



wwPDB X-ray Structure Validation Summary Report ⓘ

Sep 14, 2023 – 04:27 PM EDT

PDB ID : 3C5Y
Title : Crystal structure of a putative ribose 5-phosphate isomerase (saro_3514) from novosphingobium aromaticivorans dsm at 1.81 Å resolution
Authors : Joint Center for Structural Genomics (JCSG)
Deposited on : 2008-02-01
Resolution : 1.81 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

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 : 2.35.1
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) : 2.35.1

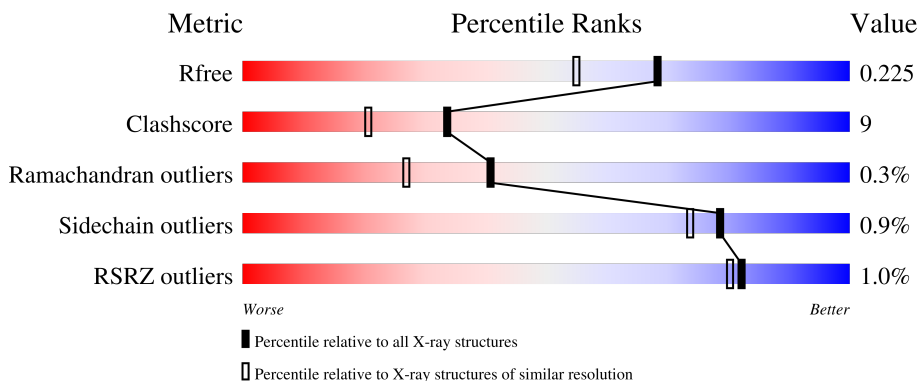
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.81 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	7484 (1.84-1.80)
Clashscore	141614	8401 (1.84-1.80)
Ramachandran outliers	138981	8290 (1.84-1.80)
Sidechain outliers	138945	8290 (1.84-1.80)
RSRZ outliers	127900	7371 (1.84-1.80)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	231	82% 10% 9%
1	B	231	84% 8% 8%
1	C	231	78% 13% 8%
1	D	231	77% 14% 9%
1	E	231	83% 9% 7%

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Mol	Chain	Length	Quality of chain
1	F	231	 2% 84% 7% 8%
1	G	231	 82% 10% 9%
1	H	231	 84% 9% 7%
1	I	231	 84% 8% 8%
1	J	231	 2% 81% 11% 8%
1	K	231	 82% 10% 8%
1	L	231	 2% 82% 10% 8%
1	M	231	 81% 11% 8%
1	N	231	 2% 77% 12% 8%
1	O	231	 5% 73% 18% 9%
1	P	231	 71% 19% 9%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	EDO	E	215	-	-	X	-

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 28863 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 Ribose/galactose isomerase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	211	Total 1630	C 1037	N 274	O 303	S 4	Se 12	0	6	0
1	B	212	Total 1612	C 1024	N 271	O 301	S 4	Se 12	0	3	0
1	C	212	Total 1625	C 1034	N 269	O 303	S 4	Se 15	0	6	0
1	D	211	Total 1605	C 1020	N 269	O 300	S 4	Se 12	0	4	0
1	E	215	Total 1652	C 1046	N 280	O 312	S 4	Se 10	0	3	0
1	F	213	Total 1634	C 1035	N 278	O 306	S 4	Se 11	0	4	0
1	G	211	Total 1622	C 1029	N 275	O 302	S 4	Se 12	0	4	0
1	H	214	Total 1663	C 1059	N 280	O 309	S 4	Se 11	0	6	0
1	I	212	Total 1633	C 1036	N 276	O 305	S 4	Se 12	0	5	0
1	J	212	Total 1618	C 1025	N 275	O 303	S 4	Se 11	0	3	0
1	K	212	Total 1615	C 1024	N 276	O 301	S 4	Se 10	0	3	0
1	L	213	Total 1616	C 1026	N 271	O 303	S 4	Se 12	0	3	0
1	M	212	Total 1616	C 1025	N 269	O 306	S 4	Se 12	0	4	0
1	N	212	Total 1616	C 1029	N 267	O 304	S 4	Se 12	0	5	0
1	O	211	Total 1568	C 1001	N 259	O 293	S 4	Se 11	0	3	0
1	P	211	Total 1597	C 1012	N 268	O 303	S 4	Se 10	0	2	0

There are 304 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-18	MSE	-	expression tag	UNP A4XEL3
A	-17	GLY	-	expression tag	UNP A4XEL3
A	-16	SER	-	expression tag	UNP A4XEL3
A	-15	ASP	-	expression tag	UNP A4XEL3
A	-14	LYS	-	expression tag	UNP A4XEL3
A	-13	ILE	-	expression tag	UNP A4XEL3
A	-12	HIS	-	expression tag	UNP A4XEL3
A	-11	HIS	-	expression tag	UNP A4XEL3
A	-10	HIS	-	expression tag	UNP A4XEL3
A	-9	HIS	-	expression tag	UNP A4XEL3
A	-8	HIS	-	expression tag	UNP A4XEL3
A	-7	HIS	-	expression tag	UNP A4XEL3
A	-6	GLU	-	expression tag	UNP A4XEL3
A	-5	ASN	-	expression tag	UNP A4XEL3
A	-4	LEU	-	expression tag	UNP A4XEL3
A	-3	TYR	-	expression tag	UNP A4XEL3
A	-2	PHE	-	expression tag	UNP A4XEL3
A	-1	GLN	-	expression tag	UNP A4XEL3
A	0	GLY	-	expression tag	UNP A4XEL3
B	-18	MSE	-	expression tag	UNP A4XEL3
B	-17	GLY	-	expression tag	UNP A4XEL3
B	-16	SER	-	expression tag	UNP A4XEL3
B	-15	ASP	-	expression tag	UNP A4XEL3
B	-14	LYS	-	expression tag	UNP A4XEL3
B	-13	ILE	-	expression tag	UNP A4XEL3
B	-12	HIS	-	expression tag	UNP A4XEL3
B	-11	HIS	-	expression tag	UNP A4XEL3
B	-10	HIS	-	expression tag	UNP A4XEL3
B	-9	HIS	-	expression tag	UNP A4XEL3
B	-8	HIS	-	expression tag	UNP A4XEL3
B	-7	HIS	-	expression tag	UNP A4XEL3
B	-6	GLU	-	expression tag	UNP A4XEL3
B	-5	ASN	-	expression tag	UNP A4XEL3
B	-4	LEU	-	expression tag	UNP A4XEL3
B	-3	TYR	-	expression tag	UNP A4XEL3
B	-2	PHE	-	expression tag	UNP A4XEL3
B	-1	GLN	-	expression tag	UNP A4XEL3
B	0	GLY	-	expression tag	UNP A4XEL3
C	-18	MSE	-	expression tag	UNP A4XEL3
C	-17	GLY	-	expression tag	UNP A4XEL3
C	-16	SER	-	expression tag	UNP A4XEL3
C	-15	ASP	-	expression tag	UNP A4XEL3

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-14	LYS	-	expression tag	UNP A4XEL3
C	-13	ILE	-	expression tag	UNP A4XEL3
C	-12	HIS	-	expression tag	UNP A4XEL3
C	-11	HIS	-	expression tag	UNP A4XEL3
C	-10	HIS	-	expression tag	UNP A4XEL3
C	-9	HIS	-	expression tag	UNP A4XEL3
C	-8	HIS	-	expression tag	UNP A4XEL3
C	-7	HIS	-	expression tag	UNP A4XEL3
C	-6	GLU	-	expression tag	UNP A4XEL3
C	-5	ASN	-	expression tag	UNP A4XEL3
C	-4	LEU	-	expression tag	UNP A4XEL3
C	-3	TYR	-	expression tag	UNP A4XEL3
C	-2	PHE	-	expression tag	UNP A4XEL3
C	-1	GLN	-	expression tag	UNP A4XEL3
C	0	GLY	-	expression tag	UNP A4XEL3
D	-18	MSE	-	expression tag	UNP A4XEL3
D	-17	GLY	-	expression tag	UNP A4XEL3
D	-16	SER	-	expression tag	UNP A4XEL3
D	-15	ASP	-	expression tag	UNP A4XEL3
D	-14	LYS	-	expression tag	UNP A4XEL3
D	-13	ILE	-	expression tag	UNP A4XEL3
D	-12	HIS	-	expression tag	UNP A4XEL3
D	-11	HIS	-	expression tag	UNP A4XEL3
D	-10	HIS	-	expression tag	UNP A4XEL3
D	-9	HIS	-	expression tag	UNP A4XEL3
D	-8	HIS	-	expression tag	UNP A4XEL3
D	-7	HIS	-	expression tag	UNP A4XEL3
D	-6	GLU	-	expression tag	UNP A4XEL3
D	-5	ASN	-	expression tag	UNP A4XEL3
D	-4	LEU	-	expression tag	UNP A4XEL3
D	-3	TYR	-	expression tag	UNP A4XEL3
D	-2	PHE	-	expression tag	UNP A4XEL3
D	-1	GLN	-	expression tag	UNP A4XEL3
D	0	GLY	-	expression tag	UNP A4XEL3
E	-18	MSE	-	expression tag	UNP A4XEL3
E	-17	GLY	-	expression tag	UNP A4XEL3
E	-16	SER	-	expression tag	UNP A4XEL3
E	-15	ASP	-	expression tag	UNP A4XEL3
E	-14	LYS	-	expression tag	UNP A4XEL3
E	-13	ILE	-	expression tag	UNP A4XEL3
E	-12	HIS	-	expression tag	UNP A4XEL3
E	-11	HIS	-	expression tag	UNP A4XEL3

