



Full wwPDB X-ray Structure Validation Report ⓘ

Dec 29, 2018 – 09:16 PM EST

PDB ID : 6HZ1
Title : THE GLIC PENTAMERIC LIGAND-GATED ION CHANNEL MUTANT E243C
Authors : Hu, H.D.; Delarue, M.
Deposited on : 2018-10-22
Resolution : 2.50 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 : 1.7.3 (157068), CSD as539be (2018)
Xtrriage (Phenix) : 1.13
EDS : rb-20031633
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)
Refmac : 5.8.0158
CCP4 : 7.0 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20031633

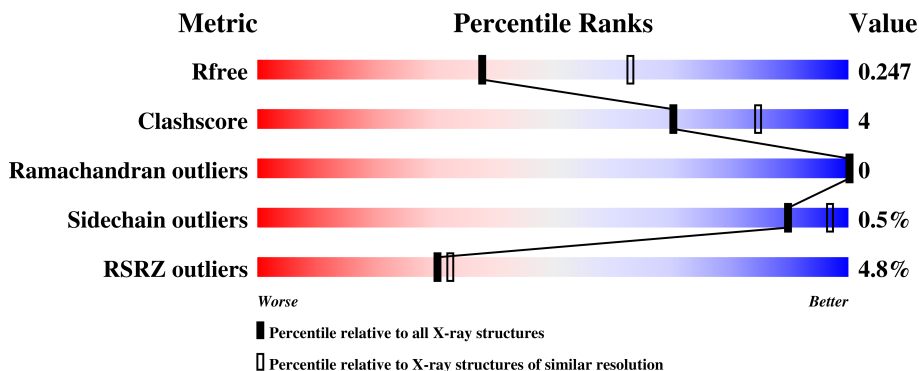
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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}	111664	4155 (2.50-2.50)
Clashscore	122126	4827 (2.50-2.50)
Ramachandran outliers	120053	4735 (2.50-2.50)
Sidechain outliers	120020	4737 (2.50-2.50)
RSRZ outliers	108989	4058 (2.50-2.50)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	317	 5% 89% 9% •
1	B	317	 4% 91% 7% •
1	C	317	 5% 90% 8% •
1	D	317	 3% 90% 9% •
1	E	317	 6% 91% 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
3	PLC	B	403	-	-	-	X
3	PLC	C	403	-	-	-	X

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 13366 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.

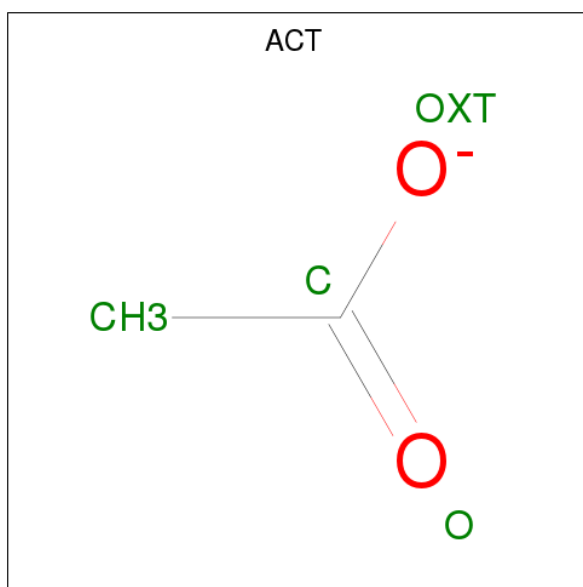
- Molecule 1 is a protein called Proton-gated ion channel.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	311	2533	1670	405	454	4	0	2	0
1	B	311	2533	1670	405	454	4	0	2	0
1	C	311	2528	1667	405	452	4	0	1	0
1	D	311	2533	1670	405	454	4	0	2	0
1	E	311	2534	1672	406	452	4	0	2	0

There are 15 discrepancies between the modelled and reference sequences:

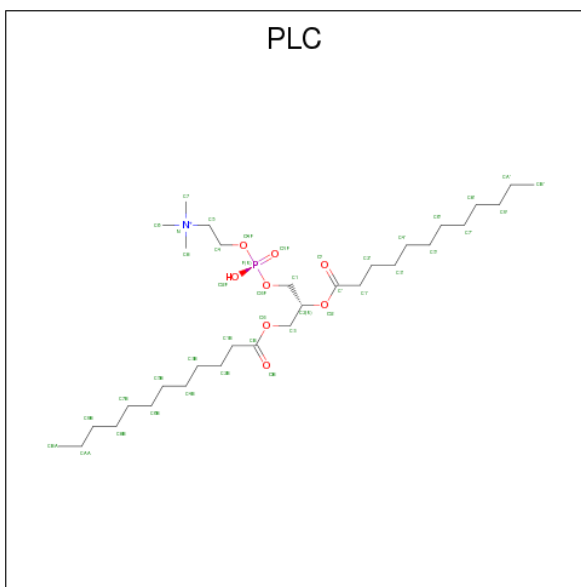
Chain	Residue	Modelled	Actual	Comment	Reference
A	1	ALA	-	expression tag	UNP Q7NDN8
A	27	SER	CYS	conflict	UNP Q7NDN8
A	243	CYS	GLU	engineered mutation	UNP Q7NDN8
B	1	ALA	-	expression tag	UNP Q7NDN8
B	27	SER	CYS	conflict	UNP Q7NDN8
B	243	CYS	GLU	engineered mutation	UNP Q7NDN8
C	1	ALA	-	expression tag	UNP Q7NDN8
C	27	SER	CYS	conflict	UNP Q7NDN8
C	243	CYS	GLU	engineered mutation	UNP Q7NDN8
D	1	ALA	-	expression tag	UNP Q7NDN8
D	27	SER	CYS	conflict	UNP Q7NDN8
D	243	CYS	GLU	engineered mutation	UNP Q7NDN8
E	1	ALA	-	expression tag	UNP Q7NDN8
E	27	SER	CYS	conflict	UNP Q7NDN8
E	243	CYS	GLU	engineered mutation	UNP Q7NDN8

