W O R L D W I D E
wwPDB
PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

Aug 10, 2020 – 02:32 AM BST

PDB ID	:	6SXN
Title	:	Crystal structure of P212121 apo form of CrtE
Authors	:	Feng, Y.; Morgan, R.M.L.; Nixon, P.J.
Deposited on	:	2019-09-26
Resolution	:	2.66 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
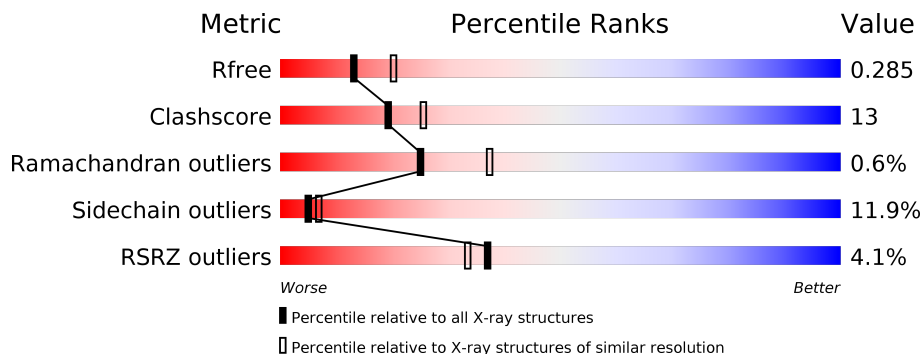with specific help available everywhere you see the (i) symbol.

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.66 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		0.285
Clashscore		13
Ramachandran outliers		0.6%
Sidechain outliers		11.9%
RSRZ outliers		4.1%

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	1332 (2.68-2.64)
Clashscore	141614	1374 (2.68-2.64)
Ramachandran outliers	138981	1349 (2.68-2.64)
Sidechain outliers	138945	1349 (2.68-2.64)
RSRZ outliers	127900	1318 (2.68-2.64)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for >=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	267	3% 76% 20% •
2	B	259	% 76% 20%
3	C	258	2% 76% 21% •
4	D	267	7% 77% 20% •
5	E	259	7% 73% 23% •
6	F	253	5% 72% 24% •

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 11367 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 Geranylgeranyl pyrophosphate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	267	1931	1221	328	371	11	0	0	0

There are 26 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	THR	deletion	UNP B1XJV9
A	?	-	ALA	deletion	UNP B1XJV9
A	?	-	THR	deletion	UNP B1XJV9
A	?	-	ALA	deletion	UNP B1XJV9
A	?	-	GLU	deletion	UNP B1XJV9
A	?	-	GLU	deletion	UNP B1XJV9
A	?	-	LEU	deletion	UNP B1XJV9
A	?	-	GLY	deletion	UNP B1XJV9
A	?	-	LYS	deletion	UNP B1XJV9
A	?	-	THR	deletion	UNP B1XJV9
A	?	-	ALA	deletion	UNP B1XJV9
A	?	-	GLY	deletion	UNP B1XJV9
A	?	-	LYS	deletion	UNP B1XJV9
A	?	-	ASP	deletion	UNP B1XJV9
A	?	-	LEU	deletion	UNP B1XJV9
A	?	-	GLU	deletion	UNP B1XJV9
A	?	-	ALA	deletion	UNP B1XJV9
A	?	-	GLN	deletion	UNP B1XJV9
A	?	-	LYS	deletion	UNP B1XJV9
A	?	-	SER	deletion	UNP B1XJV9
A	?	-	LEU	deletion	UNP B1XJV9
A	?	-	TRP	deletion	UNP B1XJV9
A	?	-	GLY	deletion	UNP B1XJV9
A	?	-	ILE	deletion	UNP B1XJV9
A	?	-	GLU	deletion	UNP B1XJV9
A	300	ALA	-	expression tag	UNP B1XJV9

• Molecule 2 is a protein called Geranylgeranyl pyrophosphate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	259	1884	1192	319	362	11	0	0	0

