Full wwPDB X-ray Structure Validation Report ⓘ

Sep 19, 2023 – 09:18 PM EDT

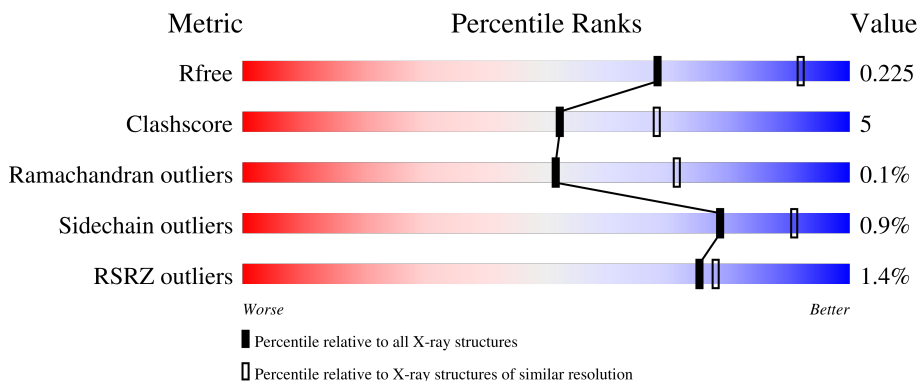|		
PDB ID	:	5JFM
Title	:	Crystal structure of Rhodopseudomonas palustris propionaldehyde dehydrogenase with bound propionyl-CoA
Authors	:	Zarzycki, J.; Sutter, M.; Kerfeld, C.A.
Deposited on	:	2016-04-19
Resolution	:	2.52 Å(reported)

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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 2.52 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.
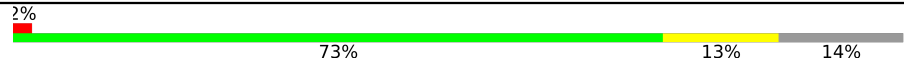
Metric	Percentile Ranks	Value
Rfree		0.225
Clashscore		5
Ramachandran outliers		0.1%
Sidechain outliers		0.9%
RSRZ outliers		1.4%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5743 (2.54-2.50)
Clashscore	141614	6463 (2.54-2.50)
Ramachandran outliers	138981	6335 (2.54-2.50)
Sidechain outliers	138945	6337 (2.54-2.50)
RSRZ outliers	127900	5630 (2.54-2.50)

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 >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	524	75% 9% 16%
1	B	524	76% 10% 14%
1	C	524	76% 8% 16%
1	D	524	74% 10% 16%
1	E	524	74% 9% • 16%

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Mol	Chain	Length	Quality of chain
1	F	524	2% 73% 13% 14%
1	G	524	2% 72% 12% 16%
1	H	524	% 71% 13% 16%

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 28030 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 Aldehyde dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	439	Total 3286	C 2069	N 566	O 629	S 22	0	0	0
1	B	452	Total 3384	C 2124	N 586	O 652	S 22	0	1	0
1	C	439	Total 3297	C 2075	N 570	O 630	S 22	0	1	0
1	D	439	Total 3297	C 2075	N 570	O 630	S 22	0	1	0
1	E	439	Total 3297	C 2075	N 570	O 630	S 22	0	1	0
1	F	452	Total 3373	C 2118	N 582	O 651	S 22	0	0	0
1	G	439	Total 3286	C 2069	N 566	O 629	S 22	0	0	0
1	H	441	Total 3307	C 2081	N 572	O 632	S 22	0	1	0

