wwPDB X-ray Structure Validation Summary Report (i)

Aug 22, 2023 – 09:50 PM EDT

PDB ID	:	3E4A
Title	:	Human IDE-inhibitor complex at 2.6 angstrom resolution
Authors	:	Malito, E.; Leissring, M.A.; Choi, S.; Cuny, G.D.; Tang, W.J.
Deposited on	:	2008-08-11
Resolution	:	2.60 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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:

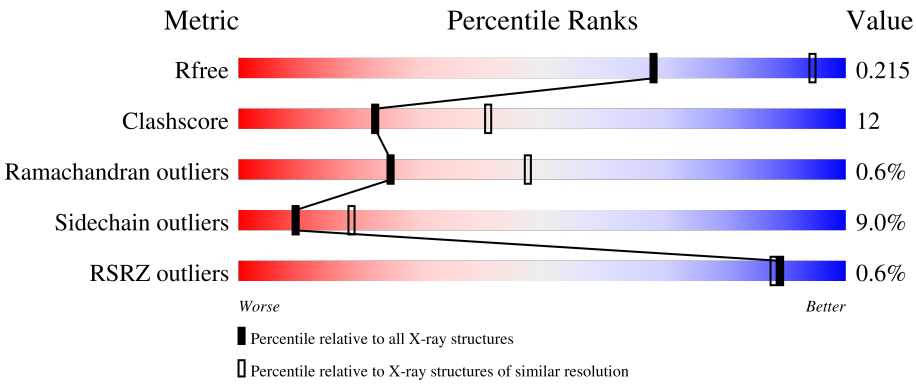
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 2.60 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}	130704	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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 <=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	1019	% 69% 20% 5% 6%
1	B	1019	68% 23% • 6%
2	F	3	67% 33%
2	G	3	100%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	QIX	A	2001	-	X	-	-
4	QIX	B	2001	-	X	-	-
5	DIO	A	2003	-	-	X	-
6	ACY	B	2007	-	X	X	-

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 16294 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 Insulin-degrading enzyme.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	961	7857	5058	1323	1454	22	0	1	0
1	B	961	7857	5058	1323	1454	22	0	1	0

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	78	ILE	MET	engineered mutation	UNP P14735
A	110	LEU	CYS	engineered mutation	UNP P14735
A	111	GLN	GLU	engineered mutation	UNP P14735
A	171	SER	CYS	engineered mutation	UNP P14735
A	178	ALA	CYS	engineered mutation	UNP P14735
A	257	VAL	CYS	engineered mutation	UNP P14735
A	414	LEU	CYS	engineered mutation	UNP P14735
A	555	ALA	VAL	engineered mutation	UNP P14735
A	567	PHE	LYS	engineered mutation	UNP P14735
A	568	PHE	LYS	engineered mutation	UNP P14735
A	569	LEU	LYS	engineered mutation	UNP P14735
A	573	ASN	CYS	engineered mutation	UNP P14735
A	590	SER	CYS	engineered mutation	UNP P14735
A	789	SER	CYS	engineered mutation	UNP P14735
A	812	ALA	CYS	engineered mutation	UNP P14735
A	819	ALA	CYS	engineered mutation	UNP P14735
A	845	GLY	SER	engineered mutation	UNP P14735
A	904	SER	CYS	engineered mutation	UNP P14735
A	966	ASN	CYS	engineered mutation	UNP P14735
A	974	ALA	CYS	engineered mutation	UNP P14735
B	78	ILE	MET	engineered mutation	UNP P14735
B	110	LEU	CYS	engineered mutation	UNP P14735
B	111	GLN	GLU	engineered mutation	UNP P14735
B	171	SER	CYS	engineered mutation	UNP P14735
B	178	ALA	CYS	engineered mutation	UNP P14735

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Chain	Residue	Modelled	Actual	Comment	Reference
B	257	VAL	CYS	engineered mutation	UNP P14735
B	414	LEU	CYS	engineered mutation	UNP P14735
B	555	ALA	VAL	engineered mutation	UNP P14735
B	567	PHE	LYS	engineered mutation	UNP P14735
B	568	PHE	LYS	engineered mutation	UNP P14735
B	569	LEU	LYS	engineered mutation	UNP P14735
B	573	ASN	CYS	engineered mutation	UNP P14735
B	590	SER	CYS	engineered mutation	UNP P14735
B	789	SER	CYS	engineered mutation	UNP P14735
B	812	ALA	CYS	engineered mutation	UNP P14735
B	819	ALA	CYS	engineered mutation	UNP P14735
B	845	GLY	SER	engineered mutation	UNP P14735
B	904	SER	CYS	engineered mutation	UNP P14735
B	966	ASN	CYS	engineered mutation	UNP P14735
B	974	ALA	CYS	engineered mutation	UNP P14735

