



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 24, 2022 – 12:35 pm GMT

PDB ID : 7ANY
Title : Structure of the Laspartomycin C Friulimicin-like mutant in complex with Geranyl phosphate
Authors : Zeronian, M.R.; Pearce, N.M.; Lutz, M.; Wood, T.M.; Martin, N.I.; Janssen, B.J.C.
Deposited on : 2020-10-13
Resolution : 1.14 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 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 : 2.24
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0267
CCP4 : 7.1.010 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.24

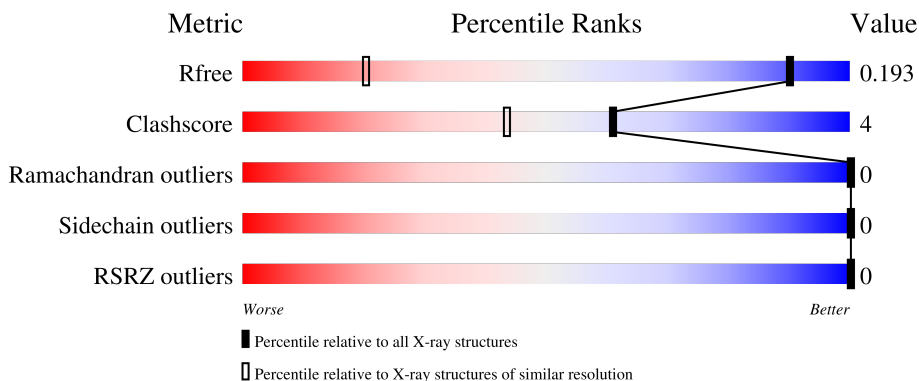
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.14 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	1492 (1.18-1.10)
Clashscore	141614	1537 (1.18-1.10)
Ramachandran outliers	138981	1483 (1.18-1.10)
Sidechain outliers	138945	1480 (1.18-1.10)
RSRZ outliers	127900	1464 (1.18-1.10)

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	12	100%
1	B	12	92% 8%
1	C	12	92% 8%
1	D	12	92% 8%
1	E	12	92% 8%

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Mol	Chain	Length	Quality of chain
1	F	12	 92% 8%
1	G	12	 92% 8%
1	H	12	 92% 8%
1	I	12	 92% 8%
1	J	12	 92% 8%
1	K	12	 92% 8%
1	L	12	 92% 8%

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	CL	J	109	-	-	X	-

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 1493 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 Laspartomycin C Friulimicin-like mutant.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
1	A	12	90	57	14	19	0	0	0
1	B	12	90	57	14	19	0	0	0
1	C	12	90	57	14	19	0	0	0
1	D	12	90	57	14	19	0	0	0
1	E	12	90	57	14	19	0	0	0
1	F	12	90	57	14	19	0	0	0
1	G	12	90	57	14	19	0	0	0
1	H	12	90	57	14	19	0	0	0
1	I	12	90	57	14	19	0	0	0
1	J	12	90	57	14	19	0	0	0
1	K	12	90	57	14	19	0	0	0
1	L	12	90	57	14	19	0	0	0

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

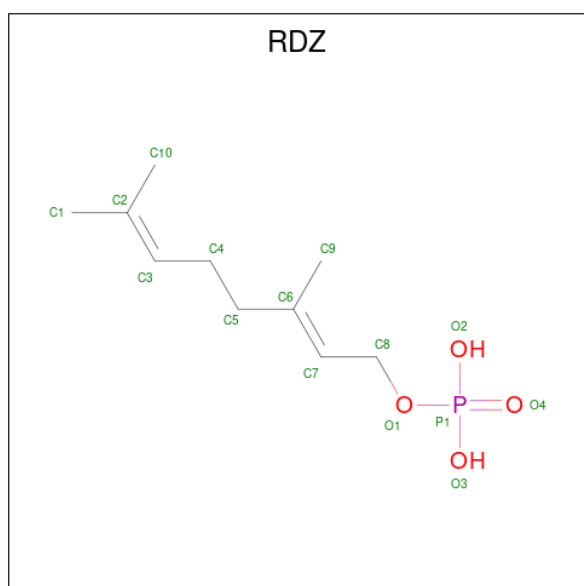
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	3	Total 3	Ca 3	0	0
2	B	3	Total 3	Ca 3	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	C	4	Total 4	Ca 4	0	1
2	D	5	Total 5	Ca 5	0	1
2	E	3	Total 3	Ca 3	0	0
2	F	4	Total 4	Ca 4	0	0
2	G	3	Total 3	Ca 3	0	0
2	H	3	Total 3	Ca 3	0	0
2	I	4	Total 4	Ca 4	0	0
2	J	4	Total 4	Ca 4	0	1
2	K	3	Total 3	Ca 3	0	0
2	L	3	Total 3	Ca 3	0	0

