG	LEU	variant	UNP P0DTC2
B	460	LYS	ASN	variant	UNP P0DTC2
B	477	ASN	SER	variant	UNP P0DTC2
B	478	LYS	THR	variant	UNP P0DTC2
B	484	ALA	GLU	variant	UNP P0DTC2
B	486	VAL	PHE	variant	UNP P0DTC2
B	498	ARG	GLN	variant	UNP P0DTC2
B	501	TYR	ASN	variant	UNP P0DTC2
B	505	HIS	TYR	variant	UNP P0DTC2
D	339	ASP	GLY	variant	UNP P0DTC2
D	346	THR	ARG	variant	UNP P0DTC2
D	371	PHE	SER	variant	UNP P0DTC2
D	373	PRO	SER	variant	UNP P0DTC2
D	375	PHE	SER	variant	UNP P0DTC2
D	405	ASN	ASP	variant	UNP P0DTC2
D	408	SER	ARG	variant	UNP P0DTC2
D	417	ASN	LYS	variant	UNP P0DTC2
D	440	LYS	ASN	variant	UNP P0DTC2
D	444	THR	LYS	variant	UNP P0DTC2
D	452	ARG	LEU	variant	UNP P0DTC2
D	460	LYS	ASN	variant	UNP P0DTC2
D	477	ASN	SER	variant	UNP P0DTC2
D	478	LYS	THR	variant	UNP P0DTC2
D	484	ALA	GLU	variant	UNP P0DTC2
D	486	VAL	PHE	variant	UNP P0DTC2
D	498	ARG	GLN	variant	UNP P0DTC2
D	501	TYR	ASN	variant	UNP P0DTC2
D	505	HIS	TYR	variant	UNP P0DTC2

3 Residue-property plots (i)

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

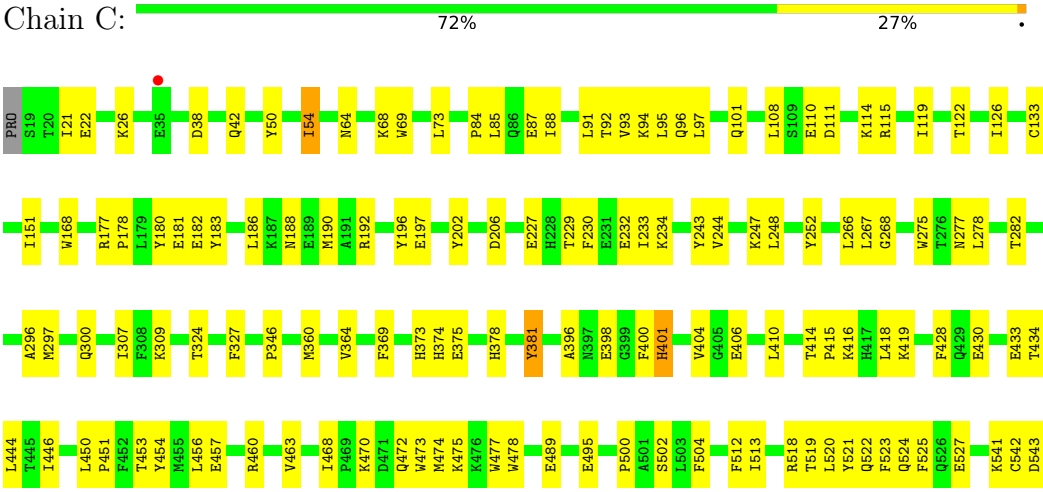
• Molecule 1: Processed angiotensin-converting enzyme 2

Chain A:

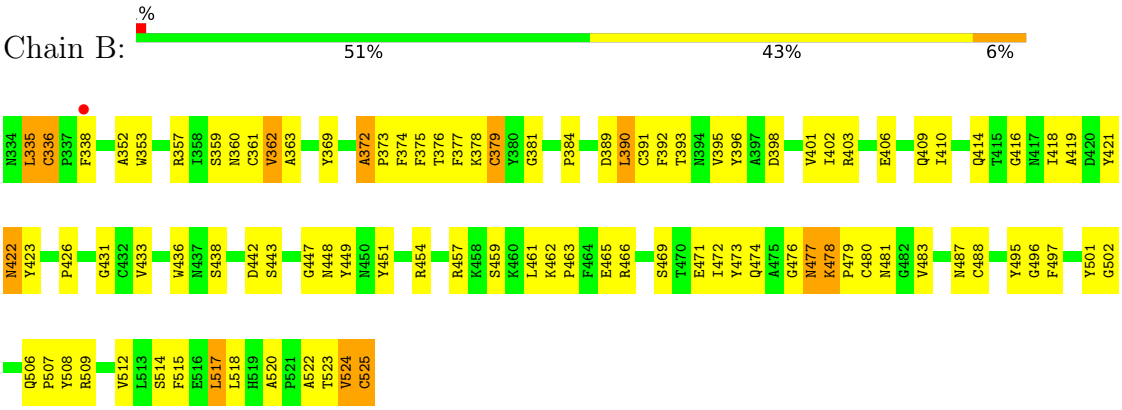


• Molecule 1: Processed angiotensin-converting enzyme 2

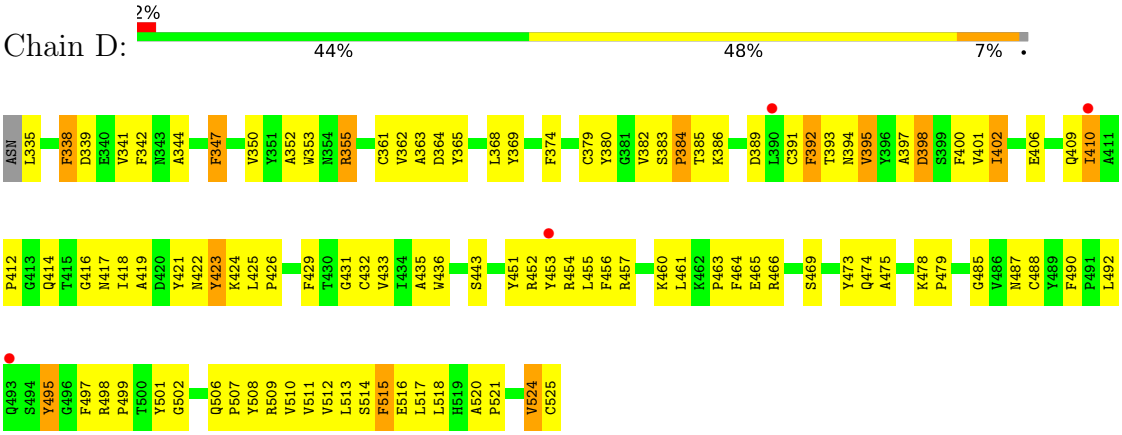
Chain C:



• Molecule 2: Spike protein S1



• Molecule 2: Spike protein S1



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	73.39Å 152.13Å 117.44Å 90.00° 102.87° 90.00°	Depositor
Resolution (Å)	33.92 – 3.64 33.92 – 3.64	Depositor EDS
% Data completeness (in resolution range)	98.3 (33.92-3.64) 98.2 (33.92-3.64)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.52 (at 3.65Å)	Xtriage
Refinement program	PHENIX (1.19.1_4122: ???)	Depositor
R, R_{free}	0.245 , 0.291 0.247 , 0.290	Depositor DCC
R_{free} test set	1383 reflections (4.90%)	wwPDB-VP
Wilson B-factor (Å^2)	117.0	Xtriage
Anisotropy	0.511	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 90.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.44$, $< L^2 > = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	12793	wwPDB-VP
Average B, all atoms (Å^2)	150.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.09% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

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	0.29	0/5013	0.49	0/6811
1	C	0.28	0/5005	0.47	0/6800
2	B	0.39	1/1579 (0.1%)	0.67	1/2151 (0.0%)
2	D	0.41	1/1571 (0.1%)	0.67	0/2140
All	All	0.32	2/13168 (0.0%)	0.53	1/17902 (0.0%)

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
2	D	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	336	CYS	CB-SG	-6.00	1.72	1.82
2	D	347	PHE	CE1-CZ	5.55	1.47	1.37

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	390	LEU	CA-CB-CG	5.57	128.12	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	D	392	PHE	Peptide

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4871	0	4649	135	0
1	C	4864	0	4641	101	0
2	B	1533	0	1457	95	0
2	D	1525	0	1451	96	0
All	All	12793	0	12198	422	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 17.

