



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 19, 2024 – 04:09 PM EST

PDB ID : 9D28
Title : Crystal structure of (+)-sabinene synthase from Thuja plicata
Authors : Gaynes, M.N.; Christianson, D.W.
Deposited on : 2024-08-08
Resolution : 2.32 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) : 1.21
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.003 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

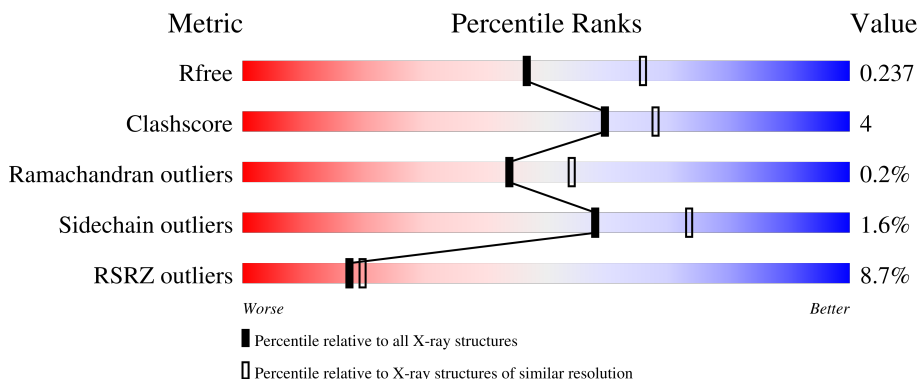
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

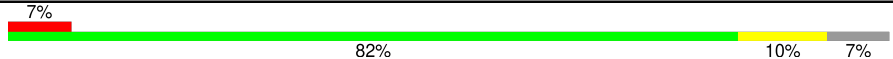



The reported resolution of this entry is 2.32 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	7250 (2.34-2.30)
Clashscore	180529	8063 (2.34-2.30)
Ramachandran outliers	177936	7993 (2.34-2.30)
Sidechain outliers	177891	7993 (2.34-2.30)
RSRZ outliers	164620	7250 (2.34-2.30)

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	554	
1	B	554	
1	C	554	
1	D	554	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 16245 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 Sabinene synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	B	515	3995	2541	674	760	20	0	0	0
1	A	515	3987	2537	671	759	20	0	0	0
1	C	522	4073	2596	686	771	20	0	0	0
1	D	515	3995	2548	671	756	20	0	0	0

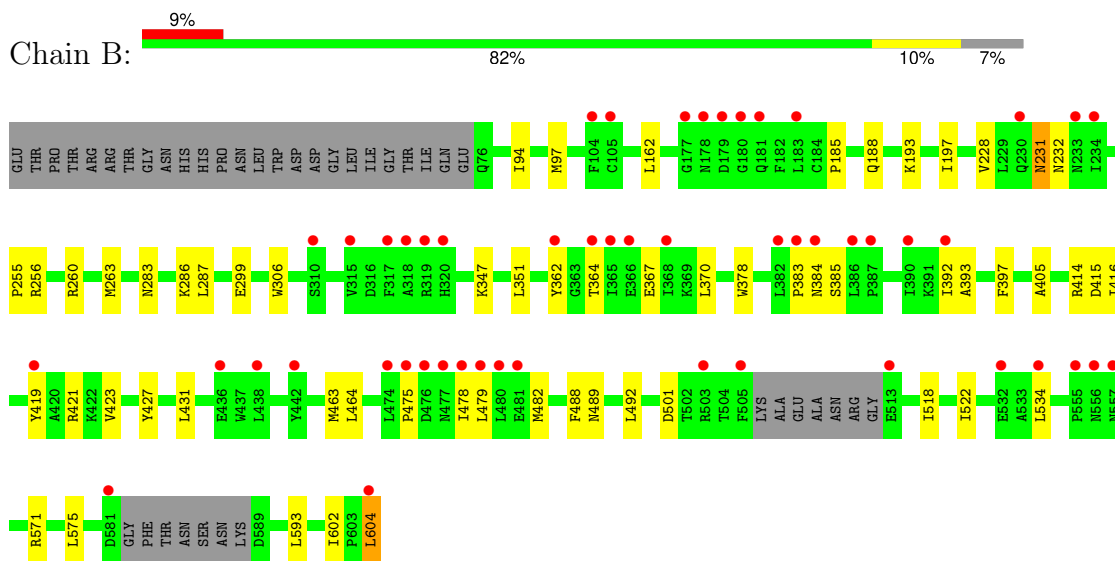
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	36	Total	O	0	0
			36	36		
2	A	38	Total	O	0	0
			38	38		
2	C	72	Total	O	0	0
			72	72		
2	D	49	Total	O	0	0
			49	49		