- Molecule 3 is Geranyl phosphate (three-letter code: RDZ) (formula: $C_{10}H_{19}O_4P$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total 15	C 10	O 4	P 1	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	B	1	Total	C	O	P	0	0
			15	10	4	1		
3	C	1	Total	C	O	P	0	0
			15	10	4	1		
3	D	1	Total	C	O	P	0	0
			15	10	4	1		
3	E	1	Total	C	O	P	0	0
			15	10	4	1		
3	F	1	Total	C	O	P	0	0
			15	10	4	1		
3	G	1	Total	C	O	P	0	0
			15	10	4	1		
3	H	1	Total	C	O	P	0	0
			15	10	4	1		
3	I	1	Total	C	O	P	0	0
			15	10	4	1		
3	J	1	Total	C	O	P	0	0
			15	10	4	1		
3	K	1	Total	C	O	P	0	0
			15	10	4	1		
3	L	1	Total	C	O	P	0	0
			15	10	4	1		

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Cl	0	0
			1	1		
4	B	1	Total	Cl	0	0
			1	1		
4	C	2	Total	Cl	0	0
			2	2		
4	D	1	Total	Cl	0	0
			1	1		
4	E	1	Total	Cl	0	0
			1	1		
4	F	1	Total	Cl	0	0
			1	1		
4	G	1	Total	Cl	0	0
			1	1		
4	H	1	Total	Cl	0	0
			1	1		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	I	1	Total Cl 1 1	0	0
4	J	2	Total Cl 2 2	0	0
4	K	1	Total Cl 1 1	0	0
4	L	1	Total Cl 1 1	0	0

- Molecule 5 is CADMIUM ION (three-letter code: CD) (formula: Cd).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total Cd 1 1	0	1
5	D	1	Total Cd 1 1	0	1
5	J	1	Total Cd 1 1	0	1

- Molecule 6 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	J	1	Total Na 1 1	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	13	Total O 13 13	0	0
7	B	16	Total O 16 16	0	0
7	C	15	Total O 15 15	0	0
7	D	13	Total O 13 13	0	0
7	E	15	Total O 15 15	0	0
7	F	13	Total O 13 13	0	0
7	G	11	Total O 11 11	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	H	17	Total O 17 17	0	0
7	I	13	Total O 13 13	0	0
7	J	15	Total O 15 15	0	0
7	K	18	Total O 18 18	0	0
7	L	14	Total O 14 14	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: Laspartomycin C Friulimicin-like mutant

Chain A:  100%

There are no outlier residues recorded for this chain.

- Molecule 1: Laspartomycin C Friulimicin-like mutant

Chain B:  92% 8%



- Molecule 1: Laspartomycin C Friulimicin-like mutant

Chain C:  92% 8%



- Molecule 1: Laspartomycin C Friulimicin-like mutant

Chain D:  92% 8%



- Molecule 1: Laspartomycin C Friulimicin-like mutant

Chain E:  92% 8%



- Molecule 1: Laspartomycin C Friulimicin-like mutant

Chain F:  92% 8%



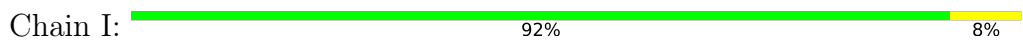
- Molecule 1: Laspartomycin C Friulimicin-like mutant



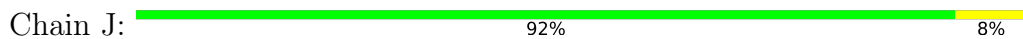
- Molecule 1: Laspartomycin C Friulimicin-like mutant



- Molecule 1: Laspartomycin C Friulimicin-like mutant



- Molecule 1: Laspartomycin C Friulimicin-like mutant



- Molecule 1: Laspartomycin C Friulimicin-like mutant



- Molecule 1: Laspartomycin C Friulimicin-like mutant



4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	40.13Å 68.32Å 40.13Å 90.00° 120.00° 90.00°	Depositor
Resolution (Å)	34.76 – 1.14 34.76 – 1.14	Depositor EDS
% Data completeness (in resolution range)	52.2 (34.76-1.14) 52.2 (34.76-1.14)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.50 (at 1.14Å)	Xtriage
Refinement program	REFMAC 5.8.0267	Depositor
R, R_{free}	0.160 , 0.192 0.160 , 0.193	Depositor DCC
R_{free} test set	1938 reflections (5.38%)	wwPDB-VP
Wilson B-factor (Å ²)	6.4	Xtriage
Anisotropy	0.090	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	(Not available) , (Not available)	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	0.237 for -h-l,k,h 0.237 for l,k,-h-l 0.286 for h,-k,-h-l 0.215 for -h-l,-k,l 0.249 for l,-k,h	Xtriage
Reported twinning fraction	0.523 for H, K, L 0.127 for -H, -K, H+L 0.235 for L, K, -H-L 0.026 for -H-L, K, H 0.033 for -H-L, -K, L 0.056 for -L, -K, -H	Depositor
Outliers	0 of 36022 reflections	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	1493	wwPDB-VP
Average B, all atoms (Å ²)	14.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 19.59% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 9GE, DNP, 2RA, CL, CD, NA, CPI, CA, RDZ

