



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 06:14 AM GMT

PDB ID : 2WDP  
Title : CRYSTAL STRUCTURE OF LIGAND FREE HUMAN CASPASE-6  
Authors : Baumgartner, R.; Briand, C.; Meder, G.; Morse, R.; Renatus, M.  
Deposited on : 2009-03-25  
Resolution : 1.95 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](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

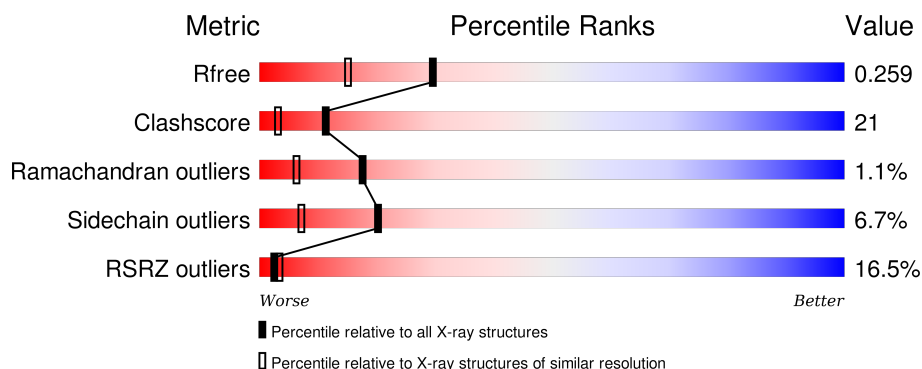
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.95 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	91344	1833 (1.96-1.96)
Clashscore	102246	1953 (1.96-1.96)
Ramachandran outliers	100387	1936 (1.96-1.96)
Sidechain outliers	100360	1936 (1.96-1.96)
RSRZ outliers	91569	1835 (1.96-1.96)

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

Mol	Chain	Length	Quality of chain
1	A	293	<div> <div>9%</div> <div>56%</div> <div>13%</div> <div>6%</div> <div>•</div> <div>24%</div> </div>
1	B	293	<div> <div>12%</div> <div>57%</div> <div>16%</div> <div>•</div> <div>23%</div> </div>
1	C	293	<div> <div>15%</div> <div>59%</div> <div>14%</div> <div>• •</div> <div>23%</div> </div>
1	D	293	<div> <div>15%</div> <div>54%</div> <div>17%</div> <div>• •</div> <div>22%</div> </div>

## 2 Entry composition [i](#)

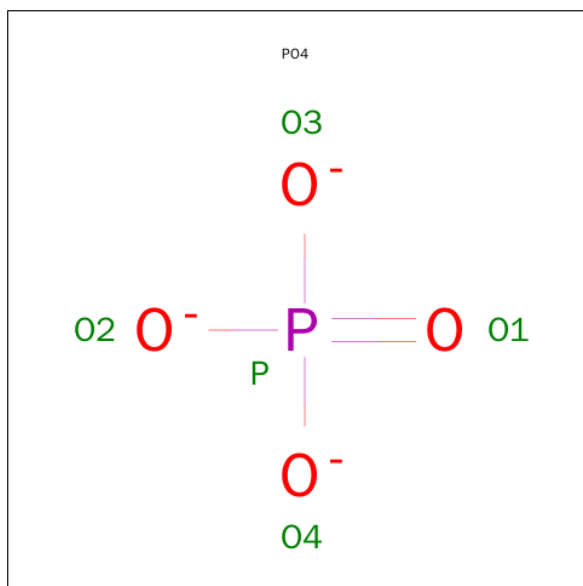
There are 3 unique types of molecules in this entry. The entry contains 7539 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 CASPASE-6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	224	Total	C	N	O	S	0	0	0
			1806	1155	317	321	13			
1	B	227	Total	C	N	O	S	0	0	0
			1833	1172	320	328	13			
1	C	227	Total	C	N	O	S	0	0	0
			1833	1170	321	328	14			
1	D	230	Total	C	N	O	S	0	0	0
			1855	1185	324	332	14			

- Molecule 2 is PHOSPHATE ION (three-letter code: PO4) (formula: O<sub>4</sub>P).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	D	1	Total	O	P	0	0
			5	4	1		

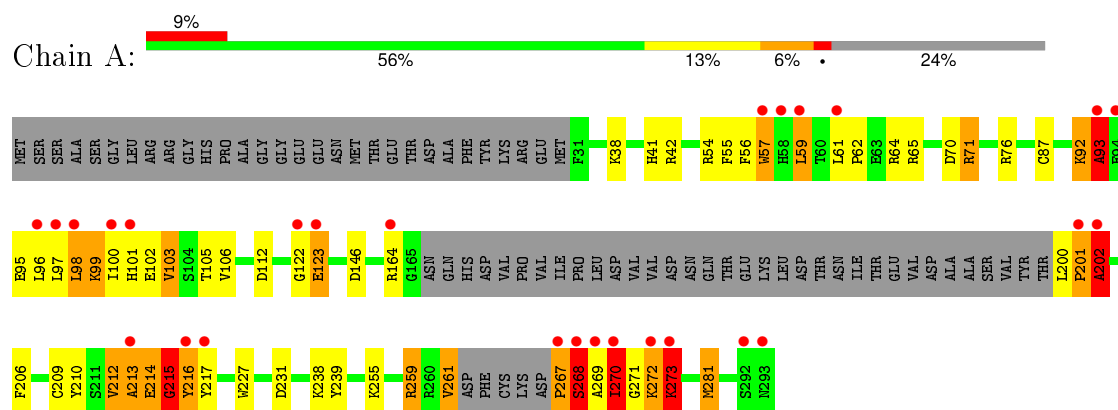
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	58	Total 58	O 58	0	0
3	B	45	Total 45	O 45	0	0
3	C	47	Total 47	O 47	0	0
3	D	57	Total 57	O 57	0	0

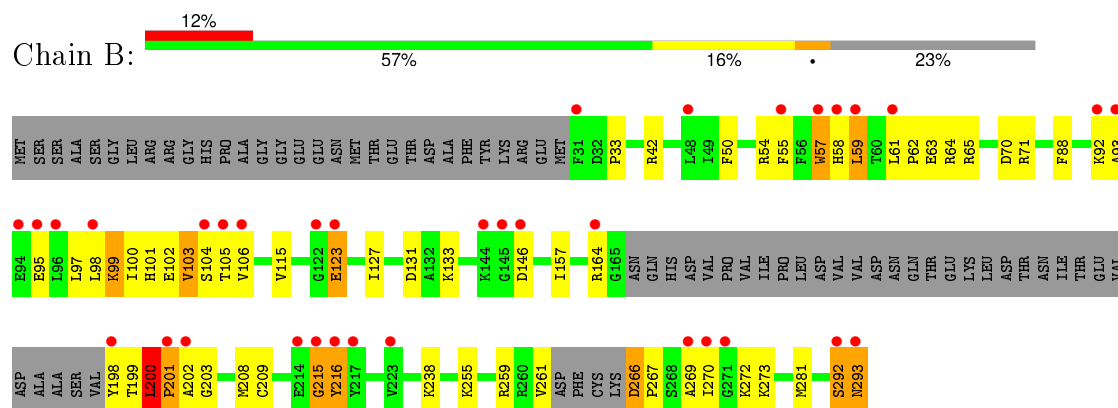
### 3 Residue-property plots [i](#)

