



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 03:31 AM UTC

PDB ID : 4OVU / pdb_00004ovu
Title : Crystal Structure of p110alpha in complex with niSH2 of p85alpha
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Deposited on : 2014-01-14
Resolution : 2.96 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	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

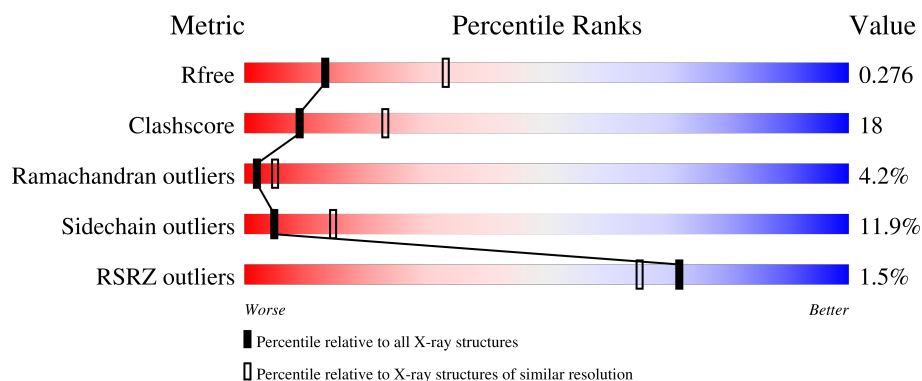
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.96 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}	180053	1130 (2.98-2.94)
Clashscore	190562	1157 (2.98-2.94)
Ramachandran outliers	187476	1101 (2.98-2.94)
Sidechain outliers	187428	1101 (2.98-2.94)
RSRZ outliers	180081	1130 (2.98-2.94)

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 $\leq 5\%$. 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	1096	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red, orange, yellow, green, grey);"></div> <div style="display: flex; justify-content: space-between; padding: 0 5px;"> 3% 54% 33% 7% 5% </div> </div>
2	B	279	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red, orange, yellow, green, grey);"></div> <div style="display: flex; justify-content: space-between; padding: 0 5px;"> 3% 57% 32% 6% • • </div> </div>

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 10848 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 Phosphatidylinositol 4,5-bisphosphate 3-kinase catalytic sub-unit alpha isoform.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	1044	Total	C	N	O	S	0	1	0
			8549	5463	1463	1554	69			

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-28	MET	-	expression tag	UNP P42336
A	-27	SER	-	expression tag	UNP P42336
A	-26	TYR	-	expression tag	UNP P42336
A	-25	TYR	-	expression tag	UNP P42336
A	-24	HIS	-	expression tag	UNP P42336
A	-23	HIS	-	expression tag	UNP P42336
A	-22	HIS	-	expression tag	UNP P42336
A	-21	HIS	-	expression tag	UNP P42336
A	-20	HIS	-	expression tag	UNP P42336
A	-19	HIS	-	expression tag	UNP P42336
A	-18	ASP	-	expression tag	UNP P42336
A	-17	TYR	-	expression tag	UNP P42336
A	-16	ASP	-	expression tag	UNP P42336
A	-15	ILE	-	expression tag	UNP P42336
A	-14	PRO	-	expression tag	UNP P42336
A	-13	THR	-	expression tag	UNP P42336
A	-12	THR	-	expression tag	UNP P42336
A	-10	GLU	-	expression tag	UNP P42336
A	-9	ASN	-	expression tag	UNP P42336
A	-8	LEU	-	expression tag	UNP P42336
A	-7	TYR	-	expression tag	UNP P42336
A	-6	PHE	-	expression tag	UNP P42336
A	-5	GLN	-	expression tag	UNP P42336
A	-4	GLY	-	expression tag	UNP P42336
A	-3	ALA	-	expression tag	UNP P42336
A	-2	MET	-	expression tag	UNP P42336

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP P42336
A	0	SER	-	expression tag	UNP P42336

- Molecule 2 is a protein called Phosphatidylinositol 3-kinase regulatory subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	268	Total 2281	C 1433	N 404	O 438	S 6	0	0	0

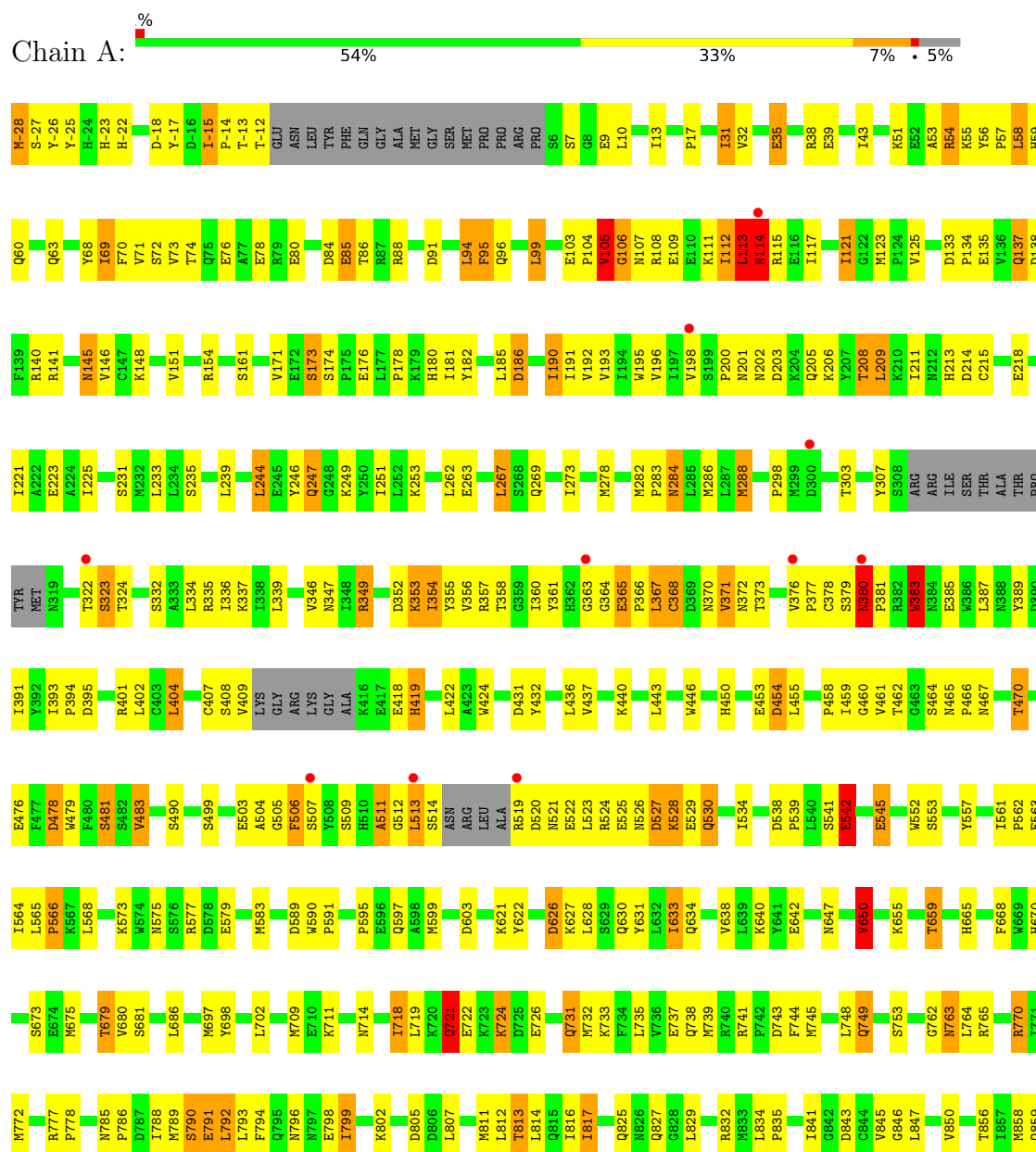
- Molecule 3 is water.

