Full wwPDB X-ray Structure Validation Report

Jul 3, 2024 – 04:54 PM EDT

PDB ID	:	4RYD
Title	:	X-ray structure of human furin in complex with the competitive inhibitor par a-guanidinomethyl-Phac-R-Tle-R-Amba
Authors	:	Dahms, S.O.; Than, M.E.
Deposited on	:	2014-12-15
Resolution	:	2.15 Å(reported)

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

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

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

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

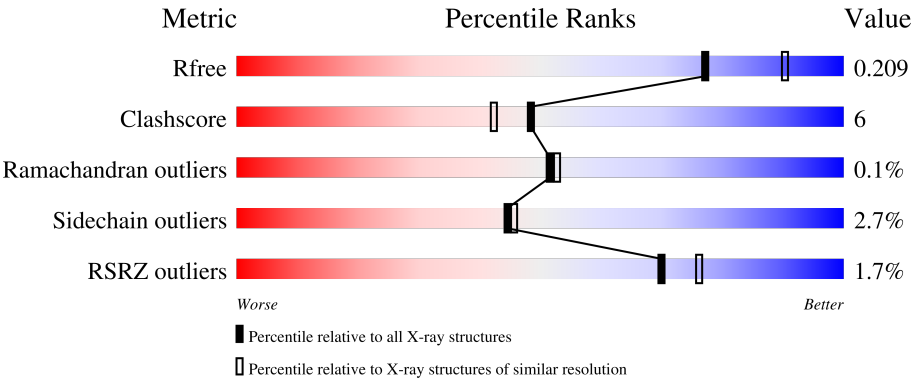
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 2.15 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	1479 (2.16-2.16)
Clashscore	141614	1585 (2.16-2.16)
Ramachandran outliers	138981	1560 (2.16-2.16)
Sidechain outliers	138945	1559 (2.16-2.16)
RSRZ outliers	127900	1456 (2.16-2.16)

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	482	2% 84% 12% ·
1	B	482	2% 82% 13% · ·
1	C	482	% 83% 13% · ·
1	D	482	% 85% 11% · ·
1	E	482	% 84% 12% · ·

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Mol	Chain	Length	Quality of chain
1	F	482	2% 80% 16%
2	H	5	80% 20%
2	I	5	80% 20%
2	J	5	80% 20%
2	K	5	80% 20%
2	L	5	80% 20%
2	N	5	80% 20%

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 23768 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 Furin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	466	Total	C	N	O	S	30	0	0
			3559	2204	637	704	14			
1	B	465	Total	C	N	O	S	31	0	0
			3552	2199	636	703	14			
1	C	466	Total	C	N	O	S	28	0	0
			3559	2204	637	704	14			
1	D	465	Total	C	N	O	S	39	0	0
			3552	2199	636	703	14			
1	E	465	Total	C	N	O	S	33	0	0
			3552	2199	636	703	14			
1	F	465	Total	C	N	O	S	40	0	0
			3552	2199	636	703	14			

There are 90 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	575	SER	-	expression tag	UNP P09958
A	576	GLY	-	expression tag	UNP P09958
A	577	SER	-	expression tag	UNP P09958
A	578	LEU	-	expression tag	UNP P09958
A	579	VAL	-	expression tag	UNP P09958
A	580	PRO	-	expression tag	UNP P09958
A	581	ARG	-	expression tag	UNP P09958
A	582	GLY	-	expression tag	UNP P09958
A	583	SER	-	expression tag	UNP P09958
A	584	HIS	-	expression tag	UNP P09958
A	585	HIS	-	expression tag	UNP P09958
A	586	HIS	-	expression tag	UNP P09958
A	587	HIS	-	expression tag	UNP P09958
A	588	HIS	-	expression tag	UNP P09958
A	589	HIS	-	expression tag	UNP P09958
B	575	SER	-	expression tag	UNP P09958
B	576	GLY	-	expression tag	UNP P09958

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Chain	Residue	Modelled	Actual	Comment	Reference
B	577	SER	-	expression tag	UNP P09958
B	578	LEU	-	expression tag	UNP P09958
B	579	VAL	-	expression tag	UNP P09958
B	580	PRO	-	expression tag	UNP P09958
B	581	ARG	-	expression tag	UNP P09958
B	582	GLY	-	expression tag	UNP P09958
B	583	SER	-	expression tag	UNP P09958
B	584	HIS	-	expression tag	UNP P09958
B	585	HIS	-	expression tag	UNP P09958
B	586	HIS	-	expression tag	UNP P09958
B	587	HIS	-	expression tag	UNP P09958
B	588	HIS	-	expression tag	UNP P09958
B	589	HIS	-	expression tag	UNP P09958
C	575	SER	-	expression tag	UNP P09958
C	576	GLY	-	expression tag	UNP P09958
C	577	SER	-	expression tag	UNP P09958
C	578	LEU	-	expression tag	UNP P09958
C	579	VAL	-	expression tag	UNP P09958
C	580	PRO	-	expression tag	UNP P09958
C	581	ARG	-	expression tag	UNP P09958
C	582	GLY	-	expression tag	UNP P09958
C	583	SER	-	expression tag	UNP P09958
C	584	HIS	-	expression tag	UNP P09958
C	585	HIS	-	expression tag	UNP P09958
C	586	HIS	-	expression tag	UNP P09958
C	587	HIS	-	expression tag	UNP P09958
C	588	HIS	-	expression tag	UNP P09958
C	589	HIS	-	expression tag	UNP P09958
D	575	SER	-	expression tag	UNP P09958
D	576	GLY	-	expression tag	UNP P09958
D	577	SER	-	expression tag	UNP P09958
D	578	LEU	-	expression tag	UNP P09958
D	579	VAL	-	expression tag	UNP P09958
D	580	PRO	-	expression tag	UNP P09958
D	581	ARG	-	expression tag	UNP P09958
D	582	GLY	-	expression tag	UNP P09958
D	583	SER	-	expression tag	UNP P09958
D	584	HIS	-	expression tag	UNP P09958
D	585	HIS	-	expression tag	UNP P09958
D	586	HIS	-	expression tag	UNP P09958
D	587	HIS	-	expression tag	UNP P09958
D	588	HIS	-	expression tag	UNP P09958

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Chain	Residue	Modelled	Actual	Comment	Reference
D	589	HIS	-	expression tag	UNP P09958
E	575	SER	-	expression tag	UNP P09958
E	576	GLY	-	expression tag	UNP P09958
E	577	SER	-	expression tag	UNP P09958
E	578	LEU	-	expression tag	UNP P09958
E	579	VAL	-	expression tag	UNP P09958
E	580	PRO	-	expression tag	UNP P09958
E	581	ARG	-	expression tag	UNP P09958
E	582	GLY	-	expression tag	UNP P09958
E	583	SER	-	expression tag	UNP P09958
E	584	HIS	-	expression tag	UNP P09958
E	585	HIS	-	expression tag	UNP P09958
E	586	HIS	-	expression tag	UNP P09958
E	587	HIS	-	expression tag	UNP P09958
E	588	HIS	-	expression tag	UNP P09958
E	589	HIS	-	expression tag	UNP P09958
F	575	SER	-	expression tag	UNP P09958
F	576	GLY	-	expression tag	UNP P09958
F	577	SER	-	expression tag	UNP P09958
F	578	LEU	-	expression tag	UNP P09958
F	579	VAL	-	expression tag	UNP P09958
F	580	PRO	-	expression tag	UNP P09958
F	581	ARG	-	expression tag	UNP P09958
F	582	GLY	-	expression tag	UNP P09958
F	583	SER	-	expression tag	UNP P09958
F	584	HIS	-	expression tag	UNP P09958
F	585	HIS	-	expression tag	UNP P09958
F	586	HIS	-	expression tag	UNP P09958
F	587	HIS	-	expression tag	UNP P09958
F	588	HIS	-	expression tag	UNP P09958
F	589	HIS	-	expression tag	UNP P09958

