



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 5, 2026 – 12:00 PM UTC

PDB ID : 3NZ4 / pdb_00003nz4
Title : Crystal Structure of a Taxus Phenylalanine Aminomutase
Authors : Feng, L.; Geiger, J.H.
Deposited on : 2010-07-16
Resolution : 2.38 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
Mogul	:	2022.3.0, CSD as543be (2022)
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

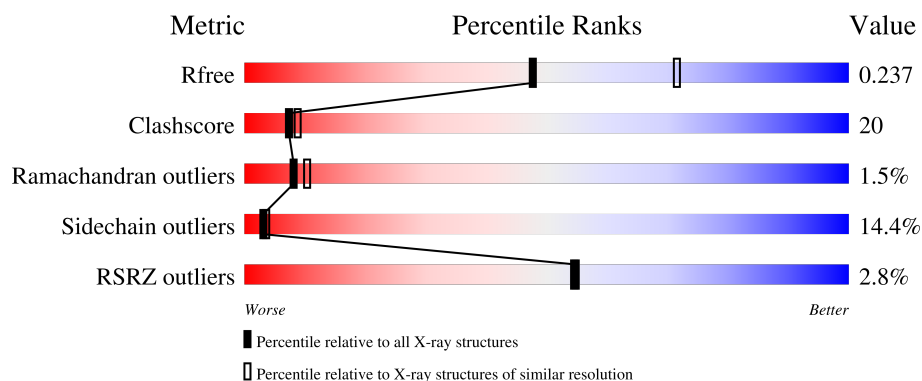
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.38 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	7164 (2.40-2.36)
Clashscore	190562	7722 (2.40-2.36)
Ramachandran outliers	187476	7626 (2.40-2.36)
Sidechain outliers	187428	7627 (2.40-2.36)
RSRZ outliers	180081	7170 (2.40-2.36)

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	696	<div> <div>4%</div> <div> <div></div> <div>58%</div> <div>28%</div> <div>7%</div> <div>6%</div> </div> </div>
1	B	696	<div> <div>2%</div> <div> <div></div> <div>60%</div> <div>27%</div> <div>7%</div> <div>6%</div> </div> </div>

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 10477 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.

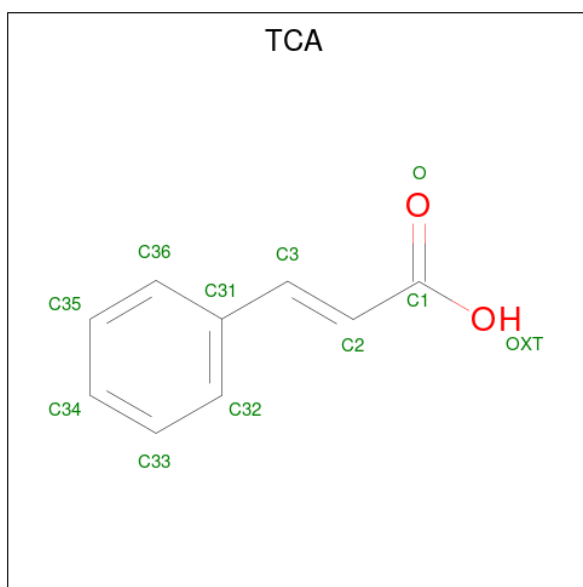
- Molecule 1 is a protein called Phenylalanine ammonia-lyase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	654	Total	C	N	O	S	0	2	0
			5086	3219	882	961	24			
1	B	656	Total	C	N	O	S	0	1	0
			5093	3225	882	962	24			

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	128	VAL	ALA	conflict	UNP Q6GZ04
A	196	ILE	VAL	conflict	UNP Q6GZ04
A	473	ASP	GLU	conflict	UNP Q6GZ04
A	556	LYS	GLU	conflict	UNP Q6GZ04
A	634	ASP	GLU	conflict	UNP Q6GZ04
B	128	VAL	ALA	conflict	UNP Q6GZ04
B	196	ILE	VAL	conflict	UNP Q6GZ04
B	473	ASP	GLU	conflict	UNP Q6GZ04
B	556	LYS	GLU	conflict	UNP Q6GZ04
B	634	ASP	GLU	conflict	UNP Q6GZ04

- Molecule 2 is PHENYLETHYLENECARBOXYLIC ACID (CCD ID: TCA) (formula: C₉H₈O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			11	9	2		
2	B	1	Total	C	O	0	0
			11	9	2		

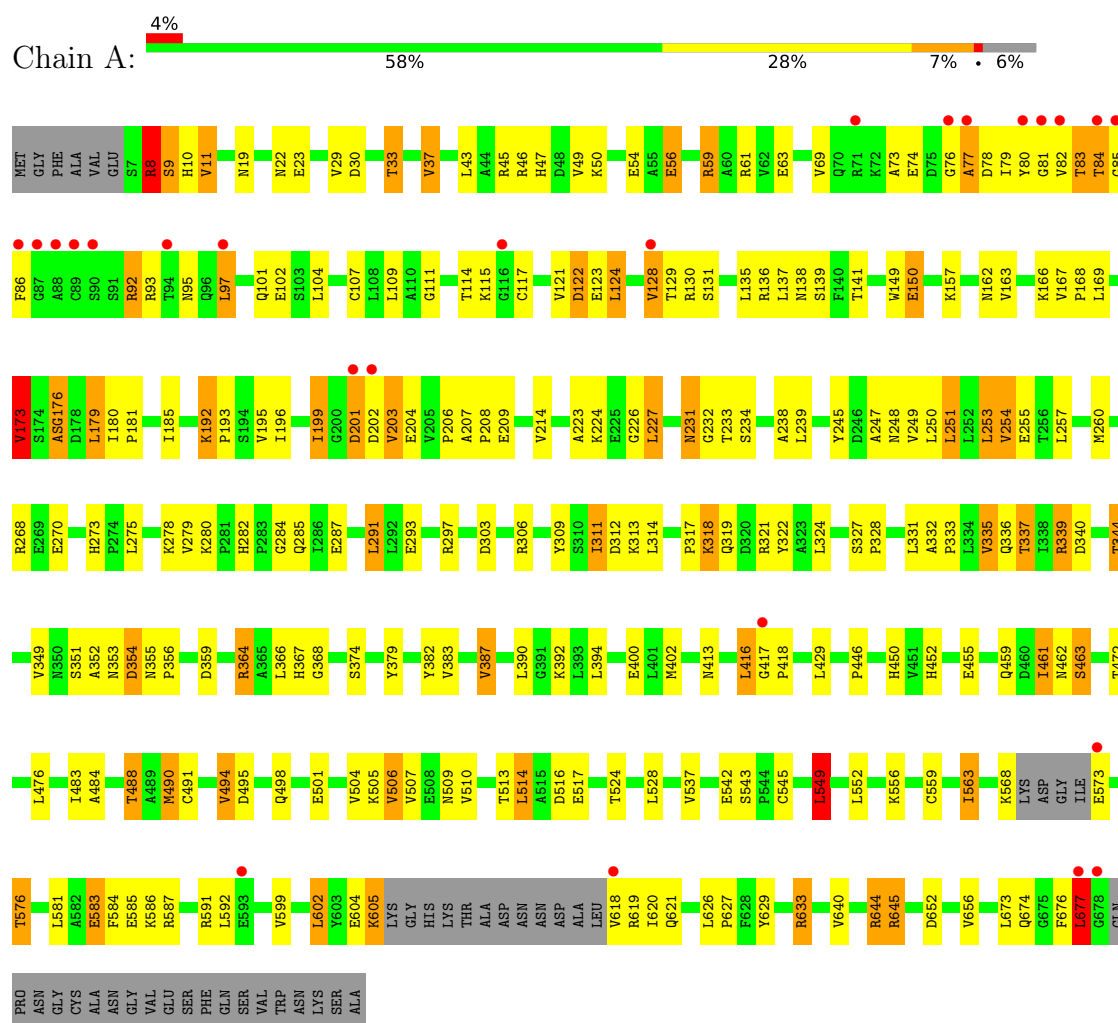
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	155	Total	O	0	0
			155	155		
3	B	121	Total	O	0	0
			121	121		

