



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 12, 2024 – 05:33 PM EDT

PDB ID : 1GPA  
Title : STRUCTURAL MECHANISM FOR GLYCOGEN PHOSPHORYLASE  
CONTROL BY PHOSPHORYLATION AND AMP  
Authors : Barford, D.; Hu, S.-H.; Johnson, L.N.  
Deposited on : 1990-11-13  
Resolution : 2.90 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36.2

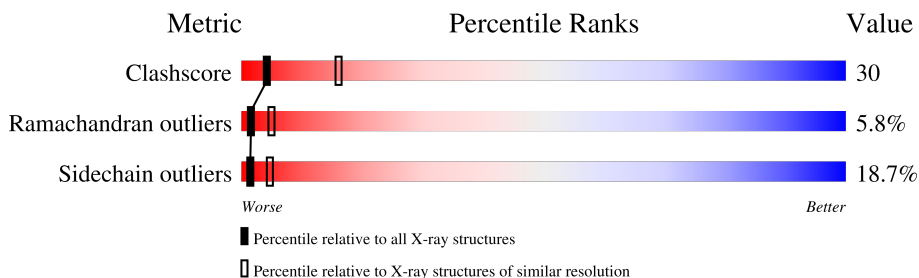
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.90 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)

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

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	842	35% 42% 16% 5% •
1	B	842	37% 41% 16% • •
1	C	842	35% 40% 18% 6% •
1	D	842	31% 42% 20% 6% •

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 27029 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 GLYCOGEN PHOSPHORYLASE A.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	P	S			
1	A	828	Total 6732	C 4287	N 1190	O 1224	P 1	S 30	44	0	0
1	B	827	Total 6733	C 4286	N 1189	O 1227	P 1	S 30	24	0	0
1	C	828	Total 6732	C 4287	N 1190	O 1224	P 1	S 30	0	0	0
1	D	828	Total 6732	C 4287	N 1190	O 1224	P 1	S 30	0	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	380	ILE	LEU	CONFLICT	UNP P00489
B	380	ILE	LEU	CONFLICT	UNP P00489
C	380	ILE	LEU	CONFLICT	UNP P00489
D	380	ILE	LEU	CONFLICT	UNP P00489

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		

- Molecule 3 is PYRIDOXAL-5'-PHOSPHATE (three-letter code: PLP) (formula: C<sub>8</sub>H<sub>10</sub>NO<sub>6</sub>P).



