



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 05:31 PM UTC

PDB ID : 4GAA / pdb_00004gaa
Title : Structure of Leukotriene A4 hydrolase from *Xenopus laevis* complexed with inhibitor bestatin
Authors : Stsiapanava, A.; Kumar, R.B.; Haeggstrom, J.Z.; Rinaldo-Matthis, A.
Deposited on : 2012-07-25
Resolution : 2.26 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
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
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

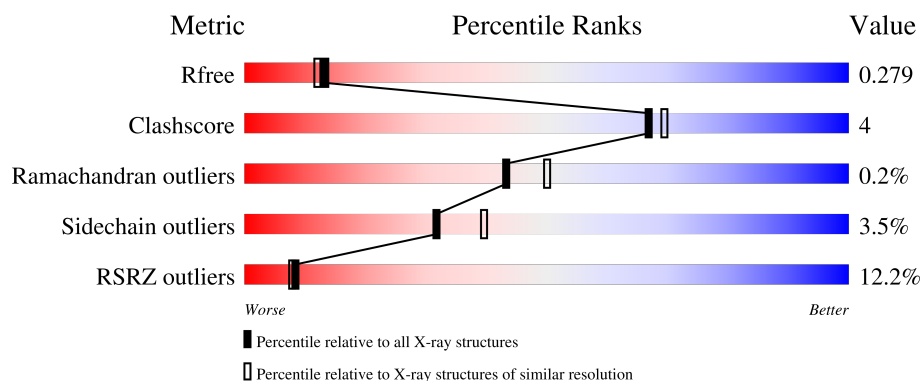
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.26 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	1898 (2.26-2.26)
Clashscore	190562	2005 (2.26-2.26)
Ramachandran outliers	187476	1965 (2.26-2.26)
Sidechain outliers	187428	1966 (2.26-2.26)
RSRZ outliers	180081	1898 (2.26-2.26)

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	609	6% 87% 11% .
1	B	609	18% 84% 15% ..

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 9859 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.

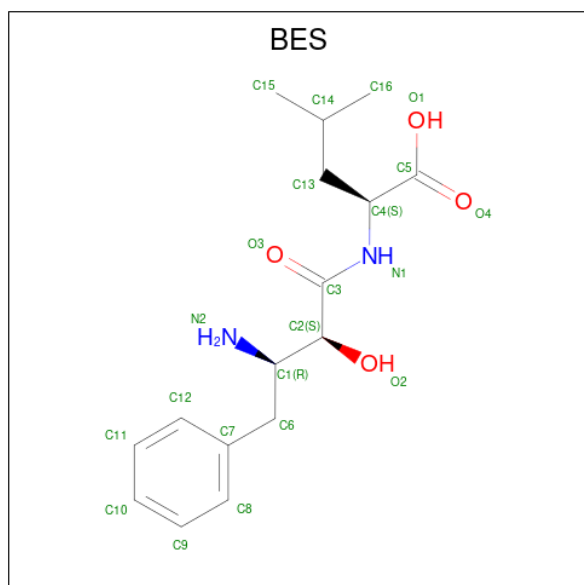
- Molecule 1 is a protein called MGC78867 protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	606	Total	C	N	O	S	0	2	0
			4861	3136	807	898	20			
1	B	605	Total	C	N	O	S	0	2	0
			4857	3133	807	897	20			

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Zn	0	0
			1	1		
2	B	1	Total	Zn	0	0
			1	1		

- Molecule 3 is 2-(3-AMINO-2-HYDROXY-4-PHENYL-BUTYRYLAMINO)-4-METHYL-PENTANOIC ACID (CCD ID: BES) (formula: C₁₆H₂₄N₂O₄).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			22	16	2	4		
3	B	1	Total	C	N	O	0	0
			22	16	2	4		