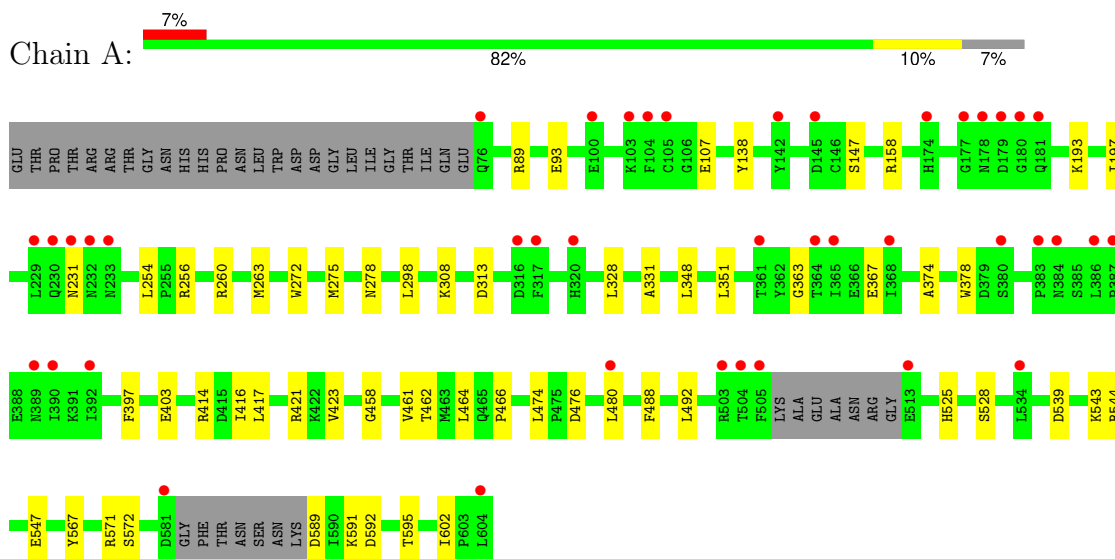
3 Residue-property plots i

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.

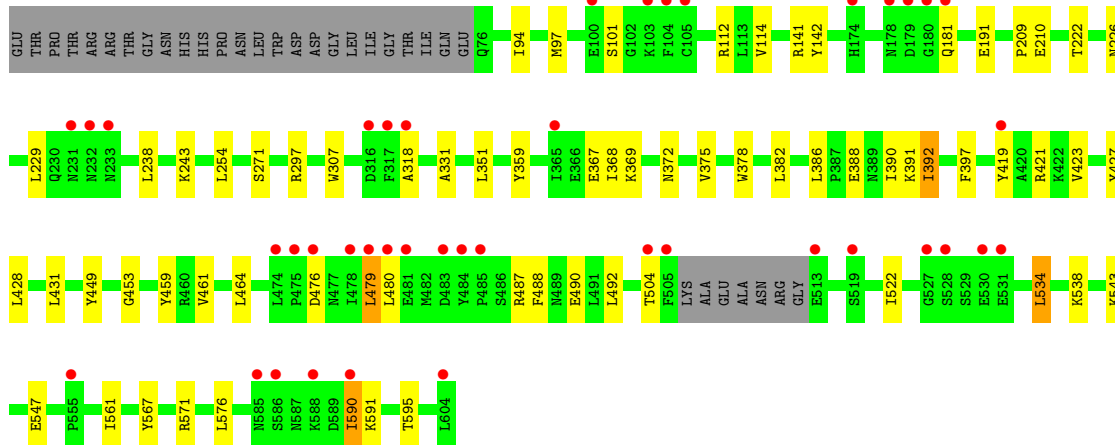
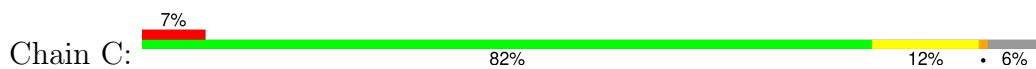
- Molecule 1: Sabinene synthase