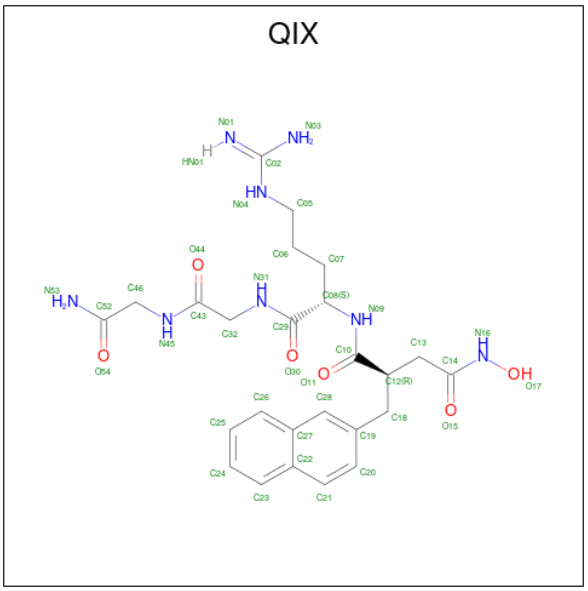
- Molecule 2 is a protein called HYDROXAMATE PEPTIDE II1.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	F	3	15	9	3	3	0	0	0
			Total	C	N	O			
2	G	3	15	9	3	3	0	0	0

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

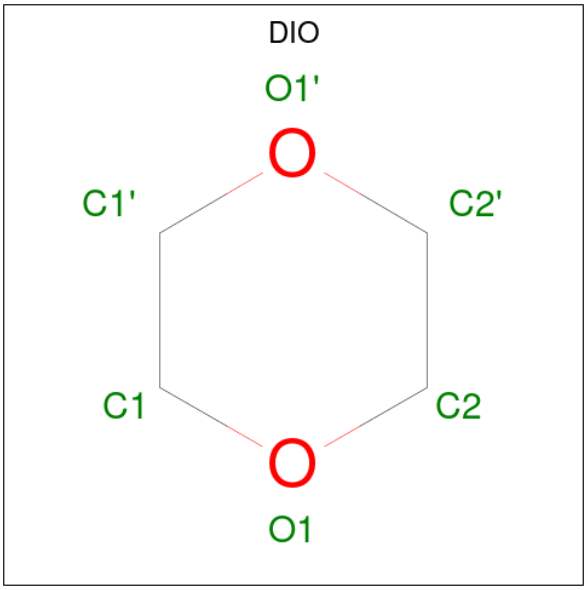
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Zn		
3	A	1	1	1	0	0
			Total	Zn		
3	B	1	1	1	0	0

- Molecule 4 is N 2 -[(2R)-4-(HYDROXYAMINO)-2-(2-NAPHTHYLMETHYL)-4-OXO BUTANOYL]-L-ARGINYLGLYCYLGLYCINAMIDE (three-letter code: QIX) (formula: $C_{25}H_{34}N_8O_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
4	A	1	39	25	8	6	0	0
			Total	C	N	O		
4	B	1	39	25	8	6	0	0

- Molecule 5 is 1,4-DIETHYLENE DIOXIDE (three-letter code: DIO) (formula: $C_4H_8O_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	O			
5	A	1	6	4	2		0	0
			Total	C	O			
5	A	1	6	4	2		0	0

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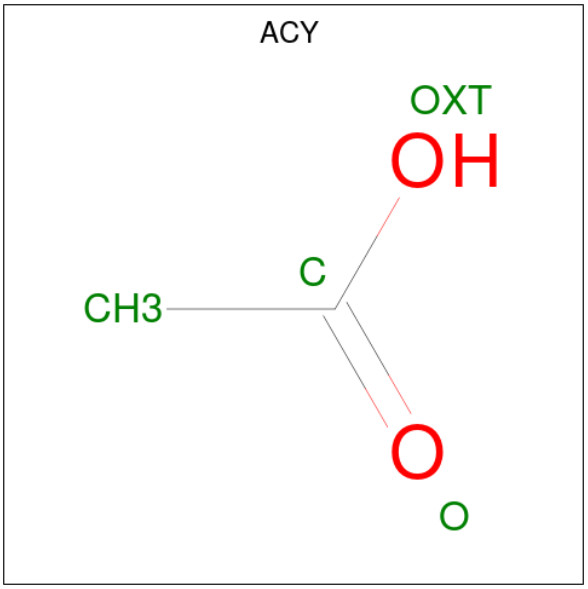
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
5	B	1	6	4	2	0	0
			Total	C	O		
5	B	1	6	4	2	0	0
			Total	C	O		
5	B	1	6	4	2	0	0
			Total	C	O		
5	B	1	6	4	2	0	0
			Total	C	O		
5	B	1	6	4	2	0	0

- Molecule 6 is ACETIC ACID (three-letter code: ACY) (formula: $C_2H_4O_2$).



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

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

- Molecule 7 is water.

