Full wwPDB X-ray Structure Validation Report (i)

Nov 1, 2023 – 08:13 PM EDT

PDB ID	:	3HOD
Title	:	Crystal structure of the PPARgamma-LBD complexed with a new aryloxy-3 phenylpropanoic acid
Authors	:	Pochetti, G.; Montanari, R.; Mazza, F.; Loiodice, F.; Fracchiolla, G.; Laghezza, A.; Lavecchia, A.; Novellino, E.
Deposited on	:	2009-06-02
Resolution	:	2.10 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 (i) 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 (i)) were used in the production of this report:

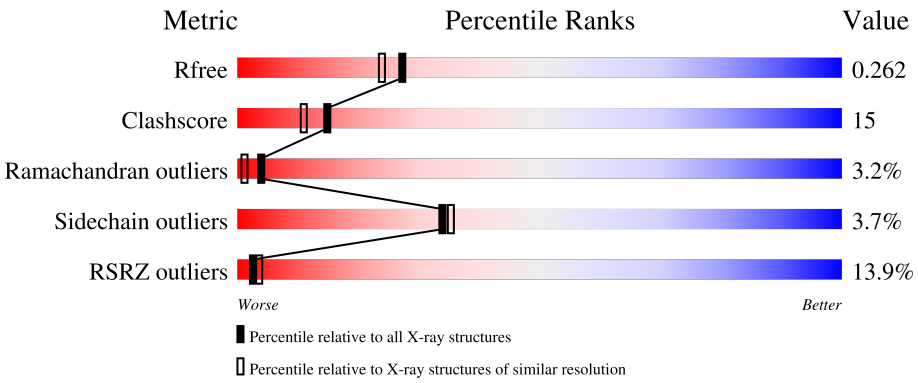
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber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

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.10 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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	286	11% 66% 26% • 6%
1	B	286	14% 72% 20% • 6%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 4521 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.

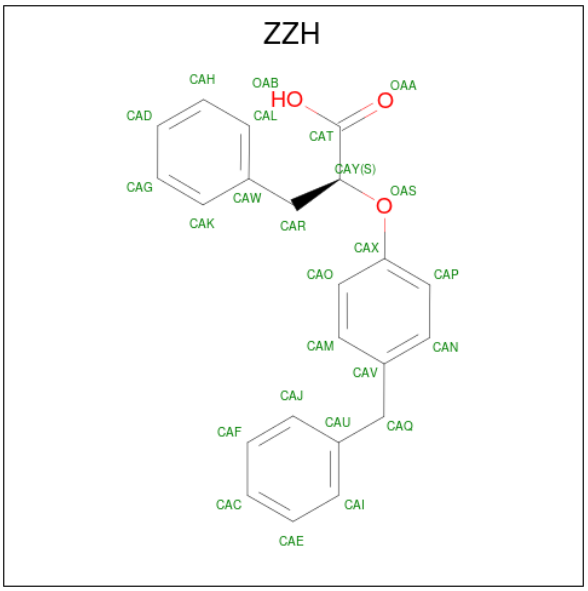
- Molecule 1 is a protein called Peroxisome proliferator-activated receptor gamma.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	270	2165	1397	354	404	10	118	0	0
1	B	270	2165	1397	354	404	10	126	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	191	GLY	-	expression tag	UNP P37231
A	192	SER	-	expression tag	UNP P37231
A	193	HIS	-	expression tag	UNP P37231
A	194	MET	-	expression tag	UNP P37231
B	191	GLY	-	expression tag	UNP P37231
B	192	SER	-	expression tag	UNP P37231
B	193	HIS	-	expression tag	UNP P37231
B	194	MET	-	expression tag	UNP P37231

- Molecule 2 is (2S)-2-(4-benzylphenoxy)-3-phenylpropanoic acid (three-letter code: ZZH) (formula: $C_{22}H_{20}O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	A	1	25	22	3	0	0

- Molecule 3 is water.