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-10	HIS	-	expression tag	UNP A4XEL3
E	-9	HIS	-	expression tag	UNP A4XEL3
E	-8	HIS	-	expression tag	UNP A4XEL3
E	-7	HIS	-	expression tag	UNP A4XEL3
E	-6	GLU	-	expression tag	UNP A4XEL3
E	-5	ASN	-	expression tag	UNP A4XEL3
E	-4	LEU	-	expression tag	UNP A4XEL3
E	-3	TYR	-	expression tag	UNP A4XEL3
E	-2	PHE	-	expression tag	UNP A4XEL3
E	-1	GLN	-	expression tag	UNP A4XEL3
E	0	GLY	-	expression tag	UNP A4XEL3
F	-18	MSE	-	expression tag	UNP A4XEL3
F	-17	GLY	-	expression tag	UNP A4XEL3
F	-16	SER	-	expression tag	UNP A4XEL3
F	-15	ASP	-	expression tag	UNP A4XEL3
F	-14	LYS	-	expression tag	UNP A4XEL3
F	-13	ILE	-	expression tag	UNP A4XEL3
F	-12	HIS	-	expression tag	UNP A4XEL3
F	-11	HIS	-	expression tag	UNP A4XEL3
F	-10	HIS	-	expression tag	UNP A4XEL3
F	-9	HIS	-	expression tag	UNP A4XEL3
F	-8	HIS	-	expression tag	UNP A4XEL3
F	-7	HIS	-	expression tag	UNP A4XEL3
F	-6	GLU	-	expression tag	UNP A4XEL3
F	-5	ASN	-	expression tag	UNP A4XEL3
F	-4	LEU	-	expression tag	UNP A4XEL3
F	-3	TYR	-	expression tag	UNP A4XEL3
F	-2	PHE	-	expression tag	UNP A4XEL3
F	-1	GLN	-	expression tag	UNP A4XEL3
F	0	GLY	-	expression tag	UNP A4XEL3
G	-18	MSE	-	expression tag	UNP A4XEL3
G	-17	GLY	-	expression tag	UNP A4XEL3
G	-16	SER	-	expression tag	UNP A4XEL3
G	-15	ASP	-	expression tag	UNP A4XEL3
G	-14	LYS	-	expression tag	UNP A4XEL3
G	-13	ILE	-	expression tag	UNP A4XEL3
G	-12	HIS	-	expression tag	UNP A4XEL3
G	-11	HIS	-	expression tag	UNP A4XEL3
G	-10	HIS	-	expression tag	UNP A4XEL3
G	-9	HIS	-	expression tag	UNP A4XEL3
G	-8	HIS	-	expression tag	UNP A4XEL3
G	-7	HIS	-	expression tag	UNP A4XEL3

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Chain	Residue	Modelled	Actual	Comment	Reference
G	-6	GLU	-	expression tag	UNP A4XEL3
G	-5	ASN	-	expression tag	UNP A4XEL3
G	-4	LEU	-	expression tag	UNP A4XEL3
G	-3	TYR	-	expression tag	UNP A4XEL3
G	-2	PHE	-	expression tag	UNP A4XEL3
G	-1	GLN	-	expression tag	UNP A4XEL3
G	0	GLY	-	expression tag	UNP A4XEL3
H	-18	MSE	-	expression tag	UNP A4XEL3
H	-17	GLY	-	expression tag	UNP A4XEL3
H	-16	SER	-	expression tag	UNP A4XEL3
H	-15	ASP	-	expression tag	UNP A4XEL3
H	-14	LYS	-	expression tag	UNP A4XEL3
H	-13	ILE	-	expression tag	UNP A4XEL3
H	-12	HIS	-	expression tag	UNP A4XEL3
H	-11	HIS	-	expression tag	UNP A4XEL3
H	-10	HIS	-	expression tag	UNP A4XEL3
H	-9	HIS	-	expression tag	UNP A4XEL3
H	-8	HIS	-	expression tag	UNP A4XEL3
H	-7	HIS	-	expression tag	UNP A4XEL3
H	-6	GLU	-	expression tag	UNP A4XEL3
H	-5	ASN	-	expression tag	UNP A4XEL3
H	-4	LEU	-	expression tag	UNP A4XEL3
H	-3	TYR	-	expression tag	UNP A4XEL3
H	-2	PHE	-	expression tag	UNP A4XEL3
H	-1	GLN	-	expression tag	UNP A4XEL3
H	0	GLY	-	expression tag	UNP A4XEL3
I	-18	MSE	-	expression tag	UNP A4XEL3
I	-17	GLY	-	expression tag	UNP A4XEL3
I	-16	SER	-	expression tag	UNP A4XEL3
I	-15	ASP	-	expression tag	UNP A4XEL3
I	-14	LYS	-	expression tag	UNP A4XEL3
I	-13	ILE	-	expression tag	UNP A4XEL3
I	-12	HIS	-	expression tag	UNP A4XEL3
I	-11	HIS	-	expression tag	UNP A4XEL3
I	-10	HIS	-	expression tag	UNP A4XEL3
I	-9	HIS	-	expression tag	UNP A4XEL3
I	-8	HIS	-	expression tag	UNP A4XEL3
I	-7	HIS	-	expression tag	UNP A4XEL3
I	-6	GLU	-	expression tag	UNP A4XEL3
I	-5	ASN	-	expression tag	UNP A4XEL3
I	-4	LEU	-	expression tag	UNP A4XEL3
I	-3	TYR	-	expression tag	UNP A4XEL3

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Chain	Residue	Modelled	Actual	Comment	Reference
I	-2	PHE	-	expression tag	UNP A4XEL3
I	-1	GLN	-	expression tag	UNP A4XEL3
I	0	GLY	-	expression tag	UNP A4XEL3
J	-18	MSE	-	expression tag	UNP A4XEL3
J	-17	GLY	-	expression tag	UNP A4XEL3
J	-16	SER	-	expression tag	UNP A4XEL3
J	-15	ASP	-	expression tag	UNP A4XEL3
J	-14	LYS	-	expression tag	UNP A4XEL3
J	-13	ILE	-	expression tag	UNP A4XEL3
J	-12	HIS	-	expression tag	UNP A4XEL3
J	-11	HIS	-	expression tag	UNP A4XEL3
J	-10	HIS	-	expression tag	UNP A4XEL3
J	-9	HIS	-	expression tag	UNP A4XEL3
J	-8	HIS	-	expression tag	UNP A4XEL3
J	-7	HIS	-	expression tag	UNP A4XEL3
J	-6	GLU	-	expression tag	UNP A4XEL3
J	-5	ASN	-	expression tag	UNP A4XEL3
J	-4	LEU	-	expression tag	UNP A4XEL3
J	-3	TYR	-	expression tag	UNP A4XEL3
J	-2	PHE	-	expression tag	UNP A4XEL3
J	-1	GLN	-	expression tag	UNP A4XEL3
J	0	GLY	-	expression tag	UNP A4XEL3
K	-18	MSE	-	expression tag	UNP A4XEL3
K	-17	GLY	-	expression tag	UNP A4XEL3
K	-16	SER	-	expression tag	UNP A4XEL3
K	-15	ASP	-	expression tag	UNP A4XEL3
K	-14	LYS	-	expression tag	UNP A4XEL3
K	-13	ILE	-	expression tag	UNP A4XEL3
K	-12	HIS	-	expression tag	UNP A4XEL3
K	-11	HIS	-	expression tag	UNP A4XEL3
K	-10	HIS	-	expression tag	UNP A4XEL3
K	-9	HIS	-	expression tag	UNP A4XEL3
K	-8	HIS	-	expression tag	UNP A4XEL3
K	-7	HIS	-	expression tag	UNP A4XEL3
K	-6	GLU	-	expression tag	UNP A4XEL3
K	-5	ASN	-	expression tag	UNP A4XEL3
K	-4	LEU	-	expression tag	UNP A4XEL3
K	-3	TYR	-	expression tag	UNP A4XEL3
K	-2	PHE	-	expression tag	UNP A4XEL3
K	-1	GLN	-	expression tag	UNP A4XEL3
K	0	GLY	-	expression tag	UNP A4XEL3
L	-18	MSE	-	expression tag	UNP A4XEL3

