WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Jan 30, 2024 – 01:05 PM EST

PDB ID	:	1ICJ
Title	:	PDF PROTEIN IS CRYSTALLIZED AS NI2+ CONTAINING FORM, COCRYSTALLIZED WITH INHIBITOR POLYETHYLENE GLYCOL (PEG)
Authors	:	Becker, A.; Schlichting, I.; Kabsch, W.; Schultz, S.; Wagner, A.F.V.
Deposited on	:	1998-03-12
Resolution	:	1.90 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

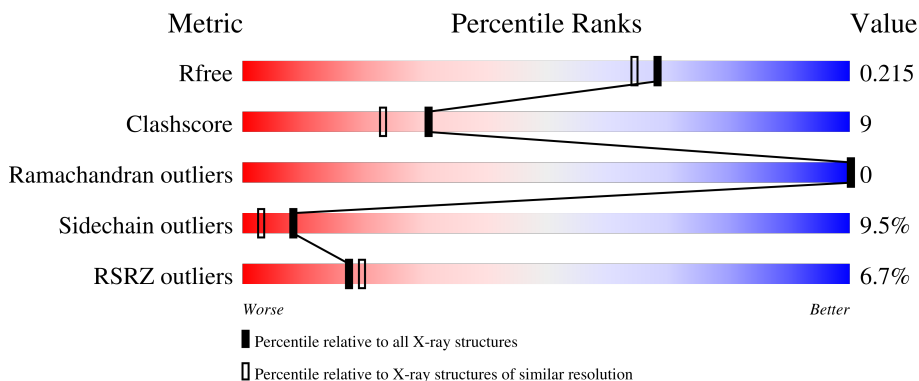|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh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

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 1.90 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	Percentile Ranks	Value
Rfree		0.215
Clashscore		9
Ramachandran outliers		0
Sidechain outliers		9.5%
RSRZ outliers		6.7%

Worse   *Better*

▌ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	6207 (1.90-1.90)
Clashscore	141614	6847 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

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	168	9% 75% 20% 5%
1	B	168	4% 83% 14% •
1	C	168	7% 80% 15% 5%

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 4424 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 PEPTIDE DEFORMYLASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	168	Total	C	N	O	S	0	7	0
			1379	863	251	257	8			
1	B	168	Total	C	N	O	S	0	9	0
			1387	869	253	257	8			
1	C	168	Total	C	N	O	S	0	3	0
			1356	849	244	255	8			

- Molecule 2 is NICKEL (II) ION (three-letter code: NI) (formula: Ni).

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

- Molecule 3 is NONAETHYLENE GLYCOL (three-letter code: 2PE) (formula: $C_{18}H_{38}O_{10}$).

2PE
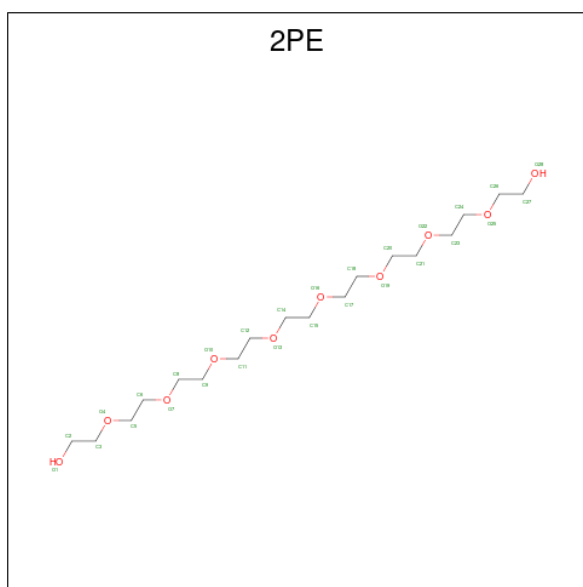
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 28	C 18	O 10	0	0
3	B	1	Total 28	C 18	O 10	0	0
3	C	1	Total 28	C 18	O 10	0	0

• Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O$_4$S).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total 5	O 4	S 1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total 5	O 4	S 1	0	0

- Molecule 5 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	66	Total 66	O 66	0	0
5	B	68	Total 68	O 68	0	0
5	C	71	Total 71	O 71	0	0