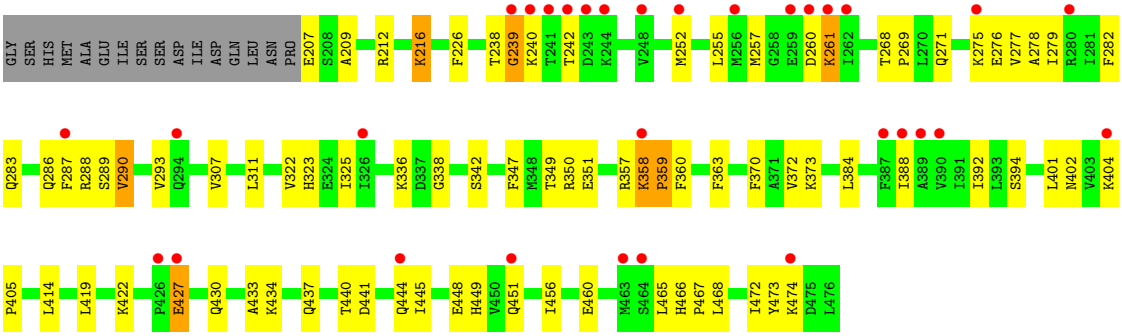
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
3	A	90	90	90	0	0
			Total	O		
3	B	76	76	76	0	0

3 Residue-property plots (i)

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

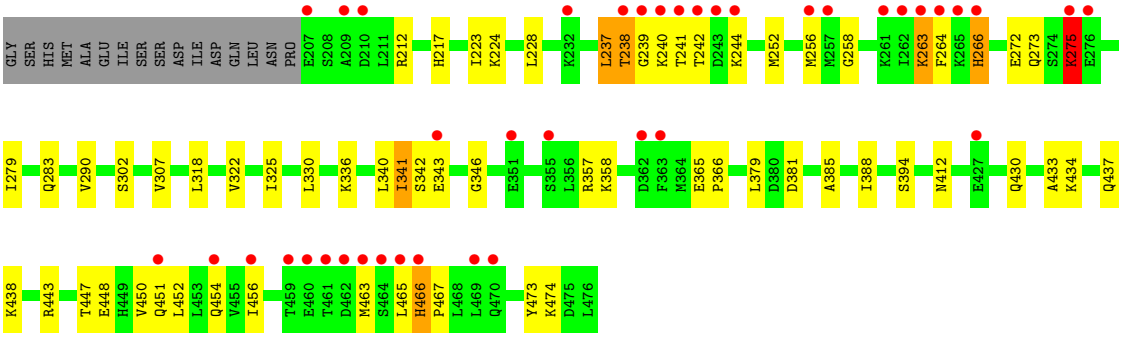
• Molecule 1: Peroxisome proliferator-activated receptor gamma

Chain A:



• Molecule 1: Peroxisome proliferator-activated receptor gamma

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	93.71Å 62.22Å 119.11Å 90.00° 102.83° 90.00°	Depositor
Resolution (Å)	10.00 – 2.10 24.79 – 2.10	Depositor EDS
% Data completeness (in resolution range)	(Not available) (10.00-2.10) 98.5 (24.79-2.10)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.06 (at 2.10Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.262 , 0.290 0.240 , 0.262	Depositor DCC
R_{free} test set	1935 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	40.6	Xtriage
Anisotropy	0.600	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 64.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	4521	wwPDB-VP
Average B, all atoms (Å^2)	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.28% of the height of the origin peak. No significant pseudotranslation is detected.*

[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 (i)

5.1 Standard geometry (i)

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

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	0.36	0/2202	0.56	0/2967
1	B	0.34	0/2202	0.52	0/2967
All	All	0.35	0/4404	0.54	0/5934

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	2165	0	2232	81	0
1	B	2165	0	2232	46	0
2	A	25	0	19	6	0
3	A	90	0	0	3	0
3	B	76	0	0	7	0
All	All	4521	0	4483	127	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 15.