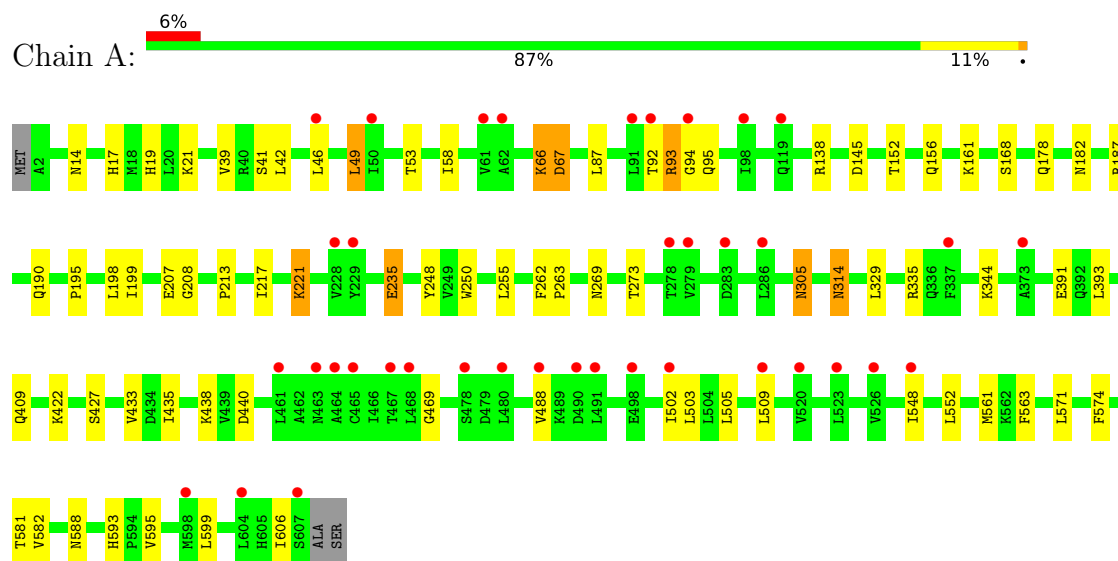
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	57	Total	O	0	1
			58	58		
4	B	36	Total	O	0	1
			37	37		

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: MGC78867 protein



• Molecule 1: MGC78867 protein



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	222.12Å 52.17Å 109.90Å 90.00° 111.58° 90.00°	Depositor
Resolution (Å)	29.30 – 2.26 29.30 – 2.26	Depositor EDS
% Data completeness (in resolution range)	97.3 (29.30-2.26) 97.3 (29.30-2.26)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.64 (at 2.26Å)	Xtriage
Refinement program	BUSTER 2.11.2	Depositor
R, R_{free}	0.222 , 0.250 0.242 , 0.279	Depositor DCC
R_{free} test set	2726 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å ²)	39.6	Xtriage
Anisotropy	0.187	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 78.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	9859	wwPDB-VP
Average B, all atoms (Å ²)	89.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.04% 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: BES, ZN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.83	1/4991 (0.0%)	1.27	13/6776 (0.2%)
1	B	0.82	0/4987	1.27	15/6771 (0.2%)
All	All	0.83	1/9978 (0.0%)	1.27	28/13547 (0.2%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	548	ILE	CA-CB	5.19	1.56	1.54

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	588	ASN	CA-C-N	6.54	129.33	120.38
1	B	588	ASN	C-N-CA	6.54	129.33	120.38
1	B	528	ASN	CA-C-N	6.45	129.21	120.38
1	B	528	ASN	C-N-CA	6.45	129.21	120.38
1	B	305	ASN	CA-CB-CG	6.19	118.79	112.60
1	A	588	ASN	CA-C-N	5.93	128.51	120.38
1	A	588	ASN	C-N-CA	5.93	128.51	120.38
1	A	488	VAL	CA-C-N	5.92	128.48	120.38
1	A	488	VAL	C-N-CA	5.92	128.48	120.38
1	B	525	ASP	CA-CB-CG	5.90	118.50	112.60
1	A	440	ASP	CA-CB-CG	5.66	118.26	112.60
1	A	305	ASN	CA-CB-CG	5.50	118.10	112.60
1	A	563	PHE	CA-CB-CG	5.47	119.27	113.80
1	B	604	LEU	CA-C-N	5.36	131.78	121.54
1	B	604	LEU	C-N-CA	5.36	131.78	121.54
1	B	440	ASP	CA-CB-CG	5.34	117.94	112.60
1	B	574	PHE	CA-C-N	5.31	128.78	120.82
1	B	574	PHE	C-N-CA	5.31	128.78	120.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	574	PHE	CA-C-N	5.26	128.71	120.82
1	A	574	PHE	C-N-CA	5.26	128.71	120.82
1	A	66	LYS	CA-C-N	5.18	131.43	121.54
1	A	66	LYS	C-N-CA	5.18	131.43	121.54
1	B	563	PHE	CA-CB-CG	5.17	118.97	113.80
1	A	14	ASN	CA-CB-CG	5.13	117.73	112.60
1	B	211	VAL	N-CA-C	-5.11	108.30	113.20
1	B	63	VAL	CA-C-N	5.08	129.33	122.07
1	B	63	VAL	C-N-CA	5.08	129.33	122.07
1	A	314	ASN	CA-CB-CG	5.06	117.66	112.60