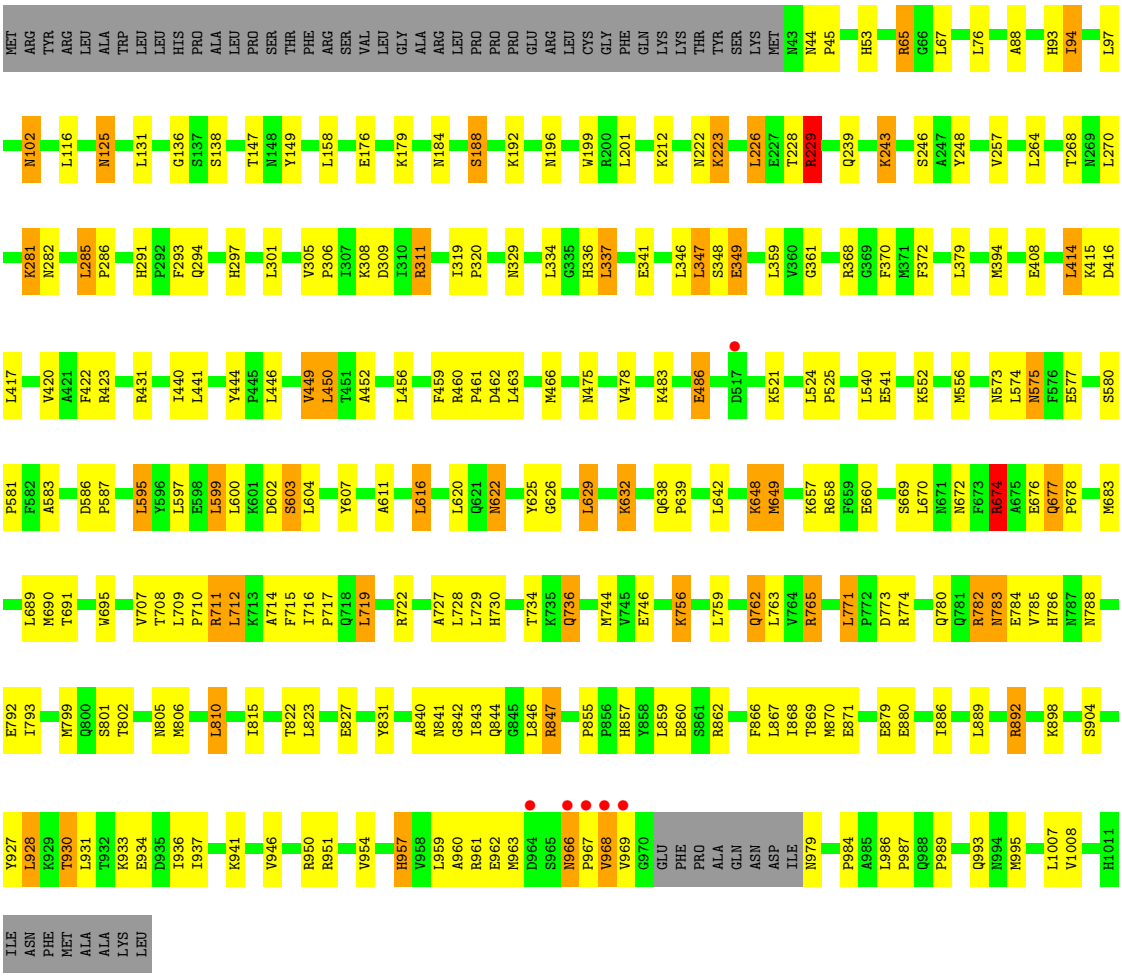
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
7	A	214	214	214	0	0
			Total	O		
7	B	158	158	158	0	0

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.

