Full wwPDB X-ray Structure Validation Report ⓘ

Feb 4, 2024 – 07:55 AM EST

PDB ID	:	1NI1
Title	:	Imidazole and cyanophenyl farnesyl transferase inhibitors
Authors	:	Tong, Y.; Lin, N.H.; Wang, L.; Hasvold, L.; Wang, W.; Leonard, N.; Li, T.; Li, Q.; Cohen, J.; Gu, W.Z.; Zhang, H.; Stoll, V.; Bauch, J.; Marsh, K.; Rosenberg, S.H.; Sham, H.L.
Deposited on	:	2002-12-20
Resolution	:	2.30 Å(reported)

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

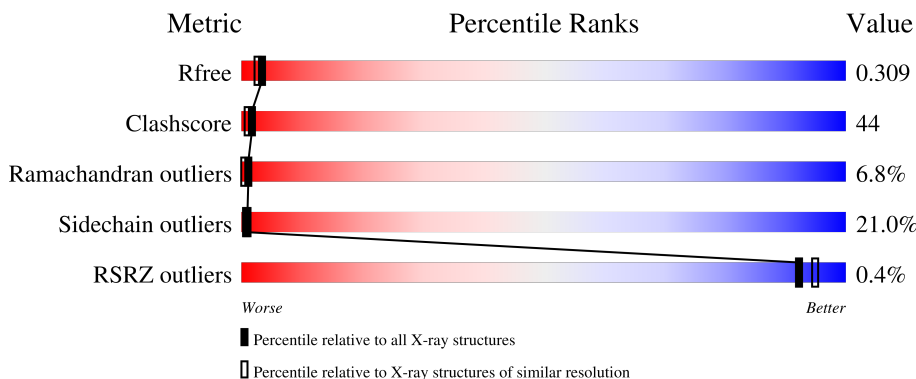|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1   Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	Percentile Ranks	Value
Rfree		0.309
Clashscore		44
Ramachandran outliers		6.8%
Sidechain outliers		21.0%
RSRZ outliers		0.4%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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 <=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	315	28% 49% 20% ··
2	B	402	29% 56% 13%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	HFP	B	501	X	-	-	-

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 5868 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 Protein farnesyltransferase alpha subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	312	2660	1695	465	495	5	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	156	THR	ILE	conflict	UNP Q04631

- Molecule 2 is a protein called Protein farnesyltransferase beta subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	401	3154	2016	543	572	23	0	0	0

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Zn		
3	B	1	1	1	0	0

- Molecule 4 is ALPHA-HYDROXYFARNESYLPHOSPHONIC ACID (three-letter code: HFP) (formula: $C_{15}H_{33}O_4P$).
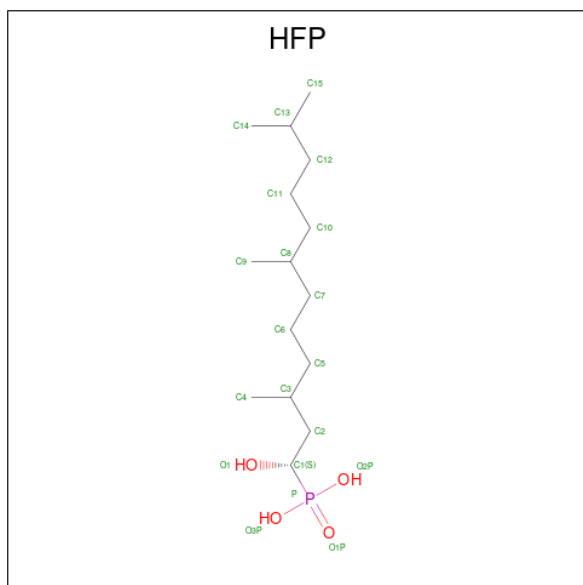
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	O	P		
4	B	1	20	15	4	1	0	0

- Molecule 5 is 2-CHLORO-5-(3-CHLORO-PHENYL)-6-[(4-CYANO-PHENYL)-(3-METHYL-3H-IMIDAZOL-4-YL)- METHOXYMETHYL]-NICOTINONITRILE (three-letter code: 2C5) (formula: $C_{25}H_{17}Cl_2N_5O$).
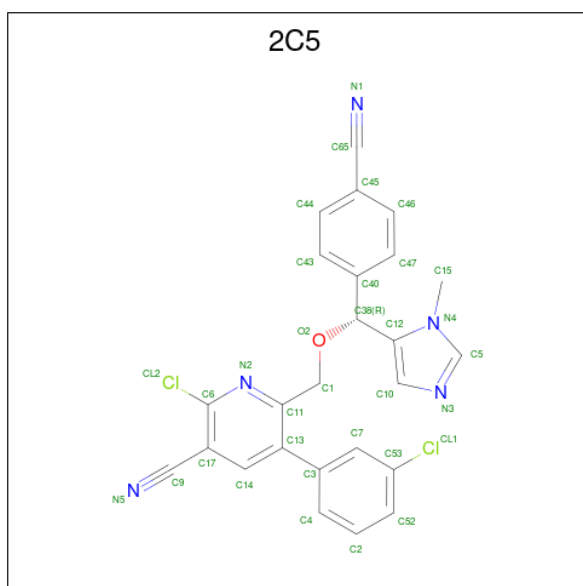

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	Cl	N	O		
5	B	1	33	25	2	5	1	0	0

3 Residue-property plots ⓘ

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

• Molecule 1: Protein farnesyltransferase alpha subunit
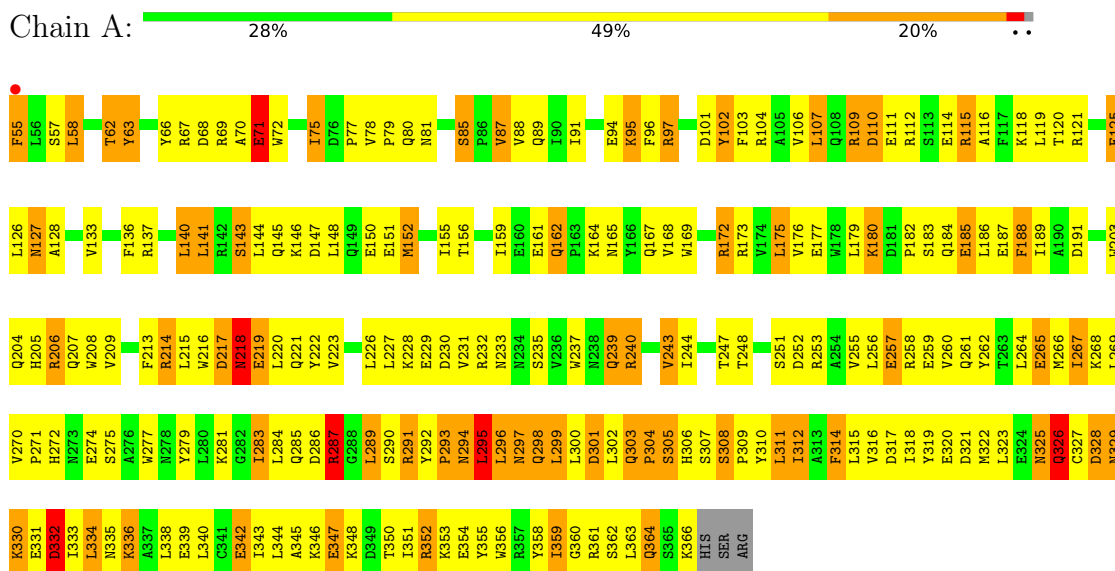
• Molecule 2: Protein farnesyltransferase beta subunit
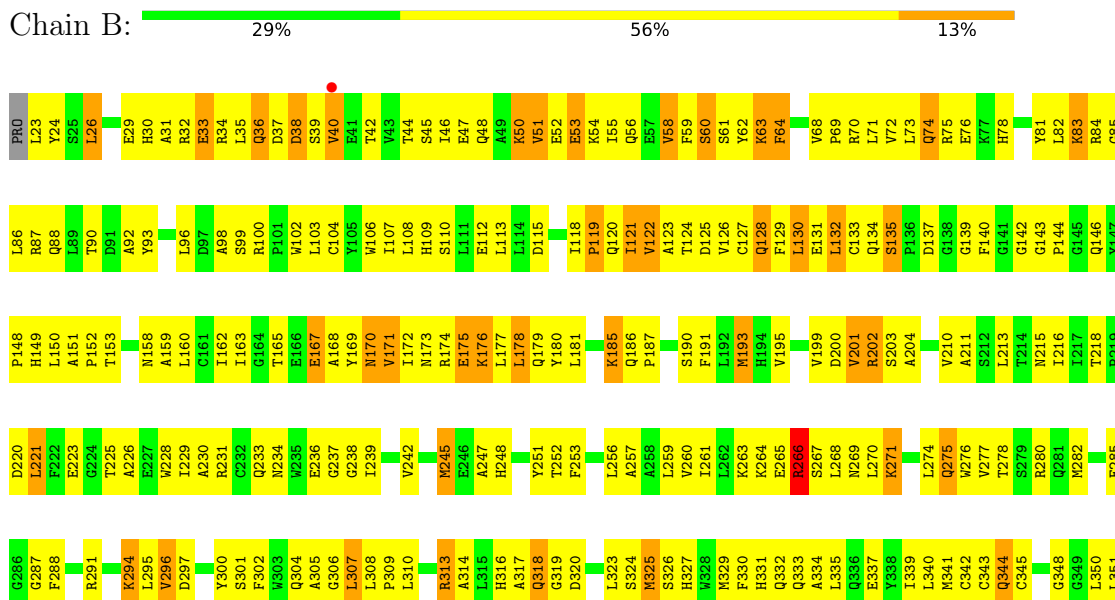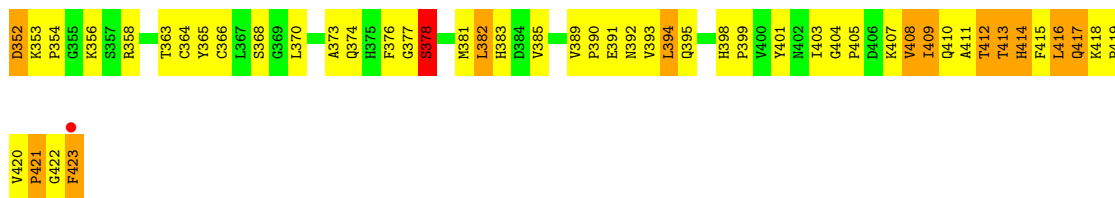
4   Data and refinement statistics   ⓘ

