



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 6, 2026 – 05:29 PM UTC

PDB ID : 6XJ5 / pdb_00006xj5
Title : Carboxypeptidase G2 modified with a versatile bioconjugate for metalloprotein design
Authors : Yachnin, B.J.; Hansen, W.A.; Khare, S.D.
Deposited on : 2020-06-22
Resolution : 3.11 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

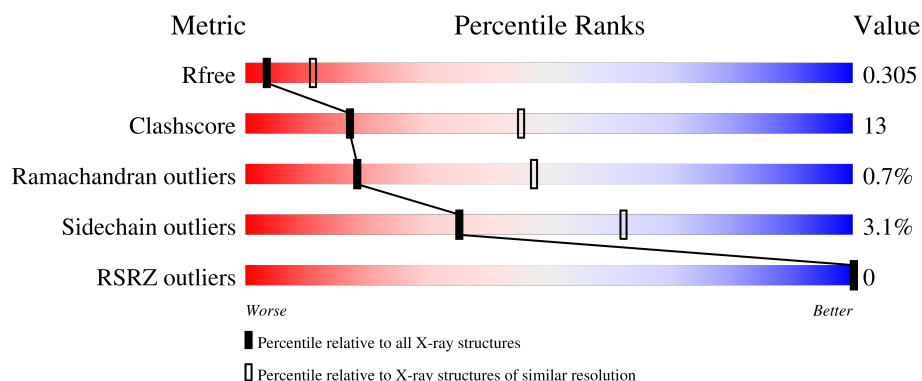
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.11 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1816 (3.14-3.10)
Clashscore	190562	1906 (3.14-3.10)
Ramachandran outliers	187476	1802 (3.14-3.10)
Sidechain outliers	187428	1802 (3.14-3.10)
RSRZ outliers	180081	1816 (3.14-3.10)

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

Mol	Chain	Length	Quality of chain
1	A	411	
1	C	411	
1	E	411	
1	G	411	
2	B	411	

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Mol	Chain	Length	Quality of chain
2	D	411	 74%18%• 6%
2	F	411	 74%20%• 5%
2	H	411	 75%18%• 5%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 21541 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 Carboxypeptidase G2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	389	Total	C	N	O	S	0	0	0
			2703	1700	464	532	7			
1	C	389	Total	C	N	O	S	0	0	0
			2671	1686	458	520	7			
1	E	389	Total	C	N	O	S	0	0	0
			2654	1665	453	531	5			
1	G	387	Total	C	N	O	S	0	0	0
			2648	1667	451	523	7			

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	5	MET	-	initiating methionine	UNP P06621
A	6	GLY	-	expression tag	UNP P06621
A	7	SER	-	expression tag	UNP P06621
A	8	ASP	-	expression tag	UNP P06621
A	9	LYS	-	expression tag	UNP P06621
A	10	ILE	-	expression tag	UNP P06621
A	11	HIS	-	expression tag	UNP P06621
A	12	HIS	-	expression tag	UNP P06621
A	13	HIS	-	expression tag	UNP P06621
A	14	HIS	-	expression tag	UNP P06621
A	15	HIS	-	expression tag	UNP P06621
A	16	HIS	-	expression tag	UNP P06621
A	17	GLU	-	expression tag	UNP P06621
A	18	ASN	-	expression tag	UNP P06621
A	19	LEU	-	expression tag	UNP P06621
A	20	TYR	-	expression tag	UNP P06621
A	21	PHE	-	expression tag	UNP P06621
A	22	GLN	-	expression tag	UNP P06621
A	23	GLY	-	expression tag	UNP P06621
A	203	CYS	SER	engineered mutation	UNP P06621
C	5	MET	-	initiating methionine	UNP P06621