There are 480 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	initiating methionine	UNP Q21A49
A	2	ALA	-	expression tag	UNP Q21A49
A	3	TRP	-	expression tag	UNP Q21A49
A	4	SER	-	expression tag	UNP Q21A49
A	5	HIS	-	expression tag	UNP Q21A49
A	6	PRO	-	expression tag	UNP Q21A49
A	7	GLN	-	expression tag	UNP Q21A49
A	8	PHE	-	expression tag	UNP Q21A49
A	9	GLU	-	expression tag	UNP Q21A49
A	10	LYS	-	expression tag	UNP Q21A49
A	11	GLY	-	expression tag	UNP Q21A49
A	12	HIS	-	expression tag	UNP Q21A49
A	13	MET	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
A	14	ASN	-	expression tag	UNP Q21A49
A	15	ASP	-	expression tag	UNP Q21A49
A	16	ALA	-	expression tag	UNP Q21A49
A	17	ASN	-	expression tag	UNP Q21A49
A	18	ILE	-	expression tag	UNP Q21A49
A	19	ALA	-	expression tag	UNP Q21A49
A	20	ASP	-	expression tag	UNP Q21A49
A	21	VAL	-	expression tag	UNP Q21A49
A	22	VAL	-	expression tag	UNP Q21A49
A	23	THR	-	expression tag	UNP Q21A49
A	24	LYS	-	expression tag	UNP Q21A49
A	25	VAL	-	expression tag	UNP Q21A49
A	26	LEU	-	expression tag	UNP Q21A49
A	27	GLY	-	expression tag	UNP Q21A49
A	28	GLU	-	expression tag	UNP Q21A49
A	29	TYR	-	expression tag	UNP Q21A49
A	30	GLY	-	expression tag	UNP Q21A49
A	31	ALA	-	expression tag	UNP Q21A49
A	32	PRO	-	expression tag	UNP Q21A49
A	33	GLY	-	expression tag	UNP Q21A49
A	34	ALA	-	expression tag	UNP Q21A49
A	35	VAL	-	expression tag	UNP Q21A49
A	36	SER	-	expression tag	UNP Q21A49
A	37	VAL	-	expression tag	UNP Q21A49
A	38	ALA	-	expression tag	UNP Q21A49
A	39	ALA	-	expression tag	UNP Q21A49
A	40	LEU	-	expression tag	UNP Q21A49
A	41	THR	-	expression tag	UNP Q21A49
A	42	ALA	-	expression tag	UNP Q21A49
A	43	LYS	-	expression tag	UNP Q21A49
A	44	SER	-	expression tag	UNP Q21A49
A	45	PRO	-	expression tag	UNP Q21A49
A	46	ASP	-	expression tag	UNP Q21A49
A	47	GLY	-	expression tag	UNP Q21A49
A	48	LYS	-	expression tag	UNP Q21A49
A	49	SER	-	expression tag	UNP Q21A49
A	50	ASN	-	expression tag	UNP Q21A49
A	51	SER	-	expression tag	UNP Q21A49
A	52	SER	-	expression tag	UNP Q21A49
A	53	ALA	-	expression tag	UNP Q21A49
A	54	ASP	-	expression tag	UNP Q21A49
A	55	ALA	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
A	56	ASP	-	expression tag	UNP Q21A49
A	57	VAL	-	expression tag	UNP Q21A49
A	58	VAL	-	expression tag	UNP Q21A49
A	59	ALA	-	expression tag	UNP Q21A49
A	60	ARG	-	expression tag	UNP Q21A49
B	1	MET	-	initiating methionine	UNP Q21A49
B	2	ALA	-	expression tag	UNP Q21A49
B	3	TRP	-	expression tag	UNP Q21A49
B	4	SER	-	expression tag	UNP Q21A49
B	5	HIS	-	expression tag	UNP Q21A49
B	6	PRO	-	expression tag	UNP Q21A49
B	7	GLN	-	expression tag	UNP Q21A49
B	8	PHE	-	expression tag	UNP Q21A49
B	9	GLU	-	expression tag	UNP Q21A49
B	10	LYS	-	expression tag	UNP Q21A49
B	11	GLY	-	expression tag	UNP Q21A49
B	12	HIS	-	expression tag	UNP Q21A49
B	13	MET	-	expression tag	UNP Q21A49
B	14	ASN	-	expression tag	UNP Q21A49
B	15	ASP	-	expression tag	UNP Q21A49
B	16	ALA	-	expression tag	UNP Q21A49
B	17	ASN	-	expression tag	UNP Q21A49
B	18	ILE	-	expression tag	UNP Q21A49
B	19	ALA	-	expression tag	UNP Q21A49
B	20	ASP	-	expression tag	UNP Q21A49
B	21	VAL	-	expression tag	UNP Q21A49
B	22	VAL	-	expression tag	UNP Q21A49
B	23	THR	-	expression tag	UNP Q21A49
B	24	LYS	-	expression tag	UNP Q21A49
B	25	VAL	-	expression tag	UNP Q21A49
B	26	LEU	-	expression tag	UNP Q21A49
B	27	GLY	-	expression tag	UNP Q21A49
B	28	GLU	-	expression tag	UNP Q21A49
B	29	TYR	-	expression tag	UNP Q21A49
B	30	GLY	-	expression tag	UNP Q21A49
B	31	ALA	-	expression tag	UNP Q21A49
B	32	PRO	-	expression tag	UNP Q21A49
B	33	GLY	-	expression tag	UNP Q21A49
B	34	ALA	-	expression tag	UNP Q21A49
B	35	VAL	-	expression tag	UNP Q21A49
B	36	SER	-	expression tag	UNP Q21A49
B	37	VAL	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
B	38	ALA	-	expression tag	UNP Q21A49
B	39	ALA	-	expression tag	UNP Q21A49
B	40	LEU	-	expression tag	UNP Q21A49
B	41	THR	-	expression tag	UNP Q21A49
B	42	ALA	-	expression tag	UNP Q21A49
B	43	LYS	-	expression tag	UNP Q21A49
B	44	SER	-	expression tag	UNP Q21A49
B	45	PRO	-	expression tag	UNP Q21A49
B	46	ASP	-	expression tag	UNP Q21A49
B	47	GLY	-	expression tag	UNP Q21A49
B	48	LYS	-	expression tag	UNP Q21A49
B	49	SER	-	expression tag	UNP Q21A49
B	50	ASN	-	expression tag	UNP Q21A49
B	51	SER	-	expression tag	UNP Q21A49
B	52	SER	-	expression tag	UNP Q21A49
B	53	ALA	-	expression tag	UNP Q21A49
B	54	ASP	-	expression tag	UNP Q21A49
B	55	ALA	-	expression tag	UNP Q21A49
B	56	ASP	-	expression tag	UNP Q21A49
B	57	VAL	-	expression tag	UNP Q21A49
B	58	VAL	-	expression tag	UNP Q21A49
B	59	ALA	-	expression tag	UNP Q21A49
B	60	ARG	-	expression tag	UNP Q21A49
C	1	MET	-	initiating methionine	UNP Q21A49
C	2	ALA	-	expression tag	UNP Q21A49
C	3	TRP	-	expression tag	UNP Q21A49
C	4	SER	-	expression tag	UNP Q21A49
C	5	HIS	-	expression tag	UNP Q21A49
C	6	PRO	-	expression tag	UNP Q21A49
C	7	GLN	-	expression tag	UNP Q21A49
C	8	PHE	-	expression tag	UNP Q21A49
C	9	GLU	-	expression tag	UNP Q21A49
C	10	LYS	-	expression tag	UNP Q21A49
C	11	GLY	-	expression tag	UNP Q21A49
C	12	HIS	-	expression tag	UNP Q21A49
C	13	MET	-	expression tag	UNP Q21A49
C	14	ASN	-	expression tag	UNP Q21A49
C	15	ASP	-	expression tag	UNP Q21A49
C	16	ALA	-	expression tag	UNP Q21A49
C	17	ASN	-	expression tag	UNP Q21A49
C	18	ILE	-	expression tag	UNP Q21A49
C	19	ALA	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
C	20	ASP	-	expression tag	UNP Q21A49
C	21	VAL	-	expression tag	UNP Q21A49
C	22	VAL	-	expression tag	UNP Q21A49
C	23	THR	-	expression tag	UNP Q21A49
C	24	LYS	-	expression tag	UNP Q21A49
C	25	VAL	-	expression tag	UNP Q21A49
C	26	LEU	-	expression tag	UNP Q21A49
C	27	GLY	-	expression tag	UNP Q21A49
C	28	GLU	-	expression tag	UNP Q21A49
C	29	TYR	-	expression tag	UNP Q21A49
C	30	GLY	-	expression tag	UNP Q21A49
C	31	ALA	-	expression tag	UNP Q21A49
C	32	PRO	-	expression tag	UNP Q21A49
C	33	GLY	-	expression tag	UNP Q21A49
C	34	ALA	-	expression tag	UNP Q21A49
C	35	VAL	-	expression tag	UNP Q21A49
C	36	SER	-	expression tag	UNP Q21A49
C	37	VAL	-	expression tag	UNP Q21A49
C	38	ALA	-	expression tag	UNP Q21A49
C	39	ALA	-	expression tag	UNP Q21A49
C	40	LEU	-	expression tag	UNP Q21A49
C	41	THR	-	expression tag	UNP Q21A49
C	42	ALA	-	expression tag	UNP Q21A49
C	43	LYS	-	expression tag	UNP Q21A49
C	44	SER	-	expression tag	UNP Q21A49
C	45	PRO	-	expression tag	UNP Q21A49
C	46	ASP	-	expression tag	UNP Q21A49
C	47	GLY	-	expression tag	UNP Q21A49
C	48	LYS	-	expression tag	UNP Q21A49
C	49	SER	-	expression tag	UNP Q21A49
C	50	ASN	-	expression tag	UNP Q21A49
C	51	SER	-	expression tag	UNP Q21A49
C	52	SER	-	expression tag	UNP Q21A49
C	53	ALA	-	expression tag	UNP Q21A49
C	54	ASP	-	expression tag	UNP Q21A49
C	55	ALA	-	expression tag	UNP Q21A49
C	56	ASP	-	expression tag	UNP Q21A49
C	57	VAL	-	expression tag	UNP Q21A49
C	58	VAL	-	expression tag	UNP Q21A49
C	59	ALA	-	expression tag	UNP Q21A49
C	60	ARG	-	expression tag	UNP Q21A49
D	1	MET	-	initiating methionine	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
D	2	ALA	-	expression tag	UNP Q21A49
D	3	TRP	-	expression tag	UNP Q21A49
D	4	SER	-	expression tag	UNP Q21A49
D	5	HIS	-	expression tag	UNP Q21A49
D	6	PRO	-	expression tag	UNP Q21A49
D	7	GLN	-	expression tag	UNP Q21A49
D	8	PHE	-	expression tag	UNP Q21A49
D	9	GLU	-	expression tag	UNP Q21A49
D	10	LYS	-	expression tag	UNP Q21A49
D	11	GLY	-	expression tag	UNP Q21A49
D	12	HIS	-	expression tag	UNP Q21A49
D	13	MET	-	expression tag	UNP Q21A49
D	14	ASN	-	expression tag	UNP Q21A49
D	15	ASP	-	expression tag	UNP Q21A49
D	16	ALA	-	expression tag	UNP Q21A49
D	17	ASN	-	expression tag	UNP Q21A49
D	18	ILE	-	expression tag	UNP Q21A49
D	19	ALA	-	expression tag	UNP Q21A49
D	20	ASP	-	expression tag	UNP Q21A49
D	21	VAL	-	expression tag	UNP Q21A49
D	22	VAL	-	expression tag	UNP Q21A49
D	23	THR	-	expression tag	UNP Q21A49
D	24	LYS	-	expression tag	UNP Q21A49
D	25	VAL	-	expression tag	UNP Q21A49
D	26	LEU	-	expression tag	UNP Q21A49
D	27	GLY	-	expression tag	UNP Q21A49
D	28	GLU	-	expression tag	UNP Q21A49
D	29	TYR	-	expression tag	UNP Q21A49
D	30	GLY	-	expression tag	UNP Q21A49
D	31	ALA	-	expression tag	UNP Q21A49
D	32	PRO	-	expression tag	UNP Q21A49
D	33	GLY	-	expression tag	UNP Q21A49
D	34	ALA	-	expression tag	UNP Q21A49
D	35	VAL	-	expression tag	UNP Q21A49
D	36	SER	-	expression tag	UNP Q21A49
D	37	VAL	-	expression tag	UNP Q21A49
D	38	ALA	-	expression tag	UNP Q21A49
D	39	ALA	-	expression tag	UNP Q21A49
D	40	LEU	-	expression tag	UNP Q21A49
D	41	THR	-	expression tag	UNP Q21A49
D	42	ALA	-	expression tag	UNP Q21A49
D	43	LYS	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
D	44	SER	-	expression tag	UNP Q21A49
D	45	PRO	-	expression tag	UNP Q21A49
D	46	ASP	-	expression tag	UNP Q21A49
D	47	GLY	-	expression tag	UNP Q21A49
D	48	LYS	-	expression tag	UNP Q21A49
D	49	SER	-	expression tag	UNP Q21A49
D	50	ASN	-	expression tag	UNP Q21A49
D	51	SER	-	expression tag	UNP Q21A49
D	52	SER	-	expression tag	UNP Q21A49
D	53	ALA	-	expression tag	UNP Q21A49
D	54	ASP	-	expression tag	UNP Q21A49
D	55	ALA	-	expression tag	UNP Q21A49
D	56	ASP	-	expression tag	UNP Q21A49
D	57	VAL	-	expression tag	UNP Q21A49
D	58	VAL	-	expression tag	UNP Q21A49
D	59	ALA	-	expression tag	UNP Q21A49
D	60	ARG	-	expression tag	UNP Q21A49
E	1	MET	-	initiating methionine	UNP Q21A49
E	2	ALA	-	expression tag	UNP Q21A49
E	3	TRP	-	expression tag	UNP Q21A49
E	4	SER	-	expression tag	UNP Q21A49
E	5	HIS	-	expression tag	UNP Q21A49
E	6	PRO	-	expression tag	UNP Q21A49
E	7	GLN	-	expression tag	UNP Q21A49
E	8	PHE	-	expression tag	UNP Q21A49
E	9	GLU	-	expression tag	UNP Q21A49
E	10	LYS	-	expression tag	UNP Q21A49
E	11	GLY	-	expression tag	UNP Q21A49
E	12	HIS	-	expression tag	UNP Q21A49
E	13	MET	-	expression tag	UNP Q21A49
E	14	ASN	-	expression tag	UNP Q21A49
E	15	ASP	-	expression tag	UNP Q21A49
E	16	ALA	-	expression tag	UNP Q21A49
E	17	ASN	-	expression tag	UNP Q21A49
E	18	ILE	-	expression tag	UNP Q21A49
E	19	ALA	-	expression tag	UNP Q21A49
E	20	ASP	-	expression tag	UNP Q21A49
E	21	VAL	-	expression tag	UNP Q21A49
E	22	VAL	-	expression tag	UNP Q21A49
E	23	THR	-	expression tag	UNP Q21A49
E	24	LYS	-	expression tag	UNP Q21A49
E	25	VAL	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
E	26	LEU	-	expression tag	UNP Q21A49
E	27	GLY	-	expression tag	UNP Q21A49
E	28	GLU	-	expression tag	UNP Q21A49
E	29	TYR	-	expression tag	UNP Q21A49
E	30	GLY	-	expression tag	UNP Q21A49
E	31	ALA	-	expression tag	UNP Q21A49
E	32	PRO	-	expression tag	UNP Q21A49
E	33	GLY	-	expression tag	UNP Q21A49
E	34	ALA	-	expression tag	UNP Q21A49
E	35	VAL	-	expression tag	UNP Q21A49
E	36	SER	-	expression tag	UNP Q21A49
E	37	VAL	-	expression tag	UNP Q21A49
E	38	ALA	-	expression tag	UNP Q21A49
E	39	ALA	-	expression tag	UNP Q21A49
E	40	LEU	-	expression tag	UNP Q21A49
E	41	THR	-	expression tag	UNP Q21A49
E	42	ALA	-	expression tag	UNP Q21A49
E	43	LYS	-	expression tag	UNP Q21A49
E	44	SER	-	expression tag	UNP Q21A49
E	45	PRO	-	expression tag	UNP Q21A49
E	46	ASP	-	expression tag	UNP Q21A49
E	47	GLY	-	expression tag	UNP Q21A49
E	48	LYS	-	expression tag	UNP Q21A49
E	49	SER	-	expression tag	UNP Q21A49
E	50	ASN	-	expression tag	UNP Q21A49
E	51	SER	-	expression tag	UNP Q21A49
E	52	SER	-	expression tag	UNP Q21A49
E	53	ALA	-	expression tag	UNP Q21A49
E	54	ASP	-	expression tag	UNP Q21A49
E	55	ALA	-	expression tag	UNP Q21A49
E	56	ASP	-	expression tag	UNP Q21A49
E	57	VAL	-	expression tag	UNP Q21A49
E	58	VAL	-	expression tag	UNP Q21A49
E	59	ALA	-	expression tag	UNP Q21A49
E	60	ARG	-	expression tag	UNP Q21A49
F	1	MET	-	initiating methionine	UNP Q21A49
F	2	ALA	-	expression tag	UNP Q21A49
F	3	TRP	-	expression tag	UNP Q21A49
F	4	SER	-	expression tag	UNP Q21A49
F	5	HIS	-	expression tag	UNP Q21A49
F	6	PRO	-	expression tag	UNP Q21A49
F	7	GLN	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
F	8	PHE	-	expression tag	UNP Q21A49
F	9	GLU	-	expression tag	UNP Q21A49
F	10	LYS	-	expression tag	UNP Q21A49
F	11	GLY	-	expression tag	UNP Q21A49
F	12	HIS	-	expression tag	UNP Q21A49
F	13	MET	-	expression tag	UNP Q21A49
F	14	ASN	-	expression tag	UNP Q21A49
F	15	ASP	-	expression tag	UNP Q21A49
F	16	ALA	-	expression tag	UNP Q21A49
F	17	ASN	-	expression tag	UNP Q21A49
F	18	ILE	-	expression tag	UNP Q21A49
F	19	ALA	-	expression tag	UNP Q21A49
F	20	ASP	-	expression tag	UNP Q21A49
F	21	VAL	-	expression tag	UNP Q21A49
F	22	VAL	-	expression tag	UNP Q21A49
F	23	THR	-	expression tag	UNP Q21A49
F	24	LYS	-	expression tag	UNP Q21A49
F	25	VAL	-	expression tag	UNP Q21A49
F	26	LEU	-	expression tag	UNP Q21A49
F	27	GLY	-	expression tag	UNP Q21A49
F	28	GLU	-	expression tag	UNP Q21A49
F	29	TYR	-	expression tag	UNP Q21A49
F	30	GLY	-	expression tag	UNP Q21A49
F	31	ALA	-	expression tag	UNP Q21A49
F	32	PRO	-	expression tag	UNP Q21A49
F	33	GLY	-	expression tag	UNP Q21A49
F	34	ALA	-	expression tag	UNP Q21A49
F	35	VAL	-	expression tag	UNP Q21A49
F	36	SER	-	expression tag	UNP Q21A49
F	37	VAL	-	expression tag	UNP Q21A49
F	38	ALA	-	expression tag	UNP Q21A49
F	39	ALA	-	expression tag	UNP Q21A49
F	40	LEU	-	expression tag	UNP Q21A49
F	41	THR	-	expression tag	UNP Q21A49
F	42	ALA	-	expression tag	UNP Q21A49
F	43	LYS	-	expression tag	UNP Q21A49
F	44	SER	-	expression tag	UNP Q21A49
F	45	PRO	-	expression tag	UNP Q21A49
F	46	ASP	-	expression tag	UNP Q21A49
F	47	GLY	-	expression tag	UNP Q21A49
F	48	LYS	-	expression tag	UNP Q21A49
F	49	SER	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
F	50	ASN	-	expression tag	UNP Q21A49
F	51	SER	-	expression tag	UNP Q21A49
F	52	SER	-	expression tag	UNP Q21A49
F	53	ALA	-	expression tag	UNP Q21A49
F	54	ASP	-	expression tag	UNP Q21A49
F	55	ALA	-	expression tag	UNP Q21A49
F	56	ASP	-	expression tag	UNP Q21A49
F	57	VAL	-	expression tag	UNP Q21A49
F	58	VAL	-	expression tag	UNP Q21A49
F	59	ALA	-	expression tag	UNP Q21A49
F	60	ARG	-	expression tag	UNP Q21A49
G	1	MET	-	initiating methionine	UNP Q21A49
G	2	ALA	-	expression tag	UNP Q21A49
G	3	TRP	-	expression tag	UNP Q21A49
G	4	SER	-	expression tag	UNP Q21A49
G	5	HIS	-	expression tag	UNP Q21A49
G	6	PRO	-	expression tag	UNP Q21A49
G	7	GLN	-	expression tag	UNP Q21A49
G	8	PHE	-	expression tag	UNP Q21A49
G	9	GLU	-	expression tag	UNP Q21A49
G	10	LYS	-	expression tag	UNP Q21A49
G	11	GLY	-	expression tag	UNP Q21A49
G	12	HIS	-	expression tag	UNP Q21A49
G	13	MET	-	expression tag	UNP Q21A49
G	14	ASN	-	expression tag	UNP Q21A49
G	15	ASP	-	expression tag	UNP Q21A49
G	16	ALA	-	expression tag	UNP Q21A49
G	17	ASN	-	expression tag	UNP Q21A49
G	18	ILE	-	expression tag	UNP Q21A49
G	19	ALA	-	expression tag	UNP Q21A49
G	20	ASP	-	expression tag	UNP Q21A49
G	21	VAL	-	expression tag	UNP Q21A49
G	22	VAL	-	expression tag	UNP Q21A49
G	23	THR	-	expression tag	UNP Q21A49
G	24	LYS	-	expression tag	UNP Q21A49
G	25	VAL	-	expression tag	UNP Q21A49
G	26	LEU	-	expression tag	UNP Q21A49
G	27	GLY	-	expression tag	UNP Q21A49
G	28	GLU	-	expression tag	UNP Q21A49
G	29	TYR	-	expression tag	UNP Q21A49
G	30	GLY	-	expression tag	UNP Q21A49
G	31	ALA	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
G	32	PRO	-	expression tag	UNP Q21A49
G	33	GLY	-	expression tag	UNP Q21A49
G	34	ALA	-	expression tag	UNP Q21A49
G	35	VAL	-	expression tag	UNP Q21A49
G	36	SER	-	expression tag	UNP Q21A49
G	37	VAL	-	expression tag	UNP Q21A49
G	38	ALA	-	expression tag	UNP Q21A49
G	39	ALA	-	expression tag	UNP Q21A49
G	40	LEU	-	expression tag	UNP Q21A49
G	41	THR	-	expression tag	UNP Q21A49
G	42	ALA	-	expression tag	UNP Q21A49
G	43	LYS	-	expression tag	UNP Q21A49
G	44	SER	-	expression tag	UNP Q21A49
G	45	PRO	-	expression tag	UNP Q21A49
G	46	ASP	-	expression tag	UNP Q21A49
G	47	GLY	-	expression tag	UNP Q21A49
G	48	LYS	-	expression tag	UNP Q21A49
G	49	SER	-	expression tag	UNP Q21A49
G	50	ASN	-	expression tag	UNP Q21A49
G	51	SER	-	expression tag	UNP Q21A49
G	52	SER	-	expression tag	UNP Q21A49
G	53	ALA	-	expression tag	UNP Q21A49
G	54	ASP	-	expression tag	UNP Q21A49
G	55	ALA	-	expression tag	UNP Q21A49
G	56	ASP	-	expression tag	UNP Q21A49
G	57	VAL	-	expression tag	UNP Q21A49
G	58	VAL	-	expression tag	UNP Q21A49
G	59	ALA	-	expression tag	UNP Q21A49
G	60	ARG	-	expression tag	UNP Q21A49
H	1	MET	-	initiating methionine	UNP Q21A49
H	2	ALA	-	expression tag	UNP Q21A49
H	3	TRP	-	expression tag	UNP Q21A49
H	4	SER	-	expression tag	UNP Q21A49
H	5	HIS	-	expression tag	UNP Q21A49
H	6	PRO	-	expression tag	UNP Q21A49
H	7	GLN	-	expression tag	UNP Q21A49
H	8	PHE	-	expression tag	UNP Q21A49
H	9	GLU	-	expression tag	UNP Q21A49
H	10	LYS	-	expression tag	UNP Q21A49
H	11	GLY	-	expression tag	UNP Q21A49
H	12	HIS	-	expression tag	UNP Q21A49
H	13	MET	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
H	14	ASN	-	expression tag	UNP Q21A49
H	15	ASP	-	expression tag	UNP Q21A49
H	16	ALA	-	expression tag	UNP Q21A49
H	17	ASN	-	expression tag	UNP Q21A49
H	18	ILE	-	expression tag	UNP Q21A49
H	19	ALA	-	expression tag	UNP Q21A49
H	20	ASP	-	expression tag	UNP Q21A49
H	21	VAL	-	expression tag	UNP Q21A49
H	22	VAL	-	expression tag	UNP Q21A49
H	23	THR	-	expression tag	UNP Q21A49
H	24	LYS	-	expression tag	UNP Q21A49
H	25	VAL	-	expression tag	UNP Q21A49
H	26	LEU	-	expression tag	UNP Q21A49
H	27	GLY	-	expression tag	UNP Q21A49
H	28	GLU	-	expression tag	UNP Q21A49
H	29	TYR	-	expression tag	UNP Q21A49
H	30	GLY	-	expression tag	UNP Q21A49
H	31	ALA	-	expression tag	UNP Q21A49
H	32	PRO	-	expression tag	UNP Q21A49
H	33	GLY	-	expression tag	UNP Q21A49
H	34	ALA	-	expression tag	UNP Q21A49
H	35	VAL	-	expression tag	UNP Q21A49
H	36	SER	-	expression tag	UNP Q21A49
H	37	VAL	-	expression tag	UNP Q21A49
H	38	ALA	-	expression tag	UNP Q21A49
H	39	ALA	-	expression tag	UNP Q21A49
H	40	LEU	-	expression tag	UNP Q21A49
H	41	THR	-	expression tag	UNP Q21A49
H	42	ALA	-	expression tag	UNP Q21A49
H	43	LYS	-	expression tag	UNP Q21A49
H	44	SER	-	expression tag	UNP Q21A49
H	45	PRO	-	expression tag	UNP Q21A49
H	46	ASP	-	expression tag	UNP Q21A49
H	47	GLY	-	expression tag	UNP Q21A49
H	48	LYS	-	expression tag	UNP Q21A49
H	49	SER	-	expression tag	UNP Q21A49
H	50	ASN	-	expression tag	UNP Q21A49
H	51	SER	-	expression tag	UNP Q21A49
H	52	SER	-	expression tag	UNP Q21A49
H	53	ALA	-	expression tag	UNP Q21A49
H	54	ASP	-	expression tag	UNP Q21A49
H	55	ALA	-	expression tag	UNP Q21A49

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Chain	Residue	Modelled	Actual	Comment	Reference
H	56	ASP	-	expression tag	UNP Q21A49
H	57	VAL	-	expression tag	UNP Q21A49
H	58	VAL	-	expression tag	UNP Q21A49
H	59	ALA	-	expression tag	UNP Q21A49
H	60	ARG	-	expression tag	UNP Q21A49

- Molecule 2 is propionyl Coenzyme A (three-letter code: 1VU) (formula: $C_{24}H_{40}N_7O_{17}P_3S$).