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	0.73	0/52	1.05	0/67
1	B	0.87	0/52	1.09	0/67
1	C	0.69	0/52	1.09	0/67
1	D	0.79	0/52	1.00	0/67
1	E	0.68	0/52	1.00	0/67
1	F	0.94	0/52	0.85	0/67
1	G	0.84	0/52	0.84	0/67
1	H	0.67	0/52	0.95	0/67
1	I	0.80	0/52	1.15	0/67
1	J	0.80	0/52	1.05	0/67
1	K	0.97	0/52	1.15	0/67
1	L	0.68	0/52	1.01	0/67
All	All	0.80	0/624	1.02	0/804

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

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	90	0	58	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	90	0	58	0	0
1	C	90	0	58	0	0
1	D	90	0	58	0	0
1	E	90	0	58	0	0
1	F	90	0	58	0	0
1	G	90	0	58	0	0
1	H	90	0	58	0	0
1	I	90	0	58	0	0
1	J	90	0	58	1	0
1	K	90	0	58	0	0
1	L	90	0	58	0	0
2	A	3	0	0	0	0
2	B	3	0	0	0	0
2	C	4	0	0	0	0
2	D	5	0	0	0	0
2	E	3	0	0	0	0
2	F	4	0	0	0	0
2	G	3	0	0	0	0
2	H	3	0	0	0	0
2	I	4	0	0	0	0
2	J	4	0	0	0	0
2	K	3	0	0	0	0
2	L	3	0	0	0	0
3	A	15	0	0	0	0
3	B	15	0	0	0	0
3	C	15	0	0	0	0
3	D	15	0	0	0	0
3	E	15	0	0	0	0
3	F	15	0	0	0	0
3	G	15	0	0	0	0
3	H	15	0	0	0	0
3	I	15	0	0	0	0
3	J	15	0	0	0	0
3	K	15	0	0	0	0
3	L	15	0	0	0	0
4	A	1	0	0	0	0
4	B	1	0	0	1	0
4	C	2	0	0	1	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	F	1	0	0	1	0
4	G	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	H	1	0	0	1	0
4	I	1	0	0	1	0
4	J	2	0	0	2	0
4	K	1	0	0	1	0
4	L	1	0	0	1	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
5	J	1	0	0	0	0
6	J	1	0	0	0	0
7	A	13	0	0	0	0
7	B	16	0	0	1	0
7	C	15	0	0	0	0
7	D	13	0	0	0	0
7	E	15	0	0	0	0
7	F	13	0	0	1	0
7	G	11	0	0	0	0
7	H	17	0	0	1	0
7	I	13	0	0	1	0
7	J	15	0	0	1	0
7	K	18	0	0	2	0
7	L	14	0	0	1	0
All	All	1493	0	696	9	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 (9) 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)
4:K:105:CL:CL	7:K:213:HOH:O	2.19	0.96
4:J:109:CL:CL	7:J:213:HOH:O	2.26	0.90
4:H:105:CL:CL	7:H:212:HOH:O	2.38	0.79
4:L:105:CL:CL	7:L:210:HOH:O	2.40	0.75
4:F:106:CL:CL	7:F:211:HOH:O	2.44	0.73
4:C:108:CL:CL	7:K:206:HOH:O	2.53	0.63
4:I:106:CL:CL	7:I:204:HOH:O	2.53	0.61
4:B:105:CL:CL	7:B:210:HOH:O	2.58	0.45
1:J:7:ASP:OD2	4:J:109:CL:CL	2.72	0.44

