



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 16, 2024 – 07:51 PM EST

PDB ID : 3MML  
Title : Allophanate Hydrolase Complex from Mycobacterium smegmatis, Msmeg0435-Msmeg0436  
Authors : Kaufmann, M.; Chernishof, I.; Shin, A.; Germano, D.; Sawaya, M.R.; Waldo, G.S.; Arbing, M.A.; Perry, J.; Eisenberg, D.; Integrated Center for Structure and Function Innovation (ISFI); TB Structural Genomics Consortium (TB-SGC)  
Deposited on : 2010-04-20  
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](mailto: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>.

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

MolProbity : 4.02b-467  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 3.0  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.003 (Gargrove)  
Density-Fitness : 1.0.11  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)

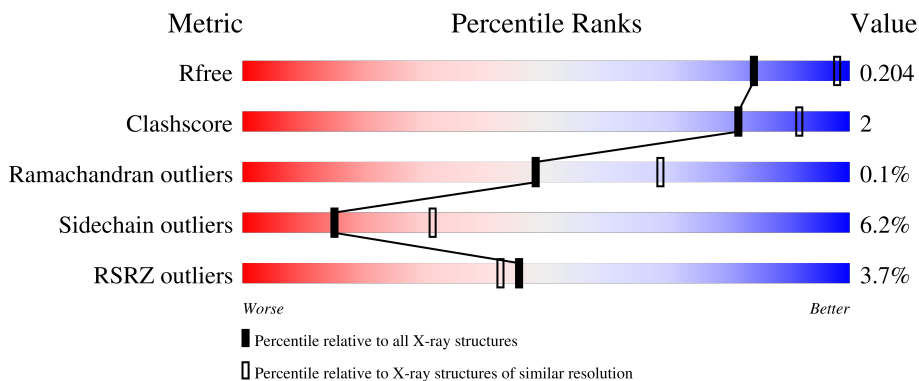
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*


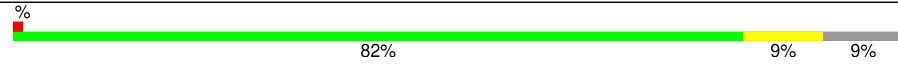
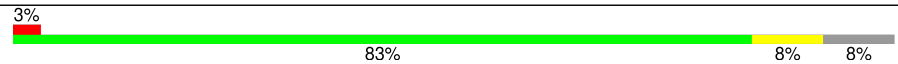

The reported resolution of this entry is 2.50 Å.

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.



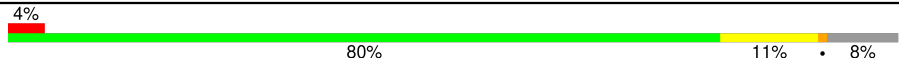
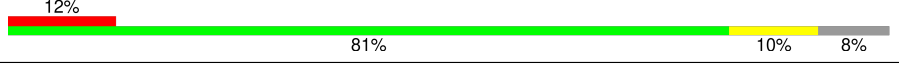
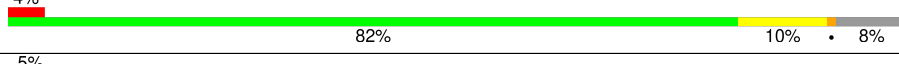

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	164625	5504 (2.50-2.50)
Clashscore	180529	6282 (2.50-2.50)
Ramachandran outliers	177936	6191 (2.50-2.50)
Sidechain outliers	177891	6193 (2.50-2.50)
RSRZ outliers	164620	5504 (2.50-2.50)

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 of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	318	
1	C	318	
1	E	318	
1	G	318	

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Mol	Chain	Length	Quality of chain
2	B	228	 4% 80% 11% • 8%
2	D	228	 12% 81% 10% • 8%
2	F	228	 4% 82% 10% • 8%
2	H	228	 5% 82% 9% • 8%

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 15919 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 Allophanate hydrolase subunit 2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	289	2160	1351	395	409	1	4	0	0	0
1	C	290	2167	1356	396	410	1	4	0	0	0
1	E	292	2187	1370	398	414	1	4	0	0	0
1	G	288	2149	1345	391	408	1	4	0	0	0

There are 96 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	295	LEU	-	expression tag	UNP A0QPL0
A	296	GLU	-	expression tag	UNP A0QPL0
A	297	SER	-	expression tag	UNP A0QPL0
A	298	GLY	-	expression tag	UNP A0QPL0
A	299	LYS	-	expression tag	UNP A0QPL0
A	300	GLU	-	expression tag	UNP A0QPL0
A	301	THR	-	expression tag	UNP A0QPL0
A	302	ALA	-	expression tag	UNP A0QPL0
A	303	ALA	-	expression tag	UNP A0QPL0
A	304	ALA	-	expression tag	UNP A0QPL0
A	305	LYS	-	expression tag	UNP A0QPL0
A	306	PHE	-	expression tag	UNP A0QPL0
A	307	GLU	-	expression tag	UNP A0QPL0
A	308	ARG	-	expression tag	UNP A0QPL0
A	309	GLN	-	expression tag	UNP A0QPL0
A	310	HIS	-	expression tag	UNP A0QPL0
A	311	MSE	-	expression tag	UNP A0QPL0
A	312	ASP	-	expression tag	UNP A0QPL0
A	313	SER	-	expression tag	UNP A0QPL0
A	314	SER	-	expression tag	UNP A0QPL0
A	315	THR	-	expression tag	UNP A0QPL0