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α, β, γ	170.10Å 170.10Å 69.29Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	19.85 – 2.30 19.85 – 2.30	Depositor EDS
% Data completeness (in resolution range)	6.1 (19.85-2.30) 90.1 (19.85-2.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.31 (at 2.30Å)	Xtriage
Refinement program	X-PLOR 3.1	Depositor
R, R_{free}	0.264 , 0.327 0.246 , 0.309	Depositor DCC
R_{free} test set	2908 reflections (6.03%)	wwPDB-VP
Wilson B-factor (Å^2)	37.6	Xtriage
Anisotropy	0.204	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 45.0	EDS
L-test for twinning[2]	$< |L| > = 0.42, < L^2 > = 0.24$	Xtriage
Estimated twinning fraction	0.075 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	5868	wwPDB-VP
Average B, all atoms (Å^2)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.38% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: HFP, ZN, 2C5

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	0.41	0/2725	0.60	0/3700
2	B	0.40	0/3239	0.60	0/4397
All	All	0.40	0/5964	0.60	0/8097

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 ⓘ

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	2660	0	2585	264	0
2	B	3154	0	3085	256	0
3	B	1	0	0	0	0
4	B	20	0	28	0	0
5	B	33	0	17	1	0
All	All	5868	0	5715	507	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 44.