All (422) 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:522:ALA:HB1	2:B:525:CYS:HB2	1.53	0.87
2:D:341:VAL:O	2:D:509:ARG:NH2	2.08	0.85
1:A:456:LEU:HD22	1:A:512:PHE:HD2	1.39	0.84
2:D:431:GLY:HA3	2:D:514:SER:HA	1.59	0.84
2:D:409:GLN:HA	2:D:414:GLN:HG2	1.59	0.82
1:A:252:TYR:HE2	1:A:266:LEU:HD22	1.43	0.80
1:A:456:LEU:HD22	1:A:512:PHE:CD2	2.18	0.79
2:B:389:ASP:OD1	2:B:390:LEU:N	2.14	0.79
2:D:374:PHE:HB3	2:D:436:TRP:HB3	1.65	0.78
2:D:410:ILE:HD13	2:D:418:ILE:HD12	1.63	0.78
2:B:454:ARG:HH12	2:B:469:SER:HB3	1.49	0.77
1:A:456:LEU:HD12	1:A:477:TRP:HH2	1.49	0.75
1:C:524:GLN:HG2	1:C:583:PRO:HG2	1.67	0.75
2:D:452:ARG:HD3	2:D:492:LEU:HD23	1.69	0.75
1:A:169:ARG:HH22	1:A:271:TRP:HA	1.52	0.75
2:D:516:GLU:HB3	2:D:518:LEU:HD13	1.68	0.75
2:D:352:ALA:HA	2:D:466:ARG:HD2	1.71	0.72
1:C:470:LYS:HA	1:C:473:TRP:CD1	2.25	0.72
2:D:524:VAL:HG13	2:D:525:CYS:HB2	1.71	0.71
2:D:478:LYS:HG2	2:D:487:ASN:HB2	1.73	0.71
2:B:433:VAL:HG22	2:B:512:VAL:HG12	1.72	0.70
1:C:574:VAL:HG23	1:C:576:ALA:H	1.56	0.69
2:D:393:THR:H	2:D:517:LEU:HA	1.58	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:527:GLU:OE2	1:A:586:ASN:ND2	2.25	0.69
1:A:524:GLN:HG2	1:A:583:PRO:HG2	1.74	0.69
2:B:375:PHE:HD1	2:B:376:THR:H	1.41	0.69
2:B:422:ASN:ND2	2:B:454:ARG:O	2.25	0.68
1:A:478:TRP:HA	1:A:481:LYS:HB2	1.76	0.68
2:D:365:TYR:HD1	2:D:368:LEU:HD12	1.59	0.68
2:B:360:ASN:O	2:B:360:ASN:ND2	2.27	0.68
2:B:393:THR:C	2:B:523:THR:HB	2.14	0.68
2:B:393:THR:HG21	2:B:520:ALA:HB3	1.75	0.67
2:B:495:TYR:HB3	2:B:497:PHE:CE1	2.29	0.67
2:D:342:PHE:HE1	2:D:511:VAL:HG11	1.58	0.67
2:B:389:ASP:O	2:B:525:CYS:HB3	1.93	0.67
2:B:476:GLY:H	2:B:487:ASN:HB3	1.58	0.67
2:D:433:VAL:HG22	2:D:512:VAL:HG22	1.77	0.67
2:D:342:PHE:O	2:D:509:ARG:NH1	2.29	0.66
2:B:443:SER:HB3	2:B:507:PRO:HG3	1.77	0.66
1:A:93:VAL:HG12	1:A:97:LEU:HD11	1.76	0.66
1:A:406:GLU:O	1:A:410:LEU:HG	1.96	0.66
1:A:500:PRO:O	1:A:506:VAL:HG11	1.97	0.65
2:D:410:ILE:CD1	2:D:418:ILE:HD12	2.27	0.65
1:A:394:ASN:HB3	1:A:562:LYS:HD2	1.79	0.64
1:C:453:THR:HG23	1:C:512:PHE:HD1	1.62	0.64
1:A:557:MET:HG2	1:A:569:ALA:HB1	1.80	0.64
2:B:401:VAL:HG11	2:B:451:TYR:CD1	2.33	0.64
1:C:518:ARG:NH2	1:C:519:THR:OG1	2.31	0.64
1:C:188:ASN:HB3	1:C:192:ARG:HE	1.63	0.64
1:C:111:ASP:HA	1:C:114:LYS:HE2	1.81	0.63
2:D:353:TRP:O	2:D:466:ARG:NH2	2.31	0.63
2:D:485:GLY:H	2:D:488:CYS:HB2	1.64	0.62
1:A:50:TYR:HE1	1:A:54:ILE:HG23	1.64	0.62
1:A:229:THR:O	1:A:233:ILE:HG13	2.00	0.62
2:B:392:PHE:CD1	2:B:517:LEU:HG	2.34	0.62
1:C:525:PHE:HD1	1:C:573:VAL:HG11	1.65	0.61
2:B:393:THR:HG22	2:B:523:THR:H	1.65	0.61
1:C:177:ARG:HB3	1:C:178:PRO:HD3	1.82	0.61
2:D:393:THR:HG22	2:D:517:LEU:N	2.15	0.61
2:B:402:ILE:HD13	2:B:418:ILE:HD12	1.83	0.61
2:D:498:ARG:HD2	2:D:499:PRO:HD2	1.83	0.61
2:D:342:PHE:CE1	2:D:511:VAL:HG11	2.36	0.61
1:A:460:ARG:NH2	1:A:506:VAL:HA	2.16	0.60
2:B:389:ASP:OD1	2:B:390:LEU:HD12	2.00	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:88:ILE:HD13	1:A:97:LEU:HD13	1.82	0.60
1:A:252:TYR:CE2	1:A:266:LEU:HD22	2.31	0.60
1:A:557:MET:HB2	1:A:573:VAL:HG23	1.82	0.60
1:C:268:GLY:O	1:C:277:ASN:ND2	2.31	0.60
1:A:245:ARG:NH2	1:A:605:GLY:O	2.34	0.59
2:B:478:LYS:HZ1	2:B:480:CYS:HA	1.67	0.59
2:D:416:GLY:O	2:D:418:ILE:N	2.35	0.59
1:A:554:LEU:O	1:A:558:LEU:HG	2.01	0.59
2:D:423:TYR:HH	2:D:464:PHE:HE1	1.50	0.59
2:B:396:TYR:O	2:B:514:SER:OG	2.19	0.59
2:D:422:ASN:OD1	2:D:454:ARG:HB3	2.03	0.59
2:D:461:LEU:HD11	2:D:465:GLU:HB3	1.84	0.58
1:A:611:SER:HB2	1:A:613:TYR:CE2	2.38	0.58
2:B:375:PHE:CD1	2:B:376:THR:HG22	2.38	0.58
1:A:456:LEU:HD23	1:A:460:ARG:HD2	1.85	0.58
1:A:515:TYR:HB3	1:A:518:ARG:HH21	1.68	0.58
2:D:347:PHE:CE1	2:D:509:ARG:NH1	2.71	0.58
2:B:431:GLY:HA2	2:B:515:PHE:HD2	1.69	0.58
2:B:362:VAL:HG22	2:B:524:VAL:O	2.03	0.58
1:C:26:LYS:HE2	1:C:93:VAL:HG21	1.86	0.58