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	?	-	GLY	deletion	UNP B1XJV9
B	?	-	LYS	deletion	UNP B1XJV9
B	258	SER	ASP	conflict	UNP B1XJV9
B	?	-	ILE	deletion	UNP B1XJV9
B	?	-	THR	deletion	UNP B1XJV9
B	?	-	ALA	deletion	UNP B1XJV9
B	?	-	THR	deletion	UNP B1XJV9
B	?	-	ALA	deletion	UNP B1XJV9
B	?	-	GLU	deletion	UNP B1XJV9
B	?	-	GLU	deletion	UNP B1XJV9
B	?	-	LEU	deletion	UNP B1XJV9
B	?	-	GLY	deletion	UNP B1XJV9
B	?	-	LYS	deletion	UNP B1XJV9
B	?	-	THR	deletion	UNP B1XJV9
B	?	-	ALA	deletion	UNP B1XJV9
B	?	-	GLY	deletion	UNP B1XJV9
B	?	-	LYS	deletion	UNP B1XJV9
B	?	-	ASP	deletion	UNP B1XJV9
B	?	-	LEU	deletion	UNP B1XJV9
B	?	-	GLU	deletion	UNP B1XJV9
B	?	-	ALA	deletion	UNP B1XJV9
B	?	-	GLN	deletion	UNP B1XJV9
B	?	-	LYS	deletion	UNP B1XJV9
B	?	-	VAL	deletion	UNP B1XJV9
B	?	-	THR	deletion	UNP B1XJV9
B	?	-	TYR	deletion	UNP B1XJV9
B	?	-	PRO	deletion	UNP B1XJV9
B	?	-	SER	deletion	UNP B1XJV9
B	?	-	LEU	deletion	UNP B1XJV9
B	?	-	TRP	deletion	UNP B1XJV9
B	?	-	GLY	deletion	UNP B1XJV9
B	259	LEU	ILE	conflict	UNP B1XJV9

• Molecule 3 is a protein called Geranylgeranyl pyrophosphate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	258	Total 1877	C 1187	N 318	O 361	S 11	0	0	0

There are 31 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	?	-	LYS	deletion	UNP B1XJV9
C	?	-	THR	deletion	UNP B1XJV9
C	?	-	ASP	deletion	UNP B1XJV9
C	?	-	VAL	deletion	UNP B1XJV9
C	?	-	ALA	deletion	UNP B1XJV9
C	?	-	ASP	deletion	UNP B1XJV9
C	?	-	ILE	deletion	UNP B1XJV9
C	?	-	THR	deletion	UNP B1XJV9
C	?	-	ALA	deletion	UNP B1XJV9
C	?	-	THR	deletion	UNP B1XJV9
C	?	-	ALA	deletion	UNP B1XJV9
C	?	-	GLU	deletion	UNP B1XJV9
C	?	-	GLU	deletion	UNP B1XJV9
C	?	-	LEU	deletion	UNP B1XJV9
C	?	-	GLY	deletion	UNP B1XJV9
C	?	-	LYS	deletion	UNP B1XJV9
C	?	-	THR	deletion	UNP B1XJV9
C	?	-	ALA	deletion	UNP B1XJV9
C	?	-	GLY	deletion	UNP B1XJV9
C	?	-	LYS	deletion	UNP B1XJV9
C	?	-	ASP	deletion	UNP B1XJV9
C	?	-	LEU	deletion	UNP B1XJV9
C	?	-	GLU	deletion	UNP B1XJV9
C	?	-	ALA	deletion	UNP B1XJV9
C	?	-	GLN	deletion	UNP B1XJV9
C	?	-	LYS	deletion	UNP B1XJV9
C	?	-	VAL	deletion	UNP B1XJV9
C	?	-	THR	deletion	UNP B1XJV9
C	?	-	TYR	deletion	UNP B1XJV9
C	?	-	PRO	deletion	UNP B1XJV9
C	?	-	SER	deletion	UNP B1XJV9

- Molecule 4 is a protein called Geranylgeranyl pyrophosphate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	267	Total 1918	C 1212	N 327	O 368	S 11	0	0	0