- Molecule 2 is a protein called para-guanidinomethyl-phenylacetyl-Arg-(3-methylvaline)-Arg -(amidomethyl)benzamidine.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	H	5	Total	C	N	O	0	0	0
			55	36	15	4			
2	I	5	Total	C	N	O	0	0	0
			55	36	15	4			
2	J	5	Total	C	N	O	0	0	0
			55	36	15	4			

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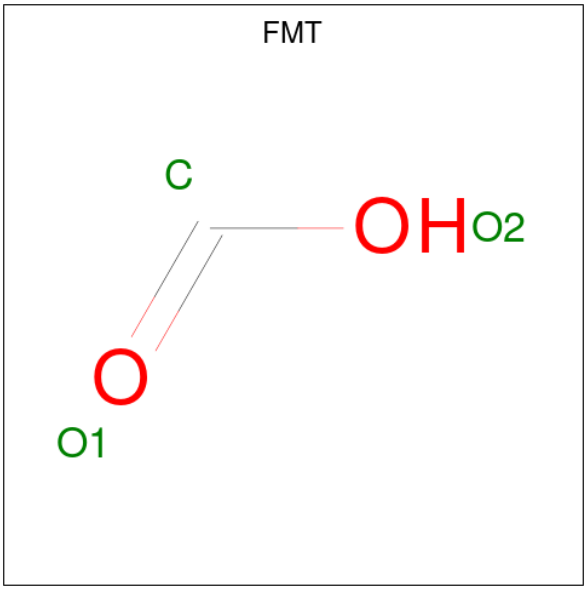
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
2	K	5	Total C N O 55 36 15 4	0	0	0
2	L	5	Total C N O 55 36 15 4	0	0	0
2	N	5	Total C N O 55 36 15 4	0	0	0

- Molecule 3 is FORMIC ACID (three-letter code: FMT) (formula: CH_2O_2).



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

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	C	1	Total C O 3 1 2	0	0
3	D	1	Total C O 3 1 2	0	0
3	D	1	Total C O 3 1 2	0	0
3	D	1	Total C O 3 1 2	0	0
3	E	1	Total C O 3 1 2	0	0
3	E	1	Total C O 3 1 2	0	0
3	E	1	Total C O 3 1 2	0	0
3	F	1	Total C O 3 1 2	0	0
3	F	1	Total C O 3 1 2	0	0
3	F	1	Total C O 3 1 2	0	0

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	3	Total Ca 3 3	0	0
4	B	3	Total Ca 3 3	0	0
4	C	3	Total Ca 3 3	0	0
4	D	3	Total Ca 3 3	0	0
4	E	3	Total Ca 3 3	0	0
4	F	3	Total Ca 3 3	0	0

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

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total Na 1 1	0	0

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

- Molecule 6 is water.

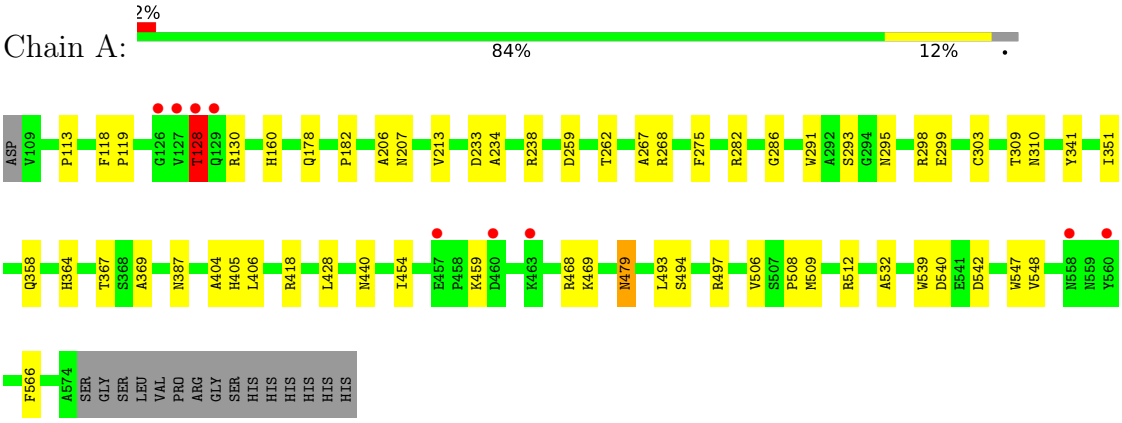
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	356	Total O 356 356	0	0
6	B	323	Total O 323 323	0	0
6	C	374	Total O 374 374	0	0
6	D	313	Total O 313 313	0	0
6	E	338	Total O 338 338	0	0
6	F	299	Total O 299 299	0	0
6	H	4	Total O 4 4	0	0
6	I	3	Total O 3 3	0	0
6	J	6	Total O 6 6	0	0
6	K	9	Total O 9 9	0	0
6	L	4	Total O 4 4	0	0
6	N	5	Total O 5 5	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.

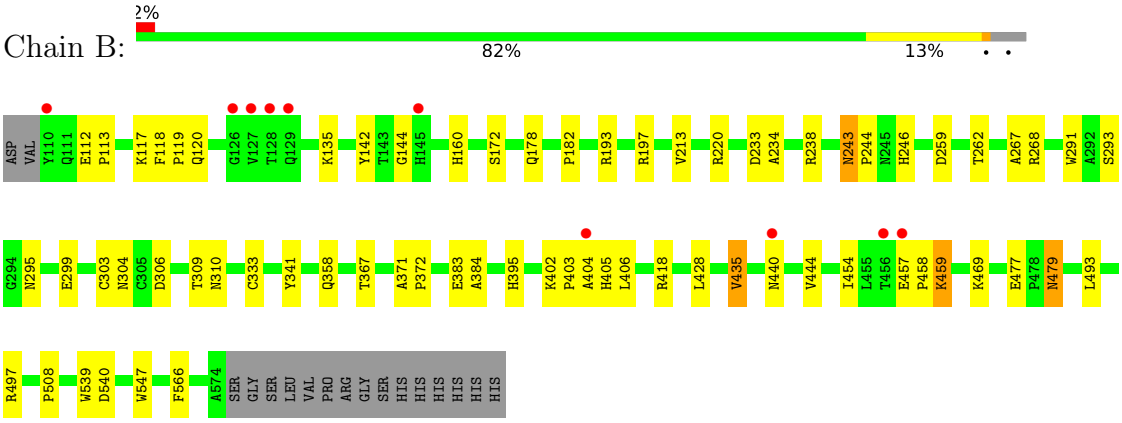
• Molecule 1: Furin

Chain A:



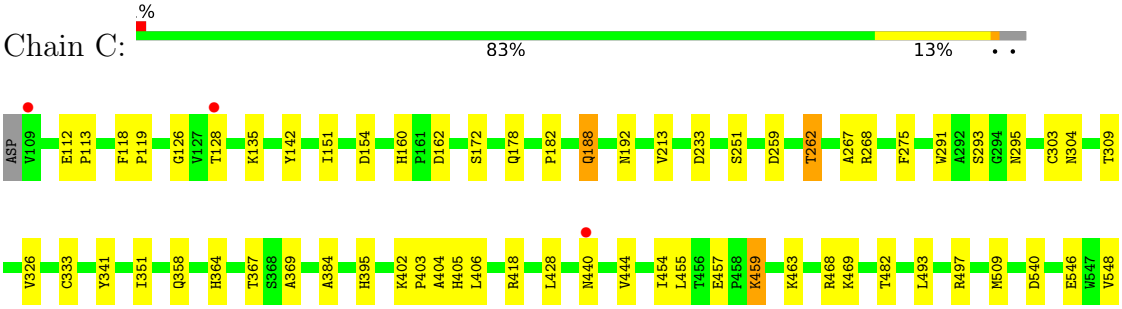
• Molecule 1: Furin

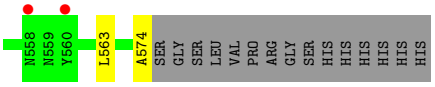
Chain B:



• Molecule 1: Furin

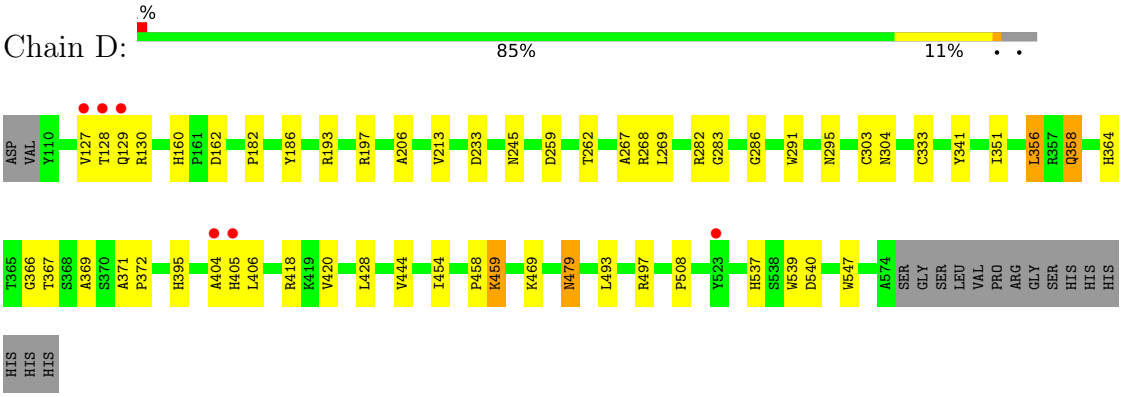
Chain C:





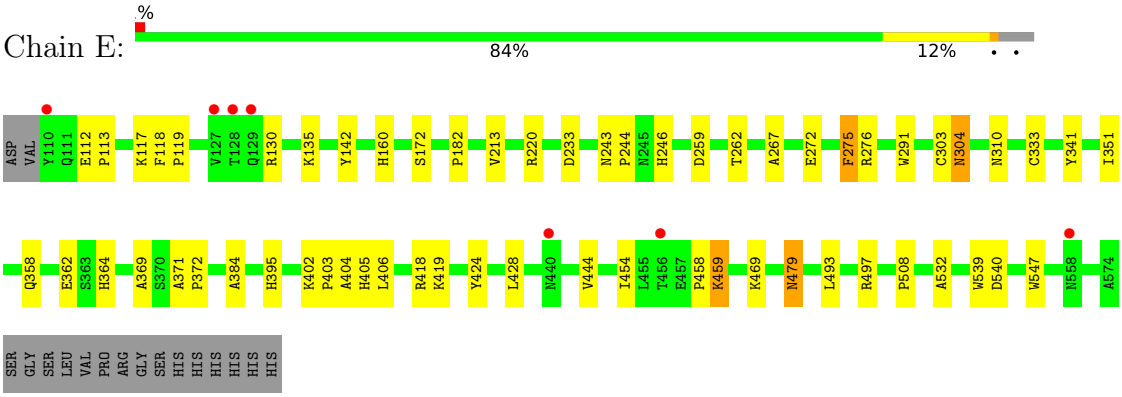
• Molecule 1: Furin

Chain D:



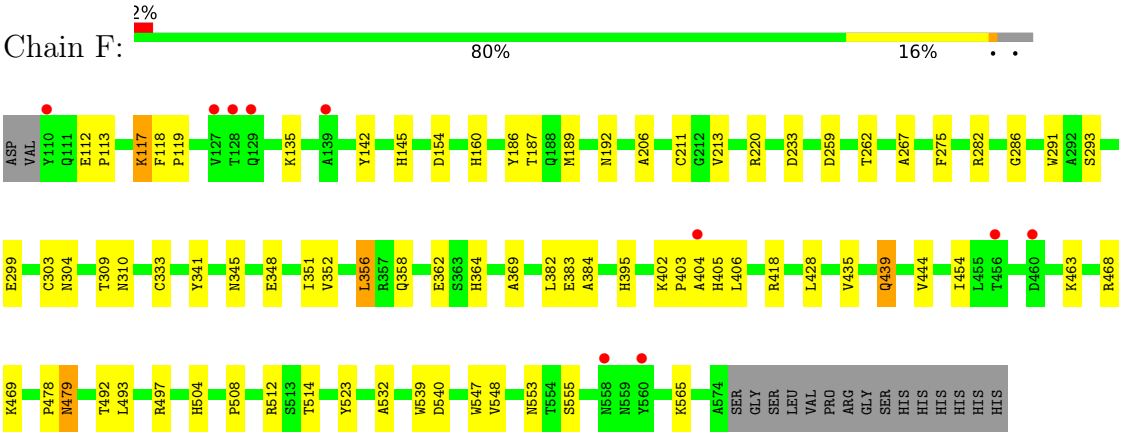
• Molecule 1: Furin

Chain E:



• Molecule 1: Furin

Chain F:



• Molecule 2: para-guanidinomethyl-phenylacetyl-Arg-(3-methylvaline)-Arg-(amidomethyl)benzamidine

Chain H:

• Molecule 2: para-guanidinomethyl-phenylacetyl-Arg-(3-methylvaline)-Arg-(amidomethyl)benzamidine

Chain I:

• Molecule 2: para-guanidinomethyl-phenylacetyl-Arg-(3-methylvaline)-Arg-(amidomethyl)benzamidine

Chain J:

• Molecule 2: para-guanidinomethyl-phenylacetyl-Arg-(3-methylvaline)-Arg-(amidomethyl)benzamidine

Chain K:

• Molecule 2: para-guanidinomethyl-phenylacetyl-Arg-(3-methylvaline)-Arg-(amidomethyl)benzamidine

Chain L:

• Molecule 2: para-guanidinomethyl-phenylacetyl-Arg-(3-methylvaline)-Arg-(amidomethyl)benzamidine

Chain N:

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	141.65Å 152.70Å 168.40Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.15 46.07 – 2.15	Depositor EDS
% Data completeness (in resolution range)	(Not available) (50.00-2.15) 98.3 (46.07-2.15)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.14	Depositor
$< I/\sigma(I) >$ [1]	1.08 (at 2.14Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.186 , 0.219 0.176 , 0.209	Depositor DCC
R_{free} test set	9740 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	24.2	Xtriage
Anisotropy	0.449	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 51.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	23768	wwPDB-VP
Average B, all atoms (Å^2)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.25% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: TBG, NA, 2UE, 00S, FMT, CA