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

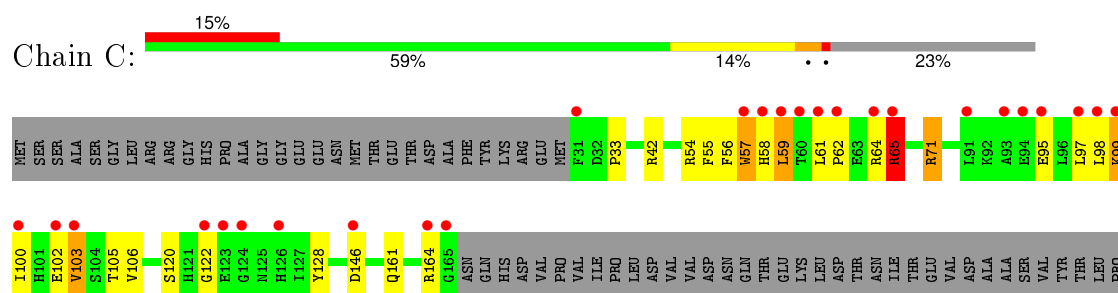
#### • Molecule 1: CASPASE-6

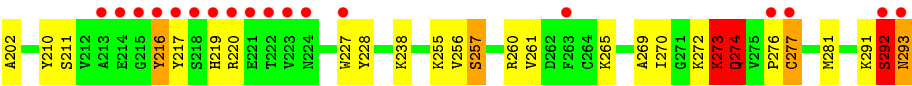


#### • Molecule 1: CASPASE-6

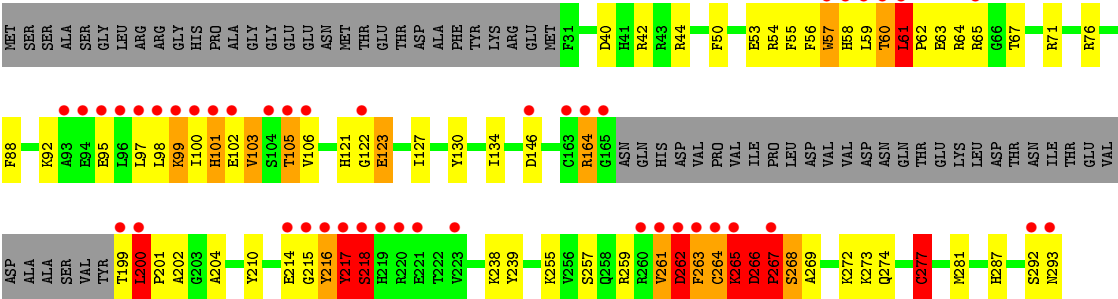


#### • Molecule 1: CASPASE-6





● Molecule 1: CASPASE-6



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	63.15Å 90.44Å 86.40Å 90.00° 92.77° 90.00°	Depositor
Resolution (Å)	63.07 – 1.95 63.07 – 1.95	Depositor EDS
% Data completeness (in resolution range)	97.7 (63.07-1.95) 97.7 (63.07-1.95)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.02 (at 1.95Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, $R_{free}$	0.224 , 0.262 0.226 , 0.259	Depositor DCC
$R_{free}$ test set	3457 reflections (5.00%)	DCC
Wilson B-factor (Å <sup>2</sup> )	25.6	Xtriage
Anisotropy	0.034	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 44.1	EDS
Estimated twinning fraction	0.098 for h,-k,-l	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.43$ , $\langle L^2 \rangle = 0.25$	Xtriage
Outliers	0 of 69153 reflections	Xtriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	7539	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.15% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

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

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PO4

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	0.83	0/1848	1.68	45/2481 (1.8%)
1	B	0.81	0/1876	1.20	22/2521 (0.9%)
1	C	0.80	0/1876	1.20	17/2519 (0.7%)
1	D	0.85	1/1899 (0.1%)	1.59	36/2552 (1.4%)
All	All	0.82	1/7499 (0.0%)	1.43	120/10073 (1.2%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	1	8
1	B	0	1
1	C	1	2
1	D	1	6
All	All	3	17

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	277	CYS	CB-SG	-10.51	1.64	1.82