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Chain	Residue	Modelled	Actual	Comment	Reference
A	316	SER	-	expression tag	UNP A0QPL0
A	317	ALA	-	expression tag	UNP A0QPL0
A	318	ALA	-	expression tag	UNP A0QPL0
C	295	LEU	-	expression tag	UNP A0QPL0
C	296	GLU	-	expression tag	UNP A0QPL0
C	297	SER	-	expression tag	UNP A0QPL0
C	298	GLY	-	expression tag	UNP A0QPL0
C	299	LYS	-	expression tag	UNP A0QPL0
C	300	GLU	-	expression tag	UNP A0QPL0
C	301	THR	-	expression tag	UNP A0QPL0
C	302	ALA	-	expression tag	UNP A0QPL0
C	303	ALA	-	expression tag	UNP A0QPL0
C	304	ALA	-	expression tag	UNP A0QPL0
C	305	LYS	-	expression tag	UNP A0QPL0
C	306	PHE	-	expression tag	UNP A0QPL0
C	307	GLU	-	expression tag	UNP A0QPL0
C	308	ARG	-	expression tag	UNP A0QPL0
C	309	GLN	-	expression tag	UNP A0QPL0
C	310	HIS	-	expression tag	UNP A0QPL0
C	311	MSE	-	expression tag	UNP A0QPL0
C	312	ASP	-	expression tag	UNP A0QPL0
C	313	SER	-	expression tag	UNP A0QPL0
C	314	SER	-	expression tag	UNP A0QPL0
C	315	THR	-	expression tag	UNP A0QPL0
C	316	SER	-	expression tag	UNP A0QPL0
C	317	ALA	-	expression tag	UNP A0QPL0
C	318	ALA	-	expression tag	UNP A0QPL0
E	295	LEU	-	expression tag	UNP A0QPL0
E	296	GLU	-	expression tag	UNP A0QPL0
E	297	SER	-	expression tag	UNP A0QPL0
E	298	GLY	-	expression tag	UNP A0QPL0
E	299	LYS	-	expression tag	UNP A0QPL0
E	300	GLU	-	expression tag	UNP A0QPL0
E	301	THR	-	expression tag	UNP A0QPL0
E	302	ALA	-	expression tag	UNP A0QPL0
E	303	ALA	-	expression tag	UNP A0QPL0
E	304	ALA	-	expression tag	UNP A0QPL0
E	305	LYS	-	expression tag	UNP A0QPL0
E	306	PHE	-	expression tag	UNP A0QPL0
E	307	GLU	-	expression tag	UNP A0QPL0
E	308	ARG	-	expression tag	UNP A0QPL0
E	309	GLN	-	expression tag	UNP A0QPL0

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Chain	Residue	Modelled	Actual	Comment	Reference
E	310	HIS	-	expression tag	UNP A0QPL0
E	311	MSE	-	expression tag	UNP A0QPL0
E	312	ASP	-	expression tag	UNP A0QPL0
E	313	SER	-	expression tag	UNP A0QPL0
E	314	SER	-	expression tag	UNP A0QPL0
E	315	THR	-	expression tag	UNP A0QPL0
E	316	SER	-	expression tag	UNP A0QPL0
E	317	ALA	-	expression tag	UNP A0QPL0
E	318	ALA	-	expression tag	UNP A0QPL0
G	295	LEU	-	expression tag	UNP A0QPL0
G	296	GLU	-	expression tag	UNP A0QPL0
G	297	SER	-	expression tag	UNP A0QPL0
G	298	GLY	-	expression tag	UNP A0QPL0
G	299	LYS	-	expression tag	UNP A0QPL0
G	300	GLU	-	expression tag	UNP A0QPL0
G	301	THR	-	expression tag	UNP A0QPL0
G	302	ALA	-	expression tag	UNP A0QPL0
G	303	ALA	-	expression tag	UNP A0QPL0
G	304	ALA	-	expression tag	UNP A0QPL0
G	305	LYS	-	expression tag	UNP A0QPL0
G	306	PHE	-	expression tag	UNP A0QPL0
G	307	GLU	-	expression tag	UNP A0QPL0
G	308	ARG	-	expression tag	UNP A0QPL0
G	309	GLN	-	expression tag	UNP A0QPL0
G	310	HIS	-	expression tag	UNP A0QPL0
G	311	MSE	-	expression tag	UNP A0QPL0
G	312	ASP	-	expression tag	UNP A0QPL0
G	313	SER	-	expression tag	UNP A0QPL0
G	314	SER	-	expression tag	UNP A0QPL0
G	315	THR	-	expression tag	UNP A0QPL0
G	316	SER	-	expression tag	UNP A0QPL0
G	317	ALA	-	expression tag	UNP A0QPL0
G	318	ALA	-	expression tag	UNP A0QPL0