There are 22 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	?	-	ASP	deletion	UNP B1XJV9
D	?	-	ILE	deletion	UNP B1XJV9
D	?	-	THR	deletion	UNP B1XJV9
D	?	-	ALA	deletion	UNP B1XJV9
D	?	-	THR	deletion	UNP B1XJV9
D	?	-	ALA	deletion	UNP B1XJV9
D	?	-	GLU	deletion	UNP B1XJV9
D	?	-	GLU	deletion	UNP B1XJV9
D	?	-	LEU	deletion	UNP B1XJV9
D	?	-	GLY	deletion	UNP B1XJV9
D	?	-	LYS	deletion	UNP B1XJV9
D	?	-	THR	deletion	UNP B1XJV9
D	?	-	ALA	deletion	UNP B1XJV9
D	?	-	GLY	deletion	UNP B1XJV9
D	?	-	LYS	deletion	UNP B1XJV9
D	?	-	ASP	deletion	UNP B1XJV9
D	?	-	LEU	deletion	UNP B1XJV9
D	?	-	GLU	deletion	UNP B1XJV9
D	?	-	ALA	deletion	UNP B1XJV9
D	?	-	GLN	deletion	UNP B1XJV9
D	?	-	LYS	deletion	UNP B1XJV9
D	?	-	VAL	deletion	UNP B1XJV9

- Molecule 5 is a protein called Geranylgeranyl pyrophosphate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	E	259	1859	1175	320	353	11	0	0	0

There are 39 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	?	-	GLY	deletion	UNP B1XJV9
E	?	-	LYS	deletion	UNP B1XJV9
E	?	-	THR	deletion	UNP B1XJV9
E	?	-	ASP	deletion	UNP B1XJV9
E	?	-	ASP	deletion	UNP B1XJV9
E	?	-	ASP	deletion	UNP B1XJV9
E	?	-	ILE	deletion	UNP B1XJV9
E	?	-	LEU	deletion	UNP B1XJV9
E	?	-	ASP	deletion	UNP B1XJV9

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Chain	Residue	Modelled	Actual	Comment	Reference
E	?	-	ILE	deletion	UNP B1XJV9
E	?	-	THR	deletion	UNP B1XJV9
E	?	-	ALA	deletion	UNP B1XJV9
E	?	-	THR	deletion	UNP B1XJV9
E	?	-	ALA	deletion	UNP B1XJV9
E	?	-	GLU	deletion	UNP B1XJV9
E	?	-	GLU	deletion	UNP B1XJV9
E	?	-	LEU	deletion	UNP B1XJV9
E	?	-	GLY	deletion	UNP B1XJV9
E	?	-	LYS	deletion	UNP B1XJV9
E	?	-	THR	deletion	UNP B1XJV9
E	?	-	ALA	deletion	UNP B1XJV9
E	?	-	GLY	deletion	UNP B1XJV9
E	?	-	LYS	deletion	UNP B1XJV9
E	?	-	ASP	deletion	UNP B1XJV9
E	?	-	LEU	deletion	UNP B1XJV9
E	?	-	GLU	deletion	UNP B1XJV9
E	?	-	ALA	deletion	UNP B1XJV9
E	?	-	GLN	deletion	UNP B1XJV9
E	?	-	LYS	deletion	UNP B1XJV9
E	?	-	VAL	deletion	UNP B1XJV9
E	?	-	THR	deletion	UNP B1XJV9
E	?	-	TYR	deletion	UNP B1XJV9
E	?	-	PRO	deletion	UNP B1XJV9
E	?	-	SER	deletion	UNP B1XJV9
E	?	-	LEU	deletion	UNP B1XJV9
E	?	-	TRP	deletion	UNP B1XJV9
E	?	-	GLY	deletion	UNP B1XJV9
E	?	-	ILE	deletion	UNP B1XJV9
E	?	-	GLU	deletion	UNP B1XJV9

- Molecule 6 is a protein called Geranylgeranyl pyrophosphate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
6	F	253	1852	1172	314	355	11	0	0	0

There are 39 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	?	-	THR	deletion	UNP B1XJV9
F	?	-	ASP	deletion	UNP B1XJV9