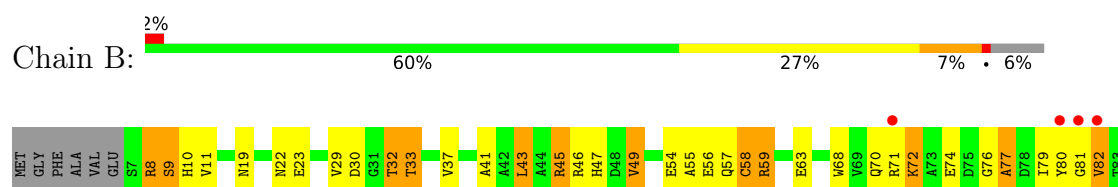
3 Residue-property plots [i](#)

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: Phenylalanine ammonia-lyase



• Molecule 1: Phenylalanine ammonia-lyase



T84	G85	F86	G87	A88	R92	R93	Q96	L97	Q101	E102	S103	L104	C107	L108	L109	T114	K115	G116	C117	A118	S119	S120	V121	D122	F123	L124	P125	V128	T129	R130	S131	L134	L135	R136	L137	N138	T141	W149	E150	S161	N162	V163	S164	P165	K166	V167	V173	S174				
ASG176	V279	K280	G284	E287	K192	V195	I196	A197	Q302	D303	L304	S305	R306	K313	L314	K315	K316	P317	G218	Q319	Y322	A323	L324	R325	S326	S327	L227	P328	N231	A238	L239	A247	N248	V249	L250	L251	L252	L253	V254	E255	T256	L257	N260	R268	E269	E270	H273	P274	L275	K278		
Y379	M380	D381	V382	V383	V387	L291	S299	Q302	D303	L304	S305	R306	K313	L314	K315	K316	P317	G218	Q319	Y322	A323	L324	R325	S326	S327	L227	P328	N231	A238	L239	A247	N248	V249	L250	L251	L252	L253	V254	E255	T256	L257	N260	R268	E269	E270	H273	P274	L275	K278			
K505	V506	V507	V510	V511	S512	T513	L514	A515	D516	E517	C518	G519	L520	P521	N522	D523	T524	K525	K533	V537	Y540	C545	D546	L549	P550	L551	L552	S558	C559	I563	L566	H567	K568	K569	ASP	GLY	I572	E573	T574	R580	K586	R591	L592	E593	V599	R600						
V601	L602	Y603	E604	K605	LYS	GLY	HIS	LYS	THR	ALA	ASP	ASN	ASN	ASP	ALA	LEU	V618	R619	I620	L626	P627	V640	M641	S642	A643	R644	R645	V656	L670	F676	L677	G678	GLN	PRO	ASN	GLY	CYS	ALA	ASN	GLY	VAL	GLU	SER	PHE	GLN	SER	VAL	TRP	ASN	LYS	SER	ALA

4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	181.73Å 76.11Å 120.39Å 90.00° 120.43° 90.00°	Depositor
Resolution (Å)	103.81 – 2.38 103.81 – 2.38	Depositor EDS
% Data completeness (in resolution range)	96.8 (103.81-2.38) 96.8 (103.81-2.38)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.25 (at 2.37Å)	Xtriage
Refinement program	REFMAC 5.5.0102	Depositor
R, R_{free}	0.183 , 0.239 0.183 , 0.237	Depositor DCC
R_{free} test set	5580 reflections (10.10%)	wwPDB-VP
Wilson B-factor (Å ²)	38.7	Xtriage
Anisotropy	0.427	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 41.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	10477	wwPDB-VP
Average B, all atoms (Å ²)	47.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.26% 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

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

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	0.64	0/5160	0.91	7/6999 (0.1%)
1	B	0.60	0/5166	0.89	7/7006 (0.1%)
All	All	0.62	0/10326	0.90	14/14005 (0.1%)

There are no bond length outliers.

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	173	VAL	N-CA-C	-9.86	103.53	113.10
1	B	173	VAL	N-CA-C	-6.04	107.10	112.90
1	A	549	LEU	CA-C-N	5.78	125.46	119.56
1	A	549	LEU	C-N-CA	5.78	125.46	119.56
1	B	82	VAL	N-CA-C	5.76	116.41	110.82
1	B	619	ARG	N-CA-C	5.54	118.08	111.71
1	A	463	SER	N-CA-C	5.50	118.20	111.82
1	A	322	TYR	N-CA-C	5.42	117.19	111.28
1	B	546	ASP	CA-C-N	5.30	125.01	119.82
1	B	546	ASP	C-N-CA	5.30	125.01	119.82
1	A	234	SER	N-CA-C	5.24	117.40	111.11
1	B	192	LYS	CA-C-N	5.08	124.74	119.56
1	B	192	LYS	C-N-CA	5.08	124.74	119.56
1	A	97	LEU	N-CA-C	5.02	116.83	111.36

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5086	0	5138	229	0
1	B	5093	0	5156	217	1
2	A	11	0	7	1	0
2	B	11	0	7	2	0
3	A	155	0	0	7	0
3	B	121	0	0	8	0
All	All	10477	0	10308	420	1

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 20.

All (420) 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:76:GLY:CA	1:A:77:ALA:HB2	1.79	1.13
1:A:76:GLY:HA2	1:A:77:ALA:HB2	1.12	1.10
1:B:572:ILE:HG13	1:B:573:GLU:H	1.03	1.10
1:B:506:VAL:HG11	1:B:599:VAL:HG21	1.26	1.08
1:A:402:MET:HE3	1:A:413:ASN:HA	1.31	1.08
1:A:101:GLN:HE21	1:A:226:GLY:N	1.55	1.04
1:B:114:THR:HG21	1:B:117:CYS:HB2	1.40	1.01
1:B:284:GLY:H	1:B:336:GLN:HE21	1.10	0.96
1:A:76:GLY:HA2	1:A:77:ALA:CB	1.94	0.96
1:B:402:MET:HE3	1:B:413:ASN:HA	1.47	0.94
1:A:402:MET:CE	1:A:413:ASN:HA	1.97	0.93
1:B:605:LYS:HE3	1:B:605:LYS:HA	1.50	0.93
1:A:114:THR:HB	1:A:122:ASP:HB2	1.50	0.93
1:A:355:ASN:HD21	1:A:368:GLY:H	1.15	0.93
1:A:417:GLY:HA3	3:A:745:HOH:O	1.69	0.92
1:A:76:GLY:CA	1:A:77:ALA:CB	2.49	0.91
1:A:82:VAL:HG13	1:A:224:LYS:HB2	1.52	0.90
1:B:572:ILE:HG13	1:B:573:GLU:N	1.83	0.90
1:B:417:GLY:HA3	3:B:742:HOH:O	1.72	0.90
1:A:284:GLY:H	1:A:336:GLN:HE21	1.17	0.89
1:A:101:GLN:NE2	1:A:226:GLY:H	1.70	0.89