2:D:490:PHE:CE2	2:D:492:LEU:HB2	2.38	0.58
1:C:457:GLU:HG2	1:C:513:ILE:HB	1.86	0.58
2:B:336:CYS:SG	2:B:363:ALA:HB2	2.44	0.58
1:A:416:LYS:HD2	1:A:543:ASP:HB3	1.85	0.57
2:D:422:ASN:HD21	2:D:453:TYR:HB2	1.68	0.57
1:C:374:HIS:NE2	1:C:378:HIS:NE2	2.53	0.57
2:B:393:THR:HA	2:B:523:THR:N	2.20	0.57
1:C:168:TRP:HE1	1:C:502:SER:HB2	1.70	0.57
1:A:91:LEU:O	1:A:95:LEU:HG	2.04	0.56
1:A:125:THR:O	1:A:129:THR:OG1	2.14	0.56
1:A:456:LEU:HD12	1:A:477:TRP:CH2	2.37	0.56
1:A:519:THR:O	1:A:522:GLN:HG2	2.05	0.56
1:A:404:VAL:O	1:A:407:ILE:HG12	2.05	0.56
1:A:418:LEU:HB2	1:A:424:LEU:HD22	1.87	0.56
2:B:375:PHE:HD1	2:B:376:THR:N	2.02	0.56
2:D:369:TYR:CD2	2:D:385:THR:HG21	2.41	0.56
1:A:247:LYS:HB2	1:A:282:THR:HG22	1.88	0.56
1:C:293:VAL:O	1:C:297:MET:HG3	2.05	0.56
1:A:284:PRO:HB3	1:A:594:TRP:CH2	2.41	0.56
1:A:144:LEU:HB2	1:A:168:TRP:CZ3	2.40	0.56
1:C:553:LYS:HE3	1:C:573:VAL:O	2.06	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:350:VAL:HG12	2:D:422:ASN:HB3	1.87	0.56
2:D:395:VAL:HA	2:D:515:PHE:HA	1.87	0.56
1:C:108:LEU:HD11	1:C:190:MET:HB2	1.88	0.56
1:C:415:PRO:O	1:C:419:LYS:HG3	2.05	0.56
2:D:380:TYR:OH	2:D:412:PRO:HD2	2.06	0.55
1:C:64:ASN:O	1:C:68:LYS:HG3	2.07	0.55
2:D:369:TYR:CE2	2:D:385:THR:HG21	2.40	0.55
2:B:375:PHE:CD2	2:B:508:TYR:HE2	2.23	0.55
1:A:96:GLN:HB3	1:A:391:LEU:HD12	1.89	0.55
2:B:419:ALA:HA	2:B:423:TYR:O	2.07	0.55
2:D:426:PRO:HB3	2:D:463:PRO:HB3	1.88	0.55
2:D:475:ALA:HB3	2:D:487:ASN:HB3	1.88	0.55
1:C:472:GLN:HB3	1:C:475:LYS:HD3	1.88	0.55
2:B:379:CYS:HB3	2:B:384:PRO:HD3	1.89	0.54
2:B:524:VAL:O	2:B:525:CYS:O	2.25	0.54
1:C:85:LEU:HB3	1:C:94:LYS:HE3	1.89	0.54
2:D:392:PHE:O	2:D:394:ASN:N	2.40	0.54
2:D:457:ARG:NH1	2:D:460:LYS:O	2.40	0.54
1:C:456:LEU:O	1:C:460:ARG:HG3	2.08	0.54
2:D:353:TRP:HZ3	2:D:355:ARG:HE	1.54	0.54
2:D:400:PHE:CE2	2:D:423:TYR:HD2	2.25	0.54
1:A:535:HIS:ND1	1:A:542:CYS:HB2	2.23	0.54
2:D:363:ALA:HB3	2:D:389:ASP:HB2	1.89	0.54
1:C:554:LEU:O	1:C:558:LEU:HG	2.07	0.54
1:A:403:ALA:O	1:A:407:ILE:HG23	2.08	0.54
2:D:412:PRO:HD3	2:D:425:LEU:HD23	1.90	0.54
1:A:115:ARG:O	1:A:119:ILE:HG13	2.08	0.53
2:B:398:ASP:HB2	2:B:512:VAL:CG2	2.37	0.53
1:C:229:THR:O	1:C:233:ILE:HG13	2.07	0.53
2:D:338:PHE:HE2	2:D:364:ASP:CG	2.11	0.53
1:C:115:ARG:O	1:C:119:ILE:HG13	2.09	0.53
1:A:482:ARG:NH1	1:A:608:THR:O	2.40	0.53
1:C:252:TYR:CZ	1:C:266:LEU:HD22	2.43	0.53
1:C:477:TRP:CE3	1:C:500:PRO:HG3	2.44	0.53
1:C:434:THR:HA	1:C:437:ASN:HD22	1.74	0.53
2:B:471:GLU:HG3	1:C:197:GLU:HB2	1.90	0.52
1:A:256:ILE:HA	1:A:610:TRP:CH2	2.44	0.52
2:B:442:ASP:O	2:B:448:ASN:ND2	2.27	0.52
2:B:474:GLN:NE2	2:B:476:GLY:O	2.42	0.52
1:A:503:LEU:HB3	1:A:506:VAL:HG12	1.92	0.52
2:B:393:THR:OG1	2:B:517:LEU:HA	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:406:GLU:O	1:C:410:LEU:HG	2.09	0.52
1:C:525:PHE:CD1	1:C:573:VAL:HG11	2.44	0.52
1:C:230:PHE:O	1:C:234:LYS:HG3	2.10	0.52
2:D:335:LEU:N	2:D:362:VAL:HG13	2.24	0.52
1:A:268:GLY:O	1:A:277:ASN:ND2	2.43	0.52
1:A:539:LEU:HD23	1:A:587:TYR:HB2	1.92	0.52
1:A:564:GLU:HB3	1:A:568:LEU:HD23	1.91	0.52
2:B:338:PHE:CE2	2:B:363:ALA:HB3	2.44	0.52
2:B:438:SER:HB3	2:B:509:ARG:HG3	1.92	0.52
1:C:133:CYS:HA	1:C:141:CYS:HA	1.92	0.52
1:A:148:LEU:HD13	1:A:168:TRP:HB2	1.92	0.51
1:C:430:GLU:OE1	1:C:541:LYS:NZ	2.43	0.51
1:A:122:THR:O	1:A:126:ILE:HG13	2.10	0.51
2:B:375:PHE:CD1	2:B:376:THR:N	2.78	0.51
2:B:481:ASN:HB3	2:B:483:VAL:HG22	1.92	0.51
1:C:307:ILE:HG23	1:C:369:PHE:CD1	2.45	0.51
2:D:498:ARG:HH11	2:D:499:PRO:HD2	1.74	0.51
1:A:97:LEU:O	1:A:101:GLN:HG3	2.11	0.51
2:B:362:VAL:HG22	2:B:524:VAL:C	2.31	0.51
2:B:395:VAL:HG23	2:B:514:SER:O	2.10	0.51
1:C:594:TRP:CE2	1:C:598:GLN:HG3	2.45	0.51
1:A:456:LEU:CD2	1:A:460:ARG:HD2	2.40	0.51
2:B:422:ASN:ND2	2:B:454:ARG:HB3	2.26	0.51
