



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 18, 2024 – 12:38 PM EST

PDB ID : 4DOP
Title : Crystal structure of the CusBA heavy-metal efflux complex from Escherichia coli, R mutant
Authors : Su, C.-C.; Long, F.; Yu, E.
Deposited on : 2012-02-10
Resolution : 4.20 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) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

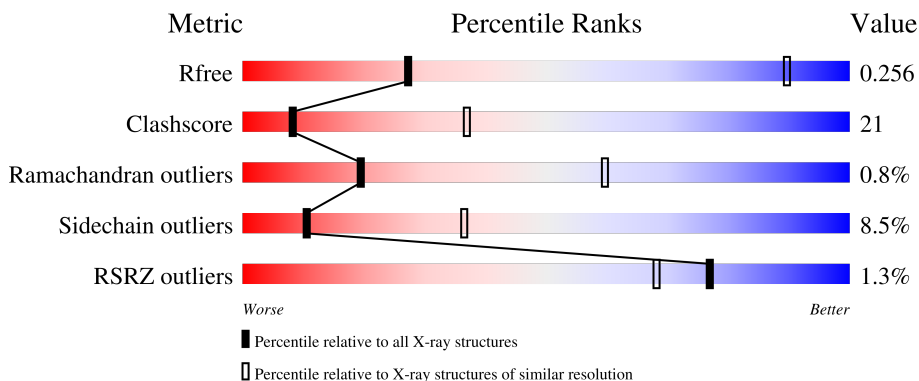
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION


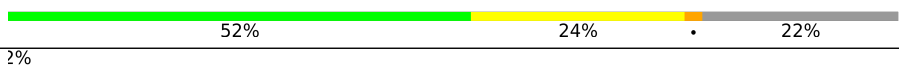

The reported resolution of this entry is 4.20 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1005 (4.62-3.78)
Clashscore	141614	1044 (4.60-3.80)
Ramachandran outliers	138981	1000 (4.60-3.80)
Sidechain outliers	138945	1007 (4.62-3.78)
RSRZ outliers	127900	1063 (4.70-3.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	B	413	
1	C	413	
2	A	1054	

2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 12891 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 Cation efflux system protein CusB.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	B	322	Total	C	N	O	S	0	0	0
			2458	1555	428	469	6			
1	C	324	Total	C	N	O	S	0	0	0
			2473	1563	430	474	6			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	408	HIS	-	expression tag	UNP P77239
B	409	HIS	-	expression tag	UNP P77239
B	410	HIS	-	expression tag	UNP P77239
B	411	HIS	-	expression tag	UNP P77239
B	412	HIS	-	expression tag	UNP P77239
B	413	HIS	-	expression tag	UNP P77239
C	408	HIS	-	expression tag	UNP P77239
C	409	HIS	-	expression tag	UNP P77239
C	410	HIS	-	expression tag	UNP P77239
C	411	HIS	-	expression tag	UNP P77239
C	412	HIS	-	expression tag	UNP P77239
C	413	HIS	-	expression tag	UNP P77239

- Molecule 2 is a protein called Cation efflux system protein CusA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	A	1031	Total	C	N	O	S	0	0	0
			7942	5137	1330	1438	37			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-6	MET	-	expression tag	UNP P38054
A	-5	HIS	-	expression tag	UNP P38054

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-4	HIS	-	expression tag	UNP P38054
A	-3	HIS	-	expression tag	UNP P38054
A	-2	HIS	-	expression tag	UNP P38054
A	-1	HIS	-	expression tag	UNP P38054
A	0	HIS	-	expression tag	UNP P38054
A	669	ALA	ARG	engineered mutation	UNP P38054

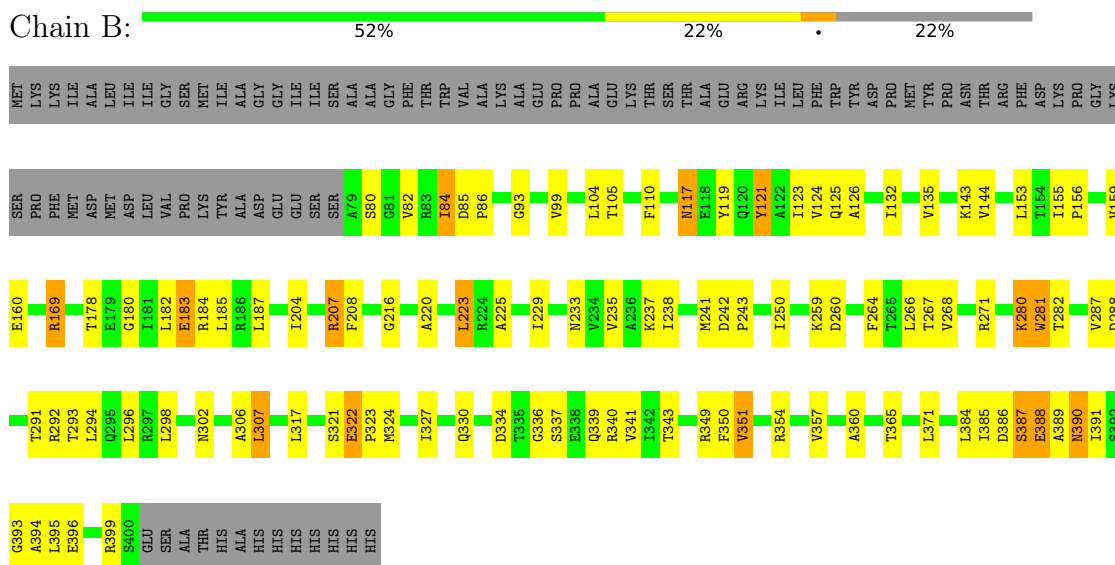
- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	4	Total O 4 4	0	0
3	C	11	Total O 11 11	0	0
3	A	3	Total O 3 3	0	0

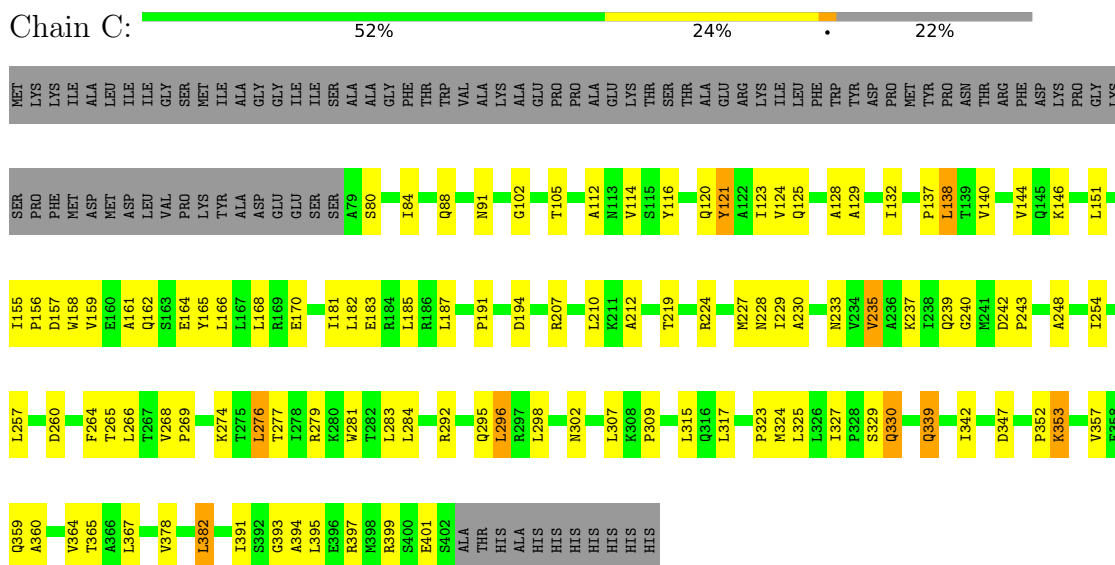
3 Residue-property plots [i](#)

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: Cation efflux system protein CusB