- Molecule 2 is ACETATE ION (three-letter code: ACT) (formula: C₂H₃O₂).



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

- Molecule 3 is DIUNDECYL PHOSPHATIDYL CHOLINE (three-letter code: PLC) (formula: C₃₂H₆₅NO₈P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
3	A	1	34	24	1	8	1	0	0
3	A	1	Total	12	12			0	0
3	A	1	Total	24	24			0	0
3	B	1	Total	24	24			0	0
3	B	1	34	24	1	8	1	0	0
3	B	1	Total	12	12			0	0
3	C	1	Total	24	24			0	0
3	C	1	34	24	1	8	1	0	0
3	C	1	Total	12	12			0	0
3	D	1	Total	24	24			0	0
3	D	1	34	24	1	8	1	0	0
3	D	1	Total	12	12			0	0
3	E	1	Total	24	24			0	0
3	E	1	34	24	1	8	1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	E	1	Total C 12 12	0	0

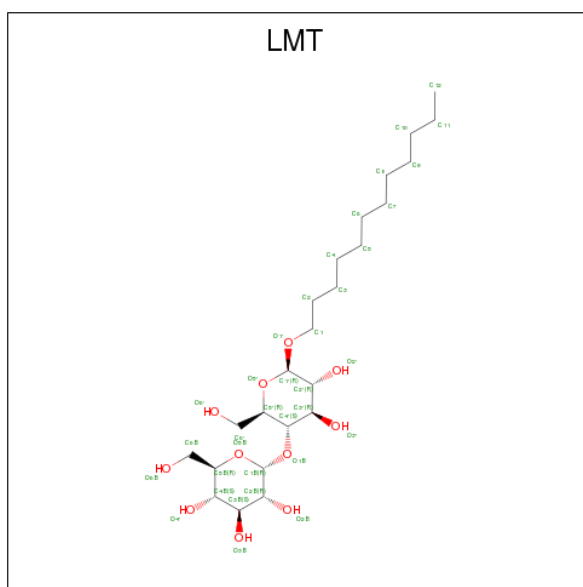
- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total Cl 1 1	0	0
4	A	3	Total Cl 3 3	0	0
4	D	1	Total Cl 1 1	0	0
4	C	1	Total Cl 1 1	0	0
4	E	1	Total Cl 1 1	0	0

- Molecule 5 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total Na 1 1	0	0
5	A	2	Total Na 2 2	0	0
5	D	1	Total Na 1 1	0	0
5	C	1	Total Na 1 1	0	0
5	E	1	Total Na 1 1	0	0

- Molecule 6 is DODECYL-BETA-D-MALTOSE (three-letter code: LMT) (formula: C₂₄H₄₆O₁₁).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C 12 12	0	0
6	A	1	Total C 12 12	0	0
6	B	1	Total C 12 12	0	0
6	C	1	Total C 12 12	0	0
6	D	1	Total C 12 12	0	0
6	D	1	Total C 12 12	0	0

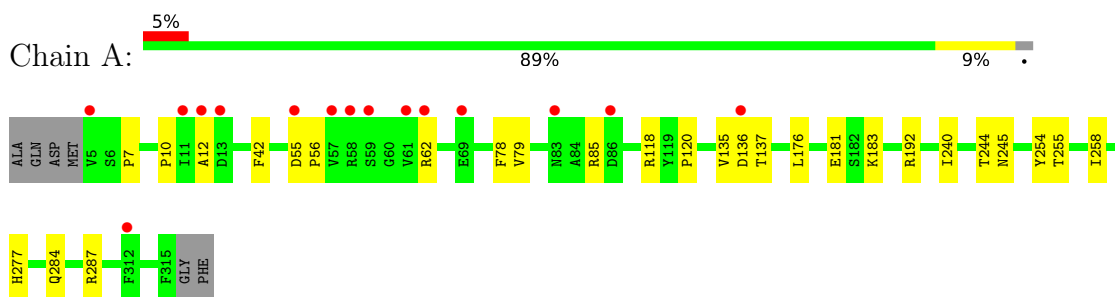
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	42	Total O 42 42	0	0
7	B	51	Total O 51 51	0	0
7	C	50	Total O 50 50	0	0
7	D	45	Total O 45 45	0	0
7	E	42	Total O 42 42	0	0