- Molecule 2 is a protein called Allophanate hydrolase subunit 1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	210	Total	C	N	O	S	Se	0	0	0
			1596	1013	286	293	1	3			
2	D	209	Total	C	N	O	S	Se	0	0	0
			1591	1011	285	291	1	3			
2	F	210	Total	C	N	O	S	Se	0	0	0
			1596	1013	286	293	1	3			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	N	O	S				Se
2	H	209	1587	1009	284	290	1	3	0	0	0

There are 76 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-17	MSE	-	expression tag	UNP A0QPL1
B	-16	GLY	-	expression tag	UNP A0QPL1
B	-15	SER	-	expression tag	UNP A0QPL1
B	-14	SER	-	expression tag	UNP A0QPL1
B	-13	HIS	-	expression tag	UNP A0QPL1
B	-12	HIS	-	expression tag	UNP A0QPL1
B	-11	HIS	-	expression tag	UNP A0QPL1
B	-10	HIS	-	expression tag	UNP A0QPL1
B	-9	HIS	-	expression tag	UNP A0QPL1
B	-8	HIS	-	expression tag	UNP A0QPL1
B	-7	GLU	-	expression tag	UNP A0QPL1
B	-6	ASN	-	expression tag	UNP A0QPL1
B	-5	LEU	-	expression tag	UNP A0QPL1
B	-4	TYR	-	expression tag	UNP A0QPL1
B	-3	PHE	-	expression tag	UNP A0QPL1
B	-2	GLN	-	expression tag	UNP A0QPL1
B	-1	GLY	-	expression tag	UNP A0QPL1
B	0	GLY	-	expression tag	UNP A0QPL1
B	1	SER	-	expression tag	UNP A0QPL1
D	-17	MSE	-	expression tag	UNP A0QPL1
D	-16	GLY	-	expression tag	UNP A0QPL1
D	-15	SER	-	expression tag	UNP A0QPL1
D	-14	SER	-	expression tag	UNP A0QPL1
D	-13	HIS	-	expression tag	UNP A0QPL1
D	-12	HIS	-	expression tag	UNP A0QPL1
D	-11	HIS	-	expression tag	UNP A0QPL1
D	-10	HIS	-	expression tag	UNP A0QPL1
D	-9	HIS	-	expression tag	UNP A0QPL1
D	-8	HIS	-	expression tag	UNP A0QPL1
D	-7	GLU	-	expression tag	UNP A0QPL1
D	-6	ASN	-	expression tag	UNP A0QPL1
D	-5	LEU	-	expression tag	UNP A0QPL1
D	-4	TYR	-	expression tag	UNP A0QPL1
D	-3	PHE	-	expression tag	UNP A0QPL1
D	-2	GLN	-	expression tag	UNP A0QPL1
D	-1	GLY	-	expression tag	UNP A0QPL1

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Chain	Residue	Modelled	Actual	Comment	Reference
D	0	GLY	-	expression tag	UNP A0QPL1
D	1	SER	-	expression tag	UNP A0QPL1
F	-17	MSE	-	expression tag	UNP A0QPL1
F	-16	GLY	-	expression tag	UNP A0QPL1
F	-15	SER	-	expression tag	UNP A0QPL1
F	-14	SER	-	expression tag	UNP A0QPL1
F	-13	HIS	-	expression tag	UNP A0QPL1
F	-12	HIS	-	expression tag	UNP A0QPL1
F	-11	HIS	-	expression tag	UNP A0QPL1
F	-10	HIS	-	expression tag	UNP A0QPL1
F	-9	HIS	-	expression tag	UNP A0QPL1
F	-8	HIS	-	expression tag	UNP A0QPL1
F	-7	GLU	-	expression tag	UNP A0QPL1
F	-6	ASN	-	expression tag	UNP A0QPL1
F	-5	LEU	-	expression tag	UNP A0QPL1
F	-4	TYR	-	expression tag	UNP A0QPL1
F	-3	PHE	-	expression tag	UNP A0QPL1
F	-2	GLN	-	expression tag	UNP A0QPL1
F	-1	GLY	-	expression tag	UNP A0QPL1
F	0	GLY	-	expression tag	UNP A0QPL1
F	1	SER	-	expression tag	UNP A0QPL1
H	-17	MSE	-	expression tag	UNP A0QPL1
H	-16	GLY	-	expression tag	UNP A0QPL1
H	-15	SER	-	expression tag	UNP A0QPL1
H	-14	SER	-	expression tag	UNP A0QPL1
H	-13	HIS	-	expression tag	UNP A0QPL1
H	-12	HIS	-	expression tag	UNP A0QPL1
H	-11	HIS	-	expression tag	UNP A0QPL1
H	-10	HIS	-	expression tag	UNP A0QPL1
H	-9	HIS	-	expression tag	UNP A0QPL1
H	-8	HIS	-	expression tag	UNP A0QPL1
H	-7	GLU	-	expression tag	UNP A0QPL1
H	-6	ASN	-	expression tag	UNP A0QPL1
H	-5	LEU	-	expression tag	UNP A0QPL1
H	-4	TYR	-	expression tag	UNP A0QPL1
H	-3	PHE	-	expression tag	UNP A0QPL1
H	-2	GLN	-	expression tag	UNP A0QPL1
H	-1	GLY	-	expression tag	UNP A0QPL1
H	0	GLY	-	expression tag	UNP A0QPL1
H	1	SER	-	expression tag	UNP A0QPL1

