



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 07:52 AM UTC

PDB ID : 3D52 / pdb_00003d52
Title : GOLGI MANNOSIDASE II complex with an N-aryl carbamate derivative of
gluco-hydroxyiminolactam
Authors : Kuntz, D.A.; Tarling, C.A.; Withers, S.G.; Rose, D.R.
Deposited on : 2008-05-15
Resolution : 1.60 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

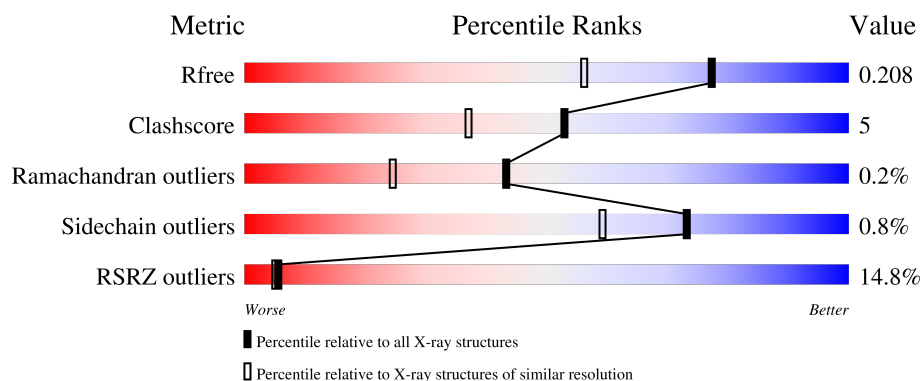
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.60 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	4673 (1.60-1.60)
Clashscore	190562	4931 (1.60-1.60)
Ramachandran outliers	187476	4831 (1.60-1.60)
Sidechain outliers	187428	4830 (1.60-1.60)
RSRZ outliers	180081	4672 (1.60-1.60)

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	1045	14% 88% 8% .

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 9128 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 Alpha-mannosidase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	1016	Total	C	N	O	S	0	2	0
			8209	5218	1440	1511	40			

There are 13 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	ARG	-	expression tag	UNP Q24451
A	2	SER	-	expression tag	UNP Q24451
A	3	SER	-	expression tag	UNP Q24451
A	4	HIS	-	expression tag	UNP Q24451
A	5	HIS	-	expression tag	UNP Q24451
A	6	HIS	-	expression tag	UNP Q24451
A	7	HIS	-	expression tag	UNP Q24451
A	8	HIS	-	expression tag	UNP Q24451
A	9	HIS	-	expression tag	UNP Q24451
A	10	GLY	-	expression tag	UNP Q24451
A	11	GLU	-	expression tag	UNP Q24451
A	12	PHE	-	expression tag	UNP Q24451
A	907	LYS	GLU	SEE REMARK 999	UNP Q24451

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

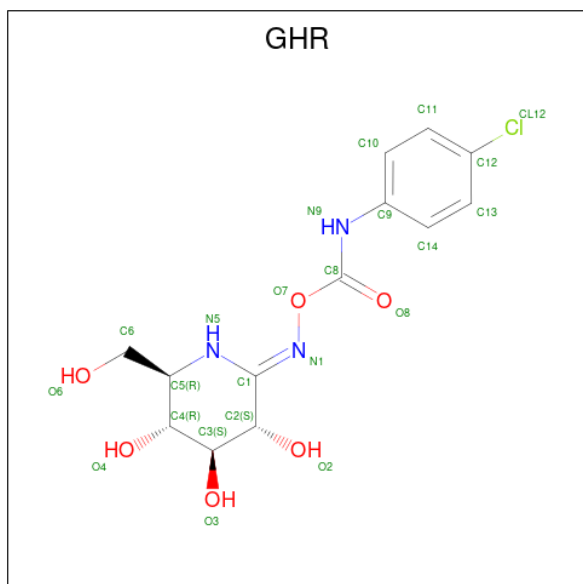
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Zn	0	0
			1	1		

- Molecule 3 is (4R)-2-METHYLPENTANE-2,4-DIOL (CCD ID: MRD) (formula: C₆H₁₄O₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	O		0	0
			8	6	2			

