



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 7, 2023 – 04:37 pm BST

PDB ID : 8CBR
Title : HIV-1 Integrase Catalytic Core Domain and C-Terminal Domain in Complex with Allosteric Integrase Inhibitor BDM-2
Authors : Singer, M.R.; Pye, V.E.; Yu, Z.; Cherepanov, P.
Deposited on : 2023-01-25
Resolution : 1.80 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.33
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) : 2.33

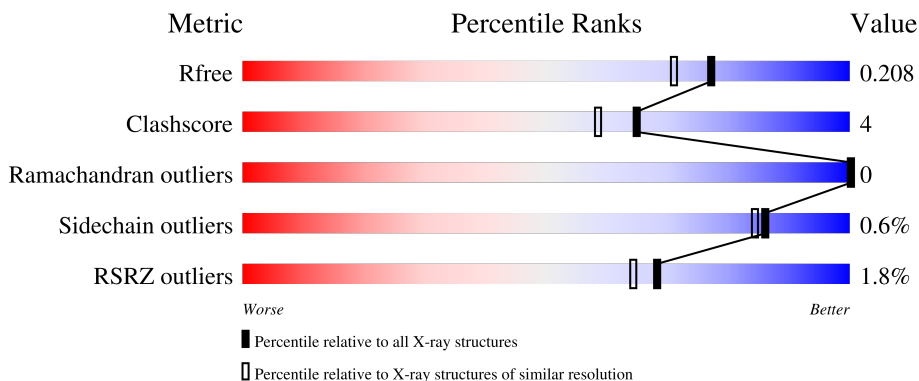
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 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	5950 (1.80-1.80)
Clashscore	141614	6793 (1.80-1.80)
Ramachandran outliers	138981	6697 (1.80-1.80)
Sidechain outliers	138945	6696 (1.80-1.80)
RSRZ outliers	127900	5850 (1.80-1.80)

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	233	
1	B	233	
1	C	233	
1	D	233	

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 3397 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.

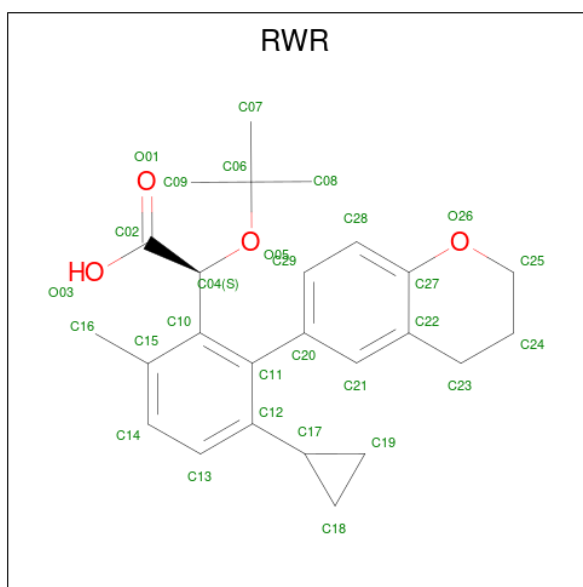
- Molecule 1 is a protein called Integrase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	51	419	268	78	73	0	0	0	
1	B	141	1131	723	197	206	5	0	5	0
1	C	50	417	268	77	72	0	1	0	
1	D	142	1116	714	195	203	4	0	2	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	219	SER	-	expression tag	UNP P12497
A	243	GLU	TRP	engineered mutation	UNP P12497
A	424	LYS	PHE	engineered mutation	UNP P12497
B	-20	SER	-	expression tag	UNP P12497
B	4	GLU	TRP	engineered mutation	UNP P12497
B	185	LYS	PHE	engineered mutation	UNP P12497
C	219	SER	-	expression tag	UNP P12497
C	243	GLU	TRP	engineered mutation	UNP P12497
C	424	LYS	PHE	engineered mutation	UNP P12497
D	-20	SER	-	expression tag	UNP P12497
D	4	GLU	TRP	engineered mutation	UNP P12497
D	185	LYS	PHE	engineered mutation	UNP P12497

