



# wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 1, 2016 – 11:22 AM GMT

PDB ID : 3OT4  
Title : Structure and Catalytic Mechanism of Bordetella bronchiseptica nicF  
Authors : Rowlett, R.S.; Snider, M.J.  
Deposited on : 2010-09-10  
Resolution : 2.40 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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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 : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

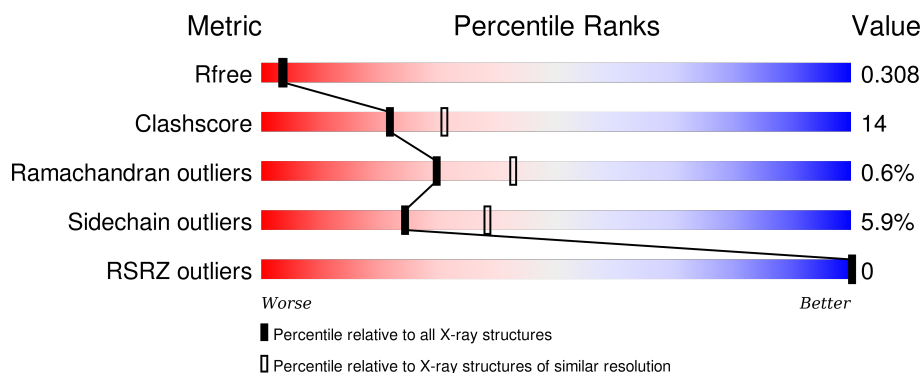
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.40 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))
$R_{free}$	91344	2919 (2.40-2.40)
Clashscore	102246	3407 (2.40-2.40)
Ramachandran outliers	100387	3351 (2.40-2.40)
Sidechain outliers	100360	3352 (2.40-2.40)
RSRZ outliers	91569	2928 (2.40-2.40)

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  $\geq 3$ , 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	236	<div> <div>61%</div> <div>20%</div> <div>•</div> <div>16%</div> </div>
1	B	236	<div> <div>64%</div> <div>18%</div> <div>•</div> <div>16%</div> </div>
1	C	236	<div> <div>61%</div> <div>20%</div> <div>•</div> <div>16%</div> </div>
1	D	236	<div> <div>56%</div> <div>25%</div> <div>•</div> <div>16%</div> </div>
1	E	236	<div> <div>67%</div> <div>16%</div> <div>•</div> <div>15%</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	236	 65% 16% • 17%
1	G	236	 65% 17% • 17%
1	H	236	 59% 21% • 16%

## 2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 12175 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 Putative isochorismatase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	198	Total	C	N	O	S	0	0	0
			1463	927	257	272	7			
1	B	198	Total	C	N	O	S	0	0	0
			1463	927	257	272	7			
1	C	198	Total	C	N	O	S	0	0	0
			1469	932	259	271	7			
1	D	198	Total	C	N	O	S	0	0	0
			1469	932	259	271	7			
1	E	201	Total	C	N	O	S	0	0	0
			1487	943	262	275	7			
1	F	197	Total	C	N	O	S	0	0	0
			1461	926	257	271	7			
1	G	197	Total	C	N	O	S	0	0	0
			1461	926	257	271	7			
1	H	198	Total	C	N	O	S	0	0	0
			1467	929	258	273	7			

There are 248 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-21	GLY	-	EXPRESSION TAG	UNP Q7TTE5
A	-20	SER	-	EXPRESSION TAG	UNP Q7TTE5
A	-19	ASP	-	EXPRESSION TAG	UNP Q7TTE5
A	-18	LYS	-	EXPRESSION TAG	UNP Q7TTE5
A	-17	ILE	-	EXPRESSION TAG	UNP Q7TTE5
A	-16	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	-15	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	-14	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	-13	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	-12	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	-11	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	-10	SER	-	EXPRESSION TAG	UNP Q7TTE5
A	-9	SER	-	EXPRESSION TAG	UNP Q7TTE5