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	1	Total Cl 1 1	0	0

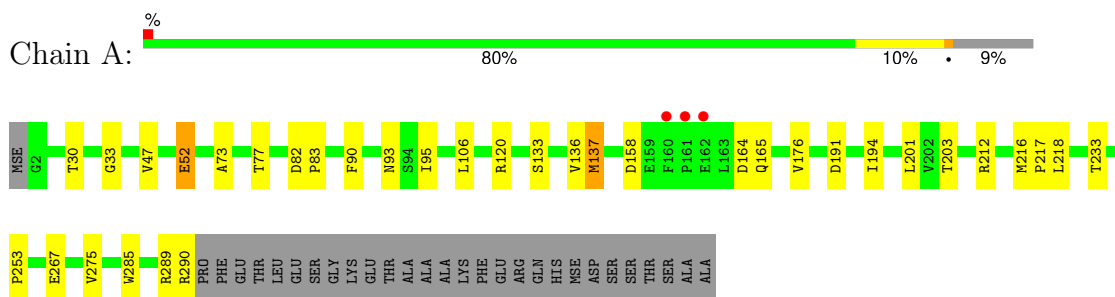
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	214	Total O 214 214	0	0
4	B	106	Total O 106 106	0	0
4	C	166	Total O 166 166	0	0
4	D	32	Total O 32 32	0	0
4	E	157	Total O 157 157	0	0
4	F	79	Total O 79 79	0	0
4	G	110	Total O 110 110	0	0
4	H	21	Total O 21 21	0	0

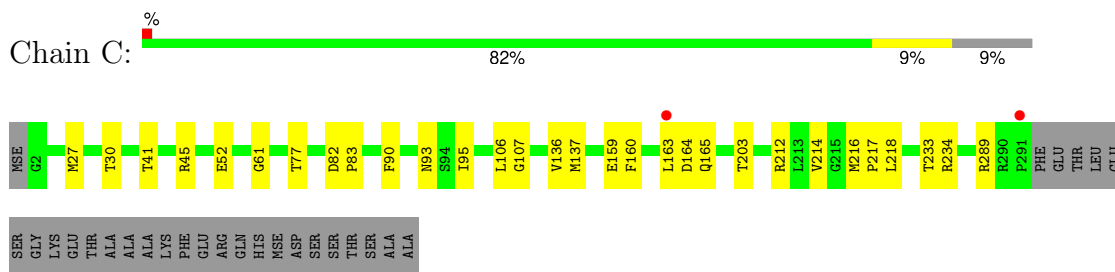
### 3 Residue-property plots [i](#)

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.

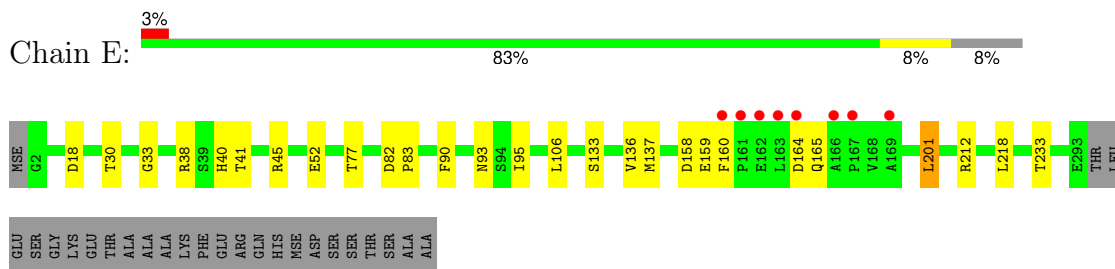
- Molecule 1: Allophanate hydrolase subunit 2



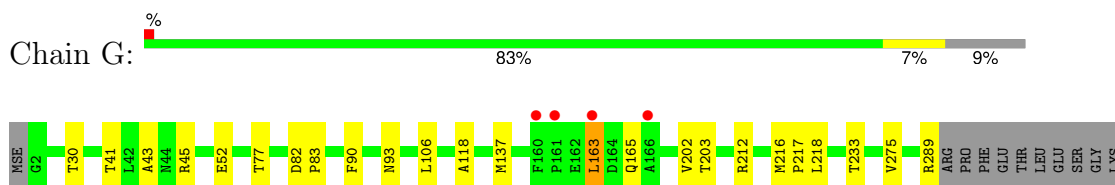
- Molecule 1: Allophanate hydrolase subunit 2