- Molecule 2 is (2S)-2-[3-cyclopropyl-2-(3,4-dihydro-2H-chromen-6-yl)-6-methyl-phenyl]-2-[(2-methylpropan-2-yl)oxy]ethanoic acid (three-letter code: RWR) (formula: C₂₅H₃₀O₄) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	
2	A	1	Total	C	O	0	0
			29	25	4		
2	B	1	Total	C	O	0	0
			29	25	4		

- Molecule 3 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		

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

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Cl 1 1	0	0

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total Mg 1 1	0	0
5	D	1	Total Mg 1 1	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	12	Total O 12 12	0	0
6	B	86	Total O 86 86	0	0
6	C	16	Total O 16 16	0	0
6	D	83	Total O 83 83	0	0

TRP TRP
 GLY ALA
 TYR GLY
 SER ILE
 ILE LYS
 GLN GLU
 PHE ARG
 GLY ILE
 ILE ILE
 PRO ASP
 TYR ILE
 ASN ILE
 PRO ALA
 GLN THR
 SER ASP
 MET ASP
 ASN GLN
 LYS ILE
 GLU VAL
 LEU ILE
 LYS LYS
 ILE ILE
 ILE ILE
 GLY GLY
 VAL VAL
 ARG ARG
 ASP ASP
 GLN GLN
 ALA HIS
 LYS LYS
 LEU LEU
 THR THR
 ILE ILE
 VAL VAL
 MET MET
 PHE PHE
 ILE ILE
 HIS HIS
 ASN ASN
 LYS LYS
 ARG ARG
 LYS LYS
 GLY GLY
 ASP ASP

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 TYR TYR
 SER SER
 ILE ILE
 ALA ALA
 GLY GLY
 GLU GLU
 ARG ARG
 ILE ILE
 VAL VAL
 ASP ASP
 TYR TYR
 ILE ILE
 ILE ILE
 THR THR
 LYS LYS
 GLU GLU

● Molecule 1: Integrase



SER SER
 ILE ILE
 GLN GLN
 ASN ASN
 PHE PHE
 ARG ARG
 VAL VAL
 TYR TYR
 TYR TYR
 ARG ARG
 ASP ASP
 MET MET
 HIS HIS
 SER SER
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 ASP ASP
 TRP TRP
 CYS CYS
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 GLY GLY
 PRO PRO
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 ASP ASP
 TYR TYR
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 LYS LYS
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 MET MET
 ALA ALA
 GLY GLY
 ASP ASP

ASP ASP
 CYS CYS
 VAL VAL
 ALA ALA
 SER SER
 ARG ARG
 GLN GLN
 ASP ASP
 GLU GLU
 ASP ASP
 MET MET
 HIS HIS
 GLY GLY
 GLN GLN
 VAL VAL
 ASP ASP
 ASP ASP
 CYS CYS
 S57 S57
 E85 E85
 T93 T93
 R107 R107
 H114 H114
 W131 W131
 G140 G140
 ILE ILE
 PRO PRO
 TYR TYR
 ASN ASN
 PRO PRO
 GLN GLN
 SER SER
 SER SER
 GLN GLN
 G149 G149
 R187 R187
 LYS LYS
 GLY GLY
 GLY GLY
 ILE ILE
 ILE ILE
 GLY GLY
 G193 G193
 Y194 Y194
 V201 V201
 A205 A205
 F211 F211
 GLU GLU

4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	53.22Å 65.17Å 70.47Å 90.00° 101.48° 90.00°	Depositor
Resolution (Å)	52.16 – 1.80 52.16 – 1.80	Depositor EDS
% Data completeness (in resolution range)	98.6 (52.16-1.80) 98.6 (52.16-1.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.97 (at 1.79Å)	Xtrriage
Refinement program	PHENIX dev_4840	Depositor
R, R_{free}	0.177 , 0.211 0.176 , 0.208	Depositor DCC
R_{free} test set	2139 reflections (4.94%)	wwPDB-VP
Wilson B-factor (Å ²)	38.6	Xtrriage
Anisotropy	0.278	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 51.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	3397	wwPDB-VP
Average B, all atoms (Å ²)	48.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.16% 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: MG, CL, EDO, RWR

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	0.32	0/426	0.60	0/570
1	B	0.38	0/1159	0.52	0/1566
1	C	0.30	0/424	0.56	0/568
1	D	0.37	0/1144	0.53	0/1546
All	All	0.36	0/3153	0.54	0/4250