All (507) 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:281:LYS:O	1:A:285:GLN:HB2	1.67	0.93
1:A:286:ASP:O	1:A:287:ARG:HB2	1.68	0.92
2:B:173:ASN:OD1	2:B:175:GLU:HG2	1.69	0.90
2:B:178:LEU:HD21	2:B:221:LEU:HD22	1.52	0.90
1:A:87:VAL:HG23	1:A:88:VAL:HG22	1.53	0.90
1:A:140:LEU:O	1:A:144:LEU:HB2	1.71	0.89
1:A:96:PHE:HA	1:A:126:LEU:HD13	1.54	0.89
1:A:189:ILE:HG21	1:A:206:ARG:HG3	1.52	0.89
2:B:370:LEU:HG	2:B:394:LEU:HD11	1.56	0.88
2:B:170:ASN:O	2:B:172:ILE:N	2.08	0.87
2:B:191:PHE:O	2:B:199:VAL:HG22	1.74	0.86
2:B:151:ALA:HB3	2:B:152:PRO:HD3	1.58	0.84
1:A:270:VAL:HG22	2:B:40:VAL:HG21	1.60	0.84
1:A:287:ARG:HG2	1:A:287:ARG:HH11	1.41	0.84
2:B:313:ARG:HG3	2:B:313:ARG:HH11	1.43	0.84
1:A:343:ILE:HG22	1:A:348:LYS:HG2	1.60	0.83
1:A:219:GLU:OE2	1:A:219:GLU:HA	1.75	0.83
1:A:327:CYS:SG	1:A:328:ASP:N	2.53	0.82
2:B:233:GLN:HE22	2:B:269:ASN:H	1.27	0.81
2:B:29:GLU:O	2:B:32:ARG:HG2	1.79	0.81
2:B:325:MET:HG2	2:B:381:MET:HG3	1.62	0.81
1:A:290:SER:HB3	1:A:321:ASP:HB3	1.64	0.80
1:A:294:ASN:HB3	1:A:298:GLN:HE22	1.47	0.79
2:B:124:THR:HG23	2:B:167:GLU:OE1	1.84	0.78
1:A:218:ASN:HA	1:A:221:GLN:NE2	1.98	0.78
2:B:285:GLU:HG2	2:B:296:VAL:HG21	1.67	0.77
2:B:389:VAL:HG12	2:B:391:GLU:H	1.48	0.77
1:A:316:VAL:O	1:A:320:GLU:HG3	1.84	0.77
1:A:78:VAL:O	1:A:104:ARG:HD2	1.83	0.77
2:B:51:VAL:HG21	2:B:295:LEU:HD22	1.67	0.77
1:A:303:GLN:O	1:A:307:SER:HB2	1.84	0.76
2:B:260:VAL:HA	2:B:265:GLU:OE1	1.86	0.76
1:A:328:ASP:O	1:A:329:ASN:HB2	1.84	0.76
2:B:139:GLY:HA3	2:B:148:PRO:HB3	1.67	0.76
2:B:309:PRO:O	2:B:313:ARG:HG2	1.85	0.75
1:A:58:LEU:HD22	1:A:125:GLU:HB3	1.68	0.75
1:A:345:ALA:HB2	1:A:356:TRP:HB2	1.69	0.75
1:A:255:VAL:HG22	1:A:258:ARG:HH21	1.52	0.74
2:B:169:TYR:OH	2:B:410:GLN:HB3	1.89	0.73
2:B:60:SER:O	2:B:64:PHE:HB2	1.89	0.73
2:B:376:PHE:O	2:B:382:LEU:HD12	1.90	0.72
2:B:33:GLU:OE2	2:B:33:GLU:HA	1.89	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:302:LEU:HG	1:A:306:HIS:HB2	1.71	0.71
2:B:398:HIS:ND1	2:B:399:PRO:HD2	2.04	0.71
2:B:256:LEU:HD21	2:B:310:LEU:HB2	1.73	0.71
1:A:172:ARG:HA	1:A:175:LEU:HD12	1.72	0.71
1:A:339:GLU:O	1:A:343:ILE:HD12	1.91	0.70
1:A:240:ARG:HG3	1:A:240:ARG:HH11	1.55	0.70
2:B:24:TYR:H	2:B:333:GLN:HE22	1.39	0.70
2:B:73:LEU:H	2:B:392:ASN:ND2	1.89	0.70
1:A:303:GLN:HB2	1:A:304:PRO:CD	2.22	0.70
2:B:86:LEU:HB2	2:B:107:ILE:HG21	1.72	0.70
2:B:420:VAL:O	2:B:422:GLY:N	2.25	0.70
1:A:239:GLN:HE21	1:A:239:GLN:HA	1.56	0.69
1:A:58:LEU:HD11	1:A:126:LEU:HD21	1.74	0.69
2:B:301:SER:O	2:B:305:ALA:HB3	1.92	0.69
1:A:345:ALA:HB2	1:A:356:TRP:CB	2.21	0.69
2:B:313:ARG:HG3	2:B:313:ARG:NH1	2.00	0.69
1:A:101:ASP:HA	1:A:104:ARG:NH1	2.07	0.69
1:A:255:VAL:O	1:A:258:ARG:HB3	1.92	0.69
1:A:159:ILE:HG13	1:A:168:VAL:HB	1.74	0.69
2:B:62:TYR:C	2:B:64:PHE:H	1.96	0.69
2:B:266:ARG:H	2:B:266:ARG:HE	1.40	0.69
1:A:332:ASP:O	1:A:336:LYS:HB3	1.92	0.69
2:B:31:ALA:O	2:B:34:ARG:HG2	1.93	0.69
2:B:135:SER:HB3	2:B:148:PRO:HG3	1.75	0.68
1:A:339:GLU:O	1:A:342:GLU:HB2	1.92	0.68
2:B:345:CYS:HB3	2:B:348:GLY:O	1.93	0.68
1:A:344:LEU:HA	1:A:348:LYS:HB2	1.75	0.68
2:B:73:LEU:H	2:B:392:ASN:HD21	1.40	0.68
1:A:264:LEU:O	1:A:268:LYS:HG3	1.95	0.67
1:A:347:GLU:HG3	1:A:348:LYS:N	2.09	0.67
1:A:151:GLU:HA	1:A:151:GLU:OE1	1.94	0.67
2:B:200:ASP:OD1	2:B:202:ARG:HB2	1.94	0.67
2:B:242:VAL:O	2:B:245:MET:HB2	1.95	0.67
1:A:182:PRO:HG3	1:A:213:PHE:CD2	2.30	0.67
2:B:149:HIS:HB3	2:B:152:PRO:HD2	1.77	0.67
2:B:115:ASP:HB2	2:B:395:GLN:HG2	1.77	0.66
1:A:287:ARG:NH1	1:A:291:ARG:HE	1.93	0.66
2:B:181:LEU:HD21	2:B:211:ALA:HB2	1.76	0.66
2:B:306:GLY:O	2:B:309:PRO:HD2	1.95	0.66
2:B:327:HIS:HB3	2:B:332:GLN:HE22	1.59	0.66
2:B:55:ILE:O	2:B:58:VAL:HG13	1.96	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:289:LEU:HD12	1:A:318:ILE:HG12	1.78	0.66
1:A:264:LEU:HD22	1:A:268:LYS:HE2	1.78	0.65
2:B:167:GLU:O	2:B:171:VAL:HG23	1.96	0.65
2:B:280:ARG:HH11	2:B:280:ARG:HG2	1.62	0.65
2:B:404:GLY:O	2:B:408:VAL:HG13	1.97	0.65
1:A:294:ASN:HB3	1:A:298:GLN:NE2	2.12	0.65
1:A:271:PRO:HB3	1:A:306:HIS:HB3	1.78	0.65
1:A:218:ASN:N	1:A:218:ASN:ND2	2.43	0.64
1:A:226:LEU:O	1:A:229:GLU:HB2	1.96	0.64
2:B:381:MET:O	2:B:382:LEU:HD13	1.96	0.64
2:B:162:ILE:O	2:B:407:LYS:HE3	1.98	0.64
2:B:308:LEU:HD13	2:B:330:PHE:CD2	2.31	0.64
2:B:270:LEU:HD22	2:B:270:LEU:H	1.62	0.64
1:A:112:ARG:O	1:A:144:LEU:HD11	1.98	0.64
1:A:55:PHE:HB2	1:A:118:LYS:HD3	1.79	0.63
1:A:328:ASP:O	1:A:329:ASN:CB	2.47	0.63
2:B:274:LEU:O	2:B:278:THR:HG23	1.97	0.63
1:A:182:PRO:HG3	1:A:213:PHE:CG	2.34	0.62
2:B:130:LEU:HD23	2:B:160:LEU:HG	1.80	0.62
2:B:140:PHE:HB2	2:B:153:THR:HA	1.82	0.62
1:A:233:ASN:O	1:A:237:TRP:HD1	1.83	0.62
1:A:262:TYR:O	1:A:265:GLU:HG2	1.98	0.62
1:A:297:ASN:HA	1:A:300:LEU:HB2	1.82	0.62
2:B:409:ILE:HG22	2:B:410:GLN:N	2.14	0.62
1:A:269:LEU:HD13	1:A:269:LEU:O	2.00	0.62
2:B:86:LEU:O	2:B:86:LEU:HG	1.99	0.62
1:A:333:ILE:C	1:A:335:ASN:H	2.03	0.62
1:A:343:ILE:HG22	1:A:348:LYS:CG	2.28	0.62
2:B:220:ASP:O	2:B:223:GLU:HG3	2.00	0.62
1:A:69:ARG:HB3	1:A:71:GLU:OE1	1.98	0.61
1:A:71:GLU:OE1	1:A:71:GLU:N	2.33	0.61
1:A:321:ASP:C	1:A:323:LEU:H	2.04	0.61
2:B:215:ASN:ND2	2:B:416:LEU:HA	2.16	0.61
1:A:209:VAL:HG12	1:A:215:LEU:HD12	1.80	0.61
2:B:175:GLU:CD	2:B:175:GLU:H	2.03	0.61
1:A:87:VAL:HG11	2:B:126:VAL:HA	1.83	0.61
1:A:355:TYR:O	1:A:358:TYR:HB3	2.01	0.61
2:B:181:LEU:CD2	2:B:211:ALA:HB2	2.31	0.61
2:B:353:LYS:HB2	2:B:354:PRO:HD2	1.83	0.61
2:B:98:ALA:O	2:B:142:GLY:HA3	2.02	0.60
1:A:58:LEU:HG	1:A:58:LEU:O	2.00	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:148:LEU:HB2	1:A:179:LEU:HD21	1.82	0.60
1:A:218:ASN:ND2	1:A:218:ASN:H	1.97	0.60
2:B:331:HIS:CD2	2:B:334:ALA:H	2.19	0.60
2:B:234:ASN:OD1	2:B:236:GLU:HG2	2.01	0.60
2:B:266:ARG:H	2:B:266:ARG:NE	1.99	0.60
2:B:414:HIS:O	2:B:417:GLN:N	2.34	0.60
1:A:287:ARG:NH1	1:A:291:ARG:NE	2.49	0.59
1:A:309:PRO:HA	1:A:312:ILE:HG13	1.85	0.59
2:B:213:LEU:HG	2:B:401:TYR:CE2	2.36	0.59
2:B:266:ARG:NH2	2:B:318:GLN:HE21	2.01	0.59
2:B:276:TRP:CZ2	2:B:280:ARG:HD2	2.38	0.59
2:B:325:MET:CG	2:B:381:MET:HG3	2.32	0.59
1:A:342:GLU:O	1:A:346:LYS:HB2	2.02	0.59
1:A:240:ARG:HG3	1:A:240:ARG:NH1	2.18	0.58
1:A:226:LEU:HA	1:A:229:GLU:HB2	1.85	0.58
2:B:76:GLU:OE1	2:B:76:GLU:HA	2.02	0.58
2:B:313:ARG:HH11	2:B:313:ARG:CG	2.14	0.58
2:B:332:GLN:HG2	2:B:373:ALA:O	2.03	0.58
1:A:159:ILE:CG1	1:A:168:VAL:HB	2.34	0.58
2:B:352:ASP:HB3	2:B:356:LYS:HG3	1.86	0.58
2:B:376:PHE:CD2	2:B:377:GLY:N	2.71	0.58
1:A:185:GLU:O	1:A:187:GLU:N	2.35	0.58
2:B:266:ARG:CZ	2:B:318:GLN:HE21	2.16	0.58
2:B:280:ARG:HG2	2:B:280:ARG:NH1	2.18	0.58
1:A:344:LEU:HD13	1:A:356:TRP:CZ2	2.39	0.58
2:B:185:LYS:HD2	2:B:186:GLN:N	2.19	0.58
1:A:70:ALA:O	1:A:72:TRP:N	2.37	0.58
1:A:94:GLU:OE1	1:A:97:ARG:NH2	2.31	0.58
1:A:110:ASP:OD1	1:A:112:ARG:HD2	2.03	0.58
1:A:302:LEU:O	1:A:303:GLN:C	2.42	0.58
2:B:257:ALA:O	2:B:261:ILE:HG13	2.03	0.57
1:A:312:ILE:O	1:A:316:VAL:HG23	2.04	0.57
1:A:364:GLN:CA	1:A:364:GLN:OE1	2.51	0.57
2:B:210:VAL:HG23	2:B:211:ALA:N	2.18	0.57
1:A:80:GLN:HB2	1:A:104:ARG:NH2	2.19	0.57
2:B:277:VAL:HG13	2:B:278:THR:N	2.18	0.57
1:A:267:ILE:HD11	1:A:277:TRP:HA	1.86	0.57
1:A:206:ARG:HG3	1:A:206:ARG:HH11	1.70	0.57
1:A:179:LEU:O	1:A:180:LYS:C	2.43	0.57
1:A:205:HIS:O	1:A:209:VAL:HG23	2.05	0.57
1:A:97:ARG:HB3	1:A:97:ARG:NH1	2.19	0.57