1VU

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	S	0	0
			52	24	7	17	3	1		
2	C	1	Total	C	N	O	P	S	0	0
			52	24	7	17	3	1		
2	D	1	Total	C	N	O	P	S	0	0
			52	24	7	17	3	1		
2	E	1	Total	C	N	O	P	S	0	0
			52	24	7	17	3	1		
2	F	1	Total	C	N	O	P	S	0	0
			52	24	7	17	3	1		
2	G	1	Total	C	N	O	P	S	0	0
			52	24	7	17	3	1		
2	H	1	Total	C	N	O	P	S	0	0
			52	24	7	17	3	1		

- Molecule 3 is COENZYME A (three-letter code: COA) (formula: $C_{21}H_{36}N_7O_{16}P_3S$).
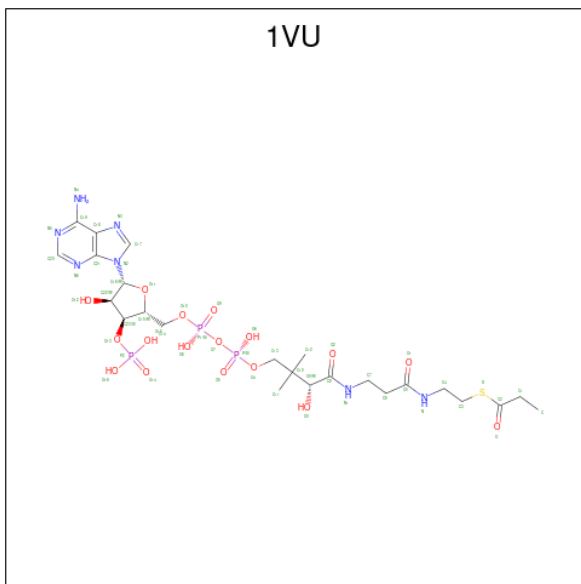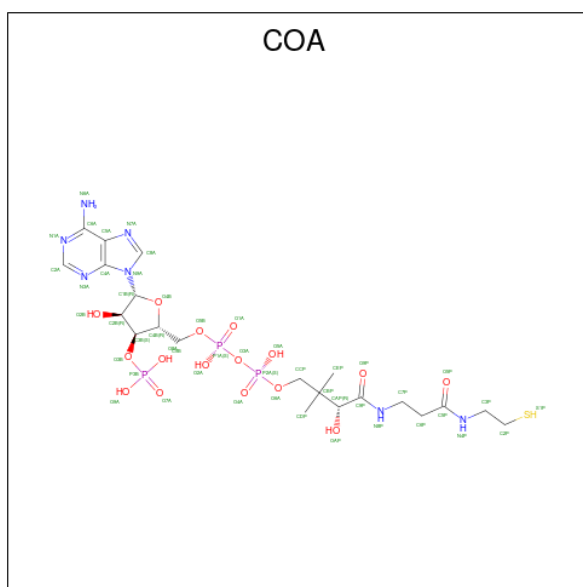
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
			Total	C	N	O	P	S		
3	B	1	48	21	7	16	3	1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	166	Total 166	O 166	0	0
4	B	160	Total 160	O 160	0	0
4	C	138	Total 138	O 138	0	0
4	D	120	Total 120	O 120	0	0
4	E	142	Total 142	O 142	0	0
4	F	141	Total 141	O 141	0	0
4	G	108	Total 108	O 108	0	0
4	H	116	Total 116	O 116	0	0

3 Residue-property plots ⓘ

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.
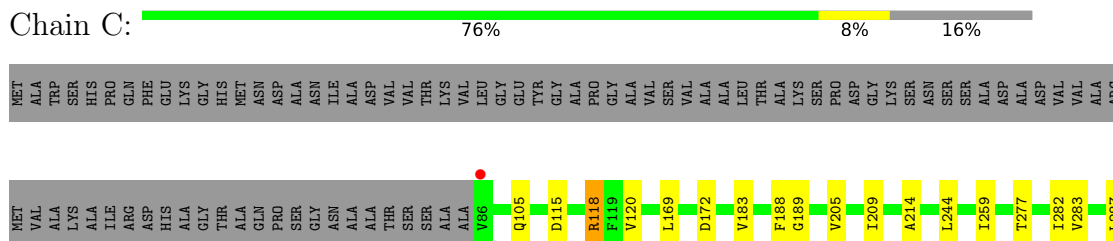
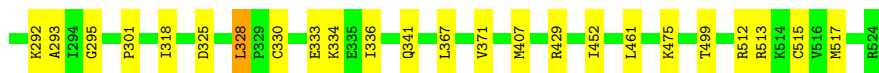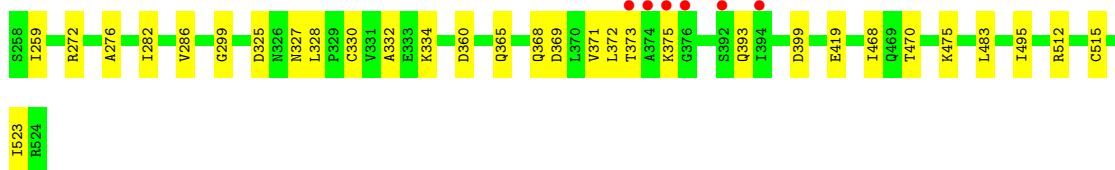- Molecule 1: Aldehyde dehydrogenase

Chain A:

- Molecule 1: Aldehyde dehydrogenase

Chain B:

- Molecule 1: Aldehyde dehydrogenase

Chain C:

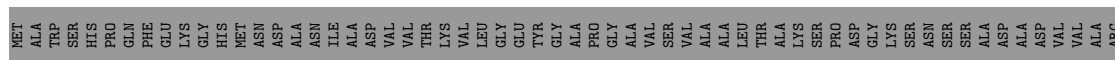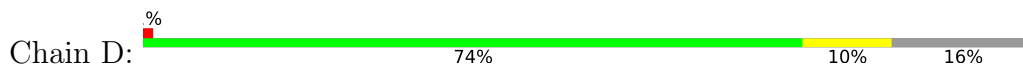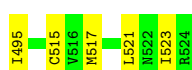K292 A293 I294 G295 P301 I318 D325 L328 P329 C330 E333 K334 E335 I336 Q341 L367 V371 M407 R429 I452 L461 K475 T499 R512 R513 C515 V516 M517 R524

• Molecule 1: Aldehyde dehydrogenase

Chain D:

%

74% 10% 16%

MET ALA TRP SER HIS PRO GLN PHE GLU LYS GLY HIS MET ASN ASP ALA ASN ILE ALA ASP VAL VAL THR LYS VAL LEU GLY GLU TYR GLY ALA PRO GLY ALA VAL SER VAL ALA ALA LEU THR ALA LYS SER PRO ASP GLY LYS SER ASN SER SER ALA ASP ALA ASP VAL VAL ALA ARG

MET VAL ALA LYS ALA ILE ARG ASP HIS GLY THR ALA GLN PRO SER GLY ASN ALA ALA THR SER SER ALA ALA V86 V120 L133 M136 S137 R138 M139 Y149 L153 F188 T198 N199 P200 T201 I209 P222 H223 P224 R225 V234 T253 K256 P257

S258 I259 R272 A276 I282 V286 G299 D325 N326 N327 L328 P329 V331 A332 E333 K334 D360 Q365 Q368 D369 L370 V371 L372 T373 A374 K375 G376 S392 Q393 I394 D399 E419 I468 Q469 T470 K475 L483 I495 R512 C515
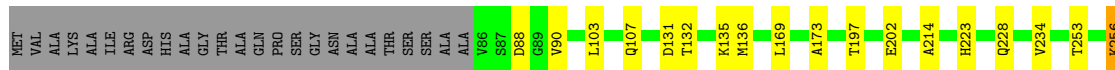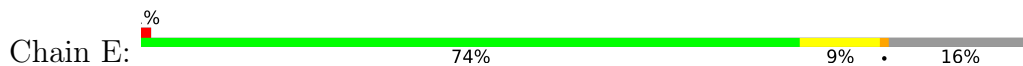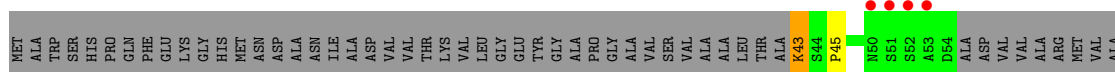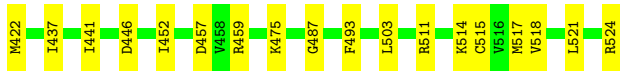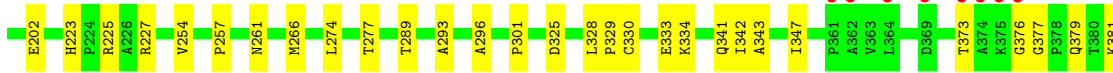
I523 R524

• Molecule 1: Aldehyde dehydrogenase

Chain E:

%

74% 9% • 16%

MET ALA TRP SER HIS PRO GLN PHE GLU LYS GLY HIS MET ASN ASP ALA ASN ILE ALA ASP VAL VAL THR LYS VAL LEU GLY GLU TYR GLY ALA PRO GLY ALA VAL SER VAL ALA ALA LEU THR ALA LYS SER PRO ASP GLY LYS SER ASN SER SER ALA ASP ALA ASP VAL VAL ALA ARG

MET VAL ALA LYS ALA ILE ARG ASP HIS GLY THR ALA GLN PRO SER GLY ASN ALA ALA THR SER SER ALA ALA V86 S87 D88 G89 V90 L103 Q107 D131 T132 K135 M136 L169 A173 T197 E202 A214 H223 Q228 V234 T253 K256

P257 S258 I259 E260 M266 T277 A285 V286 L287 S288 T289 A293 G299 N300 P301 D306 D325 L328 P329 C330 K334 T373 A374 K375 G376 Q379 T380 K381 S397 A400 M407 E419 I437 M464 K475 N476 G477 L483 F493 T494

I495 C515 V516 M517 L521 N522 I523 R524

• Molecule 1: Aldehyde dehydrogenase

Chain F:

2%

73% 13% 14%

MET ALA TRP SER HIS PRO GLN PHE GLU LYS GLY HIS MET ASN ASP ALA ASN ILE ALA ASP VAL VAL THR LYS VAL LEU GLY GLU TYR GLY ALA PRO GLY ALA VAL SER VAL ALA ALA LEU THR ALA K43 S44 P45 N50 S51 S52 A53 D54 ALA ASP VAL VAL ALA ARG MET VAL ALA

LYS ALA ILE ARG ASP HIS GLY THR ALA GLN PRO SER GLY ASN ALA ALA THR SER SER ALA A85 E99 Y108 V120 K135 M139 D172 A173 F174 S175 N178 V183 I209 I259 M266 K270 V271 R272 T277 L287 S288 T289 A293

A296 G299 N300 P301 D306 E312 L328 P329 C330 E333 K334 Q341 K351 E357 I358 K359 D360 P361 A362 V363 L364 L367 V371 L372 K375 G376 Q379 S386 A387 V388 W389 L390 L391 S392 Q393 I394 G395 I405 L406 M407 E408 E412 H413 P414

M422 I437 I441 D446 I452 D457 V458 R459 K475 G487 F493 L503 R511 K514 C515 V516 M517 V518 L521 R524

• Molecule 1: Aldehyde dehydrogenase

Chain G:

2%

72%   12%   16%

MET ALA TRP SER HIS PRO GLN PHE GLU LYS GLY HIS MET ASN ASP ALA ASN ILE ALA ASP VAL VAL THR LYS VAL LEU GLY GLU TYR GLY ALA PRO GLY ALA VAL SER VAL ALA ALA LEU THR ALA LYS SER PRO ASP GLY LYS SER ASN SER SER ALA ASP ALA ASP VAL VAL ALA ARG

MET VAL ALA LYS ALA ILE ARG ASP HIS ALA GLY THR ALA GLN PRO SER GLY ASN ALA ALA THR SER ALA ALA V86 F91 E92 T93 A96 Q106 Q107 Y108 M113 R116 N129 T132 E143 M146 Y149 E150 L153 I154 K155 D172 A173 V183

E202 H223 P224 R225 A226 R227 V254 P257 N261 M266 L274 T277 T289 A293 A296 P301 D325 L328 P329 C330 E333 K334 Q341 I342 A343 I347 P361 A362 V363 L364 D369 T373 A374 K375 G376 G377 P378 Q379 T380 K381

E418 E419 M422 P423 I424 L425 P426 A440 E444 I452 K475 R512 C515 V516 M517 V518 L521 R524

• Molecule 1: Aldehyde dehydrogenase

Chain H:

%

71%   13%   16%

MET ALA TRP SER HIS PRO GLN PHE GLU LYS GLY HIS MET ASN ASP ALA ASN ILE ALA ASP VAL VAL THR LYS VAL LEU GLU GLU TYR GLY ALA PRO GLY ALA VAL SER VAL ALA ALA LEU THR ALA LYS SER PRO ASP GLY LYS SER ASN SER SER ALA ASP ALA ASP VAL VAL ALA ARG