1:A:132:VAL:HG21	1:A:148:LEU:HD21	1.93	0.51
1:A:197:GLU:HG2	1:A:201:ASP:HB2	1.92	0.51
2:D:498:ARG:HB3	2:D:501:TYR:CE1	2.46	0.51
1:A:119:ILE:HG23	1:A:179:LEU:HB3	1.92	0.51
2:D:456:PHE:HB3	2:D:473:TYR:CD2	2.46	0.51
2:B:338:PHE:HE2	2:B:363:ALA:HB3	1.76	0.50
2:D:431:GLY:CA	2:D:514:SER:HA	2.38	0.50
2:B:362:VAL:CG2	2:B:524:VAL:O	2.58	0.50
2:B:378:LYS:HD3	2:B:378:LYS:N	2.26	0.50
1:C:520:LEU:O	1:C:524:GLN:HG3	2.11	0.50
2:B:422:ASN:HD21	2:B:454:ARG:C	2.13	0.50
1:A:115:ARG:NH2	1:A:182:GLU:OE2	2.44	0.50
2:B:447:GLY:HA3	2:B:449:TYR:CE1	2.47	0.50
1:A:22:GLU:O	1:A:26:LYS:HG3	2.12	0.50
2:B:449:TYR:HA	2:B:496:GLY:HA2	1.93	0.50
2:D:355:ARG:HA	2:D:397:ALA:O	2.11	0.50
2:B:471:GLU:OE1	2:B:472:ILE:N	2.45	0.50
1:A:46:ALA:HB1	1:A:62:MET:HA	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:92:THR:O	1:C:96:GLN:HG3	2.11	0.49
1:C:188:ASN:O	1:C:192:ARG:HG3	2.11	0.49
2:D:418:ILE:O	2:D:422:ASN:N	2.35	0.49
2:B:476:GLY:N	2:B:487:ASN:HB3	2.26	0.49
1:C:180:TYR:HA	1:C:183:TYR:HB3	1.93	0.49
1:A:520:LEU:O	1:A:524:GLN:HG3	2.12	0.49
2:D:382:VAL:HG11	2:D:515:PHE:HE2	1.76	0.49
2:D:443:SER:HB3	2:D:507:PRO:HG3	1.95	0.49
1:A:185:VAL:O	1:A:189:GLU:HG3	2.12	0.49
1:C:463:VAL:HG23	1:C:468:ILE:HD12	1.94	0.49
2:D:400:PHE:CE2	2:D:423:TYR:CD2	3.00	0.49
1:C:307:ILE:HG23	1:C:369:PHE:HD1	1.78	0.49
1:C:549:GLU:CD	1:C:549:GLU:H	2.16	0.49
2:B:402:ILE:HD11	2:B:406:GLU:HB2	1.94	0.49
2:D:393:THR:O	2:D:524:VAL:HB	2.13	0.49
1:A:343:VAL:O	1:A:359:LEU:HD21	2.13	0.49
1:A:245:ARG:HA	1:A:262:LEU:HD21	1.94	0.49
1:A:255:TYR:O	1:A:610:TRP:HH2	1.95	0.49
1:C:91:LEU:O	1:C:95:LEU:HG	2.11	0.49
2:B:359:SER:HB2	2:B:523:THR:CG2	2.43	0.48
2:B:502:GLY:O	2:B:506:GLN:HG3	2.13	0.48
1:C:324:THR:O	1:C:327:PHE:HB3	2.13	0.48
1:C:381:TYR:HB3	1:C:401:HIS:CE1	2.49	0.48
2:D:397:ALA:HA	2:D:513:LEU:HA	1.94	0.48
1:C:110:GLU:O	1:C:114:LYS:HG3	2.13	0.48
1:A:50:TYR:CE1	1:A:59:VAL:HG22	2.49	0.48
1:A:389:PRO:O	1:A:393:ARG:HG3	2.13	0.48
1:C:206:ASP:OD2	1:C:398:GLU:HB3	2.14	0.48
1:A:488:VAL:HG21	1:A:611:SER:HA	1.96	0.48
2:B:375:PHE:CD2	2:B:508:TYR:CE2	3.01	0.48
2:D:454:ARG:HH12	2:D:469:SER:HB3	1.79	0.48
1:A:320:LEU:HB3	1:A:380:GLN:OE1	2.14	0.47
1:C:396:ALA:HB3	1:C:400:PHE:CD2	2.50	0.47
1:C:416:LYS:HD2	1:C:543:ASP:HB3	1.96	0.47
2:D:338:PHE:CD1	2:D:339:ASP:N	2.82	0.47
1:A:431:ASP:OD1	1:A:434:THR:N	2.43	0.47
2:B:421:TYR:C	2:B:422:ASN:HD22	2.17	0.47
1:C:519:THR:O	1:C:522:GLN:HG2	2.14	0.47
2:B:473:TYR:O	2:B:488:CYS:HA	2.15	0.47
1:C:369:PHE:CZ	1:C:373:HIS:HE1	2.31	0.47
1:C:433:GLU:O	1:C:437:ASN:ND2	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:229:THR:HB	1:A:581:VAL:HG13	1.95	0.47
1:A:432:ASN:O	1:A:436:ILE:HG12	2.14	0.47
2:B:392:PHE:O	2:B:525:CYS:SG	2.73	0.47
2:B:474:GLN:HB2	2:B:480:CYS:HB2	1.97	0.47
2:B:374:PHE:HE1	2:B:377:PHE:HB3	1.79	0.47
2:B:522:ALA:O	2:B:523:THR:C	2.53	0.47
1:C:375:GLU:O	1:C:378:HIS:HB2	2.15	0.47
2:D:347:PHE:O	2:D:451:TYR:HE1	1.98	0.47
2:B:362:VAL:HG22	2:B:525:CYS:CA	2.45	0.47
1:C:291:ILE:HG12	1:C:428:PHE:CZ	2.49	0.47
1:A:482:ARG:NH2	1:A:488:VAL:HG23	2.30	0.47
1:A:594:TRP:CZ2	1:A:598:GLN:HG3	2.48	0.47
2:D:385:THR:HG23	2:D:385:THR:O	2.15	0.47
2:D:461:LEU:CD1	2:D:465:GLU:HB3	2.44	0.47
1:A:75:GLU:O	1:A:79:LEU:HG	2.14	0.47
1:A:224:GLU:O	1:A:228[A]:HIS:ND1	2.48	0.47
2:B:393:THR:HG22	2:B:522:ALA:N	2.30	0.47
2:B:336:CYS:CB	2:B:363:ALA:HB2	2.45	0.46
1:A:504:PHE:O	1:A:508:ASN:ND2	2.48	0.46
2:B:471:GLU:CG	1:C:197:GLU:HB2	2.45	0.46
1:C:122:THR:O	1:C:126:ILE:HG13	2.16	0.46
1:A:18:PRO:O	2:B:477:ASN:ND2	2.33	0.46
1:A:180:TYR:O	1:A:184:VAL:HG23	2.15	0.46
1:A:402:GLU:O	1:A:406:GLU:HG2	2.15	0.46
2:D:379:CYS:CB	2:D:432:CYS:HA	2.45	0.46
1:A:94:LYS:HA	1:A:97:LEU:HD12	1.97	0.46
1:A:116:LEU:O	1:A:120:LEU:HG	2.16	0.46
1:A:245:ARG:HG3	1:A:256:ILE:HD12	1.97	0.46