All (127) 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:282:PHE:HB3	2:A:1:ZZH:HAI	1.36	1.02
1:A:226:PHE:HA	3:A:161:HOH:O	1.63	0.98
1:B:325:ILE:HD12	1:B:388:ILE:HG23	1.53	0.90
1:A:437:GLN:O	1:A:440:THR:HG22	1.73	0.88
1:A:370:PHE:HA	1:A:373:LYS:HE2	1.54	0.86
1:A:261:LYS:HD2	1:A:261:LYS:H	1.43	0.84
1:B:451:GLN:O	1:B:454:GLN:HG2	1.79	0.83
1:A:286:GLN:HE22	1:A:465:LEU:HA	1.44	0.82
1:B:275:LYS:HA	1:B:275:LYS:HE3	1.60	0.81
1:B:385:ALA:HB2	3:B:148:HOH:O	1.85	0.76
1:B:465:LEU:C	1:B:467:PRO:HD2	2.05	0.76
1:B:263:LYS:HA	1:B:263:LYS:HE3	1.69	0.73
1:A:283:GLN:OE1	2:A:1:ZZH:HAC	1.91	0.71
1:A:282:PHE:HB3	2:A:1:ZZH:CAI	2.19	0.71
1:A:286:GLN:NE2	1:A:465:LEU:HD12	2.06	0.71
1:A:286:GLN:NE2	1:A:466:HIS:H	1.89	0.70
1:B:212:ARG:HB3	1:B:212:ARG:NH1	2.07	0.70
1:A:276:GLU:CD	1:A:357:ARG:HH21	1.97	0.68
1:B:466:HIS:N	1:B:467:PRO:HD2	2.08	0.67
1:A:473:TYR:O	1:A:474:LYS:HD2	1.95	0.67
1:B:290:VAL:HG21	1:B:473:TYR:CD1	2.30	0.67
1:B:290:VAL:HG21	1:B:473:TYR:HD1	1.61	0.65
1:A:293:VAL:HG22	1:A:322:VAL:HG21	1.80	0.64
1:A:349:THR:HG22	1:A:351:GLU:H	1.64	0.62
1:B:466:HIS:N	1:B:467:PRO:CD	2.63	0.62
1:B:430:GLN:HG3	1:B:433:ALA:HB3	1.82	0.61
1:A:287:PHE:O	1:A:290:VAL:HG13	2.01	0.61
1:B:336:LYS:HG3	3:B:52:HOH:O	2.02	0.60
1:B:264:PHE:CE2	1:B:266:HIS:HB3	2.37	0.60
1:A:325:ILE:HG23	1:A:388:ILE:HD12	1.83	0.59
1:A:448:GLU:HA	1:A:451:GLN:HE21	1.69	0.57
1:A:257:MET:O	1:A:260:ASP:HB3	2.04	0.56
1:B:433:ALA:O	1:B:437:GLN:HG2	2.06	0.56
1:A:433:ALA:O	1:A:437:GLN:HG3	2.06	0.56
1:A:212:ARG:O	1:A:216:LYS:HD3	2.06	0.55
1:A:419:LEU:HA	1:A:422:LYS:CE	2.37	0.55
1:B:217:HIS:HE1	1:B:302:SER:O	1.90	0.55
1:B:452:LEU:O	1:B:456:ILE:HG12	2.06	0.54
1:B:447:THR:O	1:B:450:VAL:HG22	2.08	0.53
1:A:293:VAL:HG11	1:A:468:LEU:HD11	1.90	0.53
1:B:223:ILE:HG22	1:B:224:LYS:HD3	1.89	0.53
1:A:358:LYS:HB2	1:A:359:PRO:HD3	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:237:LEU:HD21	1:B:340:LEU:HG	1.91	0.52
1:B:275:LYS:HA	1:B:275:LYS:CE	2.36	0.52
1:B:343:GLU:O	1:B:343:GLU:HG3	2.09	0.52
1:A:349:THR:HG22	1:A:351:GLU:N	2.23	0.52
1:A:282:PHE:CB	2:A:1:ZZH:HAI	2.24	0.52
1:A:325:ILE:HD11	1:A:392:ILE:CG1	2.40	0.51
1:A:441:ASP:O	1:A:445:ILE:HG13	2.11	0.51
1:A:427:GLU:H	1:A:427:GLU:CD	2.14	0.51
1:A:336:LYS:HE2	1:A:372:VAL:HG11	1.92	0.51
1:A:207:GLU:HG3	1:A:209:ALA:HB3	1.91	0.51
1:A:336:LYS:HE2	1:A:372:VAL:HG21	1.93	0.51
1:A:384:LEU:O	1:A:388:ILE:HG12	2.11	0.50
1:B:325:ILE:CD1	1:B:388:ILE:HG23	2.35	0.50
1:B:341:ILE:HG22	1:B:346:GLY:HA3	1.92	0.50
1:A:277:VAL:HG13	1:A:278:ALA:H	1.77	0.50
1:A:338:GLY:HA3	1:A:347:PHE:CZ	2.48	0.49
1:A:370:PHE:HB2	1:A:445:ILE:HD11	1.93	0.49
1:A:286:GLN:O	1:A:290:VAL:HG12	2.11	0.49
1:A:325:ILE:HD11	1:A:392:ILE:HG13	1.94	0.49
1:A:363:PHE:HE2	1:A:456:ILE:HD11	1.78	0.49
1:A:414:LEU:HD21	3:B:139:HOH:O	2.13	0.49
1:A:419:LEU:HA	1:A:422:LYS:HE3	1.96	0.48
1:B:448:GLU:O	1:B:451:GLN:HB3	2.12	0.48