- Molecule 1: Cation efflux system protein CusB



- Molecule 2: Cation efflux system protein CusA



MET	HIS	HIS	HIS	HIS	HIS	HIS	M1	L2	E3	W4	I5	I6	R7	R8	S9	V10	A11	M12	R13	F14	L15	V16	L17	M18	G19	A20	L21	F22	L23	T24	S24	L25	W26	G27	S126	T28	W29	L31	L32	V36	D37	A38	L39	P40	D41	R157	L144	V145	D146	R260	D261	V262	A263	L159	F163	P269	L169	E62	P172	D173	V177	K185	L188	I191	D192	P193	Q194	R195	L196	L201	S202	L203	L210	A212	N213	N214	Q215	I222	E223	L224	G235	Y236	L237	Q238	Q239	L240	D241	D242	F243	L246	V247	L248	V255	P256	L259	R260	F356	W358	A263	H359	V360	R361	S362	A363	L364	I367	I368	S369	L370	P371	L372	G373	L374	C375	I376	A377	F378	I379	V380	M381	M389	I390	R399	H391	S392	G395	I396	I397	A397	I398	A399	V400	M403	V404	D405	I408	M409	M410	Q422	I411	E412	M413	A414	H415	K416	R417	L418	E419	V348	V349	A350	V351	V352	C353	A354	L355	F356	W358	D427	A428	T429	L430	D431	M432	K433	T434	R436	L435	Q437	V438	I439	T440	D441	A442	S443	V444	E445	G447	P448	A449	L450	S453	L454	L455	I456	I457	T458	S460	F461	P463	T466	G469	R473	L474	F475	G476	P477	T481	K482	M486	A487	G488	G559	E560	F561	L562	P563	D569	L570	L571	Y572	I499	L500	M501	W504	I505	ARG	GLY	LYS	I508	PRO	I509	GLU	SER	SER	ASN	PRO	N517	N518	R519	F520	L521	L522	R523	V524	Y525	H526	P527	L528	L529	L530	K531	V532	L533	H534	E535	W536	T537	T538	F539	S546	V547	W548	L549	T550	V550	L551	P552	L553	L554	G559	E560	F561	L562	P563	D569	L570	L571	Y572	I499	L500	M501	W504	I505	ARG	GLY	LYS	I508	PRO	I509	GLU	K594	L595	I596	V599	P600	E601	V602	A603	R604	G607	K608	T609	P620	L621	E622	H623	E624	E625	T626	T627	L628	E634	H635	W636	R637	P638	H642	E647	E648	L649	H650	H651	T652	V653	R654	L655	P656	G657	L658	A659	L661	H662	V663	P664	P665	R667	L673	S674	T675	U676	L770	I677	K678	S679	L683	T688	V689	L690	L693	M696	A697	E701	E702	L705	T706	V707	P708	L718	R722	Y723	W725	L728	N729	K732	Y736	F746	S749	A750	L661	V756	G757	P759	R765	K851	V766	P767	L768	N769	L770	R771	Y772	P773	Q774	S775	S779	P780	Q781	R784	Q785	T788	L789	I796	T797	A802	D803	I804	S807	K814	T815	A818	R824	E825	R826	I827	A828	R831	D832	M833	V834	V837	H838	D839	L840	Q841	K842	A843	I844	A845	E846	K847	L850	R851	P852	G853	T854	S855	V856	A857	F858	S859	G860	E863	L864	L865	K871	L872	K873	L874	M875	P877	T878	R879	L880	M881	I883	F884	L887	A890	F891	R892	R893	V894	G895	E896	I900	V904	P905	L908	V909	G910	I911	I912	H913	L914	S923	V924	A925	F930	I931	A932	L933	V936	A937	E938	I939	F940	G941	V942	Y943	N944	L945	M946	Y947	H950	A951	L952	E953	A954	V955	P956	S957	L958	N959	I960	P961	Q962	T963	F964	S965	K968	L969	A972	L973	Y974	H975	G976	A977	V978	R980	V981	R982	P983	K984	A985	M986	V990	I991	L992	A993	G994	L995	L996	P997	G1001	T1002	G1005	S1006	E1007	V1008
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4 Data and refinement statistics

Property	Value	Source
Space group	H 3 2	Depositor
Cell constants a, b, c, α , β , γ	160.52Å 160.52Å 681.33Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	97.31 – 4.20 136.21 – 4.20	Depositor EDS
% Data completeness (in resolution range)	92.2 (97.31-4.20) 99.9 (136.21-4.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.33	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.07 (at 4.15Å)	Xtrriage
Refinement program	PHENIX 1.6.4_486	Depositor
R, R_{free}	0.222 , 0.268 0.209 , 0.256	Depositor DCC
R_{free} test set	1284 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	86.2	Xtrriage
Anisotropy	0.443	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 128.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.27$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.86	EDS
Total number of atoms	12891	wwPDB-VP
Average B, all atoms (Å ²)	111.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.02% 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 [i](#)

5.1 Standard geometry [i](#)

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	B	0.22	0/2498	0.43	0/3401
1	C	0.22	0/2513	0.42	0/3421
2	A	0.22	0/8108	0.41	0/11041
All	All	0.22	0/13119	0.41	0/17863