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	0.40	0/3641	0.66	0/4964
1	B	0.38	0/3634	0.66	0/4954
1	C	0.38	0/3641	0.65	0/4964
1	D	0.39	0/3634	0.66	0/4954
1	E	0.39	0/3634	0.66	0/4954
1	F	0.39	0/3634	0.65	0/4954
2	H	0.32	0/20	0.92	0/22
2	I	0.27	0/20	0.91	0/22
2	J	0.38	0/20	0.85	0/22
2	K	0.39	0/20	0.88	0/22
2	L	0.40	0/20	0.90	0/22
2	N	0.33	0/20	0.95	0/22
All	All	0.39	0/21938	0.66	0/29876

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	E	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	E	424	TYR	Sidechain

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	3559	0	3376	40	0
1	B	3552	0	3367	46	0
1	C	3559	0	3376	41	0
1	D	3552	0	3367	37	0
1	E	3552	0	3367	41	0
1	F	3552	0	3367	51	0
2	H	55	0	54	0	0
2	I	55	0	54	0	0
2	J	55	0	54	0	0
2	K	55	0	54	0	0
2	L	55	0	54	0	0
2	N	55	0	54	0	0
3	A	9	0	3	0	0
3	B	9	0	3	0	0
3	C	9	0	3	0	0
3	D	9	0	3	1	0
3	E	9	0	3	0	0
3	F	9	0	3	0	0
4	A	3	0	0	0	0
4	B	3	0	0	0	0
4	C	3	0	0	0	0
4	D	3	0	0	0	0
4	E	3	0	0	0	0
4	F	3	0	0	0	0
5	A	1	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
5	F	1	0	0	0	0
6	A	356	0	0	6	0
6	B	323	0	0	3	0
6	C	374	0	0	4	0
6	D	313	0	0	3	0
6	E	338	0	0	5	0
6	F	299	0	0	4	0
6	H	4	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	I	3	0	0	0	0
6	J	6	0	0	0	0
6	K	9	0	0	0	0
6	L	4	0	0	0	0
6	N	5	0	0	0	0
All	All	23768	0	20562	252	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 6.