1:A:293:VAL:HG22	1:A:322:VAL:CG2	2.43	0.48
1:A:363:PHE:CE2	1:A:456:ILE:HD11	2.49	0.47
1:A:238:THR:O	1:A:240:LYS:N	2.46	0.47
1:A:277:VAL:HG13	1:A:278:ALA:N	2.30	0.47
1:B:240:LYS:HG2	1:B:242:THR:HG22	1.96	0.47
1:A:261:LYS:HD2	1:A:261:LYS:N	2.21	0.47
1:A:336:LYS:HD3	1:A:350:ARG:HH12	1.79	0.47
1:B:365:GLU:HB3	3:B:164:HOH:O	2.15	0.47
1:B:381:ASP:O	3:B:148:HOH:O	2.20	0.46
1:A:289:SER:OG	2:A:1:ZZH:HAL	2.15	0.46
1:A:207:GLU:HG3	1:A:209:ALA:H	1.80	0.46
1:A:358:LYS:HB2	1:A:359:PRO:CD	2.46	0.46
1:A:473:TYR:O	1:A:474:LYS:CD	2.62	0.45
1:B:237:LEU:O	1:B:238:THR:C	2.55	0.45
1:A:401:LEU:C	1:A:402:ASN:HD22	2.20	0.45
1:B:434:LYS:O	1:B:437:GLN:HG3	2.16	0.45
1:A:430:GLN:O	1:A:434:LYS:HG2	2.17	0.45
1:B:212:ARG:HH11	1:B:212:ARG:CB	2.31	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:241:THR:O	1:B:241:THR:HG22	2.17	0.44
1:A:252:MET:O	1:A:255:LEU:HB3	2.17	0.44
1:B:237:LEU:HB3	1:B:238:THR:H	1.63	0.44
1:A:419:LEU:HA	1:A:422:LYS:HE2	1.99	0.44
1:A:430:GLN:HG3	1:A:433:ALA:HB3	1.99	0.44
1:A:449:HIS:NE2	2:A:1:ZZH:OAA	2.43	0.44
1:B:244:LYS:O	1:B:244:LYS:HG3	2.18	0.44
1:A:448:GLU:O	1:A:451:GLN:HG2	2.17	0.44
1:B:434:LYS:O	1:B:438:LYS:HD3	2.18	0.44
1:A:336:LYS:HD3	1:A:350:ARG:NH1	2.33	0.43
1:B:212:ARG:NH1	1:B:212:ARG:CB	2.80	0.43
1:A:307:VAL:HG22	3:A:7:HOH:O	2.17	0.43
1:A:336:LYS:NZ	1:A:350:ARG:HH12	2.16	0.43
1:A:440:THR:O	1:A:444:GLN:HG2	2.19	0.43
1:A:370:PHE:O	1:A:373:LYS:HG2	2.17	0.43
1:A:286:GLN:HE22	1:A:465:LEU:HD12	1.80	0.43
1:B:212:ARG:HB3	1:B:212:ARG:CZ	2.48	0.43
1:B:252:MET:O	1:B:256:MET:HG2	2.17	0.43
1:A:287:PHE:O	1:A:290:VAL:CG1	2.67	0.43
1:A:325:ILE:HD13	1:A:388:ILE:HG23	2.01	0.43
1:A:282:PHE:CE1	1:A:360:PHE:HB3	2.53	0.42
1:B:279:ILE:O	1:B:283:GLN:HG3	2.19	0.42
1:A:287:PHE:CD1	1:A:287:PHE:C	2.93	0.42
1:A:336:LYS:CE	1:A:372:VAL:HG21	2.48	0.42
1:B:463:MET:SD	1:B:466:HIS:CD2	3.13	0.42
1:A:207:GLU:CG	1:A:209:ALA:HB3	2.49	0.42
1:A:276:GLU:OE1	1:A:357:ARG:NH2	2.51	0.42
1:B:341:ILE:HG23	1:B:342:SER:N	2.34	0.42
1:A:276:GLU:HG2	1:A:279:ILE:HG12	2.00	0.42
1:B:307:VAL:HG12	3:B:158:HOH:O	2.19	0.42
1:A:322:VAL:HG13	1:A:323:HIS:N	2.35	0.42
1:B:365:GLU:N	1:B:366:PRO:HD2	2.35	0.42
1:A:311:LEU:C	1:A:311:LEU:HD23	2.40	0.42
1:A:239:GLY:O	1:A:242:THR:HG23	2.20	0.41
1:A:286:GLN:HE21	1:A:465:LEU:HD12	1.82	0.41
1:B:430:GLN:NE2	3:B:40:HOH:O	2.53	0.41
1:A:358:LYS:N	1:A:358:LYS:HD3	2.36	0.41
1:A:466:HIS:HA	1:A:467:PRO:HD3	1.94	0.41
1:A:288:ARG:NH2	1:A:342:SER:HA	2.35	0.41
1:A:474:LYS:HG2	3:A:104:HOH:O	2.21	0.41
1:B:237:LEU:O	1:B:239:GLY:N	2.53	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:322:VAL:HG11	1:A:472:ILE:HD13	2.02	0.40
1:B:212:ARG:HH11	1:B:212:ARG:CA	2.34	0.40
1:A:404:LYS:N	1:A:405:PRO:HD2	2.37	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	268/286 (94%)	252 (94%)	9 (3%)	7 (3%)	5 2
1	B	268/286 (94%)	239 (89%)	19 (7%)	10 (4%)	3 1
All	All	536/572 (94%)	491 (92%)	28 (5%)	17 (3%)	4 1