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Chain	Residue	Modelled	Actual	Comment	Reference
C	6	GLY	-	expression tag	UNP P06621
C	7	SER	-	expression tag	UNP P06621
C	8	ASP	-	expression tag	UNP P06621
C	9	LYS	-	expression tag	UNP P06621
C	10	ILE	-	expression tag	UNP P06621
C	11	HIS	-	expression tag	UNP P06621
C	12	HIS	-	expression tag	UNP P06621
C	13	HIS	-	expression tag	UNP P06621
C	14	HIS	-	expression tag	UNP P06621
C	15	HIS	-	expression tag	UNP P06621
C	16	HIS	-	expression tag	UNP P06621
C	17	GLU	-	expression tag	UNP P06621
C	18	ASN	-	expression tag	UNP P06621
C	19	LEU	-	expression tag	UNP P06621
C	20	TYR	-	expression tag	UNP P06621
C	21	PHE	-	expression tag	UNP P06621
C	22	GLN	-	expression tag	UNP P06621
C	23	GLY	-	expression tag	UNP P06621
C	203	CYS	SER	engineered mutation	UNP P06621
E	5	MET	-	initiating methionine	UNP P06621
E	6	GLY	-	expression tag	UNP P06621
E	7	SER	-	expression tag	UNP P06621
E	8	ASP	-	expression tag	UNP P06621
E	9	LYS	-	expression tag	UNP P06621
E	10	ILE	-	expression tag	UNP P06621
E	11	HIS	-	expression tag	UNP P06621
E	12	HIS	-	expression tag	UNP P06621
E	13	HIS	-	expression tag	UNP P06621
E	14	HIS	-	expression tag	UNP P06621
E	15	HIS	-	expression tag	UNP P06621
E	16	HIS	-	expression tag	UNP P06621
E	17	GLU	-	expression tag	UNP P06621
E	18	ASN	-	expression tag	UNP P06621
E	19	LEU	-	expression tag	UNP P06621
E	20	TYR	-	expression tag	UNP P06621
E	21	PHE	-	expression tag	UNP P06621
E	22	GLN	-	expression tag	UNP P06621
E	23	GLY	-	expression tag	UNP P06621
E	203	CYS	SER	engineered mutation	UNP P06621
G	5	MET	-	initiating methionine	UNP P06621
G	6	GLY	-	expression tag	UNP P06621
G	7	SER	-	expression tag	UNP P06621

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Chain	Residue	Modelled	Actual	Comment	Reference
G	8	ASP	-	expression tag	UNP P06621
G	9	LYS	-	expression tag	UNP P06621
G	10	ILE	-	expression tag	UNP P06621
G	11	HIS	-	expression tag	UNP P06621
G	12	HIS	-	expression tag	UNP P06621
G	13	HIS	-	expression tag	UNP P06621
G	14	HIS	-	expression tag	UNP P06621
G	15	HIS	-	expression tag	UNP P06621
G	16	HIS	-	expression tag	UNP P06621
G	17	GLU	-	expression tag	UNP P06621
G	18	ASN	-	expression tag	UNP P06621
G	19	LEU	-	expression tag	UNP P06621
G	20	TYR	-	expression tag	UNP P06621
G	21	PHE	-	expression tag	UNP P06621
G	22	GLN	-	expression tag	UNP P06621
G	23	GLY	-	expression tag	UNP P06621
G	203	CYS	SER	engineered mutation	UNP P06621

- Molecule 2 is a protein called Carboxypeptidase G2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	389	Total	C	N	O	S	0	0	0
			2692	1693	456	537	6			
2	D	386	Total	C	N	O	S	0	0	0
			2642	1661	453	523	5			
2	F	389	Total	C	N	O	S	0	0	0
			2635	1657	456	517	5			
2	H	389	Total	C	N	O	S	0	0	0
			2710	1703	471	530	6			

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	5	MET	-	initiating methionine	UNP P06621
B	6	GLY	-	expression tag	UNP P06621
B	7	SER	-	expression tag	UNP P06621
B	8	ASP	-	expression tag	UNP P06621
B	9	LYS	-	expression tag	UNP P06621
B	10	ILE	-	expression tag	UNP P06621
B	11	HIS	-	expression tag	UNP P06621
B	12	HIS	-	expression tag	UNP P06621
B	13	HIS	-	expression tag	UNP P06621