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:101:GLN:NE2	1:A:226:GLY:N	2.21	0.87
1:A:101:GLN:HE21	1:A:226:GLY:H	0.92	0.87
1:A:124:LEU:HG	1:A:128:VAL:HG11	1.55	0.86
1:A:201:ASP:O	1:A:203:VAL:HG13	1.76	0.86
1:A:352:ALA:HB3	1:B:279:VAL:CG1	2.06	0.85
1:A:83:THR:O	1:A:83:THR:HG22	1.77	0.84
1:B:71[A]:ARG:O	1:B:72:LYS:CB	2.25	0.84
1:B:71[B]:ARG:O	1:B:72:LYS:HB2	1.78	0.84
1:B:101:GLN:HE21	1:B:226:GLY:H	1.26	0.83
1:A:488:THR:HG22	1:A:656:VAL:HG21	1.61	0.83
1:A:506:VAL:HG11	1:A:599:VAL:HG21	1.60	0.82
1:B:114:THR:CG2	1:B:117:CYS:HB2	2.08	0.82
1:A:166:LYS:HE2	3:A:796:HOH:O	1.78	0.82
1:A:104:LEU:HD11	2:A:699:TCA:H33	1.60	0.81
1:B:572:ILE:O	1:B:573:GLU:HB2	1.79	0.81
1:A:157:LYS:HE3	1:A:214:VAL:O	1.81	0.81
1:B:355:ASN:HD21	1:B:368:GLY:H	1.29	0.80
1:A:93:ARG:NH1	1:B:314:LEU:HA	1.97	0.79
1:B:572:ILE:CG1	1:B:573:GLU:H	1.91	0.78
1:B:131:SER:HB3	1:B:238:ALA:HB1	1.64	0.78
1:A:355:ASN:ND2	1:A:368:GLY:H	1.80	0.78
1:B:55:ALA:O	1:B:59:ARG:HB2	1.84	0.78
1:A:78:ASP:O	1:A:79:ILE:HG13	1.83	0.78
1:A:319:GLN:HE21	1:B:367:HIS:HB3	1.49	0.78
1:A:260:MET:HG2	1:A:490:MET:HG2	1.64	0.77
1:B:677:LEU:HG	1:B:678:GLY:H	1.49	0.77
1:A:114:THR:HG22	1:A:115:LYS:N	1.99	0.77
1:B:56:GLU:HG2	3:B:778:HOH:O	1.84	0.77
1:B:604:GLU:OE2	1:B:644:ARG:HD2	1.83	0.77
1:B:355:ASN:ND2	1:B:368:GLY:H	1.83	0.76
1:A:273:HIS:CD2	1:A:275:LEU:H	2.04	0.76
1:B:506:VAL:CG1	1:B:599:VAL:HG21	2.12	0.76
1:A:114:THR:HG22	1:A:115:LYS:H	1.50	0.76
1:A:382:TYR:OH	1:B:337:THR:HG21	1.86	0.75
1:B:302:GLN:O	1:B:306:ARG:HG3	1.85	0.75
1:A:461:ILE:CD1	1:B:392:LYS:HG3	2.17	0.75
1:A:82:VAL:HG12	1:A:223:ALA:HB1	1.70	0.74
1:B:101:GLN:HE21	1:B:226:GLY:N	1.85	0.74
1:B:165:PRO:HG3	1:B:185:ILE:HD13	1.68	0.74
1:A:166:LYS:HD3	1:A:196:ILE:CG2	2.18	0.74
1:B:498:GLN:NE2	1:B:620:ILE:H	1.85	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:273:HIS:HD2	1:B:275:LEU:H	1.33	0.73
1:B:488:THR:HG22	1:B:656:VAL:HG21	1.71	0.73
1:A:559:CYS:O	1:A:563:ILE:HG23	1.89	0.73
1:B:498:GLN:HE22	1:B:620:ILE:HG22	1.53	0.73
1:B:402:MET:CE	1:B:413:ASN:HA	2.18	0.72
1:B:201:ASP:HB3	1:B:203:VAL:HG13	1.71	0.72
1:A:545:CYS:O	1:A:552:LEU:HD12	1.90	0.72
1:B:315:LYS:O	1:B:315:LYS:HG2	1.88	0.72
1:A:248:ASN:HD21	1:A:339:ARG:HE	1.36	0.72
1:A:352:ALA:HB3	1:B:279:VAL:HG13	1.71	0.72
1:A:273:HIS:HD2	1:A:275:LEU:H	1.36	0.71
1:B:516:ASP:OD2	1:B:525:LYS:NZ	2.22	0.71
1:B:71[A]:ARG:O	1:B:72:LYS:HB3	1.90	0.71
1:A:82:VAL:O	1:A:83:THR:OG1	2.08	0.71
1:B:200:GLY:O	1:B:202:ASP:N	2.21	0.71
1:A:201:ASP:O	1:A:203:VAL:N	2.20	0.70
1:B:567:HIS:O	1:B:568:LYS:HB3	1.90	0.70
1:A:676:PHE:O	1:A:677:LEU:O	2.09	0.69
1:A:82:VAL:CG1	1:A:224:LYS:HB2	2.23	0.69
1:A:232:GLY:HA2	1:A:353:ASN:HD22	1.58	0.69
1:A:484:ALA:O	1:A:488:THR:HG23	1.92	0.69
1:A:83:THR:O	1:A:83:THR:CG2	2.42	0.68
1:A:233:THR:H	1:A:353:ASN:ND2	1.92	0.68
1:A:270:GLU:OE1	1:B:367:HIS:HD2	1.77	0.68
1:A:461:ILE:HD11	1:B:392:LYS:HG3	1.74	0.68
1:A:293:GLU:OE1	1:A:297:ARG:NH1	2.26	0.68
1:A:337:THR:HG21	1:B:382:TYR:OH	1.93	0.67
1:B:173:VAL:HG13	1:B:462:ASN:HB2	1.75	0.67
1:B:80:TYR:H	1:B:367:HIS:HE1	1.43	0.67
1:B:545:CYS:O	1:B:552:LEU:HD12	1.95	0.67
1:B:104:LEU:HD11	2:B:699:TCA:H33	1.77	0.66
1:A:383:VAL:HG23	1:A:472:THR:HG21	1.75	0.66
1:B:101:GLN:NE2	1:B:226:GLY:H	1.93	0.66
1:A:82:VAL:O	1:A:83:THR:CB	2.42	0.66
1:B:273:HIS:CD2	1:B:275:LEU:H	2.13	0.66
1:B:501:GLU:O	1:B:504:VAL:HG12	1.96	0.66
1:A:166:LYS:HD3	1:A:196:ILE:HG23	1.76	0.66
1:A:303:ASP:OD1	1:A:306:ARG:NH1	2.29	0.66
1:B:131:SER:CB	1:B:238:ALA:HB1	2.25	0.66
1:A:253:LEU:HD13	1:A:483:ILE:HG21	1.76	0.66
1:B:284:GLY:H	1:B:336:GLN:NE2	1.90	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:340:ASP:O	1:B:344:THR:HG23	1.96	0.66
1:B:114:THR:HG21	1:B:117:CYS:CB	2.22	0.66
1:A:321:ARG:HG2	1:B:458:ASN:HA	1.77	0.65
1:A:450:HIS:O	1:A:452:HIS:HD2	1.79	0.65
1:B:501:GLU:OE1	1:B:619:ARG:HD2	1.95	0.65
1:B:559:CYS:O	1:B:563:ILE:HG23	1.96	0.65
1:A:260:MET:HB3	1:A:490:MET:HE3	1.77	0.65
1:B:124:LEU:HD12	1:B:125:PRO:HD2	1.79	0.65
1:A:69:VAL:HG13	1:A:82:VAL:HG11	1.77	0.65
1:B:101:GLN:NE2	1:B:226:GLY:N	2.45	0.65
1:B:333:PRO:O	1:B:337:THR:CG2	2.45	0.65
1:A:604:GLU:O	1:A:605:LYS:C	2.39	0.64
1:B:71[B]:ARG:O	1:B:72:LYS:CB	2.46	0.64
1:A:10:HIS:HE1	1:A:255:GLU:OE1	1.79	0.64
1:B:101:GLN:HE22	1:B:227:LEU:H	1.45	0.64
1:A:250:LEU:O	1:A:254:VAL:HG13	1.97	0.64
1:A:73:ALA:HB1	1:A:97:LEU:HD13	1.78	0.64