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Full wwPDB X-ray Structure Validation Report

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:281:LYS:O	1:A:285:GLN:CB	2.49	0.57
1:A:203:TRP:O	1:A:207:GLN:HG3	2.03	0.56
1:A:217:ASP:O	1:A:219:GLU:N	2.37	0.56
1:A:364:GLN:OE1	1:A:364:GLN:HA	2.05	0.56
1:A:89:GLN:O	2:B:88:GLN:HA	2.06	0.56
1:A:327:CYS:HG	1:A:328:ASP:H	1.51	0.56
1:A:287:ARG:HG2	1:A:287:ARG:NH1	2.13	0.56
1:A:159:ILE:HG21	1:A:188:PHE:HZ	1.71	0.56
1:A:290:SER:HB3	1:A:321:ASP:CB	2.36	0.56
1:A:314:PHE:O	1:A:317:ASP:HB2	2.06	0.56
1:A:119:LEU:HD12	1:A:119:LEU:O	2.06	0.55
1:A:296:LEU:C	1:A:300:LEU:HD13	2.26	0.55
2:B:99:SER:O	2:B:102:TRP:HB2	2.06	0.55
1:A:165:ASN:HB3	1:A:168:VAL:HG22	1.87	0.55
2:B:370:LEU:CG	2:B:394:LEU:HD11	2.32	0.55
1:A:75:ILE:HG22	1:A:102:TYR:CE1	2.42	0.55
1:A:172:ARG:NH1	1:A:185:GLU:OE2	2.40	0.55
1:A:297:ASN:OD1	1:A:297:ASN:N	2.35	0.55
1:A:303:GLN:HB2	1:A:304:PRO:HD3	1.88	0.55
2:B:63:LYS:O	2:B:63:LYS:HG3	2.07	0.54
2:B:233:GLN:HB2	2:B:268:LEU:HD22	1.89	0.54
1:A:336:LYS:HE2	1:A:340:LEU:HD11	1.88	0.54
2:B:233:GLN:NE2	2:B:269:ASN:H	2.02	0.54
1:A:296:LEU:HD23	1:A:297:ASN:OD1	2.07	0.54
1:A:329:ASN:O	1:A:330:LYS:C	2.46	0.54
2:B:30:HIS:O	2:B:33:GLU:HB2	2.08	0.54
1:A:75:ILE:HG22	1:A:102:TYR:HE1	1.73	0.54
2:B:228:TRP:O	2:B:231:ARG:HB2	2.08	0.54
1:A:226:LEU:HA	1:A:229:GLU:HG3	1.89	0.54
1:A:296:LEU:HG	1:A:300:LEU:HD13	1.90	0.54
2:B:282:MET:HB3	2:B:285:GLU:OE2	2.09	0.53
2:B:314:ALA:O	2:B:317:ALA:HB3	2.08	0.53
2:B:403:ILE:HG13	2:B:408:VAL:HG12	1.90	0.53
2:B:378:SER:HB3	2:B:381:MET:HB2	1.89	0.53
2:B:256:LEU:CD2	2:B:307:LEU:HD12	2.38	0.53
2:B:313:ARG:O	2:B:317:ALA:HB2	2.08	0.53
2:B:350:LEU:HB2	2:B:363:THR:HA	1.90	0.53
1:A:272:HIS:HB2	2:B:38:ASP:OD2	2.09	0.53
1:A:311:LEU:C	1:A:311:LEU:HD12	2.29	0.53
1:A:312:ILE:HG22	1:A:340:LEU:HD22	1.91	0.53
2:B:238:GLY:HA3	2:B:247:ALA:HB1	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:334:LEU:HD11	1:A:363:LEU:HB3	1.90	0.53
1:A:287:ARG:HD2	1:A:292:TYR:OH	2.09	0.53
2:B:316:HIS:O	2:B:319:GLY:N	2.34	0.53
2:B:405:PRO:O	2:B:409:ILE:HD12	2.09	0.53
1:A:354:GLU:OE2	2:B:327:HIS:HB2	2.09	0.53
2:B:378:SER:O	2:B:378:SER:OG	2.27	0.53
2:B:210:VAL:HG23	2:B:211:ALA:H	1.74	0.53
2:B:230:ALA:HA	2:B:268:LEU:HD21	1.90	0.53
1:A:299:LEU:O	1:A:302:LEU:N	2.42	0.52
1:A:217:ASP:HB2	1:A:218:ASN:ND2	2.24	0.52
2:B:174:ARG:HD2	2:B:415:PHE:CD2	2.44	0.52
1:A:109:ARG:O	1:A:110:ASP:C	2.46	0.52
1:A:112:ARG:HG3	1:A:140:LEU:HD22	1.91	0.52
1:A:62:THR:O	1:A:63:TYR:C	2.48	0.52
1:A:112:ARG:HG2	1:A:143:SER:OG	2.10	0.52
1:A:103:PHE:CZ	1:A:133:VAL:HG22	2.45	0.52
1:A:279:TYR:CE2	1:A:283:ILE:HD11	2.45	0.52
2:B:193:MET:SD	2:B:203:SER:HB3	2.50	0.52
1:A:165:ASN:O	1:A:169:TRP:HD1	1.93	0.52
1:A:267:ILE:O	1:A:267:ILE:HG23	2.09	0.52
1:A:296:LEU:O	1:A:300:LEU:HD13	2.10	0.52
1:A:220:LEU:HD23	1:A:223:VAL:CG2	2.40	0.52
1:A:72:TRP:CZ2	1:A:115:ARG:HB2	2.45	0.52
1:A:287:ARG:HH11	1:A:291:ARG:HE	1.58	0.52
2:B:253:PHE:HA	2:B:307:LEU:CD1	2.39	0.52
2:B:304:GLN:O	2:B:307:LEU:HB2	2.10	0.52
1:A:293:PRO:O	1:A:294:ASN:C	2.48	0.51
2:B:169:TYR:O	2:B:170:ASN:O	2.27	0.51
2:B:376:PHE:O	2:B:382:LEU:HA	2.09	0.51
1:A:219:GLU:HB3	1:A:243:VAL:HG21	1.91	0.51
2:B:126:VAL:O	2:B:129:PHE:N	2.43	0.51
1:A:339:GLU:HG2	1:A:343:ILE:HD11	1.92	0.51
2:B:130:LEU:O	2:B:133:CYS:HB2	2.10	0.51
2:B:90:THR:C	2:B:92:ALA:H	2.14	0.51
2:B:185:LYS:HG2	2:B:191:PHE:CZ	2.46	0.51
2:B:178:LEU:HD11	2:B:218:THR:HG23	1.92	0.51
2:B:398:HIS:ND1	2:B:399:PRO:CD	2.72	0.51
1:A:227:LEU:HD13	1:A:262:TYR:OH	2.11	0.51
1:A:302:LEU:HG	1:A:306:HIS:CB	2.38	0.51
2:B:339:ILE:O	2:B:343:CYS:HB2	2.11	0.51
1:A:256:LEU:O	1:A:258:ARG:N	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:302:LEU:CG	1:A:306:HIS:HB2	2.41	0.51
1:A:358:TYR:HA	1:A:361:ARG:NH2	2.25	0.51
2:B:256:LEU:HD23	2:B:310:LEU:HD12	1.93	0.51
1:A:253:ARG:O	1:A:257:GLU:HB2	2.11	0.50
2:B:62:TYR:C	2:B:64:PHE:N	2.62	0.50
1:A:214:ARG:NH2	1:A:214:ARG:HG3	2.24	0.50
2:B:233:GLN:HE22	2:B:269:ASN:N	2.01	0.50
2:B:109:HIS:ND1	2:B:112:GLU:OE2	2.39	0.50
1:A:352:ARG:NH1	2:B:278:THR:O	2.44	0.50
2:B:33:GLU:OE2	2:B:33:GLU:CA	2.59	0.50
2:B:62:TYR:CD2	2:B:69:PRO:HA	2.46	0.50
2:B:239:ILE:HB	2:B:252:THR:HA	1.92	0.50
2:B:135:SER:CB	2:B:148:PRO:HG3	2.41	0.50
2:B:423:PHE:CD2	2:B:423:PHE:N	2.79	0.50
1:A:214:ARG:HG3	1:A:214:ARG:HH21	1.76	0.50
2:B:158:ASN:O	2:B:162:ILE:HG13	2.11	0.50
2:B:56:GLN:O	2:B:59:PHE:N	2.43	0.50
1:A:80:GLN:NE2	2:B:144:PRO:HD2	2.27	0.50
2:B:71:LEU:HB3	2:B:340:LEU:HD13	1.93	0.50
2:B:163:ILE:HG22	2:B:165:THR:HG23	1.94	0.49
2:B:220:ASP:O	2:B:221:LEU:C	2.50	0.49
2:B:81:TYR:CE1	2:B:358:ARG:HD2	2.47	0.49
1:A:344:LEU:HD13	1:A:356:TRP:CE2	2.47	0.49
2:B:86:LEU:HA	2:B:107:ILE:HD13	1.94	0.49
2:B:107:ILE:O	2:B:110:SER:HB2	2.12	0.49
2:B:134:GLN:HB2	2:B:140:PHE:CE2	2.47	0.49
2:B:177:LEU:HD23	2:B:216:ILE:HD13	1.94	0.49
2:B:256:LEU:HD22	2:B:307:LEU:HD12	1.93	0.49
1:A:296:LEU:O	1:A:299:LEU:N	2.39	0.49
1:A:106:VAL:HG11	1:A:116:ALA:HB1	1.95	0.49