- Molecule 4 is [[(3S,4S,5R,6R)-3,4,5-trihydroxy-6-(hydroxymethyl)piperidin-2-ylidene]amino] N-(4-chlorophenyl)carbamate (CCD ID: GHR) (formula: $C_{13}H_{16}ClN_3O_6$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	Cl	N	O	0	1
			35	20	2	5	8		

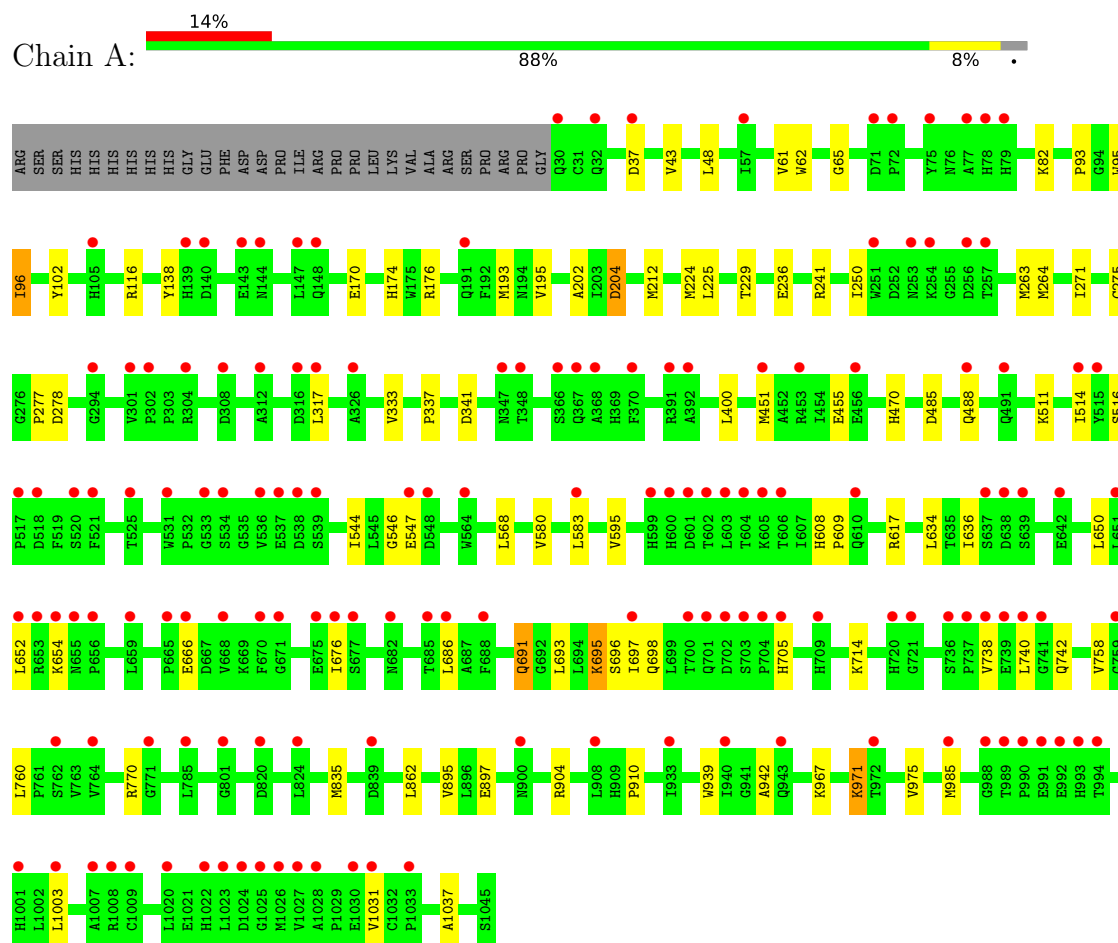
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	874	Total 875	O 875	0	1