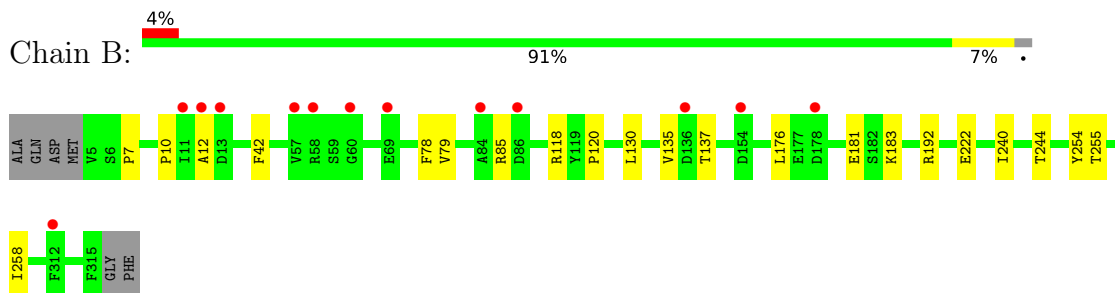
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA 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.

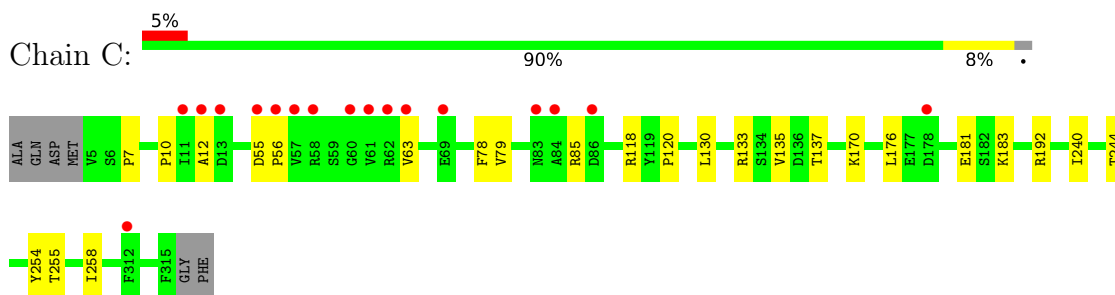
- Molecule 1: Proton-gated ion channel



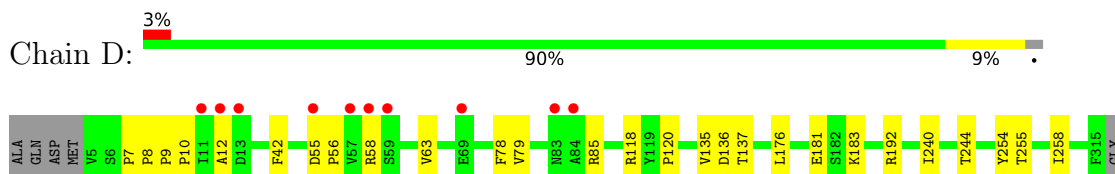
- Molecule 1: Proton-gated ion channel



- Molecule 1: Proton-gated ion channel

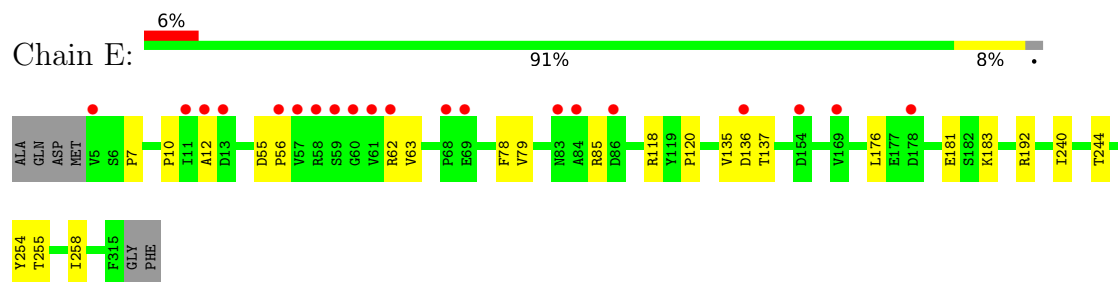


- Molecule 1: Proton-gated ion channel



PHE

- Molecule 1: Proton-gated ion channel



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	180.90Å 132.95Å 160.06Å 90.00° 102.41° 90.00°	Depositor
Resolution (Å)	20.00 – 2.50 19.98 – 2.50	Depositor EDS
% Data completeness (in resolution range)	77.3 (20.00-2.50) 77.3 (19.98-2.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.33 (at 2.50Å)	Xtrriage
Refinement program	BUSTER 2.10.3	Depositor
R, R_{free}	0.205 , 0.216 0.233 , 0.247	Depositor DCC
R_{free} test set	4903 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å ²)	33.5	Xtrriage
Anisotropy	0.074	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 51.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	13366	wwPDB-VP
Average B, all atoms (Å ²)	49.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.23% 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: NA, ACT, LMT, PLC, CL