2:B:47:GLU:O	2:B:51:VAL:HG23	2.13	0.49
2:B:302:PHE:CD1	2:B:368:SER:HB3	2.48	0.49
1:A:256:LEU:O	1:A:257:GLU:C	2.49	0.49
2:B:62:TYR:O	2:B:64:PHE:N	2.45	0.49
1:A:336:LYS:O	1:A:336:LYS:HG3	2.13	0.49
1:A:351:ILE:O	2:B:331:HIS:HB2	2.12	0.49
1:A:220:LEU:HA	1:A:223:VAL:HG22	1.94	0.49
1:A:296:LEU:HG	1:A:300:LEU:CD1	2.43	0.49
2:B:256:LEU:HD21	2:B:310:LEU:CB	2.42	0.49
1:A:58:LEU:O	1:A:95:LYS:NZ	2.45	0.49
1:A:227:LEU:HD12	1:A:240:ARG:NH1	2.28	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:260:VAL:CG2	1:A:284:LEU:HD21	2.43	0.49
1:A:266:MET:C	1:A:268:LYS:H	2.17	0.49
1:A:312:ILE:H	1:A:312:ILE:HG12	1.38	0.49
2:B:297:ASP:HB3	2:B:300:TYR:CD1	2.48	0.49
1:A:79:PRO:HA	1:A:101:ASP:OD2	2.14	0.48
1:A:147:ASP:OD1	1:A:147:ASP:C	2.49	0.48
1:A:308:SER:O	1:A:312:ILE:HG12	2.12	0.48
2:B:256:LEU:HD23	2:B:310:LEU:CD1	2.43	0.48
1:A:353:LYS:HG3	1:A:354:GLU:N	2.29	0.48
1:A:358:TYR:CE1	2:B:323:LEU:HD23	2.48	0.48
2:B:277:VAL:CG1	2:B:278:THR:N	2.76	0.48
1:A:299:LEU:C	1:A:301:ASP:N	2.64	0.48
1:A:321:ASP:C	1:A:323:LEU:N	2.66	0.48
2:B:412:THR:O	2:B:416:LEU:HB2	2.14	0.48
1:A:103:PHE:CZ	1:A:107:LEU:HG	2.48	0.48
2:B:412:THR:O	2:B:413:THR:C	2.52	0.48
1:A:189:ILE:CG2	1:A:206:ARG:HG3	2.35	0.47
1:A:172:ARG:O	1:A:176:VAL:HG23	2.15	0.47
1:A:247:THR:OG1	1:A:248:THR:N	2.42	0.47
1:A:303:GLN:CB	1:A:304:PRO:CD	2.90	0.47
2:B:24:TYR:H	2:B:333:GLN:NE2	2.08	0.47
2:B:403:ILE:CD1	2:B:408:VAL:HG12	2.44	0.47
2:B:414:HIS:HE1	2:B:418:LYS:NZ	2.12	0.47
2:B:176:LYS:NZ	2:B:176:LYS:HB3	2.30	0.47
1:A:148:LEU:HD12	1:A:179:LEU:CD2	2.44	0.47
2:B:233:GLN:NE2	2:B:268:LEU:HB3	2.29	0.47
1:A:219:GLU:O	1:A:222:TYR:HB3	2.14	0.47
1:A:299:LEU:O	1:A:300:LEU:C	2.53	0.47
1:A:72:TRP:HZ2	1:A:115:ARG:O	1.98	0.47
1:A:185:GLU:C	1:A:187:GLU:H	2.18	0.47
2:B:221:LEU:HD12	2:B:221:LEU:O	2.14	0.47
2:B:236:GLU:O	2:B:238:GLY:N	2.46	0.47
2:B:86:LEU:O	2:B:86:LEU:CG	2.61	0.47
2:B:233:GLN:HE22	2:B:268:LEU:HB3	1.79	0.47
2:B:297:ASP:HB3	2:B:300:TYR:HD1	1.80	0.47
2:B:306:GLY:C	2:B:309:PRO:HD2	2.35	0.47
1:A:172:ARG:CA	1:A:175:LEU:HD12	2.43	0.47
1:A:267:ILE:O	1:A:267:ILE:CG2	2.62	0.47
2:B:234:ASN:HD21	2:B:236:GLU:HG2	1.80	0.47
1:A:214:ARG:HH21	1:A:214:ARG:CG	2.27	0.47
2:B:73:LEU:N	2:B:392:ASN:ND2	2.61	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:282:MET:HG2	2:B:287:GLY:O	2.14	0.47
1:A:297:ASN:O	1:A:301:ASP:N	2.40	0.47
2:B:291:ARG:NH2	2:B:294:LYS:HE3	2.30	0.47
2:B:344:GLN:HA	2:B:350:LEU:HD13	1.97	0.47
1:A:159:ILE:CG2	1:A:188:PHE:HZ	2.27	0.46
1:A:295:LEU:O	1:A:296:LEU:C	2.52	0.46
1:A:319:TYR:HB3	1:A:333:ILE:HG23	1.97	0.46
2:B:268:LEU:O	2:B:270:LEU:HD22	2.16	0.46
2:B:81:TYR:CD1	2:B:358:ARG:NH1	2.84	0.46
2:B:160:LEU:HD13	2:B:168:ALA:O	2.15	0.46
2:B:181:LEU:HD23	2:B:221:LEU:HD21	1.98	0.46
2:B:265:GLU:C	2:B:267:SER:H	2.18	0.46
2:B:335:LEU:O	2:B:339:ILE:HG13	2.16	0.46
2:B:412:THR:O	2:B:414:HIS:N	2.48	0.46
1:A:232:ARG:CZ	2:B:45:SER:HB3	2.44	0.46
2:B:126:VAL:O	2:B:127:CYS:C	2.53	0.46
1:A:58:LEU:HA	1:A:63:TYR:CD1	2.51	0.46
1:A:66:TYR:HB3	1:A:102:TYR:CD2	2.51	0.46
1:A:260:VAL:HG22	1:A:284:LEU:HD21	1.97	0.46
2:B:55:ILE:HD13	2:B:354:PRO:HG3	1.98	0.46
1:A:80:GLN:HG3	1:A:81:ASN:N	2.31	0.46
1:A:101:ASP:HA	1:A:104:ARG:HH11	1.81	0.46
1:A:141:LEU:HD21	1:A:151:GLU:HG2	1.98	0.46
2:B:113:LEU:HD23	2:B:113:LEU:HA	1.74	0.46
1:A:292:TYR:CD1	1:A:292:TYR:N	2.84	0.46
1:A:345:ALA:HB2	1:A:356:TRP:HB3	1.95	0.46
1:A:89:GLN:NE2	1:A:91:ILE:HD13	2.30	0.45
1:A:219:GLU:O	1:A:223:VAL:HG13	2.16	0.45
1:A:265:GLU:O	1:A:269:LEU:N	2.50	0.45
2:B:62:TYR:CE2	2:B:69:PRO:HA	2.51	0.45
2:B:56:GLN:O	2:B:59:PHE:HB2	2.15	0.45
1:A:97:ARG:HB3	1:A:97:ARG:HH11	1.81	0.45
1:A:322:MET:HE2	1:A:333:ILE:HG12	1.97	0.45
2:B:122:VAL:CG1	2:B:123:ALA:N	2.80	0.45
2:B:412:THR:OG1	2:B:413:THR:N	2.48	0.45
2:B:74:GLN:O	2:B:75:ARG:C	2.54	0.45
2:B:178:LEU:CD2	2:B:221:LEU:HD22	2.34	0.45
2:B:253:PHE:HA	2:B:307:LEU:HD11	1.97	0.45
1:A:266:MET:C	1:A:268:LYS:N	2.69	0.45
1:A:272:HIS:CD2	1:A:308:SER:HB3	2.52	0.45
1:A:281:LYS:HZ3	2:B:275:GLN:CD	2.20	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:309:PRO:HA	1:A:312:ILE:CG1	2.45	0.45
1:A:257:GLU:O	1:A:261:GLN:HG2	2.17	0.45
1:A:334:LEU:O	1:A:338:LEU:HD12	2.16	0.45
1:A:350:THR:O	1:A:353:LYS:HB3	2.16	0.45
2:B:53:GLU:OE1	2:B:53:GLU:HA	2.17	0.45
2:B:185:LYS:HD2	2:B:186:GLN:H	1.80	0.45
2:B:264:LYS:O	2:B:265:GLU:C	2.54	0.45
1:A:173:ARG:O	1:A:177:GLU:HG3	2.16	0.45
1:A:302:LEU:CD2	1:A:306:HIS:HB2	2.46	0.45
2:B:265:GLU:O	2:B:267:SER:N	2.50	0.45
1:A:188:PHE:O	1:A:191:ASP:HB3	2.17	0.45
2:B:234:ASN:ND2	2:B:236:GLU:HG2	2.32	0.45
1:A:75:ILE:HA	1:A:75:ILE:HD13	1.75	0.45
1:A:126:LEU:O	1:A:127:ASN:HB2	2.16	0.45
2:B:285:GLU:CG	2:B:296:VAL:HG21	2.42	0.45
1:A:240:ARG:NE	1:A:259:GLU:OE1	2.45	0.45
2:B:132:LEU:H	2:B:132:LEU:HG	1.57	0.44
2:B:326:SER:O	2:B:383:HIS:HB3	2.17	0.44
1:A:107:LEU:HD23	1:A:136:PHE:CD1	2.52	0.44
1:A:226:LEU:HA	1:A:229:GLU:CG	2.47	0.44
1:A:287:ARG:NH1	1:A:287:ARG:CG	2.78	0.44
2:B:148:PRO:HB2	2:B:180:TYR:CE1	2.51	0.44