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Chain	Residue	Modelled	Actual	Comment	Reference
L	-17	GLY	-	expression tag	UNP A4XEL3
L	-16	SER	-	expression tag	UNP A4XEL3
L	-15	ASP	-	expression tag	UNP A4XEL3
L	-14	LYS	-	expression tag	UNP A4XEL3
L	-13	ILE	-	expression tag	UNP A4XEL3
L	-12	HIS	-	expression tag	UNP A4XEL3
L	-11	HIS	-	expression tag	UNP A4XEL3
L	-10	HIS	-	expression tag	UNP A4XEL3
L	-9	HIS	-	expression tag	UNP A4XEL3
L	-8	HIS	-	expression tag	UNP A4XEL3
L	-7	HIS	-	expression tag	UNP A4XEL3
L	-6	GLU	-	expression tag	UNP A4XEL3
L	-5	ASN	-	expression tag	UNP A4XEL3
L	-4	LEU	-	expression tag	UNP A4XEL3
L	-3	TYR	-	expression tag	UNP A4XEL3
L	-2	PHE	-	expression tag	UNP A4XEL3
L	-1	GLN	-	expression tag	UNP A4XEL3
L	0	GLY	-	expression tag	UNP A4XEL3
M	-18	MSE	-	expression tag	UNP A4XEL3
M	-17	GLY	-	expression tag	UNP A4XEL3
M	-16	SER	-	expression tag	UNP A4XEL3
M	-15	ASP	-	expression tag	UNP A4XEL3
M	-14	LYS	-	expression tag	UNP A4XEL3
M	-13	ILE	-	expression tag	UNP A4XEL3
M	-12	HIS	-	expression tag	UNP A4XEL3
M	-11	HIS	-	expression tag	UNP A4XEL3
M	-10	HIS	-	expression tag	UNP A4XEL3
M	-9	HIS	-	expression tag	UNP A4XEL3
M	-8	HIS	-	expression tag	UNP A4XEL3
M	-7	HIS	-	expression tag	UNP A4XEL3
M	-6	GLU	-	expression tag	UNP A4XEL3
M	-5	ASN	-	expression tag	UNP A4XEL3
M	-4	LEU	-	expression tag	UNP A4XEL3
M	-3	TYR	-	expression tag	UNP A4XEL3
M	-2	PHE	-	expression tag	UNP A4XEL3
M	-1	GLN	-	expression tag	UNP A4XEL3
M	0	GLY	-	expression tag	UNP A4XEL3
N	-18	MSE	-	expression tag	UNP A4XEL3
N	-17	GLY	-	expression tag	UNP A4XEL3
N	-16	SER	-	expression tag	UNP A4XEL3
N	-15	ASP	-	expression tag	UNP A4XEL3
N	-14	LYS	-	expression tag	UNP A4XEL3

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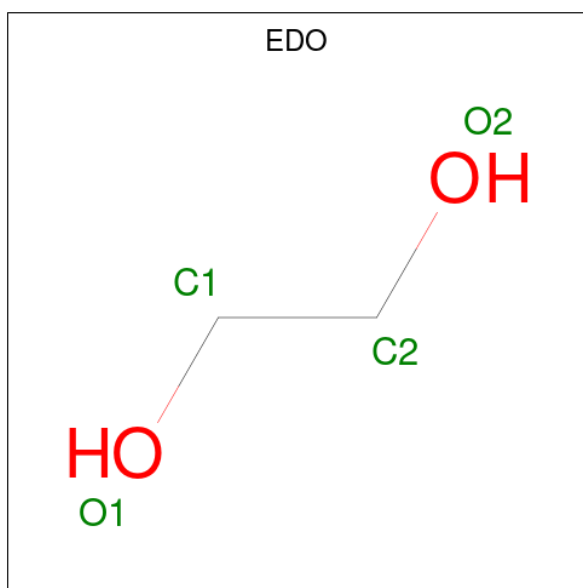
Chain	Residue	Modelled	Actual	Comment	Reference
N	-13	ILE	-	expression tag	UNP A4XEL3
N	-12	HIS	-	expression tag	UNP A4XEL3
N	-11	HIS	-	expression tag	UNP A4XEL3
N	-10	HIS	-	expression tag	UNP A4XEL3
N	-9	HIS	-	expression tag	UNP A4XEL3
N	-8	HIS	-	expression tag	UNP A4XEL3
N	-7	HIS	-	expression tag	UNP A4XEL3
N	-6	GLU	-	expression tag	UNP A4XEL3
N	-5	ASN	-	expression tag	UNP A4XEL3
N	-4	LEU	-	expression tag	UNP A4XEL3
N	-3	TYR	-	expression tag	UNP A4XEL3
N	-2	PHE	-	expression tag	UNP A4XEL3
N	-1	GLN	-	expression tag	UNP A4XEL3
N	0	GLY	-	expression tag	UNP A4XEL3
O	-18	MSE	-	expression tag	UNP A4XEL3
O	-17	GLY	-	expression tag	UNP A4XEL3
O	-16	SER	-	expression tag	UNP A4XEL3
O	-15	ASP	-	expression tag	UNP A4XEL3
O	-14	LYS	-	expression tag	UNP A4XEL3
O	-13	ILE	-	expression tag	UNP A4XEL3
O	-12	HIS	-	expression tag	UNP A4XEL3
O	-11	HIS	-	expression tag	UNP A4XEL3
O	-10	HIS	-	expression tag	UNP A4XEL3
O	-9	HIS	-	expression tag	UNP A4XEL3
O	-8	HIS	-	expression tag	UNP A4XEL3
O	-7	HIS	-	expression tag	UNP A4XEL3
O	-6	GLU	-	expression tag	UNP A4XEL3
O	-5	ASN	-	expression tag	UNP A4XEL3
O	-4	LEU	-	expression tag	UNP A4XEL3
O	-3	TYR	-	expression tag	UNP A4XEL3
O	-2	PHE	-	expression tag	UNP A4XEL3
O	-1	GLN	-	expression tag	UNP A4XEL3
O	0	GLY	-	expression tag	UNP A4XEL3
P	-18	MSE	-	expression tag	UNP A4XEL3
P	-17	GLY	-	expression tag	UNP A4XEL3
P	-16	SER	-	expression tag	UNP A4XEL3
P	-15	ASP	-	expression tag	UNP A4XEL3
P	-14	LYS	-	expression tag	UNP A4XEL3
P	-13	ILE	-	expression tag	UNP A4XEL3
P	-12	HIS	-	expression tag	UNP A4XEL3
P	-11	HIS	-	expression tag	UNP A4XEL3
P	-10	HIS	-	expression tag	UNP A4XEL3

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Chain	Residue	Modelled	Actual	Comment	Reference
P	-9	HIS	-	expression tag	UNP A4XEL3
P	-8	HIS	-	expression tag	UNP A4XEL3
P	-7	HIS	-	expression tag	UNP A4XEL3
P	-6	GLU	-	expression tag	UNP A4XEL3
P	-5	ASN	-	expression tag	UNP A4XEL3
P	-4	LEU	-	expression tag	UNP A4XEL3
P	-3	TYR	-	expression tag	UNP A4XEL3
P	-2	PHE	-	expression tag	UNP A4XEL3
P	-1	GLN	-	expression tag	UNP A4XEL3
P	0	GLY	-	expression tag	UNP A4XEL3