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	0.43	0/2606	0.64	0/3559
1	B	0.44	0/2607	0.64	0/3563
1	C	0.43	0/2598	0.65	0/3548
1	D	0.42	0/2606	0.64	0/3559
1	E	0.42	0/2607	0.64	0/3559
All	All	0.43	0/13024	0.64	0/17788

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	2533	0	2561	21	0
1	B	2533	0	2561	17	0
1	C	2528	0	2557	22	0
1	D	2533	0	2561	23	0
1	E	2534	0	2570	23	0
2	A	8	0	6	0	0
2	B	12	0	9	0	0
2	C	8	0	6	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	4	0	3	0	0
2	E	8	0	6	0	0
3	A	70	0	111	1	0
3	B	70	0	111	1	0
3	C	70	0	111	1	0
3	D	70	0	111	1	0
3	E	70	0	111	1	0
4	A	3	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
5	A	2	0	0	0	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
5	E	1	0	0	0	0
6	A	24	0	46	1	0
6	B	12	0	23	0	0
6	C	12	0	23	0	0
6	D	24	0	46	0	0
7	A	42	0	0	0	0
7	B	51	0	0	0	0
7	C	50	0	0	0	0
7	D	45	0	0	0	0
7	E	42	0	0	1	0
All	All	13366	0	13533	103	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 (103) 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:55:ASP:C	1:C:56:PRO:N	2.14	1.00
1:E:55:ASP:C	1:E:56:PRO:N	2.15	0.99
1:A:55:ASP:C	1:A:56:PRO:N	2.15	0.99
1:D:55:ASP:C	1:D:56:PRO:N	2.18	0.96
1:B:7:PRO:HG2	1:B:137:THR:HG21	1.71	0.72
1:E:7:PRO:CG	1:E:137:THR:HG21	2.22	0.70
1:C:7:PRO:CG	1:C:137:THR:HG21	2.22	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:7:PRO:HG2	1:C:137:THR:HG21	1.75	0.69
1:D:7:PRO:CG	1:D:137:THR:HG21	2.23	0.68
1:B:7:PRO:CG	1:B:137:THR:HG21	2.24	0.68
1:E:7:PRO:HG2	1:E:137:THR:HG21	1.76	0.68
1:D:7:PRO:HG2	1:D:137:THR:HG21	1.75	0.67
1:C:133:ARG:NH1	1:C:176:LEU:O	2.30	0.65
1:C:7:PRO:CG	1:C:137:THR:CG2	2.78	0.62
1:E:7:PRO:CG	1:E:137:THR:CG2	2.77	0.62
1:D:7:PRO:CG	1:D:137:THR:CG2	2.78	0.62
1:B:7:PRO:CG	1:B:137:THR:CG2	2.77	0.62
1:A:7:PRO:CG	1:A:137:THR:HG21	2.30	0.61
1:B:7:PRO:HG2	1:B:137:THR:CG2	2.31	0.61
1:A:7:PRO:CG	1:A:137:THR:CG2	2.82	0.58
1:D:55:ASP:HB3	1:D:58:ARG:HG2	1.86	0.57
1:D:7:PRO:HG2	1:D:137:THR:CG2	2.35	0.56
1:D:78:PHE:CE2	1:D:85:ARG:HD3	2.41	0.56
1:E:7:PRO:HG2	1:E:137:THR:CG2	2.36	0.56
1:A:7:PRO:HG2	1:A:137:THR:HG21	1.87	0.55
1:A:78:PHE:CE2	1:A:85:ARG:HD3	2.41	0.55
1:E:7:PRO:HG3	1:E:137:THR:CG2	2.37	0.55
1:B:78:PHE:CE2	1:B:85:ARG:HD3	2.41	0.55
1:D:63:VAL:HG11	1:E:136:ASP:HB3	1.87	0.55
1:C:7:PRO:HG3	1:C:137:THR:CG2	2.37	0.54
1:C:7:PRO:HG2	1:C:137:THR:CG2	2.36	0.54
1:D:176:LEU:HB3	1:D:181:GLU:HG3	1.89	0.54
1:E:78:PHE:CE2	1:E:85:ARG:HD3	2.43	0.54
1:B:118:ARG:HH12	3:B:403:PLC:H72	1.74	0.53
1:E:118:ARG:HH12	3:E:403:PLC:H72	1.74	0.53
1:C:78:PHE:CE2	1:C:85:ARG:HD3	2.44	0.53
1:D:118:ARG:HH12	3:D:402:PLC:H72	1.74	0.53
1:D:55:ASP:CA	1:D:56:PRO:N	2.72	0.53
1:C:118:ARG:HH12	3:C:402:PLC:H72	1.74	0.52
1:D:63:VAL:HG11	1:E:136:ASP:CB	2.39	0.52