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	7/12 (58%)	7 (100%)	0	0	100	100
1	B	7/12 (58%)	7 (100%)	0	0	100	100
1	C	7/12 (58%)	7 (100%)	0	0	100	100
1	D	7/12 (58%)	7 (100%)	0	0	100	100
1	E	7/12 (58%)	7 (100%)	0	0	100	100
1	F	7/12 (58%)	7 (100%)	0	0	100	100
1	G	7/12 (58%)	7 (100%)	0	0	100	100
1	H	7/12 (58%)	7 (100%)	0	0	100	100
1	I	7/12 (58%)	7 (100%)	0	0	100	100
1	J	7/12 (58%)	7 (100%)	0	0	100	100
1	K	7/12 (58%)	7 (100%)	0	0	100	100
1	L	7/12 (58%)	7 (100%)	0	0	100	100
All	All	84/144 (58%)	84 (100%)	0	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	6/6 (100%)	6 (100%)	0	100	100
1	B	6/6 (100%)	6 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	6/6 (100%)	6 (100%)	0	100	100
1	D	6/6 (100%)	6 (100%)	0	100	100
1	E	6/6 (100%)	6 (100%)	0	100	100
1	F	6/6 (100%)	6 (100%)	0	100	100
1	G	6/6 (100%)	6 (100%)	0	100	100
1	H	6/6 (100%)	6 (100%)	0	100	100
1	I	6/6 (100%)	6 (100%)	0	100	100
1	J	6/6 (100%)	6 (100%)	0	100	100
1	K	6/6 (100%)	6 (100%)	0	100	100
1	L	6/6 (100%)	6 (100%)	0	100	100
All	All	72/72 (100%)	72 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

36 non-standard protein/DNA/RNA residues are modelled in this entry.

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	$\# Z > 2$
1	DNP	E	2	1,2	3,5,6	0.92	0	1,5,7	0.26	0
1	CPI	A	3	1	6,8,9	0.61	0	5,9,11	1.16	0
1	CPI	C	3	1	6,8,9	0.66	0	5,9,11	1.41	1 (20%)
1	DNP	G	2	1,2	3,5,6	0.64	0	1,5,7	0.34	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	2RA	B	9	1	3,5,6	0.64	0	1,5,7	0.36	0
1	DNP	J	2	1,2	3,5,6	0.87	0	1,5,7	0.06	0
1	2RA	F	9	1	3,5,6	0.42	0	1,5,7	0.16	0
1	DNP	H	2	1,2	3,5,6	0.66	0	1,5,7	0.33	0
1	DNP	A	2	1,2	3,5,6	0.97	0	1,5,7	0.41	0
1	2RA	H	9	1	3,5,6	0.32	0	1,5,7	0.23	0
1	2RA	I	9	1	3,5,6	1.11	0	1,5,7	0.41	0
1	DNP	D	2	1,2	3,5,6	0.81	0	1,5,7	0.50	0
1	DNP	C	2	1,2	3,5,6	0.70	0	1,5,7	0.29	0
1	2RA	G	9	1	3,5,6	0.89	0	1,5,7	0.01	0
1	DNP	K	2	1,2	3,5,6	0.64	0	1,5,7	0.04	0
1	CPI	L	3	1	6,8,9	0.51	0	5,9,11	1.57	1 (20%)
1	2RA	E	9	1	3,5,6	0.72	0	1,5,7	0.11	0
1	DNP	L	2	1,2	3,5,6	0.76	0	1,5,7	0.18	0
1	CPI	H	3	1	6,8,9	0.72	0	5,9,11	1.34	1 (20%)
1	CPI	J	3	1	6,8,9	0.66	0	5,9,11	0.93	0
1	2RA	C	9	1	3,5,6	0.54	0	1,5,7	0.00	0
1	CPI	B	3	1	6,8,9	0.70	0	5,9,11	1.27	1 (20%)
1	2RA	D	9	1	3,5,6	1.02	0	1,5,7	0.10	0
1	DNP	I	2	1,2	3,5,6	0.91	0	1,5,7	0.50	0
1	2RA	A	9	1	3,5,6	0.92	0	1,5,7	0.13	0
1	2RA	K	9	1	3,5,6	0.41	0	1,5,7	0.20	0
1	CPI	D	3	1	6,8,9	0.55	0	5,9,11	1.29	1 (20%)
1	DNP	B	2	1,2	3,5,6	1.05	0	1,5,7	0.07	0
1	CPI	I	3	1	6,8,9	0.59	0	5,9,11	1.01	1 (20%)
1	2RA	L	9	1	3,5,6	0.56	0	1,5,7	0.14	0
1	2RA	J	9	1	3,5,6	1.10	0	1,5,7	0.63	0
1	DNP	F	2	1,2	3,5,6	0.69	0	1,5,7	0.37	0
1	CPI	F	3	1	6,8,9	0.62	0	5,9,11	1.06	1 (20%)
1	CPI	G	3	1	6,8,9	0.61	0	5,9,11	1.35	1 (20%)
1	CPI	E	3	1	6,8,9	0.57	0	5,9,11	1.14	1 (20%)
1	CPI	K	3	1	6,8,9	0.59	0	5,9,11	1.50	1 (20%)