All (252) 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:B:479:ASN:HD22	1:B:479:ASN:H	1.11	0.96
1:E:479:ASN:HD22	1:E:479:ASN:H	0.96	0.95
1:F:479:ASN:H	1:F:479:ASN:HD22	1.13	0.94
1:D:479:ASN:H	1:D:479:ASN:HD22	1.16	0.90
1:E:259:ASP:OD1	1:E:262:THR:HG23	1.71	0.90
1:A:259:ASP:OD1	1:A:262:THR:HG23	1.72	0.89
1:D:479:ASN:H	1:D:479:ASN:ND2	1.71	0.86
1:D:259:ASP:OD1	1:D:262:THR:HG23	1.75	0.86
1:A:479:ASN:HB3	6:A:859:HOH:O	1.75	0.85
1:E:479:ASN:HD22	1:E:479:ASN:N	1.74	0.85
1:B:384:ALA:HB2	1:B:435:VAL:HG22	1.57	0.84
1:E:479:ASN:H	1:E:479:ASN:ND2	1.76	0.83
1:D:479:ASN:HB3	6:D:839:HOH:O	1.78	0.82
1:F:479:ASN:H	1:F:479:ASN:ND2	1.76	0.82
1:B:479:ASN:H	1:B:479:ASN:ND2	1.75	0.82
1:F:259:ASP:OD1	1:F:262:THR:HG23	1.84	0.78
1:B:259:ASP:OD1	1:B:262:THR:HG23	1.84	0.78
1:F:479:ASN:HD22	1:F:479:ASN:N	1.80	0.78
1:A:479:ASN:ND2	1:A:479:ASN:H	1.83	0.76
1:B:479:ASN:HD22	1:B:479:ASN:N	1.78	0.76
1:A:506:VAL:HG22	1:A:512:ARG:HG2	1.69	0.75
1:C:259:ASP:OD1	1:C:262:THR:HG23	1.86	0.75
1:A:479:ASN:H	1:A:479:ASN:HD22	1.33	0.72
1:E:112:GLU:OE2	1:E:135:LYS:HE3	1.91	0.69
1:D:479:ASN:HD22	1:D:479:ASN:N	1.87	0.67
1:D:193:ARG:HA	1:D:356:LEU:HG	1.75	0.67
1:B:112:GLU:HB3	1:B:135:LYS:NZ	2.09	0.66
1:D:304:ASN:OD1	1:D:333:CYS:HB2	1.96	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:404:ALA:O	1:B:405:HIS:HB2	1.95	0.66
1:A:418:ARG:NH1	1:A:540:ASP:OD2	2.29	0.65
6:C:1050:HOH:O	1:F:189:MET:HG2	1.96	0.64
1:D:245:ASN:ND2	1:D:283:GLY:H	1.95	0.64
1:C:126:GLY:HA3	6:C:853:HOH:O	1.98	0.64
1:E:404:ALA:O	1:E:405:HIS:HB2	1.97	0.63
1:F:117:LYS:HE2	1:F:362:GLU:OE2	1.98	0.63
1:C:454:ILE:HD12	1:C:469:LYS:HG2	1.79	0.63
1:C:468:ARG:HG2	1:C:548:VAL:HG22	1.81	0.63
1:D:404:ALA:O	1:D:405:HIS:HB2	1.98	0.63
1:B:454:ILE:HD12	1:B:469:LYS:HG2	1.81	0.63
1:D:128:THR:O	1:D:130:ARG:HG2	1.98	0.62
1:A:468:ARG:HG2	1:A:548:VAL:HG22	1.82	0.62
1:D:233:ASP:CG	1:D:267:ALA:HB3	2.20	0.62
1:C:233:ASP:CG	1:C:267:ALA:HB3	2.19	0.62
1:B:479:ASN:ND2	1:B:479:ASN:N	2.43	0.61
1:E:220:ARG:HD3	6:E:1016:HOH:O	2.00	0.61
1:B:233:ASP:CG	1:B:267:ALA:HB3	2.20	0.60
1:F:233:ASP:CG	1:F:267:ALA:HB3	2.22	0.60
1:C:268:ARG:HG3	6:D:813:HOH:O	2.02	0.60
1:A:404:ALA:O	1:A:405:HIS:HB2	2.03	0.59
1:F:454:ILE:HD12	1:F:469:LYS:HG2	1.85	0.59
1:C:457:GLU:HG3	1:C:459:LYS:HE3	1.83	0.58
1:D:479:ASN:ND2	1:D:479:ASN:N	2.41	0.58
1:F:479:ASN:HB3	6:F:823:HOH:O	2.02	0.58
1:A:233:ASP:CG	1:A:267:ALA:HB3	2.24	0.57
1:E:112:GLU:HB3	1:E:135:LYS:HE2	1.86	0.57
1:C:188:GLN:HG2	1:F:523:TYR:CD2	2.39	0.56
1:E:233:ASP:CG	1:E:267:ALA:HB3	2.25	0.56
1:F:404:ALA:O	1:F:405:HIS:HB2	2.05	0.56
1:B:178:GLN:CD	1:B:238:ARG:HH22	2.09	0.56
1:D:458:PRO:O	1:D:459:LYS:HD2	2.06	0.56
1:E:160:HIS:CD2	1:E:358:GLN:HA	2.41	0.56
1:C:404:ALA:O	1:C:405:HIS:HB2	2.05	0.55
1:A:479:ASN:HD22	1:A:479:ASN:N	1.95	0.55
1:B:220:ARG:HH12	1:B:246:HIS:HE1	1.56	0.54
1:F:117:LYS:HG3	1:F:211:CYS:HA	1.89	0.54
1:D:371:ALA:HB3	1:D:372:PRO:HD3	1.89	0.54
1:E:419:LYS:NZ	6:E:834:HOH:O	2.37	0.54
1:E:479:ASN:HB3	6:E:841:HOH:O	2.08	0.54
1:A:206:ALA:HA	1:A:213:VAL:HG12	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:295:ASN:OD1	1:B:367:THR:HG22	2.08	0.53
1:E:351:ILE:HG13	1:E:369:ALA:HB1	1.90	0.53
1:F:479:ASN:ND2	1:F:479:ASN:N	2.45	0.53
1:D:351:ILE:HG13	1:D:369:ALA:HB1	1.90	0.53
1:B:458:PRO:O	1:B:459:LYS:HD2	2.08	0.53
1:E:454:ILE:HD12	1:E:469:LYS:HG2	1.91	0.53
1:F:112:GLU:HB3	1:F:135:LYS:HE3	1.90	0.53
1:F:508:PRO:HD3	1:F:547:TRP:CE2	2.43	0.53
1:F:351:ILE:HG13	1:F:369:ALA:HB1	1.89	0.53
1:C:468:ARG:NH2	1:C:546:GLU:OE2	2.42	0.52
1:E:458:PRO:HG3	6:E:1001:HOH:O	2.08	0.52
1:D:341:TYR:CZ	1:D:428:LEU:HD21	2.45	0.52
1:D:341:TYR:CE2	1:D:428:LEU:HD21	2.44	0.52
1:D:418:ARG:NH1	1:D:540:ASP:OD2	2.42	0.52
1:F:418:ARG:NH1	1:F:540:ASP:OD2	2.42	0.52
1:B:295:ASN:CG	1:B:367:THR:HG22	2.30	0.52
1:A:178:GLN:HB3	6:A:922:HOH:O	2.11	0.51
1:E:493:LEU:C	1:E:493:LEU:HD12	2.30	0.51
1:C:493:LEU:C	1:C:493:LEU:HD12	2.31	0.51
1:A:234:ALA:O	1:A:238:ARG:HG3	2.10	0.51
1:A:282:ARG:HD3	1:A:286:GLY:O	2.11	0.51
1:B:268:ARG:HG3	6:B:891:HOH:O	2.11	0.51
1:B:142:TYR:CE1	1:B:384:ALA:HA	2.47	0.50
1:F:160:HIS:CD2	1:F:358:GLN:HA	2.46	0.50
1:E:341:TYR:CE2	1:E:428:LEU:HD21	2.47	0.50
1:F:293:SER:HA	1:F:309:THR:HG21	1.94	0.50
1:D:206:ALA:HA	1:D:213:VAL:HG12	1.94	0.50
1:B:341:TYR:CE2	1:B:428:LEU:HD21	2.46	0.50
1:C:160:HIS:CD2	1:C:358:GLN:HA	2.47	0.50
1:C:351:ILE:HG13	1:C:369:ALA:HB1	1.93	0.49
1:D:508:PRO:HD3	1:D:547:TRP:CE2	2.47	0.49
1:C:259:ASP:OD1	1:C:262:THR:CG2	2.57	0.49
1:A:508:PRO:HD3	1:A:547:TRP:CE2	2.47	0.49
1:B:418:ARG:NH1	1:B:540:ASP:OD2	2.41	0.49
1:C:395:HIS:CD2	1:C:444:VAL:HG11	2.46	0.49
1:B:508:PRO:HD3	1:B:547:TRP:CE2	2.47	0.49
1:F:341:TYR:CE2	1:F:428:LEU:HD21	2.48	0.49
1:A:351:ILE:HG13	1:A:369:ALA:HB1	1.95	0.49
1:A:509:MET:HE3	1:A:542:ASP:HB3	1.94	0.49
1:A:160:HIS:CD2	1:A:358:GLN:HA	2.48	0.48
1:B:404:ALA:O	1:B:405:HIS:CB	2.61	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:371:ALA:HB3	1:E:372:PRO:HD3	1.95	0.48
1:B:384:ALA:CB	1:B:435:VAL:HG22	2.36	0.48
1:B:172:SER:HB3	1:B:182:PRO:HG3	1.94	0.48
1:A:298:ARG:NH2	1:A:299:GLU:OE2	2.40	0.48
1:B:234:ALA:O	1:B:238:ARG:HG3	2.14	0.48
1:C:304:ASN:OD1	1:C:333:CYS:HB2	2.14	0.48
1:D:245:ASN:HD21	1:D:283:GLY:H	1.61	0.48
1:D:295:ASN:CG	1:D:367:THR:HG22	2.34	0.48
1:D:366:GLY:HA3	3:D:603:FMT:H	1.95	0.48
1:E:117:LYS:HE3	1:E:362:GLU:OE2	2.14	0.48
1:B:193:ARG:HD2	6:B:914:HOH:O	2.14	0.47
1:B:477:GLU:HG3	6:B:910:HOH:O	2.14	0.47
1:B:493:LEU:HD12	1:B:493:LEU:C	2.34	0.47
1:E:112:GLU:HB3	1:E:135:LYS:CE	2.43	0.47
1:F:118:PHE:N	1:F:119:PRO:CD	2.77	0.47
1:F:493:LEU:C	1:F:493:LEU:HD12	2.35	0.47
1:E:418:ARG:HD3	6:E:918:HOH:O	2.14	0.47
1:F:395:HIS:CD2	1:F:444:VAL:HG11	2.50	0.47
1:A:268:ARG:HG2	1:A:268:ARG:HH11	1.80	0.47
1:C:404:ALA:O	1:C:405:HIS:CB	2.63	0.47