All (120) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	265	LYS	N-CA-CB	-22.82	69.52	110.60
1	A	213	ALA	N-CA-C	20.58	166.56	111.00
1	C	65	ARG	NE-CZ-NH1	-19.44	110.58	120.30
1	D	262	ASP	CB-CA-C	-19.13	72.14	110.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	42	ARG	NE-CZ-NH1	-18.68	110.96	120.30
1	D	268	SER	N-CA-CB	-18.58	82.63	110.50
1	A	42	ARG	NE-CZ-NH2	18.18	129.39	120.30
1	C	65	ARG	NE-CZ-NH2	17.85	129.22	120.30
1	B	93	ALA	CB-CA-C	-17.74	83.49	110.10
1	A	213	ALA	CB-CA-C	-17.37	84.05	110.10
1	D	164	ARG	NE-CZ-NH1	-17.18	111.71	120.30
1	D	218	SER	C-N-CA	16.79	163.68	121.70
1	D	164	ARG	NE-CZ-NH2	16.77	128.69	120.30
1	A	268	SER	N-CA-C	16.45	155.41	111.00
1	A	213	ALA	C-N-CA	15.03	159.28	121.70
1	D	262	ASP	N-CA-C	14.70	150.69	111.00
1	A	214	GLU	N-CA-C	14.42	149.94	111.00
1	A	273	LYS	CB-CA-C	13.68	137.77	110.40
1	A	272	LYS	N-CA-C	13.64	147.84	111.00
1	A	259	ARG	NE-CZ-NH2	-13.47	113.56	120.30
1	A	268	SER	CB-CA-C	-13.38	84.68	110.10
1	A	57	TRP	CB-CA-C	13.33	137.05	110.40
1	D	71	ARG	NE-CZ-NH2	-13.21	113.70	120.30
1	D	71	ARG	NE-CZ-NH1	13.20	126.90	120.30
1	C	57	TRP	N-CA-C	-13.09	75.65	111.00
1	A	71	ARG	NE-CZ-NH1	-12.62	113.99	120.30
1	B	71	ARG	NE-CZ-NH2	-12.48	114.06	120.30
1	A	71	ARG	NE-CZ-NH2	12.43	126.52	120.30
1	B	71	ARG	NE-CZ-NH1	12.36	126.48	120.30
1	A	214	GLU	CB-CA-C	-12.27	85.86	110.40
1	A	259	ARG	NE-CZ-NH1	11.94	126.27	120.30
1	D	266	ASP	C-N-CD	-11.92	94.38	120.60
1	B	292	SER	N-CA-C	11.89	143.10	111.00
1	D	259	ARG	NE-CZ-NH1	-11.57	114.52	120.30
1	D	123	GLU	N-CA-C	11.38	141.73	111.00
1	B	57	TRP	CB-CA-C	-11.19	88.02	110.40
1	D	259	ARG	NE-CZ-NH2	11.18	125.89	120.30
1	C	71	ARG	NE-CZ-NH2	11.01	125.80	120.30
1	B	259	ARG	NE-CZ-NH1	-10.67	114.97	120.30
1	C	71	ARG	NE-CZ-NH1	-10.53	115.03	120.30
1	D	92	LYS	CB-CA-C	10.52	131.45	110.40
1	D	215	GLY	N-CA-C	10.33	138.92	113.10
1	B	259	ARG	NE-CZ-NH2	10.18	125.39	120.30
1	D	265	LYS	CB-CA-C	-10.13	90.14	110.40
1	C	56	PHE	CB-CA-C	-10.07	90.26	110.40
1	B	292	SER	CB-CA-C	-10.01	91.07	110.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	57	TRP	CB-CA-C	9.75	129.91	110.40
1	A	202	ALA	CB-CA-C	-9.73	95.50	110.10
1	A	268	SER	C-N-CA	9.66	145.85	121.70
1	A	214	GLU	C-N-CA	9.61	142.47	122.30
1	A	122	GLY	N-CA-C	9.28	136.30	113.10
1	C	65	ARG	CD-NE-CZ	9.28	136.59	123.60
1	A	42	ARG	CD-NE-CZ	9.27	136.57	123.60
1	D	92	LYS	N-CA-C	-9.11	86.40	111.00
1	D	266	ASP	N-CA-C	8.98	135.26	111.00
1	A	202	ALA	C-N-CA	8.64	140.44	122.30
1	A	269	ALA	N-CA-C	8.29	133.39	111.00
1	C	273	LYS	C-N-CA	8.15	142.07	121.70
1	A	65	ARG	NE-CZ-NH2	-8.07	116.27	120.30
1	D	262	ASP	C-N-CA	8.06	141.85	121.70
1	A	212	VAL	CB-CA-C	7.92	126.45	111.40
1	D	164	ARG	CD-NE-CZ	7.89	134.65	123.60
1	A	267	PRO	N-CA-C	-7.80	91.82	112.10
1	D	264	CYS	N-CA-C	7.74	131.89	111.00
1	B	200	LEU	C-N-CD	-7.72	103.61	120.60
1	A	215	GLY	N-CA-C	7.65	132.22	113.10
1	D	61	LEU	N-CA-C	7.61	131.54	111.00
1	D	65	ARG	NE-CZ-NH2	-7.53	116.54	120.30
1	D	61	LEU	CB-CA-C	-7.52	95.91	110.20
1	D	123	GLU	C-N-CA	7.41	137.85	122.30
1	D	218	SER	N-CA-C	7.39	130.94	111.00
1	C	274	GLN	N-CA-C	-7.36	91.14	111.00
1	B	65	ARG	NE-CZ-NH2	-7.24	116.68	120.30
1	A	273	LYS	C-N-CA	7.23	139.78	121.70
1	B	92	LYS	CB-CA-C	7.05	124.50	110.40
1	B	92	LYS	N-CA-C	-7.04	92.00	111.00
1	A	267	PRO	CB-CA-C	7.00	129.50	112.00
1	A	259	ARG	CD-NE-CZ	6.63	132.88	123.60
1	C	71	ARG	CD-NE-CZ	6.57	132.80	123.60
1	B	42	ARG	NE-CZ-NH2	-6.50	117.05	120.30
1	B	216	TYR	N-CA-C	6.48	128.50	111.00
1	A	216	TYR	N-CA-C	6.38	128.22	111.00
1	D	200	LEU	N-CA-CB	-6.27	97.87	110.40
1	D	65	ARG	NE-CZ-NH1	6.26	123.43	120.30
1	B	70	ASP	CB-CG-OD1	6.25	123.92	118.30
1	B	71	ARG	CD-NE-CZ	6.24	132.34	123.60
1	B	216	TYR	CA-C-N	-6.23	103.49	117.20
1	C	273	LYS	N-CA-C	6.23	127.81	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	98	LEU	CB-CG-CD2	-6.15	100.55	111.00
1	D	71	ARG	CD-NE-CZ	6.13	132.18	123.60
1	A	65	ARG	NE-CZ-NH1	6.10	123.35	120.30
1	A	271	GLY	N-CA-C	5.93	127.93	113.10
1	A	71	ARG	CD-NE-CZ	5.93	131.90	123.60
1	B	42	ARG	NE-CZ-NH1	5.85	123.22	120.30
1	D	265	LYS	N-CA-C	5.80	126.65	111.00
1	C	42	ARG	NE-CZ-NH2	-5.79	117.41	120.30
1	A	281	MET	CA-CB-CG	-5.78	103.48	113.30
1	C	164	ARG	NE-CZ-NH1	5.78	123.19	120.30
1	C	273	LYS	CA-C-N	-5.77	104.51	117.20
1	A	272	LYS	N-CA-CB	-5.75	100.24	110.60
1	B	65	ARG	NE-CZ-NH1	5.74	123.17	120.30
1	A	70	ASP	CB-CG-OD1	5.70	123.43	118.30
1	D	42	ARG	NE-CZ-NH2	-5.68	117.46	120.30
1	A	270	ILE	CB-CA-C	-5.67	100.26	111.60
1	D	217	TYR	N-CA-CB	-5.63	100.47	110.60
1	D	122	GLY	O-C-N	5.59	131.64	122.70
1	C	164	ARG	NE-CZ-NH2	-5.59	117.51	120.30
1	B	164	ARG	NE-CZ-NH2	-5.58	117.51	120.30
1	D	259	ARG	CD-NE-CZ	5.54	131.36	123.60
1	A	201	PRO	N-CA-C	-5.50	97.79	112.10
1	A	164	ARG	NE-CZ-NH2	-5.48	117.56	120.30
1	A	57	TRP	C-N-CA	5.45	135.32	121.70
1	B	164	ARG	NE-CZ-NH1	5.36	122.98	120.30
1	C	292	SER	N-CA-C	5.28	125.25	111.00
1	D	44	ARG	NE-CZ-NH1	5.25	122.92	120.30
1	A	93	ALA	CB-CA-C	5.23	117.94	110.10
1	D	42	ARG	NE-CZ-NH1	5.19	122.89	120.30
1	A	272	LYS	CB-CA-C	-5.16	100.07	110.40
1	A	57	TRP	N-CA-C	-5.03	97.41	111.00
1	B	259	ARG	CD-NE-CZ	5.03	130.64	123.60

All (3) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	A	213	ALA	CA
1	C	273	LYS	CA
1	D	218	SER	CA

All (17) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	202	ALA	Peptide
1	A	213	ALA	Peptide
1	A	214	GLU	Peptide
1	A	215	GLY	Peptide
1	A	268	SER	Peptide
1	A	273	LYS	Peptide
1	A	92	LYS	Peptide
1	A	93	ALA	Peptide
1	B	215	GLY	Peptide
1	C	216	TYR	Peptide
1	C	292	SER	Peptide
1	D	217	TYR	Peptide
1	D	218	SER	Peptide
1	D	262	ASP	Peptide
1	D	265	LYS	Peptide
1	D	266	ASP	Peptide
1	D	267	PRO	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	1806	0	1786	65	3
1	B	1833	0	1807	81	4
1	C	1833	0	1804	66	4
1	D	1855	0	1829	102	4
2	D	5	0	0	0	0
3	A	58	0	0	5	0
3	B	45	0	0	3	0
3	C	47	0	0	0	0
3	D	57	0	0	4	0
All	All	7539	0	7226	300	8