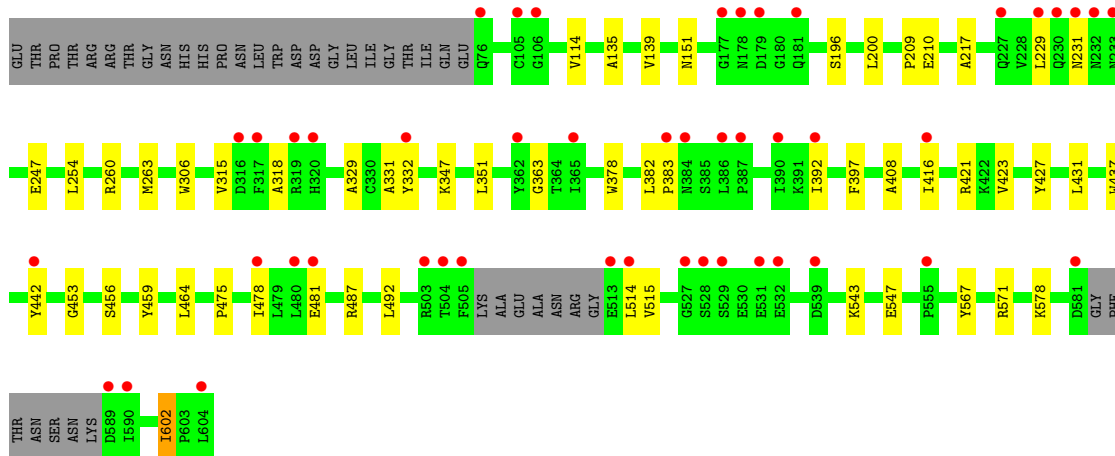
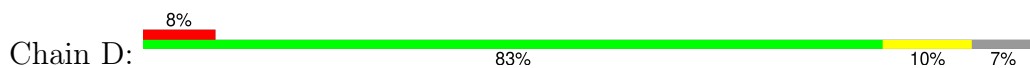
- Molecule 1: Sabinene synthase



- Molecule 1: Sabinene synthase



• Molecule 1: Sabinene synthase



4 Data and refinement statistics i

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	273.29Å 89.81Å 194.52Å 90.00° 134.89° 90.00°	Depositor
Resolution (Å)	96.81 – 2.32 96.81 – 2.32	Depositor EDS
% Data completeness (in resolution range)	99.0 (96.81-2.32) 98.8 (96.81-2.32)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.50 (at 2.32Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.213 , 0.235 0.214 , 0.237	Depositor DCC
R_{free} test set	142575 reflections (1.39%)	wwPDB-VP
Wilson B-factor (Å ²)	50.7	Xtrriage
Anisotropy	0.617	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 46.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.029 for -h-2*1,k,h+1 0.000 for h,-k,-h-l 0.000 for h+2*1,-k,-l	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	16245	wwPDB-VP
Average B, all atoms (Å ²)	60.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 39.16 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.3075e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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	A	0.39	0/4073	0.55	0/5544
1	B	0.40	0/4082	0.55	0/5554
1	C	0.41	0/4163	0.57	0/5663
1	D	0.42	0/4082	0.57	0/5556
All	All	0.41	0/16400	0.56	0/22317

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	A	3987	0	3694	28	0
1	B	3995	0	3714	31	0
1	C	4073	0	3824	41	0
1	D	3995	0	3720	31	0
2	A	38	0	0	2	0
2	B	36	0	0	2	0
2	C	72	0	0	2	0
2	D	49	0	0	0	0
All	All	16245	0	14952	131	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 4.