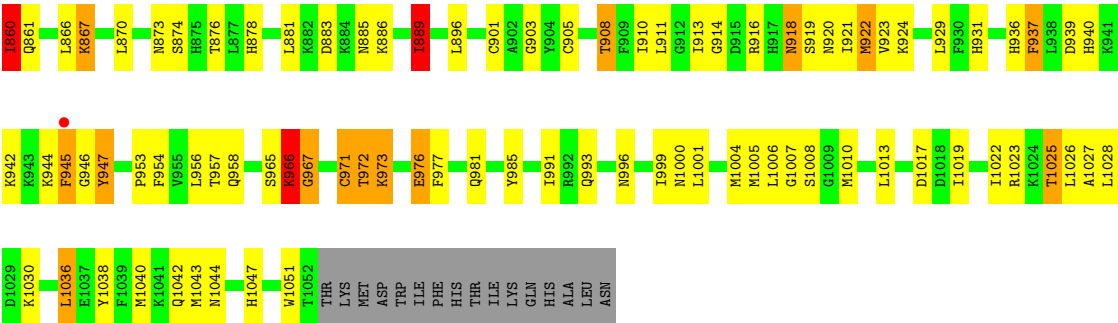
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	17	Total 17	O 17	0	0
3	B	1	Total 1	O 1	0	0

3 Residue-property plots

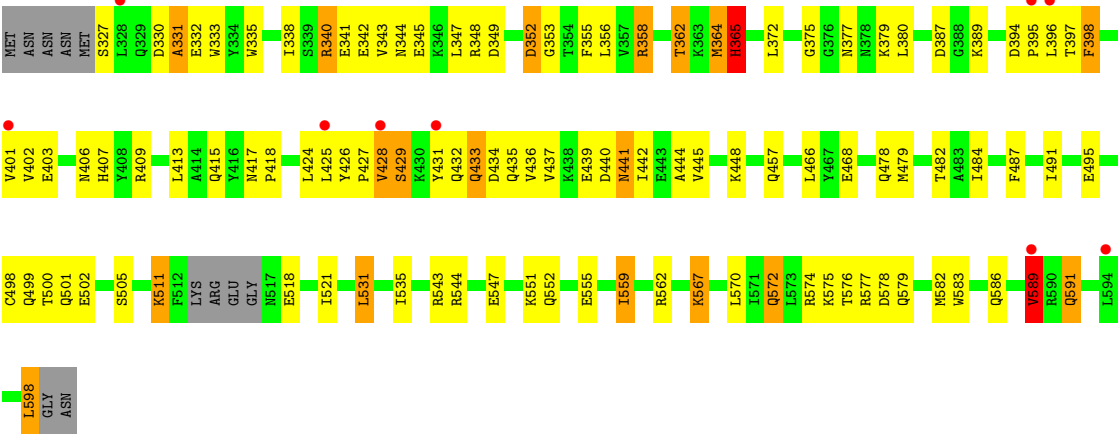
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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

- Molecule 1: Phosphatidylinositol 4,5-bisphosphate 3-kinase catalytic subunit alpha isoform





● Molecule 2: Phosphatidylinositol 3-kinase regulatory subunit alpha



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	114.69Å 116.20Å 149.09Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	37.79 – 2.96 37.79 – 2.96	Depositor EDS
% Data completeness (in resolution range)	99.1 (37.79-2.96) 99.1 (37.79-2.96)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.21 (at 2.95Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.191 , 0.272 0.194 , 0.276	Depositor DCC
R_{free} test set	2122 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å ²)	77.2	Xtriage
Anisotropy	0.227	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 89.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.016 for k,h,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	10848	wwPDB-VP
Average B, all atoms (Å ²)	90.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.83% 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, 0.333 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	0.80	1/8746 (0.0%)	1.14	37/11820 (0.3%)
2	B	0.60	1/2320 (0.0%)	0.98	2/3109 (0.1%)
All	All	0.76	2/11066 (0.0%)	1.11	39/14929 (0.3%)

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	2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	364	GLY	N-CA	6.96	1.51	1.44
2	B	511	LYS	CG-CD	5.14	1.67	1.52

All (39) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	365	GLU	N-CA-C	10.54	123.35	110.07
1	A	650	VAL	CB-CA-C	-9.38	99.47	112.14
1	A	370	ASN	N-CA-C	8.23	121.88	108.55
1	A	530	GLN	N-CA-C	-7.95	102.85	112.54
1	A	937	PHE	CA-C-N	-7.64	111.79	123.17
1	A	937	PHE	C-N-CA	-7.64	111.79	123.17
1	A	846	GLY	N-CA-C	7.63	123.23	110.56
1	A	263	GLU	N-CA-C	6.74	119.96	109.52
1	A	115	ARG	N-CA-C	-6.72	104.58	112.31
1	A	383	TRP	N-CA-C	-6.62	99.13	109.72
2	B	495	GLU	N-CA-C	-6.17	104.47	111.07
1	A	860	ILE	N-CA-C	-6.10	103.95	110.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	590	TRP	N-CA-C	-6.09	101.35	110.24
1	A	9	GLU	N-CA-C	5.93	120.13	113.01
1	A	94	LEU	N-CA-C	5.87	117.54	111.03
1	A	121	ILE	CB-CA-C	-5.87	102.60	112.16
1	A	966	LYS	N-CA-C	5.78	123.12	110.80
1	A	545	GLU	N-CA-C	5.74	117.54	111.28
1	A	749	GLN	N-CA-C	5.55	120.55	113.55
1	A	889	ILE	N-CA-C	-5.46	105.05	110.62
1	A	31	ILE	CB-CA-C	-5.41	103.09	110.77
1	A	650	VAL	N-CA-CB	5.40	117.89	110.54
1	A	262	LEU	CA-C-N	-5.38	114.14	122.59
1	A	262	LEU	C-N-CA	-5.38	114.14	122.59
2	B	433	GLN	N-CA-C	-5.32	106.17	113.30
1	A	733	LYS	N-CA-C	-5.29	105.42	111.14
1	A	896	LEU	N-CA-C	-5.21	105.50	111.07
1	A	568	LEU	N-CA-C	-5.17	105.53	111.07
1	A	106	GLY	N-CA-C	-5.16	106.92	114.61
1	A	918	ASN	N-CA-C	5.16	119.06	112.87
1	A	367	LEU	N-CA-C	5.14	115.12	107.88
1	A	17	PRO	CA-C-N	-5.11	113.38	119.05
1	A	17	PRO	C-N-CA	-5.11	113.38	119.05
1	A	249	LYS	N-CA-C	-5.11	107.04	113.28
1	A	721	GLN	CA-C-N	-5.10	118.85	126.86
1	A	721	GLN	C-N-CA	-5.10	118.85	126.86
1	A	832	ARG	N-CA-C	5.09	118.49	107.49
1	A	73	VAL	CB-CA-C	-5.06	104.58	111.15
1	A	205	GLN	N-CA-C	5.03	116.50	107.80

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	113	LEU	Peptide
1	A	114[B]	ASN	Peptide

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	8549	0	8513	331	0
2	B	2281	0	2258	80	0
3	A	17	0	0	1	0
3	B	1	0	0	0	0
All	All	10848	0	10771	395	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 18.