2:B:365:TYR:HA	2:B:368:SER:HB2	2.00	0.44
1:A:296:LEU:O	1:A:299:LEU:HB2	2.17	0.44
1:A:333:ILE:C	1:A:335:ASN:N	2.70	0.44
2:B:393:VAL:O	2:B:393:VAL:HG13	2.17	0.44
1:A:103:PHE:HA	1:A:119:LEU:HD21	1.99	0.44
2:B:131:GLU:HG3	2:B:171:VAL:HG13	1.99	0.44
2:B:143:GLY:O	2:B:146:GLN:HB2	2.17	0.44
2:B:271:LYS:NZ	2:B:271:LYS:HB3	2.33	0.44
1:A:300:LEU:CD1	1:A:315:LEU:HD22	2.48	0.44
2:B:93:TYR:CD2	2:B:96:LEU:HD12	2.53	0.44
1:A:155:ILE:CG2	1:A:156:THR:N	2.80	0.44
2:B:37:ASP:OD2	2:B:37:ASP:C	2.56	0.44
2:B:337:GLU:HB3	2:B:341:MET:HE3	1.99	0.44
1:A:111:GLU:O	1:A:111:GLU:HG2	2.18	0.44
1:A:256:LEU:C	1:A:258:ARG:N	2.70	0.44
2:B:135:SER:C	2:B:137:ASP:H	2.21	0.44
2:B:35:LEU:HD12	2:B:36:GLN:N	2.33	0.43
2:B:305:ALA:O	2:B:308:LEU:HD12	2.17	0.43
1:A:218:ASN:N	1:A:218:ASN:HD22	2.14	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:119:PRO:HB3	2:B:121:ILE:HD12	1.99	0.43
1:A:109:ARG:O	1:A:111:GLU:N	2.51	0.43
1:A:189:ILE:HD11	1:A:205:HIS:CD2	2.52	0.43
1:A:262:TYR:C	1:A:265:GLU:HG2	2.39	0.43
1:A:265:GLU:O	1:A:269:LEU:HB2	2.18	0.43
1:A:297:ASN:C	1:A:299:LEU:N	2.71	0.43
1:A:300:LEU:C	1:A:302:LEU:H	2.21	0.43
1:A:329:ASN:O	1:A:332:ASP:HB2	2.19	0.43
2:B:100:ARG:HA	2:B:103:LEU:HD12	1.99	0.43
2:B:204:ALA:HB1	2:B:229:ILE:HD11	2.00	0.43
2:B:274:LEU:O	2:B:277:VAL:HG12	2.18	0.43
1:A:77:PRO:HD3	1:A:102:TYR:CE1	2.54	0.43
2:B:159:ALA:O	2:B:163:ILE:HG12	2.19	0.43
2:B:266:ARG:HE	2:B:266:ARG:N	2.09	0.43
2:B:390:PRO:O	2:B:393:VAL:HG12	2.18	0.43
2:B:82:LEU:O	2:B:85:GLY:N	2.52	0.43
2:B:405:PRO:O	2:B:408:VAL:HG22	2.19	0.43
1:A:287:ARG:HH12	1:A:291:ARG:NH1	2.16	0.43
1:A:296:LEU:CD1	1:A:300:LEU:HD11	2.48	0.43
1:A:334:LEU:HD12	1:A:334:LEU:HA	1.82	0.43
2:B:148:PRO:HB2	2:B:180:TYR:CZ	2.54	0.43
1:A:85:SER:O	2:B:128:GLN:NE2	2.52	0.43
2:B:176:LYS:HA	2:B:179:GLN:HB2	2.01	0.43
1:A:152:MET:O	1:A:155:ILE:HG22	2.18	0.42
1:A:340:LEU:C	1:A:342:GLU:N	2.68	0.42
1:A:264:LEU:HD23	1:A:267:ILE:HG21	2.00	0.42
2:B:389:VAL:CG1	2:B:391:GLU:OE1	2.67	0.42
1:A:91:ILE:HG22	1:A:91:ILE:O	2.19	0.42
1:A:165:ASN:HB3	1:A:168:VAL:CG2	2.48	0.42
1:A:294:ASN:O	1:A:295:LEU:C	2.58	0.42
2:B:139:GLY:CA	2:B:148:PRO:HB3	2.44	0.42
1:A:300:LEU:HD12	1:A:315:LEU:HD22	2.02	0.42
2:B:73:LEU:O	2:B:75:ARG:N	2.47	0.42
2:B:302:PHE:O	2:B:306:GLY:HA3	2.20	0.42
1:A:325:ASN:O	1:A:326:GLN:C	2.58	0.42
2:B:82:LEU:O	2:B:83:LYS:C	2.58	0.42
2:B:385:VAL:HG12	2:B:385:VAL:O	2.20	0.42
1:A:66:TYR:HB3	1:A:102:TYR:CE2	2.54	0.42
1:A:116:ALA:O	1:A:119:LEU:HB3	2.20	0.42
1:A:232:ARG:HB3	2:B:44:THR:HG21	2.02	0.42
2:B:414:HIS:ND1	2:B:415:PHE:N	2.67	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:155:ILE:HG23	1:A:156:THR:N	2.34	0.42
1:A:326:GLN:OE1	1:A:326:GLN:HA	2.20	0.41
2:B:165:THR:O	2:B:168:ALA:N	2.52	0.41
2:B:174:ARG:NH1	2:B:419:PRO:O	2.49	0.41
2:B:211:ALA:HA	2:B:216:ILE:HG12	2.01	0.41
1:A:267:ILE:HG22	1:A:268:LYS:HG3	2.02	0.41
2:B:282:MET:HG2	2:B:296:VAL:HG13	2.02	0.41
1:A:203:TRP:NE1	1:A:235:SER:HB3	2.35	0.41
1:A:219:GLU:HB3	1:A:243:VAL:CG2	2.50	0.41
2:B:248:HIS:HB3	2:B:251:TYR:HD1	1.86	0.41
1:A:144:LEU:O	1:A:145:GLN:C	2.57	0.41
1:A:223:VAL:HG21	1:A:240:ARG:HG3	2.02	0.41
2:B:225:THR:O	2:B:226:ALA:C	2.59	0.41
2:B:288:PHE:CE1	2:B:305:ALA:HB2	2.56	0.41
2:B:71:LEU:HD21	2:B:341:MET:CE	2.50	0.41
2:B:104:CYS:O	2:B:108:LEU:HB2	2.20	0.41
1:A:227:LEU:HD23	1:A:227:LEU:HA	1.84	0.41
1:A:274:GLU:HB2	1:A:310:TYR:CE2	2.55	0.41
2:B:23:LEU:HD12	2:B:26:LEU:HG	2.03	0.41
2:B:213:LEU:HD11	2:B:401:TYR:CD2	2.54	0.41
2:B:320:ASP:HB3	2:B:323:LEU:HG	2.02	0.41
2:B:106:TRP:CH2	5:B:10:2C5:HC14	2.55	0.41
2:B:307:LEU:HD12	2:B:307:LEU:HA	1.94	0.41
1:A:77:PRO:HB3	1:A:102:TYR:CD1	2.56	0.41
1:A:114:GLU:OE2	1:A:146:LYS:NZ	2.46	0.41
1:A:161:GLU:C	1:A:162:GLN:HG2	2.40	0.41
1:A:267:ILE:HG22	1:A:268:LYS:CG	2.51	0.41
2:B:149:HIS:HB3	2:B:152:PRO:CD	2.49	0.41
2:B:150:LEU:HD23	2:B:150:LEU:HA	1.88	0.41
2:B:389:VAL:HG13	2:B:390:PRO:HD2	2.02	0.41
1:A:66:TYR:C	1:A:68:ASP:H	2.24	0.41
1:A:112:ARG:HG3	1:A:140:LEU:CD2	2.51	0.41
1:A:364:GLN:OE1	1:A:364:GLN:N	2.54	0.41
2:B:118:ILE:O	2:B:119:PRO:O	2.39	0.41
1:A:120:THR:OG1	1:A:137:ARG:NH1	2.54	0.40
1:A:298:GLN:HE21	1:A:298:GLN:HB2	1.71	0.40
1:A:331:GLU:OE2	1:A:331:GLU:HA	2.21	0.40
2:B:256:LEU:O	2:B:260:VAL:HG23	2.22	0.40
1:A:306:HIS:O	1:A:311:LEU:HD23	2.20	0.40
2:B:36:GLN:H	2:B:36:GLN:HG2	1.68	0.40
2:B:73:LEU:HD23	2:B:75:ARG:HG2	2.04	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:420:VAL:HA	2:B:421:PRO:HD2	1.90	0.40
1:A:173:ARG:HG3	1:A:208:TRP:CH2	2.56	0.40
1:A:356:TRP:CE3	1:A:356:TRP:HA	2.56	0.40
1:A:359:ILE:HG22	1:A:360:GLY:N	2.36	0.40
2:B:100:ARG:NH2	2:B:129:PHE:CE1	2.89	0.40
2:B:137:ASP:C	2:B:176:LYS:NZ	2.74	0.40
2:B:259:LEU:HD12	2:B:268:LEU:CD1	2.51	0.40
2:B:34:ARG:HH21	2:B:52:GLU:HB3	1.86	0.40
2:B:50:LYS:O	2:B:54:LYS:HG3	2.21	0.40
1:A:172:ARG:HA	1:A:175:LEU:CD1	2.46	0.40
1:A:331:GLU:O	1:A:332:ASP:OD1	2.40	0.40
2:B:42:THR:O	2:B:46:ILE:HD12	2.19	0.40
2:B:78:HIS:O	2:B:82:LEU:HG	2.22	0.40
2:B:414:HIS:C	2:B:416:LEU:N	2.75	0.40