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Chain	Residue	Modelled	Actual	Comment	Reference
F	?	-	VAL	deletion	UNP B1XJV9
F	?	-	ALA	deletion	UNP B1XJV9
F	?	-	VAL	deletion	UNP B1XJV9
F	?	-	ILE	deletion	UNP B1XJV9
F	?	-	LEU	deletion	UNP B1XJV9
F	?	-	ASP	deletion	UNP B1XJV9
F	?	-	ILE	deletion	UNP B1XJV9
F	?	-	THR	deletion	UNP B1XJV9
F	?	-	ALA	deletion	UNP B1XJV9
F	?	-	THR	deletion	UNP B1XJV9
F	?	-	ALA	deletion	UNP B1XJV9
F	?	-	GLU	deletion	UNP B1XJV9
F	?	-	GLU	deletion	UNP B1XJV9
F	?	-	LEU	deletion	UNP B1XJV9
F	?	-	GLY	deletion	UNP B1XJV9
F	?	-	LYS	deletion	UNP B1XJV9
F	?	-	THR	deletion	UNP B1XJV9
F	?	-	ALA	deletion	UNP B1XJV9
F	?	-	GLY	deletion	UNP B1XJV9
F	?	-	LYS	deletion	UNP B1XJV9
F	?	-	ASP	deletion	UNP B1XJV9
F	?	-	LEU	deletion	UNP B1XJV9
F	?	-	GLU	deletion	UNP B1XJV9
F	?	-	ALA	deletion	UNP B1XJV9
F	?	-	GLN	deletion	UNP B1XJV9
F	?	-	LYS	deletion	UNP B1XJV9
F	?	-	VAL	deletion	UNP B1XJV9
F	?	-	THR	deletion	UNP B1XJV9
F	?	-	TYR	deletion	UNP B1XJV9
F	?	-	PRO	deletion	UNP B1XJV9
F	?	-	SER	deletion	UNP B1XJV9
F	?	-	LEU	deletion	UNP B1XJV9
F	?	-	TRP	deletion	UNP B1XJV9
F	?	-	GLY	deletion	UNP B1XJV9
F	?	-	ILE	deletion	UNP B1XJV9
F	?	-	GLU	deletion	UNP B1XJV9
F	?	-	LYS	deletion	UNP B1XJV9