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:265:LYS:HE2	1:D:265:LYS:CA	1.49	1.33
1:A:93:ALA:HB1	1:A:96:LEU:N	1.59	1.17
1:D:265:LYS:HA	1:D:265:LYS:HE2	1.16	1.14
1:D:265:LYS:CE	1:D:265:LYS:CA	2.29	1.11
1:A:217:TYR:HD2	1:A:273:LYS:O	1.34	1.10
1:C:277:CYS:HB2	1:D:281:MET:HG3	1.33	1.09
1:C:217:TYR:CD2	1:C:274:GLN:NE2	2.21	1.08
1:D:217:TYR:HA	1:D:218:SER:CB	1.85	1.07
1:B:200:LEU:H	1:B:200:LEU:HD12	1.19	1.07
1:C:227:TRP:CE3	1:C:260:ARG:HG2	1.89	1.07
1:C:277:CYS:HB2	1:D:281:MET:CG	1.82	1.06
1:A:217:TYR:CD2	1:A:273:LYS:O	2.08	1.05
1:D:261:VAL:HG11	1:D:265:LYS:HG2	1.39	1.02
1:C:227:TRP:CZ3	1:C:260:ARG:HA	1.93	1.02
1:B:292:SER:O	1:B:293:ASN:O	1.79	1.01
1:A:93:ALA:HB1	1:A:95:GLU:C	1.80	1.00
1:C:227:TRP:CZ3	1:C:260:ARG:HG2	1.96	1.00
1:B:293:ASN:HD22	1:B:293:ASN:C	1.57	1.00
1:D:216:TYR:HB3	3:D:2031:HOH:O	1.62	0.97
1:A:93:ALA:CB	1:A:96:LEU:N	2.28	0.96
1:D:217:TYR:HA	1:D:218:SER:HB3	1.46	0.94
1:A:268:SER:H	1:A:270:ILE:HD11	1.31	0.94
1:A:93:ALA:O	1:A:96:LEU:HB3	1.69	0.93
1:C:216:TYR:HD1	1:C:217:TYR:HB3	1.32	0.91
1:D:61:LEU:HB3	1:D:62:PRO:HD3	1.50	0.90
1:D:265:LYS:HA	1:D:265:LYS:CE	1.94	0.90
1:B:215:GLY:HA3	1:B:216:TYR:CZ	2.05	0.90
1:D:200:LEU:H	1:D:201:PRO:CD	1.86	0.89
1:A:93:ALA:HB3	1:A:96:LEU:HB2	1.52	0.88
1:D:261:VAL:CG1	1:D:265:LYS:HG2	2.03	0.88
1:D:56:PHE:CE2	1:D:58:HIS:O	2.26	0.88
1:B:293:ASN:OXT	1:B:293:ASN:ND2	2.07	0.87
1:D:262:ASP:HB3	1:D:263:PHE:HD1	1.40	0.87
1:B:215:GLY:HA3	1:B:216:TYR:CE1	2.08	0.87
1:D:61:LEU:CB	1:D:62:PRO:HD3	2.05	0.85
1:B:293:ASN:ND2	1:B:293:ASN:C	2.31	0.84
1:A:56:PHE:CD2	1:A:57:TRP:O	2.32	0.83
1:D:199:THR:N	1:D:210:TYR:HH	1.76	0.82
1:D:56:PHE:HE2	1:D:58:HIS:O	1.62	0.82
1:D:261:VAL:HG11	1:D:265:LYS:CG	2.09	0.82
1:A:95:GLU:HB2	1:A:98:LEU:HD22	1.62	0.82
1:B:202:ALA:HB1	1:B:281:MET:SD	2.19	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:217:TYR:HA	1:D:218:SER:HB2	1.59	0.81
1:A:95:GLU:O	1:A:99:LYS:HG2	1.78	0.81
1:D:261:VAL:O	1:D:262:ASP:HB2	1.81	0.80
1:D:95:GLU:O	1:D:99:LYS:HG2	1.81	0.80
1:C:202:ALA:HB1	1:C:281:MET:SD	2.21	0.80
1:A:200:LEU:N	1:A:201:PRO:HD3	1.97	0.79
1:C:95:GLU:O	1:C:99:LYS:HG2	1.81	0.79
1:A:102:GLU:O	1:A:106:VAL:HG23	1.83	0.78
1:C:216:TYR:HB2	1:C:217:TYR:HB2	1.63	0.78
1:A:93:ALA:C	1:A:96:LEU:H	1.85	0.78
1:B:95:GLU:O	1:B:99:LYS:HG2	1.83	0.78
1:D:200:LEU:H	1:D:201:PRO:HD2	1.49	0.77
1:B:102:GLU:O	1:B:106:VAL:HG23	1.82	0.77
1:D:217:TYR:CA	1:D:218:SER:CB	2.63	0.77
1:C:277:CYS:HB2	1:D:281:MET:HG2	1.65	0.77
1:C:217:TYR:HD2	1:C:274:GLN:NE2	1.81	0.77
1:D:263:PHE:N	1:D:263:PHE:CD1	2.52	0.76
1:D:102:GLU:O	1:D:106:VAL:HG23	1.84	0.76
1:B:215:GLY:HA3	1:B:216:TYR:CE2	2.21	0.75
1:C:102:GLU:O	1:C:106:VAL:HG23	1.85	0.75
1:B:199:THR:O	1:B:201:PRO:HD2	1.86	0.75
1:D:263:PHE:HD1	1:D:263:PHE:N	1.85	0.74
1:A:93:ALA:HB3	1:A:96:LEU:CB	2.17	0.74
1:A:261:VAL:HG11	1:A:270:ILE:O	1.87	0.73
1:D:216:TYR:HD2	1:D:273:LYS:O	1.71	0.73
1:B:215:GLY:HA3	1:B:216:TYR:CD1	2.24	0.73
1:A:95:GLU:CB	1:A:98:LEU:HD22	2.19	0.73
1:B:95:GLU:HB2	1:B:98:LEU:HD22	1.71	0.72
1:C:217:TYR:CD2	1:C:274:GLN:CD	2.62	0.72
1:C:216:TYR:HD1	1:C:217:TYR:CB	2.02	0.72
1:C:217:TYR:HD2	1:C:274:GLN:CD	1.94	0.71
1:C:217:TYR:CE2	1:C:274:GLN:NE2	2.58	0.71
1:D:61:LEU:HB3	1:D:62:PRO:CD	2.10	0.71
1:A:268:SER:H	1:A:270:ILE:CD1	2.03	0.71
1:C:227:TRP:HE3	1:C:260:ARG:HG2	1.52	0.71
1:B:200:LEU:N	1:B:200:LEU:HD12	1.98	0.71
1:D:200:LEU:N	1:D:201:PRO:CD	2.51	0.70
1:D:61:LEU:CB	1:D:62:PRO:CD	2.67	0.70
1:C:273:LYS:HB2	1:D:204:ALA:HB2	1.72	0.69
1:D:199:THR:N	1:D:210:TYR:CZ	2.61	0.69
1:C:55:PHE:O	1:C:128:TYR:HB2	1.92	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:269:ALA:HA	1:C:272:LYS:HD2	1.75	0.68
1:B:98:LEU:O	1:B:102:GLU:HB2	1.93	0.68
1:D:95:GLU:HB2	1:D:98:LEU:HD22	1.77	0.67
1:B:54:ARG:O	1:B:55:PHE:HB2	1.93	0.67
1:A:98:LEU:O	1:A:102:GLU:HB2	1.93	0.67
1:A:93:ALA:CB	1:A:96:LEU:CA	2.72	0.66
1:D:262:ASP:HB3	1:D:263:PHE:CD1	2.26	0.66
1:D:98:LEU:O	1:D:102:GLU:HB2	1.95	0.66
1:D:266:ASP:CG	1:D:266:ASP:O	2.31	0.66
1:B:266:ASP:N	1:B:267:PRO:CD	2.59	0.66
1:B:199:THR:HA	3:B:2017:HOH:O	1.96	0.66
1:C:227:TRP:CH2	1:C:260:ARG:HA	2.31	0.65
1:D:216:TYR:HE2	1:D:273:LYS:H	1.43	0.65
1:B:200:LEU:N	1:B:201:PRO:HD3	2.11	0.65
1:D:101:HIS:O	1:D:105:THR:HG23	1.97	0.65
1:C:216:TYR:CD1	1:C:217:TYR:HB3	2.23	0.65