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: Alpha-mannosidase 2



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	68.58Å 107.91Å 137.06Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.72 – 1.60 19.72 – 1.60	Depositor EDS
% Data completeness (in resolution range)	97.5 (19.72-1.60) 97.5 (19.72-1.60)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	6.51 (at 1.60Å)	Xtriage
Refinement program	REFMAC, CNS	Depositor
R, R_{free}	0.228 , 0.240 0.209 , 0.208	Depositor DCC
R_{free} test set	1930 reflections (1.44%)	wwPDB-VP
Wilson B-factor (Å ²)	17.1	Xtriage
Anisotropy	0.021	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.50 , 77.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	9128	wwPDB-VP
Average B, all atoms (Å ²)	17.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.26% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GHR, ZN, MRD

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	0.94	2/8437 (0.0%)	1.01	3/11456 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	544	ILE	C-O	-5.93	1.17	1.24
1	A	271	ILE	CA-CB	-5.05	1.50	1.53

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	516	SER	CA-C-N	-5.40	114.39	119.85
1	A	516	SER	C-N-CA	-5.40	114.39	119.85
1	A	696	SER	N-CA-C	5.22	116.78	108.79

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	8209	0	8001	71	0
2	A	1	0	0	0	0
3	A	8	0	14	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	35	0	10	10	0
5	A	875	0	0	26	0
All	All	9128	0	8025	82	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 5.