All (131) 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:315:VAL:HG23	1:D:392:ILE:HD11	1.44	0.98
1:B:423:VAL:HG21	1:B:464:LEU:HD22	1.51	0.92
1:D:423:VAL:HG21	1:D:464:LEU:HD22	1.55	0.88
1:A:423:VAL:HG21	1:A:464:LEU:HD22	1.56	0.87
1:D:315:VAL:HG12	1:D:318:ALA:H	1.41	0.86
1:C:423:VAL:HG21	1:C:464:LEU:HD22	1.60	0.82
1:C:419:TYR:CZ	1:C:479:LEU:HD11	2.21	0.75
1:D:315:VAL:CG2	1:D:392:ILE:HD11	2.20	0.69
1:B:351:LEU:HD13	1:B:397:PHE:HA	1.75	0.68
1:D:382:LEU:HB3	1:D:383:PRO:HD2	1.77	0.66
1:D:315:VAL:HG12	1:D:318:ALA:N	2.09	0.64
1:C:94:ILE:HA	1:C:97:MET:HE2	1.80	0.63
1:A:544:ARG:NH1	1:A:547:GLU:OE2	2.29	0.63
1:D:567:TYR:CE2	1:D:571:ARG:HD2	2.33	0.62
1:C:567:TYR:CE2	1:C:571:ARG:HD2	2.35	0.62
1:C:367:GLU:HG2	1:C:386:LEU:HD22	1.81	0.62
1:D:378:TRP:CD2	1:D:421:ARG:HD3	2.36	0.61
1:B:185:PRO:HG2	1:B:188:GLN:HG3	1.83	0.60
1:C:386:LEU:O	1:C:391:LYS:HD2	2.02	0.60
1:A:567:TYR:CE2	1:A:571:ARG:HD2	2.38	0.59
1:A:351:LEU:HD13	1:A:397:PHE:HA	1.85	0.58
1:D:351:LEU:HD13	1:D:397:PHE:HA	1.85	0.58
1:C:419:TYR:CE1	1:C:479:LEU:HD11	2.40	0.56
1:C:476:ASP:HA	1:C:479:LEU:HD22	1.88	0.56
1:C:141:ARG:NH2	1:C:142:TYR:OH	2.38	0.56
1:A:417:LEU:O	1:A:421:ARG:HG3	2.07	0.55
1:A:589:ASP:HA	1:A:592:ASP:OD2	2.06	0.55
1:C:487:ARG:NH1	1:C:490:GLU:OE1	2.32	0.55
1:C:191:GLU:HG3	1:C:238:LEU:HD22	1.88	0.55
1:C:369:LYS:HA	1:C:372:ASN:HB2	1.88	0.54
1:C:382:LEU:HB3	1:C:386:LEU:HD12	1.88	0.54
1:B:94:ILE:HA	1:B:97:MET:HE2	1.90	0.54
1:D:475:PRO:HD2	1:D:478:ILE:HB	1.89	0.54
1:C:222:THR:O	1:C:226:ASN:ND2	2.41	0.54
1:D:329:ALA:HA	1:D:332:TYR:CE1	2.43	0.52
1:A:328:LEU:HD22	1:A:572:SER:HB2	1.91	0.52
1:A:193:LYS:O	1:A:197:ILE:HG12	2.11	0.51
1:C:378:TRP:CD2	1:C:421:ARG:HD2	2.46	0.51
1:D:487:ARG:NH2	1:D:547:GLU:OE1	2.44	0.50
1:D:543:LYS:O	1:D:547:GLU:HG3	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:423:VAL:HG12	1:C:461:VAL:HG12	1.93	0.50
1:D:254:LEU:HD13	1:D:331:ALA:HB3	1.93	0.50
1:B:405:ALA:HA	1:B:416:ILE:HD11	1.92	0.49