1:C:400:PHE:HE2	1:C:566:TRP:HB2	1.80	0.46
1:A:40:PHE:HB2	1:A:69:TRP:CH2	2.50	0.46
2:D:379:CYS:HB3	2:D:432:CYS:HA	1.97	0.46
2:D:409:GLN:HB2	2:D:418:ILE:HD11	1.98	0.46
1:A:512:PHE:O	1:A:514:ARG:N	2.49	0.46
1:C:247:LYS:HB2	1:C:282:THR:HG22	1.98	0.46
1:C:177:ARG:NH1	1:C:495:GLU:O	2.49	0.46
2:D:455:LEU:HG	2:D:456:PHE:CD1	2.51	0.46
1:A:455:MET:HE2	1:A:485:VAL:HG21	1.98	0.46
1:C:524:GLN:HB3	1:C:574:VAL:HG11	1.97	0.46
1:A:249:MET:HB2	1:A:256:ILE:HD11	1.98	0.46
1:A:322:ASN:OD1	1:A:322:ASN:N	2.47	0.46
1:A:243:TYR:O	1:A:247:LYS:HG2	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:382:ASP:HA	1:A:385:TYR:CZ	2.51	0.45
1:A:468:ILE:HG23	1:A:476:LYS:HG3	1.99	0.45
1:A:517:THR:HB	1:A:521:TYR:CE2	2.51	0.45
1:A:570:LEU:O	1:A:574:VAL:HG22	2.17	0.45
2:B:442:ASP:OD1	2:B:509:ARG:NH2	2.45	0.45
2:B:409:GLN:CD	2:B:416:GLY:HA3	2.36	0.45
2:D:364:ASP:OD1	2:D:364:ASP:N	2.34	0.45
2:D:419:ALA:HB1	2:D:424:LYS:HD3	1.97	0.45
1:A:188:ASN:O	1:A:192:ARG:HG3	2.16	0.45
1:A:180:TYR:HA	1:A:183:TYR:HB3	1.99	0.45
1:A:256:ILE:HA	1:A:610:TRP:CZ3	2.51	0.45
1:C:147:GLY:O	1:C:151:ILE:HG13	2.17	0.45
1:C:474:MET:O	1:C:477:TRP:HB3	2.16	0.45
2:B:375:PHE:CE1	2:B:376:THR:HG22	2.52	0.45
1:C:22:GLU:O	1:C:26:LYS:HG3	2.17	0.45
1:C:570:LEU:O	1:C:574:VAL:HG22	2.16	0.45
1:C:597:ASP:O	1:C:600:LYS:HG2	2.16	0.45
1:A:427:ASP:N	1:A:427:ASP:OD1	2.46	0.45
1:C:232:GLU:HB2	1:C:581:VAL:HG21	1.99	0.45
2:D:422:ASN:ND2	2:D:453:TYR:HB2	2.31	0.45
1:A:232:GLU:HB2	1:A:581:VAL:HG21	1.99	0.45
1:A:460:ARG:HH21	1:A:506:VAL:HA	1.81	0.45
2:D:353:TRP:HB3	2:D:400:PHE:HD2	1.82	0.45
2:D:419:ALA:HB1	2:D:424:LYS:CD	2.47	0.45
2:B:372:ALA:HB1	2:B:373:PRO:CD	2.47	0.44
1:C:50:TYR:CE1	1:C:54:ILE:HG23	2.53	0.44
2:D:338:PHE:HD1	2:D:339:ASP:N	2.16	0.44
2:D:495:TYR:O	2:D:497:PHE:N	2.48	0.44
1:A:38:ASP:O	1:A:42:GLN:HG2	2.18	0.44
1:C:177:ARG:O	1:C:181:GLU:HG3	2.17	0.44
1:A:429:GLN:OE1	1:A:429:GLN:HA	2.18	0.44
2:D:344:ALA:H	2:D:509:ARG:HH12	1.66	0.44
2:D:401:VAL:HG11	2:D:451:TYR:CD1	2.52	0.44
2:D:432:CYS:HB3	2:D:513:LEU:HD23	2.00	0.44
2:B:353:TRP:CD2	2:B:423:TYR:HE2	2.36	0.44
1:C:38:ASP:O	1:C:42:GLN:HG2	2.17	0.44
2:B:436:TRP:O	2:B:508:TYR:HA	2.18	0.44
2:B:478:LYS:NZ	2:B:480:CYS:HA	2.32	0.44
1:A:131:LYS:HD3	1:A:141:CYS:HB2	1.99	0.44
1:A:475:LYS:HG2	1:A:479:GLU:OE2	2.18	0.44
1:C:243:TYR:O	1:C:247:LYS:HG2	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:352:ALA:HA	2:B:466:ARG:HD2	1.98	0.43
2:B:402:ILE:HD12	2:B:403:ARG:H	1.83	0.43
1:A:446:ILE:HD13	1:A:523:PHE:HZ	1.83	0.43
2:B:392:PHE:CG	2:B:515:PHE:HB3	2.53	0.43
2:B:472:ILE:HG21	2:B:483:VAL:O	2.18	0.43
2:D:350:VAL:HG22	2:D:400:PHE:CD1	2.54	0.43
1:A:168:TRP:HE1	1:A:502:SER:HB2	1.83	0.43
1:C:600:LYS:HG3	1:C:601:ASN:H	1.82	0.43
1:A:511:SER:O	1:A:514:ARG:HD2	2.18	0.43
1:C:446:ILE:HD13	1:C:523:PHE:HZ	1.83	0.43
1:C:521:TYR:HB3	1:C:525:PHE:CE2	2.54	0.43
2:D:435:ALA:CB	2:D:510:VAL:HG12	2.49	0.43
2:D:502:GLY:O	2:D:506:GLN:HG3	2.18	0.43
1:A:50:TYR:CE1	1:A:54:ILE:HG23	2.49	0.43
2:D:350:VAL:CG1	2:D:422:ASN:HB3	2.48	0.43
2:B:393:THR:O	2:B:524:VAL:HG23	2.19	0.43
2:D:498:ARG:HB3	2:D:501:TYR:CZ	2.53	0.43
2:D:424:LYS:HA	2:D:424:LYS:HD2	1.62	0.43
2:B:393:THR:O	2:B:523:THR:HB	2.17	0.43
1:C:275:TRP:HB3	1:C:444:LEU:HD22	1.99	0.43
1:A:252:TYR:N	1:A:252:TYR:CD1	2.85	0.43
2:B:376:THR:HG23	2:B:378:LYS:HE2	1.99	0.43
2:B:426:PRO:HB3	2:B:463:PRO:HB3	2.00	0.43
1:C:227:GLU:HG2	1:C:454:TYR:OH	2.19	0.43
2:D:436:TRP:CZ2	2:D:509:ARG:HD3	2.54	0.43
1:C:21:ILE:HG13	1:C:87:GLU:OE1	2.19	0.42
1:C:97:LEU:HD23	1:C:101:GLN:HG3	2.00	0.42
1:A:264:ALA:C	1:A:266:LEU:H	2.22	0.42
2:B:402:ILE:HG13	2:B:403:ARG:O	2.19	0.42
2:D:392:PHE:O	2:D:524:VAL:HG11	2.19	0.42
2:D:392:PHE:C	2:D:524:VAL:HG11	2.39	0.42
1:A:294:THR:HG23	1:A:365:THR:HA	2.01	0.42
1:A:378:HIS:HE1	1:A:402:GLU:HA	1.84	0.42