There are no symmetry-related clashes.

5.3　Torsion angles　ⓘ

5.3.1　Protein backbone　ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	310/315 (98%)	235 (76%)	49 (16%)	26 (8%)	1	0
2	B	399/402 (99%)	321 (80%)	56 (14%)	22 (6%)	2	1
All	All	709/717 (99%)	556 (78%)	105 (15%)	48 (7%)	1	0

All (48) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	186	LEU
1	A	216	TRP
1	A	218	ASN
1	A	294	ASN

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Mol	Chain	Res	Type
1	A	295	LEU
1	A	329	ASN
1	A	332	ASP
2	B	119	PRO
2	B	170	ASN
2	B	171	VAL
2	B	352	ASP
2	B	421	PRO
1	A	63	TYR
1	A	71	GLU
1	A	110	ASP
1	A	127	ASN
1	A	244	ILE
1	A	287	ARG
1	A	296	LEU
1	A	305	SER
1	A	326	GLN
2	B	63	LYS
2	B	190	SER
2	B	266	ARG
2	B	324	SER
2	B	378	SER
2	B	411	ALA
1	A	230	ASP
1	A	293	PRO
2	B	38	ASP
2	B	74	GLN
2	B	329	MET
2	B	412	THR
1	A	128	ALA
1	A	257	GLU
1	A	301	ASP
1	A	304	PRO
2	B	413	THR
2	B	414	HIS
1	A	183	SER
2	B	221	LEU
1	A	303	GLN
1	A	334	LEU
2	B	121	ILE
2	B	195	VAL
2	B	237	GLY

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Mol	Chain	Res	Type
1	A	243	VAL
2	B	201	VAL

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	291/294 (99%)	219 (75%)	72 (25%)	0	0
2	B	338/339 (100%)	278 (82%)	60 (18%)	2	1
All	All	629/633 (99%)	497 (79%)	132 (21%)	1	1

All (132) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	55	PHE
1	A	57	SER
1	A	58	LEU
1	A	62	THR
1	A	67	ARG
1	A	71	GLU
1	A	75	ILE
1	A	85	SER
1	A	87	VAL
1	A	95	LYS
1	A	97	ARG
1	A	102	TYR
1	A	107	LEU
1	A	109	ARG
1	A	115	ARG
1	A	121	ARG
1	A	125	GLU
1	A	140	LEU
1	A	141	LEU
1	A	143	SER
1	A	150	GLU

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Mol	Chain	Res	Type
1	A	152	MET
1	A	162	GLN
1	A	164	LYS
1	A	167	GLN
1	A	172	ARG
1	A	175	LEU
1	A	180	LYS
1	A	184	GLN
1	A	185	GLU
1	A	188	PHE
1	A	204	GLN
1	A	206	ARG
1	A	214	ARG
1	A	217	ASP
1	A	218	ASN
1	A	219	GLU
1	A	228	LYS
1	A	231	VAL
1	A	239	GLN
1	A	240	ARG
1	A	251	SER
1	A	252	ASP
1	A	265	GLU
1	A	267	ILE
1	A	275	SER
1	A	283	ILE
1	A	287	ARG
1	A	289	LEU
1	A	291	ARG
1	A	295	LEU
1	A	297	ASN
1	A	298	GLN
1	A	299	LEU
1	A	305	SER
1	A	308	SER
1	A	311	LEU
1	A	312	ILE
1	A	314	PHE
1	A	325	ASN
1	A	326	GLN
1	A	328	ASP
1	A	330	LYS

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Mol	Chain	Res	Type
1	A	332	ASP
1	A	336	LYS
1	A	342	GLU
1	A	347	GLU
1	A	352	ARG
1	A	359	ILE
1	A	362	SER
1	A	364	GLN
1	A	366	LYS
2	B	26	LEU
2	B	33	GLU
2	B	36	GLN
2	B	39	SER
2	B	40	VAL
2	B	48	GLN
2	B	50	LYS
2	B	51	VAL
2	B	53	GLU
2	B	58	VAL
2	B	60	SER
2	B	61	SER
2	B	64	PHE
2	B	68	VAL
2	B	70	ARG
2	B	72	VAL
2	B	83	LYS
2	B	84	ARG
2	B	87	ARG
2	B	120	GLN
2	B	122	VAL
2	B	125	ASP
2	B	128	GLN
2	B	130	LEU
2	B	132	LEU
2	B	135	SER
2	B	167	GLU
2	B	175	GLU
2	B	176	LYS
2	B	178	LEU
2	B	185	LYS
2	B	187	PRO
2	B	193	MET

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Mol	Chain	Res	Type
2	B	201	VAL
2	B	202	ARG
2	B	245	MET
2	B	263	LYS
2	B	266	ARG
2	B	271	LYS
2	B	275	GLN
2	B	294	LYS
2	B	296	VAL
2	B	307	LEU
2	B	313	ARG
2	B	318	GLN
2	B	325	MET
2	B	342	CYS
2	B	344	GLN
2	B	351	LEU
2	B	364	CYS
2	B	366	CYS
2	B	374	GLN
2	B	378	SER
2	B	382	LEU
2	B	394	LEU
2	B	408	VAL
2	B	409	ILE
2	B	416	LEU
2	B	417	GLN
2	B	423	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	89	GLN
1	A	162	GLN
1	A	167	GLN
1	A	201	HIS
1	A	218	ASN
1	A	221	GLN
1	A	239	GLN
1	A	241	HIS
1	A	261	GLN
1	A	298	GLN
2	B	74	GLN

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Mol	Chain	Res	Type
2	B	120	GLN
2	B	146	GLN
2	B	233	GLN
2	B	318	GLN
2	B	327	HIS
2	B	331	HIS
2	B	332	GLN
2	B	333	GLN
2	B	392	ASN
2	B	395	GLN
2	B	414	HIS
2	B	417	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 3 ligands modelled in this entry, 1 is monoatomic - leaving 2 for Mogul analysis.