- Molecule 2 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



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

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

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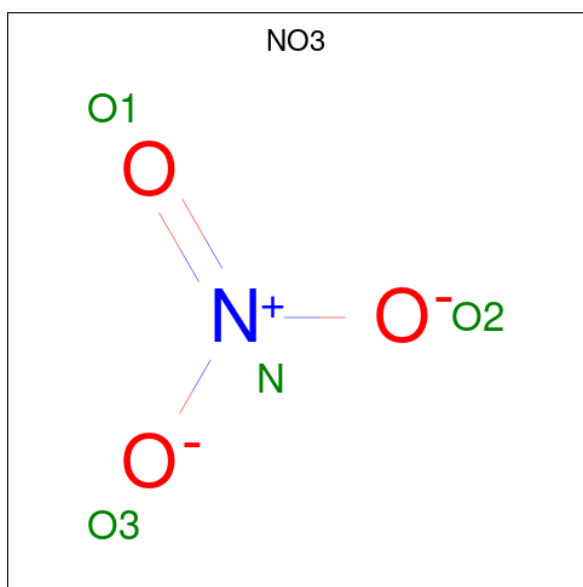
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	F	1	Total 4	C 2	O 2	0	0
2	F	1	Total 4	C 2	O 2	0	0
2	G	1	Total 4	C 2	O 2	0	0
2	G	1	Total 4	C 2	O 2	0	0
2	G	1	Total 4	C 2	O 2	0	0
2	G	1	Total 4	C 2	O 2	0	0
2	G	1	Total 4	C 2	O 2	0	0
2	G	1	Total 4	C 2	O 2	0	0
2	G	1	Total 4	C 2	O 2	0	0
2	H	1	Total 4	C 2	O 2	0	0
2	H	1	Total 4	C 2	O 2	0	0
2	H	1	Total 4	C 2	O 2	0	0
2	H	1	Total 4	C 2	O 2	0	0
2	H	1	Total 4	C 2	O 2	0	0
2	H	1	Total 4	C 2	O 2	0	0
2	I	1	Total 4	C 2	O 2	0	0
2	I	1	Total 4	C 2	O 2	0	0
2	I	1	Total 4	C 2	O 2	0	0
2	I	1	Total 4	C 2	O 2	0	0
2	J	1	Total 4	C 2	O 2	0	0
2	J	1	Total 4	C 2	O 2	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	J	1	Total 4	C 2	O 2	0	0
2	K	1	Total 4	C 2	O 2	0	0
2	K	1	Total 4	C 2	O 2	0	0
2	K	1	Total 4	C 2	O 2	0	0
2	L	1	Total 4	C 2	O 2	0	0
2	M	1	Total 4	C 2	O 2	0	0
2	M	1	Total 4	C 2	O 2	0	0
2	M	1	Total 4	C 2	O 2	0	0
2	M	1	Total 4	C 2	O 2	0	0
2	N	1	Total 4	C 2	O 2	0	0
2	N	1	Total 4	C 2	O 2	0	0
2	N	1	Total 4	C 2	O 2	0	0
2	P	1	Total 4	C 2	O 2	0	0

- Molecule 3 is NITRATE ION (three-letter code: NO3) (formula: NO₃).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	F	1	Total N O 4 1 3	0	0
3	F	1	Total N O 4 1 3	0	0
3	F	1	Total N O 4 1 3	0	0
3	F	1	Total N O 4 1 3	0	0
3	G	1	Total N O 4 1 3	0	0
3	G	1	Total N O 4 1 3	0	0
3	I	1	Total N O 4 1 3	0	0
3	P	1	Total N O 4 1 3	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	192	Total O 192 192	0	0
4	B	210	Total O 211 211	0	1
4	C	120	Total O 120 120	0	0
4	D	74	Total O 74 74	0	0

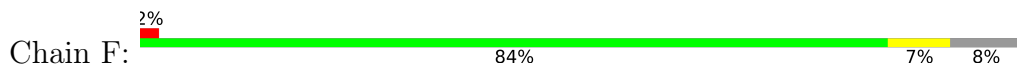
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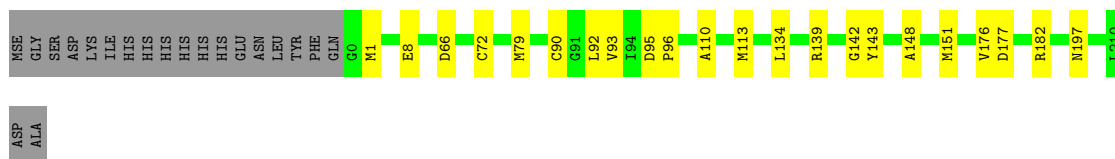
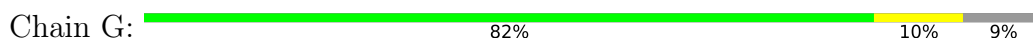
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	E	233	Total 235	O 235	0	2
4	F	210	Total 212	O 212	0	2
4	G	223	Total 223	O 223	0	0
4	H	203	Total 204	O 204	0	1
4	I	186	Total 187	O 187	0	1
4	J	167	Total 168	O 168	0	1
4	K	153	Total 153	O 153	0	0
4	L	145	Total 146	O 146	0	1
4	M	210	Total 210	O 210	0	0
4	N	141	Total 142	O 142	0	1
4	O	91	Total 91	O 91	0	0
4	P	97	Total 97	O 97	0	0



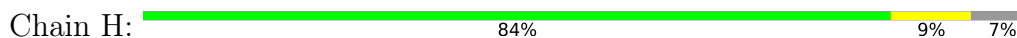
● Molecule 1: Ribose/galactose isomerase



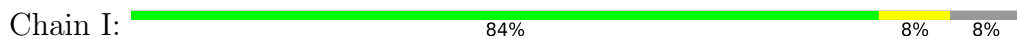
● Molecule 1: Ribose/galactose isomerase



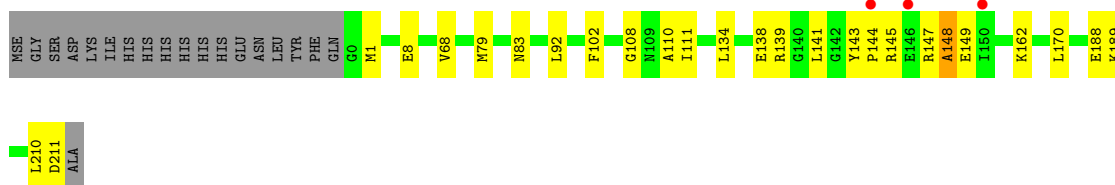
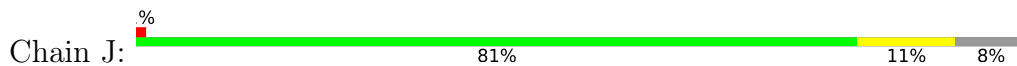
● Molecule 1: Ribose/galactose isomerase



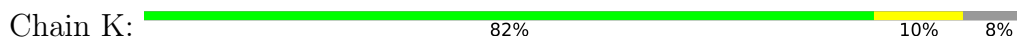
● Molecule 1: Ribose/galactose isomerase

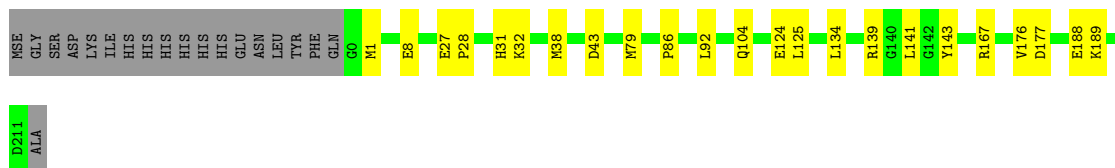


● Molecule 1: Ribose/galactose isomerase

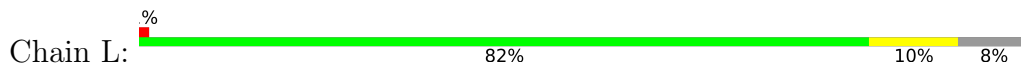


● Molecule 1: Ribose/galactose isomerase

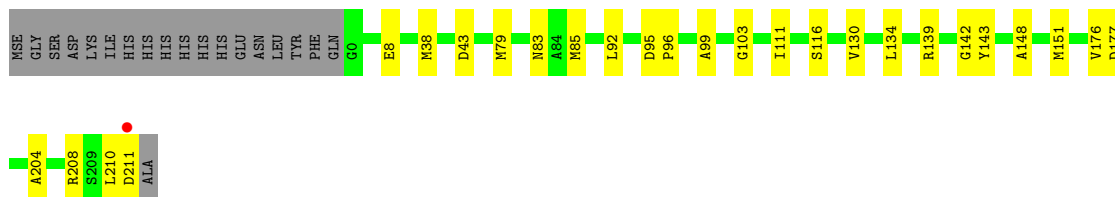
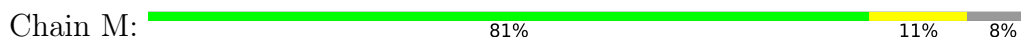