1:D:200:LEU:HD11	1:D:217:ALA:HB1	1.94	0.49
1:D:437:TRP:HE3	1:D:515:VAL:HG11	1.77	0.49
1:B:482:MET:O	1:B:489:ASN:HB2	2.12	0.49
1:C:351:LEU:HD13	1:C:397:PHE:HA	1.94	0.49
1:B:283:ASN:O	1:B:287:LEU:HG	2.13	0.49
1:C:388:GLU:OE2	1:C:391:LYS:NZ	2.37	0.48
1:C:101:SER:HB3	1:C:112:ARG:HG2	1.95	0.48
1:B:518:ILE:O	1:B:522:ILE:HG12	2.14	0.48
1:C:419:TYR:CE2	1:C:479:LEU:HD21	2.49	0.48
1:A:260:ARG:CZ	1:A:602:ILE:HD12	2.44	0.48
1:C:591:LYS:O	1:C:595:THR:HG23	2.14	0.47
1:C:427:TYR:CZ	1:C:431:LEU:HD11	2.49	0.47
1:A:591:LYS:O	1:A:595:THR:HG23	2.14	0.47
1:A:107:GLU:HA	1:A:138:TYR:OH	2.14	0.47
1:A:414:ARG:NH2	1:A:474:LEU:O	2.46	0.47
1:C:209:PRO:O	1:C:210:GLU:HB2	2.14	0.47
1:C:479:LEU:HD23	1:C:480:LEU:N	2.30	0.47
1:D:427:TYR:CZ	1:D:431:LEU:HD11	2.50	0.47
1:B:419:TYR:CZ	1:B:479:LEU:HD13	2.50	0.47
1:D:442:TYR:O	1:D:514:LEU:HD21	2.15	0.47
1:A:275:MET:O	2:A:701:HOH:O	2.21	0.46
1:D:209:PRO:O	1:D:210:GLU:HB2	2.14	0.46
1:A:89:ARG:HD2	1:A:93:GLU:OE2	2.16	0.46
1:A:256:ARG:HG3	2:A:713:HOH:O	2.14	0.46
1:C:543:LYS:O	1:C:547:GLU:HG3	2.15	0.46
1:B:228:VAL:O	1:B:231:ASN:O	2.33	0.46
1:A:272:TRP:CZ3	1:A:278:ASN:HB3	2.51	0.46
1:C:487:ARG:NH2	1:C:547:GLU:OE1	2.46	0.46
1:C:488:PHE:CE2	1:C:492:LEU:HD11	2.50	0.46
1:C:388:GLU:O	1:C:392:ILE:HG23	2.16	0.46
1:B:383:PRO:C	1:B:385:SER:H	2.19	0.46
1:C:534:LEU:HD23	1:C:534:LEU:HA	1.71	0.45
1:B:414:ARG:HG3	1:B:415:ASP:O	2.16	0.45
1:A:89:ARG:O	1:A:93:GLU:HG3	2.15	0.45
1:C:534:LEU:HD22	1:C:538:LYS:HE2	1.97	0.45
1:B:286:LYS:HB3	1:B:604:LEU:HD23	1.99	0.45
1:B:378:TRP:HB2	1:B:421:ARG:NH2	2.31	0.45
1:A:476:ASP:O	1:A:480:LEU:HG	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:419:TYR:O	1:C:423:VAL:HG23	2.17	0.45
1:B:475:PRO:O	1:B:478:ILE:N	2.47	0.45
1:A:458:GLY:O	1:A:462:THR:HG23	2.17	0.45
1:B:260:ARG:CZ	1:B:602:ILE:HD12	2.47	0.44
1:A:374:ALA:O	1:A:378:TRP:N	2.50	0.44
1:B:378:TRP:HB2	1:B:421:ARG:CZ	2.47	0.44
1:C:271:SER:OG	2:C:701:HOH:O	2.21	0.44