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	419	0	433	7	0
1	B	1131	0	1137	9	0
1	C	417	0	433	4	0
1	D	1116	0	1127	8	0
2	A	29	0	0	0	0
2	B	29	0	0	0	0
3	A	12	0	18	4	0
3	B	16	0	24	1	0
3	D	28	0	42	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	1	0	0	0	0
5	B	1	0	0	0	0
5	D	1	0	0	0	0
6	A	12	0	0	0	0
6	B	86	0	0	2	0
6	C	16	0	0	1	0
6	D	83	0	0	2	0
All	All	3397	0	3214	26	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 (26) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:187:ARG:NH1	1:D:193:GLY:O	2.28	0.67
1:A:266:LYS:HG2	3:A:502:EDO:H21	1.77	0.67
1:A:235:TRP:HD1	3:A:503:EDO:H21	1.65	0.60
1:C:224:ARG:HG3	1:D:131:TRP:CE2	2.40	0.56
1:B:67[B]:HIS:HE1	1:B:92:GLU:OE1	1.88	0.56
3:D:502:EDO:H22	6:D:647:HOH:O	2.05	0.55
1:A:249:VAL:HG11	1:A:267:ILE:HD11	1.89	0.55
1:C:223:PHE:CE2	1:C:269:ARG:HG2	2.43	0.53
1:A:223:PHE:H	3:A:504:EDO:H21	1.74	0.52
1:B:204:ILE:HG22	1:D:201:VAL:HG11	1.93	0.51
1:B:201:VAL:HG12	1:D:205:ALA:HB2	1.94	0.50
1:C:270:ASP:HB3	1:D:131:TRP:CZ2	2.47	0.50
1:A:221:GLN:HG3	1:A:269:ARG:HD2	1.93	0.49
1:C:266:LYS:NZ	6:C:501:HOH:O	2.48	0.47
1:B:85:GLU:OE1	1:B:107:ARG:NH1	2.48	0.47
1:B:95:GLN:HG3	6:B:659:HOH:O	2.17	0.45
1:A:232:ASP:OD1	1:A:234:VAL:HG12	2.17	0.44
1:B:134:GLY:HA2	3:B:506:EDO:H22	2.00	0.44
1:D:85:GLU:OE1	1:D:107:ARG:NH1	2.53	0.42
1:D:114[B]:HIS:NE2	1:D:140:GLY:O	2.44	0.42
1:B:171[B]:HIS:HD2	6:B:646:HOH:O	2.02	0.42
1:A:234:VAL:HA	3:A:503:EDO:H22	2.00	0.41
1:B:62:GLN:HG2	1:B:114:HIS:HB3	2.02	0.41
1:B:84:ILE:HG21	1:B:154:MET:HG2	2.02	0.41
3:D:502:EDO:H11	6:D:660:HOH:O	2.21	0.41
1:D:93:THR:HA	3:D:505:EDO:H22	2.02	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	47/233 (20%)	46 (98%)	1 (2%)	0	100	100
1	B	140/233 (60%)	140 (100%)	0	0	100	100
1	C	47/233 (20%)	46 (98%)	1 (2%)	0	100	100
1	D	138/233 (59%)	136 (99%)	2 (1%)	0	100	100
All	All	372/932 (40%)	368 (99%)	4 (1%)	0	100	100

There are no Ramachandran outliers to report.

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	44/193 (23%)	44 (100%)	0	100	100
1	B	120/193 (62%)	118 (98%)	2 (2%)	60	51
1	C	44/193 (23%)	43 (98%)	1 (2%)	50	37
1	D	118/193 (61%)	118 (100%)	0	100	100
All	All	326/772 (42%)	323 (99%)	3 (1%)	86	75

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	87[A]	GLU
1	B	87[B]	GLU
1	C	252	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	221	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](#)