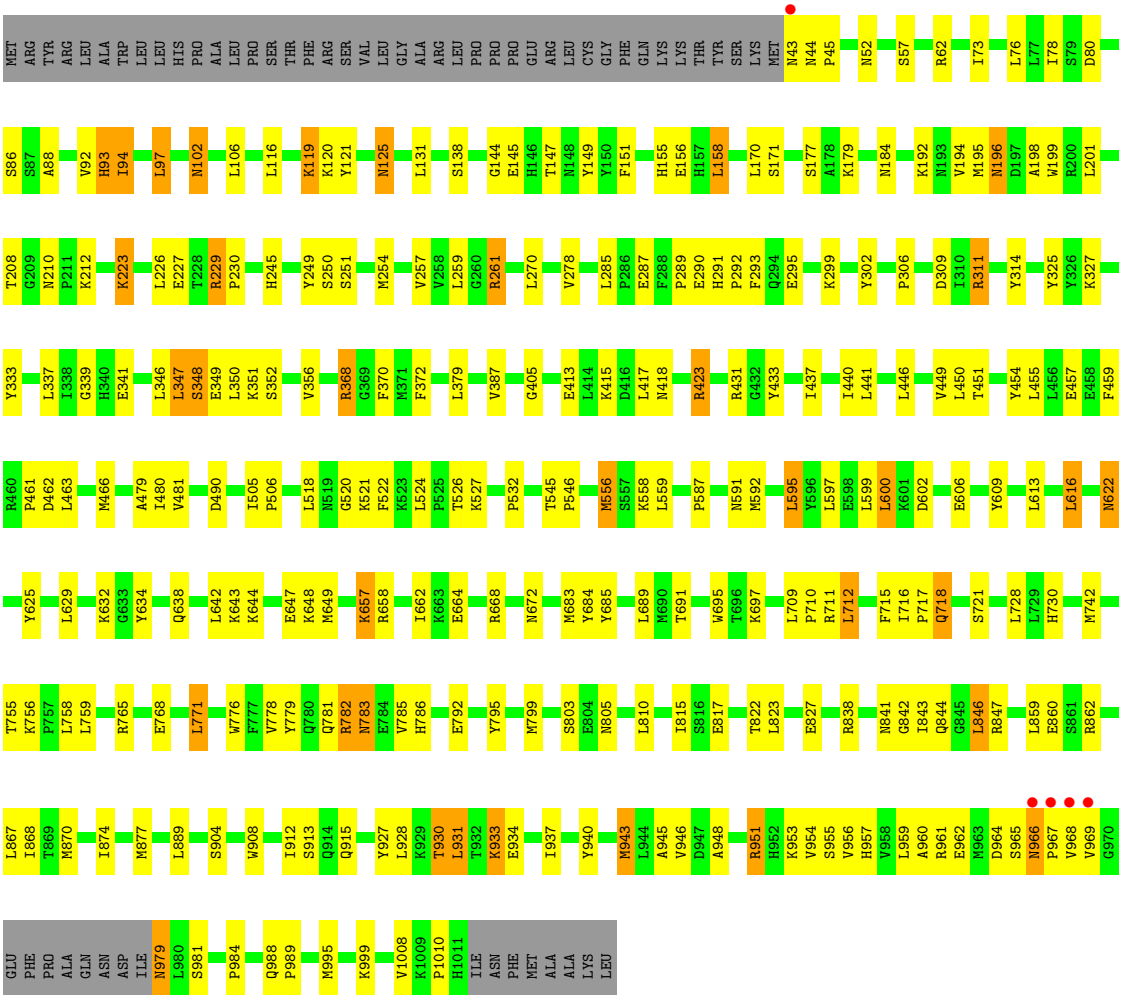
• Molecule 1: Insulin-degrading enzyme

Chain A:



• Molecule 1: Insulin-degrading enzyme

Chain B:

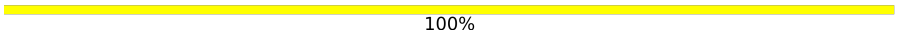


- Molecule 2: HYDROXAMATE PEPTIDE II1

Chain F:

- Molecule 2: HYDROXAMATE PEPTIDE II1

Chain G:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, α, β, γ	261.40Å 261.40Å 92.05Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	45.28 – 2.60 45.28 – 2.60	Depositor EDS
% Data completeness (in resolution range)	97.2 (45.28-2.60) 97.3 (45.28-2.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.09	Depositor
$< I/\sigma(I) >$ [1]	3.54 (at 2.61Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.167 , 0.225 0.159 , 0.215	Depositor DCC
R_{free} test set	5409 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	39.6	Xtriage
Anisotropy	0.314	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 43.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.019 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	16294	wwPDB-VP
Average B, all atoms (Å^2)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.82% 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: ACY, ZN, QIX, DIO

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	0.98	5/8053 (0.1%)	0.98	13/10896 (0.1%)
1	B	0.92	0/8053	0.93	11/10896 (0.1%)
2	F	2.44	1/14 (7.1%)	1.87	0/18
2	G	2.42	1/14 (7.1%)	1.93	0/18
All	All	0.96	7/16134 (0.0%)	0.96	24/21828 (0.1%)

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	660	GLU	CG-CD	7.27	1.62	1.51
2	F	1	ALA	CA-CB	6.52	1.66	1.52
1	A	871	GLU	CG-CD	6.00	1.60	1.51
1	A	349	GLU	CG-CD	5.49	1.60	1.51
1	A	676	GLU	CG-CD	5.41	1.60	1.51

The worst 5 of 24 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	94	ILE	CG1-CB-CG2	-6.73	96.60	111.40
1	A	674	ARG	NE-CZ-NH2	-6.49	117.05	120.30
1	A	414	LEU	CA-CB-CG	6.44	130.12	115.30
1	B	668	ARG	NE-CZ-NH1	6.39	123.50	120.30
1	A	892	ARG	NE-CZ-NH2	6.34	123.47	120.30

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	7857	0	7791	186	1
1	B	7857	0	7791	180	0
2	F	15	0	17	1	0
2	G	15	0	17	2	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	39	0	32	3	0
4	B	39	0	32	4	0
5	A	12	0	16	12	0
5	B	30	0	40	3	0
6	A	32	0	32	0	0
6	B	24	0	24	2	0
7	A	214	0	0	7	0
7	B	158	0	0	7	0
All	All	16294	0	15792	369	1

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 12.

The worst 5 of 369 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:782:ARG:HH11	1:A:782:ARG:HG2	1.10	1.09
1:B:782:ARG:HH11	1:B:782:ARG:CG	1.67	1.05
1:B:116:LEU:HD21	4:B:2001:QIX:H25	1.26	1.05
1:A:782:ARG:HG2	1:A:782:ARG:NH1	1.67	1.01
1:B:841:ASN:H	5:B:2003:DIO:H11	1.28	0.99

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:408:GLU:OE1	1:A:734:THR:OG1[2_564]	2.17	0.03

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	958/1019 (94%)	917 (96%)	39 (4%)	2 (0%)	47	71
1	B	958/1019 (94%)	919 (96%)	29 (3%)	10 (1%)	15	32
2	F	1/3 (33%)	0	1 (100%)	0	100	100
2	G	1/3 (33%)	1 (100%)	0	0	100	100
All	All	1918/2044 (94%)	1837 (96%)	69 (4%)	12 (1%)	25	47