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-8	GLY	-	EXPRESSION TAG	UNP Q7TTE5
A	-7	GLU	-	EXPRESSION TAG	UNP Q7TTE5
A	-6	ASN	-	EXPRESSION TAG	UNP Q7TTE5
A	-5	LEU	-	EXPRESSION TAG	UNP Q7TTE5
A	-4	TYR	-	EXPRESSION TAG	UNP Q7TTE5
A	-3	PHE	-	EXPRESSION TAG	UNP Q7TTE5
A	-2	GLN	-	EXPRESSION TAG	UNP Q7TTE5
A	-1	GLY	-	EXPRESSION TAG	UNP Q7TTE5
A	0	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	206	GLY	-	EXPRESSION TAG	UNP Q7TTE5
A	207	LEU	-	EXPRESSION TAG	UNP Q7TTE5
A	208	GLU	-	EXPRESSION TAG	UNP Q7TTE5
A	209	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	210	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	211	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	212	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	213	HIS	-	EXPRESSION TAG	UNP Q7TTE5
A	214	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	-21	GLY	-	EXPRESSION TAG	UNP Q7TTE5
B	-20	SER	-	EXPRESSION TAG	UNP Q7TTE5
B	-19	ASP	-	EXPRESSION TAG	UNP Q7TTE5
B	-18	LYS	-	EXPRESSION TAG	UNP Q7TTE5
B	-17	ILE	-	EXPRESSION TAG	UNP Q7TTE5
B	-16	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	-15	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	-14	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	-13	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	-12	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	-11	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	-10	SER	-	EXPRESSION TAG	UNP Q7TTE5
B	-9	SER	-	EXPRESSION TAG	UNP Q7TTE5
B	-8	GLY	-	EXPRESSION TAG	UNP Q7TTE5
B	-7	GLU	-	EXPRESSION TAG	UNP Q7TTE5
B	-6	ASN	-	EXPRESSION TAG	UNP Q7TTE5
B	-5	LEU	-	EXPRESSION TAG	UNP Q7TTE5
B	-4	TYR	-	EXPRESSION TAG	UNP Q7TTE5
B	-3	PHE	-	EXPRESSION TAG	UNP Q7TTE5
B	-2	GLN	-	EXPRESSION TAG	UNP Q7TTE5
B	-1	GLY	-	EXPRESSION TAG	UNP Q7TTE5
B	0	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	206	GLY	-	EXPRESSION TAG	UNP Q7TTE5
B	207	LEU	-	EXPRESSION TAG	UNP Q7TTE5

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Chain	Residue	Modelled	Actual	Comment	Reference
B	208	GLU	-	EXPRESSION TAG	UNP Q7TTE5
B	209	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	210	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	211	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	212	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	213	HIS	-	EXPRESSION TAG	UNP Q7TTE5
B	214	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	-21	GLY	-	EXPRESSION TAG	UNP Q7TTE5
C	-20	SER	-	EXPRESSION TAG	UNP Q7TTE5
C	-19	ASP	-	EXPRESSION TAG	UNP Q7TTE5
C	-18	LYS	-	EXPRESSION TAG	UNP Q7TTE5
C	-17	ILE	-	EXPRESSION TAG	UNP Q7TTE5
C	-16	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	-15	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	-14	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	-13	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	-12	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	-11	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	-10	SER	-	EXPRESSION TAG	UNP Q7TTE5
C	-9	SER	-	EXPRESSION TAG	UNP Q7TTE5
C	-8	GLY	-	EXPRESSION TAG	UNP Q7TTE5
C	-7	GLU	-	EXPRESSION TAG	UNP Q7TTE5
C	-6	ASN	-	EXPRESSION TAG	UNP Q7TTE5
C	-5	LEU	-	EXPRESSION TAG	UNP Q7TTE5
C	-4	TYR	-	EXPRESSION TAG	UNP Q7TTE5
C	-3	PHE	-	EXPRESSION TAG	UNP Q7TTE5
C	-2	GLN	-	EXPRESSION TAG	UNP Q7TTE5
C	-1	GLY	-	EXPRESSION TAG	UNP Q7TTE5
C	0	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	206	GLY	-	EXPRESSION TAG	UNP Q7TTE5
C	207	LEU	-	EXPRESSION TAG	UNP Q7TTE5
C	208	GLU	-	EXPRESSION TAG	UNP Q7TTE5
C	209	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	210	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	211	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	212	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	213	HIS	-	EXPRESSION TAG	UNP Q7TTE5
C	214	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	-21	GLY	-	EXPRESSION TAG	UNP Q7TTE5
D	-20	SER	-	EXPRESSION TAG	UNP Q7TTE5
D	-19	ASP	-	EXPRESSION TAG	UNP Q7TTE5
D	-18	LYS	-	EXPRESSION TAG	UNP Q7TTE5