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	11	Total O 11 11		0	0

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| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	B	12	Total 12	O 12	0	0
7	C	5	Total 5	O 5	0	0
7	D	2	Total 2	O 2	0	0
7	E	9	Total 9	O 9	0	0
7	F	7	Total 7	O 7	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.
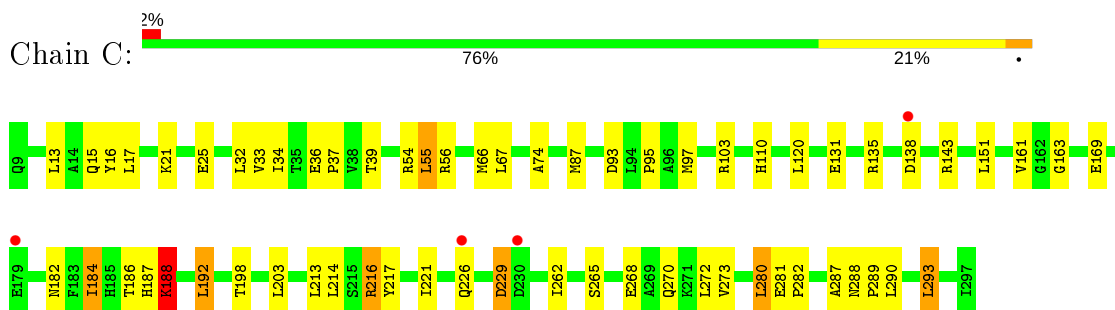
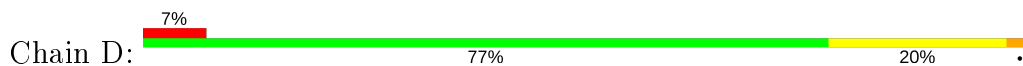- Molecule 1: Geranylgeranyl pyrophosphate synthase
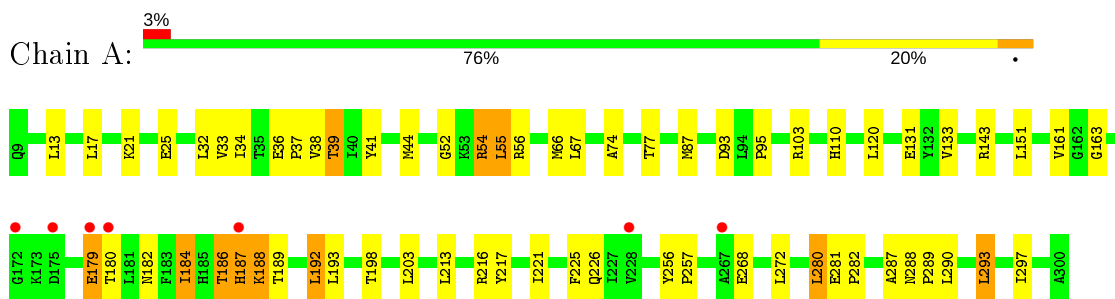
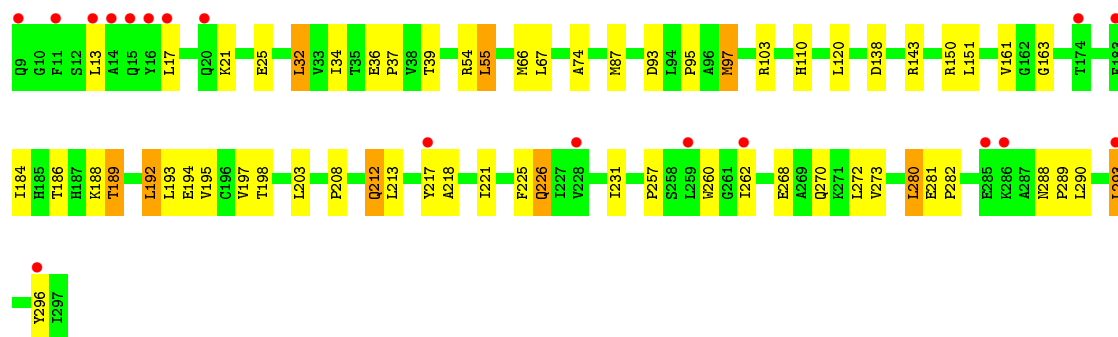- Molecule 2: Geranylgeranyl pyrophosphate synthase
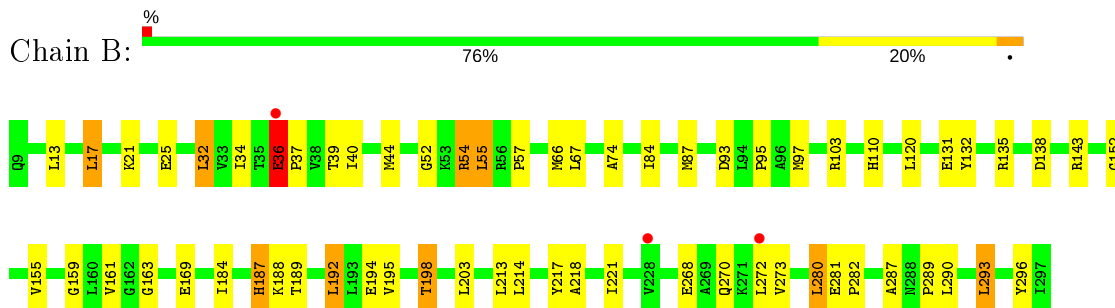
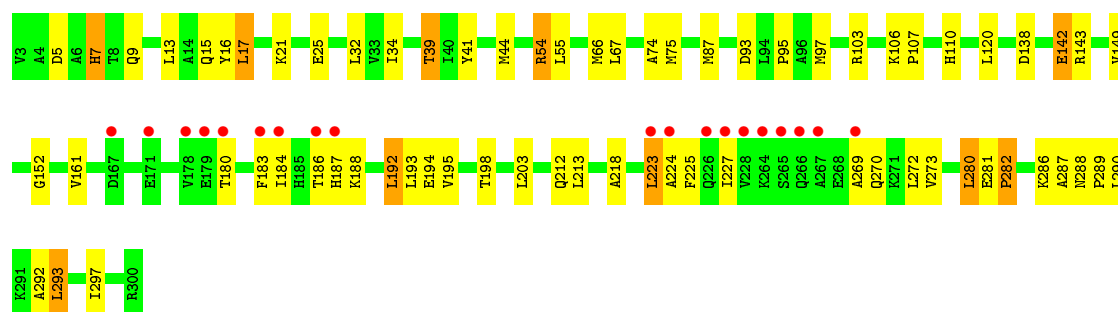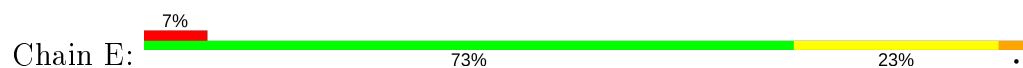- Molecule 3: Geranylgeranyl pyrophosphate synthase