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	968	VAL
1	B	52	ASN
1	B	965	SER
1	B	967	PRO
1	A	228	THR

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	855/906 (94%)	777 (91%)	78 (9%)	9	18
1	B	855/906 (94%)	780 (91%)	75 (9%)	10	19
All	All	1710/1812 (94%)	1557 (91%)	153 (9%)	9	19

5 of 153 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	592	MET
1	B	889	LEU
1	B	616	LEU
1	B	756	LYS
1	B	951	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 66 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	783	ASN
1	B	821	ASN
1	B	979	ASN
1	A	736	GLN
1	A	730	HIS

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 25 ligands modelled in this entry, 2 are monoatomic - leaving 23 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	$\#\|Z\| > 2$
5	DIO	B	2005	-	6,6,6	1.37	0	6,6,6	0.51	0
5	DIO	A	2002	-	6,6,6	1.04	0	6,6,6	0.63	0
4	QIX	A	2001	3	40,40,40	3.74	20 (50%)	50,52,52	2.95	24 (48%)
6	ACY	B	2008	-	3,3,3	1.67	1 (33%)	3,3,3	0.95	0
6	ACY	B	2012	-	3,3,3	1.46	1 (33%)	3,3,3	1.18	0
5	DIO	B	2006	-	6,6,6	1.06	0	6,6,6	0.30	0
6	ACY	B	2010	-	3,3,3	1.76	1 (33%)	3,3,3	1.24	0
6	ACY	B	2011	-	3,3,3	1.89	2 (66%)	3,3,3	1.13	0
6	ACY	B	2009	-	3,3,3	1.76	1 (33%)	3,3,3	1.36	0
6	ACY	A	2009	-	3,3,3	1.76	1 (33%)	3,3,3	1.72	1 (33%)
6	ACY	A	2005	-	3,3,3	1.56	1 (33%)	3,3,3	0.78	0
6	ACY	A	2007	-	3,3,3	1.71	1 (33%)	3,3,3	1.07	0
5	DIO	B	2002	-	6,6,6	0.68	0	6,6,6	0.32	0
6	ACY	B	2007	-	3,3,3	1.91	2 (66%)	3,3,3	1.70	2 (66%)
6	ACY	A	2004	-	3,3,3	1.80	1 (33%)	3,3,3	1.62	1 (33%)
6	ACY	A	2011	-	3,3,3	1.47	1 (33%)	3,3,3	0.66	0
6	ACY	A	2008	-	3,3,3	1.97	1 (33%)	3,3,3	1.92	1 (33%)
4	QIX	B	2001	3	40,40,40	3.62	20 (50%)	50,52,52	2.58	22 (44%)
5	DIO	B	2004	-	6,6,6	1.19	0	6,6,6	0.61	0
5	DIO	B	2003	-	6,6,6	0.96	0	6,6,6	0.68	0
5	DIO	A	2003	-	6,6,6	1.07	0	6,6,6	0.59	0
6	ACY	A	2010	-	3,3,3	1.61	1 (33%)	3,3,3	1.44	0
6	ACY	A	2006	-	3,3,3	1.63	1 (33%)	3,3,3	1.52	1 (33%)

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
5	DIO	B	2005	-	-	-	0/1/1/1
5	DIO	A	2002	-	-	-	0/1/1/1
5	DIO	B	2004	-	-	-	0/1/1/1
5	DIO	B	2006	-	-	-	0/1/1/1
5	DIO	B	2003	-	-	-	0/1/1/1
4	QIX	A	2001	3	-	16/39/39/39	0/2/2/2
5	DIO	A	2003	-	-	-	0/1/1/1
5	DIO	B	2002	-	-	-	0/1/1/1
4	QIX	B	2001	3	-	15/39/39/39	0/2/2/2

The worst 5 of 56 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	2001	QIX	C14-N16	11.35	1.44	1.32
4	A	2001	QIX	C14-N16	10.73	1.44	1.32
4	A	2001	QIX	C43-N45	8.46	1.52	1.33
4	A	2001	QIX	C02-N04	8.16	1.49	1.33
4	B	2001	QIX	C29-N31	7.82	1.50	1.33

The worst 5 of 52 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	2001	QIX	C18-C19-C20	-8.74	103.55	120.91
4	B	2001	QIX	C18-C19-C20	-6.95	107.12	120.91
4	A	2001	QIX	C18-C19-C28	6.81	135.55	120.57
4	B	2001	QIX	C18-C12-C13	-5.62	98.74	111.10
4	A	2001	QIX	C24-C25-C26	5.25	127.80	120.44

There are no chirality outliers.

5 of 31 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	2001	QIX	C10-C12-C13-C14
4	A	2001	QIX	C18-C12-C13-C14
4	A	2001	QIX	C32-C43-N45-C46
4	A	2001	QIX	N03-C02-N04-C05
4	A	2001	QIX	N01-C02-N04-C05

There are no ring outliers.