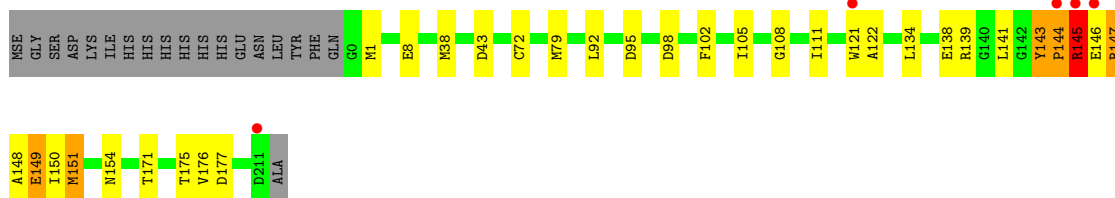
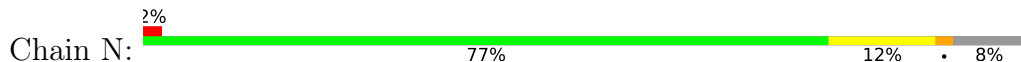
• Molecule 1: Ribose/galactose isomerase



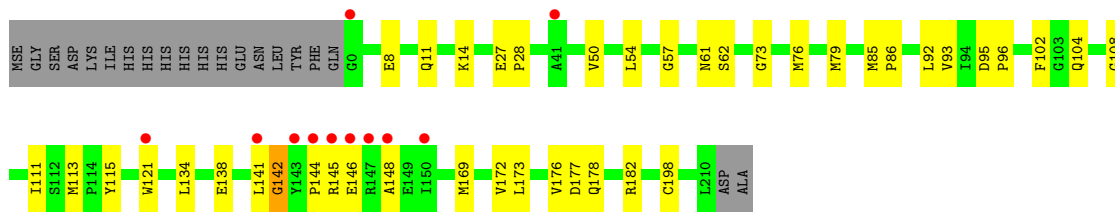
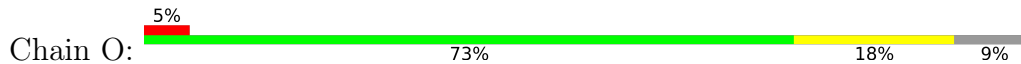
• Molecule 1: Ribose/galactose isomerase



• Molecule 1: Ribose/galactose isomerase

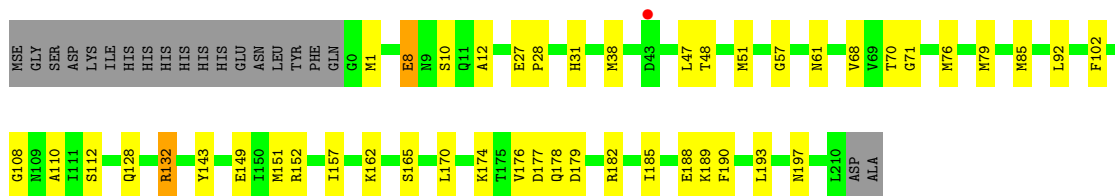


• Molecule 1: Ribose/galactose isomerase



• Molecule 1: Ribose/galactose isomerase





4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	106.75Å 109.46Å 167.57Å 90.00° 102.92° 90.00°	Depositor
Resolution (Å)	49.15 – 1.81 49.14 – 1.81	Depositor EDS
% Data completeness (in resolution range)	96.9 (49.15-1.81) 96.9 (49.14-1.81)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.34 (at 1.81Å)	Xtrriage
Refinement program	REFMAC 5.4.0067, PHENIX	Depositor
R, R_{free}	0.170 , 0.220 0.178 , 0.225	Depositor DCC
R_{free} test set	16707 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	22.5	Xtrriage
Anisotropy	0.436	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 70.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	28863	wwPDB-VP
Average B, all atoms (Å ²)	33.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.51% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: NO3, CSD, EDO

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	0.86	0/1657	0.87	0/2217
1	B	0.88	1/1630 (0.1%)	0.88	1/2184 (0.0%)
1	C	0.75	0/1652	0.83	0/2214
1	D	0.71	0/1626	0.86	0/2180
1	E	0.96	0/1671	0.96	3/2238 (0.1%)
1	F	0.91	1/1655 (0.1%)	0.98	3/2217 (0.1%)
1	G	0.91	0/1643	0.90	1/2200 (0.0%)
1	H	0.83	0/1692	0.87	1/2266 (0.0%)
1	I	0.85	0/1657	0.87	0/2219
1	J	0.85	0/1636	0.86	0/2193
1	K	0.73	0/1633	0.82	0/2189
1	L	0.76	0/1634	0.85	0/2189
1	M	0.80	0/1637	0.83	0/2195
1	N	0.70	0/1640	0.91	3/2199 (0.1%)
1	O	0.66	0/1586	0.82	0/2131
1	P	0.66	0/1612	0.84	2/2163 (0.1%)
All	All	0.81	2/26261 (0.0%)	0.87	14/35194 (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	N	0	2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	195	TYR	CD2-CE2	-5.44	1.31	1.39
1	F	195	TYR	CE1-CZ	-5.18	1.31	1.38

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	N	146	GLU	N-CA-C	-13.88	73.52	111.00
1	N	145	ARG	N-CA-C	-8.66	87.60	111.00
1	F	167	ARG	NE-CZ-NH2	-8.03	116.28	120.30
1	F	182	ARG	NE-CZ-NH2	-7.81	116.40	120.30
1	E	155	ARG	NE-CZ-NH1	7.79	124.19	120.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	N	145	ARG	Mainchain,Peptide

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	1630	0	1655	25	0
1	B	1612	0	1618	19	0
1	C	1625	0	1631	54	0
1	D	1605	0	1604	35	0
1	E	1652	0	1649	19	0
1	F	1634	0	1641	15	0
1	G	1622	0	1635	25	0
1	H	1663	0	1673	20	0
1	I	1633	0	1643	20	0
1	J	1618	0	1617	25	0
1	K	1615	0	1617	19	0
1	L	1616	0	1616	28	0
1	M	1616	0	1611	26	0
1	N	1616	0	1620	34	0
1	O	1568	0	1551	52	0
1	P	1597	0	1587	37	0
2	A	32	0	48	7	0
2	B	24	0	36	2	0
2	C	8	0	12	3	0
2	D	8	0	12	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	E	20	0	30	4	0
2	F	24	0	36	5	0
2	G	28	0	42	4	0
2	H	24	0	36	0	0
2	I	16	0	24	0	0
2	J	12	0	18	1	0
2	K	12	0	18	0	0
2	L	4	0	6	0	0
2	M	16	0	24	0	0
2	N	12	0	18	1	0
2	P	4	0	6	0	0
3	F	16	0	0	0	0
3	G	8	0	0	0	0
3	I	4	0	0	0	0
3	P	4	0	0	0	0
4	A	192	0	0	3	0
4	B	211	0	0	3	0
4	C	120	0	0	3	0
4	D	74	0	0	0	0
4	E	235	0	0	0	0
4	F	212	0	0	2	0
4	G	223	0	0	2	0
4	H	204	0	0	1	0
4	I	187	0	0	0	0
4	J	168	0	0	1	0
4	K	153	0	0	0	0
4	L	146	0	0	0	0
4	M	210	0	0	0	0
4	N	142	0	0	1	0
4	O	91	0	0	0	0
4	P	97	0	0	0	0
All	All	28863	0	26334	448	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 9.