All (395) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:749:GLN:O	1:A:762:GLY:HA2	1.42	1.16
1:A:-14:PRO:HG3	1:A:186:ASP:HB3	1.42	1.00
1:A:298:PRO:HG2	1:A:697:MET:HG3	1.41	0.99
1:A:509:SER:HB2	1:A:513:LEU:HD22	1.41	0.99
1:A:356:VAL:HB	1:A:372:ASN:HD21	1.29	0.98
1:A:799:ILE:HD11	1:A:847:LEU:HD22	1.47	0.96
1:A:360:ILE:O	1:A:366:PRO:HD2	1.66	0.96
1:A:942:LYS:HB2	1:A:946:GLY:HA3	1.49	0.93
1:A:367:LEU:HD22	1:A:389:TYR:HB3	1.52	0.92
1:A:709:MET:HE1	1:A:847:LEU:HD21	1.52	0.91
1:A:642:GLU:HG2	1:A:647:ASN:CG	1.94	0.91
1:A:137:GLN:HE22	1:A:140:ARG:HH11	1.16	0.90
1:A:721:GLN:O	1:A:722:GLU:HB2	1.72	0.90
1:A:772:MET:HE2	1:A:772:MET:HA	1.55	0.89
1:A:945:PHE:HB3	2:B:598:LEU:HD22	1.54	0.89
2:B:355:PHE:CE1	2:B:427:PRO:HA	2.08	0.88
1:A:739:MET:O	1:A:745:MET:HE3	1.71	0.88
1:A:284:ASN:OD1	1:A:792:LEU:CD1	2.22	0.88
1:A:31:ILE:HD11	2:B:531:LEU:HD13	1.56	0.88
1:A:-28:MET:C	1:A:-26:TYR:H	1.82	0.87
1:A:640:LYS:HE2	1:A:680:VAL:HG11	1.57	0.86
1:A:552:TRP:HZ3	1:A:583:MET:HE3	1.41	0.85
1:A:525:GLU:HB2	1:A:528:LYS:HG2	1.57	0.85
1:A:749:GLN:HE21	1:A:764:LEU:H	1.18	0.85
1:A:878:HIS:NE2	1:A:966:LYS:O	2.11	0.84
1:A:910:ILE:HA	1:A:1025:THR:CG2	2.09	0.82
1:A:541:SER:HB2	2:B:340:ARG:NH2	1.96	0.81
2:B:341:GLU:O	2:B:345:GLU:HG2	1.80	0.81
1:A:284:ASN:OD1	1:A:792:LEU:HD12	1.83	0.79
1:A:367:LEU:CD2	1:A:389:TYR:HB3	2.13	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:956:LEU:H	1:A:1047:HIS:HE1	1.30	0.78
1:A:192:VAL:HG13	1:A:283:PRO:HB2	1.66	0.78
1:A:910:ILE:HA	1:A:1025:THR:HG21	1.63	0.78
2:B:578:ASP:O	2:B:582:MET:HG2	1.83	0.78
1:A:284:ASN:OD1	1:A:792:LEU:HD11	1.84	0.77
1:A:731:GLN:HE22	1:A:777:ARG:HE	1.30	0.77
1:A:-28:MET:N	1:A:-25:TYR:H	1.82	0.77
1:A:942:LYS:HB2	1:A:946:GLY:CA	2.15	0.76
1:A:749:GLN:O	1:A:762:GLY:CA	2.31	0.76
1:A:453:GLU:HB2	2:B:348:ARG:HH21	1.51	0.76
2:B:355:PHE:HE1	2:B:427:PRO:HA	1.49	0.75
1:A:111:LYS:O	1:A:114[A]:ASN:HB2	1.85	0.74
1:A:154:ARG:O	1:A:161:SER:HB3	1.88	0.74
2:B:445:VAL:HG21	2:B:583:TRP:CZ3	2.23	0.73
2:B:343:VAL:HG21	2:B:358:ARG:HD3	1.70	0.73
1:A:762:GLY:O	1:A:763:ASN:HB2	1.88	0.73
1:A:367:LEU:HD13	1:A:368:CYS:O	1.87	0.72
2:B:432:GLN:HG2	2:B:579:GLN:HG2	1.69	0.72
1:A:94:LEU:O	1:A:95:PHE:CB	2.36	0.72
1:A:356:VAL:HB	1:A:372:ASN:ND2	2.04	0.72
1:A:353:LYS:HA	1:A:377:PRO:HB2	1.71	0.72
1:A:965:SER:HA	1:A:976:GLU:HG3	1.73	0.71
1:A:106:GLY:O	1:A:108:ARG:N	2.23	0.71
1:A:731:GLN:NE2	1:A:777:ARG:HE	1.88	0.71
1:A:956:LEU:H	1:A:1047:HIS:CE1	2.09	0.71
1:A:633:ILE:HD11	1:A:811:MET:HE2	1.73	0.70
2:B:340:ARG:O	2:B:344:ASN:ND2	2.24	0.70
1:A:395:ASP:OD1	1:A:577:ARG:HG2	1.91	0.70
1:A:-28:MET:C	1:A:-26:TYR:N	2.43	0.70
1:A:182:TYR:O	1:A:185:LEU:HB2	1.92	0.69
1:A:552:TRP:HZ3	1:A:583:MET:CE	2.04	0.69
1:A:278:MET:HE2	1:A:278:MET:HA	1.75	0.69
1:A:1038:TYR:O	1:A:1042:GLN:HG2	1.92	0.69
1:A:885:ASN:HB3	1:A:889:ILE:HG22	1.76	0.68
1:A:322:THR:O	1:A:323:SER:HB2	1.94	0.67
1:A:372:ASN:HB3	1:A:387:LEU:HD21	1.77	0.67
2:B:387:ASP:C	2:B:389:LYS:H	2.03	0.67
1:A:103:GLU:HG3	1:A:104:PRO:HD2	1.77	0.67
1:A:283:PRO:C	1:A:284:ASN:HD22	2.03	0.67
1:A:336:ILE:HD13	1:A:402:LEU:HD22	1.76	0.66
1:A:944:LYS:HD2	2:B:457:GLN:HG2	1.76	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:333:TRP:HA	2:B:429:SER:OG	1.96	0.65
2:B:544:ARG:O	2:B:547:GLU:HG2	1.97	0.65
2:B:330:ASP:C	2:B:332:GLU:H	2.05	0.64
1:A:251:ILE:HD12	1:A:288:MET:HB3	1.80	0.64
1:A:908:THR:HG21	1:A:954:PHE:HB2	1.80	0.64
1:A:1027:ALA:HB1	1:A:1030:LYS:HD2	1.78	0.64
2:B:330:ASP:O	2:B:332:GLU:N	2.30	0.63
1:A:770:ARG:HG3	1:A:772:MET:CE	2.27	0.63
1:A:542:GLU:HG2	2:B:380:LEU:HD22	1.79	0.63
1:A:719:LEU:HD22	1:A:731:GLN:HG2	1.79	0.63
2:B:441:ASN:HB3	2:B:444:ALA:HB3	1.78	0.63
1:A:-28:MET:H3	1:A:-25:TYR:H	1.46	0.63
1:A:198:VAL:H	1:A:201:ASN:HD22	1.47	0.63
1:A:509:SER:CB	1:A:513:LEU:HD22	2.23	0.63
1:A:772:MET:HE2	1:A:772:MET:CA	2.29	0.63
1:A:200:PRO:CD	1:A:201:ASN:HA	2.28	0.63
1:A:354:ILE:HD11	1:A:381:PRO:HB3	1.82	0.62
1:A:749:GLN:HG2	1:A:763:ASN:H	1.65	0.62
1:A:965:SER:O	1:A:967:GLY:N	2.31	0.62
1:A:94:LEU:O	1:A:95:PHE:HB3	1.99	0.61
1:A:51:LYS:HG2	1:A:54:ARG:HH21	1.64	0.61
1:A:193:VAL:HG21	1:A:282:MET:HE3	1.81	0.61
1:A:911:LEU:O	1:A:937:PHE:O	2.18	0.61
2:B:487:PHE:O	2:B:491:ILE:HG13	2.00	0.61
1:A:910:ILE:O	1:A:1025:THR:HG21	2.00	0.61
2:B:577:ARG:O	2:B:577:ARG:HG2	1.99	0.61
1:A:200:PRO:N	1:A:201:ASN:HA	2.15	0.61
1:A:527:ASP:C	1:A:529:GLU:H	2.08	0.61