Of 19 ligands modelled in this entry, 3 are monoatomic - leaving 16 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	EDO	D	503	-	3,3,3	0.29	0	2,2,2	0.07	0
3	EDO	B	505	-	3,3,3	0.29	0	2,2,2	0.13	0
2	RWR	A	501	-	31,32,32	1.77	3 (9%)	40,48,48	1.45	4 (10%)
3	EDO	D	508	-	3,3,3	0.28	0	2,2,2	0.20	0
3	EDO	A	503	-	3,3,3	0.27	0	2,2,2	0.15	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	EDO	A	502	-	3,3,3	0.31	0	2,2,2	0.08	0
3	EDO	D	504	-	3,3,3	0.29	0	2,2,2	0.16	0
3	EDO	B	506	-	3,3,3	0.30	0	2,2,2	0.04	0
3	EDO	D	506	-	3,3,3	0.26	0	2,2,2	0.18	0
3	EDO	A	504	-	3,3,3	0.25	0	2,2,2	0.45	0
3	EDO	D	502	-	3,3,3	0.37	0	2,2,2	0.51	0
3	EDO	D	505	-	3,3,3	0.23	0	2,2,2	0.35	0
2	RWR	B	501	-	31,32,32	1.69	4 (12%)	40,48,48	1.40	4 (10%)
3	EDO	D	507	-	3,3,3	0.27	0	2,2,2	0.10	0
3	EDO	B	504	-	3,3,3	0.22	0	2,2,2	0.52	0
3	EDO	B	503	-	3,3,3	0.28	0	2,2,2	0.24	0

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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	D	503	-	-	0/1/1/1	-
3	EDO	B	505	-	-	1/1/1/1	-
2	RWR	A	501	-	-	2/20/30/30	0/4/4/4
3	EDO	D	508	-	-	1/1/1/1	-
3	EDO	A	503	-	-	0/1/1/1	-
3	EDO	A	502	-	-	0/1/1/1	-
3	EDO	D	504	-	-	0/1/1/1	-
3	EDO	B	506	-	-	1/1/1/1	-
3	EDO	D	506	-	-	1/1/1/1	-
3	EDO	A	504	-	-	0/1/1/1	-
3	EDO	D	502	-	-	1/1/1/1	-
3	EDO	D	505	-	-	1/1/1/1	-
2	RWR	B	501	-	-	2/20/30/30	0/4/4/4
3	EDO	D	507	-	-	1/1/1/1	-
3	EDO	B	504	-	-	1/1/1/1	-
3	EDO	B	503	-	-	1/1/1/1	-

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	RWR	C23-C22	-6.74	1.39	1.51
2	B	501	RWR	C23-C22	-6.58	1.39	1.51
2	B	501	RWR	C11-C20	3.45	1.56	1.50
2	A	501	RWR	C11-C20	3.38	1.56	1.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	RWR	C10-C04	3.32	1.57	1.52
2	B	501	RWR	C10-C04	2.46	1.56	1.52
2	B	501	RWR	C16-C15	2.13	1.55	1.51

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	RWR	C18-C17-C12	5.98	138.33	120.68
2	B	501	RWR	C18-C17-C12	4.63	134.36	120.68
2	B	501	RWR	C13-C12-C11	2.74	120.64	118.49
2	B	501	RWR	C13-C12-C17	-2.60	115.80	120.20
2	B	501	RWR	C23-C22-C27	2.34	122.41	120.36
2	A	501	RWR	C13-C12-C11	2.29	120.29	118.49
2	A	501	RWR	C11-C10-C15	-2.08	118.99	120.78
2	A	501	RWR	O03-C02-O01	-2.06	119.42	124.09

There are no chirality outliers.

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	RWR	O01-C02-C04-C10
2	A	501	RWR	O03-C02-C04-C10
2	B	501	RWR	O01-C02-C04-C10
2	B	501	RWR	O03-C02-C04-C10
3	B	504	EDO	O1-C1-C2-O2
3	B	506	EDO	O1-C1-C2-O2
3	D	502	EDO	O1-C1-C2-O2
3	B	503	EDO	O1-C1-C2-O2
3	D	507	EDO	O1-C1-C2-O2
3	B	505	EDO	O1-C1-C2-O2
3	D	508	EDO	O1-C1-C2-O2
3	D	505	EDO	O1-C1-C2-O2
3	D	506	EDO	O1-C1-C2-O2

There are no ring outliers.