The worst 5 of 448 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:O:54:LEU:HA	1:O:85:MSE:CE	1.35	1.54
1:L:142:GLY:HA2	1:L:151[B]:MSE:CE	1.49	1.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:142:GLY:CA	1:I:151[B]:MSE:HE1	1.56	1.35
1:O:54:LEU:CD1	1:O:85:MSE:HE1	1.59	1.31
1:O:61:ASN:ND2	1:O:169[B]:MSE:HE3	1.44	1.30

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	214/231 (93%)	211 (99%)	3 (1%)	0	100	100
1	B	212/231 (92%)	209 (99%)	2 (1%)	1 (0%)	29	15
1	C	215/231 (93%)	211 (98%)	4 (2%)	0	100	100
1	D	212/231 (92%)	206 (97%)	4 (2%)	2 (1%)	17	6
1	E	215/231 (93%)	212 (99%)	3 (1%)	0	100	100
1	F	214/231 (93%)	210 (98%)	4 (2%)	0	100	100
1	G	212/231 (92%)	209 (99%)	3 (1%)	0	100	100
1	H	217/231 (94%)	212 (98%)	5 (2%)	0	100	100
1	I	214/231 (93%)	212 (99%)	2 (1%)	0	100	100
1	J	212/231 (92%)	207 (98%)	4 (2%)	1 (0%)	29	15
1	K	212/231 (92%)	209 (99%)	3 (1%)	0	100	100
1	L	213/231 (92%)	209 (98%)	4 (2%)	0	100	100
1	M	213/231 (92%)	209 (98%)	4 (2%)	0	100	100
1	N	214/231 (93%)	206 (96%)	5 (2%)	3 (1%)	11	3
1	O	211/231 (91%)	206 (98%)	3 (1%)	2 (1%)	17	6
1	P	210/231 (91%)	204 (97%)	6 (3%)	0	100	100
All	All	3410/3696 (92%)	3342 (98%)	59 (2%)	9 (0%)	41	27

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	N	147	ARG
1	B	145	ARG
1	J	148	ALA
1	D	145	ARG
1	D	148	ALA

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	168/171 (98%)	167 (99%)	1 (1%)	86	83
1	B	164/171 (96%)	163 (99%)	1 (1%)	86	83
1	C	166/171 (97%)	164 (99%)	2 (1%)	71	64
1	D	162/171 (95%)	161 (99%)	1 (1%)	86	83
1	E	168/171 (98%)	167 (99%)	1 (1%)	86	83
1	F	167/171 (98%)	165 (99%)	2 (1%)	71	64
1	G	166/171 (97%)	165 (99%)	1 (1%)	86	83
1	H	170/171 (99%)	169 (99%)	1 (1%)	86	83
1	I	167/171 (98%)	165 (99%)	2 (1%)	71	64
1	J	164/171 (96%)	163 (99%)	1 (1%)	86	83
1	K	163/171 (95%)	162 (99%)	1 (1%)	86	83
1	L	163/171 (95%)	162 (99%)	1 (1%)	86	83
1	M	165/171 (96%)	164 (99%)	1 (1%)	86	83
1	N	165/171 (96%)	160 (97%)	5 (3%)	41	26
1	O	155/171 (91%)	154 (99%)	1 (1%)	86	83
1	P	162/171 (95%)	161 (99%)	1 (1%)	86	83
All	All	2635/2736 (96%)	2612 (99%)	23 (1%)	78	74

5 of 23 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	8	GLU
1	N	143	TYR
1	N	8	GLU
1	N	149	GLU
1	F	8	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	E	154	ASN
1	G	197	ASN
1	K	11	GLN
1	L	11	GLN
1	O	11	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

16 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	CSD	K	72	1	3,7,8	0.94	0	1,8,10	1.07	0
1	CSD	B	72	1	3,7,8	0.42	0	1,8,10	1.07	0
1	CSD	D	72	1	3,7,8	1.08	0	1,8,10	3.00	1 (100%)
1	CSD	M	72	1	3,7,8	1.03	0	1,8,10	0.47	0
1	CSD	O	72	1	3,7,8	1.14	0	1,8,10	0.89	0
1	CSD	E	72	1	3,7,8	0.85	0	1,8,10	2.89	1 (100%)
1	CSD	G	72	1	3,7,8	1.60	1 (33%)	1,8,10	2.11	1 (100%)
1	CSD	H	72	1	3,7,8	1.00	0	1,8,10	1.07	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	CSD	C	72	1	3,7,8	1.21	0	1,8,10	4.97	1 (100%)
1	CSD	F	72	1	3,7,8	0.75	0	1,8,10	1.08	0
1	CSD	I	72	1	3,7,8	0.83	0	1,8,10	1.64	0
1	CSD	N	72	1	3,7,8	1.05	0	1,8,10	2.14	1 (100%)
1	CSD	L	72	1	3,7,8	1.26	0	1,8,10	3.53	1 (100%)
1	CSD	J	72	1	3,7,8	0.64	0	1,8,10	1.24	0
1	CSD	P	72	1	3,7,8	1.12	0	1,8,10	1.62	0
1	CSD	A	72	1	3,7,8	1.20	0	1,8,10	0.65	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
1	CSD	K	72	1	-	0/2/6/8	-
1	CSD	B	72	1	-	0/2/6/8	-
1	CSD	D	72	1	-	0/2/6/8	-
1	CSD	M	72	1	-	0/2/6/8	-
1	CSD	O	72	1	-	0/2/6/8	-
1	CSD	E	72	1	-	0/2/6/8	-
1	CSD	G	72	1	-	0/2/6/8	-
1	CSD	H	72	1	-	0/2/6/8	-
1	CSD	C	72	1	-	0/2/6/8	-
1	CSD	F	72	1	-	0/2/6/8	-
1	CSD	I	72	1	-	0/2/6/8	-
1	CSD	N	72	1	-	0/2/6/8	-
1	CSD	L	72	1	-	0/2/6/8	-
1	CSD	J	72	1	-	0/2/6/8	-
1	CSD	P	72	1	-	0/2/6/8	-
1	CSD	A	72	1	-	0/2/6/8	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	G	72	CSD	CA-N	-2.23	1.41	1.48

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	72	CSD	OD1-SG-CB	4.97	114.99	105.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L	72	CSD	OD1-SG-CB	3.53	112.26	105.54
1	D	72	CSD	OD1-SG-CB	3.00	111.25	105.54
1	E	72	CSD	OD1-SG-CB	2.89	111.04	105.54
1	N	72	CSD	OD1-SG-CB	2.14	109.61	105.54