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-17	ILE	-	EXPRESSION TAG	UNP Q7TTE5
D	-16	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	-15	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	-14	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	-13	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	-12	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	-11	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	-10	SER	-	EXPRESSION TAG	UNP Q7TTE5
D	-9	SER	-	EXPRESSION TAG	UNP Q7TTE5
D	-8	GLY	-	EXPRESSION TAG	UNP Q7TTE5
D	-7	GLU	-	EXPRESSION TAG	UNP Q7TTE5
D	-6	ASN	-	EXPRESSION TAG	UNP Q7TTE5
D	-5	LEU	-	EXPRESSION TAG	UNP Q7TTE5
D	-4	TYR	-	EXPRESSION TAG	UNP Q7TTE5
D	-3	PHE	-	EXPRESSION TAG	UNP Q7TTE5
D	-2	GLN	-	EXPRESSION TAG	UNP Q7TTE5
D	-1	GLY	-	EXPRESSION TAG	UNP Q7TTE5
D	0	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	206	GLY	-	EXPRESSION TAG	UNP Q7TTE5
D	207	LEU	-	EXPRESSION TAG	UNP Q7TTE5
D	208	GLU	-	EXPRESSION TAG	UNP Q7TTE5
D	209	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	210	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	211	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	212	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	213	HIS	-	EXPRESSION TAG	UNP Q7TTE5
D	214	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	-21	GLY	-	EXPRESSION TAG	UNP Q7TTE5
E	-20	SER	-	EXPRESSION TAG	UNP Q7TTE5
E	-19	ASP	-	EXPRESSION TAG	UNP Q7TTE5
E	-18	LYS	-	EXPRESSION TAG	UNP Q7TTE5
E	-17	ILE	-	EXPRESSION TAG	UNP Q7TTE5
E	-16	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	-15	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	-14	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	-13	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	-12	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	-11	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	-10	SER	-	EXPRESSION TAG	UNP Q7TTE5
E	-9	SER	-	EXPRESSION TAG	UNP Q7TTE5
E	-8	GLY	-	EXPRESSION TAG	UNP Q7TTE5
E	-7	GLU	-	EXPRESSION TAG	UNP Q7TTE5

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-6	ASN	-	EXPRESSION TAG	UNP Q7TTE5
E	-5	LEU	-	EXPRESSION TAG	UNP Q7TTE5
E	-4	TYR	-	EXPRESSION TAG	UNP Q7TTE5
E	-3	PHE	-	EXPRESSION TAG	UNP Q7TTE5
E	-2	GLN	-	EXPRESSION TAG	UNP Q7TTE5
E	-1	GLY	-	EXPRESSION TAG	UNP Q7TTE5
E	0	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	206	GLY	-	EXPRESSION TAG	UNP Q7TTE5
E	207	LEU	-	EXPRESSION TAG	UNP Q7TTE5
E	208	GLU	-	EXPRESSION TAG	UNP Q7TTE5
E	209	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	210	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	211	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	212	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	213	HIS	-	EXPRESSION TAG	UNP Q7TTE5
E	214	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	-21	GLY	-	EXPRESSION TAG	UNP Q7TTE5
F	-20	SER	-	EXPRESSION TAG	UNP Q7TTE5
F	-19	ASP	-	EXPRESSION TAG	UNP Q7TTE5
F	-18	LYS	-	EXPRESSION TAG	UNP Q7TTE5
F	-17	ILE	-	EXPRESSION TAG	UNP Q7TTE5
F	-16	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	-15	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	-14	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	-13	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	-12	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	-11	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	-10	SER	-	EXPRESSION TAG	UNP Q7TTE5
F	-9	SER	-	EXPRESSION TAG	UNP Q7TTE5
F	-8	GLY	-	EXPRESSION TAG	UNP Q7TTE5
F	-7	GLU	-	EXPRESSION TAG	UNP Q7TTE5
F	-6	ASN	-	EXPRESSION TAG	UNP Q7TTE5
F	-5	LEU	-	EXPRESSION TAG	UNP Q7TTE5
F	-4	TYR	-	EXPRESSION TAG	UNP Q7TTE5
F	-3	PHE	-	EXPRESSION TAG	UNP Q7TTE5
F	-2	GLN	-	EXPRESSION TAG	UNP Q7TTE5
F	-1	GLY	-	EXPRESSION TAG	UNP Q7TTE5
F	0	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	206	GLY	-	EXPRESSION TAG	UNP Q7TTE5
F	207	LEU	-	EXPRESSION TAG	UNP Q7TTE5
F	208	GLU	-	EXPRESSION TAG	UNP Q7TTE5
F	209	HIS	-	EXPRESSION TAG	UNP Q7TTE5