1:A:770:ARG:HG3	1:A:772:MET:HE3	1.81	0.61
1:A:910:ILE:HA	1:A:1025:THR:HG23	1.83	0.61
1:A:721:GLN:O	1:A:722:GLU:CB	2.47	0.60
1:A:117:ILE:O	1:A:121:ILE:HG13	2.01	0.60
1:A:621:LYS:HB3	1:A:622:TYR:HD1	1.65	0.60
1:A:799:ILE:CD1	1:A:847:LEU:HD22	2.27	0.60
1:A:360:ILE:C	1:A:366:PRO:HD2	2.26	0.60
1:A:977:PHE:CE1	1:A:981:GLN:NE2	2.69	0.60
1:A:284:ASN:HD22	1:A:284:ASN:N	1.99	0.60
1:A:137:GLN:HE22	1:A:140:ARG:NH1	1.93	0.60
1:A:454:ASP:HA	2:B:349:ASP:OD1	2.01	0.59
1:A:111:LYS:O	1:A:114[A]:ASN:CB	2.50	0.59
2:B:445:VAL:HG21	2:B:583:TRP:HZ3	1.63	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:253:LYS:HD3	1:A:286:MET:HE2	1.82	0.59
1:A:878:HIS:CE1	1:A:966:LYS:O	2.56	0.59
2:B:518:GLU:HG2	2:B:521:ILE:HD12	1.84	0.59
2:B:394:ASP:N	2:B:395:PRO:HD2	2.18	0.59
1:A:530:GLN:O	1:A:534:ILE:HG13	2.03	0.59
1:A:267:LEU:HD13	1:A:273:ILE:HG13	1.84	0.58
1:A:977:PHE:HE1	1:A:981:GLN:NE2	2.01	0.58
1:A:778:PRO:HB3	1:A:802:LYS:HG3	1.86	0.58
2:B:343:VAL:CG2	2:B:358:ARG:HD3	2.33	0.58
2:B:439:GLU:OE2	2:B:448:LYS:NZ	2.37	0.58
1:A:520:ASP:O	1:A:522:GLU:N	2.36	0.58
1:A:54:ARG:HG2	1:A:59:HIS:CE1	2.38	0.57
1:A:910:ILE:CA	1:A:1025:THR:HG21	2.32	0.57
1:A:401:ARG:NH2	1:A:458:PRO:O	2.36	0.57
1:A:524:ARG:HD3	1:A:557:TYR:CE1	2.40	0.57
1:A:965:SER:OG	1:A:971:CYS:HB3	2.05	0.57
1:A:714:ASN:O	1:A:718:ILE:HG13	2.05	0.56
1:A:812:LEU:HD13	1:A:1005:MET:HE2	1.87	0.56
1:A:561:ILE:O	1:A:564:ILE:HG22	2.04	0.56
2:B:355:PHE:CD1	2:B:427:PRO:HA	2.40	0.56
1:A:-15:ILE:HB	1:A:-14:PRO:HD3	1.87	0.56
1:A:138:ASP:OD1	1:A:141:ARG:NH2	2.39	0.55
2:B:355:PHE:HE1	2:B:427:PRO:CA	2.18	0.55
1:A:-28:MET:H2	1:A:-25:TYR:H	1.53	0.55
1:A:745:MET:O	1:A:749:GLN:HB2	2.06	0.55
2:B:343:VAL:HG21	2:B:358:ARG:HH11	1.72	0.55
1:A:910:ILE:HD13	1:A:991:ILE:HG21	1.89	0.55
1:A:91:ASP:OD1	1:A:711:LYS:NZ	2.40	0.55
1:A:655:LYS:O	1:A:659:THR:HB	2.06	0.55
1:A:647:ASN:ND2	1:A:650:VAL:H	2.04	0.55
1:A:178:PRO:HD2	1:A:181:ILE:HD12	1.87	0.55
2:B:582:MET:O	2:B:586:GLN:HG2	2.06	0.55
2:B:372:LEU:HD11	2:B:413:LEU:HD13	1.87	0.55
1:A:193:VAL:HG22	1:A:208:THR:HG22	1.89	0.55
1:A:642:GLU:HG2	1:A:647:ASN:OD1	2.07	0.54
1:A:113:LEU:O	1:A:114[B]:ASN:CG	2.51	0.54
1:A:817:ILE:HG22	1:A:835:PRO:HB3	1.90	0.54
1:A:372:ASN:HB2	1:A:385:GLU:OE2	2.07	0.54
1:A:332:SER:O	1:A:393:ILE:HG12	2.08	0.54
1:A:479:TRP:CE2	1:A:481:SER:HA	2.43	0.54
1:A:171:VAL:HG13	1:A:269:GLN:HG2	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:339:LEU:O	1:A:383:TRP:O	2.26	0.54
1:A:972:THR:HB	1:A:973:LYS:HG2	1.90	0.54
1:A:542:GLU:OE2	2:B:340:ARG:HD3	2.07	0.53
2:B:498:CYS:HB3	2:B:531:LEU:HG	1.89	0.53
1:A:856:THR:CG2	1:A:922:MET:HE2	2.37	0.53
1:A:541:SER:HB2	2:B:340:ARG:HH21	1.72	0.53
1:A:565:LEU:HB3	1:A:566:PRO:HD3	1.89	0.53
1:A:334:LEU:HA	1:A:393:ILE:HD11	1.90	0.53
1:A:573:LYS:HB2	1:A:579:GLU:OE1	2.09	0.53
1:A:856:THR:HG22	1:A:922:MET:HE2	1.89	0.53
1:A:353:LYS:HG3	1:A:377:PRO:HG3	1.89	0.53
1:A:467:ASN:O	1:A:470:THR:OG1	2.27	0.53
1:A:785:ASN:HD22	1:A:786:PRO:HD2	1.73	0.53
1:A:53:ALA:C	1:A:55:LYS:H	2.16	0.53
1:A:827:GLN:HG3	3:A:1115:HOH:O	2.08	0.53
1:A:718:ILE:O	1:A:721:GLN:O	2.26	0.52
1:A:10:LEU:HB3	1:A:13:ILE:HD11	1.91	0.52
1:A:446:TRP:CZ3	1:A:679:THR:HG22	2.44	0.52
2:B:362:THR:HG22	2:B:364:MET:H	1.74	0.52
2:B:572:GLN:O	2:B:576:THR:HG23	2.09	0.52
1:A:525:GLU:HB2	1:A:528:LYS:CG	2.36	0.52
2:B:440:ASP:HA	2:B:583:TRP:HH2	1.74	0.52
1:A:108:ARG:O	1:A:112:ILE:HG13	2.10	0.52
1:A:123:MET:HE3	1:A:675:MET:CE	2.39	0.52
1:A:181:ILE:HG23	1:A:278:MET:HE3	1.92	0.52
1:A:358:THR:HG22	1:A:404:LEU:HB3	1.91	0.52
1:A:908:THR:HG23	1:A:953:PRO:HB2	1.92	0.52
1:A:431:ASP:C	1:A:431:ASP:OD1	2.52	0.52
1:A:599:MET:HE1	1:A:631:TYR:CB	2.39	0.52
1:A:213:HIS:CE1	1:A:214:ASP:HB3	2.45	0.51
1:A:43:ILE:HG13	1:A:85:GLU:O	2.09	0.51
1:A:96:GLN:OE1	1:A:96:GLN:HA	2.11	0.51
1:A:562:PRO:HG3	1:A:591:PRO:HG2	1.90	0.51
1:A:621:LYS:HB3	1:A:622:TYR:CD1	2.45	0.51
1:A:765:ARG:CZ	1:A:796:ASN:HD21	2.22	0.51
1:A:916:ARG:HH12	1:A:920:ASN:HB2	1.74	0.51
1:A:789:MET:O	1:A:790:SER:C	2.53	0.51
1:A:1043:MET:O	1:A:1047:HIS:HD2	1.94	0.51
2:B:338:ILE:HB	2:B:342:GLU:HG3	1.92	0.51
1:A:7:SER:OG	2:B:479:MET:HE3	2.10	0.51
1:A:744:PHE:HD2	1:A:748:LEU:HD12	1.76	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:642:GLU:HG2	1:A:647:ASN:CB	2.40	0.51
2:B:535:ILE:O	2:B:535:ILE:HG22	2.10	0.51
1:A:353:LYS:HG3	1:A:377:PRO:CG	2.41	0.50