MET VAL ALA LYS ALA ILE ARG ASP HIS ALA GLY THR ALA GLN PRO SER GLY ASN ALA ALA THR SER ALA A84 A85 V86 S87 D88 Q107 V120 K135 M136 S137 R138 M139 N148 Y149 L153 I154 K155 A173 N178 N199 P200 T201 I209 H223 P224 R225 A226

R227 L231 R235 A242 P247 E255 K256 P257 S258 I259 M266 R272 M273 L274 V275 A276 T277 V286 T289 A293 A296 G299 N300 P301 P302 V303 D306 E312 N326 C330 E333 K334 Y345 K351 E357 Q365 Q366 L367 Q368

A374 K375 G376 V398 D399 A400 M407 I424 D434 D446 I452 V458 K463 T471 K475 N476 G477 L483 G487 I495 L503 S508 R512 C515 R524

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	92.11Å 105.78Å 126.42Å 89.52° 71.00° 68.92°	Depositor
Resolution (Å)	39.26 – 2.52 39.26 – 2.52	Depositor EDS
% Data completeness (in resolution range)	95.5 (39.26-2.52) 88.6 (39.26-2.52)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	0.92 (at 2.51Å)	Xtriage
Refinement program	PHENIX (1.10_2152: ???)	Depositor
R, R_{free}	0.172 , 0.224 0.173 , 0.225	Depositor DCC
R_{free} test set	2000 reflections (1.48%)	wwPDB-VP
Wilson B-factor (Å^2)	29.1	Xtriage
Anisotropy	0.332	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 49.4	EDS
L-test for twinning [2]	$< |L| > = 0.46, < L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	28030	wwPDB-VP
Average B, all atoms (Å^2)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.75% of the height of the origin peak. No significant pseudotranslation is detected.*

---

[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: COA, 1VU

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	0.36	1/3333 (0.0%)	0.53	1/4521 (0.0%)
1	B	0.37	1/3431 (0.0%)	0.54	1/4650 (0.0%)
1	C	0.36	0/3344	0.52	0/4535
1	D	0.34	0/3344	0.53	1/4535 (0.0%)
1	E	0.37	0/3344	0.54	1/4535 (0.0%)
1	F	0.37	0/3420	0.55	1/4636 (0.0%)
1	G	0.35	0/3333	0.53	0/4521
1	H	0.35	0/3354	0.52	1/4549 (0.0%)
All	All	0.36	2/26903 (0.0%)	0.53	6/36482 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	206	CYS	CB-SG	-5.09	1.73	1.81
1	B	206	CYS	CB-SG	-5.03	1.73	1.81

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	360	ASP	CB-CG-OD2	5.95	123.65	118.30
1	E	306	ASP	CB-CG-OD1	5.87	123.58	118.30
1	B	306	ASP	CB-CG-OD1	5.74	123.47	118.30
1	F	306	ASP	CB-CG-OD1	5.46	123.22	118.30
1	H	330	CYS	CA-CB-SG	5.43	123.78	114.00
1	A	306	ASP	CB-CG-OD1	5.07	122.86	118.30

There are no chirality outliers.

There are no planarity outliers.

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	3286	0	3377	36	0
1	B	3384	0	3468	31	0
1	C	3297	0	3389	29	0
1	D	3297	0	3389	37	0
1	E	3297	0	3389	40	0
1	F	3373	0	3456	53	0
1	G	3286	0	3377	44	0
1	H	3307	0	3399	53	0
2	A	52	0	38	6	0
2	C	52	0	38	5	0
2	D	52	0	38	5	0
2	E	52	0	38	8	0
2	F	52	0	38	4	0
2	G	52	0	38	3	0
2	H	52	0	38	8	0
3	B	48	0	32	1	0
4	A	166	0	0	2	0
4	B	160	0	0	4	0
4	C	138	0	0	3	0
4	D	120	0	0	2	0
4	E	142	0	0	8	0
4	F	141	0	0	3	0
4	G	108	0	0	5	0
4	H	116	0	0	3	0
All	All	28030	0	27542	297	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 5.

All (297) 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:H:135:LYS:NZ	1:H:139:MET:SD	2.31	1.04
1:F:43:LYS:NZ	4:F:701:HOH:O	1.98	0.96
1:G:113:MET:SD	4:G:713:HOH:O	2.25	0.94