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	4861	0	4862	34	0
1	B	4857	0	4855	40	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	22	0	23	0	0
3	B	22	0	22	0	0
4	A	58	0	0	0	0
4	B	37	0	0	0	0
All	All	9859	0	9762	73	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 (73) 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:B:571:LEU:HB3	1:B:581:THR:HG21	1.65	0.77
1:A:571:LEU:HB3	1:A:581:THR:HG21	1.64	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:312:TRP:HE1	1:B:418:THR:CG2	2.04	0.71
1:B:52:ASP:HB3	1:B:138:ARG:HG2	1.75	0.67
1:A:161:LYS:HE3	1:A:182:ASN:HA	1.77	0.65
1:B:312:TRP:HE1	1:B:418:THR:HG21	1.62	0.64
1:B:158:SER:HB3	1:B:183:ARG:HD2	1.84	0.59
1:B:195:PRO:HD2	1:B:198:LEU:HD12	1.85	0.59
1:B:159:VAL:HG11	1:B:165:ALA:HB2	1.86	0.57
1:A:195:PRO:HD2	1:A:198:LEU:HD12	1.87	0.56
1:B:310:ASN:OD1	1:B:418:THR:HG23	2.07	0.55
1:A:469:GLY:HA3	1:A:502:ILE:HD11	1.89	0.55
1:A:41:SER:O	1:A:94:GLY:HA2	2.07	0.55
1:B:335:ARG:NH2	1:B:391:GLU:OE1	2.39	0.55
1:A:335:ARG:NH2	1:A:391:GLU:OE1	2.41	0.54
1:A:138:ARG:HH21	1:A:145:ASP:HB3	1.72	0.54
1:B:532:ARG:HH22	1:B:550:LEU:HD22	1.72	0.54
1:B:267:MET:HB3	1:B:274:PHE:HB2	1.90	0.54
1:A:344:LYS:HD2	1:A:502:ILE:HG22	1.88	0.53
1:B:503:LEU:HD22	1:B:509:LEU:HD11	1.91	0.53
1:A:582:VAL:HG13	1:A:606:ILE:HD11	1.91	0.52
1:A:503:LEU:HD22	1:A:509:LEU:HD11	1.90	0.52
1:A:49:LEU:HD13	1:A:87:LEU:HD11	1.91	0.51
1:A:17:HIS:HD1	1:A:152:THR:HG22	1.77	0.50
1:B:312:TRP:HE1	1:B:418:THR:HG22	1.76	0.50
1:A:409[B]:GLN:CD	1:B:409:GLN:HG2	2.37	0.49
1:B:213:PRO:HD2	1:B:235:GLU:HG3	1.95	0.49
1:A:213:PRO:HD2	1:A:235:GLU:HG3	1.94	0.48
1:B:234:THR:HG21	1:B:255:LEU:HD11	1.94	0.48
1:B:39:VAL:HG11	1:B:49:LEU:HD11	1.96	0.47
1:B:24:VAL:HG12	1:B:31:ILE:HG12	1.97	0.47
1:B:593:HIS:ND1	1:B:594:PRO:HD2	2.30	0.47
1:A:39:VAL:HG11	1:A:49:LEU:HD11	1.96	0.47
1:B:601:ALA:HA	1:B:606:ILE:HD13	1.97	0.46