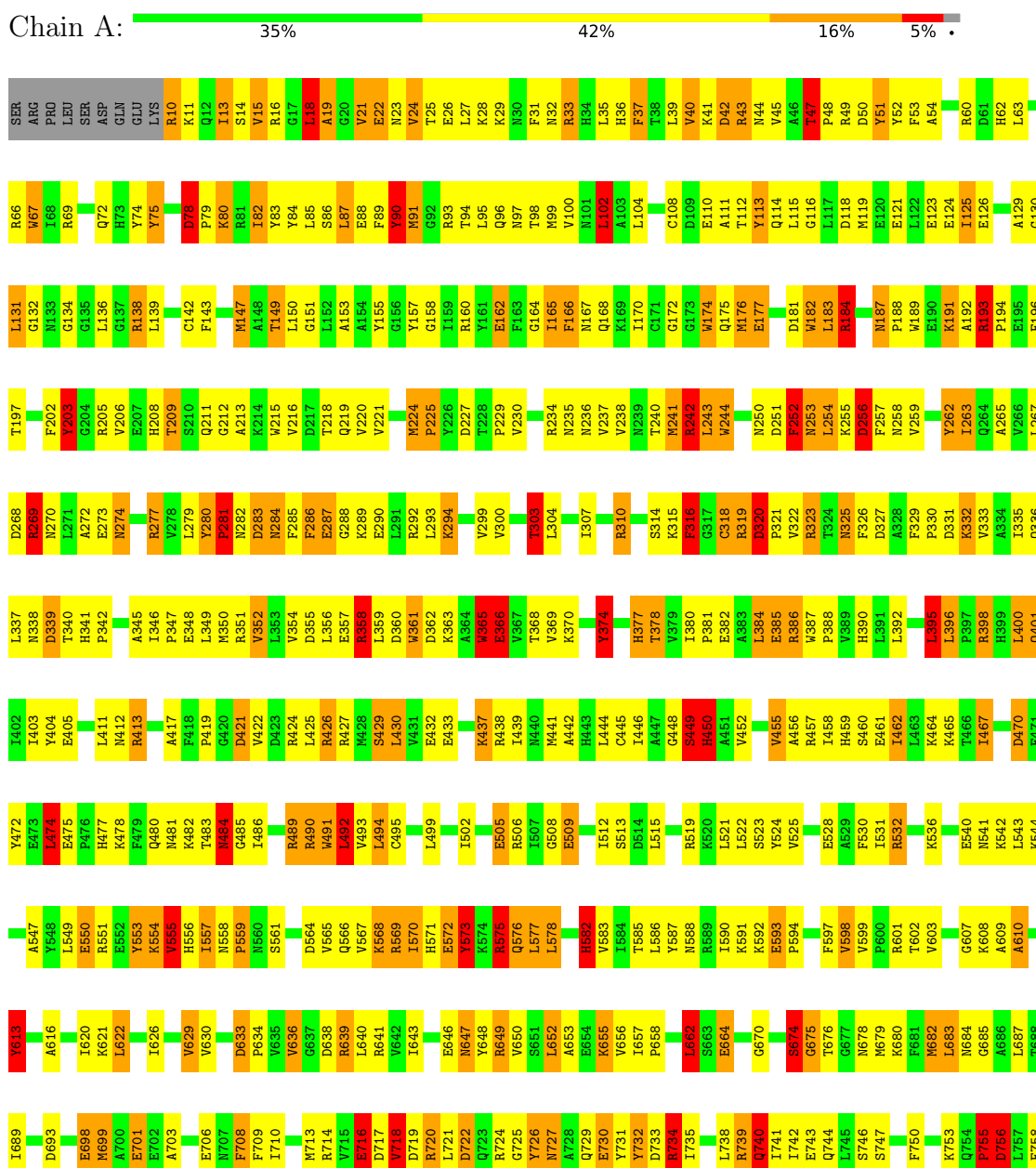
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
3	A	1	Total	C	N	O	P	0	0
			15	8	1	5	1		
3	B	1	Total	C	N	O	P	0	0
			15	8	1	5	1		
3	C	1	Total	C	N	O	P	0	0
			15	8	1	5	1		
3	D	1	Total	C	N	O	P	0	0
			15	8	1	5	1		

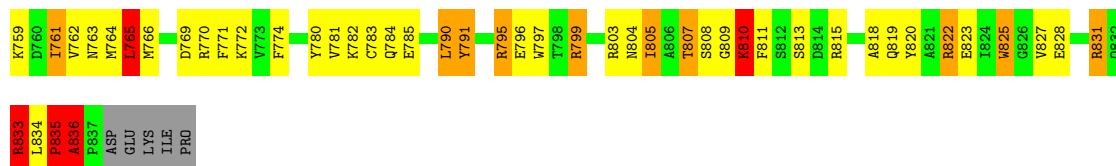
### 3 Residue-property plots

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. 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. 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.

Note EDS was not executed.