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:515:CYS:SG	1:H:475:LYS:NZ	2.42	0.93
1:A:475:LYS:NZ	1:C:515:CYS:SG	2.44	0.89
1:E:515:CYS:SG	1:G:475:LYS:NZ	2.47	0.88
1:F:475:LYS:NZ	1:H:515:CYS:SG	2.47	0.87
1:B:515:CYS:SG	1:D:475:LYS:NZ	2.48	0.86
1:E:334:LYS:HE2	1:E:419:GLU:HG3	1.62	0.81
1:A:515:CYS:SG	1:C:475:LYS:NZ	2.51	0.80
1:E:475:LYS:NZ	1:G:515:CYS:SG	2.55	0.78
1:C:330:CYS:H	2:C:601:1VU:H39	1.49	0.78
1:C:301:PRO:HD2	1:C:334:LYS:HD2	1.65	0.77
1:H:365:GLN:HA	1:H:368:GLN:HG3	1.68	0.76
1:H:256:LYS:HE3	1:H:258:SER:HB3	1.67	0.75
1:A:227:ARG:HD2	1:A:257:PRO:HD2	1.69	0.75
1:G:227:ARG:HG3	1:G:257:PRO:HD2	1.69	0.75
1:G:301:PRO:HD2	1:G:334:LYS:HG3	1.70	0.74
1:H:199:ASN:ND2	2:H:601:1VU:S	2.62	0.73
2:C:601:1VU:O	4:C:701:HOH:O	2.05	0.72
1:E:88:ASP:OD1	4:E:701:HOH:O	2.06	0.71
1:H:135:LYS:HG2	1:H:138:ARG:HH21	1.55	0.71
1:D:136:MET:HG3	1:D:201:THR:HG21	1.73	0.71
1:G:330:CYS:H	2:G:601:1VU:H39	1.56	0.71
1:F:446:ASP:OD2	1:H:272:ARG:NH2	2.24	0.70
1:G:129:ASN:ND2	1:G:132:THR:H	1.88	0.70
1:G:129:ASN:HD22	1:G:132:THR:H	1.37	0.70
1:F:259:ILE:HD13	2:F:601:1VU:H6	1.74	0.69
1:A:523:ILE:O	1:B:513:ARG:NH2	2.26	0.69
1:H:303:VAL:HG22	1:H:452:ILE:HB	1.75	0.69
1:B:475:LYS:NZ	1:D:515:CYS:SG	2.58	0.68
1:D:259:ILE:HD12	2:D:601:1VU:H6	1.75	0.68
1:A:266:MET:HB3	1:A:289:THR:HG21	1.76	0.67
1:E:330:CYS:H	2:E:601:1VU:H36	1.59	0.67
1:F:277:THR:HA	1:F:296:ALA:HB3	1.78	0.66
1:F:330:CYS:H	2:F:601:1VU:H40	1.58	0.66
1:F:301:PRO:HD2	1:F:334:LYS:HD2	1.78	0.65
1:F:328:LEU:O	4:F:702:HOH:O	2.12	0.65
1:A:278:GLY:HA2	2:A:601:1VU:H30	1.80	0.64
1:H:299:GLY:O	1:H:301:PRO:HD3	1.98	0.64
1:D:199:ASN:ND2	2:D:601:1VU:S	2.70	0.64
1:F:364:LEU:HD21	1:F:413:HIS:HE2	1.63	0.64
1:E:258:SER:OG	1:E:260:GLU:HG3	1.97	0.63
1:E:301:PRO:HD2	1:E:334:LYS:HG2	1.80	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:523:ILE:HG13	4:E:753:HOH:O	1.97	0.63
1:E:517:MET:HE3	1:H:458:VAL:HG21	1.80	0.63
1:G:333:GLU:HG3	1:G:452:ILE:HD13	1.81	0.63
1:H:107:GLN:NE2	4:H:701:HOH:O	2.31	0.63
1:F:386:SER:O	1:F:390:LEU:HD12	1.98	0.62
1:F:359:LYS:NZ	1:F:408:GLU:H	1.97	0.62
1:H:227:ARG:HB2	1:H:257:PRO:HG2	1.80	0.62
1:G:146:MET:HB3	1:G:328:LEU:HD11	1.82	0.62
1:B:483:LEU:HD21	1:B:495:ILE:HD11	1.81	0.62
1:D:393:GLN:NE2	4:D:703:HOH:O	2.31	0.62
1:H:368:GLN:NE2	4:H:702:HOH:O	2.33	0.62
1:C:259:ILE:HD13	2:C:601:1VU:H6	1.83	0.61
1:C:118:ARG:NH2	1:C:244:LEU:O	2.33	0.61
1:F:120:VAL:HG13	1:F:209:ILE:HG23	1.82	0.61
1:A:195:THR:O	2:A:601:1VU:N4	2.34	0.60
1:H:223:HIS:NE2	2:H:601:1VU:O5	2.23	0.60
1:B:301:PRO:HD2	1:B:334:LYS:HD2	1.83	0.60
1:H:136:MET:HG3	1:H:201:THR:HG21	1.83	0.60
1:H:231:LEU:HD21	1:H:255:GLU:HA	1.84	0.60
1:E:259:ILE:HD12	2:E:601:1VU:H6	1.83	0.60
1:C:277:THR:HG22	2:C:601:1VU:H32	1.85	0.59
1:B:328:LEU:HD11	1:B:384:GLY:HA3	1.83	0.59
1:F:351:LYS:HD2	1:F:357:GLU:OE1	2.01	0.59
1:F:299:GLY:O	1:F:301:PRO:HD3	2.03	0.58
1:F:359:LYS:HZ3	1:F:408:GLU:H	1.52	0.58
1:A:228:GLN:HG3	1:F:341:GLN:HB3	1.86	0.58
1:C:513:ARG:NH1	1:D:523:ILE:O	2.37	0.57
1:D:198:THR:HB	1:D:328:LEU:HG	1.86	0.57
1:A:227:ARG:NH1	1:A:255:GLU:O	2.37	0.56
1:G:261:ASN:ND2	4:G:705:HOH:O	2.37	0.56
1:H:301:PRO:HD2	1:H:334:LYS:HG3	1.87	0.56
2:E:601:1VU:O9	2:E:601:1VU:O3	2.24	0.56
1:H:225:ARG:NH2	2:H:601:1VU:O9	2.39	0.56
1:E:234:VAL:HG11	1:E:253:THR:HG22	1.86	0.56
1:F:175:SER:O	1:F:524:ARG:NH2	2.38	0.56
1:F:367:LEU:O	1:F:371:VAL:HG22	2.05	0.56
1:E:90:VAL:O	4:E:701:HOH:O	2.18	0.55
1:E:330:CYS:SG	2:E:601:1VU:H35	2.46	0.55
1:B:333:GLU:OE2	1:B:333:GLU:N	2.34	0.55
1:A:260:GLU:N	1:A:260:GLU:OE1	2.38	0.55
1:H:330:CYS:H	2:H:601:1VU:H40	1.72	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:333:GLU:OE1	1:G:333:GLU:N	2.31	0.55
1:G:379:GLN:HG3	1:G:381:LYS:HG3	1.88	0.54
1:B:414:PRO:O	1:B:418:GLU:HG2	2.08	0.54
1:G:173:ALA:HB2	1:H:173:ALA:HB2	1.87	0.54
1:G:334:LYS:HE3	1:G:419:GLU:HG3	1.90	0.54
1:E:169:LEU:HD11	1:E:214:ALA:HA	1.90	0.54
1:H:434:ASP:OD1	1:H:463:LYS:NZ	2.37	0.54
1:B:266:MET:HB3	1:B:289:THR:HG21	1.89	0.54
1:C:330:CYS:SG	2:C:601:1VU:H33	2.48	0.53
1:D:365:GLN:O	1:D:365:GLN:NE2	2.39	0.53
1:E:380:THR:HB	4:E:827:HOH:O	2.09	0.53
1:H:120:VAL:HG13	1:H:209:ILE:HG23	1.91	0.53
1:H:155:LYS:NZ	1:H:199:ASN:OD1	2.20	0.53
1:G:143:GLU:HG2	1:G:225:ARG:O	2.09	0.53
1:G:149:TYR:CZ	1:G:153:LEU:HD11	2.44	0.53
1:E:483:LEU:HD21	1:E:495:ILE:HD11	1.90	0.53
1:G:325:ASP:HB3	1:G:329:PRO:HD3	1.91	0.53
1:C:461:LEU:HD22	1:C:475:LYS:HG2	1.90	0.53
1:F:99:GLU:OE1	1:F:270:LYS:NZ	2.39	0.53
1:G:517:MET:HG2	1:G:521:LEU:HD12	1.91	0.53
1:H:330:CYS:SG	2:H:601:1VU:H32	2.49	0.53
1:C:333:GLU:HG3	1:C:452:ILE:HD13	1.90	0.52
1:E:228:GLN:NE2	4:E:704:HOH:O	2.36	0.52
1:G:223:HIS:CE1	1:G:225:ARG:HE	2.27	0.52
1:D:375:LYS:H	1:D:375:LYS:HD2	1.75	0.52
1:A:517:MET:HG2	1:A:521:LEU:HD12	1.92	0.52
1:B:172:ASP:HB2	1:B:183:VAL:HB	1.92	0.52
1:G:277:THR:HG22	2:G:601:1VU:H34	1.91	0.52
1:H:259:ILE:HD11	2:H:601:1VU:H6	1.90	0.52
2:E:601:1VU:H34	4:E:703:HOH:O	2.09	0.51
1:G:155:LYS:NZ	1:G:202:GLU:OE2	2.43	0.51
1:C:325:ASP:O	1:C:328:LEU:HB2	2.11	0.51
1:D:483:LEU:HD11	2:D:601:1VU:H38	1.92	0.51
1:G:422:MET:HE2	1:G:424:ILE:HD12	1.92	0.51
1:H:148:ASN:ND2	1:H:326:ASN:OD1	2.40	0.51
1:H:277:THR:HA	1:H:296:ALA:HB2	1.92	0.51
1:D:138:ARG:HB3	1:D:149:TYR:CD1	2.46	0.51
1:C:120:VAL:HG13	1:C:209:ILE:HG23	1.92	0.51
1:H:351:LYS:HD3	1:H:357:GLU:HB2	1.91	0.51
1:H:503:LEU:HD12	4:H:732:HOH:O	2.10	0.51
1:A:330:CYS:HB2	2:A:601:1VU:O	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:517:MET:HG2	1:B:521:LEU:HD12	1.92	0.51
1:G:150:GLU:HA	1:G:153:LEU:HD12	1.93	0.50
1:D:234:VAL:HG11	1:D:253:THR:HG22	1.94	0.50
1:D:332:ALA:O	1:D:334:LYS:HG3	2.11	0.50
1:H:266:MET:HB3	1:H:289:THR:HG21	1.94	0.50
1:A:330:CYS:SG	2:A:601:1VU:H32	2.51	0.50
1:C:341:GLN:OE1	1:C:341:GLN:N	2.45	0.50
1:B:198:THR:HG21	4:B:703:HOH:O	2.12	0.49
1:E:325:ASP:O	1:E:328:LEU:HB2	2.11	0.49
1:B:333:GLU:HG3	1:B:452:ILE:HD13	1.94	0.49
1:D:330:CYS:HB2	2:D:601:1VU:O	2.11	0.49
1:A:227:ARG:HB2	1:A:257:PRO:HG2	1.94	0.49
1:A:262:THR:OG1	2:A:601:1VU:H7	2.12	0.49
1:F:517:MET:HG2	1:F:521:LEU:HD12	1.93	0.49
1:A:138:ARG:NH2	1:F:312:GLU:OE2	2.45	0.49
1:E:517:MET:HG2	1:E:521:LEU:HD12	1.94	0.49
1:F:266:MET:HB3	1:F:289:THR:HG21	1.95	0.49
1:A:287:LEU:HD23	1:A:293:ALA:HB3	1.95	0.49
1:D:375:LYS:H	1:D:375:LYS:CD	2.26	0.49
1:F:514:LYS:HD2	1:H:503:LEU:CD1	2.43	0.49
1:C:172:ASP:HB2	1:C:183:VAL:HB	1.94	0.48
1:C:318:ILE:HG21	1:C:336:ILE:HD11	1.94	0.48
1:A:197:THR:HB	1:A:223:HIS:CG	2.48	0.48
1:H:367:LEU:HD21	1:H:424:ILE:HD13	1.94	0.48
1:E:330:CYS:H	2:E:601:1VU:C1	2.26	0.48
1:G:93:THR:HG23	1:G:96:ALA:HB3	1.95	0.48
1:A:499:THR:HA	1:C:292:LYS:HD2	1.94	0.48
1:F:371:VAL:C	1:F:379:GLN:HG3	2.34	0.48
1:A:259:ILE:HG22	2:A:601:1VU:N6	2.29	0.48
1:H:149:TYR:CZ	1:H:153:LEU:HD11	2.48	0.48
1:A:409:VAL:O	4:A:702:HOH:O	2.20	0.48
1:D:334:LYS:HD2	1:D:419:GLU:OE2	2.13	0.48
1:D:223:HIS:ND1	1:D:225:ARG:HG2	2.29	0.48
1:F:493:PHE:HD1	2:F:601:1VU:H37	1.79	0.48
1:H:303:VAL:HG21	1:H:333:GLU:CG	2.43	0.47
1:F:178:ASN:HB3	1:H:487:GLY:HA2	1.96	0.47
1:H:88:ASP:OD2	1:H:235:ARG:NH1	2.48	0.47
1:B:263:ASN:HA	1:B:266:MET:HE2	1.96	0.47
1:B:446:ASP:OD2	1:D:272:ARG:NH2	2.46	0.47
1:F:301:PRO:CD	1:F:334:LYS:HD2	2.43	0.47
1:A:415:PHE:CD1	1:A:420:LEU:HD11	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:358:ILE:O	1:F:359:LYS:HE2	2.15	0.47
1:B:368:GLN:OE1	1:B:413:HIS:NE2	2.44	0.47
1:D:373:THR:OG1	1:D:375:LYS:HD3	2.15	0.47
1:F:389:TRP:O	1:F:393:GLN:HG2	2.15	0.47
1:A:116:ARG:NH2	4:A:716:HOH:O	2.45	0.47
1:F:413:HIS:CG	1:F:414:PRO:HD2	2.49	0.47
1:A:523:ILE:HG13	4:B:702:HOH:O	2.15	0.47
2:D:601:1VU:H10	2:D:601:1VU:O6	2.15	0.47
1:E:266:MET:HB3	1:E:289:THR:HG21	1.96	0.47
1:B:523:ILE:HG13	4:B:734:HOH:O	2.14	0.47
1:A:347:ILE:HG22	1:A:351:LYS:HE2	1.97	0.46
1:E:287:LEU:HD23	1:E:293:ALA:HB3	1.97	0.46
1:G:172:ASP:HB2	1:G:183:VAL:HB	1.97	0.46
1:C:115:ASP:OD1	1:C:118:ARG:NH1	2.47	0.46
1:E:477:GLY:HA3	1:G:518:VAL:HG21	1.96	0.46
1:D:483:LEU:HD21	1:D:495:ILE:HD11	1.98	0.46
1:H:303:VAL:HG21	1:H:333:GLU:HG3	1.98	0.46
1:D:327:ASN:OD1	1:D:334:LYS:HE3	2.15	0.46
1:D:468:ILE:HG23	1:D:470:THR:HG23	1.98	0.46
1:F:272:ARG:NH2	1:H:446:ASP:OD2	2.49	0.46
1:G:113:MET:HA	4:G:713:HOH:O	2.15	0.46
1:H:107:GLN:HG3	1:H:247:PRO:HB3	1.97	0.46
1:E:135:LYS:NZ	4:E:716:HOH:O	2.49	0.46
1:F:172:ASP:HB2	1:F:183:VAL:HB	1.97	0.46
1:F:45:PRO:HA	1:G:341:GLN:HG3	1.97	0.45
1:F:371:VAL:HG23	1:F:372:LEU:CD1	2.46	0.45
1:F:487:GLY:HA2	1:H:178:ASN:HB3	1.98	0.45
1:F:287:LEU:HD23	1:F:293:ALA:HB3	1.97	0.45
1:G:440:ALA:O	1:G:444:GLU:HB2	2.16	0.45
1:A:328:LEU:N	1:A:329:PRO:HD2	2.31	0.45
1:D:120:VAL:HG13	1:D:209:ILE:HG23	1.99	0.45
1:F:457:ASP:OD1	1:F:459:ARG:HD3	2.15	0.45
1:H:259:ILE:HG12	2:H:601:1VU:N6	2.32	0.45
1:H:312:GLU:OE2	1:H:345:TYR:OH	2.20	0.45
1:H:483:LEU:HD21	1:H:495:ILE:HD11	1.97	0.45
1:C:512[A]:ARG:NH2	4:C:711:HOH:O	2.45	0.45
1:E:103:LEU:O	1:E:107:GLN:HG3	2.16	0.45
1:F:514:LYS:HD2	1:H:503:LEU:HD13	1.99	0.45
1:D:138:ARG:HB3	1:D:149:TYR:HD1	1.82	0.45
1:A:301:PRO:HD2	1:A:334:LYS:HD2	1.98	0.45
1:D:299:GLY:N	4:D:718:HOH:O	2.50	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:283:VAL:HG13	1:C:295:GLY:HA3	1.99	0.44
1:C:282:ILE:HD12	1:C:282:ILE:HA	1.82	0.44
1:E:173:ALA:HB2	1:F:173:ALA:HB2	1.99	0.44
1:D:368:GLN:HB3	1:D:372:LEU:HD12	2.00	0.44
1:C:205:VAL:O	1:C:209:ILE:HG13	2.18	0.44
1:D:328:LEU:HD12	1:D:328:LEU:HA	1.88	0.44
1:G:373:THR:HG22	1:G:377:GLY:O	2.18	0.44
1:E:301:PRO:HD2	1:E:334:LYS:CG	2.44	0.44
1:H:276:ALA:HB2	1:H:286:VAL:HG11	1.99	0.44
1:B:172:ASP:OD2	1:B:512[B]:ARG:NH1	2.51	0.44
1:F:357:GLU:OE2	1:F:359:LYS:HE3	2.18	0.44
1:C:105:GLN:HG3	1:C:189:GLY:O	2.17	0.43
1:G:334:LYS:CE	1:G:419:GLU:HG3	2.48	0.43
1:E:256:LYS:HD2	1:E:256:LYS:HA	1.41	0.43
1:E:437:ILE:HG12	1:E:464:MET:HB2	2.00	0.43
1:F:503:LEU:O	1:H:512[A]:ARG:NH2	2.51	0.43
1:C:367:LEU:O	1:C:371:VAL:HG22	2.18	0.43
1:B:134:GLU:HG2	1:B:149:TYR:OH	2.19	0.43
1:E:285:ALA:O	1:E:289:THR:HG23	2.18	0.43
1:C:169:LEU:HD11	1:C:214:ALA:HA	2.00	0.43
1:D:371:VAL:HG23	1:D:372:LEU:HG	2.00	0.43
1:F:437:ILE:O	1:F:441:ILE:HG13	2.17	0.43
1:D:325:ASP:O	1:D:328:LEU:HB2	2.19	0.43
1:G:277:THR:HA	1:G:296:ALA:HB3	2.00	0.43
1:A:187:PRO:HG3	1:A:215:GLY:HA3	2.00	0.43
1:E:197:THR:HB	1:E:223:HIS:CG	2.54	0.43
1:F:371:VAL:HB	1:F:422:MET:SD	2.59	0.43
1:H:227:ARG:CB	1:H:257:PRO:HG2	2.48	0.43
1:B:168:ASP:HB3	1:B:506:ALA:HB3	2.01	0.43
1:C:429:ARG:NH1	4:C:705:HOH:O	2.41	0.43
1:F:371:VAL:HG23	1:F:372:LEU:HD12	2.00	0.43
1:B:365:GLN:NE2	1:B:369:ASP:OD1	2.52	0.43
1:E:373:THR:HG22	1:E:379:GLN:OE1	2.19	0.42
1:F:387:ALA:HB1	1:F:405:ILE:CD1	2.50	0.42
1:F:511:ARG:NH2	1:H:471:THR:OG1	2.52	0.42
1:B:277:THR:HA	1:B:296:ALA:HB3	2.02	0.42
1:B:422:MET:O	1:B:424:ILE:N	2.47	0.42
1:D:222:PRO:HG2	1:D:257:PRO:HG3	2.01	0.42
1:E:202:GLU:HB3	1:E:493:PHE:CD2	2.54	0.42
1:E:407:MET:SD	1:E:407:MET:N	2.93	0.42
1:A:381:LYS:HB2	1:A:381:LYS:HE2	1.87	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:391:LEU:HG	1:F:405:ILE:HD11	2.00	0.42
1:G:106:GLN:NE2	4:G:712:HOH:O	2.52	0.42
1:G:343:ALA:O	1:G:347:ILE:HG13	2.19	0.42
1:G:376:GLY:O	1:G:418:GLU:HG3	2.20	0.42
1:G:334:LYS:O	1:G:426:PRO:HD2	2.20	0.42
1:G:266:MET:HB3	1:G:289:THR:HG21	2.00	0.42
1:A:372:LEU:HD22	1:A:376:GLY:O	2.20	0.42
1:D:133:LEU:HG	1:D:153:LEU:CD2	2.50	0.42
1:E:381:LYS:HB2	1:E:381:LYS:HE2	1.67	0.42
2:E:601:1VU:H25	2:E:601:1VU:P1	2.41	0.42
1:F:412:GLU:OE2	4:F:703:HOH:O	2.21	0.42
1:B:511:ARG:HD3	4:B:745:HOH:O	2.19	0.41
1:A:475:LYS:HE3	1:C:517:MET:HB2	2.03	0.41
1:F:330:CYS:HG	2:F:601:1VU:C2	2.33	0.41
1:F:333:GLU:HG3	1:F:452:ILE:HD13	2.02	0.41
1:A:373:THR:OG1	1:A:375:LYS:HB2	2.20	0.41
1:B:444:GLU:OE1	1:B:448:ARG:N	2.48	0.41
1:E:334:LYS:HB3	4:E:737:HOH:O	2.20	0.41
1:H:155:LYS:HB3	1:H:155:LYS:HE2	1.90	0.41
1:B:278:GLY:HA2	3:B:601:COA:H62	2.02	0.41
1:D:276:ALA:HB2	1:D:286:VAL:HG11	2.02	0.41
1:A:173:ALA:HB2	1:B:173:ALA:HB2	2.02	0.41
1:G:342:ILE:H	1:G:342:ILE:HG13	1.79	0.41
1:D:282:ILE:HD12	1:D:282:ILE:HA	1.84	0.41
1:G:116:ARG:NE	4:G:713:HOH:O	2.54	0.41
1:A:364:LEU:O	1:A:368:GLN:HG3	2.21	0.41
1:B:328:LEU:HD11	1:B:384:GLY:CA	2.49	0.41
1:F:518:VAL:HG21	1:H:477:GLY:HA3	2.03	0.41
1:B:103:LEU:O	1:B:107:GLN:HG3	2.21	0.41
1:C:287:LEU:HD23	1:C:293:ALA:HB3	2.03	0.41
1:D:365:GLN:NE2	1:D:369:ASP:OD1	2.53	0.41
1:E:277:THR:HG22	2:E:601:1VU:H32	2.02	0.41
1:E:299:GLY:C	1:E:301:PRO:HD3	2.41	0.41
1:G:330:CYS:SG	2:G:601:1VU:H32	2.60	0.41
1:B:204:ILE:O	1:B:208:SER:OG	2.33	0.41
1:E:328:LEU:HD12	1:E:328:LEU:HA	1.92	0.41
1:G:274:LEU:O	1:G:293:ALA:HA	2.21	0.41
1:G:225:ARG:H	1:G:225:ARG:HG3	1.57	0.40
1:A:459:ARG:HE	1:A:459:ARG:HB2	1.71	0.40
1:B:120:VAL:HG13	1:B:209:ILE:HG23	2.02	0.40
1:D:225:ARG:HG2	1:D:225:ARG:H	1.52	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:399:ASP:OD1	1:D:399:ASP:N	2.46	0.40
1:E:132:THR:O	1:E:136:MET:HG2	2.21	0.40
1:A:292:LYS:HD3	1:C:499:THR:HA	2.02	0.40
1:F:135:LYS:O	1:F:139:MET:HB2	2.21	0.40
1:G:91:PHE:O	1:G:254:VAL:HA	2.22	0.40
1:H:274:LEU:O	1:H:293:ALA:HA	2.21	0.40
1:H:330:CYS:N	2:H:601:1VU:H40	2.34	0.40

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	437/524 (83%)	433 (99%)	4 (1%)	0	100	100
1	B	449/524 (86%)	442 (98%)	7 (2%)	0	100	100
1	C	438/524 (84%)	433 (99%)	5 (1%)	0	100	100
1	D	438/524 (84%)	434 (99%)	4 (1%)	0	100	100
1	E	438/524 (84%)	432 (99%)	5 (1%)	1 (0%)	47	67
1	F	448/524 (86%)	440 (98%)	8 (2%)	0	100	100
1	G	437/524 (83%)	427 (98%)	10 (2%)	0	100	100
1	H	440/524 (84%)	431 (98%)	8 (2%)	1 (0%)	47	67
All	All	3525/4192 (84%)	3472 (98%)	51 (1%)	2 (0%)	51	71