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Chain	Residue	Modelled	Actual	Comment	Reference
F	210	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	211	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	212	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	213	HIS	-	EXPRESSION TAG	UNP Q7TTE5
F	214	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	-21	GLY	-	EXPRESSION TAG	UNP Q7TTE5
G	-20	SER	-	EXPRESSION TAG	UNP Q7TTE5
G	-19	ASP	-	EXPRESSION TAG	UNP Q7TTE5
G	-18	LYS	-	EXPRESSION TAG	UNP Q7TTE5
G	-17	ILE	-	EXPRESSION TAG	UNP Q7TTE5
G	-16	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	-15	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	-14	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	-13	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	-12	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	-11	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	-10	SER	-	EXPRESSION TAG	UNP Q7TTE5
G	-9	SER	-	EXPRESSION TAG	UNP Q7TTE5
G	-8	GLY	-	EXPRESSION TAG	UNP Q7TTE5
G	-7	GLU	-	EXPRESSION TAG	UNP Q7TTE5
G	-6	ASN	-	EXPRESSION TAG	UNP Q7TTE5
G	-5	LEU	-	EXPRESSION TAG	UNP Q7TTE5
G	-4	TYR	-	EXPRESSION TAG	UNP Q7TTE5
G	-3	PHE	-	EXPRESSION TAG	UNP Q7TTE5
G	-2	GLN	-	EXPRESSION TAG	UNP Q7TTE5
G	-1	GLY	-	EXPRESSION TAG	UNP Q7TTE5
G	0	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	206	GLY	-	EXPRESSION TAG	UNP Q7TTE5
G	207	LEU	-	EXPRESSION TAG	UNP Q7TTE5
G	208	GLU	-	EXPRESSION TAG	UNP Q7TTE5
G	209	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	210	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	211	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	212	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	213	HIS	-	EXPRESSION TAG	UNP Q7TTE5
G	214	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	-21	GLY	-	EXPRESSION TAG	UNP Q7TTE5
H	-20	SER	-	EXPRESSION TAG	UNP Q7TTE5
H	-19	ASP	-	EXPRESSION TAG	UNP Q7TTE5
H	-18	LYS	-	EXPRESSION TAG	UNP Q7TTE5
H	-17	ILE	-	EXPRESSION TAG	UNP Q7TTE5
H	-16	HIS	-	EXPRESSION TAG	UNP Q7TTE5

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Chain	Residue	Modelled	Actual	Comment	Reference
H	-15	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	-14	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	-13	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	-12	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	-11	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	-10	SER	-	EXPRESSION TAG	UNP Q7TTE5
H	-9	SER	-	EXPRESSION TAG	UNP Q7TTE5
H	-8	GLY	-	EXPRESSION TAG	UNP Q7TTE5
H	-7	GLU	-	EXPRESSION TAG	UNP Q7TTE5
H	-6	ASN	-	EXPRESSION TAG	UNP Q7TTE5
H	-5	LEU	-	EXPRESSION TAG	UNP Q7TTE5
H	-4	TYR	-	EXPRESSION TAG	UNP Q7TTE5
H	-3	PHE	-	EXPRESSION TAG	UNP Q7TTE5
H	-2	GLN	-	EXPRESSION TAG	UNP Q7TTE5
H	-1	GLY	-	EXPRESSION TAG	UNP Q7TTE5
H	0	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	206	GLY	-	EXPRESSION TAG	UNP Q7TTE5
H	207	LEU	-	EXPRESSION TAG	UNP Q7TTE5
H	208	GLU	-	EXPRESSION TAG	UNP Q7TTE5
H	209	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	210	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	211	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	212	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	213	HIS	-	EXPRESSION TAG	UNP Q7TTE5
H	214	HIS	-	EXPRESSION TAG	UNP Q7TTE5

- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	37	Total O 37 37	0	0
2	B	46	Total O 46 46	0	0
2	C	63	Total O 63 63	0	0
2	D	69	Total O 69 69	0	0
2	E	82	Total O 82 82	0	0
2	F	38	Total O 38 38	0	0
2	G	37	Total O 37 37	0	0