1:B:392:ILE:HG13	1:B:393:ALA:N	2.32	0.43
1:A:263:MET:SD	1:A:602:ILE:HD13	2.57	0.43
1:D:442:TYR:C	1:D:514:LEU:HD21	2.38	0.43
1:D:229:LEU:C	1:D:231:ASN:H	2.20	0.43
1:D:378:TRP:CE3	1:D:421:ARG:HD3	2.53	0.43
1:D:408:ALA:HB3	1:D:416:ILE:HG12	2.00	0.43
1:B:575:LEU:HD21	1:B:593:LEU:HD11	2.01	0.43
1:A:423:VAL:HG12	1:A:461:VAL:HG12	2.01	0.43
1:C:254:LEU:HD13	1:C:331:ALA:HB3	2.01	0.43
1:B:256:ARG:HG3	2:B:712:HOH:O	2.17	0.43
1:D:260:ARG:NH1	1:D:602:ILE:HD12	2.34	0.43
1:B:427:TYR:CZ	1:B:431:LEU:HD11	2.54	0.42
1:B:263:MET:SD	1:B:602:ILE:HD13	2.59	0.42
1:A:543:LYS:O	1:A:547:GLU:HG3	2.19	0.42
1:B:255:PRO:HD3	1:B:571:ARG:NH2	2.34	0.42
1:C:307:TRP:HH2	1:C:318:ALA:HB1	1.84	0.42
1:B:306:TRP:CD1	1:B:347:LYS:HE3	2.54	0.42
1:C:375:VAL:HG21	1:C:428:LEU:HD11	2.02	0.42
1:B:463:MET:HE3	1:B:482:MET:SD	2.60	0.42
1:A:525:HIS:O	1:A:528:SER:OG	2.24	0.42
1:C:359:TYR:HA	1:C:368:ILE:HD11	2.01	0.42
1:D:151:ASN:HB2	1:D:196:SER:OG	2.20	0.42
1:D:453:GLY:HA2	1:D:456:SER:OG	2.20	0.42
1:D:306:TRP:CE2	1:D:347:LYS:HD2	2.54	0.42
1:B:299:GLU:HB3	2:B:702:HOH:O	2.20	0.41
1:B:488:PHE:CE2	1:B:492:LEU:HD11	2.55	0.41
1:D:263:MET:SD	1:D:602:ILE:HD13	2.61	0.41
1:D:459:TYR:OH	1:D:492:LEU:HD13	2.20	0.41
1:A:254:LEU:HD13	1:A:331:ALA:HB3	2.01	0.41
1:A:308:LYS:HA	1:A:313:ASP:OD2	2.21	0.41
1:A:348:LEU:HD12	1:A:466:PRO:HD3	2.02	0.41
1:C:297:ARG:HG2	2:C:763:HOH:O	2.19	0.41
1:C:449:TYR:O	1:C:453:GLY:N	2.50	0.41
1:C:229:LEU:HD22	1:C:243:LYS:HE3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:351:LEU:HD23	1:B:351:LEU:HA	1.85	0.41
1:D:135:ALA:O	1:D:139:VAL:HG23	2.21	0.41
1:B:162:LEU:HD23	1:B:162:LEU:HA	1.92	0.40
1:B:364:THR:N	1:B:367:GLU:OE1	2.31	0.40
1:A:488:PHE:CE2	1:A:492:LEU:HD11	2.56	0.40
1:C:576:LEU:HD12	1:C:590:ILE:HG21	2.02	0.40
1:D:247:GLU:HG2	1:D:578:LYS:HZ1	1.87	0.40
1:B:193:LYS:O	1:B:197:ILE:HG12	2.21	0.40
1:C:459:TYR:OH	1:C:492:LEU:HD13	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [\(i\)](#)