- Molecule 4: Geranylgeranyl pyrophosphate synthase

Q9 G10 F11 S12 L13 A14 Q15 Y16 L17 Q20 K21 E25 L32 V33 I34 T35 E36 P37 V38 T39 R54 L55 M66 L67 A74 M87 D93 L94 P95 A96 M97 R103 H110 L120 D138 R143 R150 L151 V161 G162 G163 T174 F183

I184 H185 T186 H187 K188 T189 L192 L193 E194 V195 C196 V197 T198 L203 P208 Q212 L213 Y217 A218 I221 F225 Q226 I227 V228 I231 P257 S258 L259 W260 G261 I262 E268 A269 Q270 K271 L272 V273 L280 E281 P282 E285 K286 A287 N288 P289 L290 L293

Y296 I297

• **Molecule 5: Geranylgeranyl pyrophosphate synthase**

Chain E:

7%

73%   23%   •

V3 A4 D5 A6 H7 T8 Q9 L13 A14 Q15 Y16 L17 K21 E25 L32 V33 I34 T39 I40 Y41 M44 R54 L55 M66 L67 A74 M75 M87 D93 L94 P95 A96 M97 R103 K106 P107 H110 L120 D138 E142 R143 V149

G152 V161 D167 E171 V178 E179 T180 F183 I184 H185 T186 H187 K188 L192 L193 E194 V195 T198 L203 Q212 L213 A218 L223 A224 F225 Q226 I227 V228 K264 S265 Q266 A267 E268 A269 Q270 K271 L272 V273 L280 E281 P282 K286 A287 N288 P289 L290

K291 A292 L293 I297 R300

• **Molecule 6: Geranylgeranyl pyrophosphate synthase**

Chain F:

5%

72%   24%   •

Q9 L13 Y16 L17 Q18 K21 E25 L32 V33 I34 T35 E36 P37 V38 T39 I40 Y41 M44 G52 K53 R54 L55 R56 P57 M66 L67 A74 M75 M87 D93 L94 P95 A96 M97 R103 H110 L120 R143 L151 V161 G162 G163

T180 L181 N182 F183 T186 H187 K188 T189 G190 A191 L192 L193 E194 V197 T198 L203 L213 L214 S215 R216 Y217 A218 I221 F225 Q226 I227 V228 D229 D230 S265 E268 A269 Q270 K271 L272 V273 L280 E281 P282 A287 N288 P289 L290 L293 A294 E295 Y296 I297 V298 N299

R300

4   Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	102.56Å 122.97Å 134.19Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	68.02 – 2.66 67.92 – 2.66	Depositor EDS
% Data completeness (in resolution range)	99.2 (68.02-2.66) 99.3 (67.92-2.66)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.06 (at 2.65Å)	Xtriage
Refinement program	REFMAC 5.8.0257	Depositor
R, R_{free}	0.228 , 0.285 0.230 , 0.285	Depositor DCC
R_{free} test set	2407 reflections (4.90%)	wwPDB-VP
Wilson B-factor (Å^2)	57.0	Xtriage
Anisotropy	0.178	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 66.1	EDS
L-test for twinning[2]	$< |L| > = 0.48$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	11367	wwPDB-VP
Average B, all atoms (Å^2)	70.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.56% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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 (i)

5.1 Standard geometry (i)

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	0.49	0/1954	0.78	0/2656
2	B	0.48	0/1906	0.78	0/2589
3	C	0.52	1/1900 (0.1%)	0.83	2/2581 (0.1%)
4	D	0.45	0/1943	0.79	1/2644 (0.0%)
5	E	0.50	0/1882	0.83	2/2559 (0.1%)
6	F	0.48	0/1875	0.79	0/2547
All	All	0.49	1/11460 (0.0%)	0.80	5/15576 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	188	LYS	C-O	5.75	1.34	1.23

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	216	ARG	CG-CD-NE	10.49	133.82	111.80
5	E	186	THR	CB-CA-C	7.30	131.31	111.60
4	D	212	GLN	CB-CA-C	5.62	121.65	110.40
3	C	229	ASP	CB-CA-C	5.32	121.04	110.40
5	E	212	GLN	CB-CA-C	5.16	120.73	110.40

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1931	0	1891	53	0
2	B	1884	0	1853	49	0
3	C	1877	0	1849	47	0
4	D	1918	0	1867	53	0
5	E	1859	0	1816	52	3
6	F	1852	0	1839	56	3
7	A	11	0	0	4	0
7	B	12	0	0	1	0
7	C	5	0	0	1	0
7	D	2	0	0	1	0
7	E	9	0	0	2	0
7	F	7	0	0	1	0
All	All	11367	0	11115	289	3

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 13.