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.
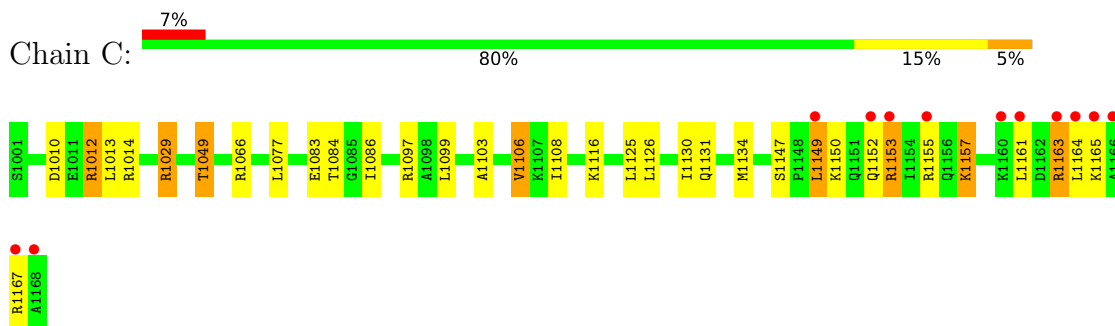
- Molecule 1: PEPTIDE DEFORMYLASE

Chain A:

- Molecule 1: PEPTIDE DEFORMYLASE

Chain B:

- Molecule 1: PEPTIDE DEFORMYLASE

Chain C:
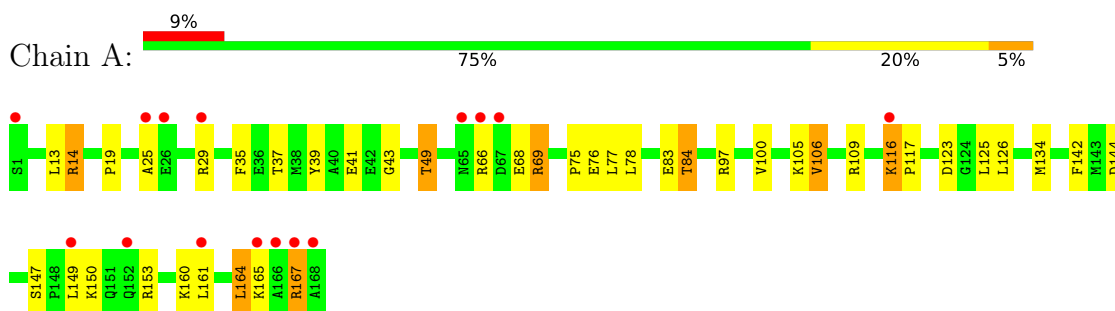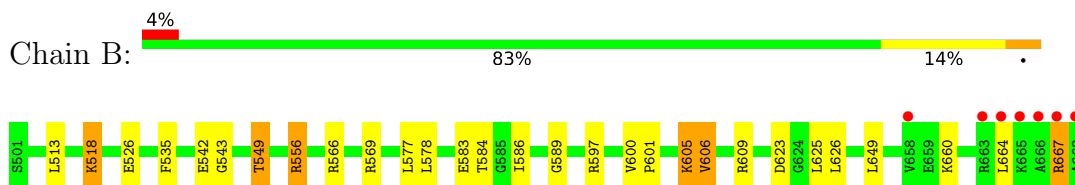
4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	140.70Å 63.40Å 86.90Å 90.00° 120.60° 90.00°	Depositor
Resolution (Å)	6.00 – 1.90 9.98 – 1.90	Depositor EDS
% Data completeness (in resolution range)	98.2 (6.00-1.90) 95.3 (9.98-1.90)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$	-	Xtriage
Refinement program	X-PLOR	Depositor
R, R_{free}	0.198 , 0.230 0.191 , 0.215	Depositor DCC
R_{free} test set	5057 reflections (9.96%)	wwPDB-VP
Wilson B-factor (Å^2)	22.6	Xtriage
Anisotropy	0.122	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.46 , 92.8	EDS
L-test for twinning[1]	$< |L| > = 0.46, < L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	4424	wwPDB-VP
Average B, all atoms (Å^2)	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.12% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]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: 2PE, SO4, NI

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	0.47	0/1434	0.62	0/1924
1	B	0.48	0/1452	0.65	1/1949 (0.1%)
1	C	0.49	0/1386	0.63	0/1862
All	All	0.48	0/4272	0.63	1/5735 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	2
1	C	0	5
All	All	0	8

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	556	ARG	NE-CZ-NH1	-6.83	116.89	120.30

There are no chirality outliers.