6 monomers are involved in 8 short contacts:

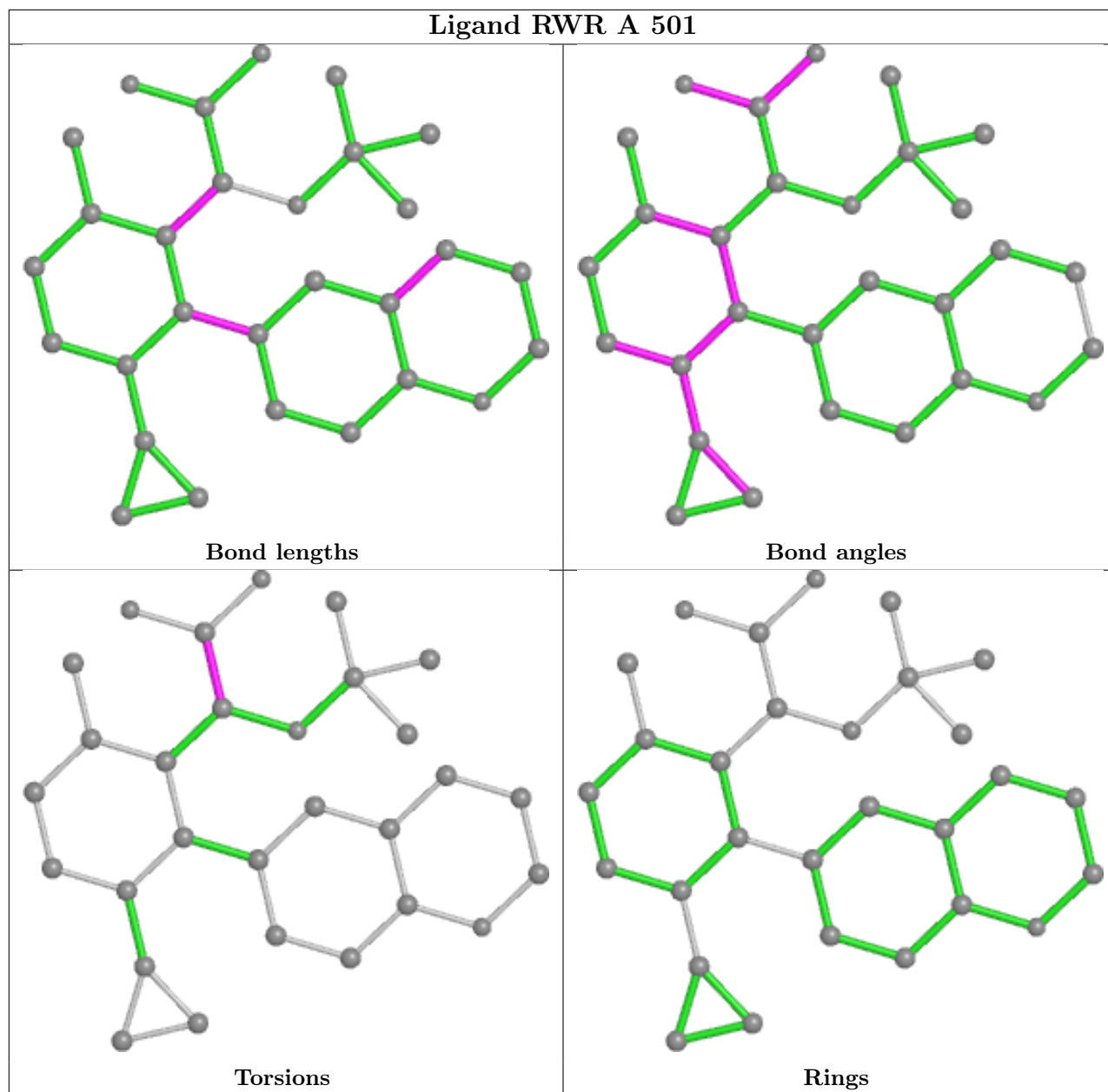
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	503	EDO	2	0
3	A	502	EDO	1	0
3	B	506	EDO	1	0