The worst 5 of 289 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)
2:B:36:GLU:HB3	2:B:37:PRO:CD	1.52	1.30
2:B:36:GLU:HB3	2:B:37:PRO:HD2	1.28	1.14
4:D:66:MET:HE3	4:D:290:LEU:HD12	1.21	1.14
6:F:186:THR:CG2	6:F:226:GLN:NE2	2.11	1.13
6:F:186:THR:HG23	6:F:226:GLN:NE2	1.64	1.10

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:180:THR:CB	6:F:187:HIS:NE2[1_655]	1.70	0.50
5:E:180:THR:N	6:F:187:HIS:NE2[1_655]	2.12	0.08
5:E:180:THR:CA	6:F:187:HIS:NE2[1_655]	2.18	0.02

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	259/267 (97%)	249 (96%)	10 (4%)	0	100	100
2	B	251/259 (97%)	237 (94%)	12 (5%)	2 (1%)	19	29
3	C	252/258 (98%)	240 (95%)	11 (4%)	1 (0%)	34	48
4	D	263/267 (98%)	247 (94%)	14 (5%)	2 (1%)	19	29
5	E	253/259 (98%)	237 (94%)	12 (5%)	4 (2%)	9	14
6	F	247/253 (98%)	239 (97%)	8 (3%)	0	100	100
All	All	1525/1563 (98%)	1449 (95%)	67 (4%)	9 (1%)	25	37

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	36	GLU
3	C	262	ILE
4	D	262	ILE
2	B	296	TYR
4	D	231	ILE

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	187/211 (89%)	164 (88%)	23 (12%)	4	6
2	B	184/205 (90%)	164 (89%)	20 (11%)	6	9
3	C	184/203 (91%)	160 (87%)	24 (13%)	4	5
4	D	183/211 (87%)	164 (90%)	19 (10%)	7	10
5	E	176/203 (87%)	156 (89%)	20 (11%)	5	8
6	F	184/199 (92%)	159 (86%)	25 (14%)	3	5
All	All	1098/1232 (89%)	967 (88%)	131 (12%)	5	7

5 of 131 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	C	198	THR
4	D	87	MET
6	F	189	THR
3	C	216	ARG
3	C	293	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 22 such sidechains are listed below:

Mol	Chain	Res	Type
4	D	153	GLN
5	E	7	HIS
6	F	226	GLN
4	D	164	GLN
4	D	288	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	B	3
1	A	3
5	E	2
3	C	2
6	F	2
4	D	1

The worst 5 of 13 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	235:THR	C	254:VAL	N	15.68
1	D	232:LEU	C	255:THR	N	14.53
1	C	232:LEU	C	259:LEU	N	12.09
1	A	257:PRO	C	264:LYS	N	12.08
1	E	228:VAL	C	264:LYS	N	11.77

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	267/267 (100%)	0.09	7 (2%)	56	52	32, 61, 127, 191	0
2	B	259/259 (100%)	0.04	3 (1%)	79	77	29, 55, 109, 156	0
3	C	258/258 (100%)	0.04	4 (1%)	72	69	30, 52, 119, 165	0
4	D	267/267 (100%)	0.38	18 (6%)	17	14	41, 79, 137, 178	0
5	E	259/259 (100%)	0.24	19 (7%)	15	12	31, 59, 158, 239	0
6	F	253/253 (100%)	0.25	13 (5%)	28	25	34, 64, 144, 192	0
All	All	1563/1563 (100%)	0.17	64 (4%)	37	33	29, 63, 132, 239	0

The worst 5 of 64 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
5	E	183	PHE	6.4
4	D	9	GLN	6.1
6	F	228	VAL	5.6
5	E	184	ILE	5.2
5	E	226	GLN	5.1

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.