All (82) 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:264[B]:MET:HE1	1:A:337:PRO:HG2	1.31	1.10
1:A:583:LEU:O	1:A:583:LEU:HD23	1.77	0.84
1:A:693:LEU:HD13	5:A:1741:HOH:O	1.78	0.82
1:A:264[B]:MET:CE	1:A:337:PRO:HG2	2.11	0.79
1:A:225:LEU:CD2	5:A:1705:HOH:O	2.30	0.79
1:A:96:ILE:HD11	5:A:1760:HOH:O	1.83	0.79
1:A:61:VAL:HG23	5:A:1716:HOH:O	1.84	0.78
3:A:1047:MRD:H1C3	5:A:1164:HOH:O	1.83	0.77
1:A:195:VAL:HG23	5:A:1422:HOH:O	1.85	0.75
1:A:740:LEU:HD22	1:A:760:LEU:HD22	1.70	0.74
1:A:195:VAL:CG2	5:A:1422:HOH:O	2.36	0.73
1:A:547:GLU:HG2	5:A:1539:HOH:O	1.88	0.72
1:A:96:ILE:CD1	5:A:1760:HOH:O	2.36	0.70
1:A:904:ARG:HG2	1:A:985:MET:SD	2.32	0.69
1:A:225:LEU:HD23	5:A:1705:HOH:O	1.92	0.66
1:A:202:ALA:N	5:A:1705:HOH:O	2.30	0.63
1:A:278:ASP:HB2	5:A:1716:HOH:O	1.97	0.63
1:A:975:VAL:HG21	1:A:1003:LEU:CD1	2.29	0.63
1:A:225:LEU:HD22	5:A:1705:HOH:O	1.94	0.62
4:A:1048[B]:GHR:O8	4:A:1048[B]:GHR:H10	2.00	0.61
1:A:546:GLY:HA2	1:A:636:ILE:HD13	1.83	0.60
1:A:174:HIS:CE1	1:A:176:ARG:HD3	2.36	0.59
1:A:96:ILE:HG12	1:A:102:TYR:OH	2.03	0.58
1:A:116:ARG:CZ	5:A:1895:HOH:O	2.51	0.58
1:A:835:MET:HE2	1:A:862:LEU:HD22	1.85	0.57
1:A:971:LYS:HB2	1:A:971:LYS:NZ	2.19	0.56
3:A:1047:MRD:H5C3	3:A:1047:MRD:HMC1	1.87	0.56
1:A:714:LYS:HE3	1:A:738:VAL:HG22	1.87	0.55
3:A:1047:MRD:H1C1	5:A:1160:HOH:O	2.06	0.55
1:A:568:LEU:HD12	1:A:770:ARG:HD3	1.90	0.53
1:A:277:PRO:C	5:A:1716:HOH:O	2.50	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:666:GLU:HG3	5:A:1876:HOH:O	2.09	0.52
1:A:264[B]:MET:HE2	5:A:1388:HOH:O	2.08	0.52
1:A:488:GLN:HB3	5:A:1788:HOH:O	2.10	0.52
1:A:61:VAL:CG2	5:A:1716:HOH:O	2.48	0.52
1:A:278:ASP:N	5:A:1716:HOH:O	2.43	0.51
1:A:511:LYS:HD3	1:A:514:ILE:CD1	2.42	0.50
1:A:82:LYS:HE3	1:A:333:VAL:HG22	1.93	0.50
1:A:485:ASP:HA	1:A:488:GLN:OE1	2.11	0.50
1:A:1031:VAL:HG11	1:A:1037:ALA:HB3	1.94	0.50
1:A:62:TRP:CD2	1:A:65:GLY:HA3	2.47	0.50
1:A:264[B]:MET:HE1	1:A:337:PRO:CG	2.21	0.50
4:A:1048[B]:GHR:O8	4:A:1048[B]:GHR:C10	2.54	0.49
1:A:691:GLN:O	1:A:758:VAL:HG21	2.12	0.49
1:A:48:LEU:HD11	1:A:236:GLU:HG2	1.95	0.48
1:A:341:ASP:OD2	4:A:1048[A]:GHR:N1	2.45	0.48
1:A:695:LYS:HB2	1:A:695:LYS:HE3	1.52	0.48
1:A:451:MET:HA	1:A:451:MET:HE2	1.95	0.48
1:A:650:LEU:HD21	1:A:652:LEU:HD21	1.96	0.48
1:A:455:GLU:HG2	1:A:967:LYS:HZ2	1.78	0.48
1:A:975:VAL:HG21	1:A:1003:LEU:HD12	1.95	0.48
1:A:250:ILE:HB	1:A:910:PRO:HG2	1.97	0.47
1:A:278:ASP:CA	5:A:1716:HOH:O	2.63	0.47
1:A:583:LEU:O	1:A:583:LEU:CD2	2.56	0.47
1:A:341:ASP:OD2	4:A:1048[B]:GHR:N1	2.47	0.46
1:A:895:VAL:HG12	1:A:897:GLU:HG3	1.97	0.46
1:A:37:ASP:N	5:A:1126:HOH:O	2.36	0.46
1:A:691:GLN:NE2	5:A:1739:HOH:O	2.38	0.46
1:A:595:VAL:HG22	1:A:617:ARG:HG3	1.98	0.45
1:A:241:ARG:NH1	5:A:1138:HOH:O	2.32	0.44
1:A:666:GLU:CG	5:A:1876:HOH:O	2.63	0.44
1:A:138:TYR:CE1	1:A:193:MET:CE	3.00	0.44
4:A:1048[A]:GHR:C10	4:A:1048[A]:GHR:O7	2.65	0.43
1:A:229:THR:HG21	1:A:263:MET:HE2	2.01	0.43
1:A:43:VAL:O	1:A:400:LEU:HA	2.18	0.43
1:A:686:LEU:HD22	1:A:697:ILE:HG12	2.00	0.43
1:A:939:TRP:CD2	1:A:942:ALA:HB2	2.54	0.43
1:A:455:GLU:HB3	1:A:967:LYS:HZ1	1.83	0.42
1:A:93:PRO:HD2	1:A:470:HIS:CE1	2.54	0.42
1:A:698:GLN:HB2	1:A:705:HIS:ND1	2.35	0.42
1:A:170:GLU:CD	1:A:212:MET:HG3	2.45	0.42
1:A:580:VAL:HG22	1:A:634:LEU:HD22	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:608:HIS:HB2	1:A:609:PRO:HD2	2.02	0.41
1:A:225:LEU:HD23	1:A:225:LEU:C	2.47	0.40
1:A:224:MET:HE3	1:A:224:MET:HB2	1.94	0.40
1:A:654:LYS:HG3	1:A:742:GLN:NE2	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	1016/1045 (97%)	992 (98%)	22 (2%)	2 (0%)	43 24

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	95	TRP
1	A	204	ASP

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	904/929 (97%)	897 (99%)	7 (1%)	73 59