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 [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	B	2458	0	2522	92	0
1	C	2473	0	2533	80	0
2	A	7942	0	8187	399	0
3	A	3	0	0	0	0
3	B	4	0	0	0	0
3	C	11	0	0	0	0
All	All	12891	0	13242	550	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 (550) 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:A:573:MET:HG2	2:A:678:LYS:NZ	1.80	0.96
1:C:242:ASP:HB3	1:C:243:PRO:HD3	1.49	0.94
2:A:696:MET:HG3	2:A:854:THR:HG21	1.50	0.93
2:A:573:MET:SD	2:A:678:LYS:HD2	2.11	0.90
2:A:574:PRO:HB2	2:A:658:LEU:HD11	1.52	0.89
2:A:574:PRO:HG2	2:A:624:VAL:HG13	1.55	0.89
2:A:459:LEU:HB3	2:A:882:ILE:HD11	1.58	0.84
1:B:117:ASN:HD22	1:B:119:TYR:H	1.23	0.83
2:A:573:MET:HG2	2:A:678:LYS:HZ2	1.37	0.83
1:B:242:ASP:HB3	1:B:243:PRO:HD3	1.61	0.82
1:B:82:VAL:HG11	2:A:652:THR:HG23	1.62	0.80
2:A:851:LYS:HB3	2:A:852:PRO:HD2	1.63	0.80
2:A:43:SER:HB2	2:A:673:LEU:HD23	1.63	0.79
2:A:950:HIS:HA	2:A:953:GLU:HB2	1.63	0.79
2:A:550:VAL:HB	2:A:909:VAL:HG13	1.65	0.79
2:A:191:ILE:HD13	2:A:263:ALA:HB2	1.65	0.77
2:A:550:VAL:HG11	2:A:909:VAL:HG22	1.65	0.77
1:C:339:GLN:HG3	1:C:357:VAL:HG23	1.67	0.76
1:C:80:SER:HA	1:C:397:ARG:HD2	1.67	0.76
2:A:518:ASN:HA	2:A:521:LEU:HD21	1.69	0.75
1:B:117:ASN:ND2	1:B:119:TYR:H	1.85	0.74
2:A:6:ILE:HD13	2:A:443:SER:HB3	1.70	0.74
2:A:118:GLN:HE22	2:A:127:ALA:H	1.35	0.74
1:B:159:VAL:HG23	1:B:204:ILE:HG21	1.70	0.74
1:C:283:LEU:HD23	1:C:296:LEU:HD12	1.69	0.74
1:B:125:GLN:NE2	1:C:228:ASN:H	1.88	0.72
1:B:125:GLN:HE21	1:C:228:ASN:H	1.38	0.71
2:A:20:ALA:HA	2:A:23:LEU:HD23	1.71	0.71
2:A:275:ILE:HD13	2:A:586:ALA:HB2	1.71	0.71
2:A:529:LEU:O	2:A:532:VAL:HG12	1.92	0.70
2:A:27:GLY:HA3	2:A:375:CYS:HB3	1.72	0.70
2:A:409:VAL:HB	2:A:450:LEU:HD11	1.73	0.70
2:A:784:ARG:HG3	2:A:804:ILE:HD11	1.73	0.70
2:A:425:HIS:HB3	2:A:426:PRO:HD2	1.71	0.70
2:A:377:ALA:O	2:A:381:MET:HG3	1.93	0.69
2:A:466:THR:O	2:A:871:LYS:HE2	1.92	0.69
2:A:493:ALA:HA	2:A:497:ILE:HB	1.74	0.69
2:A:609:THR:HG22	2:A:624:VAL:HB	1.75	0.69
2:A:42:LEU:HA	2:A:473:ARG:HD2	1.75	0.68
2:A:80:LYS:HG2	2:A:81:THR:HG23	1.74	0.68
2:A:991:ILE:O	2:A:995:LEU:HB2	1.93	0.68
2:A:573:MET:CG	2:A:678:LYS:HD2	2.23	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:165:TYR:HB2	1:C:181:ILE:HG21	1.76	0.68
2:A:279:ASN:HD21	2:A:604:ARG:HA	1.57	0.68
1:B:360:ALA:HA	1:B:365:THR:HA	1.74	0.67
2:A:980:ARG:O	2:A:984:LYS:HB2	1.94	0.67
2:A:547:VAL:O	2:A:550:VAL:HG12	1.95	0.66
2:A:690:LEU:HD22	2:A:718:LEU:HD23	1.76	0.66
2:A:964:PHE:CZ	2:A:1043:HIS:HB3	2.30	0.66
2:A:552:TRP:HB3	2:A:553:PRO:HD3	1.76	0.66
2:A:65:VAL:O	2:A:69:LEU:HB2	1.96	0.66
2:A:977:ALA:HA	2:A:980:ARG:NE	2.10	0.66
2:A:940:PHE:CE1	2:A:1024:PRO:HA	2.32	0.65
2:A:986:MET:O	2:A:990:VAL:HG22	1.97	0.65
1:C:254:ILE:HG22	1:C:257:LEU:HB2	1.77	0.65
1:C:219:THR:OG1	1:C:237:LYS:HD2	1.95	0.65
2:A:707:VAL:HG21	2:A:840:LEU:HD23	1.77	0.65
2:A:573:MET:HG2	2:A:678:LYS:HD2	1.78	0.65
2:A:364:LEU:O	2:A:368:ILE:HG12	1.96	0.65
1:C:302:ASN:HD21	1:C:307:LEU:H	1.45	0.64
2:A:482:LYS:O	2:A:486:MET:HG2	1.96	0.64
2:A:573:MET:HG2	2:A:678:LYS:CE	2.28	0.64
1:B:280:LYS:HE3	1:B:280:LYS:HA	1.80	0.63
2:A:601:GLU:OE2	2:A:637:ARG:HD3	1.99	0.63
2:A:982:ARG:HB3	2:A:983:PRO:HD3	1.79	0.63
2:A:532:VAL:HG23	2:A:539:THR:HG21	1.81	0.63
2:A:370:LEU:HB2	2:A:371:PRO:HD3	1.81	0.63
2:A:569:ASP:HB3	2:A:628:ILE:O	1.98	0.63
2:A:224:LEU:HB2	2:A:229:TYR:CE1	2.34	0.63
1:B:341:VAL:HG21	1:B:371:LEU:HD11	1.79	0.63
2:A:361:ARG:HB3	2:A:504:TRP:HB3	1.79	0.63
2:A:398:ILE:HD11	2:A:482:LYS:HG3	1.82	0.62
2:A:955:VAL:HG12	2:A:956:PRO:HD3	1.81	0.62
2:A:960:ASN:HB2	2:A:961:PRO:HD3	1.81	0.62
2:A:550:VAL:HG21	2:A:909:VAL:HA	1.80	0.62
1:B:385:ILE:HG22	1:B:389:ALA:HB2	1.82	0.62
2:A:834:VAL:HG22	2:A:838:HIS:CD2	2.34	0.62
1:B:84:ILE:HD11	2:A:594:LYS:HD2	1.80	0.62
1:B:360:ALA:HB2	1:B:365:THR:HG22	1.82	0.62
2:A:891:PHE:HE2	2:A:942:VAL:HG13	1.64	0.62
2:A:660:ASN:N	2:A:660:ASN:HD22	1.98	0.61
2:A:1001:GLY:HA2	2:A:1006:SER:HB2	1.82	0.61
2:A:1023:ALA:HB3	2:A:1024:PRO:HD3	1.81	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:940:PHE:C	2:A:940:PHE:CD2	2.73	0.61
2:A:877:PRO:O	2:A:881:MET:HG2	2.00	0.61
2:A:570:LEU:HA	2:A:665:PRO:HD3	1.83	0.60
2:A:707:VAL:HG13	2:A:708:PRO:HD2	1.83	0.60
2:A:696:MET:CE	2:A:851:LYS:HG3	2.31	0.60
2:A:519:ARG:O	2:A:523:ARG:HG3	2.01	0.60
2:A:370:LEU:O	2:A:374:LEU:HB2	2.01	0.60
2:A:418:LEU:HD21	2:A:438:VAL:HG11	1.83	0.60
1:C:327:ILE:HG12	1:C:367:LEU:HD21	1.83	0.59
2:A:338:LEU:HD21	2:A:390:ILE:HG13	1.85	0.59
1:C:279:ARG:NH1	1:C:279:ARG:HB2	2.16	0.59
2:A:2:ILE:H	2:A:2:ILE:HD12	1.68	0.59
2:A:573:MET:HG2	2:A:678:LYS:CD	2.32	0.59
2:A:416:LYS:HD2	2:A:419:GLU:HB3	1.84	0.59
2:A:969:LEU:O	2:A:973:LEU:HD13	2.02	0.59
2:A:563:PRO:HG3	2:A:1011:ARG:HG2	1.85	0.58
2:A:599:VAL:HG21	2:A:649:LEU:HD12	1.84	0.58
2:A:904:VAL:HG12	2:A:937:ALA:HB3	1.84	0.58
2:A:340:GLY:O	2:A:344:GLU:HG3	2.03	0.58
1:B:287:VAL:HG12	1:B:294:LEU:HD23	1.84	0.58
1:C:342:ILE:HB	1:C:378:VAL:CG1	2.34	0.58