- Molecule 1: Allophanate hydrolase subunit 2



- Molecule 1: Allophanate hydrolase subunit 2



GLU  
THR  
ALA  
ALA  
LYS  
PHE  
GLU  
ARG  
GLN  
HIS  
NSE  
ASP  
SER  
SER  
THR  
SER  
GLY  
ALA  
ALA

• Molecule 2: Allophanate hydrolase subunit 1

Chain B: 4% 80% 11% 8%

MSE  
GLY  
SER  
SER  
HIS  
HIS  
HIS  
HIS  
HIS  
HIS  
HIS  
ASN  
LEU  
TYR  
PHE  
GLN  
GLY  
GLY  
S1  
T2  
L50  
V51  
K52  
P86  
R57  
L66  
L69  
R70  
V71  
R72  
P73  
E74  
A75  
I76  
I77  
H78  
Q79  
P80  
P81  
V85  
M107  
Q111  
V123  
G127  
F132  
R141  
T152

V168  
G176  
W177  
Q178  
M187  
V190  
P200  
Q205  
G210

• Molecule 2: Allophanate hydrolase subunit 1

Chain D: 12% 81% 10% 8%

MSE  
GLY  
SER  
SER  
HIS  
HIS  
HIS  
HIS  
HIS  
HIS  
HIS  
ASN  
LEU  
TYR  
PHE  
GLN  
GLY  
GLY  
S1  
R32  
L50  
V51  
K52  
R57  
A60  
R63  
L66  
R72  
V85  
D86  
V87  
L98  
H99  
E100  
V101  
L104  
T105  
G106  
M107  
T108  
P109  
A110  
Q111  
T119  
R122  
V123  
C126

G127  
F132  
R141  
Q143  
V144  
P145  
R146  
L147  
E148  
A149  
P150  
R151  
T152  
G176  
W177  
Q178  
L179  
I180  
G181  
H182  
V190  
P195  
T199  
P200  
G201  
W202  
W203  
A208  
V209  
GLY

• Molecule 2: Allophanate hydrolase subunit 1

Chain F: 4% 82% 10% 8%

MSE  
GLY  
SER  
SER  
HIS  
HIS  
HIS  
HIS  
HIS  
HIS  
ASN  
LEU  
TYR  
PHE  
GLN  
GLY  
GLY  
S1  
A26  
W27  
T28  
E29  
R32  
L36  
L50  
V51  
K52  
R57  
R65  
L66  
L69  
R70  
V71  
R72  
P73  
E74  
A75  
I76  
I77  
H78  
Q79  
P80  
P81  
G82  
D83  
R84  
V85  
M107  
Q111

V123  
R141  
T152  
Q178  
V190  
P200  
G210

• Molecule 2: Allophanate hydrolase subunit 1

Chain H: 5% 82% 9% 8%

MSE  
GLY  
SER  
SER  
HIS  
HIS  
HIS  
HIS  
HIS  
HIS  
ASN  
LEU  
TYR  
PHE  
GLN  
GLY  
GLY  
S1  
A22  
R32  
L37  
L50  
V51  
K52  
L66  
I76  
I77  
H78  
Q79  
P80  
P81  
R84  
V85  
G106  
M107  
Q111  
V123  
D137  
R141  
R146  
T152  
G176  
W177  
Q178

V190  
T199  
P200  
G201  
M202  
W203  
V204  
Q205  
V209  
GLY

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	77.48Å 84.24Å 402.07Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.92 – 2.50 19.92 – 2.50	Depositor EDS
% Data completeness (in resolution range)	(Not available) (19.92-2.50) 97.6 (19.92-2.50)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.61 (at 2.50Å)	Xtrriage
Refinement program	TNT, BUSTER 2.8.0	Depositor
R, $R_{free}$	0.169 , 0.202 0.169 , 0.204	Depositor DCC
$R_{free}$ test set	4507 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	36.2	Xtrriage
Anisotropy	0.053	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 56.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	15919	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	50.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.62% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: 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	0.59	0/2208	0.75	0/3017
1	C	0.54	0/2216	0.71	0/3029
1	E	0.51	0/2237	0.71	0/3057
1	G	0.48	0/2197	0.72	0/3003
2	B	0.53	0/1633	0.72	0/2228
2	D	0.44	0/1628	0.68	0/2223
2	F	0.48	0/1633	0.70	0/2228
2	H	0.43	0/1624	0.67	0/2218
All	All	0.51	0/15376	0.71	0/21003

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	2160	0	2132	14	0
1	C	2167	0	2139	13	0
1	E	2187	0	2154	9	0
1	G	2149	0	2119	9	0
2	B	1596	0	1587	9	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	1591	0	1584	9	0
2	F	1596	0	1587	8	0
2	H	1587	0	1578	10	0
3	B	1	0	0	1	0
4	A	214	0	0	2	0
4	B	106	0	0	0	0
4	C	166	0	0	1	0
4	D	32	0	0	0	0
4	E	157	0	0	1	0
4	F	79	0	0	0	0
4	G	110	0	0	0	0
4	H	21	0	0	0	0
All	All	15919	0	14880	72	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 2.