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	96	ILE
1	A	275	CYS
1	A	317	LEU
1	A	676	ILE
1	A	691	GLN
1	A	695	LYS
1	A	971	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	249	GLN
1	A	347	ASN
1	A	373	GLN
1	A	491	GLN
1	A	766	GLN
1	A	812	GLN
1	A	923	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, 1 is monoatomic - leaving 3 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	MRD	A	1047	-	7,7,7	0.38	0	9,10,10	0.63	0
4	GHR	A	1048[A]	-	22,24,24	1.30	2 (9%)	27,33,33	1.38	6 (22%)
4	GHR	A	1048[B]	-	22,24,24	1.47	2 (9%)	27,33,33	1.22	4 (14%)

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	MRD	A	1047	-	-	2/5/5/5	-
4	GHR	A	1048[A]	-	-	3/8/31/31	0/2/2/2
4	GHR	A	1048[B]	-	-	2/8/31/31	0/2/2/2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1048[B]	GHR	C9-N9	-4.44	1.32	1.41
4	A	1048[A]	GHR	C9-N9	-4.01	1.33	1.41
4	A	1048[B]	GHR	O7-N1	-3.81	1.36	1.44
4	A	1048[A]	GHR	O7-N1	-3.08	1.37	1.44

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	1048[A]	GHR	O8-C8-N9	-3.08	119.57	126.12
4	A	1048[B]	GHR	O8-C8-N9	-2.35	121.13	126.12
4	A	1048[A]	GHR	C4-C5-N5	2.22	114.26	110.47
4	A	1048[B]	GHR	C4-C5-N5	2.22	114.26	110.47
4	A	1048[A]	GHR	N5-C1-N1	-2.21	121.92	125.19
4	A	1048[A]	GHR	C10-C11-C12	2.21	121.47	119.24
4	A	1048[B]	GHR	C9-N9-C8	-2.19	122.93	126.39
4	A	1048[A]	GHR	C13-C12-C11	-2.09	118.65	121.24
4	A	1048[A]	GHR	C3-C2-C1	-2.06	106.20	110.28
4	A	1048[B]	GHR	C3-C2-C1	-2.06	106.20	110.28

There are no chirality outliers.

All (7) torsion outliers are listed below:

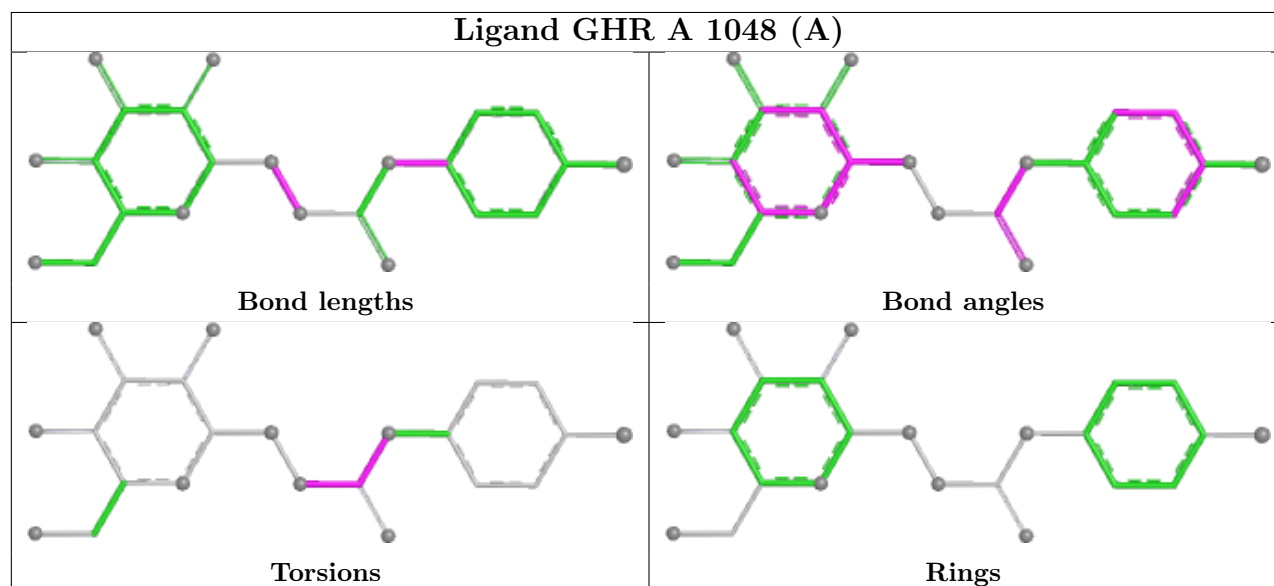
Mol	Chain	Res	Type	Atoms
3	A	1047	MRD	C2-C3-C4-O4
3	A	1047	MRD	C2-C3-C4-C5
4	A	1048[A]	GHR	N9-C8-O7-N1
4	A	1048[A]	GHR	O8-C8-O7-N1
4	A	1048[B]	GHR	N9-C8-O7-N1
4	A	1048[B]	GHR	O8-C8-O7-N1
4	A	1048[A]	GHR	O8-C8-N9-C9