1:A:552:TRP:CZ3	1:A:583:MET:CE	2.90	0.50
1:A:1019:ILE:HG22	1:A:1019:ILE:O	2.10	0.50
1:A:13:ILE:C	1:A:13:ILE:HD12	2.36	0.50
1:A:192:VAL:HG12	1:A:193:VAL:N	2.26	0.50
2:B:466:LEU:HD21	2:B:562:ARG:NH1	2.25	0.50
1:A:772:MET:HA	1:A:772:MET:CE	2.37	0.50
1:A:225:ILE:HD13	1:A:246:TYR:HB3	1.94	0.50
1:A:354:ILE:HA	1:A:407:CYS:O	2.11	0.50
1:A:-28:MET:O	1:A:-26:TYR:N	2.40	0.49
1:A:813:THR:HG22	1:A:814:LEU:N	2.27	0.49
2:B:433:GLN:HG2	2:B:583:TRP:CD1	2.46	0.49
1:A:942:LYS:C	1:A:944:LYS:N	2.71	0.49
1:A:985:TYR:CZ	1:A:1040:MET:HG2	2.48	0.49
1:A:1044:ASN:ND2	1:A:1051:TRP:O	2.45	0.49
1:A:84:ASP:OD1	1:A:86:THR:OG1	2.31	0.49
1:A:108:ARG:HD3	1:A:111:LYS:HD2	1.94	0.49
1:A:324:THR:HG22	1:A:483:VAL:HG22	1.95	0.49
1:A:538:ASP:HB2	1:A:539:PRO:CD	2.42	0.49
2:B:427:PRO:O	2:B:428:VAL:C	2.55	0.49
2:B:518:GLU:HA	2:B:521:ILE:HD12	1.94	0.49
1:A:53:ALA:O	1:A:55:LYS:N	2.46	0.49
1:A:361:TYR:CE2	1:A:365:GLU:HB3	2.48	0.49
1:A:985:TYR:OH	1:A:1040:MET:HG2	2.13	0.49
1:A:640:LYS:HG2	1:A:680:VAL:CG1	2.43	0.48
1:A:1010:MET:HE3	1:A:1013:LEU:HD12	1.94	0.48
1:A:503:GLU:O	1:A:505:GLY:N	2.46	0.48
2:B:441:ASN:CB	2:B:444:ALA:HB3	2.42	0.48
1:A:39:GLU:O	1:A:88:ARG:HG2	2.13	0.48
1:A:813:THR:CG2	1:A:814:LEU:N	2.75	0.48
1:A:503:GLU:C	1:A:505:GLY:H	2.22	0.48
1:A:583:MET:HE2	1:A:583:MET:HA	1.95	0.48
2:B:466:LEU:HD21	2:B:562:ARG:HH12	1.79	0.48
1:A:542:GLU:HG2	2:B:380:LEU:CD2	2.43	0.47
1:A:542:GLU:N	1:A:542:GLU:CD	2.72	0.47
1:A:70:PHE:CD1	1:A:99:LEU:HB3	2.49	0.47
1:A:945:PHE:CD1	2:B:598:LEU:HB3	2.49	0.47
1:A:137:GLN:NE2	1:A:140:ARG:HD3	2.30	0.47
1:A:916:ARG:NH1	1:A:920:ASN:HB2	2.29	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:53:ALA:C	1:A:55:LYS:N	2.71	0.47
1:A:538:ASP:HA	1:A:996:ASN:ND2	2.29	0.47
1:A:802:LYS:NZ	1:A:805:ASP:OD2	2.39	0.47
1:A:913:ILE:HD12	1:A:914:GLY:O	2.14	0.47
1:A:791:GLU:CD	1:A:791:GLU:H	2.22	0.47
1:A:858:MET:HE3	1:A:919:SER:HB3	1.95	0.47
1:A:901:CYS:HA	1:A:929:LEU:HD22	1.95	0.47
1:A:971:CYS:C	1:A:973:LYS:N	2.71	0.47
1:A:858:MET:O	1:A:858:MET:HG2	2.15	0.47
2:B:377:ASN:HB3	2:B:379:LYS:NZ	2.30	0.47
1:A:244:LEU:HD12	1:A:247:GLN:HE22	1.79	0.47
2:B:394:ASP:C	2:B:396:LEU:H	2.20	0.47
1:A:971:CYS:O	1:A:972:THR:C	2.58	0.46
1:A:503:GLU:HA	1:A:506:PHE:CE2	2.49	0.46
2:B:372:LEU:HB2	2:B:379:LYS:HB2	1.97	0.46
2:B:499:GLN:O	2:B:500:THR:C	2.58	0.46
1:A:944:LYS:HE2	1:A:944:LYS:HB2	1.79	0.46
1:A:724:LYS:H	1:A:724:LYS:HG3	1.60	0.46
1:A:944:LYS:HD2	2:B:457:GLN:CG	2.44	0.46
1:A:109:GLU:O	1:A:113:LEU:HD13	2.16	0.46
1:A:640:LYS:HG2	1:A:680:VAL:HG12	1.98	0.46
1:A:173:SER:HB3	1:A:626:ASP:OD2	2.16	0.46
1:A:985:TYR:HB3	1:A:1036:LEU:HD21	1.98	0.46
1:A:360:ILE:HG22	1:A:366:PRO:HG2	1.96	0.46
1:A:946:GLY:O	1:A:947:TYR:C	2.59	0.46
2:B:511:LYS:N	2:B:511:LYS:HD2	2.31	0.46
1:A:190:ILE:HD11	1:A:213:HIS:HA	1.97	0.45
1:A:337:LYS:HD3	1:A:339:LEU:HD11	1.97	0.45
1:A:542:GLU:OE2	2:B:340:ARG:CD	2.64	0.45
1:A:628:LEU:HD12	1:A:628:LEU:O	2.16	0.45
1:A:971:CYS:O	1:A:973:LYS:N	2.49	0.45
1:A:1023:ARG:HA	1:A:1028:LEU:HD12	1.97	0.45
2:B:407:HIS:C	2:B:407:HIS:CD2	2.95	0.45
1:A:360:ILE:HD13	1:A:367:LEU:HD21	1.97	0.45
2:B:387:ASP:C	2:B:389:LYS:N	2.72	0.45
1:A:424:TRP:CH2	1:A:460:GLY:HA3	2.52	0.45
1:A:76:GLU:O	1:A:78:GLU:N	2.48	0.45
1:A:191:ILE:HA	1:A:209:LEU:O	2.17	0.45
1:A:735:LEU:O	1:A:739:MET:HG3	2.17	0.45
1:A:936:HIS:HB3	1:A:940:HIS:HB3	1.98	0.45
1:A:60:GLN:H	1:A:60:GLN:CD	2.24	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:367:LEU:HD23	1:A:391:ILE:CG2	2.47	0.45
1:A:901:CYS:O	1:A:905:CYS:HB2	2.17	0.45
1:A:352:ASP:HB3	1:A:353:LYS:HE3	1.99	0.45
1:A:843:ASP:O	1:A:845:VAL:HG23	2.17	0.45
2:B:394:ASP:C	2:B:396:LEU:N	2.75	0.45
1:A:145:ASN:OD1	1:A:145:ASN:N	2.49	0.45
1:A:738:GLN:HE22	1:A:741:ARG:HH21	1.65	0.45
1:A:785:ASN:ND2	1:A:785:ASN:C	2.75	0.45
1:A:408:SER:OG	1:A:422:LEU:HD21	2.17	0.44
1:A:453:GLU:HG2	2:B:567:LYS:NZ	2.31	0.44
1:A:709:MET:HE1	1:A:847:LEU:CD2	2.36	0.44
1:A:785:ASN:HD22	1:A:786:PRO:CD	2.30	0.44
1:A:108:ARG:HH22	1:A:303:THR:HG21	1.82	0.44
1:A:367:LEU:C	1:A:367:LEU:HD12	2.41	0.44
1:A:419:HIS:HB3	1:A:455:LEU:HD11	2.00	0.44
1:A:799:ILE:HD13	1:A:847:LEU:HB3	2.00	0.44
1:A:218:GLU:HA	1:A:221:ILE:HD12	1.99	0.44
1:A:670:HIS:O	1:A:673:SER:HB3	2.17	0.44
1:A:353:LYS:HG3	1:A:377:PRO:CB	2.47	0.44
1:A:511:ALA:HB3	2:B:417:ASN:HD22	1.83	0.44
1:A:524:ARG:HD2	1:A:529:GLU:OE2	2.18	0.44
2:B:355:PHE:O	2:B:356:LEU:HB3	2.18	0.44