1:C:95:GLU:HB2	1:C:98:LEU:HD22	1.79	0.65
1:D:266:ASP:O	1:D:266:ASP:OD2	2.14	0.64
1:C:277:CYS:CB	1:D:281:MET:CG	2.70	0.64
1:A:93:ALA:O	1:A:96:LEU:N	2.27	0.64
1:B:199:THR:C	1:B:201:PRO:HD3	2.18	0.64
1:C:98:LEU:O	1:C:102:GLU:HB2	1.97	0.64
1:D:262:ASP:O	1:D:262:ASP:OD1	2.16	0.63
1:B:199:THR:CA	3:B:2017:HOH:O	2.45	0.63
1:B:123:GLU:HG2	1:B:123:GLU:O	1.98	0.63
1:A:272:LYS:O	1:A:273:LYS:HB3	1.98	0.63
1:D:261:VAL:HG11	1:D:265:LYS:CD	2.28	0.63
1:D:101:HIS:O	1:D:105:THR:CG2	2.47	0.63
1:C:61:LEU:HG	1:C:65:ARG:HD2	1.80	0.62
1:D:265:LYS:C	1:D:265:LYS:HE2	2.19	0.62
1:B:266:ASP:N	1:B:267:PRO:HD3	2.15	0.62
1:D:261:VAL:O	1:D:262:ASP:CB	2.49	0.61
1:B:58:HIS:O	1:B:63:GLU:OE1	2.19	0.61
1:D:262:ASP:CG	1:D:262:ASP:O	2.33	0.61
1:D:217:TYR:CA	1:D:218:SER:HB3	2.25	0.61
1:B:292:SER:O	1:B:293:ASN:C	2.37	0.61
1:A:93:ALA:HB3	1:A:96:LEU:CA	2.29	0.61
1:B:215:GLY:HA3	1:B:216:TYR:CD2	2.36	0.61
1:A:93:ALA:C	1:A:95:GLU:N	2.52	0.60
1:B:127:ILE:HD13	1:D:130:TYR:CE2	2.37	0.60
1:D:57:TRP:HE3	1:D:57:TRP:HA	1.67	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:95:GLU:CB	1:B:98:LEU:HD22	2.32	0.59
1:D:287:HIS:HE1	3:D:2053:HOH:O	1.83	0.59
1:A:38:LYS:HE2	3:A:2053:HOH:O	2.02	0.59
1:D:95:GLU:CB	1:D:98:LEU:HD22	2.33	0.59
1:C:216:TYR:HE1	1:C:274:GLN:HA	1.68	0.59
1:C:227:TRP:CZ3	1:C:260:ARG:CA	2.79	0.59
1:D:216:TYR:CD2	1:D:273:LYS:O	2.55	0.58
1:D:57:TRP:HA	1:D:57:TRP:CE3	2.37	0.58
1:D:199:THR:N	1:D:210:TYR:OH	2.37	0.58
1:C:95:GLU:CB	1:C:98:LEU:HD22	2.33	0.58
1:B:55:PHE:CE2	1:B:131:ASP:HB2	2.38	0.58
1:D:202:ALA:HB1	1:D:281:MET:SD	2.42	0.58
1:A:76:ARG:HD3	3:A:2014:HOH:O	2.02	0.58
1:C:273:LYS:HB2	1:D:204:ALA:CB	2.34	0.58
1:C:227:TRP:HZ3	1:C:260:ARG:HG2	1.65	0.57
1:B:199:THR:C	1:B:201:PRO:CD	2.73	0.57
1:B:215:GLY:HA3	1:B:216:TYR:CG	2.40	0.56
1:C:216:TYR:CD1	1:C:217:TYR:CB	2.87	0.56
1:B:201:PRO:HG2	1:B:208:MET:HE2	1.86	0.56
1:C:227:TRP:CZ3	1:C:260:ARG:CG	2.81	0.56
1:D:263:PHE:C	1:D:264:CYS:SG	2.84	0.56
1:B:272:LYS:O	1:B:273:LYS:HD3	2.06	0.55
1:A:209:CYS:HB3	3:A:2039:HOH:O	2.05	0.55
1:B:203:GLY:H	1:B:281:MET:HE1	1.70	0.55
1:B:100:ILE:HG22	1:B:101:HIS:N	2.21	0.55
1:A:210:TYR:HB3	1:A:212:VAL:O	2.06	0.55
1:C:227:TRP:HZ3	1:C:260:ARG:HA	1.63	0.55
1:C:64:ARG:HG2	1:C:64:ARG:HH11	1.72	0.55
1:A:261:VAL:HG22	1:A:267:PRO:HB3	1.89	0.54
1:B:199:THR:O	1:B:201:PRO:CD	2.56	0.54
1:C:33:PRO:HG3	1:D:239:TYR:CZ	2.43	0.54
1:B:200:LEU:N	1:B:201:PRO:CD	2.71	0.54
1:B:99:LYS:O	1:B:103:VAL:HG22	2.08	0.54
1:A:202:ALA:HB1	1:A:206:PHE:CG	2.43	0.54
1:B:261:VAL:C	1:B:267:PRO:HG2	2.27	0.53
1:D:267:PRO:C	1:D:269:ALA:H	2.11	0.53
1:C:211:SER:O	1:C:276:PRO:HG3	2.08	0.53
1:A:200:LEU:N	1:A:201:PRO:CD	2.67	0.53
1:B:127:ILE:HD13	1:D:130:TYR:CD2	2.43	0.53
1:B:202:ALA:HB1	1:B:281:MET:HE1	1.90	0.53
1:C:61:LEU:HG	1:C:65:ARG:CD	2.39	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:267:PRO:O	1:D:269:ALA:N	2.42	0.53
1:D:217:TYR:CD1	1:D:218:SER:N	2.77	0.53
1:C:54:ARG:HG3	1:C:55:PHE:CD2	2.44	0.53
1:C:256:VAL:O	1:C:260:ARG:HG3	2.08	0.52
1:A:231:ASP:OD2	1:A:259:ARG:HD2	2.09	0.52
1:D:53:GLU:CD	1:D:121:HIS:HE2	2.13	0.52
1:A:56:PHE:CE2	1:A:57:TRP:O	2.63	0.52
1:B:202:ALA:HB1	1:B:281:MET:CE	2.39	0.52
1:B:215:GLY:CA	1:B:216:TYR:CD2	2.93	0.52
1:B:203:GLY:H	1:B:281:MET:CE	2.23	0.52
1:B:269:ALA:HB1	1:B:272:LYS:HD2	1.91	0.52
1:A:93:ALA:O	1:A:96:LEU:CB	2.52	0.51
1:A:95:GLU:HA	1:A:98:LEU:HD13	1.91	0.51
1:B:133:LYS:HE3	1:B:198:TYR:HB2	1.92	0.51
1:B:201:PRO:HG2	1:B:208:MET:CE	2.41	0.51
1:A:93:ALA:HB1	1:A:96:LEU:CA	2.35	0.50
1:D:293:ASN:C	1:D:293:ASN:OD1	2.48	0.50
1:D:216:TYR:HE2	1:D:273:LYS:N	2.09	0.50
1:C:277:CYS:CB	1:D:281:MET:HG2	2.35	0.50
1:D:200:LEU:H	1:D:201:PRO:HD3	1.72	0.50
1:C:216:TYR:CE1	1:C:274:GLN:HA	2.47	0.50
1:D:60:THR:OG1	1:D:62:PRO:HD2	2.11	0.50
1:D:200:LEU:N	1:D:201:PRO:HD3	2.26	0.50
1:C:210:TYR:O	1:C:276:PRO:HB3	2.12	0.50
1:D:200:LEU:HB3	1:D:201:PRO:HD3	1.94	0.50
1:C:57:TRP:O	1:C:58:HIS:HB2	2.12	0.50
1:D:217:TYR:CA	1:D:218:SER:HB2	2.34	0.49
1:D:54:ARG:O	1:D:55:PHE:HB2	2.12	0.49
1:C:257:SER:O	1:C:261:VAL:HG23	2.11	0.49
1:A:268:SER:N	1:A:270:ILE:HD11	2.13	0.48
1:B:215:GLY:CA	1:B:216:TYR:CG	2.97	0.48
1:D:58:HIS:O	1:D:63:GLU:OE1	2.31	0.48
1:A:200:LEU:HD22	1:A:210:TYR:OH	2.13	0.48
1:B:200:LEU:CD1	1:B:200:LEU:H	1.94	0.48
1:C:99:LYS:O	1:C:103:VAL:HG22	2.13	0.48