1:A:519:THR:O	1:A:523:PHE:HD2	2.02	0.42
2:D:515:PHE:O	2:D:516:GLU:HG2	2.19	0.42
1:A:284:PRO:HG2	1:A:436:ILE:HG22	2.02	0.42
2:B:457:ARG:C	2:B:459:SER:H	2.23	0.42
1:C:578:ASN:OD1	1:C:579:MET:N	2.53	0.42
1:A:112:LYS:HA	1:A:115:ARG:HD3	2.02	0.42
1:A:144:LEU:HD22	1:A:168:TRP:CZ2	2.54	0.42
1:A:305:GLN:O	1:A:309:LYS:HG2	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:332:MET:SD	1:A:336:PRO:HD3	2.59	0.42
1:A:188:ASN:HB3	1:A:192:ARG:HE	1.84	0.42
1:A:471:ASP:OD1	1:A:472:GLN:HG3	2.20	0.42
1:A:504:PHE:HD1	1:A:505:HIS:ND1	2.18	0.42
2:B:362:VAL:HG12	2:B:362:VAL:O	2.19	0.42
1:C:22:GLU:HA	1:C:88:ILE:HD12	2.01	0.42
1:C:296:ALA:O	1:C:300:GLN:HG3	2.20	0.42
1:C:346:PRO:HB3	1:C:360:MET:HE2	2.01	0.42
1:C:400:PHE:O	1:C:404:VAL:HG23	2.19	0.42
2:B:410:ILE:HD11	2:B:418:ILE:HD13	2.02	0.42
1:C:414:THR:O	1:C:418:LEU:HG	2.20	0.42
1:A:535:HIS:CG	1:A:542:CYS:HB2	2.54	0.42
2:D:402:ILE:HD11	2:D:406:GLU:OE1	2.20	0.42
1:C:244:VAL:O	1:C:248:LEU:HG	2.19	0.42
2:D:520:ALA:HB1	2:D:521:PRO:HD2	2.02	0.42
2:B:391:CYS:C	2:B:525:CYS:SG	2.98	0.41
1:A:245:ARG:O	1:A:256:ILE:HD11	2.20	0.41
1:C:267:LEU:HA	1:C:278:LEU:HD11	2.02	0.41
1:C:557:MET:HB2	1:C:573:VAL:HG23	2.02	0.41
2:D:398:ASP:O	2:D:511:VAL:HA	2.20	0.41
2:D:421:TYR:CD1	2:D:457:ARG:HB3	2.55	0.41
1:A:549:GLU:H	1:A:549:GLU:CD	2.22	0.41
2:B:522:ALA:HB1	2:B:525:CYS:CB	2.38	0.41
2:D:474:GLN:HE22	2:D:479:PRO:HA	1.84	0.41
1:A:145:GLU:HA	1:A:146:PRO:HA	1.73	0.41
2:D:338:PHE:CD1	2:D:368:LEU:HD21	2.55	0.41
2:D:384:PRO:HB2	2:D:385:THR:H	1.61	0.41
2:B:409:GLN:HA	2:B:414:GLN:HG2	2.01	0.41
2:B:461:LEU:HG	2:B:462:LYS:H	1.85	0.41
2:B:461:LEU:HG	2:B:465:GLU:HB3	2.02	0.41
2:D:393:THR:HG21	2:D:518:LEU:HB2	2.02	0.41
1:A:474:MET:CE	1:A:499:ASP:H	2.34	0.41
1:A:589:GLU:O	1:A:593:THR:HG23	2.20	0.41
1:C:594:TRP:CZ2	1:C:598:GLN:HG3	2.56	0.41
1:C:478:TRP:CD2	1:C:489:GLU:HB3	2.56	0.41
1:C:582:ARG:HB3	1:C:583:PRO:HD3	2.02	0.41
1:A:19:SER:HB2	2:B:477:ASN:ND2	2.36	0.41
1:A:293:VAL:O	1:A:297:MET:HG3	2.21	0.41
1:A:440:LEU:HA	1:A:591:LEU:HD22	2.03	0.41
1:C:192:ARG:HA	1:C:196:TYR:O	2.20	0.41
1:A:208:GLU:OE2	1:A:219:ARG:NH1	2.54	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:284:PRO:HB3	1:A:594:TRP:CZ2	2.56	0.41
2:B:402:ILE:HD12	2:B:403:ARG:N	2.36	0.41
1:C:84:PRO:O	1:C:88:ILE:HG12	2.21	0.41
1:C:527:GLU:OE1	1:C:583:PRO:HG3	2.20	0.41
1:A:107:VAL:HG21	1:A:193:ALA:HB1	2.02	0.41
1:A:183:TYR:OH	1:A:509:ASP:OD2	2.26	0.41
1:A:353:LYS:HD3	2:B:501:TYR:CE1	2.56	0.41
1:A:525:PHE:O	1:A:529:LEU:HG	2.20	0.41
1:C:309:LYS:HD3	1:C:309:LYS:HA	1.91	0.41
1:C:436:ILE:HD13	1:C:436:ILE:HA	1.93	0.41
2:D:382:VAL:HG22	2:D:383:SER:H	1.86	0.41
2:D:416:GLY:C	2:D:418:ILE:H	2.23	0.41
1:A:111:ASP:O	1:A:115:ARG:HG3	2.22	0.40
1:A:271:TRP:HE1	1:A:502:SER:C	2.25	0.40
1:A:494:ASP:OD1	1:A:494:ASP:N	2.53	0.40
2:B:369:TYR:HH	2:B:377:PHE:HZ	1.70	0.40
2:D:383:SER:HB3	2:D:386:LYS:HE2	2.04	0.40
2:D:507:PRO:C	2:D:508:TYR:HD1	2.24	0.40
2:B:335:LEU:O	2:B:361:CYS:HA	2.21	0.40
1:A:450:LEU:HB2	1:A:451:PRO:HD3	2.02	0.40
1:C:69:TRP:CZ2	1:C:73:LEU:HD21	2.56	0.40
1:A:161:ARG:HH21	1:A:266:LEU:HA	1.86	0.40
1:A:327:PHE:HE1	1:A:358:ILE:HB	1.87	0.40
1:C:182:GLU:O	1:C:186:LEU:HG	2.22	0.40
1:C:450:LEU:HB2	1:C:451:PRO:HD3	2.03	0.40
1:C:582:ARG:HA	1:C:585:LEU:HD12	2.04	0.40
2:D:361:CYS:C	2:D:363:ALA:H	2.24	0.40
2:B:398:ASP:HB2	2:B:512:VAL:HG22	2.02	0.40
1:C:50:TYR:HE1	1:C:54:ILE:HG23	1.87	0.40
1:C:290:ASN:OD1	1:C:291:ILE:N	2.54	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	595/596 (100%)	556 (93%)	35 (6%)	4 (1%)	19 50
1	C	594/596 (100%)	563 (95%)	29 (5%)	2 (0%)	37 66
2	B	190/192 (99%)	147 (77%)	37 (20%)	6 (3%)	3 22
2	D	189/192 (98%)	139 (74%)	42 (22%)	8 (4%)	2 17
All	All	1568/1576 (100%)	1405 (90%)	143 (9%)	20 (1%)	10 37