1:A:-18:ASP:O	1:A:-17:TYR:C	2.61	0.43
1:A:859:GLN:O	1:A:860:ILE:C	2.60	0.43
1:A:873:ASN:HB3	1:A:876:THR:HG23	2.00	0.43
2:B:441:ASN:O	2:B:442:ILE:HB	2.18	0.43
1:A:71:VAL:HG22	1:A:72:SER:N	2.33	0.43
1:A:785:ASN:HD22	1:A:785:ASN:C	2.26	0.43
1:A:1001:LEU:HD23	1:A:1001:LEU:HA	1.87	0.43
1:A:68:TYR:O	1:A:69:ILE:HD12	2.18	0.43
2:B:589:VAL:HG12	2:B:591:GLN:HG3	2.00	0.43
1:A:-28:MET:HB3	1:A:-26:TYR:HD2	1.83	0.43
1:A:35:GLU:O	1:A:35:GLU:HG3	2.17	0.43
2:B:439:GLU:O	2:B:445:VAL:HG23	2.19	0.43
1:A:180:HIS:CE1	1:A:825:GLN:HG3	2.54	0.43
1:A:883:ASP:HA	1:A:886:LYS:HE3	1.99	0.43
2:B:394:ASP:O	2:B:396:LEU:N	2.43	0.43
2:B:409:ARG:HA	2:B:424:LEU:HB2	2.01	0.43
2:B:555:GLU:O	2:B:559:ILE:HG12	2.19	0.43
1:A:512:GLY:O	1:A:514:SER:N	2.52	0.43
1:A:903:GLY:C	1:A:905:CYS:H	2.25	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:916:ARG:HA	1:A:920:ASN:OD1	2.19	0.43
2:B:570:LEU:O	2:B:574:ARG:HB2	2.18	0.43
1:A:233:LEU:HD23	1:A:233:LEU:HA	1.84	0.43
1:A:298:PRO:CG	1:A:697:MET:HG3	2.29	0.43
1:A:1026:LEU:O	1:A:1027:ALA:C	2.62	0.43
2:B:343:VAL:HG12	2:B:347:LEU:HD12	2.01	0.43
2:B:439:GLU:C	2:B:441:ASN:H	2.27	0.43
1:A:347:ASN:C	1:A:349:ARG:N	2.77	0.42
1:A:1000:ASN:O	1:A:1004:MET:HG3	2.19	0.42
1:A:718:ILE:HG13	1:A:718:ILE:H	1.69	0.42
1:A:-14:PRO:CG	1:A:186:ASP:HB3	2.31	0.42
1:A:244:LEU:HD12	1:A:247:GLN:NE2	2.34	0.42
1:A:355:TYR:HD2	1:A:371:VAL:HB	1.85	0.42
1:A:380:ASN:HA	1:A:381:PRO:HD3	1.74	0.42
1:A:527:ASP:O	1:A:529:GLU:N	2.51	0.42
1:A:861:GLN:HE22	1:A:918:ASN:ND2	2.17	0.42
1:A:1019:ILE:O	1:A:1019:ILE:CG2	2.67	0.42
2:B:327:SER:O	2:B:331:ALA:N	2.52	0.42
1:A:63:GLN:HB2	1:A:68:TYR:CE2	2.55	0.42
1:A:71:VAL:HG23	1:A:80:GLU:C	2.43	0.42
2:B:402:VAL:O	2:B:406:ASN:ND2	2.51	0.42
1:A:193:VAL:HG22	1:A:208:THR:CG2	2.50	0.42
1:A:418:GLU:O	1:A:419:HIS:C	2.62	0.42
1:A:151:VAL:HA	1:A:154:ARG:HD3	2.02	0.42
1:A:524:ARG:HD3	1:A:557:TYR:CZ	2.54	0.42
1:A:793:LEU:HG	1:A:794:PHE:CD2	2.55	0.42
2:B:335:TRP:CD1	2:B:335:TRP:N	2.87	0.42
1:A:200:PRO:HD2	1:A:201:ASN:HA	2.00	0.42
1:A:446:TRP:CZ2	1:A:465:ASN:HA	2.54	0.42
1:A:526:ASN:O	1:A:529:GLU:HG2	2.19	0.42
1:A:790:SER:O	1:A:791:GLU:C	2.63	0.42
1:A:200:PRO:HG2	1:A:202:ASN:H	1.84	0.42
1:A:866:LEU:HG	1:A:867:LYS:H	1.84	0.41
1:A:939:ASP:O	1:A:942:LYS:HG2	2.19	0.41
2:B:398:PHE:HD1	2:B:403:GLU:HG3	1.84	0.41
1:A:146:VAL:HG13	1:A:655:LYS:HB2	2.02	0.41
1:A:942:LYS:C	1:A:944:LYS:H	2.28	0.41
1:A:195:TRP:HB3	1:A:789:MET:HE1	2.02	0.41
1:A:465:ASN:HA	1:A:466:PRO:HD3	1.96	0.41
1:A:647:ASN:HD21	1:A:650:VAL:H	1.67	0.41
1:A:770:ARG:HG3	1:A:772:MET:HE1	2.00	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1006:LEU:HD23	1:A:1013:LEU:HB3	2.02	0.41
1:A:337:LYS:HA	1:A:385:GLU:O	2.20	0.41
1:A:409:VAL:HA	1:A:418:GLU:HB2	2.02	0.41
1:A:527:ASP:C	1:A:529:GLU:N	2.73	0.41
1:A:595:PRO:C	1:A:597:GLN:N	2.77	0.41
1:A:686:LEU:HD23	1:A:686:LEU:HA	1.94	0.41
2:B:502:GLU:HA	2:B:505:SER:OG	2.20	0.41
1:A:38:ARG:NH2	1:A:743:ASP:OD2	2.54	0.41
1:A:443:LEU:HD12	1:A:464:SER:HB3	2.02	0.41
1:A:665:HIS:ND1	1:A:698:TYR:OH	2.41	0.41
2:B:426:TYR:C	2:B:428:VAL:H	2.28	0.41
1:A:353:LYS:HA	1:A:377:PRO:CB	2.47	0.41
1:A:209:LEU:HD11	1:A:223:GLU:HB3	2.03	0.41
1:A:355:TYR:CD2	1:A:371:VAL:HB	2.56	0.41
1:A:724:LYS:C	1:A:726:GLU:H	2.28	0.41
1:A:-22:HIS:C	1:A:-22:HIS:CD2	2.99	0.41
1:A:634:GLN:HG2	1:A:1001:LEU:HD22	2.02	0.41
1:A:916:ARG:HB3	1:A:921:ILE:HD11	2.03	0.41
1:A:940:HIS:C	1:A:942:LYS:H	2.29	0.41
1:A:57:PRO:O	1:A:58:LEU:HB2	2.21	0.41
2:B:330:ASP:C	2:B:332:GLU:N	2.72	0.41
2:B:364:MET:O	2:B:365:HIS:HD2	2.03	0.41
1:A:94:LEU:O	1:A:95:PHE:HB2	2.19	0.40
1:A:668:PHE:CD2	1:A:702:LEU:HD22	2.56	0.40
1:A:921:ILE:HG12	1:A:931:HIS:CE1	2.56	0.40
1:A:957:THR:O	1:A:958:GLN:C	2.64	0.40
1:A:56:TYR:HB3	1:A:57:PRO:HD2	2.03	0.40
1:A:135:GLU:HG3	1:A:432:TYR:CG	2.56	0.40
1:A:192:VAL:HG12	1:A:193:VAL:H	1.86	0.40
1:A:603:ASP:OD1	1:A:603:ASP:C	2.63	0.40
1:A:732:MET:HE3	1:A:732:MET:HB3	1.93	0.40
1:A:361:TYR:HA	1:A:366:PRO:CD	2.51	0.40
1:A:393:ILE:N	1:A:394:PRO:CD	2.85	0.40
1:A:-28:MET:N	1:A:-23:HIS:H	2.19	0.40
1:A:105:VAL:HG12	1:A:106:GLY:H	1.85	0.40
1:A:133:ASP:HA	1:A:134:PRO:HD3	1.95	0.40
1:A:251:ILE:HD11	1:A:288:MET:HG2	2.03	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	1035/1096 (94%)	895 (86%)	99 (10%)	41 (4%)	2	5
2	B	264/279 (95%)	208 (79%)	41 (16%)	15 (6%)	1	2
All	All	1299/1375 (94%)	1103 (85%)	140 (11%)	56 (4%)	2	4