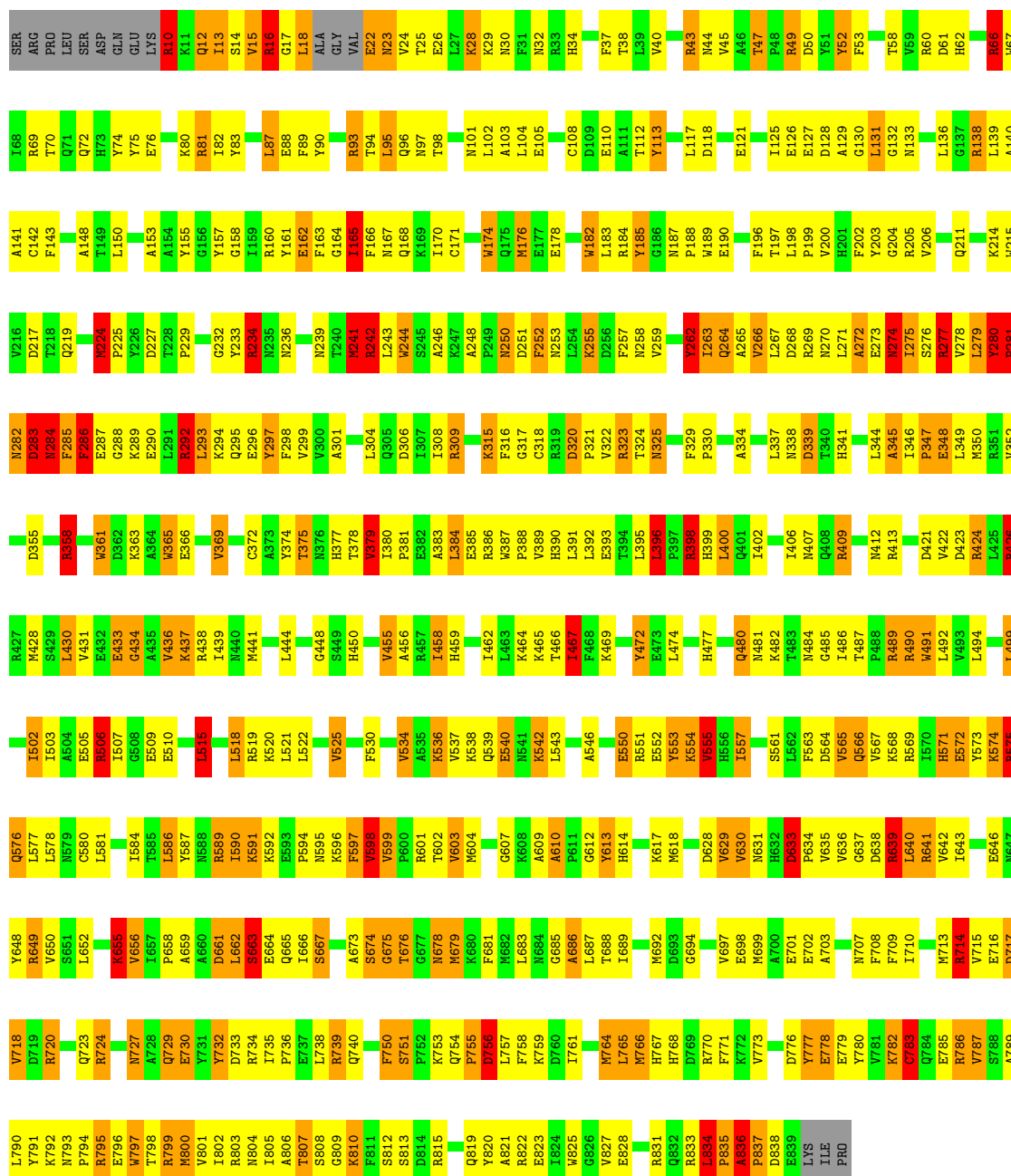
- Molecule 1: GLYCOGEN PHOSPHORYLASE A





• Molecule 1: GLYCOGEN PHOSPHORYLASE A

Chain B: 37% 41% 16% ••



• Molecule 1: GLYCOGEN PHOSPHORYLASE A

Chain C: 35% 40% 18% 6% •





S808	L745	L683	H614	E550	T487	I406	N338	E273	T209	L136
G809	S746	M684	R617	R551	F488	M407	D389	M274	S210	G137
R810	F750	L687	M618	E552	R489	Q408	T340	R277	Q211	R138
S813	S751	T688	L619	Y553	R490	R409	H341	W278	K214	L139
R814	F752	T689	T620	K554	W491	F410	P342	L279	W215	A140
R815	K753	G690	K621	H555	L492	R413	S343	Y280	V216	A141
A818	Q754	T691	L622	H556	L494	V414	L344	D217	D218	C142
A821	F755	M692	T623	H557	C495	E348	E348	T218	L144	F143
R822	D756	D693	T624	M558	C495	R424	L349	Q219	D145	L144
S823	D757	G694	A625	P559	N496	L425	M350	L222	S146	M147
R824	F758	A695	L626	S561	F497	R426	R351	A223	L152	L152
E828	D760	V697	D628	F563	A500	M428	L352	M224	A153	A153
R831	I761	E698	V629	D584	E501	S429	V354	P225	A154	A154
Q832	N762	M699	V630	V585	I502	L430	D355	Y226	A155	A154
R833	N763	A700	Q566	Q566	I503	G434	L356	D227	Y155	Y155
L834	N764	E701	V567	I504	A504	A435	E357	T228		
P835	L765	F702	K568	E505	E505	R358	R292	P229		
A836	K766	A703	R569	R506	R506	L359	L293	V230		
P837	H767	G704	I570	G508	G508	W361	K294	P231		
ASP	D769	E705	H571	E509	E509	A364	Y297	Y233		
GLU	R770	E706	E572	E509	E509	A364	F298	R234		
LYS	R770	N707	Y573	E510	E510	A364	W299	N235		
ILE	F771	F708	K574	Y511	Y511	L444	V299	N236		
PRO	K772	F709	R575	I512	I512	C445	A302	N237		
	F773	I710	Q576	S513	S513	T368	T303	V237		
	F774	F711	L577	D514	D514	C445	T303	V238		
	Y777	G712	L578	L515	L515	V369	F311	N239		
	E778	M713	M579	D516	D516	S449	D306	T240		
	E779	R714	G580	Q517	Q517	H450	D306	W241		
	Y780	L715	L581	L518	L518	A451	I307	R242		
	Y781	E716	L582	R519	R519	V452	I308	W244		
	K782	D717	V648	K520	K520	V452	R309	L243		
	G783	F718	R649	L521	L521	A456	F311	W244		
	Q784	D719	R649	L522	L522	R457	K312	A246		
	E785	L721	L652	S523	S523	I458	S313	K247		