1:A:92:THR:O	1:A:95:GLN:HB2	2.16	0.46
1:B:234:THR:HG22	1:B:290:ILE:HG21	1.98	0.46
1:A:156:GLN:HG2	1:A:187:ARG:HG2	1.97	0.46
1:B:219:THR:HG23	1:B:257:ILE:HB	1.97	0.45
1:A:42:LEU:C	1:A:93:ARG:HG3	2.41	0.45
1:B:20:LEU:HD23	1:B:35:THR:HG23	1.99	0.44
1:B:344:LYS:HA	1:B:347:GLN:HG2	1.99	0.44
1:A:207:GLU:HG3	1:A:221:LYS:HG3	1.99	0.44
1:A:53:THR:HG21	1:A:58:ILE:HD11	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:262:PHE:CD1	1:A:263:PRO:HD2	2.53	0.44
1:A:255:LEU:HD23	1:A:273:THR:HB	2.00	0.43
1:A:152:THR:HG23	1:A:190:GLN:O	2.19	0.43
1:B:69:THR:HG23	1:B:86:THR:HG23	1.99	0.43
1:B:262:PHE:CD1	1:B:263:PRO:HD2	2.54	0.43
1:A:248:TYR:CZ	1:A:250:TRP:HB2	2.53	0.43
1:B:168:SER:HB3	1:B:269:ASN:HB3	2.01	0.43
1:A:593:HIS:CE1	1:A:595:VAL:HG23	2.54	0.43
1:A:66:LYS:O	1:A:67:ASP:HB2	2.17	0.43
1:A:208:GLY:HA2	1:A:217:ILE:O	2.19	0.43
1:A:593:HIS:HE1	1:A:595:VAL:HG23	1.84	0.43
1:A:17:HIS:ND1	1:A:152:THR:HG22	2.34	0.42
1:B:552:LEU:HD21	1:B:581:THR:HG22	2.01	0.42
1:B:255:LEU:HD23	1:B:273:THR:HB	2.01	0.42
1:B:394:LEU:HD13	1:B:429:PHE:CE1	2.54	0.42
1:B:536:LEU:HD13	1:B:551:ALA:HA	2.02	0.42
1:A:19:HIS:ND1	1:A:21:LYS:HE2	2.35	0.41
1:B:436:LEU:O	1:B:439:VAL:HG13	2.21	0.41
1:B:568:TYR:CZ	1:B:585:PHE:HD1	2.38	0.41
1:B:53:THR:HG21	1:B:58:ILE:HD11	2.01	0.41
1:B:544:TRP:O	1:B:547:VAL:HG12	2.21	0.41
1:A:561:MET:SD	1:A:599:LEU:HD12	2.60	0.41
1:A:168:SER:HB3	1:A:269:ASN:HB3	2.03	0.41
1:B:159:VAL:O	1:B:184:LYS:N	2.54	0.41
1:B:299:THR:HG21	1:B:317:HIS:HB3	2.03	0.41
1:B:14:ASN:HB3	1:B:16:LYS:HE2	2.02	0.41
1:B:278:THR:HG22	1:B:558:GLN:HG2	2.03	0.41
1:A:435:ILE:HA	1:A:438:LYS:HD2	2.03	0.41
1:A:552:LEU:HD21	1:A:581:THR:HG22	2.02	0.40
1:B:278:THR:HG22	1:B:558:GLN:HE21	1.87	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	606/609 (100%)	581 (96%)	23 (4%)	2 (0%)	36	40
1	B	605/609 (99%)	584 (96%)	20 (3%)	1 (0%)	43	50
All	All	1211/1218 (99%)	1165 (96%)	43 (4%)	3 (0%)	43	50