All (56) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	95	PHE
1	A	107	ASN
1	A	114[A]	ASN
1	A	114[B]	ASN
1	A	478	ASP
1	A	504	ALA
1	A	511	ALA
1	A	513	LEU
1	A	521	ASN
1	A	966	LYS
2	B	331	ALA
2	B	352	ASP
2	B	398	PHE
1	A	58	LEU
1	A	481	SER
1	A	528	LYS
1	A	791	GLU
1	A	867	LYS
1	A	947	TYR
1	A	972	THR
2	B	365	HIS
2	B	375	GLY
2	B	428	VAL
2	B	429	SER
2	B	437	VAL

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Mol	Chain	Res	Type
2	B	589	VAL
1	A	54	ARG
1	A	323	SER
1	A	379	SER
1	A	507	SER
1	A	542	GLU
1	A	967	GLY
2	B	340	ARG
2	B	353	GLY
2	B	418	PRO
2	B	431	TYR
1	A	235	SER
1	A	376	VAL
1	A	419	HIS
1	A	450	HIS
1	A	454	ASP
1	A	506	PHE
1	A	1008	SER
2	B	591	GLN
1	A	-27	SER
1	A	186	ASP
1	A	307	TYR
1	A	378	CYS
1	A	763	ASN
1	A	945	PHE
1	A	176	GLU
1	A	1007	GLY
1	A	380	ASN
1	A	363	GLY
2	B	436	VAL
1	A	105	VAL