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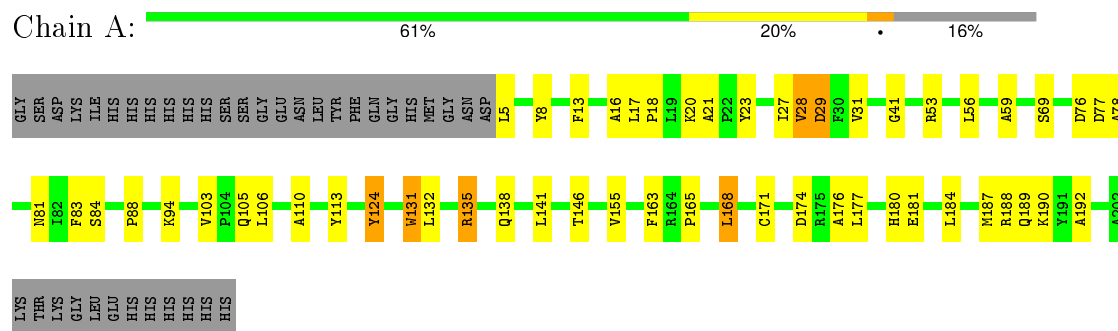
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	H	63	Total	O	0	0
			63	63		

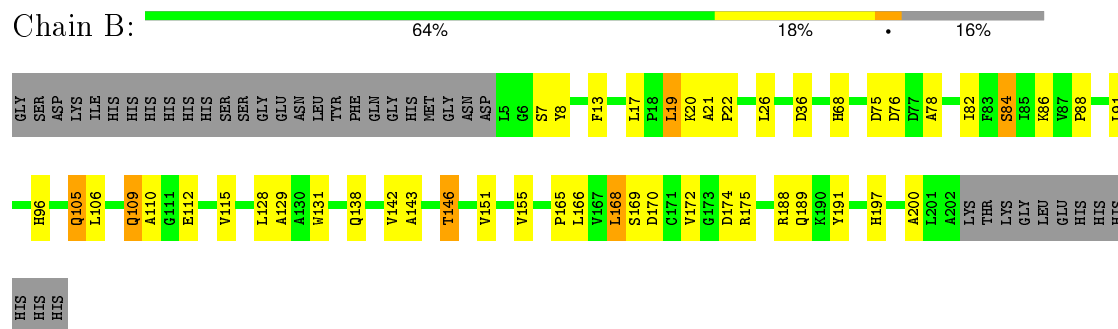
### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

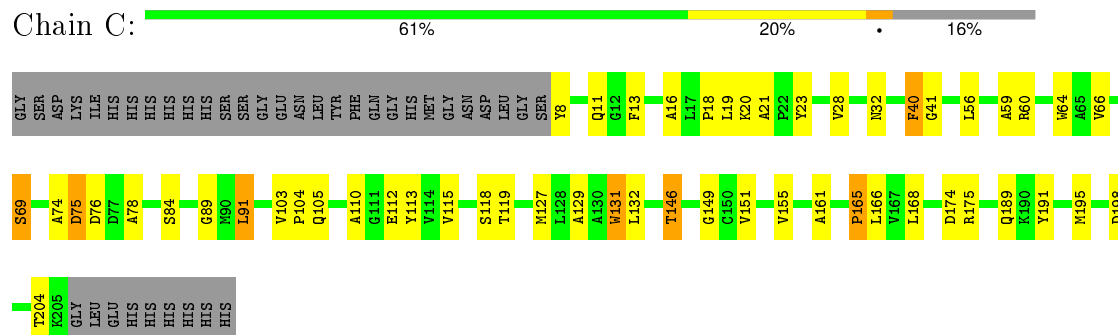
- Molecule 1: Putative isochorismatase



- Molecule 1: Putative isochorismatase



- Molecule 1: Putative isochorismatase



- Molecule 1: Putative isochorismatase



R188	Q189	K190	Y191	Y194	D198	T204	LYS	GLY	LEU	GLU	HIS	HIS	HIS	HIS	HIS	HIS
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## 4 Data and refinement statistics