	R786	L722	K655	Y524	Y524	H459	S314	K248		
	Y787	Q723	V656	R525	R525	S460	R315	P249		
	S788	R724	V657	D526	D526	E461	F316	N250		
	A789	G725	P658	D527	D527	L462	G317	D251		
	L790	F726	A659	F530	F530	L463	C318	F252		
	Y791	Y726	A660	K464	K464	L463	F252	N253		
	K792	M727	A661	K465	K465	W367	R319	L254		
	N793	E730	D661	E531	E531	P368	D320	K255		
	R794	F731	S663	R532	R532	V368	P321	L254		
	E795	Y732	E664	D533	D533	H390	V322	D256		
	E796	D733	O665	F534	F534	L391	R323	D256		
	Y797	R734	V666	A535	A535	L392	T324	F257		
	F798	I735	S674	V599	V599	L392	N325	N258		
	R799	F736	T675	P600	P600	Y472	F326	V259		
	M800	E737	G675	R601	R601	L395	D327	G260		
	W801	L738	T676	V603	V603	L396	A328	G261		
	I802	L738	G677	M604	M604	P397	R398	Y262		
	S803	Q740	M678	L605	L605	R398	H399	L263		
	M804	I741	M679	I605	I605	L400	H477	Q264		
	M805	I742	R680	A610	A610	Q401	L400	A265		
	A806	E743	F681	P611	P611	I462	D331	D268		
	T807	Q744	M682	Y613	Y613	I462	K332	R269		
						I486	I335	A272		
							I336			
							I337			

## 4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	119.00Å 190.00Å 88.20Å 90.00° 109.35° 90.00°	Depositor
Resolution (Å)	(Not available) – 2.90	Depositor
% Data completeness (in resolution range)	(Not available) ((Not available)-2.90)	Depositor
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	X-PLOR	Depositor
R, $R_{free}$	0.176 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	27029	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	22.0	wwPDB-VP

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: SEP, PLP, SO4

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	1.12	5/6873 (0.1%)	2.11	267/9300 (2.9%)
1	B	1.07	5/6873 (0.1%)	2.08	259/9298 (2.8%)
1	C	1.11	5/6873 (0.1%)	2.10	264/9300 (2.8%)
1	D	1.09	7/6873 (0.1%)	2.19	266/9300 (2.9%)
All	All	1.10	22/27492 (0.1%)	2.12	1056/37198 (2.8%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	11
1	B	0	11
1	C	0	9
1	D	0	15
All	All	0	46