1:A:232:GLY:CA	1:A:353:ASN:HD22	2.11	0.64
1:B:306:ARG:HH11	1:B:306:ARG:HB3	1.63	0.63
1:B:572:ILE:O	1:B:573:GLU:CB	2.45	0.63
1:A:163:VAL:HG22	1:A:199:ILE:HG23	1.79	0.63
1:B:166:LYS:HB2	1:B:196:ILE:HG23	1.80	0.63
1:B:224:LYS:O	1:B:224:LYS:HG3	1.98	0.63
1:B:76:GLY:O	1:B:77:ALA:O	2.17	0.63
1:B:81:GLY:HA2	1:B:227:LEU:HD12	1.79	0.63
1:B:163:VAL:HG22	1:B:199:ILE:HD13	1.81	0.63
1:A:81:GLY:HA2	1:A:227:LEU:HD12	1.81	0.63
1:A:311:ILE:O	1:A:312:ASP:HB2	1.98	0.63
1:B:253:LEU:HD13	1:B:483:ILE:HG21	1.81	0.62
1:A:510:VAL:O	1:A:514:LEU:HB2	1.99	0.62
1:B:43:LEU:O	1:B:130:ARG:NH2	2.31	0.62
1:B:192:LYS:O	1:B:195:VAL:HG13	1.99	0.62
1:A:111:GLY:HA3	1:A:168:PRO:HG2	1.80	0.61
1:B:202:ASP:O	1:B:204:GLU:HG2	1.99	0.61
1:B:510:VAL:O	1:B:514:LEU:HB2	1.99	0.61
1:A:124:LEU:HD13	1:A:169:LEU:HD12	1.82	0.61
1:A:340:ASP:O	1:A:344:THR:HG23	2.01	0.61
1:A:268:ARG:NH2	1:A:317:PRO:O	2.33	0.60
1:A:367:HIS:HB3	1:B:319:GLN:HE21	1.66	0.60
1:B:71[A]:ARG:O	1:B:72:LYS:HB2	2.01	0.60
1:B:46:ARG:O	1:B:49:VAL:HG13	2.01	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:379:TYR:O	1:B:383:VAL:HG12	2.02	0.60
1:A:260:MET:CG	1:A:490:MET:HG2	2.31	0.60
1:A:501:GLU:OE1	1:A:619:ARG:HD2	2.02	0.60
1:B:10:HIS:HD2	1:B:287:GLU:OE1	1.85	0.60
1:B:268:ARG:NH2	1:B:317:PRO:O	2.29	0.60
1:A:248:ASN:ND2	1:A:339:ARG:HE	2.00	0.59
1:B:43:LEU:HD22	1:B:134:LEU:HD22	1.84	0.59
1:B:165:PRO:CG	1:B:185:ILE:HD13	2.32	0.59
1:A:80:TYR:H	1:A:367:HIS:HE1	1.50	0.59
1:A:461:ILE:HD12	1:B:392:LYS:HG3	1.84	0.59
1:B:333:PRO:O	1:B:337:THR:HG23	2.01	0.59
1:B:450:HIS:O	1:B:452:HIS:HD2	1.86	0.59
1:A:30:ASP:OD1	1:A:33:THR:HG22	2.03	0.58
1:B:79:ILE:HB	1:B:82:VAL:HG22	1.85	0.58
1:A:114:THR:CG2	1:A:115:LYS:H	2.16	0.58
1:B:600:ARG:NH2	3:B:776:HOH:O	2.28	0.58
1:A:284:GLY:H	1:A:336:GLN:NE2	1.94	0.58
1:B:192:LYS:HG3	3:B:757:HOH:O	2.04	0.58
1:B:416:LEU:O	1:B:417:GLY:C	2.47	0.58
1:B:416:LEU:HD13	1:B:417:GLY:N	2.18	0.58
1:A:10:HIS:HD2	1:A:287:GLU:OE1	1.86	0.58
1:A:114:THR:HB	1:A:122:ASP:CB	2.30	0.58
1:A:101:GLN:HE21	1:A:226:GLY:CA	2.17	0.57
1:A:318:LYS:HG3	1:A:318:LYS:O	2.04	0.57
1:A:355:ASN:ND2	1:A:356:PRO:HA	2.19	0.57
1:A:645:ARG:NH1	1:A:652:ASP:OD2	2.37	0.57
1:B:47:HIS:HD2	1:B:162:ASN:OD1	1.86	0.57
1:A:173:VAL:HG13	1:A:462:ASN:HB2	1.84	0.57
1:A:101:GLN:NE2	1:A:226:GLY:CA	2.67	0.57
1:A:556:LYS:HE2	1:A:585:GLU:OE2	2.04	0.57
1:B:19:ASN:HB3	1:B:23:GLU:OE2	2.05	0.57
1:B:201:ASP:C	1:B:203:VAL:H	2.13	0.57
1:A:114:THR:CG2	1:A:115:LYS:N	2.68	0.57
1:A:383:VAL:O	1:A:387:VAL:HG13	2.05	0.56
1:B:484:ALA:O	1:B:488:THR:HG23	2.04	0.56
1:B:416:LEU:C	1:B:416:LEU:HD22	2.29	0.56
1:A:291:LEU:HD21	1:A:673:LEU:HD22	1.86	0.56
1:A:92:ARG:HA	1:A:92:ARG:CZ	2.36	0.56
1:A:273:HIS:HD2	1:A:275:LEU:N	2.04	0.56
1:B:223:ALA:O	1:B:224:LYS:HB3	2.05	0.56
1:B:506:VAL:O	1:B:510:VAL:HG23	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:284:GLY:N	1:B:336:GLN:HE21	1.92	0.56
1:B:495:ASP:CB	1:B:640:VAL:HG13	2.36	0.56
1:A:29:VAL:HG13	1:A:138:ASN:HD22	1.71	0.55
1:A:121:VAL:O	1:A:122:ASP:CG	2.49	0.55
1:A:344:THR:HB	3:B:744:HOH:O	2.05	0.55
1:B:166:LYS:HE3	1:B:196:ILE:HG21	1.88	0.55
1:A:383:VAL:CG2	1:A:472:THR:HG21	2.36	0.55
1:A:59:ARG:HG2	1:A:149:TRP:CD2	2.42	0.55
1:A:364:ARG:HD3	1:A:366:LEU:HD21	1.88	0.55
1:B:278:LYS:HD2	1:B:278:LYS:C	2.32	0.55
1:A:122:ASP:OD2	1:A:122:ASP:C	2.50	0.55
1:A:131:SER:HB3	1:A:238:ALA:HB1	1.88	0.55
1:B:567:HIS:O	1:B:567:HIS:CG	2.59	0.55
1:B:79:ILE:HB	1:B:82:VAL:CG2	2.37	0.54
1:B:114:THR:HG22	1:B:115:LYS:N	2.22	0.54
1:A:86:PHE:CE1	1:A:104:LEU:HB2	2.43	0.54
1:B:540:TYR:CE1	1:B:551:LEU:HD22	2.42	0.54
1:B:498:GLN:HE21	1:B:620:ILE:H	1.54	0.54
1:A:56:GLU:OE2	1:A:56:GLU:HA	2.05	0.54
1:B:248:ASN:HD21	1:B:339:ARG:HE	1.55	0.54
1:A:166:LYS:HD3	1:A:196:ILE:HG21	1.87	0.54
1:A:46:ARG:O	1:A:49:VAL:HG12	2.08	0.54
1:A:677:LEU:C	1:A:677:LEU:HD23	2.32	0.54
1:B:29:VAL:HG12	1:B:141:THR:HG21	1.89	0.54
1:A:101:GLN:HE22	1:A:227:LEU:H	1.56	0.54
1:A:333:PRO:O	1:A:337:THR:CG2	2.55	0.54
1:A:114:THR:HG21	1:A:117:CYS:HB2	1.90	0.54
1:A:128:VAL:HG12	1:A:129:THR:N	2.23	0.54
1:A:573:GLU:OE1	1:A:576:THR:HG21	2.08	0.54
1:B:101:GLN:HE21	1:B:226:GLY:CA	2.21	0.54
1:B:29:VAL:HG13	1:B:138:ASN:HD22	1.73	0.53
1:A:491:CYS:HA	1:A:494:VAL:HG13	1.89	0.53
1:B:383:VAL:O	1:B:387:VAL:HG13	2.07	0.53
1:B:495:ASP:HB3	1:B:640:VAL:HG13	1.89	0.53