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	157.56Å 157.56Å 198.48Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	12.01 – 2.40 12.01 – 2.40	Depositor EDS
% Data completeness (in resolution range)	98.1 (12.01-2.40) 98.1 (12.01-2.40)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.09	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.67 (at 2.40Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, $R_{free}$	0.241 , 0.311 0.241 , 0.308	Depositor DCC
$R_{free}$ test set	1400 reflections (2.04%)	DCC
Wilson B-factor (Å <sup>2</sup> )	18.9	Xtriage
Anisotropy	0.046	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.41 , -1.1	EDS
Estimated twinning fraction	0.105 for -2/3*h-1/3*k+2/3*l,-1/3*h-2/3*k-2/3*l,2/3*h-2/3*k+1/3*l 0.095 for -h,1/3*h-1/3*k+2/3*l,2/3*h+4/3*k+1/3*l 0.095 for -1/3*h+1/3*k-2/3*l,-k,-4/3*h-2/3*k+1/3*l 0.094 for -h,2/3*h+1/3*k-2/3*l,-2/3*h-4/3*k-1/3*l 0.096 for 1/3*h+2/3*k+2/3*l,-k,4/3*h+2/3*k-1/3*l 0.105 for -1/3*h-2/3*k-2/3*l,-2/3*h-1/3*k+2/3*l,-2/3*h+2/3*k-1/3*l 0.380 for h,-h-k,-l	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.40$ , $\langle L^2 \rangle = 0.23$	Xtriage
Outliers	0 of 69904 reflections	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	12175	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	14.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.22% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: CSO

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	0.69	0/1486	0.80	0/2021
1	B	0.74	0/1486	0.80	0/2021
1	C	0.71	0/1492	0.78	0/2028
1	D	0.70	0/1492	0.78	0/2028
1	E	0.74	0/1510	0.81	0/2052
1	F	0.74	0/1484	0.81	0/2018
1	G	0.67	0/1484	0.76	1/2018 (0.0%)
1	H	0.73	0/1490	0.80	1/2026 (0.0%)
All	All	0.72	0/11924	0.79	2/16212 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1
1	C	0	1
1	E	0	2
1	G	0	1
1	H	0	1
All	All	0	6

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	175	ARG	NE-CZ-NH1	5.90	123.25	120.30
1	G	60	ARG	NE-CZ-NH1	5.36	122.98	120.30



There are no chirality outliers.

5 of 6 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	109	GLN	Peptide
1	C	40	PHE	Peptide
1	E	125	GLY	Peptide
1	E	40	PHE	Peptide
1	G	109	GLN	Peptide

## 5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1463	0	1452	56	0
1	B	1463	0	1452	34	0
1	C	1469	0	1466	44	0
1	D	1469	0	1466	63	0
1	E	1487	0	1485	42	0
1	F	1461	0	1453	36	0
1	G	1461	0	1453	37	0
1	H	1467	0	1458	58	0
2	A	37	0	0	1	0
2	B	46	0	0	4	0
2	C	63	0	0	3	0
2	D	69	0	0	6	0
2	E	82	0	0	2	0
2	F	38	0	0	3	0
2	G	37	0	0	0	0
2	H	63	0	0	1	0
All	All	12175	0	11685	327	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 14.

The worst 5 of 327 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:D:159:MET:CE	1:G:83:PHE:HA	1.84	1.06
1:D:159:MET:HE2	1:G:83:PHE:HA	1.42	0.98
1:A:83:PHE:HA	1:H:159:MET:HE2	1.46	0.97
1:F:105:GLN:HE21	1:F:105:GLN:H	1.12	0.96
1:C:84:SER:HB2	1:C:91:LEU:HD12	1.49	0.93

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	195/236 (83%)	179 (92%)	14 (7%)	2 (1%)	19	28
1	B	195/236 (83%)	183 (94%)	10 (5%)	2 (1%)	19	28
1	C	195/236 (83%)	185 (95%)	9 (5%)	1 (0%)	34	48
1	D	195/236 (83%)	185 (95%)	9 (5%)	1 (0%)	34	48
1	E	198/236 (84%)	192 (97%)	5 (2%)	1 (0%)	34	48
1	F	194/236 (82%)	184 (95%)	9 (5%)	1 (0%)	34	48
1	G	194/236 (82%)	181 (93%)	12 (6%)	1 (0%)	34	48
1	H	195/236 (83%)	191 (98%)	4 (2%)	0	100	100
All	All	1561/1888 (83%)	1480 (95%)	72 (5%)	9 (1%)	30	43

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	29	ASP
1	D	175	ARG
1	F	110	ALA
1	C	75	ASP
1	B	7	SER