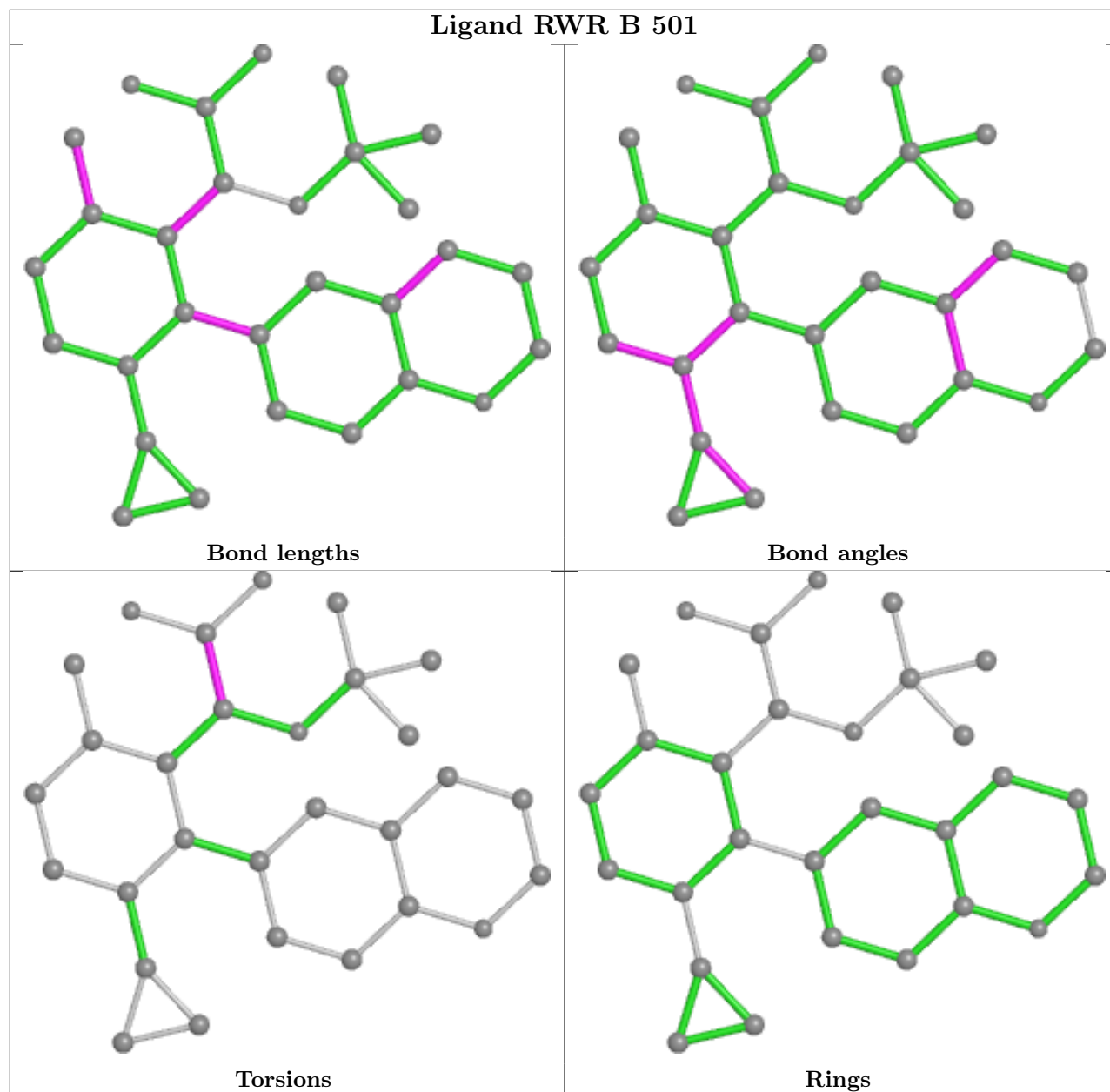
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	504	EDO	1	0
3	D	502	EDO	2	0
3	D	505	EDO	1	0

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 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 [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	51/233 (21%)	-0.31	1 (1%) 65 61	42, 56, 95, 105	0
1	B	141/233 (60%)	-0.30	1 (0%) 87 86	28, 39, 70, 94	0
1	C	50/233 (21%)	0.30	4 (8%) 12 9	42, 60, 99, 105	0
1	D	142/233 (60%)	-0.34	1 (0%) 87 86	29, 40, 63, 88	0
All	All	384/932 (41%)	-0.24	7 (1%) 68 64	28, 44, 79, 105	0