2:A:188:GLN:HA	2:A:769:ASN:ND2	2.18	0.58
2:A:276:ALA:HB3	2:A:284:VAL:O	2.03	0.58
2:A:995:LEU:O	2:A:1017:ILE:HD11	2.04	0.58
2:A:38:ALA:O	2:A:390:ILE:HG22	2.03	0.58
2:A:588:MET:HE1	2:A:658:LEU:HD13	1.86	0.58
2:A:729:ASN:C	2:A:729:ASN:HD22	2.07	0.58
1:B:110:PHE:CG	1:B:250:ILE:HG12	2.38	0.58
2:A:168:LEU:HB3	2:A:177:VAL:HG21	1.86	0.57
2:A:804:ILE:HG13	2:A:804:ILE:O	2.04	0.57
2:A:2:ILE:HD13	2:A:448:PRO:HB3	1.86	0.57
2:A:535:TRP:O	2:A:538:THR:HG22	2.05	0.57
2:A:746:PHE:CZ	2:A:788:ILE:HG23	2.40	0.57
2:A:188:GLN:HA	2:A:769:ASN:HD21	1.70	0.57
2:A:912:ILE:HD12	2:A:930:PHE:CZ	2.40	0.57
1:C:342:ILE:HB	1:C:378:VAL:HG12	1.86	0.57
2:A:756:VAL:HG21	2:A:770:LEU:HD22	1.87	0.57
2:A:28:THR:O	2:A:32:ILE:HG13	2.05	0.56
2:A:222:ILE:HG12	2:A:223:GLU:N	2.20	0.56
2:A:141:GLU:HB3	2:A:325:TYR:HB3	1.87	0.56
2:A:534:HIS:C	2:A:534:HIS:CD2	2.78	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:893:ARG:HB3	2:A:896:GLU:HB3	1.87	0.56
1:B:390:ASN:HD22	1:B:393:GLY:H	1.53	0.56
2:A:4:TRP:O	2:A:8:ARG:HG2	2.06	0.56
2:A:900:ILE:HG23	2:A:941:GLY:HA3	1.88	0.56
1:C:116:TYR:CE2	1:C:309:PRO:HG2	2.40	0.56
2:A:390:ILE:HD12	2:A:1005:GLY:HA3	1.88	0.56
2:A:933:LEU:HB2	2:A:1016:MET:HG2	1.87	0.55
1:B:330:GLN:HA	1:B:330:GLN:HE21	1.71	0.55
2:A:488:GLY:O	2:A:492:LEU:HB2	2.07	0.55
2:A:607:GLY:HA2	2:A:626:THR:HG22	1.88	0.55
2:A:351:VAL:O	2:A:355:LEU:HG	2.06	0.55
2:A:449:ALA:O	2:A:453:SER:HB2	2.05	0.55
1:B:220:ALA:HB3	1:B:237:LYS:HB2	1.88	0.55
2:A:696:MET:HE2	2:A:851:LYS:HG3	1.88	0.55
1:B:123:ILE:CD1	1:B:237:LYS:HG3	2.37	0.55
1:C:359:GLN:HG3	1:C:360:ALA:N	2.22	0.55
1:B:322:GLU:HG3	1:B:323:PRO:HD2	1.89	0.55
2:A:954:ALA:HB3	2:A:956:PRO:HD2	1.87	0.55
1:B:144:VAL:HG21	1:B:238:ILE:HD13	1.88	0.55
1:C:123:ILE:HG12	1:C:237:LYS:HG3	1.87	0.55
2:A:536:PRO:HB3	2:A:1033:ALA:HB1	1.89	0.54
2:A:1031:ILE:HB	2:A:1032:PRO:HD3	1.88	0.54
1:B:268:VAL:HG23	1:B:271:ARG:H	1.72	0.54
2:A:40:PRO:O	2:A:42:LEU:HG	2.06	0.54
1:B:387:SER:HA	2:A:771:ARG:HH12	1.72	0.54
2:A:573:MET:CG	2:A:678:LYS:HZ2	2.17	0.54
2:A:1007:GLU:O	2:A:1011:ARG:HD3	2.08	0.54
1:C:242:ASP:HB3	1:C:243:PRO:CD	2.30	0.54
2:A:53:TYR:O	2:A:89:GLY:HA2	2.08	0.54
2:A:363:ALA:O	2:A:367:ILE:HG13	2.08	0.54
2:A:955:VAL:HA	2:A:958:LEU:HD13	1.90	0.54
2:A:880:LEU:HA	2:A:883:ILE:HG22	1.89	0.54
2:A:972:ALA:HA	2:A:975:HIS:HD2	1.73	0.54
1:B:123:ILE:HD12	1:B:237:LYS:HG3	1.89	0.54
1:B:242:ASP:CB	1:B:243:PRO:HD3	2.37	0.54
1:B:135:VAL:HG12	1:B:225:ALA:HB2	1.89	0.53
2:A:522:ILE:HG12	2:A:981:VAL:HG11	1.90	0.53
1:B:123:ILE:HB	1:C:227:MET:CG	2.38	0.53
2:A:842:LYS:O	2:A:846:GLU:HG2	2.08	0.53
1:C:164:GLU:O	1:C:168:LEU:HD13	2.09	0.53
1:B:155:ILE:HB	1:B:208:PHE:HE1	1.74	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:441:ASP:HA	2:A:444:VAL:HG23	1.89	0.53
1:B:126:ALA:HB2	1:B:229:ILE:HD13	1.91	0.53
2:A:620:PRO:HG2	2:A:622:GLU:HG2	1.91	0.53
2:A:940:PHE:C	2:A:940:PHE:HD2	2.09	0.53
2:A:459:LEU:HB3	2:A:882:ILE:CD1	2.34	0.53
1:C:102:GLY:O	1:C:323:PRO:HA	2.09	0.53
1:C:317:LEU:C	1:C:317:LEU:HD12	2.30	0.53
2:A:9:SER:HA	2:A:12:ASN:ND2	2.24	0.53
2:A:421:TRP:HD1	2:A:421:TRP:O	1.92	0.53
2:A:43:SER:HB2	2:A:673:LEU:CD2	2.35	0.52
2:A:248:LEU:HD11	2:A:259:LEU:HA	1.91	0.52
2:A:239:THR:HG22	2:A:241:ASP:H	1.72	0.52
2:A:301:ILE:HD12	2:A:328:SER:HB3	1.91	0.52
1:B:180:GLY:O	1:B:184:ARG:HG3	2.09	0.52
1:B:156:PRO:O	1:B:159:VAL:HG12	2.09	0.52
2:A:955:VAL:N	2:A:956:PRO:CD	2.72	0.52
1:C:325:LEU:HD12	1:C:325:LEU:H	1.73	0.52
2:A:338:LEU:HG	2:A:390:ILE:HA	1.91	0.52
2:A:474:LEU:HD23	2:A:475:PHE:CE1	2.45	0.52
1:B:266:LEU:HD13	1:B:267:THR:N	2.25	0.52
1:B:223:LEU:HD11	1:B:235:VAL:HA	1.90	0.52
2:A:759:THR:HG22	2:A:768:ILE:HD11	1.91	0.52
2:A:977:ALA:O	2:A:981:VAL:HG23	2.10	0.52
2:A:904:VAL:N	2:A:905:PRO:CD	2.73	0.52
1:B:143:LYS:HD2	1:B:216:GLY:O	2.10	0.51
2:A:546:SER:O	2:A:549:THR:HG22	2.10	0.51
2:A:710:VAL:HA	2:A:828:ALA:HB2	1.92	0.51
2:A:214:ASN:OD1	2:A:237:LEU:HB2	2.09	0.51
2:A:891:PHE:CE2	2:A:942:VAL:HG13	2.44	0.51
2:A:975:HIS:C	2:A:977:ALA:H	2.13	0.51
2:A:1022:THR:O	2:A:1026:LEU:HB2	2.09	0.51
1:B:259:LYS:HG3	1:B:260:ASP:N	2.25	0.51
2:A:964:PHE:CE2	2:A:1043:HIS:HB3	2.46	0.51
2:A:361:ARG:HA	2:A:364:LEU:HB2	1.92	0.51
1:B:124:VAL:HB	1:B:235:VAL:HG22	1.92	0.51
2:A:844:ILE:HD12	2:A:858:PHE:HZ	1.76	0.51
1:B:340:ARG:HB3	1:B:354:ARG:HA	1.92	0.51
2:A:214:ASN:H	2:A:215:GLN:NE2	2.09	0.51
2:A:102:ASP:HB3	2:A:105:TRP:HB3	1.92	0.51
2:A:342:LEU:HD21	2:A:396:ILE:HG22	1.93	0.51
2:A:914:LEU:HD23	2:A:1014:ALA:O	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:242:ASP:HB3	1:B:243:PRO:CD	2.37	0.51
1:C:156:PRO:O	1:C:159:VAL:HG22	2.11	0.51
2:A:522:ILE:HG23	2:A:526:HIS:HE2	1.75	0.51
1:C:254:ILE:HD11	2:A:797:THR:HG21	1.93	0.50
2:A:850:LEU:HD21	2:A:856:VAL:HG23	1.94	0.50
1:C:128:ALA:HB3	1:C:155:ILE:HG21	1.93	0.50
2:A:97:PHE:CE1	2:A:106:ALA:HB1	2.46	0.50
2:A:746:PHE:O	2:A:750:ALA:HB3	2.11	0.50
1:B:384:LEU:HD12	1:B:384:LEU:N	2.26	0.50
1:C:80:SER:HB3	1:C:401:GLU:OE2	2.11	0.50