1:E:176:LEU:HB3	1:E:181:GLU:HG3	1.90	0.52
1:A:118:ARG:HH12	3:A:402:PLC:H72	1.74	0.52
1:D:7:PRO:HG3	1:D:137:THR:CG2	2.39	0.52
1:A:7:PRO:HG3	1:A:137:THR:CG2	2.40	0.52
1:B:7:PRO:HG3	1:B:135:VAL:HG21	1.92	0.52
1:E:55:ASP:CA	1:E:56:PRO:N	2.73	0.52
1:A:55:ASP:CA	1:A:56:PRO:N	2.73	0.51
1:B:10:PRO:HB2	1:B:12:ALA:O	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:78:PHE:HE2	1:A:85:ARG:HD3	1.77	0.50
1:D:78:PHE:HE2	1:D:85:ARG:HD3	1.77	0.50
1:C:55:ASP:CA	1:C:56:PRO:N	2.75	0.50
1:D:79:VAL:HG21	1:D:183:LYS:HD2	1.94	0.50
1:B:176:LEU:HB3	1:B:181:GLU:HG3	1.94	0.50
1:A:176:LEU:HB3	1:A:181:GLU:HG3	1.94	0.49
1:A:79:VAL:HG21	1:A:183:LYS:HD2	1.93	0.49
1:B:7:PRO:HG3	1:B:137:THR:CG2	2.42	0.49
1:C:120:PRO:HD3	1:C:255:THR:OG1	2.12	0.49
6:A:410:LMT:H62	6:A:411:LMT:H92	1.92	0.49
1:C:176:LEU:HB3	1:C:181:GLU:HG3	1.94	0.49
1:B:120:PRO:HD3	1:B:255:THR:OG1	2.13	0.49
1:A:7:PRO:HG2	1:A:137:THR:CG2	2.43	0.49
1:D:120:PRO:HD3	1:D:255:THR:OG1	2.13	0.48
1:B:78:PHE:HE2	1:B:85:ARG:HD3	1.77	0.48
1:C:10:PRO:HB2	1:C:12:ALA:O	2.13	0.48
1:D:10:PRO:HB2	1:D:12:ALA:O	2.14	0.48
1:E:10:PRO:HB2	1:E:12:ALA:O	2.14	0.48
1:E:78:PHE:HE2	1:E:85:ARG:HD3	1.78	0.48
1:C:79:VAL:HG21	1:C:183:LYS:HD2	1.95	0.48
1:E:120:PRO:HD3	1:E:255:THR:OG1	2.14	0.48
1:A:120:PRO:HD3	1:A:255:THR:OG1	2.14	0.47
1:D:7:PRO:HG3	1:D:135:VAL:HG21	1.96	0.47
1:E:79:VAL:HG21	1:E:183:LYS:HD2	1.95	0.47
1:A:240:ILE:O	1:A:244:THR:HG23	2.15	0.47
1:C:78:PHE:HE2	1:C:85:ARG:HD3	1.79	0.46
1:A:10:PRO:HB2	1:A:12:ALA:O	2.15	0.46
1:C:7:PRO:HG3	1:C:135:VAL:HG21	1.98	0.46
1:A:284:GLN:NE2	1:A:287:ARG:HH11	2.14	0.46
1:B:79:VAL:HG21	1:B:183:LYS:HD2	1.96	0.46
1:A:7:PRO:HG3	1:A:135:VAL:HG21	1.97	0.46
1:B:240:ILE:O	1:B:244:THR:HG23	2.15	0.46
1:D:240:ILE:O	1:D:244:THR:HG23	2.17	0.45
1:C:240:ILE:O	1:C:244:THR:HG23	2.17	0.45
1:C:63:VAL:HG11	1:D:136:ASP:OD2	2.17	0.44
1:E:55:ASP:C	1:E:56:PRO:CA	2.87	0.44
1:E:240:ILE:O	1:E:244:THR:HG23	2.18	0.43
1:A:277:HIS:HD2	7:E:508:HOH:O	1.99	0.43
1:E:7:PRO:HG3	1:E:135:VAL:HG21	1.99	0.43
1:E:62:ARG:HD2	1:E:63:VAL:HG23	1.99	0.43
1:D:120:PRO:O	1:D:192:ARG:HD2	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:136:ASP:OD2	1:E:63:VAL:HG11	2.19	0.43
1:E:254:TYR:CZ	1:E:258:ILE:HD11	2.54	0.43
1:A:120:PRO:O	1:A:192:ARG:HD2	2.20	0.42
1:C:120:PRO:O	1:C:192:ARG:HD2	2.20	0.42
1:C:55:ASP:C	1:C:56:PRO:CA	2.87	0.42
1:D:254:TYR:CZ	1:D:258:ILE:HD11	2.55	0.42
1:B:120:PRO:O	1:B:192:ARG:HD2	2.20	0.41
1:A:254:TYR:CZ	1:A:258:ILE:HD11	2.56	0.41
1:C:254:TYR:CZ	1:C:258:ILE:HD11	2.54	0.41
1:B:130:LEU:HA	1:B:130:LEU:HD23	1.93	0.41
1:C:130:LEU:HD23	1:C:130:LEU:HA	1.93	0.41
1:D:8:PRO:HA	1:D:9:PRO:HD3	1.99	0.41
1:B:254:TYR:CZ	1:B:258:ILE:HD11	2.56	0.41
1:E:120:PRO:O	1:E:192:ARG:HD2	2.21	0.41