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	194	TYR	3.4
1	C	269	ARG	2.7
1	C	268	ILE	2.6
1	C	233	PRO	2.3
1	C	255	SER	2.3
1	B	194	TYR	2.2
1	A	255	SER	2.2

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

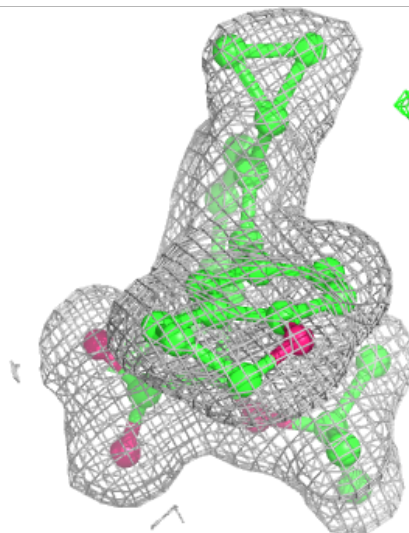
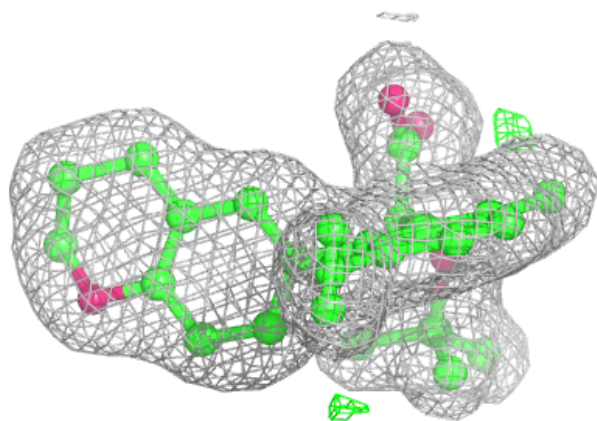
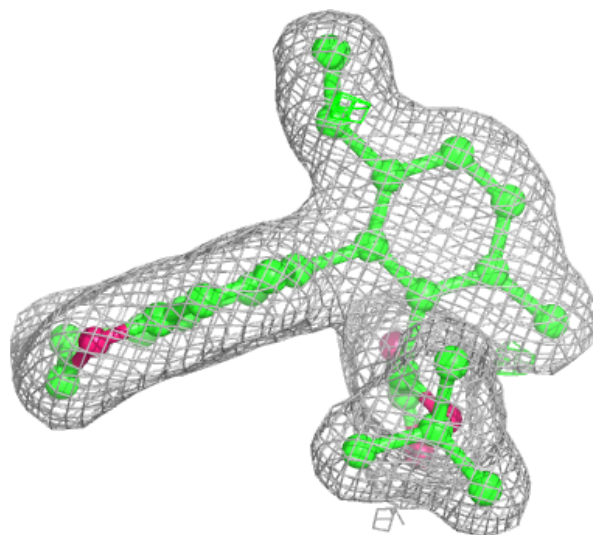
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists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