The worst 5 of 22 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	24	VAL	C-N	26.58	1.95	1.34
1	A	756	ASP	N-CA	15.44	1.77	1.46
1	A	47	THR	N-CA	-11.92	1.22	1.46
1	D	22	GLU	CD-OE2	6.78	1.33	1.25
1	A	543	LEU	N-CA	6.35	1.59	1.46

The worst 5 of 1056 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	24	VAL	O-C-N	26.50	165.09	122.70
1	D	251	ASP	CA-CB-CG	25.67	169.87	113.40
1	D	24	VAL	CA-C-N	-20.73	71.59	117.20
1	D	575	ARG	NE-CZ-NH1	18.09	129.35	120.30
1	D	281	PRO	O-C-N	17.08	150.02	122.70

There are no chirality outliers.

5 of 46 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	113	TYR	Sidechain
1	A	203	TYR	Sidechain
1	A	320	ASP	Peptide
1	A	380	ILE	Peptide
1	A	51	TYR	Sidechain

## 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	6732	0	6675	411	1
1	B	6733	0	6667	363	0
1	C	6732	0	6674	391	0
1	D	6732	0	6674	454	1
2	A	10	0	0	0	0
2	B	10	0	0	0	0
2	C	10	0	0	1	0
2	D	10	0	0	0	0
3	A	15	0	7	1	0
3	B	15	0	7	1	0
3	C	15	0	7	1	0
3	D	15	0	6	1	0
All	All	27029	0	26717	1582	1

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 30.

The worst 5 of 1582 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:756:ASP:N	1:A:756:ASP:CA	1.77	1.46
1:C:279:LEU:HD22	1:C:281:PRO:CD	1.62	1.28
1:C:279:LEU:HD22	1:C:281:PRO:CG	1.70	1.22
1:B:283:ASP:OD2	1:B:383:ALA:HB1	1.39	1.21
1:C:283:ASP:OD2	1:C:383:ALA:HB1	1.37	1.19

All (1) 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)
1:A:21:VAL:O	1:D:370:LYS:NZ[2_646]	1.97	0.23

## 5.3 Torsion angles [\(i\)](#)

### 5.3.1 Protein backbone [\(i\)](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	825/842 (98%)	656 (80%)	130 (16%)	39 (5%)	2	8
1	B	822/842 (98%)	674 (82%)	105 (13%)	43 (5%)	2	6
1	C	825/842 (98%)	673 (82%)	100 (12%)	52 (6%)	1	4
1	D	825/842 (98%)	635 (77%)	133 (16%)	57 (7%)	1	3
All	All	3297/3368 (98%)	2638 (80%)	468 (14%)	191 (6%)	1	5

5 of 191 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	19	ALA
1	A	166	PHE
1	A	252	PHE
1	A	256	ASP
1	A	265	ALA

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	714/730 (98%)	585 (82%)	129 (18%)	1	5
1	B	715/730 (98%)	600 (84%)	115 (16%)	2	7
1	C	714/730 (98%)	574 (80%)	140 (20%)	1	4
1	D	714/730 (98%)	563 (79%)	151 (21%)	1	3
All	All	2857/2920 (98%)	2322 (81%)	535 (19%)	1	5

5 of 535 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	400	LEU
1	D	490	ARG
1	D	398	ARG
1	D	727	ASN
1	B	555	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 89 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	481	ASN
1	D	377	HIS
1	C	576	GLN
1	D	23	ASN
1	D	450	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
1	SEP	D	14	1	8,9,10	1.22	0	8,12,14	13.73	1 (12%)
1	SEP	C	14	1	8,9,10	1.30	1 (12%)	8,12,14	4.09	2 (25%)
1	SEP	A	14	1	8,9,10	1.17	0	8,12,14	2.86	2 (25%)
1	SEP	B	14	1	8,9,10	1.09	0	8,12,14	2.49	2 (25%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	SEP	D	14	1	-	4/5/8/10	-
1	SEP	C	14	1	-	2/5/8/10	-
1	SEP	A	14	1	-	5/5/8/10	-
1	SEP	B	14	1	-	5/5/8/10	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	14	SEP	CA-N	-2.11	1.41	1.48