All (8) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	83	GLU	Mainchain
1	B	556	ARG	Sidechain
1	B	583	GLU	Mainchain

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Mol	Chain	Res	Type	Group
1	C	1012	ARG	Sidechain
1	C	1014	ARG	Sidechain
1	C	1029	ARG	Sidechain
1	C	1083	GLU	Mainchain
1	C	1153	ARG	Sidechain

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	1379	0	1446	30	0
1	B	1387	0	1461	15	0
1	C	1356	0	1405	28	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
3	A	28	0	38	3	0
3	B	28	0	38	8	0
3	C	28	0	38	12	0
4	B	10	0	0	0	0
5	A	66	0	0	2	0
5	B	68	0	0	1	0
5	C	71	0	0	2	0
All	All	4424	0	4426	80	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 9.

All (80) 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:C:1150:LYS:HD3	1:C:1153:ARG:HH11	1.34	0.93
1:C:1103:ALA:H	1:C:1131:GLN:HE22	1.23	0.83
1:C:1097:ARG:HH22	3:C:2:2PE:H62	1.45	0.81
1:B:578:LEU:HD11	1:B:609[B]:ARG:HG3	1.61	0.81
3:B:3:2PE:H91	3:B:3:2PE:H272	1.65	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:84:THR:HG21	5:A:2019:HOH:O	1.91	0.70
1:C:1097:ARG:NH2	3:C:2:2PE:H62	2.06	0.69
1:A:37:THR:O	1:A:41:GLU:HG2	1.97	0.64
1:A:147:SER:OG	1:A:150[A]:LYS:HG2	1.97	0.64
1:C:1149:LEU:HD12	1:C:1153:ARG:NH2	2.14	0.63
1:B:542:GLU:HB2	3:B:3:2PE:H51	1.79	0.63
1:A:25:ALA:HB1	1:A:29:ARG:NH2	2.15	0.62
1:A:25:ALA:HB1	1:A:29:ARG:CZ	2.30	0.61
1:B:543:GLY:HA2	3:B:3:2PE:H122	1.84	0.60
3:B:3:2PE:H112	3:B:3:2PE:H261	1.85	0.59
1:B:549:THR:HB	5:B:3049:HOH:O	2.03	0.59
1:A:35:PHE:CZ	1:A:69:ARG:HB3	2.38	0.58
1:C:1010:ASP:OD1	1:C:1012:ARG:HD3	2.03	0.58
1:C:1150:LYS:HD3	1:C:1153:ARG:NH1	2.14	0.58
1:A:160:LYS:O	1:A:164:LEU:HD22	2.05	0.56
1:A:116:LYS:HE3	1:A:117:PRO:HD2	1.87	0.56
1:A:39:TYR:CE1	1:A:66:ARG:HD2	2.42	0.55
3:C:2:2PE:O7	3:C:2:2PE:H231	2.06	0.55
1:A:25:ALA:O	1:A:29:ARG:HD2	2.08	0.54
1:C:1097:ARG:HH21	3:C:2:2PE:C20	2.21	0.54
1:C:1097:ARG:HH22	3:C:2:2PE:C6	2.18	0.53
3:B:3:2PE:H272	3:B:3:2PE:C9	2.39	0.52
1:B:605:LYS:HG2	1:B:623:ASP:HB3	1.91	0.51
1:A:97:ARG:NH2	3:A:2002:2PE:H52	2.26	0.51
1:B:526:GLU:OE2	1:C:1029:ARG:HD2	2.11	0.50