All (72) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:216:MSE:HE3	1:A:217:PRO:HD2	1.55	0.89
1:C:216:MSE:HE3	1:C:217:PRO:HD2	1.65	0.79
2:H:107:MSE:HE2	2:H:111:GLN:HB3	1.62	0.79
1:G:216:MSE:HE3	1:G:217:PRO:HD2	1.66	0.77
2:B:107:MSE:HE2	2:B:111:GLN:HB3	1.69	0.73
2:D:107:MSE:HE2	2:D:111:GLN:HB3	1.72	0.72
2:F:26:ALA:HB2	2:F:74:GLU:HB3	1.75	0.68
1:G:233:THR:HG22	2:H:52:LYS:HD3	1.74	0.67
1:C:95:ILE:HD12	1:C:160:PHE:HZ	1.59	0.66
2:D:123:VAL:HG22	2:D:200:PRO:HA	1.77	0.65
1:C:233:THR:HG22	2:D:52:LYS:HD3	1.78	0.64
1:C:95:ILE:CD1	1:C:160:PHE:HZ	2.09	0.64
2:F:29:GLU:HB3	2:F:72:ARG:HD3	1.79	0.63
2:B:123:VAL:HG22	2:B:200:PRO:HA	1.80	0.63
2:F:123:VAL:HG22	2:F:200:PRO:HA	1.82	0.62
1:A:47:VAL:O	1:A:120:ARG:HD3	2.00	0.62
2:H:123:VAL:HG22	2:H:200:PRO:HA	1.81	0.61
1:A:52:GLU:HG3	4:A:425:HOH:O	2.02	0.59
1:C:95:ILE:HD12	1:C:160:PHE:CZ	2.38	0.58
2:B:168:VAL:HB	2:B:187:MSE:HE2	1.86	0.58
1:C:234:ARG:NH2	4:C:328:HOH:O	2.35	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:199:THR:H	2:D:202:MSE:SE	2.38	0.57
1:E:201:LEU:HD11	1:G:203:THR:HG22	1.87	0.56
2:F:36:LEU:HD23	2:F:65:ARG:NH1	2.21	0.55
1:G:163:LEU:H	1:G:163:LEU:HD13	1.71	0.55
1:E:95:ILE:HD11	1:E:160:PHE:HZ	1.74	0.53
1:E:77:THR:HG22	1:E:93:ASN:HD22	1.76	0.51
1:A:233:THR:HG22	2:B:52:LYS:HD3	1.92	0.51
1:A:77:THR:HG22	1:A:93:ASN:HD22	1.76	0.51
1:E:233:THR:HG22	2:F:52:LYS:HD3	1.93	0.50
2:F:107:MSE:HE2	2:F:111:GLN:HB3	1.94	0.50
2:D:60:ALA:HA	2:H:106:GLY:O	2.12	0.50
1:A:194:ILE:HD13	4:A:543:HOH:O	2.10	0.49
1:A:201:LEU:HG	1:C:214:VAL:HG21	1.95	0.49
2:D:122:ARG:HD2	2:D:203:TRP:CZ2	2.47	0.49
1:A:137:MSE:HE2	1:A:253:PRO:HD3	1.94	0.49
1:C:27:MSE:HE1	2:D:195:PRO:HD2	1.96	0.48
1:G:77:THR:HG22	1:G:93:ASN:HD22	1.78	0.48
2:D:63:ARG:HD3	2:H:106:GLY:O	2.13	0.48
1:G:41:THR:HG22	1:G:45:ARG:HH21	1.79	0.48
1:G:43:ALA:HB1	1:G:118:ALA:HB2	1.96	0.47
2:H:199:THR:O	2:H:202:MSE:HB2	2.15	0.47
2:H:22:ALA:HB1	2:H:76:ILE:HG23	1.97	0.47
1:C:95:ILE:CD1	1:C:160:PHE:CZ	2.96	0.46
2:B:56:PRO:HD2	3:B:211:CL:CL	2.53	0.46
1:A:191:ASP:HB3	1:A:194:ILE:HD12	1.97	0.45
1:C:77:THR:HG22	1:C:93:ASN:HD22	1.80	0.45
1:A:285:TRP:CZ2	1:A:289:ARG:HD3	2.52	0.44
1:E:45:ARG:NH2	4:E:560:HOH:O	2.51	0.44
2:F:36:LEU:HD23	2:F:65:ARG:HH11	1.82	0.44
1:C:41:THR:HG22	1:C:45:ARG:HH21	1.83	0.43
1:G:83:PRO:HB2	1:G:90:PHE:CZ	2.54	0.42
2:B:80:PRO:HA	2:B:81:PRO:HD3	1.94	0.42
1:E:83:PRO:HB2	1:E:90:PHE:CZ	2.55	0.42
2:B:71:VAL:HG22	2:B:73:PRO:HD2	2.01	0.41
2:B:85:VAL:HG21	2:B:205:GLN:HB2	2.02	0.41
1:A:83:PRO:HB2	1:A:90:PHE:CZ	2.55	0.41
2:F:27:TRP:CE2	2:F:71:VAL:HB	2.55	0.41
2:H:85:VAL:HG21	2:H:205:GLN:HB2	2.02	0.41
2:B:127:GLY:O	2:B:132:PHE:HB3	2.21	0.41
1:C:83:PRO:HB2	1:C:90:PHE:CZ	2.55	0.41
1:A:73:ALA:HB1	1:A:95:ILE:HD11	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:199:THR:H	2:H:202:MSE:SE	2.54	0.40
1:A:33:GLY:HA2	1:A:133:SER:OG	2.21	0.40
1:A:176:VAL:HG21	1:A:275:VAL:HG22	2.04	0.40
1:C:61:GLY:HA3	1:C:107:GLY:O	2.21	0.40
1:G:202:VAL:HG21	1:G:275:VAL:CG1	2.51	0.40
1:E:33:GLY:HA2	1:E:133:SER:OG	2.20	0.40
1:E:41:THR:HG22	1:E:45:ARG:HH21	1.85	0.40
2:D:127:GLY:O	2:D:132:PHE:HB3	2.22	0.40
1:E:18:ASP:HA	1:E:40:HIS:CE1	2.56	0.40
2:H:80:PRO:HA	2:H:81:PRO:HD3	1.96	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	287/318 (90%)	280 (98%)	7 (2%)	0	100	100
1	C	288/318 (91%)	281 (98%)	7 (2%)	0	100	100
1	E	290/318 (91%)	284 (98%)	6 (2%)	0	100	100
1	G	286/318 (90%)	278 (97%)	8 (3%)	0	100	100
2	B	208/228 (91%)	200 (96%)	7 (3%)	1 (0%)	25	44
2	D	207/228 (91%)	203 (98%)	4 (2%)	0	100	100
2	F	208/228 (91%)	200 (96%)	7 (3%)	1 (0%)	25	44
2	H	207/228 (91%)	202 (98%)	5 (2%)	0	100	100
All	All	1981/2184 (91%)	1928 (97%)	51 (3%)	2 (0%)	48	69