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	67	ASP
1	A	221	LYS
1	B	268	GLU

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	538/538 (100%)	524 (97%)	14 (3%)	40	50
1	B	537/538 (100%)	513 (96%)	24 (4%)	24	29
All	All	1075/1076 (100%)	1037 (96%)	38 (4%)	32	39

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	46	LEU
1	A	49	LEU
1	A	93	ARG
1	A	178	GLN
1	A	199	ILE
1	A	235	GLU
1	A	305	ASN
1	A	314	ASN
1	A	329	LEU
1	A	393	LEU

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Mol	Chain	Res	Type
1	A	422	LYS
1	A	427	SER
1	A	433	VAL
1	A	505	LEU
1	B	14	ASN
1	B	44	ASP
1	B	49	LEU
1	B	63	VAL
1	B	67	ASP
1	B	91	LEU
1	B	100	GLU
1	B	162	GLU
1	B	175	LEU
1	B	182	ASN
1	B	209	ARG
1	B	219	THR
1	B	220	GLU
1	B	235	GLU
1	B	252	GLN
1	B	305	ASN
1	B	356	THR
1	B	393	LEU
1	B	419	GLU
1	B	422	LYS
1	B	439	VAL
1	B	466	ILE
1	B	592	MET
1	B	597	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	113	GLN
1	A	252	GLN
1	A	269	ASN
1	A	314	ASN
1	A	347	GLN
1	A	361	ASN
1	A	522	ASN
1	A	528	ASN
1	A	583	ASN
1	B	113	GLN

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Mol	Chain	Res	Type
1	B	116	ASN
1	B	119	GLN
1	B	136	HIS
1	B	361	ASN
1	B	367	HIS
1	B	409	GLN
1	B	494	HIS
1	B	522	ASN
1	B	558	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 4 ligands modelled in this entry, 2 are 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	$\# Z > 2$
3	BES	A	702	2	22,22,22	0.91	0	26,29,29	1.30	4 (15%)
3	BES	B	702	2	22,22,22	0.79	0	26,29,29	0.87	1 (3%)

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
3	BES	A	702	2	-	4/24/24/24	0/1/1/1
3	BES	B	702	2	-	5/24/24/24	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($^{\circ}$)	Ideal($^{\circ}$)
3	A	702	BES	C13-C4-N1	-3.30	103.14	110.58
3	A	702	BES	C2-C3-N1	-2.68	112.60	116.22
3	A	702	BES	C4-N1-C3	2.50	127.02	121.65
3	B	702	BES	C13-C4-N1	-2.43	105.09	110.58
3	A	702	BES	O2-C2-C1	2.41	114.60	109.64

There are no chirality outliers.

All (9) torsion outliers are listed below:

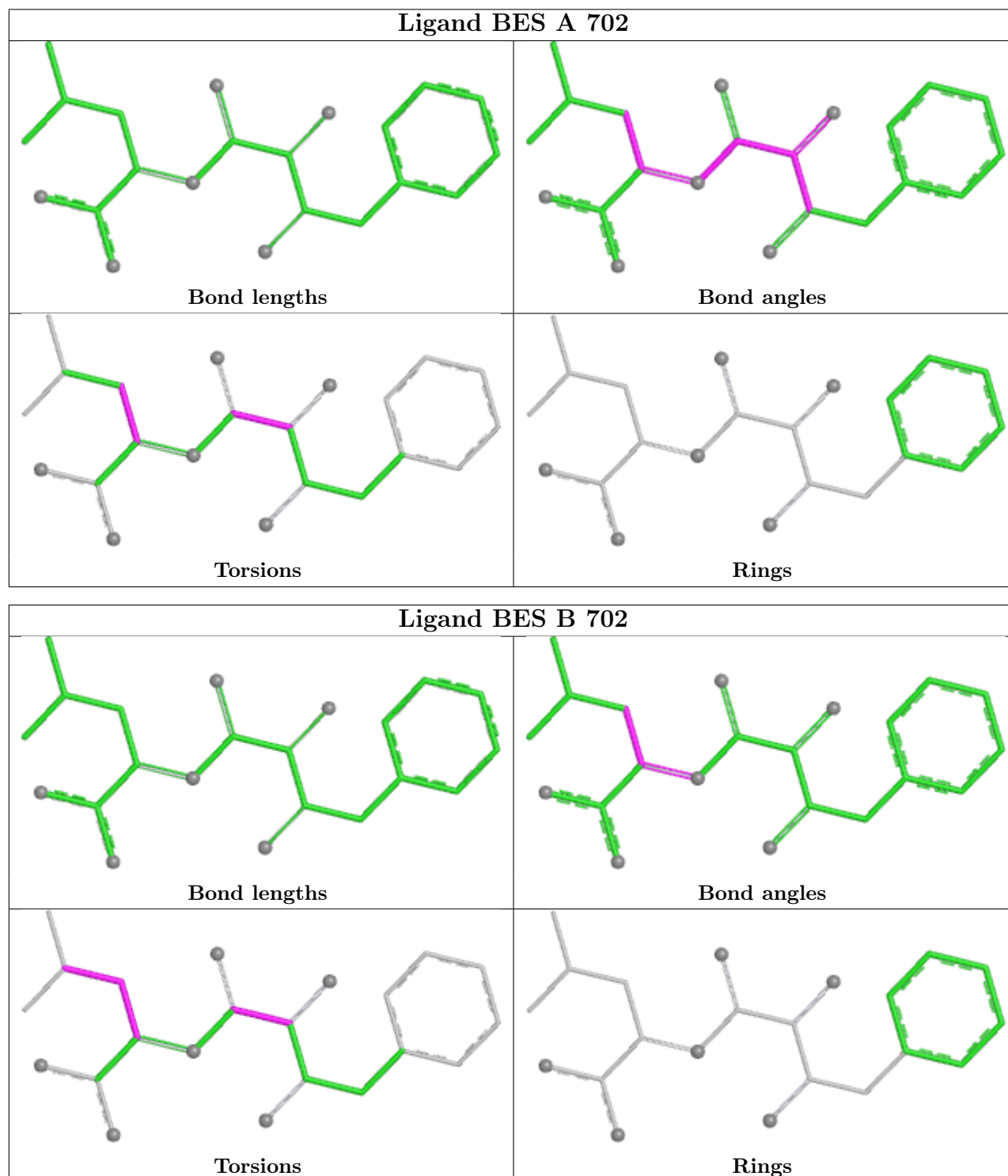
Mol	Chain	Res	Type	Atoms
3	A	702	BES	O2-C2-C3-N1
3	B	702	BES	C14-C13-C4-C5
3	B	702	BES	C14-C13-C4-N1
3	A	702	BES	C14-C13-C4-C5
3	A	702	BES	O2-C2-C3-O3
3	A	702	BES	C14-C13-C4-N1
3	B	702	BES	O2-C2-C3-N1
3	B	702	BES	C4-C13-C14-C15
3	B	702	BES	O2-C2-C3-O3

There are no ring outliers.

No monomer is involved in short contacts.

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 than 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.



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	606/609 (99%)	0.54	38 (6%)	26 24	24, 74, 127, 141	2 (0%)
1	B	605/609 (99%)	1.00	110 (18%)	3 3	36, 105, 164, 185	2 (0%)
All	All	1211/1218 (99%)	0.77	148 (12%)	8 8	24, 83, 156, 185	4 (0%)

All (148) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	126	PRO	4.9
1	B	157	VAL	4.4
1	B	175	LEU	4.2
1	B	127	TYR	4.0
1	B	121	ALA	3.9
1	B	115	LEU	3.8
1	B	110	SER	3.7
1	B	26	PHE	3.6
1	B	71	ALA	3.6
1	B	259	PRO	3.6
1	B	595	VAL	3.6
1	A	229	TYR	3.5
1	B	165	ALA	3.5
1	A	98	ILE	3.5
1	B	72	LEU	3.5
1	A	467	THR	3.4
1	B	129	PHE	3.4
1	B	82	PRO	3.4
1	B	86	THR	3.4
1	A	491	LEU	3.3
1	B	112	LEU	3.3
1	B	201	LEU	3.3
1	B	122	GLY	3.3
1	B	219	THR	3.3