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.

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	957/999 (96%)	841 (88%)	116 (12%)	5	14
2	B	250/259 (96%)	223 (89%)	27 (11%)	6	18
All	All	1207/1258 (96%)	1064 (88%)	143 (12%)	5	15

All (143) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	-28	MET
1	A	-15	ILE
1	A	-13	THR
1	A	-12	THR
1	A	32	VAL
1	A	35	GLU
1	A	69	ILE
1	A	74	THR
1	A	85	GLU
1	A	99	LEU
1	A	105	VAL
1	A	112	ILE
1	A	113	LEU
1	A	125	VAL
1	A	137	GLN
1	A	145	ASN
1	A	148	LYS
1	A	173	SER
1	A	174	SER
1	A	190	ILE
1	A	196	VAL
1	A	203	ASP
1	A	206	LYS
1	A	208	THR
1	A	209	LEU
1	A	211	ILE
1	A	215	CYS
1	A	231	SER
1	A	239	LEU
1	A	244	LEU
1	A	247	GLN
1	A	267	LEU

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Mol	Chain	Res	Type
1	A	284	ASN
1	A	288	MET
1	A	335	ARG
1	A	346	VAL
1	A	349	ARG
1	A	353	LYS
1	A	354	ILE
1	A	357	ARG
1	A	368	CYS
1	A	371	VAL
1	A	373	THR
1	A	380	ASN
1	A	383	TRP
1	A	404	LEU
1	A	436	LEU
1	A	437	VAL
1	A	440	LYS
1	A	459	ILE
1	A	461	VAL
1	A	462	THR
1	A	470	THR
1	A	476	GLU
1	A	478	ASP
1	A	483	VAL
1	A	490	SER
1	A	499	SER
1	A	519	ARG
1	A	523	LEU
1	A	527	ASP
1	A	542	GLU
1	A	545	GLU
1	A	553	SER
1	A	563	GLU
1	A	566	PRO
1	A	575	ASN
1	A	589	ASP
1	A	626	ASP
1	A	627	LYS
1	A	630	GLN
1	A	633	ILE
1	A	638	VAL
1	A	650	VAL

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Mol	Chain	Res	Type
1	A	659	THR
1	A	679	THR
1	A	681	SER
1	A	718	ILE
1	A	721	GLN
1	A	724	LYS
1	A	731	GLN
1	A	737	GLU
1	A	753	SER
1	A	770	ARG
1	A	788	ILE
1	A	790	SER
1	A	792	LEU
1	A	798	GLU
1	A	799	ILE
1	A	807	LEU
1	A	813	THR
1	A	816	ILE
1	A	817	ILE
1	A	829	LEU
1	A	834	LEU
1	A	841	ILE
1	A	850	VAL
1	A	860	ILE
1	A	870	LEU
1	A	874	SER
1	A	881	LEU
1	A	889	ILE
1	A	908	THR
1	A	922	MET
1	A	923	VAL
1	A	924	LYS
1	A	966	LYS
1	A	971	CYS
1	A	973	LYS
1	A	976	GLU
1	A	993	GLN
1	A	999	ILE
1	A	1017	ASP
1	A	1022	ILE
1	A	1025	THR
1	A	1036	LEU

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Mol	Chain	Res	Type
2	B	352	ASP
2	B	358	ARG
2	B	362	THR
2	B	364	MET
2	B	365	HIS
2	B	397	THR
2	B	401	VAL
2	B	415	GLN
2	B	425	LEU
2	B	434	ASP
2	B	435	GLN
2	B	441	ASN
2	B	468	GLU
2	B	478	GLN
2	B	482	THR
2	B	484	ILE
2	B	501	GLN
2	B	531	LEU
2	B	543	ARG
2	B	551	LYS
2	B	552	GLN
2	B	559	ILE
2	B	567	LYS
2	B	572	GLN
2	B	575	LYS
2	B	589	VAL
2	B	598	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (38) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	-24	HIS
1	A	-22	HIS
1	A	137	GLN
1	A	247	GLN
1	A	345	ASN
1	A	374	GLN
1	A	428	ASN
1	A	444	ASN
1	A	556	HIS
1	A	575	ASN
1	A	605	ASN

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Mol	Chain	Res	Type
1	A	647	ASN
1	A	731	GLN
1	A	749	GLN
1	A	759	HIS
1	A	760	GLN
1	A	782	ASN
1	A	785	ASN
1	A	796	ASN
1	A	861	GLN
1	A	917	HIS
1	A	918	ASN
1	A	931	HIS
1	A	936	HIS
1	A	981	GLN
1	A	996	ASN
1	A	1014	GLN
1	A	1047	HIS
2	B	365	HIS
2	B	406	ASN
2	B	415	GLN
2	B	417	ASN
2	B	453	ASN
2	B	457	GLN
2	B	475	GLN
2	B	488	ASN
2	B	499	GLN
2	B	552	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no 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, 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	1044/1096 (95%)	-0.35	11 (1%) 78 73	31, 76, 130, 176	1 (0%)
2	B	268/279 (96%)	0.31	9 (3%) 48 41	82, 126, 174, 189	0
All	All	1312/1375 (95%)	-0.22	20 (1%) 72 65	31, 83, 154, 189	1 (0%)

All (20) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	589	VAL	4.7
2	B	431	TYR	4.3
1	A	114[A]	ASN	4.0
1	A	198	VAL	3.3
1	A	945	PHE	3.0
1	A	380	ASN	2.9
1	A	519	ARG	2.8
2	B	428	VAL	2.8
2	B	328	LEU	2.8
2	B	425	LEU	2.6
2	B	594	LEU	2.6
2	B	401	VAL	2.5
1	A	376	VAL	2.3
1	A	363	GLY	2.2
1	A	507	SER	2.2
2	B	395	PRO	2.1
1	A	322	THR	2.1
1	A	513	LEU	2.0
2	B	396	LEU	2.0
1	A	300	ASP	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 oligosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.