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	237	LEU
1	B	474	LYS
1	A	239	GLY
1	B	266	HIS
1	A	269	PRO
1	A	275	LYS
1	B	238	THR
1	B	394	SER
1	A	358	LYS
1	A	394	SER
1	B	275	LYS
1	B	258	GLY
1	B	272	GLU
1	B	357	ARG
1	A	268	THR

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Mol	Chain	Res	Type
1	A	359	PRO
1	B	466	HIS

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	243/257 (95%)	237 (98%)	6 (2%)	47	52
1	B	243/257 (95%)	231 (95%)	12 (5%)	25	23
All	All	486/514 (95%)	468 (96%)	18 (4%)	34	35

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	216	LYS
1	A	261	LYS
1	A	271	GLN
1	A	290	VAL
1	A	427	GLU
1	A	460	GLU
1	B	228	LEU
1	B	263	LYS
1	B	273	GLN
1	B	275	LYS
1	B	318	LEU
1	B	322	VAL
1	B	330	LEU
1	B	341	ILE
1	B	358	LYS
1	B	379	LEU
1	B	412	ASN
1	B	443	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	286	GLN
1	A	308	ASN
1	A	314	GLN
1	A	402	ASN
1	A	410	GLN
1	A	430	GLN
1	A	451	GLN
1	A	454	GLN
1	A	470	GLN
1	B	217	HIS
1	B	253	ASN
1	B	410	GLN
1	B	412	ASN
1	B	415	GLN
1	B	430	GLN
1	B	444	GLN
1	B	449	HIS
1	B	451	GLN
1	B	466	HIS
1	B	470	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