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	257	PRO
1	H	300	ASN

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	358/417 (86%)	356 (99%)	2 (1%)	86	94
1	B	369/417 (88%)	366 (99%)	3 (1%)	81	92
1	C	359/417 (86%)	355 (99%)	4 (1%)	73	88
1	D	359/417 (86%)	354 (99%)	5 (1%)	67	85
1	E	359/417 (86%)	355 (99%)	4 (1%)	73	88
1	F	368/417 (88%)	365 (99%)	3 (1%)	81	92
1	G	358/417 (86%)	356 (99%)	2 (1%)	86	94
1	H	359/417 (86%)	355 (99%)	4 (1%)	73	88
All	All	2889/3336 (87%)	2862 (99%)	27 (1%)	78	91

All (27) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	381	LYS
1	A	407	MET
1	B	108	TYR
1	B	240	LYS
1	B	330	CYS
1	C	118	ARG
1	C	188	PHE
1	C	328	LEU
1	C	407	MET
1	D	139	MET
1	D	188	PHE
1	D	256	LYS
1	D	512[A]	ARG
1	D	512[B]	ARG
1	E	131	ASP
1	E	256	LYS
1	E	328	LEU
1	E	330	CYS
1	F	43	LYS

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Mol	Chain	Res	Type
1	F	108	TYR
1	F	407	MET
1	G	108	TYR
1	G	512	ARG
1	H	306	ASP
1	H	367	LEU
1	H	407	MET
1	H	508	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	365	GLN
1	C	105	GLN
1	F	50	ASN
1	G	129	ASN
1	H	366	GLN
1	H	368	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

8 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	1VU	H	601	-	46,54,54	3.42	12 (26%)	56,80,80	1.84	9 (16%)
2	1VU	F	601	-	46,54,54	3.31	10 (21%)	56,80,80	1.83	8 (14%)
2	1VU	D	601	-	46,54,54	3.36	11 (23%)	56,80,80	1.49	7 (12%)
2	1VU	E	601	-	46,54,54	3.25	9 (19%)	56,80,80	1.71	13 (23%)
2	1VU	G	601	-	46,54,54	3.29	9 (19%)	56,80,80	1.90	13 (23%)
2	1VU	C	601	-	46,54,54	3.33	11 (23%)	56,80,80	1.81	9 (16%)
2	1VU	A	601	-	46,54,54	3.34	9 (19%)	56,80,80	1.57	12 (21%)
3	COA	B	601	-	41,50,50	3.50	11 (26%)	52,75,75	1.28	6 (11%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	1VU	H	601	-	-	14/49/69/69	0/3/3/3
2	1VU	F	601	-	-	14/49/69/69	0/3/3/3
2	1VU	D	601	-	-	21/49/69/69	0/3/3/3
2	1VU	E	601	-	-	19/49/69/69	0/3/3/3
2	1VU	G	601	-	-	29/49/69/69	0/3/3/3
2	1VU	C	601	-	-	29/49/69/69	0/3/3/3
2	1VU	A	601	-	-	15/49/69/69	0/3/3/3
3	COA	B	601	-	-	12/44/64/64	0/3/3/3

All (82) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	601	1VU	O11-C16	14.28	1.61	1.41
2	D	601	1VU	O11-C16	14.10	1.60	1.41
3	B	601	COA	O4B-C1B	13.92	1.60	1.41
2	F	601	1VU	O11-C16	13.82	1.60	1.41
2	H	601	1VU	O11-C16	13.75	1.60	1.41
2	G	601	1VU	O11-C16	13.71	1.60	1.41
2	E	601	1VU	O11-C16	13.70	1.60	1.41
2	C	601	1VU	O11-C16	13.56	1.60	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	601	1VU	C22-C16	-12.93	1.34	1.53
2	C	601	1VU	C22-C16	-12.90	1.34	1.53
2	D	601	1VU	C22-C16	-12.70	1.34	1.53
3	B	601	COA	C2B-C1B	-12.62	1.34	1.53
2	A	601	1VU	C22-C16	-12.56	1.34	1.53
2	F	601	1VU	C22-C16	-12.39	1.35	1.53
2	G	601	1VU	C22-C16	-12.06	1.35	1.53
2	E	601	1VU	C22-C16	-12.03	1.35	1.53
2	C	601	1VU	O11-C15	-6.11	1.31	1.45
2	F	601	1VU	O11-C15	-6.11	1.31	1.45
2	H	601	1VU	O11-C15	-6.04	1.31	1.45
2	D	601	1VU	O11-C15	-5.98	1.31	1.45
2	H	601	1VU	C5-N	5.90	1.46	1.33
2	E	601	1VU	O11-C15	-5.87	1.31	1.45
3	B	601	COA	O4B-C4B	-5.79	1.32	1.45
2	G	601	1VU	O11-C15	-5.79	1.32	1.45
2	C	601	1VU	C5-N	5.79	1.46	1.33
2	G	601	1VU	C5-N	5.77	1.46	1.33
2	D	601	1VU	C5-N	5.74	1.46	1.33
2	F	601	1VU	C5-N	5.73	1.46	1.33
2	A	601	1VU	O11-C15	-5.71	1.32	1.45
3	B	601	COA	C5P-N4P	5.61	1.46	1.33
2	A	601	1VU	C5-N	5.51	1.45	1.33
2	E	601	1VU	C5-N	5.51	1.45	1.33
2	G	601	1VU	C8-N1	5.08	1.44	1.33
2	D	601	1VU	C8-N1	5.04	1.44	1.33
2	C	601	1VU	C8-N1	4.93	1.44	1.33
2	H	601	1VU	C8-N1	4.93	1.44	1.33
3	B	601	COA	C9P-N8P	4.89	1.44	1.33
2	F	601	1VU	C8-N1	4.85	1.44	1.33
2	A	601	1VU	C8-N1	4.84	1.44	1.33
2	E	601	1VU	C8-N1	4.50	1.43	1.33
2	H	601	1VU	C1-C2	-3.90	1.44	1.51
2	G	601	1VU	C19-N4	3.57	1.47	1.34
2	H	601	1VU	C19-N4	3.52	1.46	1.34
2	C	601	1VU	C19-N4	3.47	1.46	1.34
3	B	601	COA	C6A-N6A	3.45	1.46	1.34
2	D	601	1VU	C19-N4	3.45	1.46	1.34
2	E	601	1VU	C19-N4	3.39	1.46	1.34
2	A	601	1VU	C19-N4	3.39	1.46	1.34
2	F	601	1VU	C19-N4	3.33	1.46	1.34
2	G	601	1VU	C20-N6	3.00	1.36	1.32

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	601	1VU	C20-N6	2.85	1.36	1.32
3	B	601	COA	C2A-N3A	2.85	1.36	1.32
2	E	601	1VU	C20-N6	2.85	1.36	1.32
2	D	601	1VU	O3-C9	-2.79	1.37	1.42
2	D	601	1VU	C20-N6	2.78	1.36	1.32
2	E	601	1VU	O3-C9	-2.75	1.37	1.42
2	F	601	1VU	C20-N6	2.71	1.36	1.32
2	A	601	1VU	C20-N6	2.70	1.36	1.32
3	B	601	COA	OAP-CAP	-2.69	1.37	1.42
2	H	601	1VU	O-C2	-2.64	1.16	1.21
2	A	601	1VU	O3-C9	-2.62	1.37	1.42
2	F	601	1VU	O3-C9	-2.59	1.37	1.42
2	G	601	1VU	O-C2	2.55	1.25	1.21
2	H	601	1VU	O3-C9	-2.51	1.37	1.42
2	G	601	1VU	O3-C9	-2.48	1.37	1.42
2	C	601	1VU	O3-C9	-2.48	1.37	1.42
2	C	601	1VU	C20-N6	2.44	1.36	1.32
2	D	601	1VU	O13-C23	-2.28	1.35	1.44
2	C	601	1VU	O12-C22	2.25	1.48	1.43
3	B	601	COA	O3B-C3B	-2.20	1.36	1.44
2	F	601	1VU	O13-C23	-2.17	1.36	1.44
2	H	601	1VU	O13-C23	-2.16	1.36	1.44
2	C	601	1VU	C18-C21	-2.13	1.35	1.40
2	C	601	1VU	O13-C23	-2.12	1.36	1.44
2	E	601	1VU	O12-C22	2.10	1.47	1.43
2	D	601	1VU	C18-C21	-2.06	1.35	1.40
2	D	601	1VU	O12-C22	2.05	1.47	1.43
2	F	601	1VU	C18-C21	-2.04	1.35	1.40
3	B	601	COA	C5A-C4A	-2.03	1.35	1.40
2	A	601	1VU	O13-C23	-2.03	1.36	1.44
3	B	601	COA	O2B-C2B	2.03	1.47	1.43
2	H	601	1VU	O12-C22	2.01	1.47	1.43

All (77) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	601	1VU	C1-C2-S	7.58	123.01	113.63
2	F	601	1VU	C1-C2-S	7.55	122.97	113.63
2	C	601	1VU	C1-C2-S	7.29	122.65	113.63
2	E	601	1VU	N6-C20-N5	-5.69	119.78	128.68
2	E	601	1VU	C1-C2-S	5.69	120.67	113.63
2	F	601	1VU	N6-C20-N5	-5.61	119.90	128.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	601	1VU	N6-C20-N5	-5.53	120.03	128.68
2	G	601	1VU	N6-C20-N5	-5.52	120.05	128.68
2	A	601	1VU	N6-C20-N5	-5.51	120.06	128.68
2	H	601	1VU	N6-C20-N5	-5.49	120.09	128.68
3	B	601	COA	N3A-C2A-N1A	-5.45	120.16	128.68
2	G	601	1VU	C11-C10-C13	-5.41	99.41	108.23
2	D	601	1VU	N6-C20-N5	-5.20	120.55	128.68
2	A	601	1VU	C1-C2-S	5.10	119.94	113.63
2	G	601	1VU	C1-C2-S	4.65	119.39	113.63
2	F	601	1VU	O-C2-C1	-4.31	117.01	123.71
2	H	601	1VU	O-C2-S	-4.20	117.16	122.61
2	F	601	1VU	C16-N2-C21	-4.19	119.27	126.64
2	D	601	1VU	C16-N2-C21	-3.96	119.68	126.64
2	G	601	1VU	C9-C8-N1	3.78	124.11	116.58
2	C	601	1VU	C16-N2-C21	-3.74	120.07	126.64
2	C	601	1VU	O-C2-S	-3.73	117.77	122.61
2	F	601	1VU	C3-S-C2	3.61	113.11	101.87
2	C	601	1VU	P-O7-P1	-3.53	120.71	132.83
2	D	601	1VU	C1-C2-S	3.53	117.99	113.63
2	G	601	1VU	C23-C22-C16	3.47	107.58	99.89
2	D	601	1VU	C3-S-C2	3.44	112.58	101.87
2	A	601	1VU	C3-S-C2	3.35	112.31	101.87
2	H	601	1VU	C3-S-C2	3.34	112.28	101.87
2	G	601	1VU	C3-S-C2	3.33	112.23	101.87
2	H	601	1VU	C16-N2-C21	-3.21	121.00	126.64
2	E	601	1VU	C16-N2-C21	-3.08	121.24	126.64
2	A	601	1VU	C16-N2-C21	-2.91	121.53	126.64
2	G	601	1VU	O-C2-C1	-2.89	119.22	123.71
2	E	601	1VU	O-C2-C1	-2.88	119.22	123.71
2	G	601	1VU	C16-N2-C21	-2.82	121.68	126.64
2	E	601	1VU	C4-N-C5	-2.78	117.67	122.84
3	B	601	COA	C6P-C5P-N4P	2.77	121.08	116.42
2	G	601	1VU	C6-C5-N	2.67	120.91	116.42
2	C	601	1VU	O-C2-C1	-2.66	119.56	123.71
3	B	601	COA	C1B-N9A-C4A	-2.64	121.99	126.64
2	C	601	1VU	C23-C22-C16	2.62	105.70	99.89
2	H	601	1VU	C23-C22-C16	2.61	105.68	99.89
2	G	601	1VU	P-O4-C13	-2.61	106.52	121.56
2	E	601	1VU	C14-C15-C23	-2.60	105.78	114.40
2	H	601	1VU	O-C2-C1	-2.54	119.76	123.71
2	E	601	1VU	C7-C6-C5	-2.52	108.16	112.36
2	D	601	1VU	C6-C5-N	2.51	120.64	116.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	E	601	1VU	C6-C7-N1	-2.48	106.89	111.90
2	C	601	1VU	C3-S-C2	2.47	109.57	101.87
2	A	601	1VU	C7-C6-C5	-2.47	108.24	112.36
2	H	601	1VU	C6-C5-N	2.47	120.58	116.42
2	D	601	1VU	O-C2-C1	-2.45	119.89	123.71
2	H	601	1VU	P-O7-P1	-2.45	124.42	132.83
2	G	601	1VU	O2-C8-N1	-2.43	117.78	122.99
2	E	601	1VU	C3-S-C2	2.38	109.29	101.87
2	G	601	1VU	O4-P-O5	-2.36	99.84	109.07
2	A	601	1VU	O-C2-C1	-2.33	120.08	123.71
2	F	601	1VU	C23-C22-C16	2.33	105.04	99.89
2	E	601	1VU	C22-C23-C15	-2.26	99.21	103.22
2	A	601	1VU	C6-C5-N	2.21	120.13	116.42
2	E	601	1VU	C6-C5-N	2.20	120.12	116.42
2	E	601	1VU	C18-C19-N4	2.13	123.58	120.35
2	C	601	1VU	C7-C6-C5	-2.12	108.82	112.36
2	A	601	1VU	P-O7-P1	-2.10	125.62	132.83
2	G	601	1VU	C11-C10-C9	2.10	112.46	108.82
2	E	601	1VU	P-O7-P1	-2.10	125.62	132.83
3	B	601	COA	P2A-O3A-P1A	-2.09	125.65	132.83
2	A	601	1VU	C18-C19-N4	2.08	123.51	120.35
3	B	601	COA	C6P-C7P-N8P	-2.08	107.71	111.90
2	F	601	1VU	O11-C16-C22	2.04	109.91	106.93
2	D	601	1VU	C7-C6-C5	-2.04	108.96	112.36
2	A	601	1VU	C7-N1-C8	-2.04	118.95	122.59
2	A	601	1VU	O-C2-S	-2.03	119.98	122.61
2	A	601	1VU	C9-C8-N1	2.01	120.59	116.58
3	B	601	COA	C3B-C2B-C1B	2.00	104.33	99.89
2	F	601	1VU	O-C2-S	-2.00	120.02	122.61

There are no chirality outliers.