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Mol	Chain	Res	Type	RSRZ
1	A	464	ALA	3.2
1	B	63	VAL	3.3
1	B	176	SER	3.1
1	B	371	VAL	3.1
1	B	606	ILE	3.1
1	B	69	THR	3.1
1	B	22	LEU	3.1
1	A	607	SER	3.0
1	B	128	LEU	3.0
1	B	202	VAL	3.0
1	B	604	LEU	3.0
1	B	179	SER	3.0
1	A	94	GLY	3.0
1	A	50	ILE	2.9
1	A	92	THR	2.9
1	A	278	THR	2.9
1	B	601	ALA	2.9
1	B	59	LYS	2.9
1	A	478	SER	2.9
1	B	585	PHE	2.9
1	B	596	THR	2.9
1	A	461	LEU	2.8
1	A	520	VAL	2.8
1	B	275	VAL	2.8
1	B	203	VAL	2.8
1	A	502	ILE	2.8
1	B	185	ILE	2.8
1	B	186	TYR	2.8
1	A	228	VAL	2.8
1	B	181	SER	2.7
1	A	468	LEU	2.7
1	B	163	LEU	2.7
1	B	599	LEU	2.7
1	A	526	VAL	2.7
1	B	53	THR	2.7
1	B	98	ILE	2.7
1	B	88	PRO	2.7
1	B	600	VAL	2.7
1	B	83	LEU	2.7
1	B	73	GLY	2.7
1	B	218	TRP	2.7
1	B	62	ALA	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	509	LEU	2.6
1	B	260	PRO	2.6
1	A	286	LEU	2.6
1	B	47	ALA	2.6
1	B	120	THR	2.6
1	B	117	LYS	2.6
1	B	46	LEU	2.6
1	B	586	LEU	2.6
1	B	2	ALA	2.6
1	B	200	ALA	2.6
1	B	31	ILE	2.6
1	B	101	ILE	2.6
1	B	143	CYS	2.5
1	B	205	ALA	2.5
1	B	7	PHE	2.5
1	B	106	SER	2.5
1	A	463	ASN	2.5
1	B	123	LYS	2.5
1	B	141	ILE	2.4
1	B	369	VAL	2.4
1	B	77	SER	2.4
1	A	91	LEU	2.4
1	A	373	ALA	2.4
1	A	279	VAL	2.4
1	A	465	CYS	2.4
1	B	97	VAL	2.4
1	B	160	PRO	2.3
1	B	27	THR	2.3
1	B	35	THR	2.3
1	B	124	ILE	2.3
1	B	159	VAL	2.3
1	B	67	ASP	2.3
1	B	58	ILE	2.3
1	B	206	LEU	2.3
1	B	603	ASP	2.3
1	B	87	LEU	2.3
1	A	283	ASP	2.3
1	B	173	GLY	2.3
1	A	480	LEU	2.2
1	B	224	LEU	2.2
1	B	505	LEU	2.2
1	B	64	ASN	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	581	THR	2.2
1	A	548	ILE	2.2
1	B	435	ILE	2.2
1	A	498	GLU	2.2
1	B	81	THR	2.2
1	B	568	TYR	2.2
1	B	140	ILE	2.2
1	A	604	LEU	2.2
1	B	61	VAL	2.2
1	B	182	ASN	2.2
1	B	559	GLY	2.2
1	B	216	THR	2.2
1	B	373	ALA	2.2
1	B	551	ALA	2.2
1	B	158	SER	2.2
1	B	28	SER	2.1
1	B	37	LEU	2.1
1	B	257	ILE	2.1
1	B	272	LEU	2.1
1	A	490	ASP	2.1
1	B	213	PRO	2.1
1	A	598	MET	2.1
1	A	61	VAL	2.1
1	A	62	ALA	2.1
1	B	592	MET	2.1
1	A	523	LEU	2.1
1	B	549	PRO	2.1
1	B	308	TRP	2.1
1	B	184	LYS	2.0
1	B	9	SER	2.0
1	B	55	ASP	2.0
1	B	56	LEU	2.0
1	A	488	VAL	2.0
1	A	337	PHE	2.0
1	B	114	TRP	2.0
1	A	119	GLN	2.0
1	A	46	LEU	2.0
1	B	51	LEU	2.0
1	B	255	LEU	2.0
1	B	571	LEU	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 oligosaccharides in this entry.