1:B:55:PHE:HE2	1:B:131:ASP:CG	2.16	0.48
1:B:95:GLU:HA	1:B:98:LEU:HD13	1.96	0.47
1:C:292:SER:OG	1:C:293:ASN:C	2.52	0.47
1:D:76:ARG:HD3	3:D:2011:HOH:O	2.14	0.47
1:C:238:LYS:HE3	1:C:238:LYS:HB2	1.57	0.47
1:D:261:VAL:HG13	1:D:262:ASP:H	1.80	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:99:LYS:O	1:A:103:VAL:HG22	2.15	0.47
1:B:215:GLY:CA	1:B:216:TYR:CE2	2.96	0.47
1:B:198:TYR:O	1:B:198:TYR:CD2	2.67	0.47
1:A:227:TRP:HB2	3:A:2052:HOH:O	2.14	0.47
1:B:59:LEU:HD13	1:B:59:LEU:HA	1.75	0.47
1:D:261:VAL:HG11	1:D:265:LYS:HD2	1.96	0.47
1:B:55:PHE:CZ	1:D:127:ILE:HG21	2.50	0.47
1:A:100:ILE:HG22	1:A:101:HIS:N	2.29	0.47
1:A:97:LEU:HA	1:A:100:ILE:HB	1.96	0.46
1:C:216:TYR:CE1	1:C:274:GLN:HG2	2.51	0.46
1:C:95:GLU:HA	1:C:98:LEU:HD13	1.97	0.46
1:B:261:VAL:HB	1:B:267:PRO:CB	2.46	0.46
1:A:123:GLU:HG2	1:A:123:GLU:O	2.14	0.46
1:D:134:ILE:N	1:D:134:ILE:HD13	2.30	0.46
1:B:61:LEU:N	1:B:62:PRO:HD2	2.30	0.46
1:A:272:LYS:O	1:A:273:LYS:HD2	2.15	0.46
1:A:93:ALA:CB	1:A:96:LEU:CB	2.91	0.46
1:B:270:ILE:C	1:B:270:ILE:HD12	2.36	0.46
1:D:257:SER:HA	1:D:274:GLN:O	2.15	0.45
1:B:55:PHE:CE2	1:B:131:ASP:CG	2.89	0.45
1:D:267:PRO:C	1:D:269:ALA:N	2.66	0.45
1:A:95:GLU:CA	1:A:98:LEU:HD22	2.46	0.45
1:A:95:GLU:HA	1:A:98:LEU:HD22	1.99	0.45
1:A:268:SER:N	1:A:270:ILE:CD1	2.75	0.45
1:B:100:ILE:O	1:B:103:VAL:HG23	2.17	0.45
1:D:238:LYS:HB2	1:D:238:LYS:HE3	1.69	0.45
1:D:99:LYS:HB3	1:D:99:LYS:NZ	2.30	0.45
1:D:95:GLU:HA	1:D:98:LEU:HD13	1.98	0.45
1:B:55:PHE:HE2	1:B:131:ASP:HB2	1.81	0.45
1:A:61:LEU:N	1:A:62:PRO:HD2	2.32	0.45
1:B:64:ARG:HH11	1:B:64:ARG:HG2	1.82	0.45
1:D:262:ASP:C	1:D:263:PHE:HD1	2.20	0.45
1:C:61:LEU:N	1:C:62:PRO:HD2	2.32	0.45
1:A:261:VAL:CG1	1:A:270:ILE:O	2.61	0.45
1:B:209:CYS:HB3	3:B:2022:HOH:O	2.17	0.45
1:B:238:LYS:HE3	1:B:238:LYS:HB2	1.62	0.45
1:D:97:LEU:HA	1:D:100:ILE:HB	1.99	0.45
1:B:133:LYS:HE3	1:B:198:TYR:CB	2.47	0.45
1:A:239:TYR:CZ	1:B:33:PRO:HG3	2.52	0.44
1:C:97:LEU:HA	1:C:100:ILE:HB	1.99	0.44
1:D:67:THR:OG1	1:D:121:HIS:CE1	2.70	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:215:GLY:CA	1:B:216:TYR:CD1	2.97	0.44
1:D:199:THR:HG22	1:D:199:THR:O	2.16	0.44
1:B:54:ARG:O	1:B:55:PHE:CB	2.61	0.44
1:C:61:LEU:CD1	1:C:64:ARG:NH2	2.81	0.44
1:C:61:LEU:CG	1:C:65:ARG:HD2	2.46	0.44
1:D:56:PHE:O	1:D:57:TRP:CE3	2.71	0.43
1:B:261:VAL:HG21	1:B:269:ALA:O	2.18	0.43
1:A:216:TYR:N	1:A:216:TYR:CD1	2.85	0.43
1:B:55:PHE:CE2	1:B:131:ASP:CB	3.02	0.43
1:C:217:TYR:CE2	1:C:274:GLN:CD	2.91	0.43
1:B:215:GLY:C	1:B:216:TYR:CG	2.92	0.43
1:A:200:LEU:HD23	1:A:200:LEU:HA	1.71	0.43
1:B:101:HIS:O	1:B:104:SER:HB2	2.18	0.43
1:D:217:TYR:HD1	1:D:218:SER:N	2.17	0.43
1:C:219:HIS:HB2	1:C:227:TRP:CZ3	2.54	0.42
1:A:201:PRO:CD	1:A:201:PRO:O	2.67	0.42
1:A:100:ILE:O	1:A:101:HIS:C	2.57	0.42
1:B:202:ALA:CB	1:B:281:MET:SD	3.02	0.42
1:C:281:MET:HG3	1:D:277:CYS:HB2	2.00	0.42
1:D:95:GLU:HA	1:D:98:LEU:HB2	2.01	0.42
1:A:61:LEU:CD1	1:A:64:ARG:NH2	2.83	0.42
1:C:265:LYS:HB2	1:C:265:LYS:HE2	1.83	0.42
1:D:99:LYS:O	1:D:103:VAL:HG22	2.19	0.42
1:B:97:LEU:HA	1:B:100:ILE:HB	2.01	0.42
1:C:61:LEU:HB3	1:C:62:PRO:HD3	2.02	0.42
1:C:120:SER:H	1:C:161:GLN:HE21	1.67	0.42
1:D:100:ILE:O	1:D:103:VAL:HG23	2.20	0.42
1:A:54:ARG:O	1:A:55:PHE:HB2	2.20	0.42
1:C:291:LYS:HB3	1:C:291:LYS:HE3	1.90	0.42
1:A:64:ARG:HG2	1:A:64:ARG:HH11	1.85	0.41
1:D:64:ARG:HH11	1:D:64:ARG:HG2	1.85	0.41
1:D:50:PHE:HD1	1:D:88:PHE:CE1	2.39	0.41
1:A:99:LYS:HB3	1:A:99:LYS:NZ	2.35	0.41
1:B:61:LEU:CD1	1:B:64:ARG:NH2	2.83	0.41
1:D:214:GLU:O	1:D:214:GLU:HG3	2.21	0.41
1:C:216:TYR:CB	1:C:217:TYR:HB2	2.42	0.41
1:B:55:PHE:HZ	1:D:127:ILE:HG13	1.85	0.41
1:D:268:SER:O	1:D:272:LYS:HE3	2.20	0.41
1:D:40:ASP:OD1	3:D:2005:HOH:O	2.22	0.41
1:C:211:SER:HA	1:C:228:TYR:CD1	2.56	0.41
1:A:61:LEU:HB3	1:A:62:PRO:HD3	2.04	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:199:THR:O	1:D:199:THR:CG2	2.66	0.40
1:C:95:GLU:HA	1:C:98:LEU:HB2	2.02	0.40
1:B:115:VAL:HG22	1:B:157:ILE:HB	2.03	0.40
1:A:95:GLU:HA	1:A:98:LEU:HB2	2.03	0.40
1:A:202:ALA:O	1:A:281:MET:HE1	2.22	0.40
1:C:59:LEU:HA	1:C:59:LEU:HD13	1.74	0.40
1:A:238:LYS:HB2	1:A:238:LYS:HE3	1.70	0.40
1:B:100:ILE:O	1:B:101:HIS:C	2.59	0.40
1:B:266:ASP:OD1	1:B:266:ASP:N	2.54	0.40
1:A:87:CYS:HB3	3:A:2011:HOH:O	2.21	0.40
1:A:41:HIS:HD2	1:A:112:ASP:OD1	2.05	0.40
1:B:50:PHE:HD1	1:B:88:PHE:CE1	2.40	0.40