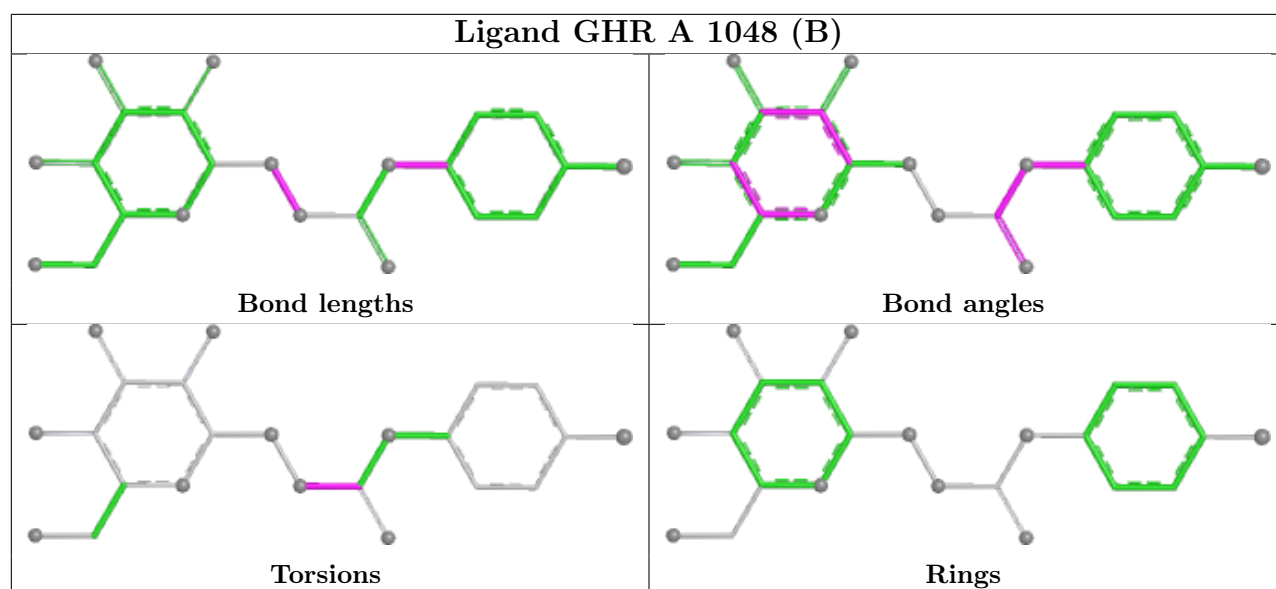
There are no ring outliers.

3 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1047	MRD	3	0
4	A	1048[A]	GHR	4	0
4	A	1048[B]	GHR	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 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	1016/1045 (97%)	0.90	150 (14%) 5 5	6, 14, 29, 48	2 (0%)