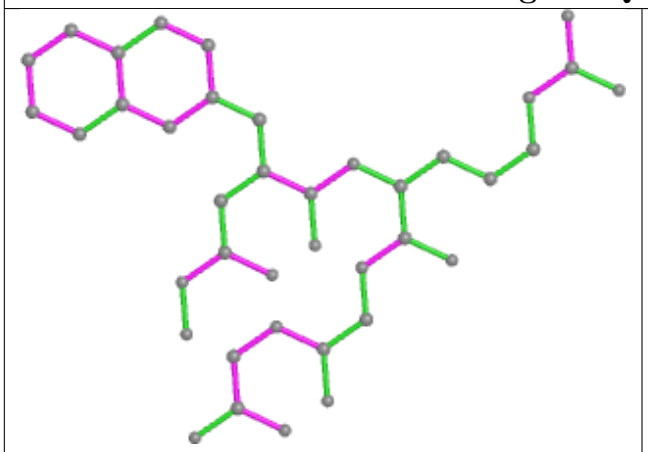
7 monomers are involved in 24 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	2002	DIO	3	0
4	A	2001	QIX	3	0
5	B	2002	DIO	1	0
6	B	2007	ACY	2	0
4	B	2001	QIX	4	0
5	B	2003	DIO	2	0
5	A	2003	DIO	12	0

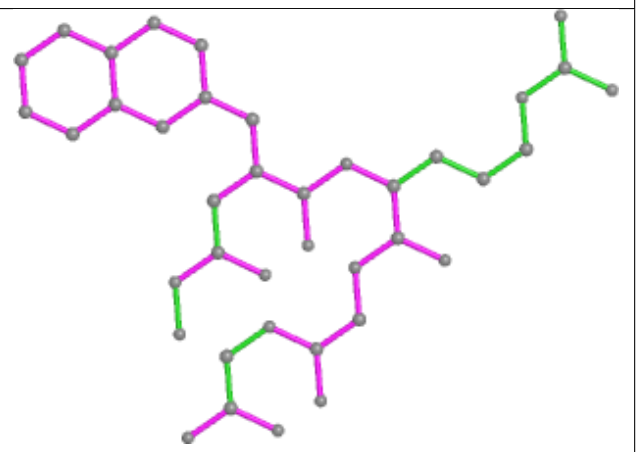
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