### 5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	143/176 (81%)	139 (97%)	4 (3%)	51	72
1	B	143/176 (81%)	133 (93%)	10 (7%)	19	29
1	C	144/176 (82%)	134 (93%)	10 (7%)	19	30
1	D	144/176 (82%)	136 (94%)	8 (6%)	26	41
1	E	146/176 (83%)	138 (94%)	8 (6%)	27	42
1	F	143/176 (81%)	135 (94%)	8 (6%)	26	41
1	G	143/176 (81%)	137 (96%)	6 (4%)	36	56
1	H	144/176 (82%)	130 (90%)	14 (10%)	10	15
All	All	1150/1408 (82%)	1082 (94%)	68 (6%)	24	38

5 of 68 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	131	TRP
1	E	184	LEU
1	H	135	ARG
1	D	198	ASP
1	E	91	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 29 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	138	GLN
1	E	109	GLN
1	H	180	HIS
1	E	11	GLN
1	E	138	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
1	CSO	A	150	1	3,6,7	0.49	0	1,6,8	2.15	1 (100%)
1	CSO	B	150	1	3,6,7	0.49	0	1,6,8	2.34	1 (100%)
1	CSO	C	150	1	3,6,7	0.74	0	1,6,8	1.95	0
1	CSO	D	150	1	3,6,7	0.59	0	1,6,8	2.31	1 (100%)
1	CSO	E	150	1	3,6,7	0.59	0	1,6,8	2.42	1 (100%)
1	CSO	F	150	1	3,6,7	0.67	0	1,6,8	2.12	1 (100%)
1	CSO	G	150	1	3,6,7	0.84	0	1,6,8	2.11	1 (100%)
1	CSO	H	150	1	3,6,7	0.54	0	1,6,8	2.53	1 (100%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	CSO	A	150	1	-	0/1/5/7	0/0/0/0
1	CSO	B	150	1	-	0/1/5/7	0/0/0/0
1	CSO	C	150	1	-	0/1/5/7	0/0/0/0
1	CSO	D	150	1	-	0/1/5/7	0/0/0/0
1	CSO	E	150	1	-	0/1/5/7	0/0/0/0
1	CSO	F	150	1	-	0/1/5/7	0/0/0/0
1	CSO	G	150	1	-	0/1/5/7	0/0/0/0
1	CSO	H	150	1	-	0/1/5/7	0/0/0/0

There are no bond length outliers.

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	150	CSO	O-C-CA	-2.53	118.89	125.49

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Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
1	E	150	CSO	O-C-CA	-2.42	119.20	125.49
1	B	150	CSO	O-C-CA	-2.34	119.41	125.49
1	D	150	CSO	O-C-CA	-2.31	119.48	125.49
1	A	150	CSO	O-C-CA	-2.15	119.89	125.49

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
1	G	150	CSO	1	0

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	197/236 (83%)	-0.65	0 100 100	7, 15, 27, 37	0
1	B	197/236 (83%)	-0.74	0 100 100	7, 13, 24, 33	0
1	C	197/236 (83%)	-0.74	0 100 100	6, 14, 24, 30	0
1	D	197/236 (83%)	-0.72	0 100 100	7, 13, 25, 39	0
1	E	200/236 (84%)	-0.72	0 100 100	6, 12, 24, 41	0
1	F	196/236 (83%)	-0.74	0 100 100	6, 12, 21, 32	0
1	G	196/236 (83%)	-0.62	0 100 100	11, 18, 28, 38	0
1	H	197/236 (83%)	-0.69	0 100 100	6, 12, 23, 42	0
All	All	1577/1888 (83%)	-0.70	0 100 100	6, 14, 25, 42	0

There are no RSRZ outliers to report.

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
1	CSO	B	150	7/8	0.98	0.08	-	6,7,8,16	0
1	CSO	A	150	7/8	0.97	0.09	-	7,9,11,11	0
1	CSO	C	150	7/8	0.98	0.10	-	11,11,11,12	0
1	CSO	F	150	7/8	0.98	0.07	-	9,9,14,14	0
1	CSO	E	150	7/8	0.98	0.09	-	8,9,10,15	0
1	CSO	G	150	7/8	0.97	0.11	-	15,16,18,21	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
1	CSO	D	150	7/8	0.98	0.08	-	9,10,11,14	0
1	CSO	H	150	7/8	0.97	0.10	-	13,13,17,22	0

### 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

### 6.4 Ligands [i](#)

There are no ligands in this entry.

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

There are no such residues in this entry.