All (8) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:220:ARG:NE	1:D:61:LEU:CD2[1_655]	1.53	0.67
1:C:220:ARG:CD	1:D:61:LEU:CD2[1_655]	1.76	0.44
1:A:98:LEU:CD2	1:B:101:HIS:CD2[1_655]	1.87	0.33
1:A:101:HIS:CD2	1:B:98:LEU:CD2[1_655]	2.03	0.17
1:C:102:GLU:OE1	1:C:270:ILE:O[2_545]	2.06	0.14
1:B:238:LYS:NZ	1:D:292:SER:OG[1_554]	2.08	0.12
1:A:98:LEU:CD2	1:B:101:HIS:NE2[1_655]	2.18	0.02
1:C:64:ARG:NH1	1:D:264:CYS:CB[1_655]	2.18	0.02

## 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	218/293 (74%)	200 (92%)	15 (7%)	3 (1%)	14 4

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	221/293 (75%)	208 (94%)	12 (5%)	1 (0%)	34	21
1	C	223/293 (76%)	207 (93%)	13 (6%)	3 (1%)	15	4
1	D	226/293 (77%)	204 (90%)	19 (8%)	3 (1%)	15	4
All	All	888/1172 (76%)	819 (92%)	59 (7%)	10 (1%)	17	6

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	201	PRO
1	C	273	LYS
1	D	200	LEU
1	D	267	PRO
1	C	274	GLN
1	D	266	ASP
1	A	59	LEU
1	A	93	ALA
1	C	122	GLY
1	A	215	GLY

### 5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	195/255 (76%)	182 (93%)	13 (7%)	20	7
1	B	198/255 (78%)	187 (94%)	11 (6%)	26	11
1	C	198/255 (78%)	187 (94%)	11 (6%)	26	11
1	D	201/255 (79%)	183 (91%)	18 (9%)	12	3
All	All	792/1020 (78%)	739 (93%)	53 (7%)	20	7

All (53) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	59	LEU

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Mol	Chain	Res	Type
1	A	71	ARG
1	A	92	LYS
1	A	99	LYS
1	A	103	VAL
1	A	105	THR
1	A	123	GLU
1	A	146	ASP
1	A	255	LYS
1	A	261	VAL
1	A	268	SER
1	A	270	ILE
1	A	273	LYS
1	B	57	TRP
1	B	59	LEU
1	B	99	LYS
1	B	103	VAL
1	B	105	THR
1	B	123	GLU
1	B	146	ASP
1	B	200	LEU
1	B	255	LYS
1	B	266	ASP
1	B	293	ASN
1	C	59	LEU
1	C	65	ARG
1	C	71	ARG
1	C	99	LYS
1	C	103	VAL
1	C	105	THR
1	C	146	ASP
1	C	255	LYS
1	C	257	SER
1	C	277	CYS
1	C	293	ASN
1	D	57	TRP
1	D	59	LEU
1	D	60	THR
1	D	61	LEU
1	D	99	LYS
1	D	101	HIS
1	D	103	VAL
1	D	105	THR