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	$\#|Z| > 2$
4	HFP	B	501	-	17,19,19	1.78	4 (23%)	22,25,25	2.62	5 (22%)
5	2C5	B	10	3	31,36,36	1.70	10 (32%)	36,50,50	1.18	4 (11%)

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
4	HFP	B	501	-	2/2/5/5	12/22/22/22	-
5	2C5	B	10	3	-	1/12/21/21	0/4/4/4

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	501	HFP	C2-C3	-4.19	1.36	1.53
4	B	501	HFP	O1-C1	4.08	1.46	1.41
5	B	10	2C5	C10-N3	3.67	1.46	1.35
5	B	10	2C5	C11-N2	3.26	1.36	1.32
4	B	501	HFP	C7-C8	-3.10	1.36	1.52
5	B	10	2C5	C43-C40	2.97	1.43	1.39
5	B	10	2C5	C7-C53	2.93	1.42	1.36
5	B	10	2C5	C40-C38	2.76	1.55	1.52
5	B	10	2C5	C2-C4	2.55	1.42	1.36
5	B	10	2C5	C44-C43	2.49	1.43	1.38
5	B	10	2C5	C6-N2	2.31	1.36	1.32
5	B	10	2C5	C14-C17	2.29	1.42	1.37
4	B	501	HFP	C12-C13	-2.13	1.37	1.51
5	B	10	2C5	C47-C40	2.07	1.42	1.39

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	501	HFP	C3-C2-C1	9.66	125.00	115.21
5	B	10	2C5	C1-C11-C13	3.54	124.75	121.40
4	B	501	HFP	C4-C3-C2	3.23	121.18	110.89
5	B	10	2C5	C17-C6-N2	-3.16	120.64	124.83
4	B	501	HFP	C2-C3-C5	2.53	120.35	111.98
4	B	501	HFP	C9-C8-C7	2.52	120.44	111.29
5	B	10	2C5	C15-N4-C12	2.44	127.35	124.35
5	B	10	2C5	C12-C10-N3	2.14	112.47	108.62
4	B	501	HFP	C6-C7-C8	2.12	122.76	115.92

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	B	501	HFP	C8

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Mol	Chain	Res	Type	Atom
4	B	501	HFP	C3

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	501	HFP	C2-C1-P-O1P
4	B	501	HFP	O1-C1-P-O2P
4	B	501	HFP	O1-C1-P-O3P
4	B	501	HFP	P-C1-C2-C3
4	B	501	HFP	O1-C1-C2-C3
4	B	501	HFP	C1-C2-C3-C4
4	B	501	HFP	C6-C7-C8-C9
4	B	501	HFP	C11-C12-C13-C14
4	B	501	HFP	C4-C3-C5-C6
4	B	501	HFP	C11-C10-C8-C9
4	B	501	HFP	C5-C6-C7-C8
4	B	501	HFP	C2-C1-P-O2P
5	B	10	2C5	O2-C1-C11-C13

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	10	2C5	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand HFP B 501

Ligand 2C5 B 10
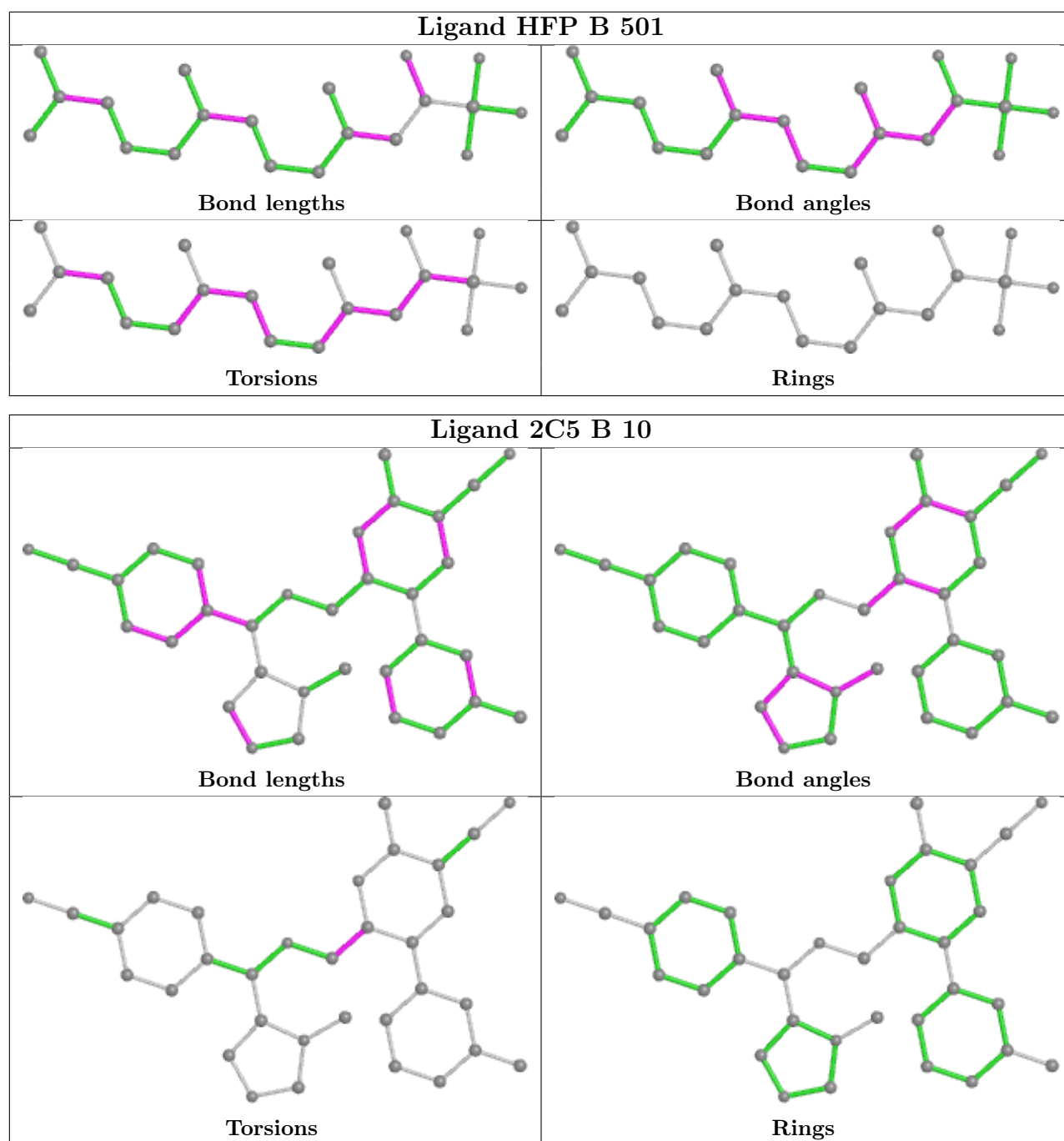
5.7 Other polymers (i)

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	312/315 (99%)	0.12	1 (0%)	94	96	22, 40, 55, 68	0
2	B	401/402 (99%)	0.03	2 (0%)	91	94	20, 35, 49, 62	0
All	All	713/717 (99%)	0.07	3 (0%)	92	95	20, 37, 52, 68	0

All (3) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	423	PHE	4.4
1	A	55	PHE	3.6
2	B	40	VAL	2.1

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

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
5	2C5	B	10	33/33	0.88	0.16	14,28,39,44	0
4	HFP	B	501	20/20	0.93	0.17	18,24,54,55	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
3	ZN	B	500	1/1	0.99	0.17	32,32,32,32	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around 2C5 B 10:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

Electron density around HFP B 501:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

6.5 Other polymers (i)

There are no such residues in this entry.