1 ligand is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond

length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	ZZH	A	1	-	27,27,27	0.75	1 (3%)	33,35,35	1.04	2 (6%)

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	ZZH	A	1	-	-	0/16/16/16	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1	ZZH	CAQ-CAV	-2.07	1.45	1.52

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	1	ZZH	CAX-OAS-CAY	-2.97	116.38	118.77
2	A	1	ZZH	CAR-CAY-CAT	-2.04	105.68	110.23

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

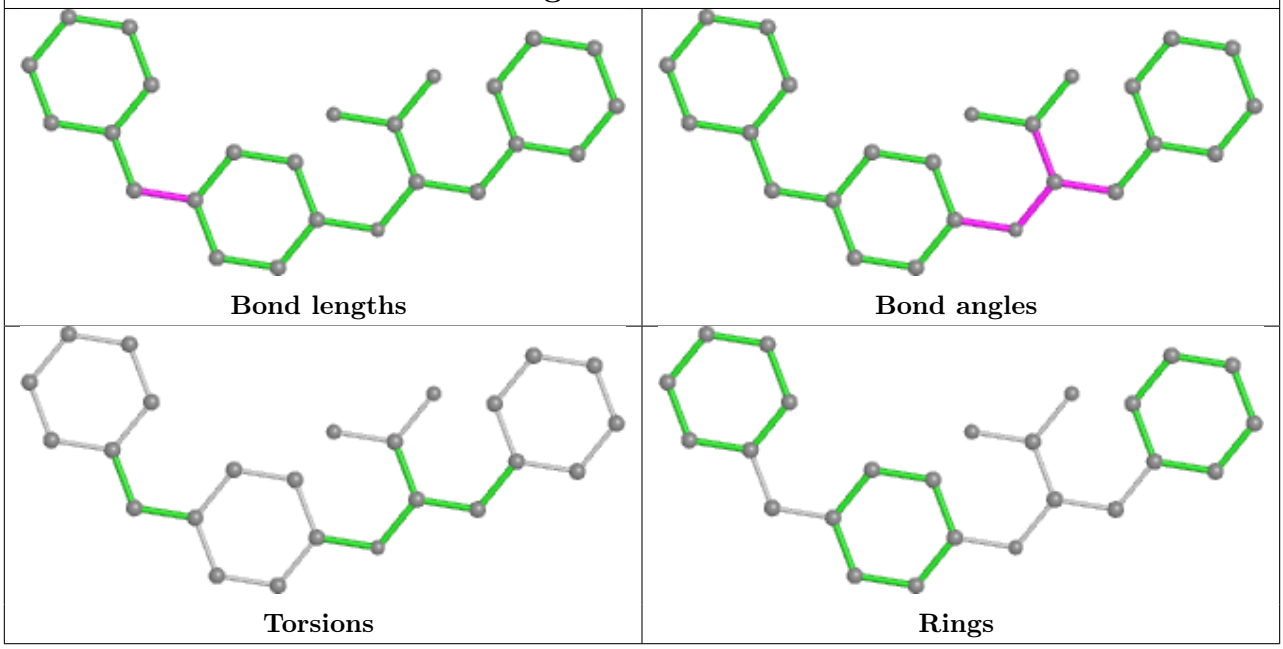
1 monomer is involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1	ZZH	6	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 ZZH A 1



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data (i)

6.1 Protein, DNA and RNA chains (i)

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	256/286 (89%)	0.67	31 (12%)	4	5	24, 42, 75, 99	0
1	B	256/286 (89%)	1.00	40 (15%)	2	2	23, 45, 100, 100	2 (0%)
All	All	512/572 (89%)	0.83	71 (13%)	2	3	23, 44, 96, 100	2 (0%)