3:B:3:2PE:H112	3:B:3:2PE:C26	2.41	0.50
1:C:1167:ARG:HH11	1:C:1167:ARG:HG2	1.76	0.50
1:A:43:GLY:HA2	3:A:2002:2PE:H182	1.93	0.50
1:C:1153:ARG:O	1:C:1157:LYS:HD3	2.11	0.50
1:B:660:LYS:O	1:B:664:LEU:HD13	2.13	0.49
1:C:1049:THR:HB	5:C:2067:HOH:O	2.12	0.49
1:C:1149:LEU:HB3	1:C:1153:ARG:NH1	2.28	0.49
1:C:1086:ILE:O	1:C:1099:LEU:HA	2.12	0.49
1:A:14:ARG:NH2	1:A:144:ASP:OD2	2.46	0.48
1:A:97:ARG:HH22	3:A:2002:2PE:H52	1.80	0.47
1:C:1150:LYS:HA	1:C:1153:ARG:HD2	1.95	0.47
1:A:77:LEU:HD11	1:A:106:VAL:HG22	1.97	0.47
1:A:100:VAL:HG21	1:A:142:PHE:HB2	1.97	0.47
1:A:29:ARG:HG3	1:A:29:ARG:HH11	1.79	0.46
1:A:160:LYS:NZ	1:A:160:LYS:HB2	2.30	0.46
1:A:49:THR:HB	5:A:2057:HOH:O	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:535:PHE:CZ	1:B:569[B]:ARG:HB3	2.50	0.46
1:B:667:ARG:HH11	1:B:667:ARG:HB2	1.81	0.46
1:A:19:PRO:HG3	1:C:1066:ARG:HG2	1.98	0.46
1:C:1077:LEU:HD11	1:C:1106:VAL:HG22	1.98	0.45
3:C:2:2PE:H21	5:C:2039:HOH:O	2.16	0.45
1:A:78:LEU:HD11	1:A:109:ARG:HB2	1.99	0.45
1:C:1147:SER:OG	1:C:1150:LYS:HG2	2.17	0.45
1:B:589:GLY:H	3:B:3:2PE:H201	1.82	0.44
1:A:76:GLU:HG2	1:A:109:ARG:HB3	1.99	0.44
1:C:1097:ARG:HH12	3:C:2:2PE:H22	1.83	0.44
1:C:1097:ARG:HH12	3:C:2:2PE:C2	2.31	0.43
1:C:1108:ILE:HG21	1:C:1134[A]:MET:HE3	2.01	0.43
1:C:1149:LEU:HD12	1:C:1153:ARG:CZ	2.48	0.43
1:A:167:ARG:HE	1:A:167:ARG:HB3	1.73	0.43
1:B:667:ARG:HB2	1:B:667:ARG:NH1	2.34	0.43
1:A:25:ALA:O	1:A:29:ARG:NH1	2.52	0.43
1:A:75:PRO:HB2	1:A:134[B]:MET:CE	2.48	0.43
1:C:1163:ARG:HB3	1:C:1164:LEU:HD22	2.01	0.42
1:A:105:LYS:HE2	1:A:123:ASP:HB3	2.00	0.42
3:C:2:2PE:O22	3:C:2:2PE:H272	2.19	0.42
1:B:577:LEU:HD11	1:B:606:VAL:HG22	2.01	0.42
1:C:1130:ILE:CG2	1:C:1134[A]:MET:HE3	2.51	0.41
3:B:3:2PE:O7	3:B:3:2PE:H32	2.21	0.41
1:C:1108:ILE:HG21	1:C:1134[A]:MET:CE	2.51	0.41
1:A:39:TYR:HE1	1:A:66:ARG:HD2	1.86	0.41
1:C:1097:ARG:NH2	3:C:2:2PE:C6	2.81	0.40
1:B:600:VAL:HA	1:B:601:PRO:HD3	1.97	0.40
3:C:2:2PE:O25	3:C:2:2PE:H51	2.20	0.40
1:A:29:ARG:HG3	1:A:29:ARG:NH1	2.36	0.40
1:B:535:PHE:CZ	1:B:569[A]:ARG:HB3	2.56	0.40
1:C:1097:ARG:NH2	3:C:2:2PE:O19	2.53	0.40