6.4 Ligands [i](#)

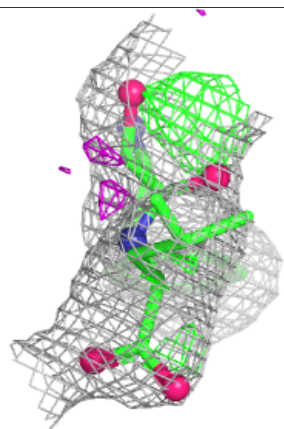
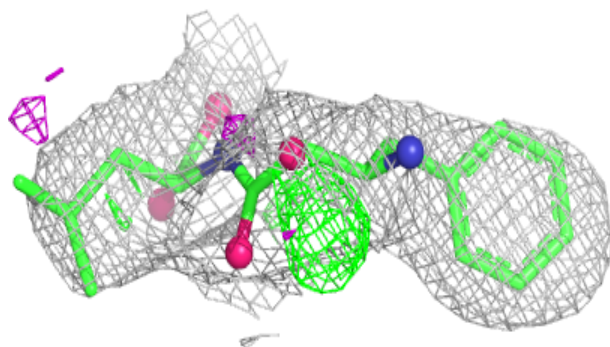
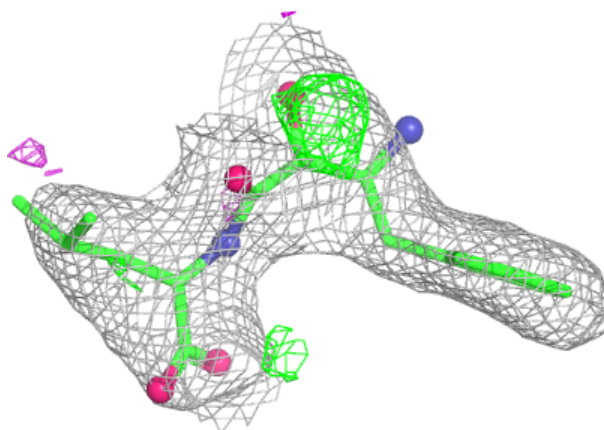
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	BES	B	702	22/22	0.82	0.16	48,66,76,78	0
3	BES	A	702	22/22	0.89	0.13	33,48,63,65	0
2	ZN	A	701	1/1	0.95	0.05	44,44,44,44	0
2	ZN	B	701	1/1	0.97	0.04	55,55,55,55	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.

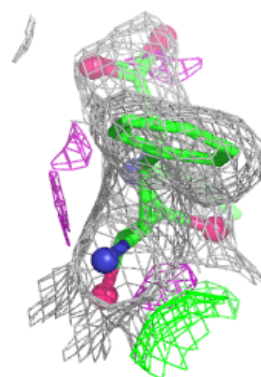
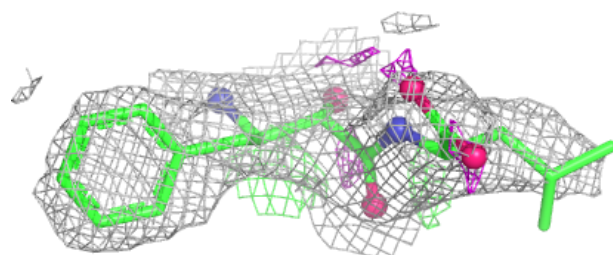
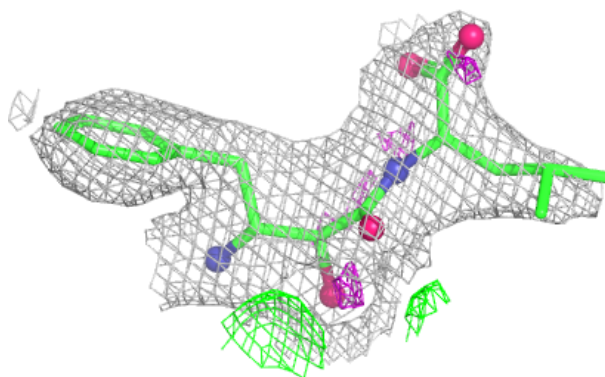
Electron density around BES B 702:

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



Electron density around BES A 702:

$2mF_o-DF_c$ (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.