1:C:295:ASN:CG	1:C:367:THR:HG22	2.35	0.47
1:A:310:ASN:ND2	1:A:532:ALA:O	2.48	0.47
1:A:454:ILE:HD12	1:A:469:LYS:HG2	1.97	0.47
1:C:293:SER:HA	1:C:309:THR:HG21	1.97	0.47
1:D:160:HIS:CD2	1:D:358:GLN:HA	2.49	0.47
1:C:455:LEU:HD11	1:C:563:LEU:HG	1.97	0.47
1:E:404:ALA:O	1:E:405:HIS:CB	2.62	0.47
1:F:352:VAL:HG22	1:F:362:GLU:HG2	1.96	0.47
1:F:512:ARG:HG2	6:F:746:HOH:O	2.14	0.46
1:C:454:ILE:CD1	1:C:469:LYS:HG2	2.44	0.46
1:E:458:PRO:O	1:E:459:LYS:HD2	2.15	0.46
1:B:371:ALA:HB3	1:B:372:PRO:HD3	1.97	0.46
1:D:395:HIS:CD2	1:D:444:VAL:HG11	2.50	0.46
1:D:420:VAL:HG11	1:D:537:HIS:CD2	2.51	0.46
1:F:468:ARG:HG2	1:F:548:VAL:HG22	1.96	0.46
1:C:482:THR:OG1	1:C:574:ALA:HA	2.15	0.46
1:D:193:ARG:HE	1:D:197:ARG:CZ	2.29	0.46
1:D:404:ALA:O	1:D:405:HIS:CB	2.63	0.46
1:F:187:THR:HB	6:F:944:HOH:O	2.14	0.46
1:A:509:MET:HE1	1:A:542:ASP:H	1.80	0.46
1:D:454:ILE:HD12	1:D:469:LYS:HG2	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:128:THR:O	1:A:130:ARG:HG2	2.16	0.46
1:A:404:ALA:O	1:A:405:HIS:CB	2.64	0.46
1:A:494:SER:HA	6:A:961:HOH:O	2.15	0.46
1:C:112:GLU:HB3	1:C:135:LYS:HE3	1.98	0.46
1:C:341:TYR:CE2	1:C:428:LEU:HD21	2.51	0.45
1:C:172:SER:HB3	1:C:182:PRO:HG3	1.97	0.45
1:E:351:ILE:HB	1:E:364:HIS:HB3	1.99	0.45
1:D:282:ARG:HD3	1:D:286:GLY:O	2.16	0.45
1:F:142:TYR:CE1	1:F:384:ALA:HA	2.50	0.45
1:A:293:SER:HA	1:A:309:THR:HG21	1.98	0.45
1:A:351:ILE:HB	1:A:364:HIS:HB3	1.97	0.45
1:D:295:ASN:OD1	1:D:367:THR:HG22	2.16	0.45
1:A:493:LEU:C	1:A:493:LEU:HD12	2.36	0.45
1:A:118:PHE:HB3	1:A:119:PRO:HD3	1.98	0.45
1:F:345:ASN:OD1	1:F:348:GLU:HG3	2.17	0.45
1:B:112:GLU:HB3	1:B:135:LYS:HZ2	1.80	0.45
1:C:463:LYS:O	1:C:463:LYS:HD3	2.16	0.45
1:B:220:ARG:NH1	1:B:246:HIS:HE1	2.15	0.45
1:B:306:ASP:O	1:B:310:ASN:HB2	2.17	0.45
1:E:113:PRO:HB3	1:E:213:VAL:HG11	1.99	0.45
1:E:275:PHE:CD1	1:F:275:PHE:CE1	3.05	0.45
1:B:402:LYS:HA	1:B:403:PRO:HD3	1.88	0.44
1:E:272:GLU:O	1:E:276:ARG:HG3	2.16	0.44
1:E:304:ASN:ND2	1:E:333:CYS:HB2	2.32	0.44
1:F:351:ILE:HB	1:F:364:HIS:HB3	1.98	0.44
1:A:341:TYR:CZ	1:A:428:LEU:HD21	2.52	0.44
1:F:463:LYS:HD2	1:F:553:ASN:HB3	2.00	0.44
1:F:492:THR:OG1	1:F:565:LYS:HE3	2.17	0.44
1:D:186:TYR:CE2	1:D:356:LEU:HD22	2.52	0.44
1:E:395:HIS:CD2	1:E:444:VAL:HG11	2.52	0.44
1:B:160:HIS:CD2	1:B:358:GLN:HA	2.52	0.44
1:C:351:ILE:HB	1:C:364:HIS:HB3	1.98	0.44
1:E:142:TYR:CE1	1:E:384:ALA:HA	2.52	0.44
1:F:382:LEU:HD23	1:F:382:LEU:HA	1.86	0.44
1:F:404:ALA:O	1:F:405:HIS:CB	2.64	0.44
1:F:220:ARG:HG2	6:F:897:HOH:O	2.17	0.44
1:F:539:TRP:O	1:F:540:ASP:HB2	2.17	0.44
1:E:402:LYS:HA	1:E:403:PRO:HD3	1.87	0.44
1:F:435:VAL:O	1:F:439:GLN:NE2	2.51	0.44
1:A:113:PRO:HA	1:A:207:ASN:OD1	2.17	0.43
1:A:454:ILE:HG13	1:A:566:PHE:CE2	2.53	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:395:HIS:CD2	1:B:444:VAL:HG11	2.53	0.43
1:B:293:SER:HA	1:B:309:THR:HG21	2.00	0.43
1:A:341:TYR:CE2	1:A:428:LEU:HD21	2.53	0.43
1:B:117:LYS:HD2	1:B:120:GLN:OE1	2.17	0.43
1:C:142:TYR:CE1	1:C:384:ALA:HA	2.53	0.43
1:C:402:LYS:HA	1:C:403:PRO:HD3	1.84	0.43
1:C:457:GLU:HG3	1:C:459:LYS:CE	2.47	0.43
1:E:118:PHE:N	1:E:119:PRO:CD	2.82	0.43
1:A:539:TRP:O	1:A:540:ASP:HB2	2.17	0.43
1:C:118:PHE:N	1:C:119:PRO:CD	2.80	0.43
1:C:418:ARG:NH1	1:C:540:ASP:OD2	2.52	0.43
1:C:440:ASN:HB2	6:C:919:HOH:O	2.17	0.43
1:E:172:SER:HB3	1:E:182:PRO:HG3	2.00	0.43
1:A:295:ASN:CG	1:A:367:THR:HG22	2.39	0.43
1:B:243:ASN:N	1:B:244:PRO:HD3	2.34	0.43
1:C:113:PRO:HB3	1:C:213:VAL:HG11	2.00	0.42
1:F:206:ALA:HA	1:F:213:VAL:HG12	2.01	0.42
1:A:387:ASN:HD22	1:A:387:ASN:HA	1.62	0.42
1:D:351:ILE:HB	1:D:364:HIS:HB3	2.02	0.42
1:E:341:TYR:CZ	1:E:428:LEU:HD21	2.53	0.42
1:E:508:PRO:HD3	1:E:547:TRP:CE2	2.54	0.42
1:F:310:ASN:ND2	1:F:532:ALA:O	2.51	0.42
1:C:154:ASP:OD2	1:C:192:ASN:HA	2.20	0.42
1:F:402:LYS:HA	1:F:403:PRO:HD3	1.88	0.42
1:A:459:LYS:HE2	6:A:980:HOH:O	2.18	0.42
1:B:304:ASN:OD1	1:B:333:CYS:HB2	2.18	0.42
1:C:455:LEU:HD22	1:C:459:LYS:HD3	2.02	0.42
1:B:113:PRO:HB3	1:B:213:VAL:HG11	2.02	0.42
1:E:243:ASN:N	1:E:244:PRO:HD3	2.35	0.42
1:D:269:LEU:HD23	1:D:269:LEU:HA	1.92	0.41
1:F:113:PRO:HB3	1:F:213:VAL:HG11	2.02	0.41
1:A:233:ASP:OD1	1:A:267:ALA:HB3	2.20	0.41
1:D:493:LEU:HD12	1:D:493:LEU:C	2.40	0.41
1:B:440:ASN:HD22	1:B:440:ASN:HA	1.60	0.41
1:C:233:ASP:OD1	1:C:267:ALA:HB3	2.19	0.41
1:E:310:ASN:ND2	1:E:532:ALA:O	2.41	0.41
1:A:238:ARG:NH1	6:A:926:HOH:O	2.43	0.41
1:F:145:HIS:HB3	1:F:383:GLU:OE2	2.21	0.41
1:B:193:ARG:HE	1:B:197:ARG:CZ	2.33	0.41
1:E:220:ARG:HH12	1:E:246:HIS:HE1	1.67	0.41
1:E:243:ASN:ND2	1:F:478:PRO:HG2	2.35	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:118:PHE:HB3	1:B:119:PRO:HD3	2.02	0.41
1:C:509:MET:HG3	6:C:710:HOH:O	2.21	0.41
6:A:853:HOH:O	1:B:268:ARG:HD3	2.19	0.41
1:C:151:ILE:HD13	1:C:251:SER:HB3	2.03	0.41
1:D:458:PRO:HG3	6:D:871:HOH:O	2.20	0.41
1:E:233:ASP:OD1	1:E:267:ALA:HB3	2.21	0.41
1:F:304:ASN:OD1	1:F:333:CYS:HB2	2.21	0.41
1:B:457:GLU:HG3	1:B:459:LYS:HE3	2.02	0.41
1:F:282:ARG:HD3	1:F:286:GLY:O	2.20	0.41
1:C:295:ASN:OD1	1:C:367:THR:HG22	2.20	0.40
1:C:326:VAL:O	1:F:345:ASN:HB2	2.21	0.40
1:F:186:TYR:CE2	1:F:356:LEU:HD22	2.56	0.40
1:B:144:GLY:N	1:B:383:GLU:OE1	2.45	0.40
1:D:539:TRP:O	1:D:540:ASP:HB2	2.20	0.40
1:B:539:TRP:O	1:B:540:ASP:HB2	2.21	0.40
1:F:154:ASP:OD2	1:F:192:ASN:HA	2.22	0.40
1:E:539:TRP:O	1:E:540:ASP:HB2	2.21	0.40
1:F:463:LYS:NZ	1:F:555:SER:O	2.54	0.40
1:F:504:HIS:HD2	1:F:514:THR:OG1	2.05	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	464/482 (96%)	442 (95%)	21 (4%)	1 (0%)	47 46
1	B	463/482 (96%)	441 (95%)	22 (5%)	0	100 100
1	C	464/482 (96%)	441 (95%)	22 (5%)	1 (0%)	47 46
1	D	463/482 (96%)	441 (95%)	22 (5%)	0	100 100
1	E	463/482 (96%)	440 (95%)	23 (5%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	F	463/482 (96%)	441 (95%)	22 (5%)	0	100 100
All	All	2780/2892 (96%)	2646 (95%)	132 (5%)	2 (0%)	51 53