5.3.1 Protein backbone [\(i\)](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	509/554 (92%)	491 (96%)	17 (3%)	1 (0%)	44	54
1	B	509/554 (92%)	488 (96%)	19 (4%)	2 (0%)	30	37
1	C	518/554 (94%)	493 (95%)	24 (5%)	1 (0%)	44	54
1	D	509/554 (92%)	487 (96%)	21 (4%)	1 (0%)	44	54
All	All	2045/2216 (92%)	1959 (96%)	81 (4%)	5 (0%)	44	54

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	232	ASN
1	B	384	ASN
1	A	363	GLY
1	C	590	ILE
1	D	363	GLY

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	394/487 (81%)	386 (98%)	8 (2%)	50	67
1	B	398/487 (82%)	392 (98%)	6 (2%)	60	75
1	C	411/487 (84%)	402 (98%)	9 (2%)	47	63
1	D	396/487 (81%)	393 (99%)	3 (1%)	79	88
All	All	1599/1948 (82%)	1573 (98%)	26 (2%)	58	73

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	231	ASN
1	B	362	TYR
1	B	370	LEU
1	B	501	ASP
1	B	534	LEU
1	B	604	LEU
1	A	147	SER
1	A	158	ARG
1	A	231	ASN
1	A	298	LEU
1	A	367	GLU
1	A	403	GLU
1	A	416	ILE
1	A	539	ASP
1	C	114	VAL
1	C	181	GLN
1	C	390	ILE
1	C	392	ILE
1	C	479	LEU
1	C	504	THR
1	C	522	ILE
1	C	534	LEU
1	C	561	ILE
1	D	114	VAL

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Mol	Chain	Res	Type
1	D	481	GLU
1	D	602	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	525	HIS
1	D	231	ASN

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 oligosaccharides 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

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	515/554 (92%)	0.59	41 (7%) 20 22	41, 61, 86, 96	0
1	B	515/554 (92%)	0.68	51 (9%) 14 16	40, 62, 90, 99	0
1	C	522/554 (94%)	0.49	41 (7%) 20 23	37, 56, 82, 93	0
1	D	515/554 (92%)	0.64	47 (9%) 16 18	40, 59, 87, 104	0
All	All	2067/2216 (93%)	0.60	180 (8%) 17 20	37, 60, 87, 104	0

All (180) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	232	ASN	6.8
1	C	478	ILE	6.6
1	B	478	ILE	6.4
1	C	586	SER	6.3
1	D	505	PHE	5.8
1	D	317	PHE	5.6
1	C	505	PHE	5.5
1	C	180	GLY	5.4
1	C	179	ASP	5.3
1	D	105	CYS	5.0
1	A	505	PHE	4.8
1	B	581	ASP	4.7
1	A	178	ASN	4.7
1	C	316	ASP	4.6
1	B	476	ASP	4.6
1	D	581	ASP	4.6
1	C	483	ASP	4.6
1	C	479	LEU	4.5
1	A	504	THR	4.4
1	C	105	CYS	4.4
1	C	481	GLU	4.3

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Mol	Chain	Res	Type	RSRZ
1	A	76	GLN	4.3
1	B	480	LEU	4.2
1	B	105	CYS	4.2
1	B	505	PHE	4.1
1	D	320	HIS	4.1
1	D	513	GLU	4.0
1	B	179	ASP	3.9
1	A	581	ASP	3.9
1	C	484	TYR	3.9
1	D	514	LEU	3.8
1	D	590	ILE	3.8
1	C	476	ASP	3.8
1	A	320	HIS	3.8
1	B	604	LEU	3.7
1	B	319	ARG	3.7
1	B	320	HIS	3.6
1	A	604	LEU	3.6
1	D	233	ASN	3.6
1	D	178	ASN	3.5
1	A	179	ASP	3.5
1	C	588	LYS	3.5
1	C	531	GLU	3.5
1	D	529	SER	3.5
1	D	316	ASP	3.4
1	D	555	PRO	3.4
1	B	178	ASN	3.4
1	C	480	LEU	3.4
1	A	384	ASN	3.4
1	B	233	ASN	3.3
1	B	383	PRO	3.3
1	A	229	LEU	3.3
1	A	105	CYS	3.3
1	A	231	ASN	3.3
1	A	390	ILE	3.3
1	B	477	ASN	3.3
1	D	532	GLU	3.2
1	A	180	GLY	3.2
1	D	230	GLN	3.2
1	B	386	LEU	3.2
1	B	438	LEU	3.2
1	D	504	THR	3.2
1	B	479	LEU	3.2