There are no symmetry-related clashes.

5.3   Torsion angles ⓘ

5.3.1   Protein backbone ⓘ

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	174/168 (104%)	166 (95%)	8 (5%)	0	100	100
1	B	176/168 (105%)	170 (97%)	6 (3%)	0	100	100
1	C	169/168 (101%)	162 (96%)	7 (4%)	0	100	100
All	All	519/504 (103%)	498 (96%)	21 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	156/148 (105%)	140 (90%)	16 (10%)	7	2
1	B	158/148 (107%)	142 (90%)	16 (10%)	7	2
1	C	151/148 (102%)	137 (91%)	14 (9%)	9	3
All	All	465/444 (105%)	419 (90%)	46 (10%)	8	3

All (46) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	13	LEU
1	A	14	ARG
1	A	49	THR
1	A	68	GLU
1	A	69	ARG
1	A	84	THR
1	A	106	VAL
1	A	116	LYS
1	A	125	LEU
1	A	126	LEU
1	A	153[A]	ARG
1	A	153[B]	ARG
1	A	161	LEU

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Mol	Chain	Res	Type
1	A	164	LEU
1	A	165	LYS
1	A	167	ARG
1	B	513	LEU
1	B	518[A]	LYS
1	B	518[B]	LYS
1	B	518[C]	LYS
1	B	549	THR
1	B	566	ARG
1	B	584	THR
1	B	586	ILE
1	B	597	ARG
1	B	605	LYS
1	B	606	VAL
1	B	625	LEU
1	B	626	LEU
1	B	649[A]	LEU
1	B	649[B]	LEU
1	B	667	ARG
1	C	1013	LEU
1	C	1049	THR
1	C	1084	THR
1	C	1106	VAL
1	C	1116	LYS
1	C	1125	LEU
1	C	1126	LEU
1	C	1149	LEU
1	C	1152	GLN
1	C	1155	ARG
1	C	1157	LYS
1	C	1161	LEU
1	C	1163	ARG
1	C	1165	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	65	ASN
1	A	152	GLN
1	A	156	GLN
1	C	1131	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 8 ligands modelled in this entry, 3 are monoatomic - leaving 5 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	$\#|Z| > 2$
4	SO4	B	3002	-	4,4,4	0.14	0	6,6,6	0.31	0
3	2PE	C	2	-	27,27,27	0.74	0	26,26,26	0.50	0
3	2PE	B	3	-	27,27,27	0.66	0	26,26,26	0.53	0
3	2PE	A	2002	-	27,27,27	0.72	0	26,26,26	0.50	0
4	SO4	B	3001	-	4,4,4	0.28	0	6,6,6	0.32	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. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	2PE	B	3	-	-	16/25/25/25	-
3	2PE	A	2002	-	-	14/25/25/25	-
3	2PE	C	2	-	-	11/25/25/25	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (41) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	2002	2PE	O16-C17-C18-O19
3	B	3	2PE	O16-C17-C18-O19
3	A	2002	2PE	O4-C5-C6-O7
3	B	3	2PE	O19-C20-C21-O22
3	C	2	2PE	O7-C8-C9-O10
3	B	3	2PE	O25-C26-C27-O28
3	A	2002	2PE	O7-C8-C9-O10
3	C	2	2PE	O1-C2-C3-O4
3	B	3	2PE	O22-C23-C24-O25
3	A	2002	2PE	O25-C26-C27-O28
3	C	2	2PE	C5-C6-O7-C8
3	A	2002	2PE	C14-C15-O16-C17
3	A	2002	2PE	C23-C24-O25-C26
3	B	3	2PE	C6-C5-O4-C3
3	B	3	2PE	O4-C5-C6-O7
3	B	3	2PE	C15-C14-O13-C12
3	A	2002	2PE	C5-C6-O7-C8
3	A	2002	2PE	C27-C26-O25-C24
3	C	2	2PE	C21-C20-O19-C18
3	B	3	2PE	C27-C26-O25-C24
3	C	2	2PE	C23-C24-O25-C26
3	A	2002	2PE	C9-C8-O7-C6
3	A	2002	2PE	C20-C21-O22-C23
3	B	3	2PE	O10-C11-C12-O13
3	B	3	2PE	C17-C18-O19-C20
3	A	2002	2PE	C6-C5-O4-C3
3	B	3	2PE	C2-C3-O4-C5
3	A	2002	2PE	C2-C3-O4-C5
3	B	3	2PE	C14-C15-O16-C17
3	B	3	2PE	C11-C12-O13-C14
3	C	2	2PE	O16-C17-C18-O19
3	C	2	2PE	C27-C26-O25-C24
3	A	2002	2PE	C15-C14-O13-C12
3	C	2	2PE	C8-C9-O10-C11
3	C	2	2PE	O10-C11-C12-O13
3	B	3	2PE	O13-C14-C15-O16
3	C	2	2PE	O4-C5-C6-O7
3	B	3	2PE	O7-C8-C9-O10
3	C	2	2PE	O19-C20-C21-O22

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| Mol	Chain	Res	Type	Atoms
3	A	2002	2PE	C8-C9-O10-C11
3	B	3	2PE	C20-C21-O22-C23

There are no ring outliers.