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Mol	Chain	Res	Type
1	D	123	GLU
1	D	146	ASP
1	D	164	ARG
1	D	216	TYR
1	D	255	LYS
1	D	261	VAL
1	D	262	ASP
1	D	263	PHE
1	D	265	LYS
1	D	277	CYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	41	HIS
1	A	51	ASN
1	A	161	GLN
1	B	137	GLN
1	B	161	GLN
1	B	293	ASN
1	C	51	ASN
1	C	121	HIS
1	D	161	GLN
1	D	287	HIS

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry

1 ligand is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
2	PO4	D	1294	-	4,4,4	0.41	0	6,6,6	0.27	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PO4	D	1294	-	-	0/0/0/0	0/0/0/0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	224/293 (76%)	0.55	27 (12%) 6 9	11, 32, 93, 118	0
1	B	227/293 (77%)	0.68	35 (15%) 3 4	12, 33, 97, 123	0
1	C	227/293 (77%)	0.86	44 (19%) 1 2	16, 35, 97, 118	0
1	D	230/293 (78%)	0.84	44 (19%) 2 2	16, 32, 99, 119	0
All	All	908/1172 (77%)	0.73	150 (16%) 2 3	11, 34, 99, 123	0

All (150) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	263	PHE	13.2
1	D	97	LEU	10.8
1	B	98	LEU	9.1
1	B	93	ALA	8.7
1	C	217	TYR	8.6
1	C	62	PRO	8.1
1	D	61	LEU	7.8
1	D	262	ASP	7.6
1	D	58	HIS	7.6
1	B	215	GLY	7.6
1	A	216	TYR	7.1
1	D	293	ASN	6.5
1	A	123	GLU	6.4
1	C	219	HIS	6.4
1	C	124	GLY	6.3
1	C	293	ASN	6.2
1	C	58	HIS	6.1
1	C	60	THR	6.1
1	C	216	TYR	5.8
1	D	93	ALA	5.6
1	C	57	TRP	5.3

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Mol	Chain	Res	Type	RSRZ
1	D	220	ARG	5.3
1	A	213	ALA	5.3
1	A	98	LEU	5.3
1	D	214	GLU	5.3
1	A	122	GLY	5.2
1	C	59	LEU	5.2
1	A	93	ALA	5.1
1	C	164	ARG	5.1
1	C	220	ARG	4.9
1	C	65	ARG	4.9
1	D	98	LEU	4.9
1	B	123	GLU	4.9
1	D	218	SER	4.8
1	C	64	ARG	4.8
1	D	60	THR	4.7
1	B	55	PHE	4.7
1	C	31	PHE	4.7
1	D	59	LEU	4.7
1	C	215	GLY	4.7
1	A	268	SER	4.6
1	D	200	LEU	4.4
1	C	224	ASN	4.4
1	B	92	LYS	4.3
1	B	94	GLU	4.3
1	D	216	TYR	4.1
1	D	267	PRO	4.1
1	C	123	GLU	4.1
1	A	96	LEU	4.1
1	D	292	SER	4.1
1	C	165	GLY	4.0
1	B	58	HIS	4.0
1	B	146	ASP	3.9
1	A	59	LEU	3.9
1	D	260	ARG	3.9
1	D	101	HIS	3.8
1	B	214	GLU	3.8
1	A	201	PRO	3.8
1	B	106	VAL	3.7
1	B	95	GLU	3.7
1	C	213	ALA	3.7
1	C	227	TRP	3.7
1	D	223	VAL	3.6

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Mol	Chain	Res	Type	RSRZ
1	A	57	TRP	3.6
1	B	198	TYR	3.6
1	C	97	LEU	3.6
1	A	292	SER	3.6
1	C	94	GLU	3.6
1	D	122	GLY	3.6
1	B	216	TYR	3.5
1	B	271	GLY	3.5
1	D	106	VAL	3.5
1	C	277	CYS	3.5
1	C	218	SER	3.4
1	C	222	THR	3.4
1	B	57	TRP	3.4
1	B	292	SER	3.4
1	D	264	CYS	3.4
1	C	214	GLU	3.4
1	A	164	ARG	3.3
1	D	57	TRP	3.3
1	D	261	VAL	3.3
1	A	217	TYR	3.3
1	C	263	PHE	3.2
1	D	215	GLY	3.2
1	A	270	ILE	3.2
1	B	223	VAL	3.1
1	C	292	SER	3.1
1	C	95	GLU	3.1
1	C	103	VAL	3.1
1	A	58	HIS	3.1
1	D	100	ILE	3.1
1	B	105	THR	3.0
1	C	61	LEU	3.0
1	B	201	PRO	3.0
1	B	144	LYS	3.0
1	C	223	VAL	2.9
1	C	98	LEU	2.9
1	D	102	GLU	2.9
1	D	65	ARG	2.8
1	A	269	ALA	2.8
1	B	145	GLY	2.8
1	A	202	ALA	2.8
1	B	202	ALA	2.8
1	A	94	GLU	2.7

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Mol	Chain	Res	Type	RSRZ
1	C	100	ILE	2.7
1	B	269	ALA	2.7
1	B	61	LEU	2.6
1	A	272	LYS	2.6
1	D	99	LYS	2.6
1	D	199	THR	2.6
1	A	97	LEU	2.6
1	C	146	ASP	2.6
1	A	100	ILE	2.6
1	B	122	GLY	2.6
1	A	273	LYS	2.5
1	D	94	GLU	2.5
1	A	267	PRO	2.5
1	B	164	ARG	2.5
1	A	101	HIS	2.5
1	B	31	PHE	2.5
1	B	293	ASN	2.5
1	D	217	TYR	2.5
1	B	96	LEU	2.5
1	D	164	ARG	2.5
1	C	91	LEU	2.4
1	D	163	CYS	2.4
1	B	59	LEU	2.4
1	D	165	GLY	2.4
1	B	270	ILE	2.4
1	C	276	PRO	2.4
1	D	96	LEU	2.3
1	D	146	ASP	2.3
1	C	99	LYS	2.3
1	D	265	LYS	2.2
1	D	219	HIS	2.2
1	D	105	THR	2.2
1	B	48	LEU	2.2
1	B	104	SER	2.1
1	C	93	ALA	2.1
1	B	217	TYR	2.1
1	C	126	HIS	2.1
1	D	95	GLU	2.1
1	D	221	GLU	2.1
1	C	122	GLY	2.1
1	A	61	LEU	2.1
1	C	221	GLU	2.0

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Mol	Chain	Res	Type	RSRZ
1	C	102	GLU	2.0
1	A	293	ASN	2.0
1	D	104	SER	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	PO4	D	1294	5/5	0.58	0.21	-	123,125,131,136	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.