1:B:355:ASN:ND2	1:B:356:PRO:HA	2.24	0.53
1:A:400:GLU:OE2	1:B:460:ASP:OD2	2.26	0.53
1:A:80:TYR:HD1	1:A:84:THR:HG21	1.74	0.52
1:A:124:LEU:HG	1:A:128:VAL:CG1	2.32	0.52
1:A:270:GLU:OE1	1:B:367:HIS:CD2	2.61	0.52
1:A:446:PRO:HD3	1:B:446:PRO:HD3	1.91	0.52
1:B:88:ALA:HB2	1:B:458:ASN:HB2	1.90	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:402:MET:HE3	1:A:413:ASN:HD22	1.75	0.52
1:B:30:ASP:OD1	1:B:33:THR:HG23	2.10	0.52
1:B:114:THR:CG2	1:B:115:LYS:N	2.73	0.52
1:B:333:PRO:O	1:B:337:THR:HG22	2.10	0.52
1:A:76:GLY:HA3	1:A:77:ALA:HB2	1.84	0.52
1:A:284:GLY:N	1:A:336:GLN:HE21	1.97	0.52
1:A:353:ASN:O	1:A:354:ASP:HB2	2.09	0.52
1:A:417:GLY:HA2	1:A:644:ARG:HH22	1.74	0.52
1:A:43:LEU:HD12	3:A:845:HOH:O	2.10	0.51
1:A:333:PRO:O	1:A:337:THR:HG22	2.10	0.51
1:B:339:ARG:HG2	3:B:753:HOH:O	2.11	0.51
1:B:71[B]:ARG:NH1	1:B:74:GLU:OE1	2.44	0.51
1:B:82:VAL:HG13	1:B:224:LYS:HB2	1.92	0.51
1:B:513:THR:O	1:B:517:GLU:HG3	2.11	0.51
1:B:537:VAL:HA	1:B:540:TYR:CE2	2.45	0.51
1:B:676:PHE:O	1:B:677:LEU:C	2.54	0.51
1:A:136:ARG:NH1	1:A:231:ASN:O	2.35	0.51
1:A:352:ALA:HB3	1:B:279:VAL:HG11	1.89	0.51
1:A:37:VAL:HG13	1:A:245:TYR:HB2	1.92	0.51
1:B:201:ASP:O	1:B:202:ASP:HB3	2.11	0.51
1:A:335:VAL:O	1:A:339:ARG:HB2	2.11	0.51
1:A:59:ARG:O	1:A:63:GLU:HG3	2.11	0.50
1:B:87:GLY:HA3	1:B:455:GLU:OE2	2.11	0.50
1:B:626:LEU:HB3	1:B:627:PRO:HD3	1.93	0.50
1:B:200:GLY:C	1:B:202:ASP:H	2.15	0.50
1:B:568:LYS:O	1:B:568:LYS:HG2	2.10	0.50
1:A:285:GLN:HB2	1:A:332:ALA:HB2	1.94	0.49
1:A:416:LEU:C	1:A:416:LEU:CD2	2.85	0.49
1:A:150:GLU:CD	1:A:150:GLU:H	2.21	0.49
1:A:629:TYR:O	1:A:633:ARG:HB2	2.12	0.49
1:A:11:VAL:HG11	1:A:676:PHE:HE2	1.77	0.49
1:A:507:VAL:HG22	1:A:592:LEU:HD11	1.95	0.49
1:B:247:ALA:O	1:B:251:LEU:HB2	2.12	0.49
1:B:248:ASN:ND2	1:B:339:ARG:HE	2.10	0.49
1:A:192:LYS:HG3	3:A:738:HOH:O	2.12	0.49
1:A:416:LEU:C	1:A:416:LEU:HD22	2.38	0.49
1:A:93:ARG:HH11	1:B:314:LEU:HD23	1.76	0.49
1:A:166:LYS:HD2	1:A:204:GLU:OE2	2.13	0.49
1:A:314:LEU:HD23	1:B:93:ARG:HH11	1.78	0.48
1:A:327:SER:OG	1:A:328:PRO:HD3	2.13	0.48
1:B:567:HIS:HB2	1:B:574:THR:OG1	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:207:ALA:HB3	1:B:208:PRO:HD3	1.95	0.48
1:B:344:THR:HG22	3:B:711:HOH:O	2.13	0.48
1:B:495:ASP:HB3	1:B:640:VAL:CG1	2.43	0.48
1:A:80:TYR:CD1	1:A:84:THR:HG21	2.48	0.48
1:A:383:VAL:HG23	1:A:472:THR:CG2	2.42	0.48
1:A:128:VAL:CG1	1:A:129:THR:N	2.75	0.48
1:B:642:SER:OG	1:B:644:ARG:HG2	2.13	0.48
1:A:282:HIS:HB3	1:A:336:GLN:HE22	1.78	0.48
1:B:618:VAL:O	1:B:618:VAL:CG2	2.62	0.48
1:A:78:ASP:C	1:A:79:ILE:HG13	2.38	0.48
1:A:354:ASP:HB2	3:A:748:HOH:O	2.13	0.48
1:B:677:LEU:CG	1:B:678:GLY:H	2.20	0.48
1:B:192:LYS:O	1:B:195:VAL:CG1	2.61	0.47
1:B:379:TYR:O	1:B:383:VAL:CG1	2.62	0.47
1:A:374:SER:HA	1:A:463:SER:HB2	1.96	0.47
1:A:450:HIS:O	1:A:452:HIS:CD2	2.65	0.47
1:B:85:GLY:N	1:B:92:ARG:O	2.47	0.47
1:A:80:TYR:CD1	1:A:84:THR:CG2	2.98	0.47
1:B:101:GLN:NE2	1:B:226:GLY:CA	2.77	0.47
1:B:572:ILE:CG1	1:B:573:GLU:N	2.62	0.47
1:B:231:ASN:HD22	1:B:231:ASN:HA	1.53	0.47
1:A:47:HIS:HD2	1:A:162:ASN:OD1	1.97	0.47
1:A:254:VAL:HG21	1:A:390:LEU:HD22	1.97	0.47
1:A:498:GLN:NE2	1:A:620:ILE:H	2.13	0.47
1:B:55:ALA:HB1	1:B:59:ARG:HG3	1.96	0.47
1:B:59:ARG:HG2	1:B:149:TRP:CE2	2.50	0.47
1:B:605:LYS:HA	1:B:605:LYS:CE	2.23	0.47
1:B:41:ALA:O	1:B:45:ARG:HB2	2.15	0.47
1:A:130:ARG:NH2	3:A:845:HOH:O	2.47	0.46
1:A:131:SER:CB	1:A:238:ALA:HB1	2.45	0.46
1:A:223:ALA:O	1:A:224:LYS:HB3	2.15	0.46
1:A:461:ILE:HG22	1:B:322:TYR:HB3	1.97	0.46
1:B:150:GLU:H	1:B:150:GLU:CD	2.23	0.46
1:B:604:GLU:O	1:B:605:LYS:C	2.57	0.46
1:B:192:LYS:HB3	1:B:195:VAL:HG12	1.97	0.46
1:B:450:HIS:O	1:B:452:HIS:CD2	2.68	0.46
1:A:207:ALA:N	1:A:208:PRO:CD	2.79	0.46
1:B:59:ARG:NH1	1:B:63:GLU:OE2	2.48	0.46
1:B:10:HIS:HE1	1:B:255:GLU:OE1	1.99	0.46
1:B:80:TYR:H	1:B:367:HIS:CE1	2.29	0.46
1:A:618:VAL:HG23	1:A:621:GLN:OE1	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:626:LEU:HB3	1:A:627:PRO:HD3	1.96	0.46
1:B:84:THR:HG22	1:B:85:GLY:O	2.15	0.46
1:B:227:LEU:O	1:B:231:ASN:HB2	2.15	0.46
1:A:506:VAL:CG1	1:A:599:VAL:HG21	2.39	0.46
1:B:322:TYR:O	1:B:326:SER:HB3	2.16	0.46
1:A:247:ALA:O	1:A:251:LEU:HB2	2.16	0.45
1:B:306:ARG:HB3	1:B:306:ARG:NH1	2.29	0.45
1:B:586:LYS:HE3	1:B:586:LYS:HB3	1.84	0.45
1:B:677:LEU:HG	1:B:678:GLY:N	2.26	0.45
1:A:93:ARG:HG3	1:B:314:LEU:HD22	1.97	0.45
1:A:93:ARG:HH11	1:B:314:LEU:CD2	2.30	0.45