All (150) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	603	LEU	9.4
1	A	721	GLY	6.3
1	A	583	LEU	6.0
1	A	602	THR	5.7
1	A	993	HIS	5.5
1	A	604	THR	5.2
1	A	703	SER	5.0
1	A	682	ASN	5.0
1	A	600	HIS	4.7
1	A	989	THR	4.6
1	A	520	SER	4.6
1	A	990	PRO	4.6
1	A	521	PHE	4.4
1	A	1026	MET	4.4
1	A	908	LEU	4.4
1	A	534	SER	4.4
1	A	139	HIS	4.3
1	A	994	THR	4.3
1	A	1009	CYS	4.1
1	A	77	ALA	4.0
1	A	638	ASP	3.8
1	A	57	ILE	3.7
1	A	304	ARG	3.6
1	A	72	PRO	3.6
1	A	700	THR	3.6
1	A	1023	LEU	3.5
1	A	347	ASN	3.5

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Mol	Chain	Res	Type	RSRZ
1	A	659	LEU	3.3
1	A	536	VAL	3.3
1	A	1020	LEU	3.3
1	A	991	GLU	3.3
1	A	992	GLU	3.3
1	A	1003	LEU	3.2
1	A	326	ALA	3.2
1	A	702	ASP	3.2
1	A	655	ASN	3.2
1	A	256	ASP	3.2
1	A	988	GLY	3.1
1	A	548	ASP	3.1
1	A	676	ILE	3.1
1	A	312	ALA	3.1
1	A	538	ASP	3.1
1	A	940	ILE	3.1
1	A	147	LEU	2.9
1	A	367	GLN	2.9
1	A	601	ASP	2.9
1	A	1001	HIS	2.9
1	A	144	ASN	2.9
1	A	785	LEU	2.9
1	A	316	ASP	2.9
1	A	539	SER	2.8
1	A	75	TYR	2.8
1	A	537	GLU	2.8
1	A	531	TRP	2.8
1	A	824	LEU	2.8
1	A	71	ASP	2.8
1	A	720	HIS	2.8
1	A	704	PRO	2.7
1	A	301	VAL	2.7
1	A	79	HIS	2.7
1	A	677	SER	2.7
1	A	368	ALA	2.7
1	A	1007	ALA	2.7
1	A	709	HIS	2.7
1	A	518	ASP	2.7
1	A	820	ASP	2.7
1	A	392	ALA	2.7
1	A	653	ARG	2.6
1	A	294	GLY	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	348	THR	2.6
1	A	605	LYS	2.6
1	A	1024	ASP	2.6
1	A	599	HIS	2.6
1	A	1022	HIS	2.6
1	A	637	SER	2.6
1	A	308	ASP	2.5
1	A	639	SER	2.5
1	A	740	LEU	2.5
1	A	1008	ARG	2.5
1	A	668	VAL	2.5
1	A	701	GLN	2.5
1	A	943	GLN	2.5
1	A	78	HIS	2.5
1	A	257	THR	2.5
1	A	525	THR	2.5
1	A	148	GLN	2.5
1	A	1030	GLU	2.5
1	A	900	ASN	2.4
1	A	564	TRP	2.4
1	A	456	GLU	2.4
1	A	666	GLU	2.4
1	A	105	HIS	2.4
1	A	533	GLY	2.3
1	A	451	MET	2.3
1	A	453	ARG	2.3
1	A	1033	PRO	2.3
1	A	191	GLN	2.3
1	A	143	GLU	2.3
1	A	254	LYS	2.3
1	A	606	THR	2.3
1	A	1028	ALA	2.3
1	A	317	LEU	2.3
1	A	741	GLY	2.3
1	A	764	VAL	2.3
1	A	491	GLN	2.2
1	A	651	LEU	2.2
1	A	801	GLY	2.2
1	A	514	ILE	2.2
1	A	738	VAL	2.2
1	A	1031	VAL	2.2
1	A	302	PRO	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	517	PRO	2.2
1	A	737	PRO	2.2
1	A	972	THR	2.2
1	A	37	ASP	2.2
1	A	1025	GLY	2.2
1	A	32	GLN	2.2
1	A	547	GLU	2.2
1	A	370	PHE	2.2
1	A	670	PHE	2.2
1	A	656	PRO	2.2
1	A	685	THR	2.2
1	A	839	ASP	2.2
1	A	642	GLU	2.2
1	A	739	GLU	2.2
1	A	697	ILE	2.2
1	A	366	SER	2.2
1	A	736	SER	2.2
1	A	140	ASP	2.1
1	A	610	GLN	2.1
1	A	652	LEU	2.1
1	A	253	ASN	2.1
1	A	762	SER	2.1
1	A	391	ARG	2.1
1	A	1027	VAL	2.1
1	A	705	HIS	2.1
1	A	759	GLY	2.1
1	A	686	LEU	2.1
1	A	654	LYS	2.1
1	A	771	GLY	2.1
1	A	488	GLN	2.1
1	A	665	PRO	2.1
1	A	515	TYR	2.1
1	A	933	ILE	2.1
1	A	675	GLU	2.0
1	A	985	MET	2.0
1	A	30	GLN	2.0
1	A	671	GLY	2.0
1	A	251	TRP	2.0
1	A	688	PHE	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](#)