All (2) Ramachandran outliers are listed below:



Mol	Chain	Res	Type
2	B	73	PRO
2	F	83	ASP

### 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	232/249 (93%)	218 (94%)	14 (6%)	16	33
1	C	233/249 (94%)	219 (94%)	14 (6%)	16	33
1	E	235/249 (94%)	221 (94%)	14 (6%)	16	33
1	G	231/249 (93%)	221 (96%)	10 (4%)	25	48
2	B	164/175 (94%)	151 (92%)	13 (8%)	10	21
2	D	164/175 (94%)	153 (93%)	11 (7%)	13	28
2	F	164/175 (94%)	152 (93%)	12 (7%)	11	24
2	H	163/175 (93%)	153 (94%)	10 (6%)	15	32
All	All	1586/1696 (94%)	1488 (94%)	98 (6%)	15	31

All (98) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	30	THR
1	A	52	GLU
1	A	82	ASP
1	A	106	LEU
1	A	136	VAL
1	A	137	MSE
1	A	158	ASP
1	A	164	ASP
1	A	165	GLN
1	A	203	THR
1	A	212	ARG
1	A	218	LEU
1	A	267	GLU
1	A	290	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	B	2	THR
2	B	50	LEU
2	B	57	ARG
2	B	66	LEU
2	B	69	LEU
2	B	70	ARG
2	B	78	HIS
2	B	85	VAL
2	B	123	VAL
2	B	141	ARG
2	B	152	THR
2	B	178	GLN
2	B	190	VAL
1	C	30	THR
1	C	52	GLU
1	C	82	ASP
1	C	106	LEU
1	C	136	VAL
1	C	137	MSE
1	C	159	GLU
1	C	163	LEU
1	C	164	ASP
1	C	165	GLN
1	C	203	THR
1	C	212	ARG
1	C	218	LEU
1	C	289	ARG
2	D	32	ARG
2	D	50	LEU
2	D	57	ARG
2	D	66	LEU
2	D	85	VAL
2	D	123	VAL
2	D	141	ARG
2	D	146	ARG
2	D	152	THR
2	D	178	GLN
2	D	190	VAL
1	E	30	THR
1	E	38	ARG
1	E	52	GLU
1	E	82	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	E	106	LEU
1	E	136	VAL
1	E	137	MSE
1	E	158	ASP
1	E	159	GLU
1	E	164	ASP
1	E	165	GLN
1	E	201	LEU
1	E	212	ARG
1	E	218	LEU
2	F	32	ARG
2	F	50	LEU
2	F	57	ARG
2	F	66	LEU
2	F	69	LEU
2	F	83	ASP
2	F	85	VAL
2	F	123	VAL
2	F	141	ARG
2	F	152	THR
2	F	178	GLN
2	F	190	VAL
1	G	30	THR
1	G	52	GLU
1	G	82	ASP
1	G	106	LEU
1	G	137	MSE
1	G	163	LEU
1	G	165	GLN
1	G	212	ARG
1	G	218	LEU
1	G	289	ARG
2	H	32	ARG
2	H	50	LEU
2	H	66	LEU
2	H	123	VAL
2	H	141	ARG
2	H	146	ARG
2	H	152	THR
2	H	178	GLN
2	H	190	VAL
2	H	202	MSE