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	14	SEP	OG-CB-CA	-38.78	70.41	108.14
1	C	14	SEP	OG-CB-CA	11.01	118.86	108.14
1	A	14	SEP	OG-CB-CA	7.29	115.24	108.14
1	B	14	SEP	OG-CB-CA	6.21	114.19	108.14
1	A	14	SEP	O2P-P-OG	2.87	114.38	106.73

There are no chirality outliers.

5 of 16 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	14	SEP	N-CA-CB-OG
1	A	14	SEP	CA-CB-OG-P
1	A	14	SEP	CB-OG-P-O2P
1	A	14	SEP	CB-OG-P-O3P
1	B	14	SEP	CA-CB-OG-P

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	D	14	SEP	1	0
1	C	14	SEP	1	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

12 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
3	PLP	B	999	1	15,15,16	1.30	2 (13%)	20,22,23	1.71	2 (10%)
2	SO4	D	902	-	4,4,4	0.52	0	6,6,6	0.34	0
3	PLP	C	999	1	15,15,16	1.36	1 (6%)	20,22,23	1.22	2 (10%)
2	SO4	A	901	-	4,4,4	0.39	0	6,6,6	0.46	0
3	PLP	A	999	1	15,15,16	2.20	4 (26%)	20,22,23	1.48	4 (20%)
2	SO4	A	902	-	4,4,4	0.36	0	6,6,6	0.33	0
2	SO4	B	901	-	4,4,4	0.31	0	6,6,6	0.40	0
2	SO4	C	901	-	4,4,4	0.25	0	6,6,6	0.43	0
2	SO4	C	902	-	4,4,4	0.41	0	6,6,6	0.46	0
2	SO4	D	901	-	4,4,4	0.26	0	6,6,6	0.71	0
2	SO4	B	902	-	4,4,4	0.45	0	6,6,6	0.39	0



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	PLP	D	999	1	15,15,16	1.46	2 (13%)	20,22,23	1.14	2 (10%)

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
3	PLP	C	999	1	-	1/6/6/8	0/1/1/1
3	PLP	D	999	1	-	2/6/6/8	0/1/1/1
3	PLP	A	999	1	-	3/6/6/8	0/1/1/1
3	PLP	B	999	1	-	2/6/6/8	0/1/1/1

The worst 5 of 9 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	999	PLP	C5-C4	-5.49	1.34	1.40
3	C	999	PLP	C3-C2	-3.93	1.37	1.40
3	A	999	PLP	C3-C2	-3.58	1.37	1.40
3	D	999	PLP	C3-C2	-3.45	1.37	1.40
3	A	999	PLP	C2A-C2	-3.11	1.45	1.50

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	999	PLP	O4P-C5A-C5	5.39	119.62	109.35
3	A	999	PLP	C4A-C4-C5	-4.17	116.64	120.94
3	C	999	PLP	O4P-C5A-C5	3.53	116.08	109.35
3	D	999	PLP	O4P-C5A-C5	2.69	114.47	109.35
3	C	999	PLP	O3P-P-O4P	2.64	113.75	106.73

There are no chirality outliers.

5 of 8 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	999	PLP	C5A-O4P-P-O2P
3	A	999	PLP	C5A-O4P-P-O3P
3	B	999	PLP	C5A-O4P-P-O2P
3	B	999	PLP	C5A-O4P-P-O3P
3	D	999	PLP	C5A-O4P-P-O2P

There are no ring outliers.

5 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	999	PLP	1	0
3	C	999	PLP	1	0
3	A	999	PLP	1	0
2	C	902	SO4	1	0
3	D	999	PLP	1	0

## 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
1	C	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	C	24:VAL	C	25:THR	N	1.95

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

### 6.4 Ligands

EDS was not executed - this section is therefore empty.

### 6.5 Other polymers

EDS was not executed - this section is therefore empty.