All (153) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	1VU	C9-C10-C13-O4
2	A	601	1VU	C11-C10-C9-C8
2	A	601	1VU	C12-C10-C9-O3
2	A	601	1VU	C12-C10-C9-C8
2	A	601	1VU	S-C3-C4-N
2	A	601	1VU	O-C2-S-C3
2	A	601	1VU	C1-C2-S-C3
2	C	601	1VU	C14-O10-P1-O8

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Mol	Chain	Res	Type	Atoms
2	C	601	1VU	C14-O10-P1-O9
2	C	601	1VU	C13-O4-P-O5
2	C	601	1VU	C13-O4-P-O6
2	C	601	1VU	C11-C10-C13-O4
2	C	601	1VU	C12-C10-C13-O4
2	C	601	1VU	C9-C10-C13-O4
2	C	601	1VU	C13-C10-C9-C8
2	C	601	1VU	C11-C10-C9-C8
2	C	601	1VU	C12-C10-C9-C8
2	C	601	1VU	N1-C8-C9-O3
2	C	601	1VU	O-C2-S-C3
2	C	601	1VU	C1-C2-S-C3
2	C	601	1VU	C-C1-C2-O
2	D	601	1VU	P-O7-P1-O10
2	D	601	1VU	C9-C10-C13-O4
2	D	601	1VU	C13-C10-C9-O3
2	D	601	1VU	C12-C10-C9-O3
2	D	601	1VU	N1-C8-C9-O3
2	D	601	1VU	C9-C8-N1-C7
2	D	601	1VU	C5-C6-C7-N1
2	D	601	1VU	S-C3-C4-N
2	E	601	1VU	C14-O10-P1-O8
2	E	601	1VU	C14-O10-P1-O9
2	E	601	1VU	C13-O4-P-O5
2	E	601	1VU	C5-C6-C7-N1
2	F	601	1VU	O10-C14-C15-O11
2	F	601	1VU	C14-O10-P1-O8
2	F	601	1VU	C14-O10-P1-O9
2	F	601	1VU	C14-O10-P1-O7
2	F	601	1VU	O-C2-S-C3
2	F	601	1VU	C1-C2-S-C3
2	G	601	1VU	O10-C14-C15-C23
2	G	601	1VU	C14-O10-P1-O9
2	G	601	1VU	C13-O4-P-O5
2	G	601	1VU	C13-O4-P-O6
2	G	601	1VU	C13-C10-C9-O3
2	G	601	1VU	C13-C10-C9-C8
2	G	601	1VU	C11-C10-C9-O3
2	G	601	1VU	C11-C10-C9-C8
2	G	601	1VU	C12-C10-C9-O3
2	G	601	1VU	C12-C10-C9-C8
2	G	601	1VU	O2-C8-C9-O3

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Mol	Chain	Res	Type	Atoms
2	G	601	1VU	N1-C8-C9-O3
2	G	601	1VU	C9-C8-N1-C7
2	G	601	1VU	C4-C3-S-C2
2	G	601	1VU	O-C2-S-C3
2	G	601	1VU	C1-C2-S-C3
2	G	601	1VU	C-C1-C2-S
2	G	601	1VU	C-C1-C2-O
2	H	601	1VU	O10-C14-C15-C23
2	H	601	1VU	O10-C14-C15-O11
2	H	601	1VU	C13-O4-P-O7
2	H	601	1VU	C13-O4-P-O5
2	H	601	1VU	C13-O4-P-O6
2	H	601	1VU	C5-C6-C7-N1
2	H	601	1VU	S-C3-C4-N
3	B	601	COA	CCP-O6A-P2A-O3A
3	B	601	COA	CDP-CBP-CCP-O6A
3	B	601	COA	CEP-CBP-CCP-O6A
3	B	601	COA	CAP-CBP-CCP-O6A
3	B	601	COA	C5P-C6P-C7P-N8P
3	B	601	COA	S1P-C2P-C3P-N4P
2	D	601	1VU	O2-C8-N1-C7
2	G	601	1VU	O2-C8-N1-C7
2	F	601	1VU	O10-C14-C15-C23
2	G	601	1VU	O10-C14-C15-O11
2	E	601	1VU	C22-C23-O13-P2
2	E	601	1VU	C15-C23-O13-P2
2	G	601	1VU	C15-C23-O13-P2
2	D	601	1VU	C11-C10-C13-O4
2	D	601	1VU	C12-C10-C13-O4
2	G	601	1VU	C22-C23-O13-P2
2	E	601	1VU	S-C3-C4-N
2	F	601	1VU	S-C3-C4-N
2	C	601	1VU	O1-C5-C6-C7
2	C	601	1VU	N-C5-C6-C7
2	C	601	1VU	O2-C8-C9-O3
2	D	601	1VU	O2-C8-C9-O3
2	A	601	1VU	C12-C10-C13-O4
2	A	601	1VU	C11-C10-C9-O3
2	C	601	1VU	C11-C10-C9-O3
2	C	601	1VU	C12-C10-C9-O3
2	D	601	1VU	C11-C10-C9-O3
2	E	601	1VU	O10-C14-C15-C23

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Mol	Chain	Res	Type	Atoms
2	G	601	1VU	C15-C14-O10-P1
2	E	601	1VU	O-C2-S-C3
2	H	601	1VU	O-C2-S-C3
2	A	601	1VU	C23-O13-P2-O14
2	E	601	1VU	C1-C2-S-C3
2	H	601	1VU	C1-C2-S-C3
2	C	601	1VU	C5-C6-C7-N1
2	D	601	1VU	C12-C10-C9-C8
2	C	601	1VU	C23-O13-P2-O16
2	D	601	1VU	C23-O13-P2-O15
2	E	601	1VU	C14-O10-P1-O7
2	E	601	1VU	C13-O4-P-O7
2	G	601	1VU	C14-O10-P1-O7
2	H	601	1VU	C14-O10-P1-O7
2	C	601	1VU	P-O7-P1-O8
2	G	601	1VU	P-O7-P1-O9
3	B	601	COA	P1A-O3A-P2A-O4A
2	E	601	1VU	C13-O4-P-O6
3	B	601	COA	CCP-O6A-P2A-O5A
2	E	601	1VU	C13-C10-C9-C8
2	A	601	1VU	C13-C10-C9-O3
2	C	601	1VU	C13-C10-C9-O3
2	A	601	1VU	C11-C10-C13-O4
2	C	601	1VU	C15-C14-O10-P1
2	F	601	1VU	C5-C6-C7-N1
2	G	601	1VU	C5-C6-C7-N1
3	B	601	COA	C4B-C5B-O5B-P1A
2	F	601	1VU	O1-C5-C6-C7
2	H	601	1VU	C11-C10-C13-O4
2	H	601	1VU	C12-C10-C13-O4
2	E	601	1VU	C4-C3-S-C2
2	F	601	1VU	C4-C3-S-C2
2	D	601	1VU	P1-O7-P-O5
2	E	601	1VU	P-O7-P1-O9
2	D	601	1VU	O-C2-S-C3
2	D	601	1VU	C11-C10-C9-C8
2	E	601	1VU	C11-C10-C9-C8
2	E	601	1VU	C12-C10-C9-C8
2	A	601	1VU	C23-O13-P2-O15
2	C	601	1VU	C23-O13-P2-O15
2	C	601	1VU	C14-O10-P1-O7
2	C	601	1VU	C13-O4-P-O7

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Mol	Chain	Res	Type	Atoms
2	E	601	1VU	C23-O13-P2-O15
2	F	601	1VU	C23-O13-P2-O15
2	F	601	1VU	N-C5-C6-C7
2	G	601	1VU	C23-O13-P2-O15
2	G	601	1VU	C13-O4-P-O7
2	H	601	1VU	C23-O13-P2-O16
3	B	601	COA	C3B-O3B-P3B-O9A
2	D	601	1VU	O10-C14-C15-O11
2	C	601	1VU	P-O7-P1-O9
2	D	601	1VU	C10-C13-O4-P
2	F	601	1VU	C10-C13-O4-P
2	G	601	1VU	C10-C13-O4-P
3	B	601	COA	CBP-CCP-O6A-P2A
2	A	601	1VU	C14-O10-P1-O9
2	H	601	1VU	C14-O10-P1-O8
3	B	601	COA	CCP-O6A-P2A-O4A
2	C	601	1VU	O10-C14-C15-O11
2	A	601	1VU	C13-C10-C9-C8
2	D	601	1VU	C13-C10-C9-C8

There are no ring outliers.

8 monomers are involved in 40 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	H	601	1VU	8	0
2	F	601	1VU	4	0
2	D	601	1VU	5	0
2	E	601	1VU	8	0
2	G	601	1VU	3	0
2	C	601	1VU	5	0
2	A	601	1VU	6	0
3	B	601	COA	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and

any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand 1VU H 601

Bond lengths

Bond angles

Torsions

Rings

Ligand 1VU F 601

Bond lengths

Bond angles

Torsions

Rings

Ligand 1VU D 601

Bond lengths

Bond angles

Torsions

Rings

Ligand 1VU E 601

Bond lengths

Bond angles

Torsions

Rings

Ligand 1VU G 601

Bond lengths

Bond angles

Torsions

Rings

Ligand 1VU C 601

Bond lengths

Bond angles

Torsions

Rings

Ligand 1VU A 601	
Bond lengths	Bond angles
Torsions	Rings

Ligand COA B 601	
Bond lengths	Bond angles
Torsions	Rings

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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, 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	439/524 (83%)	-0.54	6 (1%)	75	78	22, 32, 54, 85	0
1	B	452/524 (86%)	-0.55	5 (1%)	80	83	22, 31, 52, 83	0
1	C	439/524 (83%)	-0.61	1 (0%)	95	96	22, 32, 48, 65	0
1	D	439/524 (83%)	-0.26	7 (1%)	72	74	25, 37, 62, 81	0
1	E	439/524 (83%)	-0.53	6 (1%)	75	78	22, 33, 54, 76	0
1	F	452/524 (86%)	-0.51	9 (1%)	65	68	21, 32, 62, 84	0
1	G	439/524 (83%)	-0.43	8 (1%)	68	71	22, 38, 63, 88	0
1	H	441/524 (84%)	-0.32	7 (1%)	72	74	24, 40, 64, 78	0
All	All	3540/4192 (84%)	-0.47	49 (1%)	75	78	21, 34, 59, 88	0

All (49) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	375	LYS	5.6
1	A	376	GLY	5.3
1	B	53	ALA	4.8
1	A	374	ALA	4.2
1	B	54	ASP	4.0
1	E	375	LYS	4.0
1	F	53	ALA	3.9
1	H	84	ALA	3.9
1	G	375	LYS	3.9
1	D	374	ALA	3.8
1	G	376	GLY	3.8
1	E	376	GLY	3.8
1	F	362	ALA	3.6
1	G	374	ALA	3.6
1	D	86	VAL	3.6
1	B	52	SER	3.5

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Mol	Chain	Res	Type	RSRZ
1	E	374	ALA	3.5
1	G	362	ALA	3.4
1	F	51	SER	3.3
1	B	50	ASN	3.0
1	F	50	ASN	2.9
1	F	375	LYS	2.9
1	A	400	ALA	2.8
1	D	375	LYS	2.7
1	H	374	ALA	2.7
1	B	51	SER	2.7
1	G	373	THR	2.7
1	H	398	VAL	2.7
1	H	86	VAL	2.7
1	G	361	PRO	2.6
1	F	52	SER	2.6
1	A	259	ILE	2.6
1	F	361	PRO	2.5
1	D	394	ILE	2.5
1	H	376	GLY	2.5
1	F	376	GLY	2.5
1	H	242	ALA	2.4
1	C	86	VAL	2.3
1	G	369	ASP	2.3
1	E	259	ILE	2.3
1	D	376	GLY	2.3
1	E	400	ALA	2.2
1	E	397	SER	2.2
1	D	373	THR	2.2
1	H	400	ALA	2.2
1	G	364	LEU	2.2
1	A	260	GLU	2.1
1	D	392	SER	2.1
1	F	395	GLY	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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	1VU	G	601	52/52	0.71	0.29	49,76,91,95	52
2	1VU	C	601	52/52	0.75	0.24	33,61,77,93	52
2	1VU	A	601	52/52	0.76	0.22	37,64,77,91	52
2	1VU	H	601	52/52	0.77	0.24	45,75,87,99	52
2	1VU	E	601	52/52	0.80	0.21	37,65,80,91	52
2	1VU	D	601	52/52	0.81	0.22	42,65,80,93	52
3	COA	B	601	48/48	0.82	0.21	39,61,76,79	48
2	1VU	F	601	52/52	0.83	0.20	38,60,75,85	52