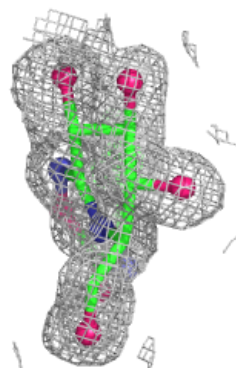
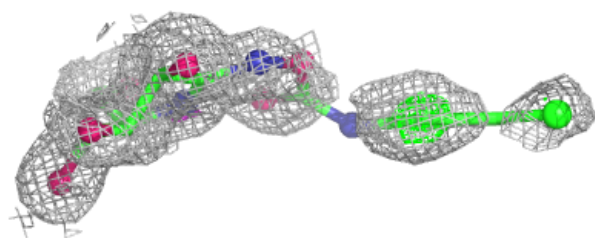
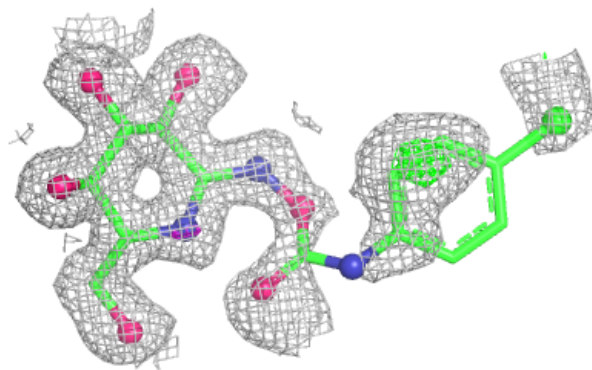
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	MRD	A	1047	8/8	0.84	0.13	13,20,25,25	0
4	GHR	A	1048[A]	23/23	0.93	0.15	7,14,34,35	12
4	GHR	A	1048[B]	23/23	0.93	0.15	7,14,33,33	12
2	ZN	A	1046	1/1	1.00	0.01	9,9,9,9	0

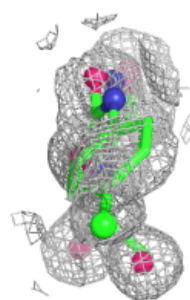
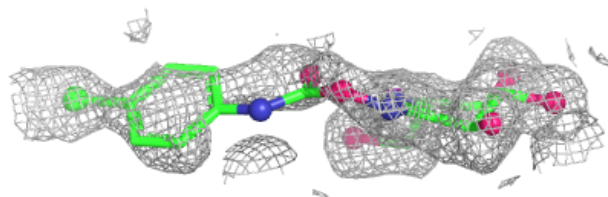
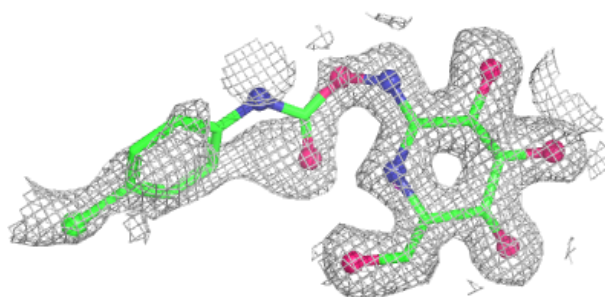
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around GHR A 1048 (A):

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

**Electron density around GHR A 1048 (B):**

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



6.5 Other polymers ⓘ

There are no such residues in this entry.