2:A:16:VAL:HG11	2:A:495:VAL:HG12	1.93	0.50
1:B:385:ILE:HG13	2:A:272:ARG:H	1.77	0.50
2:A:359:HIS:HB3	2:A:362:SER:OG	2.12	0.50
2:A:392:SER:O	2:A:481:THR:HG21	2.11	0.50
2:A:725:ASN:O	2:A:804:ILE:HA	2.12	0.50
1:B:117:ASN:HD21	1:B:119:TYR:HB2	1.77	0.50
2:A:1:MET:O	2:A:5:ILE:HG13	2.12	0.50
1:C:138:LEU:HD21	1:C:144:VAL:HG11	1.94	0.50
1:B:336:GLY:HA3	2:A:775:SER:HB2	1.94	0.50
2:A:19:GLY:O	2:A:23:LEU:HB3	2.12	0.50
2:A:26:TRP:O	2:A:30:THR:HG23	2.12	0.50
2:A:121:LEU:HB3	2:A:125:VAL:CG2	2.42	0.50
2:A:111:LEU:HD13	2:A:129:LEU:HD22	1.94	0.49
2:A:878:MET:O	2:A:882:ILE:HG22	2.11	0.49
2:A:932:ALA:O	2:A:936:VAL:HG23	2.12	0.49
2:A:964:PHE:HZ	2:A:1043:HIS:HB3	1.73	0.49
1:B:169:ARG:HE	1:B:169:ARG:HA	1.77	0.49
2:A:21:LEU:O	2:A:25:ILE:HG22	2.12	0.49
1:B:391:ILE:HG12	2:A:774:GLN:OE1	2.12	0.49
2:A:405:ASP:OD2	2:A:991:ILE:HG12	2.12	0.49
2:A:596:ILE:HG12	2:A:653:VAL:HG21	1.93	0.49
2:A:697:ALA:HA	2:A:824:ILE:HD11	1.93	0.49
1:B:389:ALA:O	1:B:390:ASN:C	2.50	0.49
2:A:5:ILE:HA	2:A:8:ARG:HG3	1.94	0.49
2:A:390:ILE:HD12	2:A:1005:GLY:CA	2.43	0.49
2:A:458:THR:HA	2:A:482:LYS:NZ	2.27	0.49
2:A:42:LEU:HD12	2:A:42:LEU:H	1.77	0.49
1:B:153:LEU:H	1:B:153:LEU:HD23	1.76	0.49
1:C:166:LEU:O	1:C:170:GLU:HG2	2.12	0.49
2:A:23:LEU:HD12	2:A:23:LEU:O	2.13	0.49
2:A:14:PHE:O	2:A:17:LEU:HB3	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:113:TYR:HA	2:A:116:GLN:HE21	1.78	0.49
1:C:242:ASP:CB	1:C:243:PRO:HD3	2.33	0.49
2:A:421:TRP:O	2:A:421:TRP:CD1	2.66	0.49
2:A:526:HIS:HA	2:A:529:LEU:HB3	1.94	0.49
2:A:592:THR:O	2:A:596:ILE:HG13	2.13	0.49
2:A:596:ILE:HD13	2:A:628:ILE:HD11	1.94	0.49
2:A:550:VAL:HG23	2:A:913:TRP:CD1	2.48	0.49
2:A:947:TYR:O	2:A:951:ALA:HB2	2.12	0.49
1:B:121:TYR:CG	1:C:224:ARG:HD3	2.48	0.48
1:C:302:ASN:ND2	1:C:307:LEU:H	2.11	0.48
2:A:338:LEU:O	2:A:342:LEU:HB2	2.12	0.48
2:A:399:ALA:O	2:A:403:MET:HG3	2.12	0.48
2:A:458:THR:HA	2:A:482:LYS:HZ3	1.79	0.48
2:A:779:SER:HB2	2:A:780:PRO:HD2	1.95	0.48
1:B:220:ALA:HB3	1:B:237:LYS:CB	2.43	0.48
2:A:356:PHE:HD2	2:A:986:MET:CB	2.27	0.48
2:A:526:HIS:N	2:A:527:PRO:CD	2.77	0.48
2:A:683:ILE:HB	2:A:824:ILE:HB	1.95	0.48
2:A:945:LEU:HD13	2:A:945:LEU:O	2.14	0.48
2:A:173:ASP:HB2	2:A:300:VAL:CG2	2.44	0.48
2:A:270:GLU:HG2	2:A:271:MET:H	1.79	0.48
2:A:436:TRP:CD1	2:A:436:TRP:C	2.87	0.48
2:A:900:ILE:HD12	2:A:941:GLY:O	2.14	0.48
2:A:925:ALA:O	2:A:1012:ILE:HG13	2.14	0.48
1:B:84:ILE:HG22	1:C:91:ASN:OD1	2.14	0.48
1:C:158:TRP:O	1:C:162:GLN:HG3	2.13	0.48
2:A:270:GLU:HG2	2:A:271:MET:N	2.28	0.48
2:A:522:ILE:HG23	2:A:526:HIS:NE2	2.29	0.48
2:A:784:ARG:HG3	2:A:804:ILE:CD1	2.44	0.48
2:A:882:ILE:HD13	2:A:882:ILE:C	2.35	0.48
1:B:390:ASN:ND2	1:B:393:GLY:H	2.12	0.48
1:C:360:ALA:HB2	1:C:365:THR:HG22	1.96	0.48
2:A:85:PHE:HB2	2:A:92:TYR:HB2	1.96	0.48
2:A:2:ILE:HD12	2:A:2:ILE:N	2.28	0.47
2:A:550:VAL:O	2:A:553:PRO:HD2	2.14	0.47
2:A:736:TYR:CE1	2:A:796:ILE:HG21	2.49	0.47
2:A:661:LEU:HD21	2:A:663:VAL:HG13	1.96	0.47
1:B:124:VAL:O	1:B:235:VAL:HG22	2.14	0.47
2:A:6:ILE:HG12	2:A:494:ILE:HG13	1.96	0.47
2:A:27:GLY:O	2:A:31:ILE:HG22	2.14	0.47
2:A:368:ILE:O	2:A:372:LEU:HD13	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:80:SER:HB3	1:B:82:VAL:HG12	1.96	0.47
1:B:178:THR:O	1:B:182:LEU:HB2	2.15	0.47
1:C:394:ALA:HA	1:C:397:ARG:NH1	2.30	0.47
2:A:421:TRP:CE3	2:A:438:VAL:HB	2.49	0.47
1:C:279:ARG:HB2	1:C:279:ARG:HH11	1.79	0.47
2:A:408:ILE:HG13	2:A:409:VAL:N	2.29	0.47
2:A:574:PRO:HD2	2:A:624:VAL:HG22	1.95	0.47
2:A:911:GLY:HA3	2:A:930:PHE:HE2	1.80	0.47
1:B:85:ASP:HA	1:B:86:PRO:HD3	1.78	0.47
1:B:99:VAL:HG22	1:B:327:ILE:HG22	1.95	0.47
1:C:114:VAL:O	1:C:309:PRO:HA	2.14	0.47
1:C:264:PHE:HB3	1:C:315:LEU:HD11	1.97	0.47
2:A:6:ILE:HG21	2:A:443:SER:HB3	1.97	0.47
2:A:715:ALA:HB2	2:A:824:ILE:HG12	1.97	0.47
2:A:833:MET:O	2:A:837:VAL:HG12	2.15	0.47
2:A:213:SER:O	2:A:237:LEU:HD13	2.14	0.47
2:A:951:ALA:HB1	2:A:972:ALA:O	2.14	0.47
2:A:461:PHE:CE2	2:A:932:ALA:HB2	2.49	0.47
2:A:571:LEU:CD1	2:A:665:PRO:HA	2.45	0.47
2:A:574:PRO:HA	2:A:659:ALA:O	2.15	0.47
2:A:846:GLU:HG3	2:A:847:LYS:HG3	1.97	0.47
1:B:93:GLY:HA3	2:A:146:ASP:O	2.15	0.47
1:B:343:THR:OG1	1:B:351:VAL:HG23	2.15	0.47
2:A:463:PRO:CB	2:A:875:MET:HG3	2.45	0.47
2:A:589:LEU:HD13	2:A:609:THR:HG23	1.95	0.47
2:A:837:VAL:O	2:A:841:GLN:HG3	2.14	0.47
1:B:339:GLN:OE1	1:B:339:GLN:N	2.47	0.46
1:C:284:LEU:HB2	1:C:295:GLN:HB2	1.97	0.46
2:A:419:GLU:O	2:A:423:HIS:HD2	1.97	0.46
2:A:859:SER:HA	2:A:863:GLU:HB2	1.97	0.46
1:B:386:ASP:HB2	2:A:269:PRO:O	2.16	0.46
2:A:702:GLU:HA	2:A:705:ARG:HH21	1.80	0.46
1:B:264:PHE:CE2	1:B:317:LEU:HD22	2.50	0.46
2:A:1036:LYS:O	2:A:1036:LYS:HG2	2.15	0.46
2:A:433:LYS:HA	2:A:436:TRP:HB3	1.96	0.46
1:B:121:TYR:HE1	1:B:123:ILE:HD11	1.81	0.46
1:B:259:LYS:HE3	1:B:259:LYS:HB2	1.81	0.46
1:C:121:TYR:HE1	1:C:237:LYS:HD3	1.81	0.46
1:C:125:GLN:HG2	1:C:233:ASN:O	2.14	0.46
2:A:1014:ALA:HB3	2:A:1015:PRO:HD3	1.98	0.46
1:C:352:PRO:O	1:C:353:LYS:HG3	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:378:PHE:HA	2:A:381:MET:HE2	1.96	0.46