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Chain	Residue	Modelled	Actual	Comment	Reference
B	14	HIS	-	expression tag	UNP P06621
B	15	HIS	-	expression tag	UNP P06621
B	16	HIS	-	expression tag	UNP P06621
B	17	GLU	-	expression tag	UNP P06621
B	18	ASN	-	expression tag	UNP P06621
B	19	LEU	-	expression tag	UNP P06621
B	20	TYR	-	expression tag	UNP P06621
B	21	PHE	-	expression tag	UNP P06621
B	22	GLN	-	expression tag	UNP P06621
B	23	GLY	-	expression tag	UNP P06621
B	203	V44	SER	engineered mutation	UNP P06621
D	5	MET	-	initiating methionine	UNP P06621
D	6	GLY	-	expression tag	UNP P06621
D	7	SER	-	expression tag	UNP P06621
D	8	ASP	-	expression tag	UNP P06621
D	9	LYS	-	expression tag	UNP P06621
D	10	ILE	-	expression tag	UNP P06621
D	11	HIS	-	expression tag	UNP P06621
D	12	HIS	-	expression tag	UNP P06621
D	13	HIS	-	expression tag	UNP P06621
D	14	HIS	-	expression tag	UNP P06621
D	15	HIS	-	expression tag	UNP P06621
D	16	HIS	-	expression tag	UNP P06621
D	17	GLU	-	expression tag	UNP P06621
D	18	ASN	-	expression tag	UNP P06621
D	19	LEU	-	expression tag	UNP P06621
D	20	TYR	-	expression tag	UNP P06621
D	21	PHE	-	expression tag	UNP P06621
D	22	GLN	-	expression tag	UNP P06621
D	23	GLY	-	expression tag	UNP P06621
D	203	V44	SER	engineered mutation	UNP P06621
F	5	MET	-	initiating methionine	UNP P06621
F	6	GLY	-	expression tag	UNP P06621
F	7	SER	-	expression tag	UNP P06621
F	8	ASP	-	expression tag	UNP P06621
F	9	LYS	-	expression tag	UNP P06621
F	10	ILE	-	expression tag	UNP P06621
F	11	HIS	-	expression tag	UNP P06621
F	12	HIS	-	expression tag	UNP P06621
F	13	HIS	-	expression tag	UNP P06621
F	14	HIS	-	expression tag	UNP P06621
F	15	HIS	-	expression tag	UNP P06621

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Chain	Residue	Modelled	Actual	Comment	Reference
F	16	HIS	-	expression tag	UNP P06621
F	17	GLU	-	expression tag	UNP P06621
F	18	ASN	-	expression tag	UNP P06621
F	19	LEU	-	expression tag	UNP P06621
F	20	TYR	-	expression tag	UNP P06621
F	21	PHE	-	expression tag	UNP P06621
F	22	GLN	-	expression tag	UNP P06621
F	23	GLY	-	expression tag	UNP P06621
F	203	V44	SER	engineered mutation	UNP P06621
H	5	MET	-	initiating methionine	UNP P06621
H	6	GLY	-	expression tag	UNP P06621
H	7	SER	-	expression tag	UNP P06621
H	8	ASP	-	expression tag	UNP P06621
H	9	LYS	-	expression tag	UNP P06621
H	10	ILE	-	expression tag	UNP P06621
H	11	HIS	-	expression tag	UNP P06621
H	12	HIS	-	expression tag	UNP P06621
H	13	HIS	-	expression tag	UNP P06621
H	14	HIS	-	expression tag	UNP P06621
H	15	HIS	-	expression tag	UNP P06621
H	16	HIS	-	expression tag	UNP P06621
H	17	GLU	-	expression tag	UNP P06621
H	18	ASN	-	expression tag	UNP P06621
H	19	LEU	-	expression tag	UNP P06621
H	20	TYR	-	expression tag	UNP P06621
H	21	PHE	-	expression tag	UNP P06621
H	22	GLN	-	expression tag	UNP P06621
H	23	GLY	-	expression tag	UNP P06621
H	203	V44	SER	engineered mutation	UNP P06621

- Molecule 3 is ZINC ION (CCD ID: ZN) (formula: Zn).

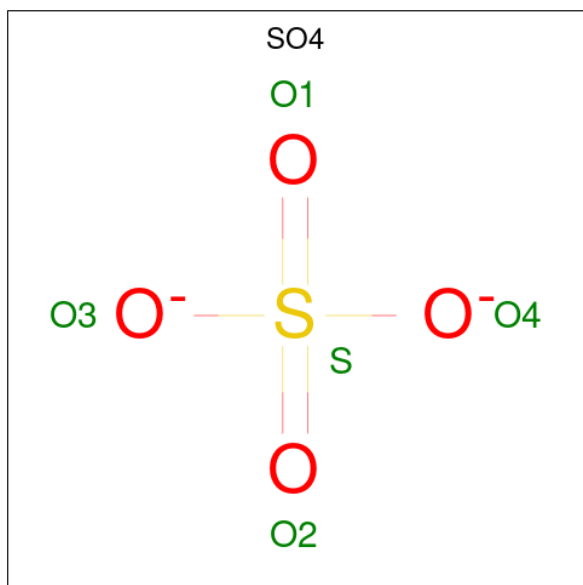
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	7	Total Zn 7 7	0	0
3	B	5	Total Zn 5 5	0	0
3	C	5	Total Zn 5 5	0	0
3	D	9	Total Zn 9 9	0	0
3	E	8	Total Zn 8 8	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	F	9	Total	Zn	0	0
			9	9		
3	G	3	Total	Zn	0	0
			3	3		
3	H	10	Total	Zn	0	0
			10	10		