1:B:10:HIS:CD2	1:B:287:GLU:OE1	2.68	0.45
1:B:260:MET:HB3	1:B:490:MET:HE3	1.98	0.45
1:A:84:THR:HG23	1:A:85:GLY:O	2.17	0.45
1:A:86:PHE:CD1	1:A:104:LEU:HD13	2.52	0.45
1:A:573:GLU:OE1	1:A:576:THR:CG2	2.65	0.45
1:B:68:TRP:O	1:B:71[A]:ARG:O	2.35	0.45
1:B:380:MET:HA	1:B:380:MET:HE2	1.99	0.45
1:B:515:ALA:HA	1:B:520:LEU:HD22	1.99	0.45
1:A:180:ILE:HB	1:A:181:PRO:HD3	1.99	0.44
1:A:417:GLY:O	1:A:418:PRO:C	2.59	0.44
1:B:166:LYS:CE	1:B:196:ILE:HG21	2.47	0.44
1:B:491:CYS:HA	1:B:494:VAL:HG13	1.98	0.44
1:A:495:ASP:CB	1:A:640:VAL:HG12	2.47	0.44
1:B:58:CYS:O	1:B:59:ARG:C	2.60	0.44
1:B:82:VAL:CG1	1:B:224:LYS:HB2	2.47	0.44
1:A:8:ARG:O	1:A:9:SER:HB2	2.18	0.44
1:A:331:LEU:O	1:A:335:VAL:HG13	2.18	0.44
1:A:80:TYR:O	1:A:84:THR:HG22	2.18	0.44
1:A:355:ASN:HD21	1:A:368:GLY:N	1.98	0.44
1:B:327:SER:OG	1:B:328:PRO:HD3	2.18	0.44
1:A:501:GLU:O	1:A:504:VAL:HG12	2.18	0.44
1:A:176:MDO:CB2	1:A:179:LEU:HD21	2.48	0.43
1:A:313:LYS:HG3	1:A:314:LEU:N	2.33	0.43
1:B:250:LEU:O	1:B:254:VAL:HG13	2.17	0.43
1:A:542:GLU:HG3	1:A:543:SER:N	2.32	0.43
1:B:645:ARG:O	1:B:645:ARG:HG3	2.18	0.43
1:A:8:ARG:O	1:A:9:SER:CB	2.65	0.43
1:A:206:PRO:HG2	1:A:209:GLU:OE2	2.18	0.43
1:B:114:THR:HB	1:B:122:ASP:CB	2.48	0.43
1:A:135:LEU:HD22	1:A:349:VAL:HG13	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:233:THR:H	1:A:353:ASN:HD22	1.66	0.43
1:A:618:VAL:HG22	1:A:618:VAL:O	2.17	0.43
1:A:673:LEU:O	1:A:674:GLN:C	2.62	0.43
1:A:280:LYS:HE3	1:B:348:GLU:OE1	2.18	0.43
1:A:516:ASP:O	1:A:517:GLU:C	2.60	0.43
1:A:640:VAL:HG23	1:A:640:VAL:O	2.17	0.43
1:B:117:CYS:HB3	1:B:120:SER:O	2.19	0.43
1:B:518:CYS:O	1:B:580:ARG:HD3	2.19	0.43
1:A:581:LEU:O	1:A:584:PHE:HB3	2.18	0.43
1:B:335:VAL:O	1:B:339:ARG:HB2	2.18	0.43
1:A:79:ILE:HB	1:A:82:VAL:HG23	2.01	0.43
1:A:80:TYR:HB3	1:A:367:HIS:CE1	2.54	0.42
1:A:367:HIS:HD2	1:B:270:GLU:OE1	2.02	0.42
1:A:10:HIS:CD2	1:A:287:GLU:OE1	2.69	0.42
1:A:192:LYS:HA	1:A:193:PRO:HD3	1.89	0.42
1:A:505:LYS:HB3	1:A:505:LYS:HE2	1.61	0.42
1:A:80:TYR:CB	1:A:367:HIS:CE1	3.02	0.42
1:B:417:GLY:HA2	1:B:418:PRO:HD3	1.91	0.42
1:B:670:LEU:N	1:B:670:LEU:HD23	2.35	0.42
1:A:19:ASN:HB3	1:A:23:GLU:OE2	2.20	0.42
1:B:8:ARG:O	1:B:9:SER:CB	2.68	0.42
1:B:68:TRP:CZ2	1:B:72:LYS:HE3	2.55	0.42
1:A:92:ARG:HA	1:A:92:ARG:NE	2.35	0.42
1:B:32:THR:HG21	1:B:57:GLN:OE1	2.19	0.42
1:A:364:ARG:HG2	1:A:364:ARG:HH11	1.84	0.42
1:A:379:TYR:O	1:A:383:VAL:HG13	2.19	0.41
1:A:583:GLU:O	1:A:587:ARG:HG2	2.20	0.41
1:B:114:THR:HB	1:B:122:ASP:HB2	2.02	0.41
1:B:251:LEU:HD11	1:B:335:VAL:HB	2.02	0.41
1:B:507:VAL:O	1:B:511:VAL:HG23	2.19	0.41
1:A:10:HIS:HB2	1:A:339:ARG:HD3	2.00	0.41
1:A:351:SER:HB2	1:B:280:LYS:HA	2.02	0.41
1:B:374:SER:HA	1:B:463:SER:HB2	2.02	0.41
1:A:459:GLN:NE2	3:A:811:HOH:O	2.37	0.41
1:B:201:ASP:O	1:B:202:ASP:CB	2.66	0.41
1:A:29:VAL:HG12	1:A:141:THR:HG21	2.01	0.41
1:A:30:ASP:OD1	1:A:33:THR:CG2	2.67	0.41
1:A:260:MET:HG2	1:A:490:MET:CG	2.42	0.41
1:A:402:MET:CE	1:A:413:ASN:HD22	2.33	0.41
1:A:359:ASP:HB3	1:A:364:ARG:HD2	2.02	0.41
1:A:524:THR:O	1:A:528:LEU:HG	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:173:VAL:HG13	1:B:173:VAL:O	2.20	0.41
1:B:313:LYS:C	1:B:315:LYS:H	2.29	0.41
1:B:173:VAL:CG1	1:B:462:ASN:HB2	2.48	0.41
1:A:333:PRO:O	1:A:337:THR:HG23	2.21	0.41
1:A:416:LEU:O	1:A:417:GLY:C	2.64	0.41
1:A:490:MET:O	1:A:494:VAL:HG12	2.20	0.41
1:A:583:GLU:OE2	1:A:587:ARG:NE	2.48	0.41
1:B:196:ILE:HG13	1:B:197:ALA:N	2.36	0.41
1:A:231:ASN:HD22	1:A:231:ASN:HA	1.54	0.41
1:A:280:LYS:HA	1:B:351:SER:HB2	2.03	0.41
1:A:549:LEU:HD12	1:A:549:LEU:HA	1.80	0.41
1:A:602:LEU:HD22	1:A:602:LEU:HA	1.98	0.41
1:B:427:LYS:N	3:B:714:HOH:O	2.53	0.41
1:B:520:LEU:HA	1:B:521:PRO:HD3	1.90	0.41
1:B:677:LEU:CG	1:B:678:GLY:N	2.83	0.41
1:A:309:TYR:O	1:A:313:LYS:HB3	2.21	0.40
1:B:135:LEU:HD22	1:B:349:VAL:HG13	2.03	0.40
1:B:253:LEU:HD22	1:B:257:LEU:HD22	2.03	0.40
1:A:8:ARG:CG	1:A:9:SER:H	2.34	0.40
1:A:114:THR:CG2	1:A:117:CYS:HB2	2.51	0.40
1:A:251:LEU:HD11	1:A:335:VAL:HB	2.04	0.40
1:A:273:HIS:CD2	1:A:275:LEU:HB3	2.56	0.40
1:B:80:TYR:OH	2:B:699:TCA:C3	2.69	0.40
1:B:220:LYS:HA	1:B:220:LYS:HD3	1.86	0.40
1:B:82:VAL:HG12	1:B:223:ALA:HB1	2.04	0.40
1:B:327:SER:N	1:B:328:PRO:CD	2.85	0.40
1:A:382:TYR:HH	1:B:337:THR:HG21	1.85	0.40
1:A:498:GLN:HE22	1:A:620:ILE:HG22	1.87	0.40
1:B:498:GLN:HE22	1:B:620:ILE:H	1.67	0.40
1:B:567:HIS:O	1:B:568:LYS:CB	2.67	0.40