All (20) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	362	VAL
2	B	477	ASN
2	D	417	ASN
2	B	372	ALA
2	B	524	VAL
2	D	384	PRO
2	D	395	VAL
2	D	495	TYR
2	D	429	PHE
1	A	474	MET
1	A	561	GLY
1	C	54	ILE
1	A	611	SER
2	B	381	GLY
2	B	479	PRO
1	C	364	VAL
2	D	524	VAL
1	A	84	PRO
2	D	410	ILE
2	D	402	ILE

5.3.2 Protein sidechains (i)

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	528/527 (100%)	525 (99%)	3 (1%)	84 91
1	C	527/527 (100%)	521 (99%)	6 (1%)	70 81
2	B	166/166 (100%)	158 (95%)	8 (5%)	21 47
2	D	165/166 (99%)	159 (96%)	6 (4%)	30 55
All	All	1386/1386 (100%)	1363 (98%)	23 (2%)	56 73

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	381	TYR
1	A	512	PHE
1	A	542	CYS
2	B	335	LEU
2	B	357	ARG
2	B	379	CYS
2	B	422	ASN
2	B	478	LYS
2	B	517	LEU
2	B	518	LEU
2	B	525	CYS
1	C	202	TYR
1	C	381	TYR
1	C	401	HIS
1	C	504	PHE
1	C	542	CYS
1	C	609	ASP
2	D	338	PHE
2	D	355	ARG
2	D	391	CYS
2	D	398	ASP
2	D	423	TYR
2	D	515	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	401	HIS
1	A	535	HIS
1	C	552	GLN
1	C	556	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 oligosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	596/596 (100%)	-0.27	0	100	100	75, 138, 190, 266	1 (0%)
1	C	595/596 (99%)	-0.26	1 (0%)	92	84	73, 139, 203, 278	1 (0%)
2	B	192/192 (100%)	-0.07	1 (0%)	87	71	109, 151, 246, 307	0
2	D	191/192 (99%)	0.07	4 (2%)	63	42	115, 169, 269, 305	0
All	All	1574/1576 (99%)	-0.20	6 (0%)	89	75	73, 143, 222, 307	2 (0%)

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	410	ILE	3.1
2	B	338	PHE	2.8
2	D	390	LEU	2.2
2	D	493	GLN	2.1
1	C	35	GLU	2.1
2	D	453	TYR	2.0

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

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

6.3 Carbohydrates

There are no monosaccharides in this entry.

6.4 Ligands

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.