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
1	DNP	E	2	1,2	-	1/2/4/6	-
1	CPI	A	3	1	-	0/1/10/12	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	CPI	C	3	1	-	0/1/10/12	0/1/1/1
1	DNP	G	2	1,2	-	0/2/4/6	-
1	2RA	B	9	1	-	0/2/4/6	-
1	DNP	J	2	1,2	-	0/2/4/6	-
1	2RA	F	9	1	-	0/2/4/6	-
1	DNP	H	2	1,2	-	1/2/4/6	-
1	DNP	A	2	1,2	-	0/2/4/6	-
1	2RA	H	9	1	-	1/2/4/6	-
1	2RA	I	9	1	-	1/2/4/6	-
1	DNP	D	2	1,2	-	1/2/4/6	-
1	DNP	C	2	1,2	-	0/2/4/6	-
1	2RA	G	9	1	-	1/2/4/6	-
1	DNP	K	2	1,2	-	1/2/4/6	-
1	CPI	L	3	1	-	0/1/10/12	0/1/1/1
1	2RA	E	9	1	-	0/2/4/6	-
1	DNP	L	2	1,2	-	0/2/4/6	-
1	CPI	H	3	1	-	0/1/10/12	0/1/1/1
1	CPI	J	3	1	-	0/1/10/12	0/1/1/1
1	2RA	C	9	1	-	0/2/4/6	-
1	CPI	B	3	1	-	0/1/10/12	0/1/1/1
1	2RA	D	9	1	-	0/2/4/6	-
1	DNP	I	2	1,2	-	0/2/4/6	-
1	2RA	A	9	1	-	1/2/4/6	-
1	2RA	K	9	1	-	0/2/4/6	-
1	CPI	D	3	1	-	0/1/10/12	0/1/1/1
1	DNP	B	2	1,2	-	1/2/4/6	-
1	CPI	I	3	1	-	0/1/10/12	0/1/1/1
1	2RA	L	9	1	-	0/2/4/6	-
1	2RA	J	9	1	-	0/2/4/6	-
1	DNP	F	2	1,2	-	0/2/4/6	-
1	CPI	F	3	1	-	0/1/10/12	0/1/1/1
1	CPI	G	3	1	-	0/1/10/12	0/1/1/1
1	CPI	E	3	1	-	0/1/10/12	0/1/1/1
1	CPI	K	3	1	-	0/1/10/12	0/1/1/1

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L	3	CPI	O-C-CA	-3.22	116.34	124.78
1	K	3	CPI	O-C-CA	-2.91	117.16	124.78
1	C	3	CPI	O-C-CA	-2.90	117.19	124.78

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	3	CPI	O-C-CA	-2.67	117.77	124.78
1	G	3	CPI	O-C-CA	-2.66	117.81	124.78
1	B	3	CPI	CG-CB-CA	2.38	114.52	110.98
1	H	3	CPI	CG-CB-CA	2.26	114.34	110.98
1	E	3	CPI	O-C-CA	-2.10	119.28	124.78
1	I	3	CPI	O-C-CA	-2.07	119.35	124.78
1	F	3	CPI	O-C-CA	-2.02	119.49	124.78

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	B	2	DNP	N-CA-CB-NG
1	D	2	DNP	N-CA-CB-NG
1	E	2	DNP	N-CA-CB-NG
1	H	2	DNP	N-CA-CB-NG
1	K	2	DNP	N-CA-CB-NG
1	A	9	2RA	N-CA-CB-NG
1	G	9	2RA	N-CA-CB-NG
1	H	9	2RA	N-CA-CB-NG
1	I	9	2RA	N-CA-CB-NG

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 72 ligands modelled in this entry, 60 are monoatomic - leaving 12 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	RDZ	C	103	2	14,14,14	0.91	1 (7%)	17,18,18	1.20	2 (11%)
3	RDZ	L	103	2	14,14,14	1.04	1 (7%)	17,18,18	1.38	3 (17%)
3	RDZ	H	103	2	14,14,14	0.85	1 (7%)	17,18,18	1.00	1 (5%)
3	RDZ	B	103	2	14,14,14	0.51	0	17,18,18	1.15	2 (11%)
3	RDZ	J	103	2	14,14,14	0.61	0	17,18,18	1.19	2 (11%)
3	RDZ	A	103	2	14,14,14	0.65	0	17,18,18	1.06	2 (11%)
3	RDZ	G	103	2	14,14,14	0.63	0	17,18,18	0.78	1 (5%)
3	RDZ	K	103	2	14,14,14	0.56	0	17,18,18	1.49	2 (11%)
3	RDZ	I	103	2	14,14,14	0.85	1 (7%)	17,18,18	1.12	2 (11%)
3	RDZ	D	104	5,2	14,14,14	1.09	1 (7%)	17,18,18	1.50	3 (17%)
3	RDZ	F	103	2	14,14,14	0.76	1 (7%)	17,18,18	1.33	3 (17%)
3	RDZ	E	103	2	14,14,14	0.62	0	17,18,18	0.94	1 (5%)