- Molecule 4 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	C	1	Total	O	S	0	0
			5	4	1		
4	C	1	Total	O	S	0	0
			5	4	1		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	18	Total	O	0	0
			18	18		
5	B	14	Total	O	0	0
			14	14		
5	C	13	Total	O	0	0
			13	13		
5	D	15	Total	O	0	0
			15	15		

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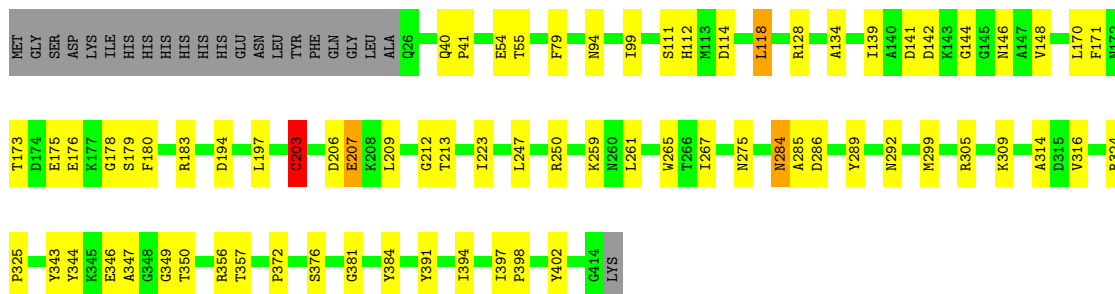
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	E	14	Total 14	O 14	0	0
5	F	18	Total 18	O 18	0	0
5	G	8	Total 8	O 8	0	0
5	H	20	Total 20	O 20	0	0

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.

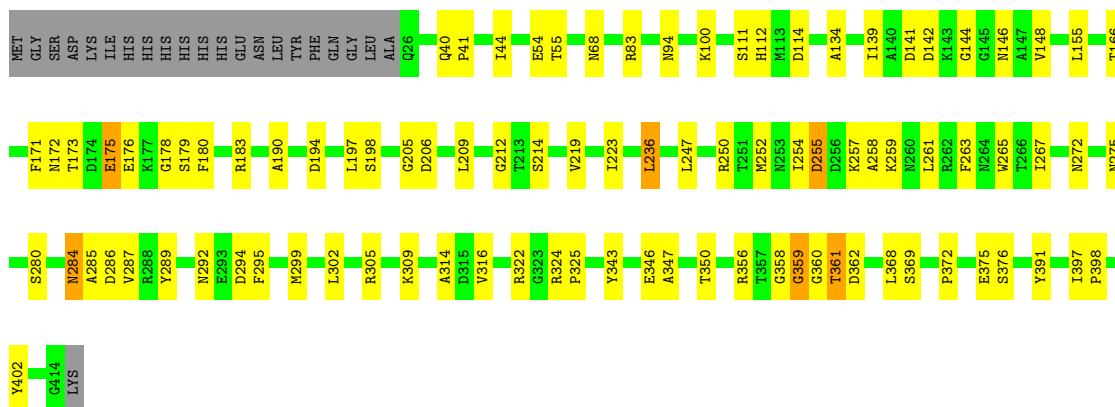
• Molecule 1: Carboxypeptidase G2

Chain A: 