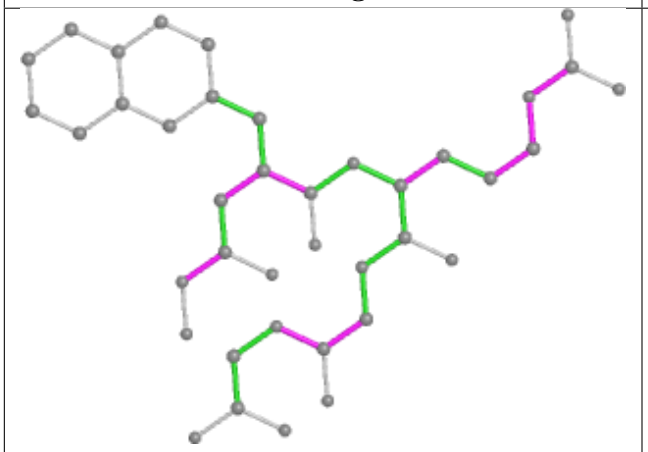
Ligand QIX A 2001



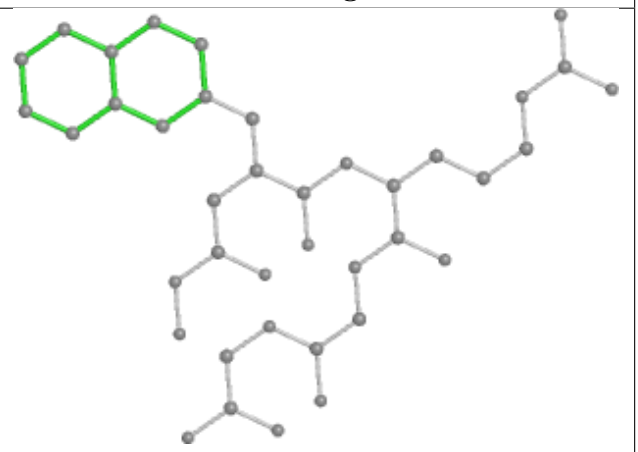
Bond lengths



Bond angles

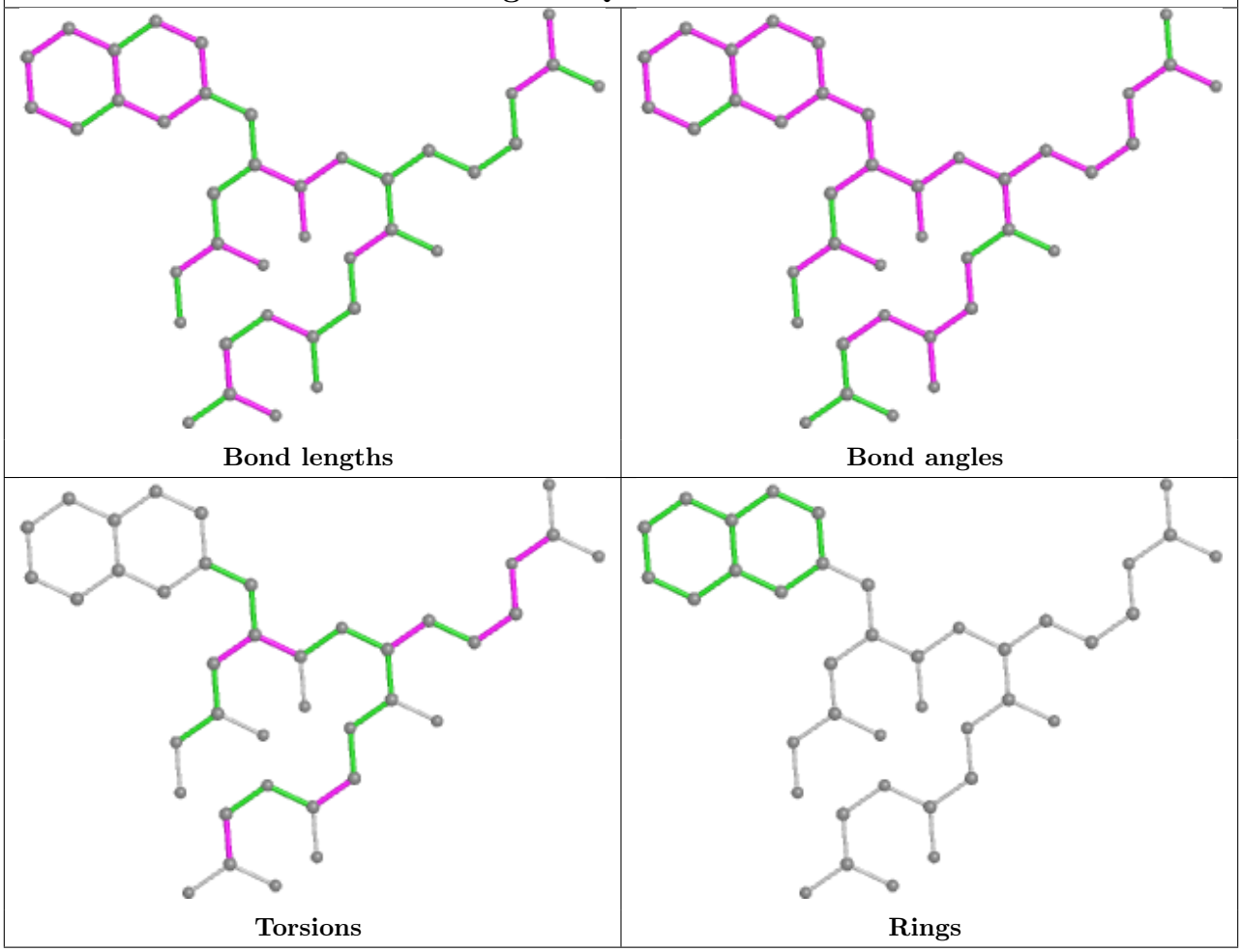


Torsions



Rings

Ligand QIX B 2001



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	961/1019 (94%)	-0.68	6 (0%) 89 88	16, 33, 55, 100	0
1	B	961/1019 (94%)	-0.67	5 (0%) 91 89	24, 37, 58, 102	0
2	F	3/3 (100%)	0.66	0 100 100	52, 52, 55, 56	0
2	G	3/3 (100%)	0.74	0 100 100	42, 42, 45, 51	0
All	All	1928/2044 (94%)	-0.67	11 (0%) 89 88	16, 35, 57, 102	0

The worst 5 of 11 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	966	ASN	5.3
1	A	966	ASN	5.1
1	B	968	VAL	3.5
1	A	967	PRO	3.3
1	B	969	VAL	3.1

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)

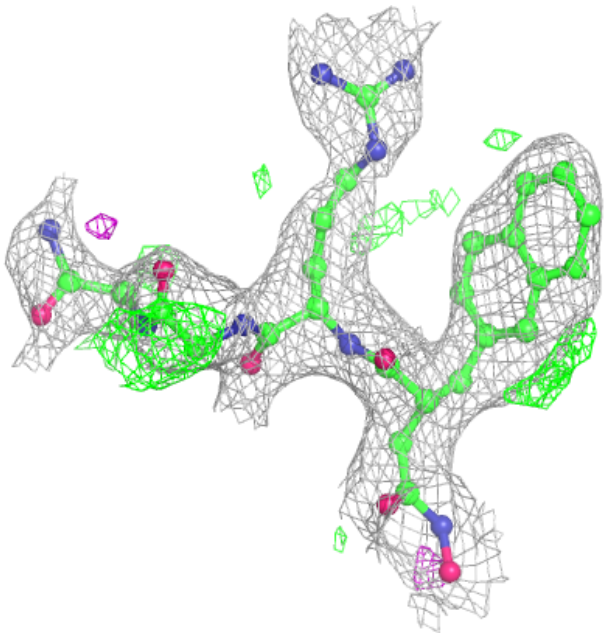
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