2:A:678:LYS:HE2	2:A:825:TYR:CD2	2.51	0.46
1:B:121:TYR:CE1	1:B:123:ILE:HD11	2.50	0.46
1:B:384:LEU:HD23	1:B:394:ALA:HB3	1.97	0.46
2:A:647:GLU:O	2:A:651:ASN:HB2	2.16	0.46
1:C:281:TRP:HB2	1:C:298:LEU:HD23	1.97	0.46
2:A:537:LYS:HD3	2:A:1037:LEU:HD11	1.98	0.46
2:A:550:VAL:CB	2:A:909:VAL:HG13	2.41	0.46
2:A:693:ILE:HD11	2:A:718:LEU:HD22	1.98	0.46
2:A:728:ILE:HA	2:A:802:ALA:HB2	1.97	0.46
2:A:785:GLN:HA	2:A:797:THR:HB	1.98	0.46
2:A:758:GLU:HA	2:A:766:TYR:O	2.16	0.46
2:A:759:THR:HG23	2:A:766:TYR:HB2	1.98	0.46
2:A:952:ILE:O	2:A:952:ILE:HG22	2.16	0.46
1:C:165:TYR:HB2	1:C:181:ILE:CG2	2.44	0.45
2:A:534:HIS:O	2:A:535:TRP:C	2.55	0.45
2:A:769:ASN:HD22	2:A:769:ASN:N	2.15	0.45
2:A:13:ARG:HA	2:A:499:ILE:HD13	1.98	0.45
2:A:395:GLY:O	2:A:398:ILE:HG12	2.16	0.45
1:C:391:ILE:C	1:C:393:GLY:H	2.19	0.45
2:A:525:TYR:OH	2:A:980:ARG:NH2	2.49	0.45
2:A:887:LEU:HD13	2:A:900:ILE:HB	1.98	0.45
2:A:930:PHE:CE1	2:A:1015:PRO:HB3	2.51	0.45
1:B:183:GLU:O	1:B:187:LEU:HG	2.16	0.45
1:B:207:ARG:O	1:B:207:ARG:HG3	2.13	0.45
2:A:348:VAL:HG12	2:A:993:ALA:HB1	1.98	0.45
2:A:418:LEU:HD12	2:A:439:ILE:HD11	1.98	0.45
2:A:844:ILE:HD12	2:A:858:PHE:CZ	2.51	0.45
2:A:42:LEU:HD21	2:A:474:LEU:HD13	1.98	0.45
2:A:453:SER:OG	2:A:939:GLU:HA	2.15	0.45
2:A:474:LEU:O	2:A:477:PRO:HD2	2.16	0.45
2:A:637:ARG:HB3	2:A:638:PRO:HD2	1.99	0.45
2:A:675:THR:HG21	2:A:860:GLY:O	2.16	0.45
1:C:266:LEU:HB3	1:C:276:LEU:HD12	1.97	0.45
2:A:421:TRP:HE1	2:A:425:HIS:CD2	2.34	0.45
1:C:395:LEU:HB3	1:C:399:ARG:HH12	1.82	0.45
2:A:2:ILE:O	2:A:6:ILE:HG13	2.15	0.45
2:A:18:MET:HA	2:A:21:LEU:HB3	1.99	0.45
2:A:411:ILE:HA	2:A:501:MET:CE	2.47	0.45
1:C:230:ALA:H	1:C:233:ASN:ND2	2.15	0.45
1:C:329:SER:HA	1:C:365:THR:HG23	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:195:ARG:HD3	2:A:261:ASP:O	2.17	0.45
2:A:297:ALA:O	2:A:301:ILE:HG13	2.16	0.45
2:A:463:PRO:HB2	2:A:875:MET:HG3	1.99	0.45
2:A:875:MET:CE	2:A:931:ILE:HG21	2.47	0.45
1:B:387:SER:HB2	2:A:271:MET:HG3	1.98	0.45
2:A:38:ALA:O	2:A:389:ASN:HB2	2.16	0.45
2:A:298:ARG:NE	2:A:328:SER:HB2	2.32	0.45
2:A:701:GLU:HG2	2:A:705:ARG:HH22	1.80	0.45
1:C:323:PRO:O	1:C:324:MET:HE3	2.17	0.44
2:A:952:ILE:C	2:A:957:SER:HB3	2.37	0.44
1:C:397:ARG:O	1:C:401:GLU:HG3	2.17	0.44
2:A:118:GLN:HE22	2:A:127:ALA:N	2.11	0.44
2:A:301:ILE:CD1	2:A:328:SER:HB3	2.46	0.44
2:A:350:ALA:HA	2:A:353:CYS:SG	2.58	0.44
2:A:554:LEU:CD2	2:A:912:ILE:HG12	2.48	0.44
2:A:716:GLU:OE1	2:A:814:LYS:HE3	2.17	0.44
1:B:121:TYR:CD1	1:C:224:ARG:HD3	2.52	0.44
2:A:482:LYS:HD3	2:A:482:LYS:C	2.38	0.44
2:A:559:GLY:H	2:A:834:VAL:HG12	1.81	0.44
1:C:151:LEU:HD11	1:C:210:LEU:HD12	2.00	0.44
1:C:281:TRP:CB	1:C:298:LEU:HD23	2.47	0.44
2:A:6:ILE:O	2:A:10:VAL:HG23	2.17	0.44
2:A:561:PHE:HA	2:A:865:LEU:HG	1.99	0.44
1:B:288:ASP:O	1:B:292:ARG:N	2.50	0.44
1:C:298:LEU:HD11	1:C:315:LEU:HD22	1.99	0.44
1:C:330:GLN:O	1:C:382:LEU:HD12	2.18	0.44
2:A:116:GLN:H	2:A:116:GLN:HG2	1.65	0.44
2:A:1009:MET:O	2:A:1012:ILE:HG22	2.17	0.44
2:A:420:GLU:HG3	2:A:421:TRP:N	2.33	0.44
2:A:711:ALA:HB3	2:A:827:ASP:O	2.18	0.44
2:A:723:TYR:HB2	2:A:807:SER:OG	2.18	0.44
2:A:73:MET:HE3	2:A:110:VAL:HG13	2.00	0.44
2:A:118:GLN:NE2	2:A:126:SER:HA	2.33	0.44
2:A:288:VAL:HG22	2:A:290:ILE:HD12	2.00	0.44
2:A:969:LEU:O	2:A:969:LEU:HD12	2.18	0.44
1:C:183:GLU:O	1:C:187:LEU:HG	2.18	0.43
2:A:574:PRO:HG2	2:A:624:VAL:CG1	2.37	0.43
1:B:117:ASN:HD22	1:B:117:ASN:C	2.21	0.43
1:C:146:LYS:HA	1:C:212:ALA:O	2.18	0.43
2:A:196:LEU:HD22	2:A:201:ILE:O	2.17	0.43
2:A:431:ASP:CG	2:A:432:ASN:H	2.21	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:88:GLN:HE21	2:A:654:ARG:HG3	1.82	0.43
1:C:120:GLN:NE2	1:C:243:PRO:HD2	2.32	0.43
2:A:492:LEU:HD22	2:A:492:LEU:HA	1.81	0.43
2:A:571:LEU:HD11	2:A:665:PRO:HA	2.00	0.43
2:A:940:PHE:CE1	2:A:984:LYS:HE3	2.54	0.43
1:C:191:PRO:HG2	1:C:194:ASP:OD2	2.19	0.43
2:A:595:LEU:HD23	2:A:595:LEU:HA	1.86	0.43
2:A:661:LEU:CD2	2:A:663:VAL:HG13	2.48	0.43
1:B:396:GLU:HG2	1:B:399:ARG:HH21	1.83	0.43
2:A:40:PRO:O	2:A:41:ASP:C	2.56	0.43
1:B:287:VAL:CG1	1:B:294:LEU:HD23	2.47	0.43
2:A:550:VAL:CG1	2:A:909:VAL:HG22	2.43	0.43
2:A:965:SER:OG	2:A:968:LYS:HB3	2.19	0.43
1:B:104:LEU:HB2	1:B:321:SER:OG	2.19	0.43
1:C:132:ILE:CD1	1:C:229:ILE:HB	2.48	0.43
2:A:526:HIS:HB3	2:A:974:TYR:OH	2.18	0.43
2:A:834:VAL:HG22	2:A:838:HIS:NE2	2.33	0.43
2:A:996:LEU:N	2:A:997:PRO:CD	2.82	0.43
1:C:84:ILE:HG21	2:A:656:PRO:HG3	2.01	0.43
2:A:42:LEU:HD12	2:A:42:LEU:N	2.33	0.43
2:A:461:PHE:CD1	2:A:482:LYS:HD2	2.53	0.43
2:A:642:MET:HA	2:A:642:MET:HE3	2.00	0.43
2:A:677:ILE:HG22	2:A:679:SER:H	1.82	0.43
2:A:1036:LYS:O	2:A:1040:LEU:HG	2.19	0.43
1:B:334:ASP:OD2	1:B:339:GLN:HB3	2.19	0.43
1:C:181:ILE:O	1:C:185:LEU:HD13	2.18	0.43
2:A:636:TRP:CD1	2:A:636:TRP:N	2.87	0.43
2:A:891:PHE:CE1	2:A:945:LEU:HD12	2.54	0.43
1:B:340:ARG:HD2	1:B:395:LEU:HD13	1.99	0.43
1:C:121:TYR:CE1	1:C:237:LYS:HD3	2.54	0.43
1:C:254:ILE:HD11	2:A:797:THR:CG2	2.49	0.43
2:A:526:HIS:HB3	2:A:974:TYR:CZ	2.54	0.43