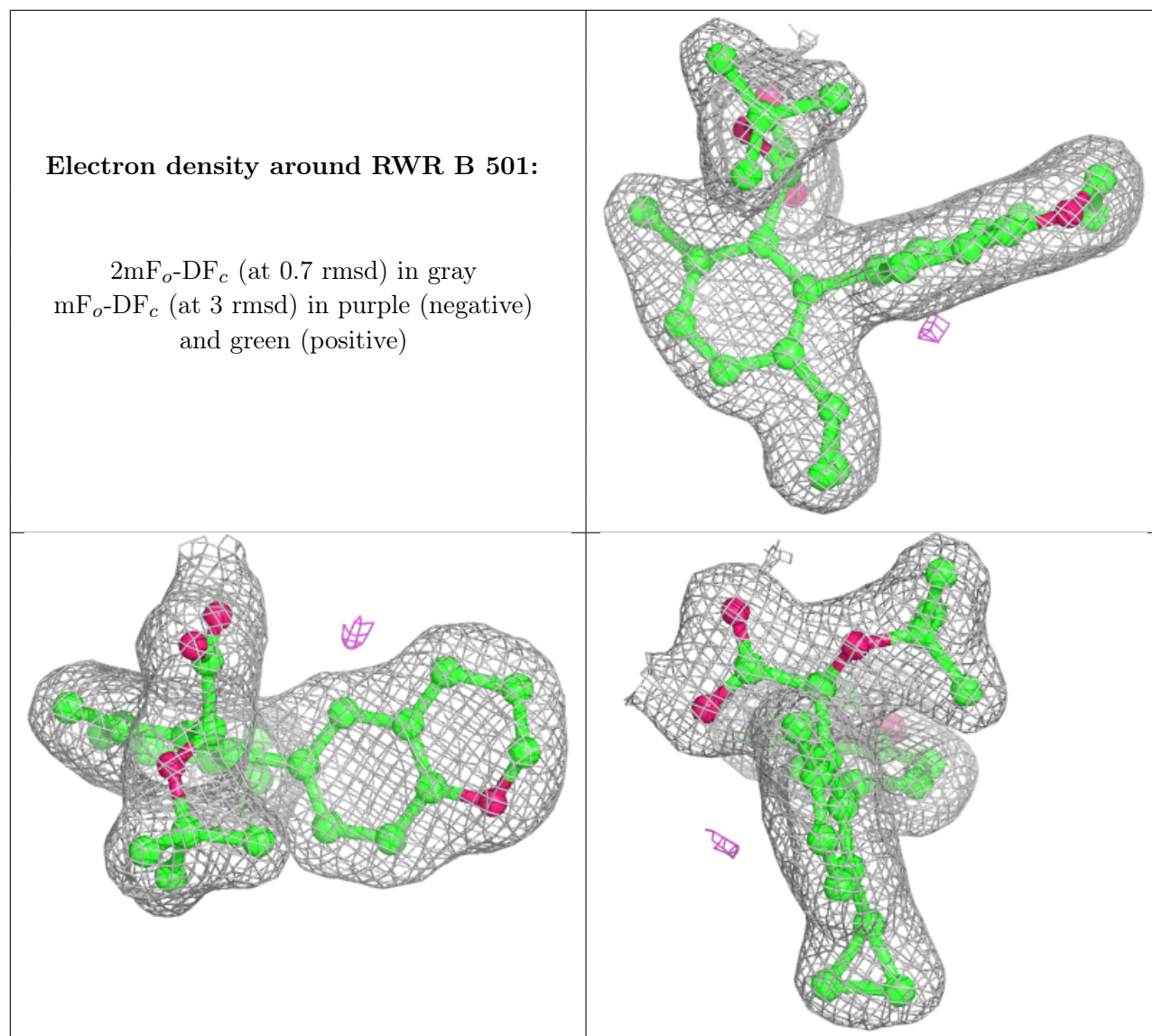
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	EDO	A	502	4/4	0.67	0.19	58,59,63,69	0
3	EDO	B	503	4/4	0.79	0.24	58,58,59,60	0
3	EDO	D	507	4/4	0.81	0.30	52,59,59,60	0
3	EDO	D	506	4/4	0.83	0.28	55,57,58,64	0
3	EDO	B	506	4/4	0.85	0.18	45,53,54,56	0
3	EDO	D	503	4/4	0.85	0.23	44,54,55,58	0
3	EDO	A	504	4/4	0.89	0.09	67,74,74,79	0
3	EDO	B	504	4/4	0.90	0.12	45,48,48,55	0
3	EDO	A	503	4/4	0.91	0.21	47,55,59,65	0
3	EDO	D	508	4/4	0.91	0.20	47,56,58,59	0
3	EDO	D	505	4/4	0.93	0.14	45,55,58,59	0
3	EDO	D	502	4/4	0.94	0.21	46,48,49,53	0
4	CL	A	505	1/1	0.94	0.09	61,61,61,61	0
3	EDO	B	505	4/4	0.95	0.13	46,51,51,58	0
5	MG	D	501	1/1	0.96	0.05	44,44,44,44	0
2	RWR	A	501	29/29	0.97	0.09	26,32,37,41	0
3	EDO	D	504	4/4	0.97	0.13	41,42,49,51	0
5	MG	B	502	1/1	0.98	0.06	36,36,36,36	0
2	RWR	B	501	29/29	0.98	0.09	31,34,38,42	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 RWR A 501:

$2mF_o-DF_c$ (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.