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	E	72	CSD	1	0

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

69 ligands 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	EDO	H	217	-	3,3,3	0.37	0	2,2,2	0.72	0
2	EDO	K	215	-	3,3,3	0.44	0	2,2,2	0.21	0
2	EDO	M	213	-	3,3,3	0.48	0	2,2,2	0.27	0
2	EDO	C	213	-	3,3,3	0.45	0	2,2,2	0.69	0
2	EDO	D	213	-	3,3,3	0.65	0	2,2,2	0.38	0
2	EDO	E	217	-	3,3,3	0.43	0	2,2,2	0.37	0
3	NO3	P	213	-	1,3,3	3.55	1 (100%)	0,3,3	-	-
2	EDO	H	215	-	3,3,3	0.58	0	2,2,2	0.15	0
2	EDO	A	217	-	3,3,3	0.29	0	2,2,2	0.48	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	EDO	B	217	-	3,3,3	0.43	0	2,2,2	0.16	0
2	EDO	K	213	-	3,3,3	0.36	0	2,2,2	0.34	0
2	EDO	F	220	-	3,3,3	0.47	0	2,2,2	0.03	0
2	EDO	A	219	-	3,3,3	0.42	0	2,2,2	0.46	0
2	EDO	A	216	-	3,3,3	0.70	0	2,2,2	0.68	0
2	EDO	H	214	-	3,3,3	0.69	0	2,2,2	0.19	0
2	EDO	H	216	-	3,3,3	0.47	0	2,2,2	0.74	0
2	EDO	J	215	-	3,3,3	0.51	0	2,2,2	0.03	0
2	EDO	N	215	-	3,3,3	0.56	0	2,2,2	0.26	0
2	EDO	D	214	-	3,3,3	0.42	0	2,2,2	0.48	0
3	NO3	F	215	-	1,3,3	2.21	1 (100%)	0,3,3	-	-
2	EDO	H	218	-	3,3,3	0.48	0	2,2,2	0.19	0
2	EDO	G	221	-	3,3,3	0.65	0	2,2,2	0.18	0
2	EDO	J	214	-	3,3,3	0.45	0	2,2,2	0.23	0
2	EDO	A	214	-	3,3,3	0.55	0	2,2,2	0.44	0
2	EDO	B	214	-	3,3,3	0.43	0	2,2,2	0.44	0
2	EDO	G	218	-	3,3,3	0.60	0	2,2,2	0.19	0
2	EDO	M	216	-	3,3,3	0.70	0	2,2,2	0.05	0
2	EDO	G	217	-	3,3,3	0.42	0	2,2,2	0.66	0
3	NO3	F	213	-	1,3,3	2.93	1 (100%)	0,3,3	-	-
2	EDO	A	218	-	3,3,3	0.44	0	2,2,2	0.35	0
2	EDO	I	215	-	3,3,3	0.43	0	2,2,2	0.32	0
2	EDO	F	219	-	3,3,3	0.39	0	2,2,2	0.51	0
2	EDO	I	217	-	3,3,3	0.34	0	2,2,2	0.64	0
2	EDO	N	213	-	3,3,3	0.43	0	2,2,2	0.51	0
3	NO3	F	216	-	1,3,3	3.78	1 (100%)	0,3,3	-	-
2	EDO	B	213	-	3,3,3	0.16	0	2,2,2	0.79	0
2	EDO	E	213	-	3,3,3	0.41	0	2,2,2	0.47	0
2	EDO	E	214	-	3,3,3	0.36	0	2,2,2	0.54	0
2	EDO	G	216	-	3,3,3	0.40	0	2,2,2	0.47	0
2	EDO	H	213	-	3,3,3	0.52	0	2,2,2	0.34	0
2	EDO	L	213	-	3,3,3	0.39	0	2,2,2	0.52	0
2	EDO	F	221	-	3,3,3	0.51	0	2,2,2	0.37	0
2	EDO	F	222	-	3,3,3	0.52	0	2,2,2	0.21	0
2	EDO	J	213	-	3,3,3	0.49	0	2,2,2	0.32	0
2	EDO	N	214	-	3,3,3	0.36	0	2,2,2	0.57	0
2	EDO	M	215	-	3,3,3	0.59	0	2,2,2	0.10	0
2	EDO	K	214	-	3,3,3	0.51	0	2,2,2	0.40	0
2	EDO	E	215	-	3,3,3	0.26	0	2,2,2	0.82	0
2	EDO	F	217	-	3,3,3	0.36	0	2,2,2	0.30	0
2	EDO	G	219	-	3,3,3	0.65	0	2,2,2	0.10	0
2	EDO	I	214	-	3,3,3	0.31	0	2,2,2	0.07	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	EDO	E	216	-	3,3,3	0.48	0	2,2,2	0.35	0
2	EDO	P	214	-	3,3,3	0.52	0	2,2,2	0.11	0
2	EDO	I	216	-	3,3,3	0.40	0	2,2,2	0.18	0
2	EDO	C	214	-	3,3,3	0.44	0	2,2,2	0.35	0
2	EDO	G	215	-	3,3,3	0.36	0	2,2,2	0.73	0
2	EDO	B	218	-	3,3,3	0.61	0	2,2,2	0.18	0
3	NO3	F	214	-	1,3,3	3.65	1 (100%)	0,3,3	-	-
2	EDO	A	215	-	3,3,3	0.40	0	2,2,2	0.49	0
2	EDO	B	215	-	3,3,3	0.60	0	2,2,2	0.30	0
3	NO3	G	213	-	1,3,3	3.82	1 (100%)	0,3,3	-	-
2	EDO	A	213	-	3,3,3	0.32	0	2,2,2	0.48	0
3	NO3	I	213	-	1,3,3	3.90	1 (100%)	0,3,3	-	-
2	EDO	F	218	-	3,3,3	0.28	0	2,2,2	0.63	0
2	EDO	M	214	-	3,3,3	0.41	0	2,2,2	0.47	0
3	NO3	G	214	-	1,3,3	2.64	1 (100%)	0,3,3	-	-
2	EDO	B	216	-	3,3,3	0.45	0	2,2,2	0.37	0
2	EDO	A	220	-	3,3,3	0.61	0	2,2,2	0.32	0
2	EDO	G	220	-	3,3,3	0.62	0	2,2,2	0.08	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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	EDO	H	217	-	-	1/1/1/1	-
2	EDO	K	215	-	-	0/1/1/1	-
2	EDO	M	213	-	-	0/1/1/1	-
2	EDO	C	213	-	-	1/1/1/1	-
2	EDO	D	213	-	-	1/1/1/1	-
2	EDO	E	217	-	-	1/1/1/1	-
2	EDO	H	215	-	-	0/1/1/1	-
2	EDO	A	217	-	-	0/1/1/1	-
2	EDO	B	217	-	-	0/1/1/1	-
2	EDO	K	213	-	-	0/1/1/1	-
2	EDO	F	220	-	-	1/1/1/1	-
2	EDO	A	219	-	-	1/1/1/1	-
2	EDO	A	216	-	-	1/1/1/1	-
2	EDO	H	214	-	-	0/1/1/1	-
2	EDO	H	216	-	-	1/1/1/1	-
2	EDO	J	215	-	-	1/1/1/1	-
2	EDO	N	215	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	EDO	D	214	-	-	1/1/1/1	-
2	EDO	H	218	-	-	0/1/1/1	-
2	EDO	G	221	-	-	1/1/1/1	-
2	EDO	J	214	-	-	0/1/1/1	-
2	EDO	A	214	-	-	0/1/1/1	-
2	EDO	B	214	-	-	0/1/1/1	-
2	EDO	G	218	-	-	0/1/1/1	-
2	EDO	M	216	-	-	1/1/1/1	-
2	EDO	G	217	-	-	1/1/1/1	-
2	EDO	A	218	-	-	1/1/1/1	-
2	EDO	I	215	-	-	1/1/1/1	-
2	EDO	F	219	-	-	0/1/1/1	-
2	EDO	I	217	-	-	0/1/1/1	-
2	EDO	N	213	-	-	0/1/1/1	-
2	EDO	B	213	-	-	0/1/1/1	-
2	EDO	E	213	-	-	0/1/1/1	-
2	EDO	E	214	-	-	1/1/1/1	-
2	EDO	G	216	-	-	0/1/1/1	-
2	EDO	H	213	-	-	0/1/1/1	-
2	EDO	L	213	-	-	0/1/1/1	-
2	EDO	F	221	-	-	0/1/1/1	-
2	EDO	F	222	-	-	1/1/1/1	-
2	EDO	J	213	-	-	0/1/1/1	-
2	EDO	N	214	-	-	0/1/1/1	-
2	EDO	M	215	-	-	0/1/1/1	-
2	EDO	K	214	-	-	1/1/1/1	-
2	EDO	E	215	-	-	1/1/1/1	-
2	EDO	F	217	-	-	1/1/1/1	-
2	EDO	G	219	-	-	1/1/1/1	-
2	EDO	I	214	-	-	0/1/1/1	-
2	EDO	E	216	-	-	1/1/1/1	-
2	EDO	P	214	-	-	0/1/1/1	-
2	EDO	I	216	-	-	1/1/1/1	-
2	EDO	C	214	-	-	1/1/1/1	-
2	EDO	G	215	-	-	1/1/1/1	-
2	EDO	B	218	-	-	1/1/1/1	-
2	EDO	A	215	-	-	1/1/1/1	-
2	EDO	B	215	-	-	0/1/1/1	-
2	EDO	A	213	-	-	0/1/1/1	-
2	EDO	F	218	-	-	1/1/1/1	-
2	EDO	M	214	-	-	1/1/1/1	-
2	EDO	B	216	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	EDO	A	220	-	-	1/1/1/1	-
2	EDO	G	220	-	-	0/1/1/1	-

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	I	213	NO3	O1-N	3.90	1.42	1.24
3	G	213	NO3	O1-N	3.82	1.41	1.24
3	F	216	NO3	O1-N	3.78	1.41	1.24
3	F	214	NO3	O1-N	3.65	1.40	1.24
3	P	213	NO3	O1-N	3.55	1.40	1.24

There are no bond angle outliers.

There are no chirality outliers.

5 of 32 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	H	216	EDO	O1-C1-C2-O2
2	A	215	EDO	O1-C1-C2-O2
2	A	216	EDO	O1-C1-C2-O2
2	A	219	EDO	O1-C1-C2-O2
2	B	216	EDO	O1-C1-C2-O2

There are no ring outliers.