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	RDZ	C	103	2	-	2/13/13/13	-
3	RDZ	L	103	2	-	1/13/13/13	-
3	RDZ	H	103	2	-	0/13/13/13	-
3	RDZ	B	103	2	-	2/13/13/13	-
3	RDZ	J	103	2	-	2/13/13/13	-
3	RDZ	A	103	2	-	2/13/13/13	-
3	RDZ	G	103	2	-	0/13/13/13	-
3	RDZ	K	103	2	-	0/13/13/13	-
3	RDZ	I	103	2	-	0/13/13/13	-
3	RDZ	D	104	5,2	-	2/13/13/13	-
3	RDZ	F	103	2	-	1/13/13/13	-
3	RDZ	E	103	2	-	0/13/13/13	-

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	103	RDZ	P1-O3	-3.00	1.43	1.54
3	D	104	RDZ	P1-O3	-2.91	1.43	1.54
3	I	103	RDZ	P1-O1	2.59	1.68	1.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	H	103	RDZ	P1-O1	2.16	1.67	1.60
3	F	103	RDZ	P1-O4	2.08	1.57	1.50
3	L	103	RDZ	P1-O1	2.05	1.66	1.60

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	K	103	RDZ	C8-C7-C6	4.65	134.08	126.04
3	D	104	RDZ	C8-C7-C6	-3.66	119.71	126.04
3	F	103	RDZ	O3-P1-O1	-3.30	97.96	106.73
3	L	103	RDZ	C5-C4-C3	2.90	121.42	111.88
3	F	103	RDZ	C8-C7-C6	-2.78	121.23	126.04
3	L	103	RDZ	O3-P1-O1	-2.68	99.61	106.73
3	D	104	RDZ	O3-P1-O1	-2.63	99.74	106.73
3	I	103	RDZ	O3-P1-O1	-2.53	100.00	106.73
3	B	103	RDZ	O2-P1-O1	2.53	113.46	106.73
3	J	103	RDZ	O1-P1-O4	-2.52	99.40	106.47
3	K	103	RDZ	O1-P1-O4	2.42	113.26	106.47
3	D	104	RDZ	O2-P1-O1	2.34	112.95	106.73
3	F	103	RDZ	O3-P1-O2	2.31	116.45	107.64
3	B	103	RDZ	O1-P1-O4	-2.25	100.15	106.47
3	E	103	RDZ	C5-C4-C3	2.24	119.23	111.88
3	A	103	RDZ	C5-C4-C3	2.23	119.21	111.88
3	C	103	RDZ	O3-P1-O4	2.22	119.39	110.68
3	H	103	RDZ	C5-C4-C3	2.22	119.19	111.88
3	C	103	RDZ	O1-P1-O4	2.20	112.65	106.47
3	J	103	RDZ	O2-P1-O1	2.17	112.52	106.73
3	I	103	RDZ	O1-P1-O4	2.12	112.41	106.47
3	L	103	RDZ	O2-P1-O1	2.04	112.16	106.73
3	A	103	RDZ	O1-P1-O4	2.03	112.18	106.47
3	G	103	RDZ	O3-P1-O2	2.00	115.29	107.64

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	104	RDZ	C10-C2-C3-C4
3	D	104	RDZ	C1-C2-C3-C4
3	C	103	RDZ	C10-C2-C3-C4
3	B	103	RDZ	C10-C2-C3-C4
3	B	103	RDZ	C1-C2-C3-C4
3	A	103	RDZ	C10-C2-C3-C4

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Mol	Chain	Res	Type	Atoms
3	L	103	RDZ	C10-C2-C3-C4
3	A	103	RDZ	C1-C2-C3-C4
3	C	103	RDZ	C1-C2-C3-C4
3	J	103	RDZ	C3-C4-C5-C6
3	J	103	RDZ	C9-C6-C7-C8
3	F	103	RDZ	C1-C2-C3-C4

There are no ring outliers.

No monomer is involved in short contacts.