1:B:385:ILE:HG23	1:B:385:ILE:O	2.19	0.42
2:A:940:PHE:CE2	2:A:944:MET:HG3	2.54	0.42
1:B:298:LEU:N	1:B:298:LEU:HD23	2.34	0.42
1:C:268:VAL:HA	1:C:269:PRO:HD3	1.85	0.42
2:A:240:LEU:HD23	2:A:240:LEU:HA	1.85	0.42
2:A:325:TYR:HB2	2:A:627:THR:HG21	2.00	0.42
2:A:348:VAL:O	2:A:352:VAL:HG23	2.19	0.42
2:A:425:HIS:HB3	2:A:426:PRO:CD	2.46	0.42
2:A:522:ILE:CG1	2:A:981:VAL:HG11	2.48	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:575:SER:O	2:A:714:LEU:HD22	2.19	0.42
1:B:390:ASN:HA	2:A:774:GLN:HE22	1.85	0.42
2:A:185:LYS:O	2:A:767:PRO:HD2	2.19	0.42
2:A:469:GLY:O	2:A:473:ARG:HG3	2.18	0.42
2:A:904:VAL:O	2:A:908:LEU:HG	2.19	0.42
2:A:110:VAL:O	2:A:114:LEU:HB2	2.19	0.42
2:A:376:ILE:O	2:A:380:VAL:HG23	2.19	0.42
2:A:534:HIS:CD2	2:A:534:HIS:O	2.72	0.42
2:A:715:ALA:CB	2:A:824:ILE:HG12	2.49	0.42
1:B:322:GLU:O	1:B:324:MET:HG3	2.20	0.42
2:A:222:ILE:CD1	2:A:224:LEU:HG	2.49	0.42
2:A:311:LEU:O	2:A:315:LEU:HG	2.19	0.42
2:A:718:LEU:HD12	2:A:718:LEU:HA	1.84	0.42
1:B:291:THR:O	1:B:293:THR:HG23	2.19	0.42
1:C:367:LEU:N	1:C:367:LEU:HD22	2.35	0.42
2:A:295:LYS:HA	2:A:295:LYS:HD3	1.88	0.42
2:A:531:LYS:O	2:A:534:HIS:HB3	2.19	0.42
1:B:125:GLN:HG2	1:B:233:ASN:O	2.19	0.42
1:C:161:ALA:HB3	1:C:185:LEU:HD11	2.01	0.42
2:A:62:GLU:HA	2:A:66:THR:HB	2.00	0.42
2:A:67:TYR:N	2:A:68:PRO:HD2	2.34	0.42
2:A:421:TRP:HE3	2:A:438:VAL:HB	1.84	0.42
2:A:933:LEU:HD23	2:A:1016:MET:HA	2.02	0.42
2:A:399:ALA:HA	2:A:486:MET:HE1	2.00	0.42
2:A:534:HIS:O	2:A:534:HIS:HD2	2.02	0.42
2:A:770:LEU:O	2:A:771:ARG:HB2	2.18	0.42
2:A:97:PHE:CZ	2:A:106:ALA:HB1	2.55	0.42
2:A:172:PRO:O	2:A:173:ASP:HB2	2.20	0.42
2:A:550:VAL:C	2:A:553:PRO:HD2	2.40	0.42
1:B:132:ILE:HD11	1:B:229:ILE:HB	2.01	0.42
2:A:729:ASN:HB3	2:A:732:LYS:HB2	2.01	0.42
1:B:121:TYR:OH	1:B:237:LYS:HE2	2.20	0.41
1:B:389:ALA:O	1:B:391:ILE:N	2.53	0.41
2:A:114:LEU:HD12	2:A:114:LEU:HA	1.95	0.41
1:B:280:LYS:HE3	1:B:281:TRP:H	1.84	0.41
1:B:302:ASN:HD21	1:B:306:ALA:N	2.19	0.41
1:C:274:LYS:HB3	1:C:274:LYS:HE2	1.72	0.41
2:A:275:ILE:O	2:A:608:LYS:HA	2.20	0.41
2:A:375:CYS:O	2:A:379:ILE:HG13	2.20	0.41
2:A:992:ILE:O	2:A:996:LEU:HB2	2.20	0.41
2:A:1016:MET:O	2:A:1020:MET:HB2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:391:ILE:HG12	2:A:774:GLN:CD	2.40	0.41
2:A:15:LEU:HD22	2:A:15:LEU:HA	1.92	0.41
2:A:404:VAL:O	2:A:408:ILE:HG12	2.19	0.41
2:A:599:VAL:HG12	2:A:601:GLU:H	1.86	0.41
2:A:972:ALA:HA	2:A:975:HIS:CD2	2.55	0.41
2:A:992:ILE:HD11	2:A:1020:MET:O	2.20	0.41
1:B:159:VAL:HG13	1:B:160:GLU:N	2.36	0.41
2:A:188:GLN:NE2	2:A:268:GLY:HA3	2.35	0.41
2:A:193:PRO:HG3	2:A:772:TYR:CD2	2.54	0.41
2:A:578:PRO:HG2	2:A:717:ARG:HB2	2.02	0.41
2:A:904:VAL:HG22	2:A:905:PRO:HD3	2.03	0.41
1:B:110:PHE:CD1	1:B:250:ILE:HG12	2.56	0.41
1:C:129:ALA:O	1:C:155:ILE:HG23	2.20	0.41
2:A:214:ASN:HB2	2:A:237:LEU:HD22	2.03	0.41
2:A:535:TRP:NE1	2:A:537:LYS:HB3	2.35	0.41
1:C:395:LEU:O	1:C:399:ARG:HG3	2.20	0.41
2:A:1020:MET:HA	2:A:1020:MET:CE	2.51	0.41
1:C:112:ALA:HB2	1:C:248:ALA:HB2	2.02	0.41
2:A:418:LEU:CD2	2:A:438:VAL:HG11	2.51	0.41
2:A:456:ILE:HG23	2:A:883:ILE:HD13	2.02	0.41
2:A:574:PRO:CD	2:A:624:VAL:HG22	2.51	0.41
2:A:962:GLN:HG3	2:A:963:THR:N	2.34	0.41
1:B:296:LEU:C	1:B:296:LEU:HD23	2.41	0.41
2:A:22:PHE:O	2:A:25:ILE:HG23	2.21	0.41
2:A:159:LEU:O	2:A:163:PHE:HB3	2.20	0.41
2:A:494:ILE:HG12	2:A:494:ILE:O	2.21	0.41
2:A:911:GLY:HA3	2:A:930:PHE:CE2	2.56	0.41
1:B:350:PHE:O	1:B:351:VAL:HG13	2.20	0.41
1:C:120:GLN:OE1	1:C:240:GLY:HA3	2.21	0.41
1:C:124:VAL:O	1:C:235:VAL:HG13	2.21	0.41
1:C:266:LEU:HD23	1:C:266:LEU:HA	1.93	0.41
2:A:243:PHE:O	2:A:246:ILE:HG13	2.21	0.41
2:A:373:GLY:HA2	2:A:376:ILE:HG22	2.02	0.41
2:A:459:LEU:C	2:A:461:PHE:H	2.24	0.41
2:A:560:GLU:HG3	2:A:923:SER:HB3	2.02	0.41
2:A:574:PRO:HD2	2:A:624:VAL:O	2.21	0.41
2:A:595:LEU:CB	2:A:653:VAL:HG22	2.50	0.41
2:A:440:THR:O	2:A:440:THR:HG22	2.21	0.41
2:A:36:VAL:HG21	2:A:335:ILE:HG12	2.02	0.40
2:A:296:ASN:HB3	2:A:299:GLU:CB	2.51	0.40
2:A:535:TRP:O	2:A:537:LYS:N	2.54	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:769:ASN:HD22	2:A:769:ASN:H	1.69	0.40
2:A:815:THR:HG22	2:A:818:ALA:HA	2.03	0.40
2:A:945:LEU:HD22	2:A:945:LEU:HA	1.96	0.40
2:A:664:PRO:HA	2:A:665:PRO:HD3	1.99	0.40
1:B:307:LEU:HD22	1:B:307:LEU:H	1.85	0.40
1:C:156:PRO:O	1:C:157:ASP:C	2.60	0.40
1:C:161:ALA:CB	1:C:185:LEU:HD11	2.51	0.40
2:A:46:GLN:OE1	2:A:94:TYR:HD2	2.04	0.40
2:A:553:PRO:HB2	2:A:912:ILE:HG22	2.02	0.40
2:A:1031:ILE:N	2:A:1032:PRO:CD	2.85	0.40
2:A:522:ILE:HD13	2:A:978:VAL:HG23	2.04	0.40
2:A:599:VAL:HA	2:A:600:PRO:HD3	1.85	0.40
1:C:360:ALA:CB	1:C:365:THR:HG22	2.52	0.40
2:A:255:VAL:HA	2:A:256:PRO:HD3	1.87	0.40
2:A:390:ILE:O	2:A:390:ILE:HG12	2.16	0.40
2:A:831:ARG:HH22	2:A:839:ASP:CG	2.24	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	B	320/413 (78%)	281 (88%)	36 (11%)	3 (1%)	17	56
1	C	322/413 (78%)	300 (93%)	21 (6%)	1 (0%)	41	76
2	A	1027/1054 (97%)	922 (90%)	95 (9%)	10 (1%)	15	54
All	All	1669/1880 (89%)	1503 (90%)	152 (9%)	14 (1%)	19	60