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

Mol	Chain	Res	Type
1	A	93	ASN
1	C	93	ASN
1	E	93	ASN
1	G	93	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 oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 1 ligands modelled in this entry, 1 is monoatomic - leaving 0 for Mogul analysis.

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.

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

### 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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	285/318 (89%)	-0.89	3 (1%) 77 74	15, 25, 54, 111	0
1	C	286/318 (89%)	-0.75	2 (0%) 84 81	17, 32, 73, 115	0
1	E	288/318 (90%)	-0.67	8 (2%) 55 51	24, 35, 70, 116	0
1	G	284/318 (89%)	-0.56	4 (1%) 73 70	24, 42, 83, 132	0
2	B	207/228 (90%)	-0.46	8 (3%) 44 40	18, 39, 107, 139	0
2	D	206/228 (90%)	0.69	28 (13%) 8 7	32, 84, 155, 181	0
2	F	207/228 (90%)	-0.37	8 (3%) 44 40	29, 47, 100, 121	0
2	H	206/228 (90%)	0.43	12 (5%) 30 28	46, 73, 123, 146	0
All	All	1969/2184 (90%)	-0.39	73 (3%) 45 42	15, 40, 113, 181	0

All (73) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	F	76	ILE	6.2
2	B	76	ILE	5.5
2	F	77	THR	5.3
2	D	85	VAL	5.0
2	D	209	VAL	4.7
1	E	160	PHE	4.2
2	B	73	PRO	4.1
2	D	101	VAL	4.1
1	E	163	LEU	4.0
2	F	73	PRO	3.6
2	H	152	THR	3.5
2	D	152	THR	3.4
1	A	161	PRO	3.4
2	F	82	GLY	3.3
1	A	160	PHE	3.2
2	D	179	LEU	3.2

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	C	291	PRO	3.2
2	D	150	PRO	3.1
1	C	163	LEU	3.1
2	D	98	LEU	3.0
1	E	167	PRO	3.0
2	F	75	ALA	3.0
2	D	108	THR	3.0
2	H	77	THR	3.0
1	G	163	LEU	2.9
2	B	74	GLU	2.9
1	E	166	ALA	2.9
2	D	126	CYS	2.8
1	E	169	ALA	2.8
2	D	180	ILE	2.7
2	B	77	THR	2.7
2	D	144	VAL	2.6
2	D	182	HIS	2.6
2	H	37	LEU	2.6
1	G	166	ALA	2.6
1	A	162	GLU	2.6
2	D	105	THR	2.5
2	H	79	GLN	2.5
2	H	137	ASP	2.5
2	D	104	LEU	2.4
2	H	84	ARG	2.4
1	E	161	PRO	2.4
2	D	148	ALA	2.4
2	B	81	PRO	2.4
2	H	85	VAL	2.4
2	D	106	GLY	2.4
2	H	176	GLY	2.4
1	G	161	PRO	2.3
2	D	176	GLY	2.3
2	D	142	LEU	2.3
2	D	151	ARG	2.3
2	H	203	TRP	2.3
2	D	99	HIS	2.2
2	H	146	ARG	2.2
2	B	80	PRO	2.2
2	D	201	GLY	2.2
2	F	1	SER	2.2
1	G	160	PHE	2.2

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Mol	Chain	Res	Type	RSRZ
2	F	80	PRO	2.2
2	F	78	HIS	2.2
2	D	119	THR	2.2
2	D	146	ARG	2.2
2	B	176	GLY	2.1
2	B	75	ALA	2.1
2	D	208	ALA	2.1
2	H	1	SER	2.1
2	D	72	ARG	2.1
2	H	199	THR	2.1
2	D	109	PRO	2.1
1	E	164	ASP	2.1
1	E	162	GLU	2.0
2	D	1	SER	2.0
2	D	87	VAL	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 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q < 0.9
3	CL	B	211	1/1	0.99	0.03	41,41,41,41	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.