3 monomers are involved in 23 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	2	2PE	12	0
3	B	3	2PE	8	0
3	A	2002	2PE	3	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 2PE C 2

Ligand 2PE B 3

Ligand 2PE A 2002
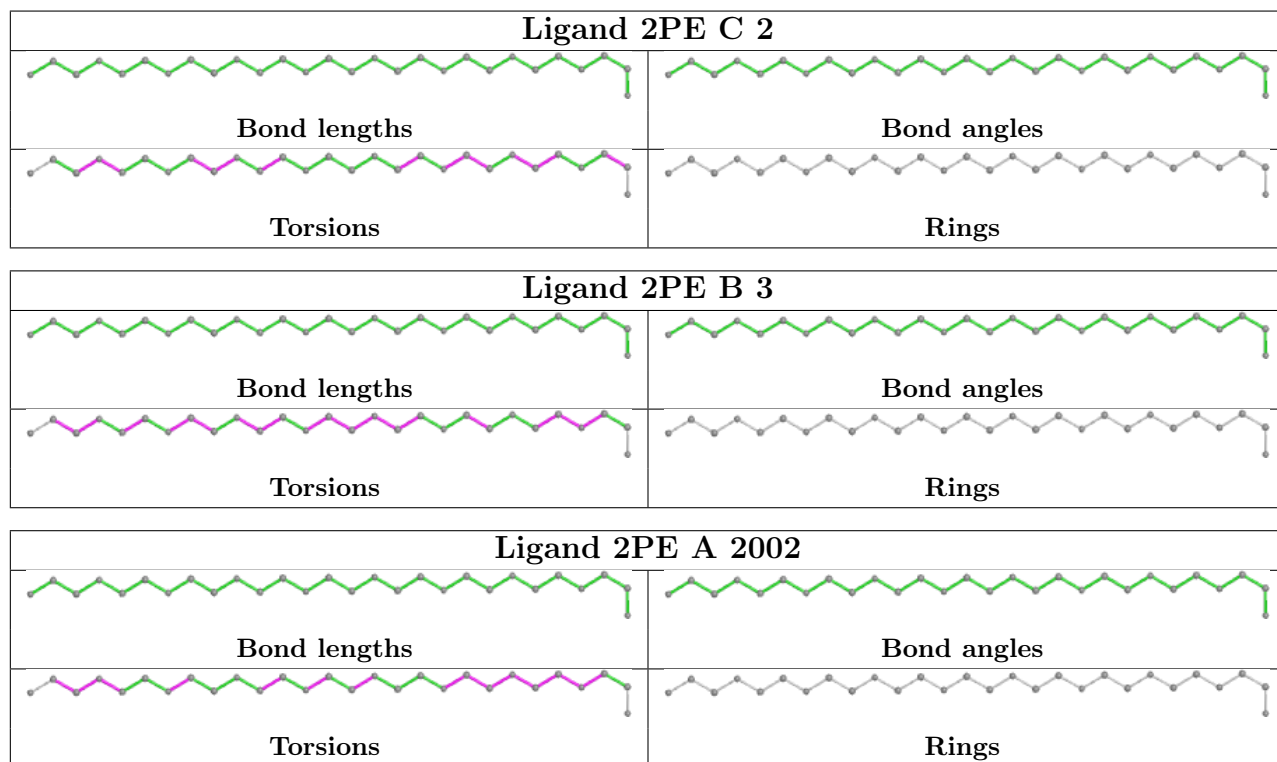
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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	168/168 (100%)	0.23	15 (8%)	9	11	14, 25, 47, 68	0
1	B	168/168 (100%)	-0.06	7 (4%)	36	39	12, 22, 41, 69	0
1	C	168/168 (100%)	0.05	12 (7%)	16	17	12, 24, 47, 72	0
All	All	504/504 (100%)	0.07	34 (6%)	17	20	12, 23, 47, 72	0

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	1168	ALA	9.0
1	B	668	ALA	8.9
1	B	667	ARG	7.4
1	C	1166	ALA	6.8
1	C	1164	LEU	6.8
1	A	166	ALA	6.7
1	A	167	ARG	6.2
1	A	168	ALA	6.2
1	C	1165	LYS	5.6
1	A	29	ARG	5.1
1	C	1167	ARG	5.1
1	B	665	LYS	4.5
1	C	1149	LEU	3.8
1	B	664	LEU	3.7
1	A	165	LYS	3.7
1	C	1153	ARG	3.6
1	B	666	ALA	3.5
1	C	1161	LEU	3.0
1	C	1152	GLN	2.9
1	C	1163	ARG	2.7
1	A	116	LYS	2.7
1	A	66	ARG	2.6
1	A	1	SER	2.6