All (1) 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:B:119:SER:OG	1:B:477:ASP:OD2[2_556]	2.15	0.05

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	647/696 (93%)	616 (95%)	23 (4%)	8 (1%)	10	14
1	B	648/696 (93%)	600 (93%)	37 (6%)	11 (2%)	7	9
All	All	1295/1392 (93%)	1216 (94%)	60 (5%)	19 (2%)	8	10

All (19) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	9	SER
1	A	77	ALA
1	A	83	THR
1	A	677	LEU
1	B	9	SER
1	B	72	LYS
1	B	77	ALA
1	B	201	ASP
1	B	568	LYS
1	B	573	GLU
1	A	201	ASP
1	A	202	ASP
1	B	566	LEU
1	B	677	LEU
1	A	354	ASP
1	B	70	GLN
1	B	8	ARG
1	A	8	ARG
1	B	200	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	556/586 (95%)	475 (85%)	81 (15%)	3	3
1	B	557/586 (95%)	478 (86%)	79 (14%)	3	4
All	All	1113/1172 (95%)	953 (86%)	160 (14%)	3	3

All (160) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	8	ARG
1	A	11	VAL
1	A	22	ASN
1	A	33	THR
1	A	37	VAL
1	A	45	ARG
1	A	50	LYS
1	A	54	GLU
1	A	56	GLU
1	A	59	ARG
1	A	61	ARG
1	A	74	GLU
1	A	84	THR
1	A	92	ARG
1	A	95	ASN
1	A	102	GLU
1	A	107	CYS
1	A	109	LEU
1	A	122	ASP
1	A	123	GLU
1	A	124	LEU
1	A	128	VAL
1	A	137	LEU
1	A	139	SER
1	A	150	GLU
1	A	167	VAL
1	A	173	VAL
1	A	179	LEU
1	A	185	ILE
1	A	192	LYS
1	A	195	VAL
1	A	199	ILE
1	A	203	VAL

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Mol	Chain	Res	Type
1	A	227	LEU
1	A	231	ASN
1	A	239	LEU
1	A	249	VAL
1	A	251	LEU
1	A	253	LEU
1	A	254	VAL
1	A	257	LEU
1	A	278	LYS
1	A	279	VAL
1	A	291	LEU
1	A	311	ILE
1	A	318	LYS
1	A	324	LEU
1	A	335	VAL
1	A	337	THR
1	A	339	ARG
1	A	344	THR
1	A	364	ARG
1	A	387	VAL
1	A	392	LYS
1	A	394	LEU
1	A	416	LEU
1	A	429	LEU
1	A	455	GLU
1	A	461	ILE
1	A	476	LEU
1	A	488	THR
1	A	490	MET
1	A	494	VAL
1	A	506	VAL
1	A	509	ASN
1	A	513	THR
1	A	514	LEU
1	A	537	VAL
1	A	549	LEU
1	A	563	ILE
1	A	568	LYS
1	A	576	THR
1	A	583	GLU
1	A	586	LYS
1	A	591	ARG

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Mol	Chain	Res	Type
1	A	602	LEU
1	A	605	LYS
1	A	633	ARG
1	A	644	ARG
1	A	645	ARG
1	A	677	LEU
1	B	11	VAL
1	B	22	ASN
1	B	32	THR
1	B	33	THR
1	B	37	VAL
1	B	43	LEU
1	B	45	ARG
1	B	49	VAL
1	B	54	GLU
1	B	58	CYS
1	B	59	ARG
1	B	84	THR
1	B	96	GLN
1	B	97	LEU
1	B	102	GLU
1	B	107	CYS
1	B	109	LEU
1	B	124	LEU
1	B	137	LEU
1	B	150	GLU
1	B	161	SER
1	B	167	VAL
1	B	173	VAL
1	B	179	LEU
1	B	192	LYS
1	B	195	VAL
1	B	199	ILE
1	B	201	ASP
1	B	212	SER
1	B	227	LEU
1	B	231	ASN
1	B	239	LEU
1	B	249	VAL
1	B	251	LEU
1	B	253	LEU
1	B	254	VAL