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	128	THR
1	C	128	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	376/390 (96%)	367 (98%)	9 (2%)	49 51
1	B	375/390 (96%)	365 (97%)	10 (3%)	44 46
1	C	376/390 (96%)	366 (97%)	10 (3%)	44 46
1	D	375/390 (96%)	362 (96%)	13 (4%)	36 34
1	E	375/390 (96%)	366 (98%)	9 (2%)	49 51
1	F	375/390 (96%)	366 (98%)	9 (2%)	49 51
2	H	2/2 (100%)	2 (100%)	0	100 100
2	I	2/2 (100%)	2 (100%)	0	100 100
2	J	2/2 (100%)	2 (100%)	0	100 100
2	K	2/2 (100%)	2 (100%)	0	100 100
2	L	2/2 (100%)	2 (100%)	0	100 100
2	N	2/2 (100%)	2 (100%)	0	100 100
All	All	2264/2352 (96%)	2204 (97%)	60 (3%)	44 46

All (60) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	128	THR

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Mol	Chain	Res	Type
1	A	182	PRO
1	A	275	PHE
1	A	291	TRP
1	A	303	CYS
1	A	406	LEU
1	A	440	ASN
1	A	479	ASN
1	A	497	ARG
1	B	243	ASN
1	B	291	TRP
1	B	299	GLU
1	B	303	CYS
1	B	406	LEU
1	B	435	VAL
1	B	459	LYS
1	B	479	ASN
1	B	497	ARG
1	B	566	PHE
1	C	162	ASP
1	C	178	GLN
1	C	188	GLN
1	C	262	THR
1	C	275	PHE
1	C	291	TRP
1	C	303	CYS
1	C	406	LEU
1	C	459	LYS
1	C	497	ARG
1	D	127	VAL
1	D	129	GLN
1	D	162	ASP
1	D	182	PRO
1	D	268	ARG
1	D	291	TRP
1	D	303	CYS
1	D	356	LEU
1	D	358	GLN
1	D	406	LEU
1	D	459	LYS
1	D	479	ASN
1	D	497	ARG
1	E	130	ARG

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Mol	Chain	Res	Type
1	E	275	PHE
1	E	291	TRP
1	E	303	CYS
1	E	304	ASN
1	E	406	LEU
1	E	459	LYS
1	E	479	ASN
1	E	497	ARG
1	F	117	LYS
1	F	291	TRP
1	F	299	GLU
1	F	303	CYS
1	F	356	LEU
1	F	406	LEU
1	F	439	GLN
1	F	479	ASN
1	F	497	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	111	GLN
1	A	218	ASN
1	A	387	ASN
1	A	479	ASN
1	B	243	ASN
1	B	346	GLN
1	B	387	ASN
1	B	440	ASN
1	B	479	ASN
1	C	111	GLN
1	C	280	GLN
1	C	346	GLN
1	C	358	GLN
1	C	387	ASN
1	D	245	ASN
1	D	346	GLN
1	D	479	ASN
1	E	304	ASN
1	E	346	GLN
1	E	387	ASN
1	E	440	ASN

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Mol	Chain	Res	Type
1	E	479	ASN
1	F	346	GLN
1	F	387	ASN
1	F	440	ASN
1	F	479	ASN
1	F	504	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

6 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	$\#\|Z\| > 2$
2	TBG	N	3	2	6,7,8	2.24	2 (33%)	7,10,12	0.49	0
2	TBG	J	3	2	6,7,8	2.18	2 (33%)	7,10,12	0.50	0
2	TBG	I	3	2	6,7,8	2.16	2 (33%)	7,10,12	0.53	0
2	TBG	K	3	2	6,7,8	2.45	2 (33%)	7,10,12	0.51	0
2	TBG	H	3	2	6,7,8	2.12	2 (33%)	7,10,12	0.54	0
2	TBG	L	3	2	6,7,8	2.43	2 (33%)	7,10,12	0.51	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
2	TBG	N	3	2	-	0/6/8/10	-
2	TBG	J	3	2	-	0/6/8/10	-
2	TBG	I	3	2	-	0/6/8/10	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	TBG	K	3	2	-	0/6/8/10	-
2	TBG	H	3	2	-	0/6/8/10	-
2	TBG	L	3	2	-	0/6/8/10	-

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	J	3	TBG	CA-N	-4.80	1.33	1.48
2	K	3	TBG	CA-N	-4.76	1.33	1.48
2	L	3	TBG	CA-N	-4.73	1.33	1.48
2	I	3	TBG	CA-N	-4.70	1.33	1.48
2	H	3	TBG	CA-N	-4.70	1.33	1.48
2	N	3	TBG	CA-N	-4.68	1.34	1.48
2	K	3	TBG	CB-CA	3.61	1.61	1.56
2	L	3	TBG	CB-CA	3.38	1.61	1.56
2	N	3	TBG	CB-CA	2.63	1.60	1.56
2	J	3	TBG	CB-CA	2.20	1.59	1.56
2	I	3	TBG	CB-CA	2.19	1.59	1.56
2	H	3	TBG	CB-CA	2.03	1.59	1.56

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

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 42 ligands modelled in this entry, 24 are monoatomic - leaving 18 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	FMT	D	601	-	2,2,2	0.66	0	1,1,1	0.05	0
3	FMT	E	602	-	2,2,2	0.62	0	1,1,1	0.07	0
3	FMT	E	601	-	2,2,2	0.63	0	1,1,1	0.06	0
3	FMT	B	602	-	2,2,2	0.66	0	1,1,1	0.07	0
3	FMT	F	601	-	2,2,2	0.68	0	1,1,1	0.04	0
3	FMT	F	602	-	2,2,2	0.63	0	1,1,1	0.06	0
3	FMT	F	603	-	2,2,2	0.61	0	1,1,1	0.05	0
3	FMT	B	601	-	2,2,2	0.73	0	1,1,1	0.04	0
3	FMT	A	603	-	2,2,2	0.64	0	1,1,1	0.07	0
3	FMT	C	601	-	2,2,2	0.64	0	1,1,1	0.04	0
3	FMT	D	602	-	2,2,2	0.60	0	1,1,1	0.06	0
3	FMT	A	601	-	2,2,2	0.63	0	1,1,1	0.05	0
3	FMT	B	603	-	2,2,2	0.62	0	1,1,1	0.07	0
3	FMT	A	602	-	2,2,2	0.66	0	1,1,1	0.05	0
3	FMT	C	602	-	2,2,2	0.77	0	1,1,1	0.04	0
3	FMT	E	603	-	2,2,2	0.61	0	1,1,1	0.06	0
3	FMT	C	603	-	2,2,2	0.65	0	1,1,1	0.08	0
3	FMT	D	603	-	2,2,2	0.64	0	1,1,1	0.05	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	603	FMT	1	0