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	8/12 (66%)	-0.34	0 100 100	6, 9, 9, 12	0
1	B	8/12 (66%)	-0.26	0 100 100	7, 9, 9, 12	0
1	C	8/12 (66%)	-0.35	0 100 100	7, 9, 10, 10	0
1	D	8/12 (66%)	-0.24	0 100 100	7, 9, 10, 10	0
1	E	8/12 (66%)	-0.33	0 100 100	6, 8, 10, 11	0
1	F	8/12 (66%)	-0.35	0 100 100	7, 8, 10, 11	0
1	G	8/12 (66%)	-0.22	0 100 100	8, 8, 9, 11	0
1	H	8/12 (66%)	-0.28	0 100 100	7, 9, 9, 11	0
1	I	8/12 (66%)	-0.19	0 100 100	8, 9, 10, 11	0
1	J	8/12 (66%)	-0.07	0 100 100	7, 8, 9, 11	0
1	K	8/12 (66%)	-0.23	0 100 100	7, 8, 10, 12	0
1	L	8/12 (66%)	-0.15	0 100 100	7, 9, 10, 10	0
All	All	96/144 (66%)	-0.25	0 100 100	6, 9, 11, 12	0

There are no RSRZ outliers to report.

6.2 Non-standard residues in protein, DNA, RNA chains [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
1	CPI	B	3	8/9	0.96	0.08	6,8,9,10	0
1	CPI	J	3	8/9	0.96	0.07	8,8,9,10	0
1	DNP	C	2	6/7	0.97	0.06	6,7,8,8	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
1	CPI	I	3	8/9	0.97	0.07	8,9,9,10	0
1	DNP	F	2	6/7	0.97	0.06	6,8,8,9	0
1	CPI	K	3	8/9	0.97	0.07	7,8,9,9	0
1	2RA	J	9	6/7	0.97	0.07	6,7,7,9	0
1	DNP	H	2	6/7	0.98	0.05	7,7,7,8	0
1	DNP	I	2	6/7	0.98	0.06	5,7,8,8	0
1	DNP	J	2	6/7	0.98	0.06	7,8,8,8	0
1	DNP	K	2	6/7	0.98	0.06	6,8,9,9	0
1	DNP	L	2	6/7	0.98	0.06	7,8,8,9	0
1	CPI	A	3	8/9	0.98	0.05	8,9,9,9	0
1	DNP	A	2	6/7	0.98	0.05	7,8,8,8	0
1	CPI	C	3	8/9	0.98	0.05	7,8,8,9	0
1	CPI	D	3	8/9	0.98	0.05	6,7,7,7	0
1	CPI	E	3	8/9	0.98	0.06	7,8,8,9	0
1	CPI	F	3	8/9	0.98	0.05	7,8,8,8	0
1	CPI	G	3	8/9	0.98	0.06	7,7,8,8	0
1	CPI	H	3	8/9	0.98	0.06	6,7,8,9	0
1	DNP	D	2	6/7	0.98	0.06	6,7,7,7	0
1	DNP	E	2	6/7	0.98	0.05	8,9,9,9	0
1	DNP	B	2	6/7	0.98	0.06	7,8,8,9	0
1	CPI	L	3	8/9	0.98	0.06	8,8,8,8	0
1	2RA	A	9	6/7	0.98	0.05	6,7,8,9	0
1	2RA	B	9	6/7	0.98	0.06	7,7,8,8	0
1	2RA	C	9	6/7	0.98	0.06	6,7,8,10	0
1	2RA	D	9	6/7	0.98	0.07	5,7,8,10	0
1	2RA	E	9	6/7	0.98	0.05	6,6,7,8	0
1	2RA	F	9	6/7	0.98	0.06	7,8,9,9	0
1	2RA	G	9	6/7	0.98	0.05	5,8,8,10	0
1	2RA	H	9	6/7	0.98	0.06	7,7,7,8	0
1	2RA	I	9	6/7	0.98	0.05	7,7,10,12	0
1	DNP	G	2	6/7	0.98	0.06	7,8,9,10	0
1	2RA	K	9	6/7	0.98	0.06	6,7,7,8	0
1	2RA	L	9	6/7	0.98	0.05	7,8,9,9	0