All (71) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	465	LEU	15.4
1	B	238	THR	10.2
1	B	463	MET	9.9
1	B	242	THR	8.8
1	B	462	ASP	7.3
1	A	240	LYS	7.3
1	B	241	THR	7.2
1	A	239	GLY	7.0
1	B	461	THR	6.3
1	B	257	MET	6.1
1	B	464	SER	6.1
1	B	264	PHE	5.7
1	B	266	HIS	5.6
1	A	243	ASP	4.7
1	B	263	LYS	4.6
1	A	260	ASP	4.3
1	B	261	LYS	4.3
1	B	451	GLN	4.3
1	B	363	PHE	4.2
1	B	276	GLU	3.9
1	A	242	THR	3.8
1	B	209	ALA	3.6
1	B	243	ASP	3.5
1	A	358	LYS	3.5

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Mol	Chain	Res	Type	RSRZ
1	A	241	THR	3.5
1	B	466	HIS	3.5
1	A	244	LYS	3.5
1	B	256	MET	3.3
1	A	252	MET	3.3
1	B	207	GLU	3.2
1	B	262	ILE	3.2
1	A	426	PRO	3.1
1	A	256	MET	3.1
1	A	262	ILE	2.9
1	B	275	LYS	2.9
1	B	355	SER	2.8
1	A	404	LYS	2.8
1	A	287	PHE	2.8
1	B	239	GLY	2.7
1	A	464	SER	2.7
1	B	244	LYS	2.7
1	A	387	PHE	2.6
1	A	259	GLU	2.6
1	B	456	ILE	2.6
1	B	470	GLN	2.6
1	A	326	ILE	2.6
1	B	240	LYS	2.5
1	B	460	GLU	2.5
1	B	454	GLN	2.5
1	B	427	GLU	2.5
1	A	444	GLN	2.4
1	B	469	LEU	2.4
1	B	459	THR	2.3
1	B	265	LYS	2.3
1	A	389	ALA	2.3
1	A	388	ILE	2.3
1	B	351	GLU	2.2
1	A	451	GLN	2.2
1	B	362	ASP	2.2
1	A	275	LYS	2.2
1	A	294	GLN	2.2
1	A	261	LYS	2.2
1	B	232	LYS	2.2
1	A	427	GLU	2.2
1	A	280	ARG	2.2
1	B	343	GLU	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	463	MET	2.1
1	B	210	ASP	2.0
1	A	248	VAL	2.0
1	A	474	LYS	2.0
1	A	390	VAL	2.0

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

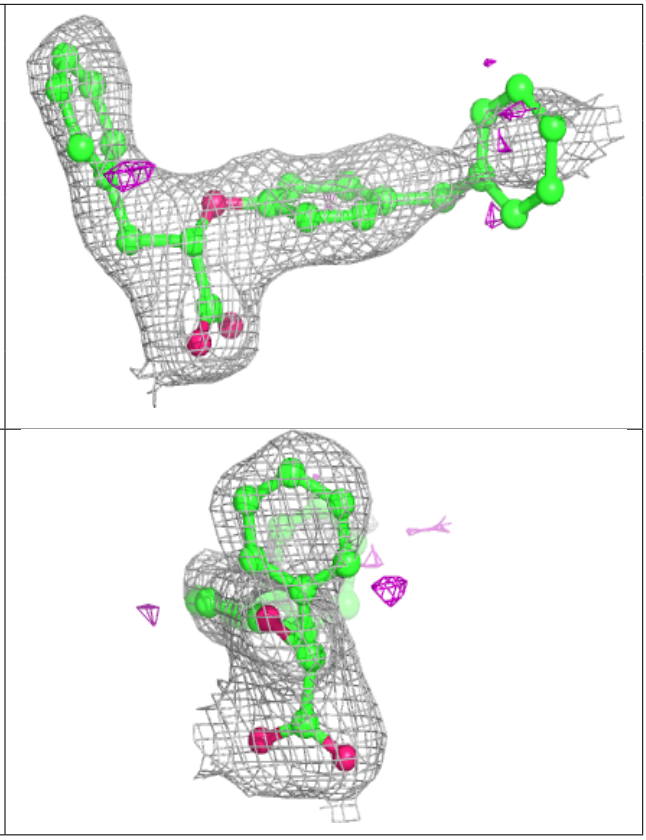
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	ZZH	A	1	25/25	0.74	0.29	60,63,71,71	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 ZZH A 1:

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



6.5 Other polymers (i)

There are no such residues in this entry.