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	309/317 (98%)	306 (99%)	3 (1%)	0	100	100
1	B	311/317 (98%)	307 (99%)	4 (1%)	0	100	100
1	C	308/317 (97%)	304 (99%)	4 (1%)	0	100	100
1	D	309/317 (98%)	306 (99%)	3 (1%)	0	100	100
1	E	309/317 (98%)	305 (99%)	4 (1%)	0	100	100
All	All	1546/1585 (98%)	1528 (99%)	18 (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	282/284 (99%)	279 (99%)	3 (1%)	76	91
1	B	282/284 (99%)	280 (99%)	2 (1%)	85	95
1	C	281/284 (99%)	280 (100%)	1 (0%)	92	98
1	D	282/284 (99%)	281 (100%)	1 (0%)	92	98
1	E	282/284 (99%)	282 (100%)	0	100	100
All	All	1409/1420 (99%)	1402 (100%)	7 (0%)	90	97

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

Mol	Chain	Res	Type
1	A	42	PHE
1	A	62	ARG
1	A	245	ASN
1	B	42	PHE
1	B	222	GLU
1	C	170	LYS
1	D	42	PHE

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

Mol	Chain	Res	Type
1	A	277	HIS
1	A	284	GLN
1	C	307	ASN
1	D	284	GLN
1	D	307	ASN
1	E	284	GLN
1	E	307	ASN

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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 44 ligands modelled in this entry, 13 are monoatomic - leaving 31 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
2	ACT	A	401	-	1,3,3	5.12	1 (100%)	0,3,3	0.00	-
3	PLC	A	402	-	33,33,41	0.44	0	39,41,49	0.69	0
3	PLC	A	403	-	11,11,41	0.15	0	10,10,49	0.17	0
2	ACT	A	409	-	1,3,3	4.33	1 (100%)	0,3,3	0.00	-
6	LMT	A	410	-	11,11,36	0.21	0	10,10,47	0.12	0
6	LMT	A	411	-	11,11,36	0.17	0	10,10,47	0.17	0
3	PLC	A	412	-	22,22,41	0.19	0	20,20,49	0.17	0
3	PLC	B	401	-	22,22,41	0.19	0	20,20,49	0.17	0
2	ACT	B	402	-	1,3,3	5.58	1 (100%)	0,3,3	0.00	-
3	PLC	B	403	-	33,33,41	0.44	0	39,41,49	0.69	0
3	PLC	B	404	-	11,11,41	0.17	0	10,10,49	0.15	0
2	ACT	B	407	-	1,3,3	5.03	1 (100%)	0,3,3	0.00	-
6	LMT	B	408	-	11,11,36	0.14	0	10,10,47	0.12	0
2	ACT	B	409	-	1,3,3	5.55	1 (100%)	0,3,3	0.00	-
3	PLC	C	401	-	22,22,41	0.20	0	20,20,49	0.15	0
3	PLC	C	402	-	33,33,41	0.43	0	39,41,49	0.68	0
3	PLC	C	403	-	11,11,41	0.17	0	10,10,49	0.15	0
2	ACT	C	406	-	1,3,3	4.30	1 (100%)	0,3,3	0.00	-
6	LMT	C	407	-	11,11,36	0.20	0	10,10,47	0.18	0
2	ACT	C	408	-	1,3,3	4.46	1 (100%)	0,3,3	0.00	-
3	PLC	D	401	-	22,22,41	0.19	0	20,20,49	0.17	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	PLC	D	402	-	33,33,41	0.45	0	39,41,49	0.68	0
3	PLC	D	403	-	11,11,41	0.17	0	10,10,49	0.17	0
2	ACT	D	406	-	1,3,3	4.35	1 (100%)	0,3,3	0.00	-
6	LMT	D	407	-	11,11,36	0.22	0	10,10,47	0.19	0
6	LMT	D	408	-	11,11,36	0.15	0	10,10,47	0.27	0
3	PLC	E	401	-	22,22,41	0.20	0	20,20,49	0.18	0
2	ACT	E	402	-	1,3,3	4.95	1 (100%)	0,3,3	0.00	-
3	PLC	E	403	-	33,33,41	0.44	0	39,41,49	0.68	0
3	PLC	E	404	-	11,11,41	0.17	0	10,10,49	0.16	0
2	ACT	E	407	-	1,3,3	2.00	0	0,3,3	0.00	-