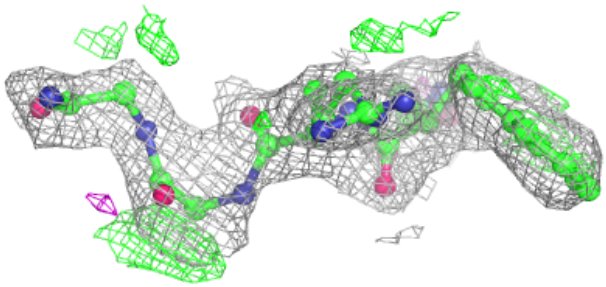
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	ACY	B	2007	4/4	0.85	0.17	43,60,65,75	0
4	QIX	B	2001	39/39	0.91	0.20	40,58,90,102	0
6	ACY	B	2011	4/4	0.91	0.12	28,53,55,70	0
4	QIX	A	2001	39/39	0.92	0.20	33,53,81,84	0
5	DIO	B	2005	6/6	0.92	0.20	55,70,84,95	0
5	DIO	B	2003	6/6	0.93	0.23	35,56,63,86	0
5	DIO	B	2006	6/6	0.93	0.21	69,76,87,90	0
6	ACY	A	2009	4/4	0.94	0.14	45,49,60,65	0
5	DIO	A	2003	6/6	0.94	0.23	31,43,51,60	0
6	ACY	A	2008	4/4	0.94	0.15	41,43,53,60	0
6	ACY	B	2010	4/4	0.95	0.16	29,52,60,63	0
6	ACY	A	2004	4/4	0.95	0.11	51,60,64,74	0
6	ACY	A	2011	4/4	0.96	0.17	24,37,42,51	0
6	ACY	A	2007	4/4	0.96	0.13	38,51,60,66	0
6	ACY	B	2008	4/4	0.96	0.11	56,61,68,69	0
6	ACY	B	2009	4/4	0.96	0.13	34,48,57,58	0
5	DIO	B	2004	6/6	0.96	0.17	51,64,67,78	0
6	ACY	A	2006	4/4	0.96	0.10	32,62,70,82	0
6	ACY	B	2012	4/4	0.96	0.14	42,51,56,59	0
6	ACY	A	2005	4/4	0.97	0.12	42,53,61,68	0
6	ACY	A	2010	4/4	0.97	0.21	33,53,56,58	0
5	DIO	A	2002	6/6	0.97	0.12	45,59,65,67	0
5	DIO	B	2002	6/6	0.99	0.16	33,38,46,54	0
3	ZN	B	2000	1/1	1.00	0.11	32,32,32,32	0
3	ZN	A	2000	1/1	1.00	0.12	31,31,31,31	0

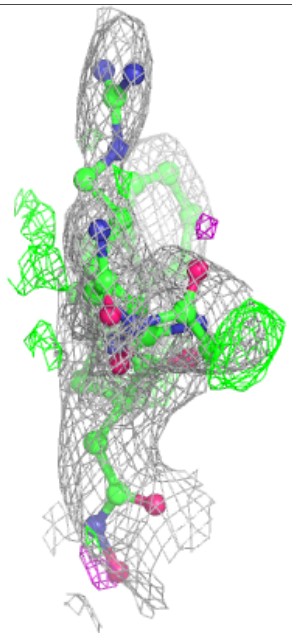
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around QIX B 2001:

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

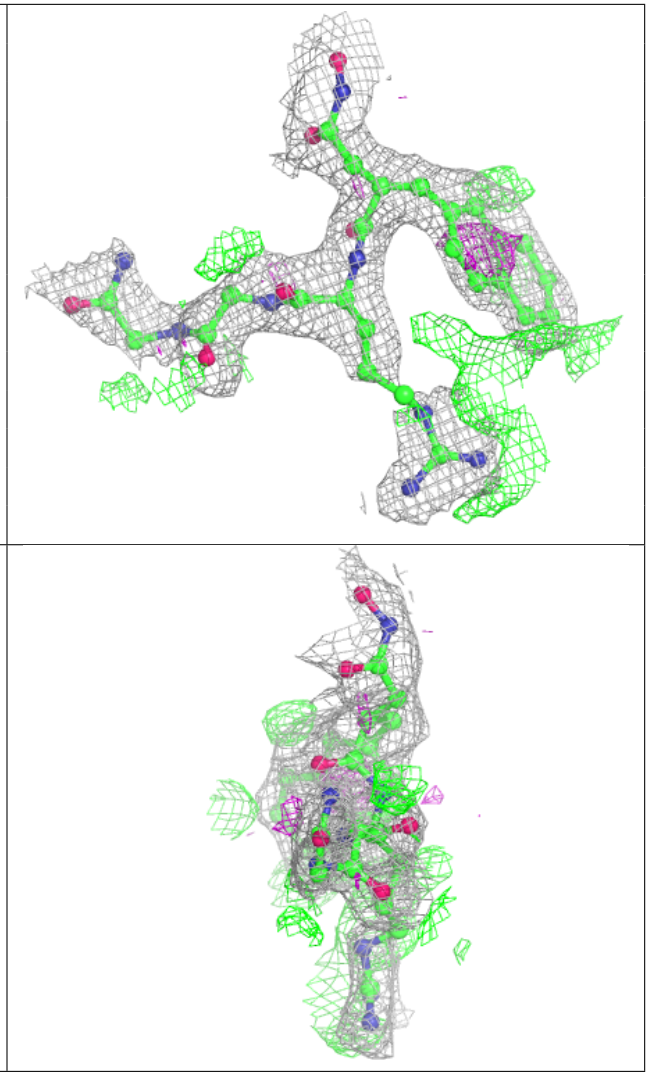






Electron density around QIX A 2001:

$2mF_o$-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.