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

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, 95^{th} 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	466/482 (96%)	-0.22	9 (1%) 66 74	13, 21, 39, 61	11 (2%)
1	B	465/482 (96%)	-0.17	10 (2%) 62 69	14, 23, 39, 72	12 (2%)
1	C	466/482 (96%)	-0.21	5 (1%) 80 85	14, 21, 37, 60	11 (2%)
1	D	465/482 (96%)	-0.23	6 (1%) 77 82	14, 23, 40, 69	16 (3%)
1	E	465/482 (96%)	-0.14	7 (1%) 73 79	14, 23, 40, 74	9 (1%)
1	F	465/482 (96%)	-0.13	10 (2%) 62 69	16, 26, 43, 74	14 (3%)
2	H	2/5 (40%)	-0.73	0 100 100	19, 19, 19, 20	0
2	I	2/5 (40%)	-0.57	0 100 100	21, 21, 21, 22	0
2	J	2/5 (40%)	-0.60	0 100 100	22, 22, 22, 23	0
2	K	2/5 (40%)	-0.62	0 100 100	20, 20, 20, 20	0
2	L	2/5 (40%)	-0.59	0 100 100	22, 22, 22, 22	0
2	N	2/5 (40%)	-0.74	0 100 100	21, 21, 21, 23	0
All	All	2804/2922 (95%)	-0.19	47 (1%) 70 76	13, 23, 40, 74	73 (2%)

All (47) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	127	VAL	8.8
1	E	127	VAL	6.4
1	F	128	THR	5.6
1	A	127	VAL	5.4
1	A	128	THR	5.3
1	B	127	VAL	4.7
1	D	127	VAL	4.6
1	E	110	TYR	4.2
1	D	128	THR	3.9
1	C	128	THR	3.8
1	B	128	THR	3.4

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Mol	Chain	Res	Type	RSRZ
1	F	558	ASN	3.4
1	F	560	TYR	3.3
1	D	405	HIS	3.3
1	F	139	ALA	3.0
1	B	126	GLY	3.0
1	F	110	TYR	3.0
1	B	110	TYR	2.9
1	E	456	THR	2.9
1	C	440	ASN	2.9
1	E	128	THR	2.9
1	A	126	GLY	2.8
1	D	129	GLN	2.7
1	C	560	TYR	2.7
1	C	558	ASN	2.6
1	D	523	TYR	2.5
1	D	404	ALA	2.5
1	A	129	GLN	2.5
1	B	145	HIS	2.4
1	F	404	ALA	2.4
1	F	129	GLN	2.4
1	A	560	TYR	2.4
1	A	558	ASN	2.4
1	B	440	ASN	2.2
1	F	456	THR	2.2
1	B	129	GLN	2.2
1	A	463	LYS	2.2
1	E	558	ASN	2.2
1	C	109	VAL	2.1
1	E	129	GLN	2.1
1	A	460	ASP	2.1
1	B	404	ALA	2.1
1	F	460	ASP	2.1
1	B	457	GLU	2.1
1	B	456	THR	2.1
1	E	440	ASN	2.0
1	A	457	GLU	2.0

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, 95^{th} 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	TBG	L	3	8/9	0.95	0.11	19,22,24,24	0
2	TBG	K	3	8/9	0.96	0.13	11,16,19,19	0
2	TBG	H	3	8/9	0.96	0.09	17,20,22,24	0
2	TBG	N	3	8/9	0.96	0.10	20,23,25,26	0
2	TBG	J	3	8/9	0.97	0.10	17,21,24,24	0
2	TBG	I	3	8/9	0.97	0.13	20,21,23,24	0

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
3	FMT	B	601	3/3	0.76	0.23	29,29,31,35	0
3	FMT	C	602	3/3	0.86	0.23	22,22,24,31	0
3	FMT	B	603	3/3	0.87	0.28	47,47,47,48	0
3	FMT	C	601	3/3	0.87	0.24	34,34,41,41	0
3	FMT	A	602	3/3	0.87	0.27	31,31,32,36	0
3	FMT	D	601	3/3	0.88	0.18	29,29,30,33	0
3	FMT	F	601	3/3	0.88	0.18	27,27,34,35	0
3	FMT	E	601	3/3	0.89	0.33	46,46,48,48	0
3	FMT	A	601	3/3	0.90	0.20	37,37,38,39	0
3	FMT	E	602	3/3	0.93	0.26	23,23,28,30	0
3	FMT	F	603	3/3	0.94	0.23	38,38,39,41	0
3	FMT	D	603	3/3	0.96	0.15	30,30,34,38	0
4	CA	C	606	1/1	0.98	0.06	33,33,33,33	0
5	NA	C	607	1/1	0.98	0.14	18,18,18,18	0
3	FMT	E	603	3/3	0.99	0.17	19,19,19,24	0
3	FMT	D	602	3/3	0.99	0.18	26,26,27,33	0
3	FMT	F	602	3/3	0.99	0.15	19,19,24,25	0
3	FMT	A	603	3/3	0.99	0.18	21,21,23,24	0
4	CA	A	606	1/1	0.99	0.04	31,31,31,31	0
4	CA	B	604	1/1	0.99	0.03	28,28,28,28	0
4	CA	B	605	1/1	0.99	0.09	18,18,18,18	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	CA	B	606	1/1	0.99	0.06	38,38,38,38	0
3	FMT	C	603	3/3	0.99	0.15	21,21,21,24	0
4	CA	D	605	1/1	0.99	0.10	19,19,19,19	0
4	CA	E	604	1/1	0.99	0.03	25,25,25,25	0
4	CA	E	605	1/1	0.99	0.09	17,17,17,17	0
4	CA	E	606	1/1	0.99	0.10	33,33,33,33	0
4	CA	F	604	1/1	0.99	0.03	27,27,27,27	0
4	CA	F	606	1/1	0.99	0.04	31,31,31,31	0
5	NA	B	607	1/1	0.99	0.12	16,16,16,16	0
3	FMT	B	602	3/3	0.99	0.13	20,20,21,21	0
5	NA	D	607	1/1	0.99	0.10	16,16,16,16	0
5	NA	E	607	1/1	0.99	0.17	20,20,20,20	0
5	NA	F	607	1/1	0.99	0.05	18,18,18,18	0
4	CA	F	605	1/1	1.00	0.09	17,17,17,17	0
4	CA	A	605	1/1	1.00	0.09	15,15,15,15	0
5	NA	A	607	1/1	1.00	0.11	16,16,16,16	0
4	CA	D	606	1/1	1.00	0.05	24,24,24,24	0
4	CA	C	604	1/1	1.00	0.05	17,17,17,17	0
4	CA	C	605	1/1	1.00	0.12	20,20,20,20	0
4	CA	A	604	1/1	1.00	0.06	20,20,20,20	0
4	CA	D	604	1/1	1.00	0.05	24,24,24,24	0

6.5 Other polymers (i)

There are no such residues in this entry.