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Mol	Chain	Res	Type
1	B	257	LEU
1	B	268	ARG
1	B	278	LYS
1	B	279	VAL
1	B	291	LEU
1	B	299	SER
1	B	304	LEU
1	B	306	ARG
1	B	324	LEU
1	B	335	VAL
1	B	337	THR
1	B	339	ARG
1	B	344	THR
1	B	353	ASN
1	B	364	ARG
1	B	383	VAL
1	B	387	VAL
1	B	394	LEU
1	B	416	LEU
1	B	429	LEU
1	B	455	GLU
1	B	461	ILE
1	B	476	LEU
1	B	490	MET
1	B	494	VAL
1	B	497	ARG
1	B	505	LYS
1	B	506	VAL
1	B	523	ASP
1	B	533	LYS
1	B	537	VAL
1	B	549	LEU
1	B	558	SER
1	B	566	LEU
1	B	568	LYS
1	B	591	ARG
1	B	602	LEU
1	B	605	LYS
1	B	618	VAL
1	B	640	VAL
1	B	645	ARG
1	B	670	LEU

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Mol	Chain	Res	Type
1	B	677	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (47) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	10	HIS
1	A	19	ASN
1	A	47	HIS
1	A	101	GLN
1	A	138	ASN
1	A	231	ASN
1	A	248	ASN
1	A	273	HIS
1	A	285	GLN
1	A	319	GLN
1	A	336	GLN
1	A	353	ASN
1	A	355	ASN
1	A	362	ASN
1	A	367	HIS
1	A	413	ASN
1	A	452	HIS
1	A	459	GLN
1	A	498	GLN
1	A	594	ASN
1	A	654	GLN
1	B	10	HIS
1	B	19	ASN
1	B	22	ASN
1	B	47	HIS
1	B	96	GLN
1	B	101	GLN
1	B	138	ASN
1	B	231	ASN
1	B	248	ASN
1	B	273	HIS
1	B	285	GLN
1	B	302	GLN
1	B	319	GLN
1	B	336	GLN
1	B	355	ASN
1	B	367	HIS

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Mol	Chain	Res	Type
1	B	450	HIS
1	B	452	HIS
1	B	456	GLN
1	B	459	GLN
1	B	462	ASN
1	B	498	GLN
1	B	557	GLN
1	B	594	ASN
1	B	621	GLN
1	B	654	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
1	MDO	B	176	1	11,13,14	3.95	4 (36%)	15,18,20	4.93	7 (46%)
1	MDO	A	176	1	11,13,14	3.97	4 (36%)	15,18,20	4.90	6 (40%)

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
1	MDO	B	176	1	-	2/4/23/24	0/1/1/1
1	MDO	A	176	1	-	2/4/23/24	0/1/1/1

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	176	MDO	O2-C2	11.75	1.47	1.23
1	B	176	MDO	O2-C2	11.20	1.45	1.23
1	B	176	MDO	C1-N2	4.38	1.38	1.32
1	B	176	MDO	C2-N3	-4.05	1.30	1.40
1	A	176	MDO	C1-N2	3.82	1.37	1.32
1	A	176	MDO	C2-N3	-3.41	1.32	1.40
1	B	176	MDO	CA2-C2	2.28	1.47	1.43
1	A	176	MDO	CA2-C2	2.07	1.47	1.43

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	176	MDO	CA2-C2-N3	11.44	113.11	103.50
1	B	176	MDO	C2-CA2-N2	-10.98	101.08	108.95
1	A	176	MDO	CA2-C2-N3	10.61	112.41	103.50
1	A	176	MDO	C2-CA2-N2	-10.27	101.59	108.95
1	A	176	MDO	O2-C2-CA2	-8.48	125.61	131.02
1	B	176	MDO	O2-C2-CA2	-6.33	126.98	131.02
1	A	176	MDO	C2-N3-C1	-5.71	105.43	108.07
1	B	176	MDO	C2-N3-C1	-5.43	105.56	108.07
1	B	176	MDO	CA2-N2-C1	4.79	109.68	105.39
1	A	176	MDO	CA2-N2-C1	4.53	109.45	105.39
1	B	176	MDO	C3-CA3-N3	-2.91	105.81	112.43
1	A	176	MDO	C3-CA3-N3	-2.68	106.33	112.43
1	B	176	MDO	O2-C2-N3	-2.11	119.91	124.31

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	176	MDO	N2-C1-CA1-CB
1	B	176	MDO	N2-C1-CA1-CB
1	A	176	MDO	C3-CA3-N3-C2
1	B	176	MDO	N3-C1-CA1-CB

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	176	MDO	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

2 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	TCA	A	699	-	11,11,11	0.64	0	13,13,13	2.13	3 (23%)
2	TCA	B	699	-	11,11,11	0.73	0	13,13,13	1.36	2 (15%)

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	TCA	A	699	-	-	2/5/5/5	0/1/1/1
2	TCA	B	699	-	-	2/5/5/5	0/1/1/1

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	699	TCA	C31-C3-C2	-6.37	113.01	126.92
2	B	699	TCA	C31-C3-C2	-3.42	119.45	126.92
2	B	699	TCA	C36-C31-C32	2.34	121.12	117.65
2	A	699	TCA	O-C1-C2	-2.27	114.11	121.06
2	A	699	TCA	C36-C31-C32	2.04	120.68	117.65

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	699	TCA	O-C1-C2-C3
2	A	699	TCA	C2-C3-C31-C32
2	B	699	TCA	OXT-C1-C2-C3
2	A	699	TCA	C2-C3-C31-C36

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	699	TCA	1	0
2	B	699	TCA	2	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2		OWAB(Å ²)	Q<0.9
1	A	653/696 (93%)	-0.03	25 (3%)	44 44	22, 42, 68, 93	4 (0%)
1	B	655/696 (94%)	0.02	12 (1%)	67 66	28, 46, 73, 93	3 (0%)
All	All	1308/1392 (93%)	-0.00	37 (2%)	55 54	22, 44, 73, 93	7 (0%)

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	71[A]	ARG	4.1
1	B	71[A]	ARG	3.9
1	A	82	VAL	3.9
1	A	81	GLY	3.7
1	A	85	GLY	3.7
1	A	86	PHE	3.6
1	B	81	GLY	3.6
1	B	86	PHE	3.5
1	A	90	SER	3.5
1	B	618	VAL	3.4
1	B	82	VAL	3.4
1	A	84	THR	3.3
1	A	80	TYR	3.3
1	A	77	ALA	3.2
1	A	128	VAL	3.2
1	A	88	ALA	3.0
1	A	677	LEU	2.9
1	A	89	CYS	2.8
1	B	677	LEU	2.8
1	B	128	VAL	2.8
1	B	354	ASP	2.7
1	B	572	ILE	2.7
1	B	593	GLU	2.6
1	A	417	GLY	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	76	GLY	2.5
1	A	618	VAL	2.4
1	A	573	GLU	2.4
1	A	94	THR	2.4
1	A	97	LEU	2.3
1	B	196	ILE	2.3
1	A	202	ASP	2.3
1	A	87	GLY	2.2
1	A	593	GLU	2.2
1	A	116	GLY	2.2
1	B	80	TYR	2.1
1	A	678	GLY	2.1
1	A	201	ASP	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
1	MDO	A	176	13/14	0.95	0.07	34,36,37,37	0
1	MDO	B	176	13/14	0.95	0.07	33,35,36,37	0

6.3 Carbohydrates [i](#)

There are no oligosaccharides 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. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	TCA	B	699	11/11	0.88	0.13	60,61,62,62	0
2	TCA	A	699	11/11	0.89	0.11	46,49,49,50	0

6.5 Other polymers [i](#)

There are no such residues in this entry.