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
2	ACT	A	401	-	-	0/0/0/0	0/0/0/0
3	PLC	A	402	-	-	0/37/37/45	0/0/0/0
3	PLC	A	403	-	-	0/9/9/45	0/0/0/0
2	ACT	A	409	-	-	0/0/0/0	0/0/0/0
6	LMT	A	410	-	-	0/9/9/61	0/0/0/2
6	LMT	A	411	-	-	0/9/9/61	0/0/0/2
3	PLC	A	412	-	-	0/18/18/45	0/0/0/0
3	PLC	B	401	-	-	0/18/18/45	0/0/0/0
2	ACT	B	402	-	-	0/0/0/0	0/0/0/0
3	PLC	B	403	-	-	0/37/37/45	0/0/0/0
3	PLC	B	404	-	-	0/9/9/45	0/0/0/0
2	ACT	B	407	-	-	0/0/0/0	0/0/0/0
6	LMT	B	408	-	-	0/9/9/61	0/0/0/2
2	ACT	B	409	-	-	0/0/0/0	0/0/0/0
3	PLC	C	401	-	-	0/18/18/45	0/0/0/0
3	PLC	C	402	-	-	0/37/37/45	0/0/0/0
3	PLC	C	403	-	-	0/9/9/45	0/0/0/0
2	ACT	C	406	-	-	0/0/0/0	0/0/0/0
6	LMT	C	407	-	-	0/9/9/61	0/0/0/2
2	ACT	C	408	-	-	0/0/0/0	0/0/0/0
3	PLC	D	401	-	-	0/18/18/45	0/0/0/0
3	PLC	D	402	-	-	0/37/37/45	0/0/0/0
3	PLC	D	403	-	-	0/9/9/45	0/0/0/0
2	ACT	D	406	-	-	0/0/0/0	0/0/0/0
6	LMT	D	407	-	-	0/9/9/61	0/0/0/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	LMT	D	408	-	-	0/9/9/61	0/0/0/2
3	PLC	E	401	-	-	0/18/18/45	0/0/0/0
2	ACT	E	402	-	-	0/0/0/0	0/0/0/0
3	PLC	E	403	-	-	0/37/37/45	0/0/0/0
3	PLC	E	404	-	-	0/9/9/45	0/0/0/0
2	ACT	E	407	-	-	0/0/0/0	0/0/0/0

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	406	ACT	CH3-C	4.30	1.54	1.48
2	A	409	ACT	CH3-C	4.33	1.54	1.48
2	D	406	ACT	CH3-C	4.35	1.54	1.48
2	C	408	ACT	CH3-C	4.46	1.54	1.48
2	E	402	ACT	CH3-C	4.95	1.55	1.48
2	B	407	ACT	CH3-C	5.03	1.55	1.48
2	A	401	ACT	CH3-C	5.12	1.55	1.48
2	B	409	ACT	CH3-C	5.55	1.55	1.48
2	B	402	ACT	CH3-C	5.58	1.55	1.48

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

7 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	402	PLC	1	0
6	A	410	LMT	1	0
6	A	411	LMT	1	0
3	B	403	PLC	1	0
3	C	402	PLC	1	0
3	D	402	PLC	1	0
3	E	403	PLC	1	0

5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	1
1	D	1
1	C	1
1	E	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	D	55:ASP	C	56:PRO	N	2.18
1	A	55:ASP	C	56:PRO	N	2.15
1	E	55:ASP	C	56:PRO	N	2.15
1	C	55:ASP	C	56:PRO	N	2.14

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	311/317 (98%)	-0.16	15 (4%) 30 32	26, 42, 104, 232	0
1	B	311/317 (98%)	-0.19	13 (4%) 36 39	25, 41, 79, 107	0
1	C	311/317 (98%)	-0.08	17 (5%) 25 27	24, 39, 94, 225	0
1	D	311/317 (98%)	-0.19	10 (3%) 47 51	25, 41, 97, 233	0
1	E	311/317 (98%)	-0.05	20 (6%) 19 20	27, 41, 101, 195	0
All	All	1555/1585 (98%)	-0.13	75 (4%) 30 32	24, 41, 94, 233	0

All (75) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	60	GLY	9.1
1	C	58	ARG	8.5
1	C	57	VAL	7.7
1	E	58	ARG	7.5
1	D	57	VAL	6.6
1	A	57	VAL	5.7
1	A	11	ILE	5.5
1	C	11	ILE	4.9
1	A	55	ASP	4.8
1	E	62	ARG	4.7
1	C	56	PRO	4.7
1	C	13	ASP	4.6
1	E	83	ASN	4.6
1	E	56	PRO	4.5
1	E	57	VAL	4.4
1	B	84	ALA	4.4
1	A	69	GLU	4.4
1	E	13	ASP	4.3
1	C	61	VAL	4.3
1	A	58	ARG	4.2