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	388	GLU

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Mol	Chain	Res	Type
2	A	638	PRO
1	B	337	SER
1	B	390	ASN
2	A	894	VAL
2	A	574	PRO
2	A	13	ARG
2	A	238	GLN
1	C	137	PRO
2	A	38	ALA
2	A	235	GLY
2	A	852	PRO
2	A	1024	PRO
2	A	426	PRO

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	B	263/338 (78%)	243 (92%)	20 (8%)	13	40
1	C	265/338 (78%)	245 (92%)	20 (8%)	13	40
2	A	849/871 (98%)	772 (91%)	77 (9%)	9	32
All	All	1377/1547 (89%)	1260 (92%)	117 (8%)	10	36

All (117) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	84	ILE
1	B	105	THR
1	B	117	ASN
1	B	121	TYR
1	B	169	ARG
1	B	183	GLU
1	B	185	LEU
1	B	207	ARG
1	B	223	LEU

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Mol	Chain	Res	Type
1	B	241	MET
1	B	280	LYS
1	B	281	TRP
1	B	282	THR
1	B	307	LEU
1	B	322	GLU
1	B	349	ARG
1	B	351	VAL
1	B	357	VAL
1	B	387	SER
1	B	388	GLU
1	C	105	THR
1	C	121	TYR
1	C	138	LEU
1	C	140	VAL
1	C	182	LEU
1	C	207	ARG
1	C	235	VAL
1	C	239	GLN
1	C	260	ASP
1	C	265	THR
1	C	276	LEU
1	C	277	THR
1	C	292	ARG
1	C	296	LEU
1	C	330	GLN
1	C	339	GLN
1	C	347	ASP
1	C	353	LYS
1	C	364	VAL
1	C	382	LEU
2	A	13	ARG
2	A	15	LEU
2	A	23	LEU
2	A	25	ILE
2	A	42	LEU
2	A	53	TYR
2	A	105	TRP
2	A	144	LEU
2	A	145	VAL
2	A	157	ARG
2	A	203	LEU

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Mol	Chain	Res	Type
2	A	210	LEU
2	A	211	ASP
2	A	215	GLN
2	A	222	ILE
2	A	236	TYR
2	A	237	LEU
2	A	260	ARG
2	A	288	VAL
2	A	293	SER
2	A	298	ARG
2	A	322	VAL
2	A	342	LEU
2	A	351	VAL
2	A	358	TRP
2	A	364	LEU
2	A	374	LEU
2	A	390	ILE
2	A	400	VAL
2	A	412	GLU
2	A	415	HIS
2	A	417	ARG
2	A	419	GLU
2	A	434	THR
2	A	453	SER
2	A	455	LEU
2	A	457	ILE
2	A	492	LEU
2	A	521	LEU
2	A	531	LYS
2	A	534	HIS
2	A	554	LEU
2	A	569	ASP
2	A	573	MET
2	A	592	THR
2	A	602	VAL
2	A	621	LEU
2	A	624	VAL
2	A	634	GLU
2	A	637	ARG
2	A	642	MET
2	A	660	ASN
2	A	667	ARG

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Mol	Chain	Res	Type
2	A	688	THR
2	A	693	ILE
2	A	722	ARG
2	A	729	ASN
2	A	749	SER
2	A	759	THR
2	A	765	ARG
2	A	769	ASN
2	A	770	LEU
2	A	781	GLN
2	A	789	LEU
2	A	815	THR
2	A	837	VAL
2	A	865	LEU
2	A	879	THR
2	A	882	ILE
2	A	940	PHE
2	A	945	LEU
2	A	969	LEU
2	A	984	LYS
2	A	991	ILE
2	A	1020	MET
2	A	1035	TYR
2	A	1039	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (34) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	113	ASN
1	B	117	ASN
1	B	125	GLN
1	B	177	GLN
1	B	302	ASN
1	B	330	GLN
1	B	359	GLN
1	B	390	ASN
1	C	88	GLN
1	C	177	GLN
1	C	233	ASN
1	C	263	GLN
1	C	302	ASN
2	A	116	GLN

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Mol	Chain	Res	Type
2	A	118	GLN
2	A	151	HIS
2	A	215	GLN
2	A	238	GLN
2	A	279	ASN
2	A	329	GLN
2	A	359	HIS
2	A	423	HIS
2	A	470	GLN
2	A	534	HIS
2	A	629	GLN
2	A	633	GLN
2	A	635	GLN
2	A	651	ASN
2	A	660	ASN
2	A	729	ASN
2	A	744	GLN
2	A	769	ASN
2	A	795	GLN
2	A	838	HIS

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	B	322/413 (77%)	0.04	0 100 100	36, 86, 147, 228	0
1	C	324/413 (78%)	0.11	0 100 100	35, 88, 138, 216	0
2	A	1031/1054 (97%)	0.27	21 (2%) 65 56	30, 110, 226, 401	0
All	All	1677/1880 (89%)	0.20	21 (1%) 77 68	30, 99, 210, 401	0

All (21) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	A	446	VAL	6.9
2	A	445	GLU	5.1
2	A	954	ALA	4.4
2	A	429	THR	3.9
2	A	450	LEU	3.6
2	A	890	ALA	3.6
2	A	3	GLU	2.8
2	A	449	ALA	2.6
2	A	416	LYS	2.6
2	A	428	ALA	2.5
2	A	413	ASN	2.4
2	A	523	ARG	2.4
2	A	400	VAL	2.2
2	A	896	GLU	2.2
2	A	345	GLU	2.2
2	A	873	LYS	2.2
2	A	412	GLU	2.2
2	A	1002	THR	2.1
2	A	846	GLU	2.0
2	A	950	HIS	2.0
2	A	955	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 monosaccharides 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.