12 monomers are involved in 26 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	217	EDO	3	0
2	B	217	EDO	2	0
2	F	220	EDO	2	0
2	A	216	EDO	2	0
2	N	215	EDO	1	0
2	J	214	EDO	1	0
2	F	219	EDO	3	0
2	E	215	EDO	4	0
2	G	219	EDO	3	0
2	C	214	EDO	3	0
2	A	215	EDO	2	0
2	G	220	EDO	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 [i](#)

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

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	201/231 (87%)	-0.73	0 100 100	17, 25, 40, 58	0
1	B	202/231 (87%)	-0.47	1 (0%) 91 89	19, 27, 50, 69	0
1	C	202/231 (87%)	-0.47	0 100 100	23, 33, 50, 60	0
1	D	201/231 (87%)	-0.29	1 (0%) 91 89	24, 36, 55, 70	0
1	E	205/231 (88%)	-0.72	2 (0%) 82 80	14, 23, 37, 57	0
1	F	203/231 (87%)	-0.33	4 (1%) 65 61	14, 25, 51, 70	0
1	G	201/231 (87%)	-0.73	0 100 100	17, 24, 38, 64	0
1	H	204/231 (88%)	-0.48	1 (0%) 91 89	18, 28, 45, 66	0
1	I	202/231 (87%)	-0.69	0 100 100	19, 27, 42, 59	0
1	J	202/231 (87%)	-0.45	3 (1%) 73 70	20, 28, 56, 76	0
1	K	202/231 (87%)	-0.46	0 100 100	23, 33, 49, 62	0
1	L	203/231 (87%)	-0.49	2 (0%) 82 80	22, 31, 47, 71	0
1	M	202/231 (87%)	-0.61	1 (0%) 91 89	18, 27, 45, 57	0
1	N	202/231 (87%)	-0.30	5 (2%) 57 52	24, 35, 61, 86	0
1	O	201/231 (87%)	-0.02	11 (5%) 25 20	27, 41, 63, 90	0
1	P	201/231 (87%)	-0.16	1 (0%) 91 89	26, 40, 58, 68	0
All	All	3234/3696 (87%)	-0.46	32 (0%) 82 80	14, 30, 53, 90	0

The worst 5 of 32 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	O	146	GLU	6.0
1	L	212	ALA	5.9
1	N	145	ARG	5.0
1	O	144	PRO	4.9
1	O	150	ILE	4.7

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
1	CSD	B	72	8/9	0.96	0.10	16,20,40,40	0
1	CSD	E	72	8/9	0.97	0.08	15,19,36,39	0
1	CSD	J	72	8/9	0.97	0.08	18,22,41,42	0
1	CSD	N	72	8/9	0.97	0.08	26,29,41,45	0
1	CSD	P	72	8/9	0.97	0.11	34,35,52,55	0
1	CSD	F	72	8/9	0.98	0.08	16,18,32,34	0
1	CSD	G	72	8/9	0.98	0.09	20,21,32,41	0
1	CSD	H	72	8/9	0.98	0.07	18,21,31,40	0
1	CSD	I	72	8/9	0.98	0.07	21,23,36,43	0
1	CSD	C	72	8/9	0.98	0.08	23,27,47,57	0
1	CSD	K	72	8/9	0.98	0.08	26,29,43,45	0
1	CSD	L	72	8/9	0.98	0.07	23,26,37,39	0
1	CSD	M	72	8/9	0.98	0.07	22,25,43,44	0
1	CSD	D	72	8/9	0.98	0.07	24,27,41,45	0
1	CSD	O	72	8/9	0.98	0.07	27,31,45,48	0
1	CSD	A	72	8/9	0.98	0.08	18,22,32,39	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
2	EDO	B	218	4/4	0.54	0.29	55,72,72,72	0
3	NO3	I	213	4/4	0.57	0.15	55,56,57,59	0
2	EDO	A	217	4/4	0.61	0.27	53,56,57,72	0
2	EDO	H	218	4/4	0.75	0.22	69,78,82,87	0
3	NO3	F	216	4/4	0.76	0.13	62,63,64,65	0
2	EDO	J	214	4/4	0.76	0.23	60,60,61,61	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	EDO	N	215	4/4	0.77	0.19	52,56,56,62	0
3	NO3	F	214	4/4	0.80	0.13	54,54,54,54	0
2	EDO	M	216	4/4	0.80	0.16	42,47,49,58	0
2	EDO	I	215	4/4	0.80	0.14	46,51,53,56	0
2	EDO	A	215	4/4	0.81	0.17	49,51,55,56	0
2	EDO	G	221	4/4	0.82	0.14	48,50,57,60	0
2	EDO	G	220	4/4	0.83	0.20	48,52,54,56	0
2	EDO	D	214	4/4	0.83	0.17	49,56,56,69	0
2	EDO	A	216	4/4	0.84	0.16	43,50,51,53	0
2	EDO	A	220	4/4	0.84	0.12	51,53,53,56	0
2	EDO	B	217	4/4	0.84	0.17	49,56,57,57	0
2	EDO	J	215	4/4	0.85	0.14	55,60,61,61	0
2	EDO	G	218	4/4	0.85	0.12	46,47,51,55	0
2	EDO	A	218	4/4	0.87	0.09	60,61,64,65	0
2	EDO	I	216	4/4	0.87	0.13	51,52,56,57	0
2	EDO	F	219	4/4	0.87	0.19	33,39,51,57	0
2	EDO	F	222	4/4	0.88	0.09	56,59,60,61	0
2	EDO	H	217	4/4	0.88	0.13	40,48,54,56	0
2	EDO	B	215	4/4	0.88	0.10	46,46,47,54	0
2	EDO	C	214	4/4	0.88	0.13	48,49,52,53	0
3	NO3	P	213	4/4	0.88	0.23	66,66,67,70	0
2	EDO	A	219	4/4	0.89	0.16	57,61,61,66	0
2	EDO	F	220	4/4	0.89	0.21	45,45,52,60	0
2	EDO	E	215	4/4	0.89	0.13	21,33,41,46	0
2	EDO	H	215	4/4	0.89	0.13	40,40,45,45	0
2	EDO	G	219	4/4	0.90	0.19	31,40,49,52	0
3	NO3	G	213	4/4	0.90	0.17	40,42,43,43	0
2	EDO	H	216	4/4	0.90	0.18	36,54,54,55	0
2	EDO	K	215	4/4	0.90	0.12	45,48,50,52	0
2	EDO	F	221	4/4	0.91	0.13	39,42,48,55	0
2	EDO	H	214	4/4	0.91	0.09	34,42,44,53	0
2	EDO	B	216	4/4	0.92	0.14	32,37,42,45	0
2	EDO	K	214	4/4	0.92	0.09	39,39,41,41	0
2	EDO	I	217	4/4	0.92	0.11	48,49,56,61	0
2	EDO	M	214	4/4	0.92	0.12	46,48,56,60	0
2	EDO	M	215	4/4	0.92	0.10	38,45,51,58	0
2	EDO	F	217	4/4	0.92	0.09	33,39,40,42	0
2	EDO	G	216	4/4	0.93	0.12	41,46,49,51	0
2	EDO	P	214	4/4	0.93	0.10	34,36,39,39	0
3	NO3	F	213	4/4	0.93	0.16	39,40,44,44	0
2	EDO	D	213	4/4	0.93	0.10	33,34,34,40	0
2	EDO	E	217	4/4	0.94	0.11	42,52,53,63	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	EDO	N	214	4/4	0.94	0.11	45,49,52,52	0
2	EDO	G	217	4/4	0.94	0.12	37,54,56,63	0
2	EDO	A	214	4/4	0.94	0.09	28,40,43,49	0
2	EDO	E	216	4/4	0.94	0.16	48,59,59,65	0
2	EDO	A	213	4/4	0.96	0.08	24,25,31,33	0
2	EDO	E	214	4/4	0.96	0.09	22,33,42,49	0
2	EDO	B	213	4/4	0.96	0.08	22,26,30,31	0
3	NO3	F	215	4/4	0.96	0.11	27,30,34,35	0
2	EDO	C	213	4/4	0.97	0.06	29,30,32,34	0
2	EDO	F	218	4/4	0.97	0.07	28,28,31,33	0
2	EDO	M	213	4/4	0.97	0.07	25,30,32,35	0
2	EDO	K	213	4/4	0.97	0.08	27,28,32,33	0
2	EDO	H	213	4/4	0.98	0.11	20,22,26,30	0
2	EDO	N	213	4/4	0.98	0.06	25,29,30,30	0
2	EDO	L	213	4/4	0.98	0.06	27,29,31,38	0
2	EDO	B	214	4/4	0.98	0.07	43,46,46,48	0
3	NO3	G	214	4/4	0.98	0.10	28,31,32,35	0
2	EDO	I	214	4/4	0.98	0.09	22,25,27,28	0
2	EDO	J	213	4/4	0.98	0.06	19,29,30,31	0
2	EDO	G	215	4/4	0.99	0.06	24,27,27,27	0
2	EDO	E	213	4/4	0.99	0.07	17,18,21,24	0

6.5 Other polymers [i](#)

There are no such residues in this entry.