6.3 Carbohydrates

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
2	CA	K	104	1/1	0.73	0.17	41,41,41,41	0
2	CA	J	106	1/1	0.86	0.10	38,38,38,38	0
2	CA	L	104	1/1	0.95	0.08	30,30,30,30	0
4	CL	I	106	1/1	0.96	0.10	41,41,41,41	0
2	CA	E	104	1/1	0.97	0.05	32,32,32,32	0
3	RDZ	C	103	15/15	0.98	0.08	7,12,25,27	0
3	RDZ	D	104	15/15	0.98	0.09	6,13,31,32	0
3	RDZ	E	103	15/15	0.98	0.08	6,13,27,31	0
3	RDZ	F	103	15/15	0.98	0.10	7,13,35,35	0
3	RDZ	J	103	15/15	0.98	0.08	5,13,27,29	0
3	RDZ	L	103	15/15	0.98	0.10	6,12,38,43	0
4	CL	G	105	1/1	0.98	0.11	28,28,28,28	0
2	CA	G	104	1/1	0.98	0.04	32,32,32,32	0
2	CA	D	106	1/1	0.99	0.09	24,24,24,24	0
3	RDZ	A	103	15/15	0.99	0.09	7,15,48,50	0
3	RDZ	B	103	15/15	0.99	0.08	7,14,34,35	0
2	CA	A	104	1/1	0.99	0.05	32,32,32,32	0
2	CA	F	104	1/1	0.99	0.04	25,25,25,25	0
2	CA	F	105	1/1	0.99	0.05	26,26,26,26	0
2	CA	B	104	1/1	0.99	0.04	30,30,30,30	0
3	RDZ	G	103	15/15	0.99	0.07	7,14,36,38	0
3	RDZ	H	103	15/15	0.99	0.09	5,14,30,30	0
3	RDZ	I	103	15/15	0.99	0.08	6,13,29,29	0
2	CA	H	104	1/1	0.99	0.03	24,24,24,24	0
3	RDZ	K	103	15/15	0.99	0.09	6,14,45,47	0
2	CA	I	104	1/1	0.99	0.04	25,25,25,25	0
4	CL	A	105	1/1	0.99	0.05	27,27,27,27	0
4	CL	B	105	1/1	0.99	0.04	26,26,26,26	0
4	CL	C	107	1/1	0.99	0.03	25,25,25,25	0
4	CL	C	108	1/1	0.99	0.03	13,13,13,13	0
4	CL	D	108	1/1	0.99	0.07	32,32,32,32	0
4	CL	E	105	1/1	0.99	0.03	28,28,28,28	0
2	CA	C	106	1/1	0.99	0.10	36,36,36,36	0
4	CL	H	105	1/1	0.99	0.07	25,25,25,25	0
2	CA	D	105	1/1	0.99	0.04	32,32,32,32	0
4	CL	J	108	1/1	0.99	0.05	26,26,26,26	0
4	CL	K	105	1/1	0.99	0.05	19,19,19,19	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	CA	K	102	1/1	1.00	0.05	6,6,6,6	0
2	CA	B	101	1/1	1.00	0.08	5,5,5,5	0
2	CA	L	101	1/1	1.00	0.05	5,5,5,5	0
2	CA	L	102	1/1	1.00	0.04	6,6,6,6	0
2	CA	B	102	1/1	1.00	0.07	5,5,5,5	0
2	CA	D	107	1/1	1.00	0.02	22,22,22,22	0
2	CA	E	101	1/1	1.00	0.05	5,5,5,5	0
2	CA	E	102	1/1	1.00	0.06	6,6,6,6	0
2	CA	A	102	1/1	1.00	0.04	5,5,5,5	0
2	CA	F	101	1/1	1.00	0.05	5,5,5,5	0
2	CA	F	102	1/1	1.00	0.06	6,6,6,6	0
2	CA	C	101	1/1	1.00	0.05	5,5,5,5	0
2	CA	C	102	1/1	1.00	0.09	5,5,5,5	0
2	CA	G	101	1/1	1.00	0.05	5,5,5,5	0
2	CA	G	102	1/1	1.00	0.04	5,5,5,5	0
2	CA	C	104[A]	1/1	1.00	0.02	4,4,4,4	1
2	CA	H	101	1/1	1.00	0.04	5,5,5,5	0
2	CA	H	102	1/1	1.00	0.05	5,5,5,5	0
2	CA	A	101	1/1	1.00	0.07	5,5,5,5	0
2	CA	I	101	1/1	1.00	0.05	5,5,5,5	0
2	CA	I	102	1/1	1.00	0.06	5,5,5,5	0
2	CA	D	101	1/1	1.00	0.05	5,5,5,5	0
2	CA	I	105	1/1	1.00	0.02	27,27,27,27	0
4	CL	F	106	1/1	1.00	0.08	22,22,22,22	0
2	CA	J	101	1/1	1.00	0.05	5,5,5,5	0
2	CA	J	102	1/1	1.00	0.06	4,4,4,4	0
2	CA	J	104[A]	1/1	1.00	0.03	6,6,6,6	1
2	CA	D	102[A]	1/1	1.00	0.04	8,8,8,8	1
4	CL	J	109	1/1	1.00	0.03	10,10,10,10	0
2	CA	K	101	1/1	1.00	0.04	5,5,5,5	0
4	CL	L	105	1/1	1.00	0.06	23,23,23,23	0
5	CD	C	105[B]	1/1	1.00	0.02	20,20,20,20	1
5	CD	D	103[B]	1/1	1.00	0.04	8,8,8,8	1
5	CD	J	105[B]	1/1	1.00	0.03	26,26,26,26	1
6	NA	J	107	1/1	1.00	0.05	14,14,14,14	0

6.5 Other polymers [i](#)

There are no such residues in this entry.