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Mol	Chain	Res	Type	RSRZ
1	C	1155	ARG	2.5
1	A	152	GLN	2.5
1	A	65	ASN	2.4
1	C	1160	LYS	2.4
1	B	663	ARG	2.3
1	A	25	ALA	2.3
1	B	658	VAL	2.2
1	A	161	LEU	2.2
1	A	149[A]	LEU	2.1
1	A	67	ASP	2.1
1	A	26	GLU	2.1

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

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

6.3 Carbohydrates ⓘ

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	2PE	B	3	28/28	0.65	0.27	41,56,67,67	0
3	2PE	A	2002	28/28	0.70	0.24	43,57,65,67	0
3	2PE	C	2	28/28	0.71	0.29	43,57,67,68	0
4	SO4	B	3001	5/5	0.94	0.12	48,49,50,51	0
4	SO4	B	3002	5/5	0.98	0.16	40,42,42,44	0
2	NI	C	2001	1/1	0.99	0.04	27,27,27,27	0
2	NI	A	2001	1/1	0.99	0.03	28,28,28,28	0
2	NI	B	2001	1/1	0.99	0.02	22,22,22,22	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.
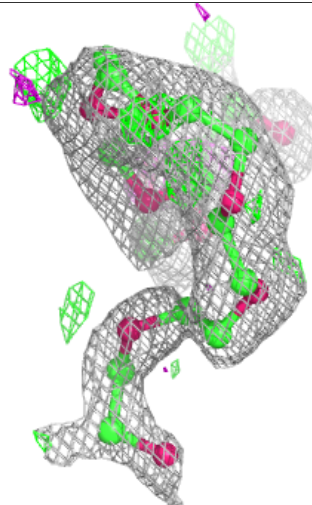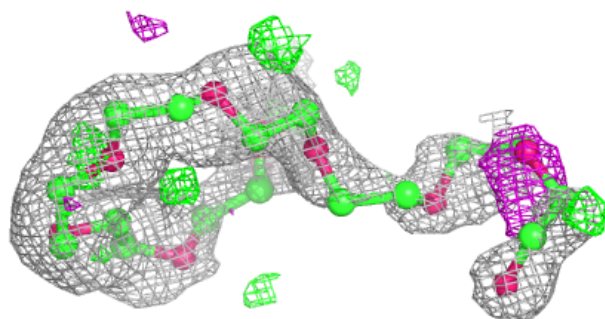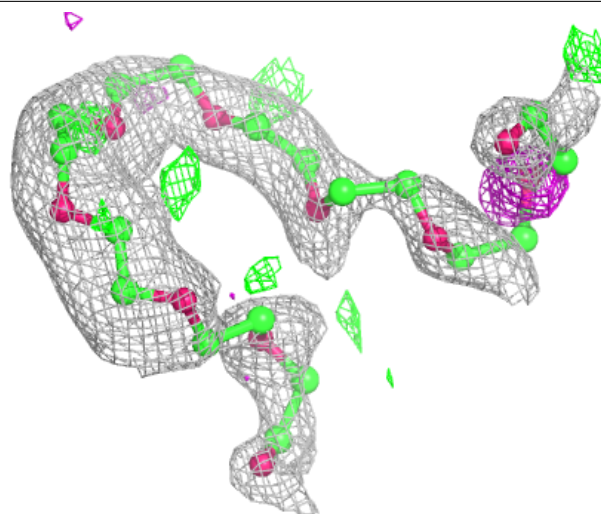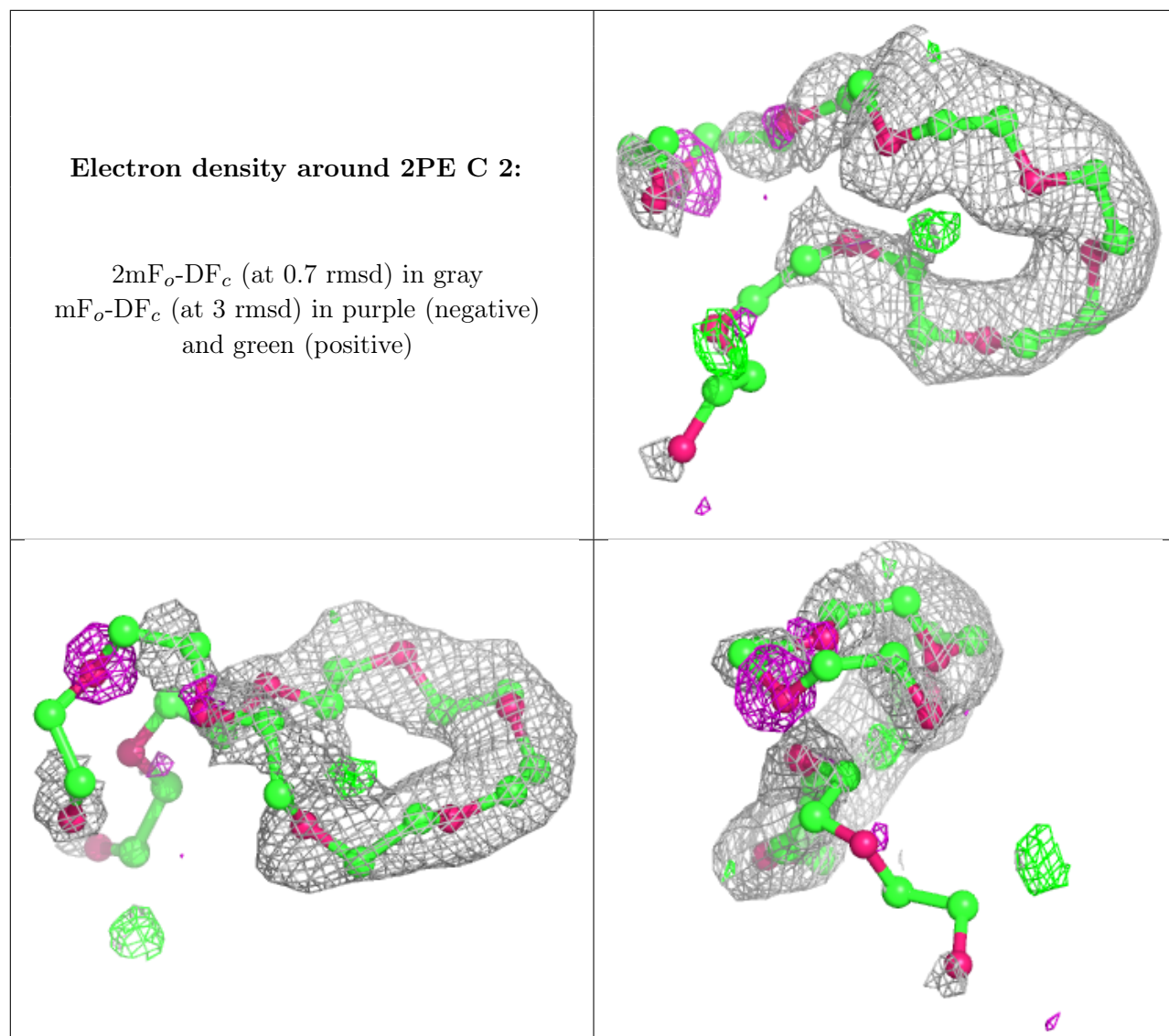
Electron density around 2PE B 3:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
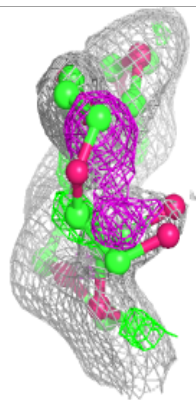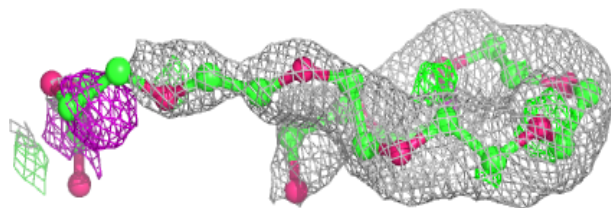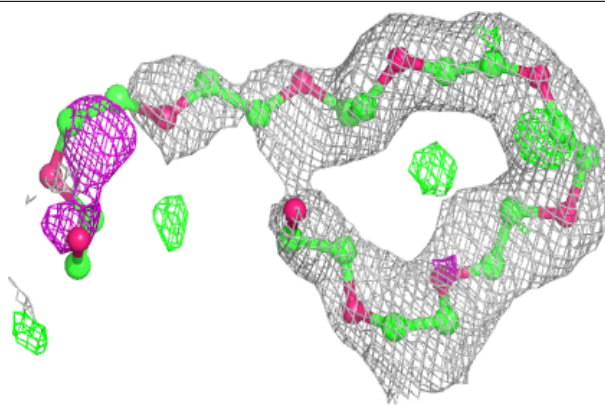
Electron density around 2PE A 2002:

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

Electron density around 2PE C 2:

$2mF_o$-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.