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Mol	Chain	Res	Type	RSRZ
1	D	383	PRO	3.2
1	C	485	PRO	3.1
1	D	181	GLN	3.1
1	B	384	ASN	3.1
1	D	589	ASP	3.1
1	B	365	ILE	3.0
1	B	317	PHE	3.0
1	D	177	GLY	3.0
1	C	530	GLU	3.0
1	C	181	GLN	3.0
1	B	180	GLY	3.0
1	C	474	LEU	3.0
1	C	604	LEU	3.0
1	B	315	VAL	3.0
1	C	475	PRO	3.0
1	A	233	ASN	2.9
1	D	106	GLY	2.9
1	D	231	ASN	2.9
1	A	365	ILE	2.8
1	A	230	GLN	2.8
1	D	76	GLN	2.8
1	C	317	PHE	2.8
1	B	503	ARG	2.8
1	A	103	LYS	2.8
1	B	475	PRO	2.8
1	B	555	PRO	2.8
1	C	513	GLU	2.8
1	A	503	ARG	2.8
1	A	364	THR	2.8
1	C	178	ASN	2.8
1	A	316	ASP	2.7
1	A	383	PRO	2.7
1	B	419	TYR	2.7
1	A	386	LEU	2.7
1	D	384	ASN	2.7
1	C	419	TYR	2.7
1	D	229	LEU	2.7
1	B	442	TYR	2.7
1	B	474	LEU	2.7
1	D	503	ARG	2.7
1	D	387	PRO	2.7
1	B	557	ASN	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	534	LEU	2.6
1	A	534	LEU	2.6
1	B	230	GLN	2.6
1	B	364	THR	2.6
1	B	382	LEU	2.6
1	C	233	ASN	2.6
1	B	390	ILE	2.6
1	B	513	GLU	2.6
1	B	481	GLU	2.5
1	A	480	LEU	2.5
1	C	585	ASN	2.5
1	B	310	SER	2.5
1	B	177	GLY	2.5
1	A	380	SER	2.4
1	C	527	GLY	2.4
1	C	232	ASN	2.4
1	B	234	ILE	2.4
1	D	365	ILE	2.4
1	D	531	GLU	2.4
1	D	480	LEU	2.4
1	A	387	PRO	2.4
1	B	366	GLU	2.4
1	D	539	ASP	2.4
1	A	177	GLY	2.4
1	D	527	GLY	2.4
1	D	227	GLN	2.4
1	A	317	PHE	2.4
1	D	392	ILE	2.4
1	D	332	TYR	2.4
1	D	386	LEU	2.4
1	C	103	LYS	2.3
1	C	174	HIS	2.3
1	A	232	ASN	2.3
1	D	604	LEU	2.3
1	C	365	ILE	2.3
1	C	519	SER	2.3
1	C	528	SER	2.3
1	B	181	GLN	2.3
1	A	145	ASP	2.3
1	B	362	TYR	2.3
1	B	556	ASN	2.3
1	C	504	THR	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	318	ALA	2.2
1	A	104	PHE	2.2
1	D	416	ILE	2.2
1	A	513	GLU	2.2
1	C	318	ALA	2.2
1	B	104	PHE	2.2
1	D	179	ASP	2.2
1	D	528	SER	2.2
1	B	392	ILE	2.2
1	A	368	ILE	2.2
1	A	392	ILE	2.2
1	C	590	ILE	2.2
1	B	532	GLU	2.2
1	C	231	ASN	2.2
1	A	142	TYR	2.2
1	A	181	GLN	2.2
1	A	100	GLU	2.1
1	C	100	GLU	2.1
1	B	183	LEU	2.1
1	B	436	GLU	2.1
1	D	478	ILE	2.1
1	D	362	TYR	2.1
1	C	104	PHE	2.1
1	D	481	GLU	2.1
1	C	555	PRO	2.1
1	D	319	ARG	2.1
1	A	174	HIS	2.1
1	B	387	PRO	2.1
1	A	361	THR	2.1
1	A	389	ASN	2.0
1	D	442	TYR	2.0
1	B	368	ILE	2.0
1	D	390	ILE	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

There are no ligands in this entry.

6.5 Other polymers

There are no such residues in this entry.