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around 1VU G 601:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
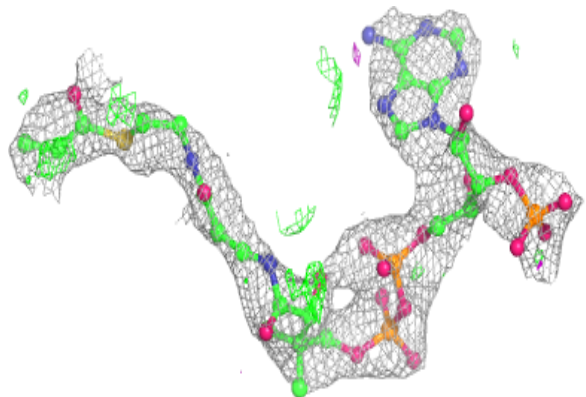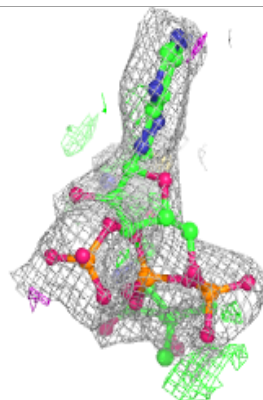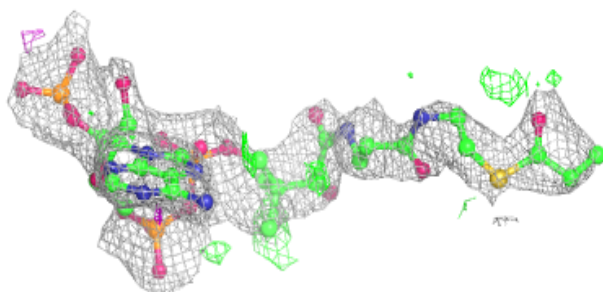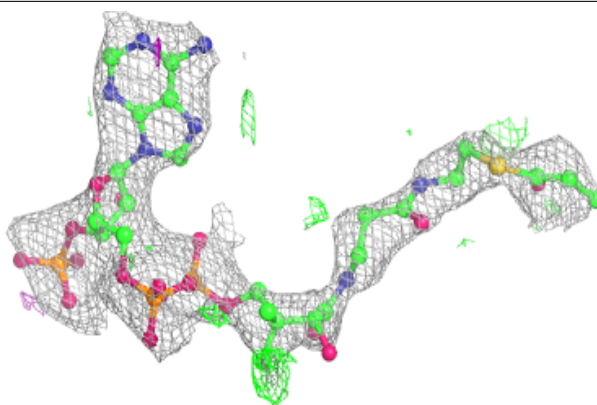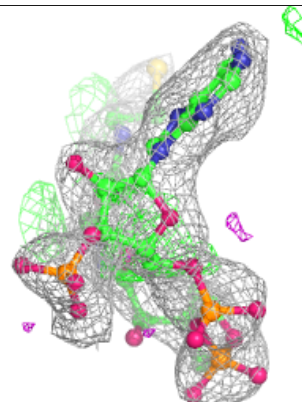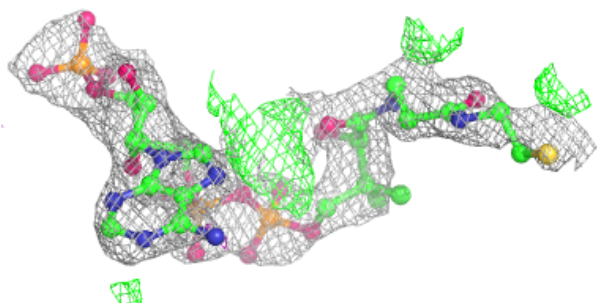mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)
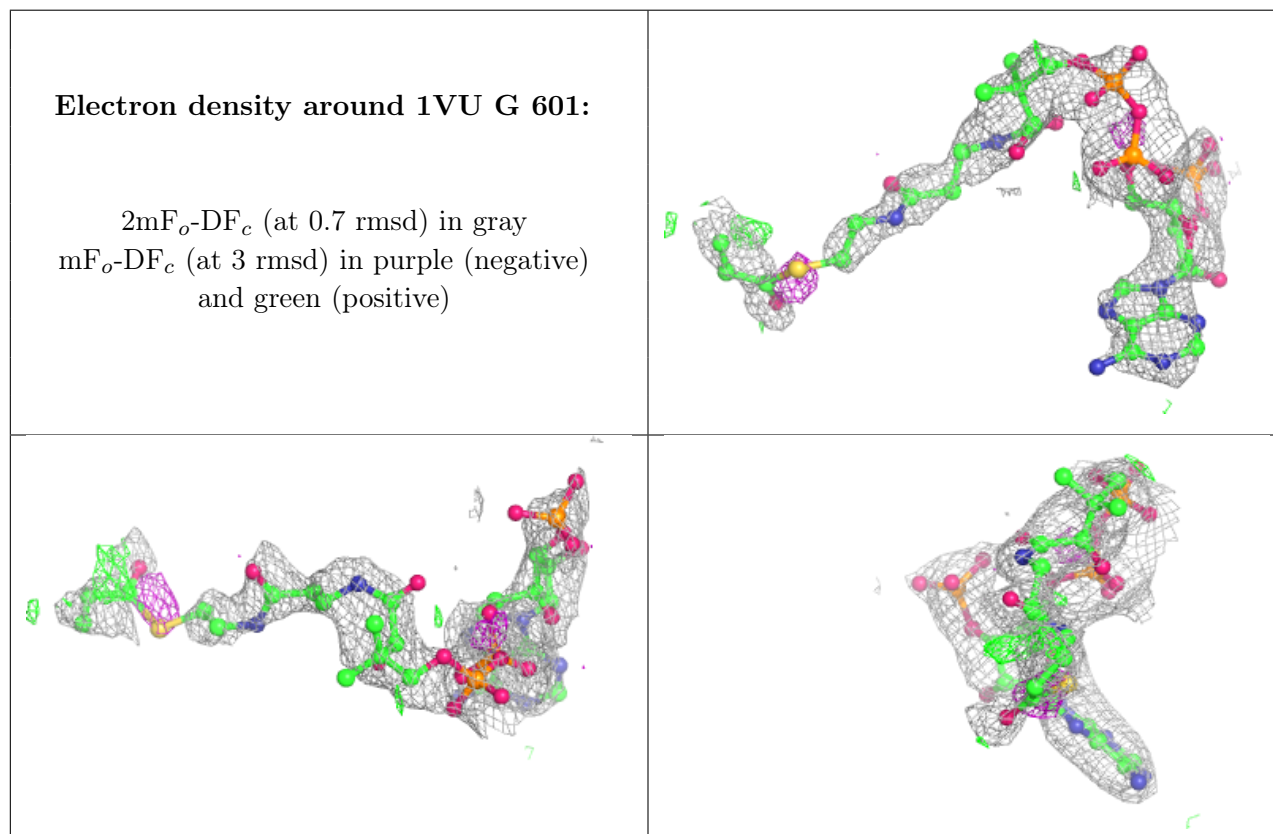
Electron density around 1VU C 601:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
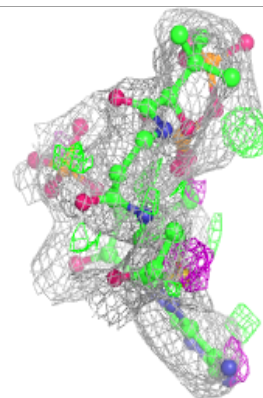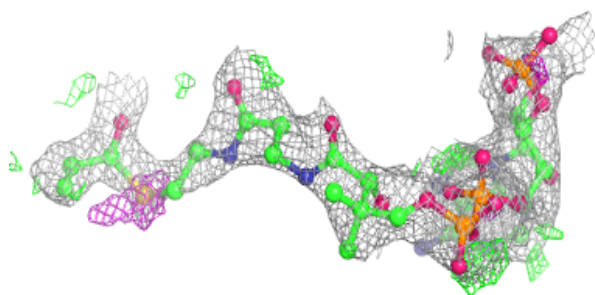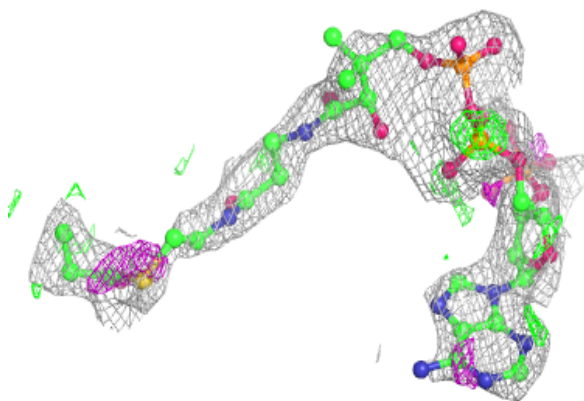
Electron density around 1VU A 601:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
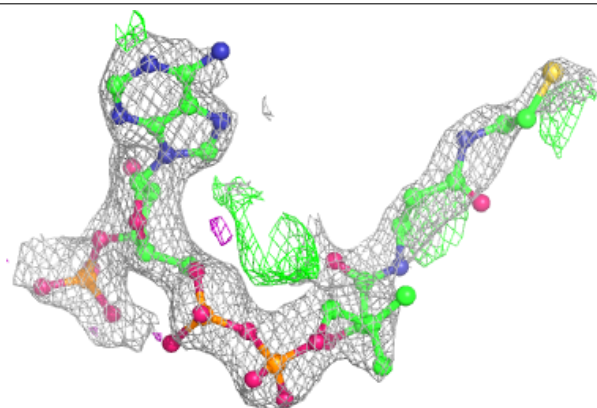$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
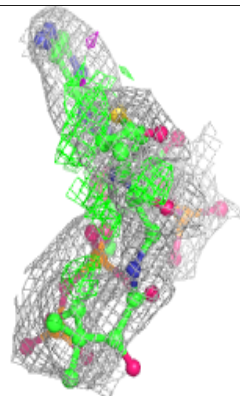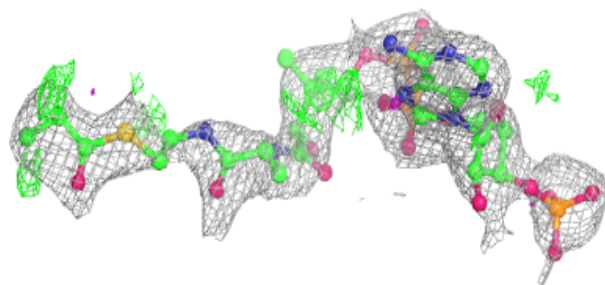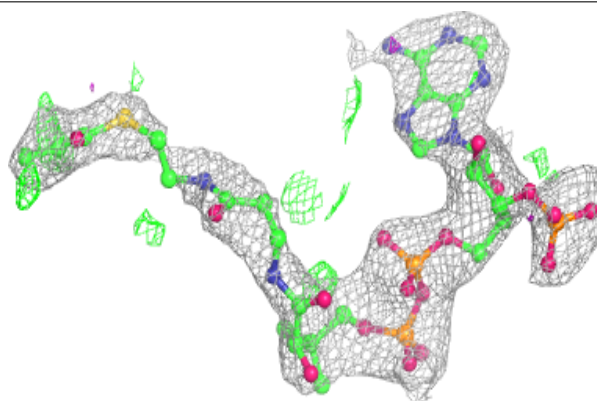
Electron density around 1VU H 601:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
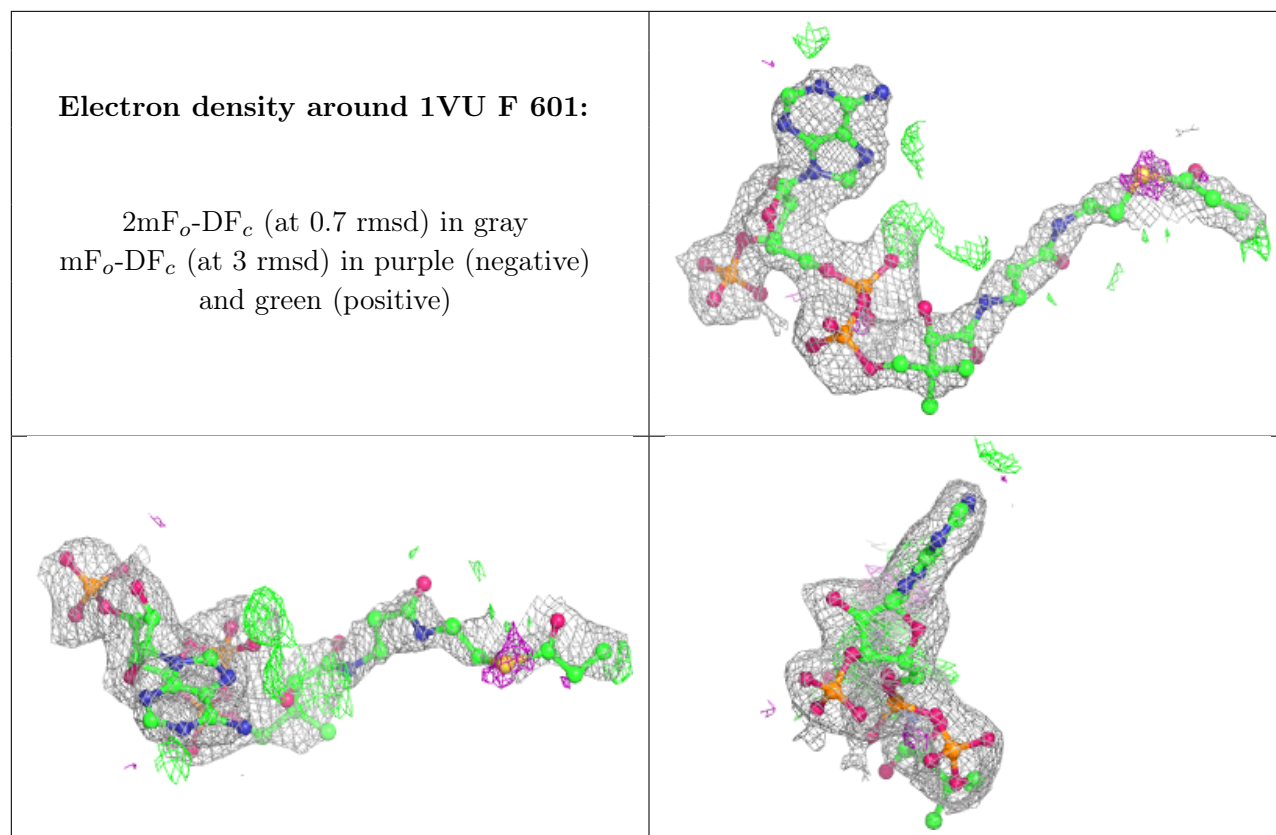mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
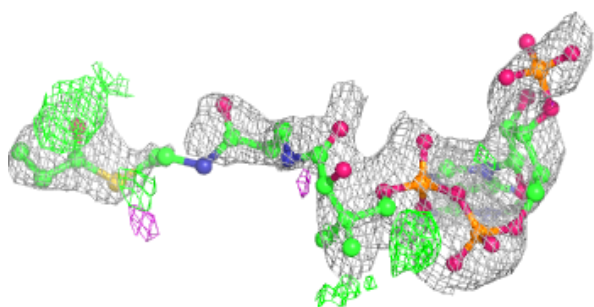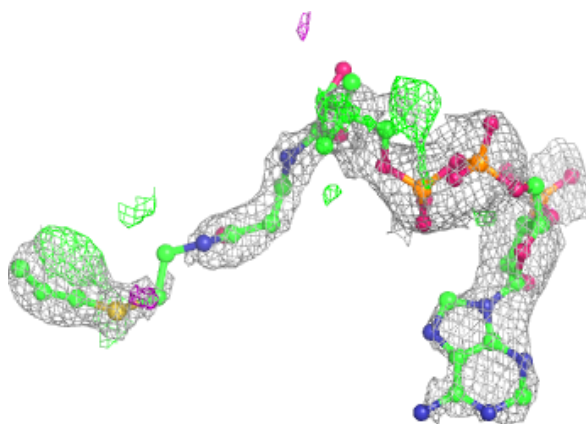
Electron density around 1VU E 601:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
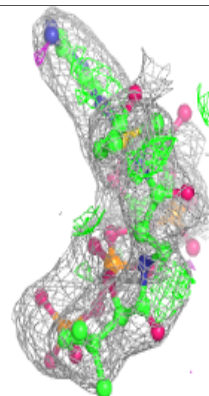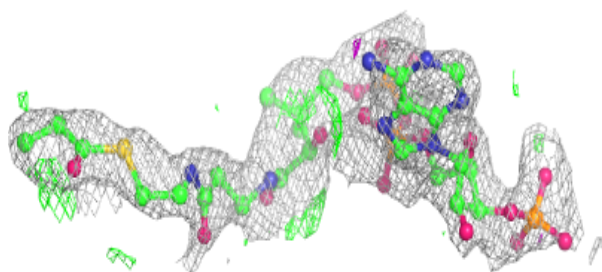
Electron density around 1VU D 601:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around COA B 601:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around 1VU F 601:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

6.5 Other polymers ⓘ

There are no such residues in this entry.