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Mol	Chain	Res	Type	RSRZ
1	E	11	ILE	4.2
1	D	58	ARG	4.1
1	D	11	ILE	3.9
1	B	13	ASP	3.8
1	D	13	ASP	3.7
1	B	12	ALA	3.7
1	D	12	ALA	3.6
1	C	86	ASP	3.5
1	B	11	ILE	3.5
1	E	61	VAL	3.5
1	A	12	ALA	3.5
1	A	13	ASP	3.5
1	B	60	GLY	3.5
1	E	84	ALA	3.3
1	B	57	VAL	3.3
1	C	178	ASP	3.3
1	C	83	ASN	3.2
1	E	68	PRO	3.2
1	E	12	ALA	3.1
1	A	62	ARG	3.1
1	C	12	ALA	3.0
1	E	69	GLU	3.0
1	C	62	ARG	3.0
1	C	84	ALA	2.9
1	E	136	ASP	2.9
1	E	86	ASP	2.9
1	B	136	ASP	2.8
1	C	312	PHE	2.8
1	E	60	GLY	2.7
1	E	5	VAL	2.7
1	C	69	GLU	2.7
1	A	86	ASP	2.7
1	B	69	GLU	2.6
1	A	59	SER	2.6
1	A	312	PHE	2.6
1	D	55	ASP	2.5
1	E	178	ASP	2.5
1	C	63	VAL	2.5
1	C	55	ASP	2.5
1	B	154	ASP	2.5
1	B	178	ASP	2.5
1	D	83	ASN	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	136	ASP	2.3
1	B	312	PHE	2.3
1	A	83	ASN	2.3
1	A	61	VAL	2.3
1	E	169	VAL	2.3
1	D	84	ALA	2.2
1	A	5	VAL	2.2
1	D	59	SER	2.1
1	E	154	ASP	2.0
1	E	59	SER	2.0
1	B	58	ARG	2.0
1	B	86	ASP	2.0
1	D	69	GLU	2.0

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

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

6.3 Carbohydrates [i](#)

There are no carbohydrates 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
5	NA	A	408	1/1	0.36	0.35	77,77,77,77	0
3	PLC	B	403	34/42	0.57	0.41	75,94,124,125	0
3	PLC	A	402	34/42	0.60	0.38	72,96,123,124	0
3	PLC	D	402	34/42	0.62	0.32	61,87,116,117	0
3	PLC	E	403	34/42	0.64	0.30	65,96,123,125	0
3	PLC	C	402	34/42	0.67	0.32	76,91,115,116	0
3	PLC	C	403	12/42	0.74	0.45	68,72,74,75	0
3	PLC	C	401	24/42	0.77	0.31	45,57,65,67	0
3	PLC	A	403	12/42	0.78	0.38	68,70,76,77	0
3	PLC	E	404	12/42	0.79	0.30	66,68,71,71	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	PLC	B	404	12/42	0.80	0.42	69,71,77,78	0
3	PLC	D	401	24/42	0.80	0.24	37,46,49,51	0
3	PLC	B	401	24/42	0.81	0.27	42,52,62,66	0
6	LMT	A	410	12/35	0.82	0.16	22,29,43,44	0
5	NA	E	406	1/1	0.83	0.10	71,71,71,71	0
2	ACT	B	409	4/4	0.83	0.28	78,78,78,79	0
2	ACT	B	402	4/4	0.84	0.26	74,74,74,75	0
3	PLC	E	401	24/42	0.84	0.23	42,47,55,56	0
3	PLC	A	412	24/42	0.85	0.26	42,48,65,68	0
6	LMT	D	407	12/35	0.86	0.19	26,28,35,37	0
6	LMT	B	408	12/35	0.86	0.16	30,33,44,45	0
6	LMT	D	408	12/35	0.87	0.18	29,31,42,44	0
6	LMT	A	411	12/35	0.87	0.17	30,34,41,42	0
2	ACT	E	402	4/4	0.87	0.28	94,95,95,95	0
5	NA	C	405	1/1	0.87	0.11	57,57,57,57	0
5	NA	A	407	1/1	0.88	0.09	69,69,69,69	0
5	NA	D	405	1/1	0.88	0.09	83,83,83,83	0
3	PLC	D	403	12/42	0.88	0.35	65,67,69,70	0
6	LMT	C	407	12/35	0.91	0.16	25,28,33,34	0
2	ACT	A	401	4/4	0.92	0.24	65,65,66,66	0
4	CL	A	405	1/1	0.92	0.19	91,91,91,91	0
4	CL	C	404	1/1	0.93	0.07	55,55,55,55	0
4	CL	A	406	1/1	0.93	0.21	88,88,88,88	0
2	ACT	D	406	4/4	0.95	0.16	60,60,60,60	0
5	NA	B	406	1/1	0.95	0.07	54,54,54,54	0
2	ACT	E	407	4/4	0.95	0.15	61,62,62,63	0
2	ACT	C	408	4/4	0.95	0.14	54,55,56,56	0
4	CL	D	404	1/1	0.96	0.05	53,53,53,53	0
4	CL	E	405	1/1	0.96	0.09	69,69,69,69	0
2	ACT	B	407	4/4	0.96	0.17	53,53,53,53	0
2	ACT	A	409	4/4	0.97	0.14	58,58,59,59	0
4	CL	A	404	1/1	0.97	0.06	47,47,47,47	0
4	CL	B	405	1/1	0.98	0.05	64,64,64,64	0
2	ACT	C	406	4/4	0.98	0.10	50,50,50,52	0

6.5 Other polymers [\(i\)](#)

There are no such residues in this entry.