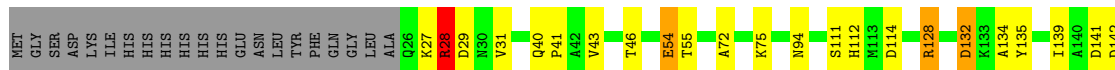
• Molecule 1: Carboxypeptidase G2

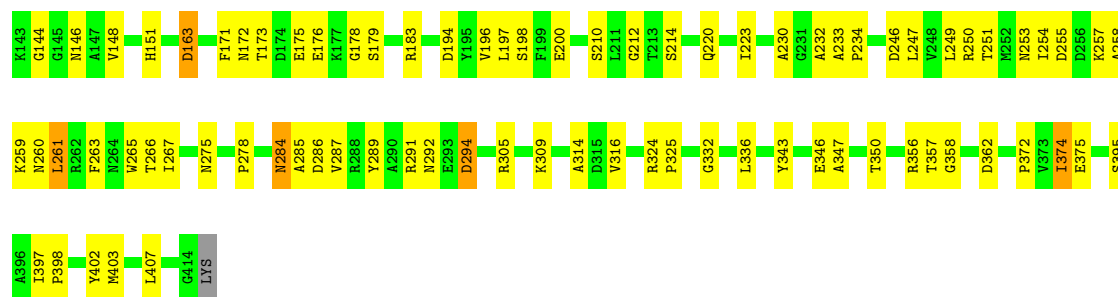
Chain C: 



• Molecule 1: Carboxypeptidase G2

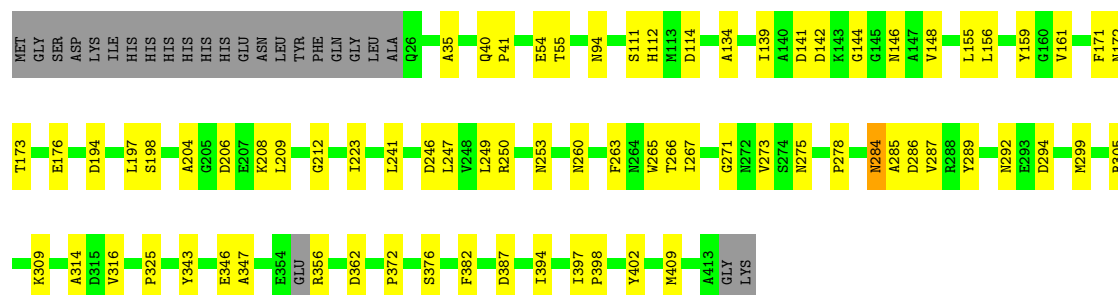
Chain E: 





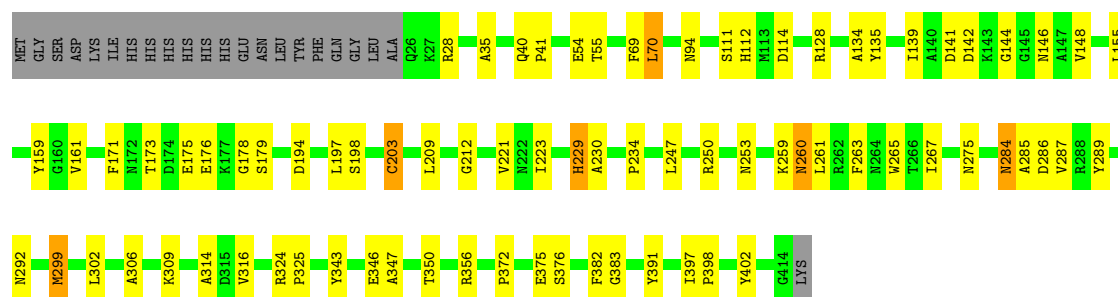
- Molecule 1: Carboxypeptidase G2

Chain G: 76% 18% 6%



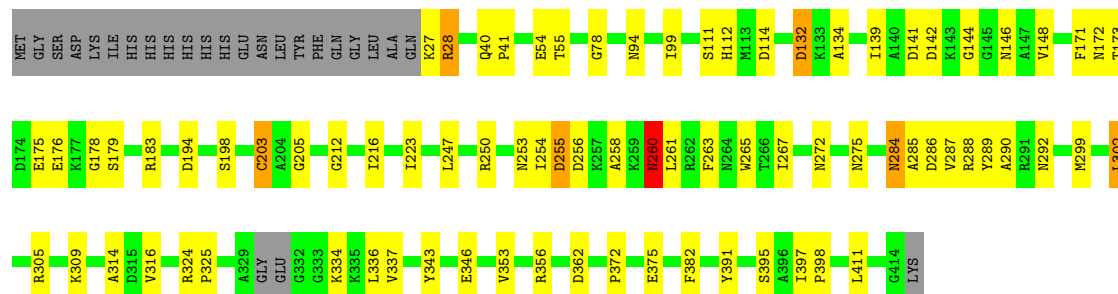
- Molecule 2: Carboxypeptidase G2

Chain B: 75% 18% 5%



- Molecule 2: Carboxypeptidase G2

Chain D: 74% 18% 6%



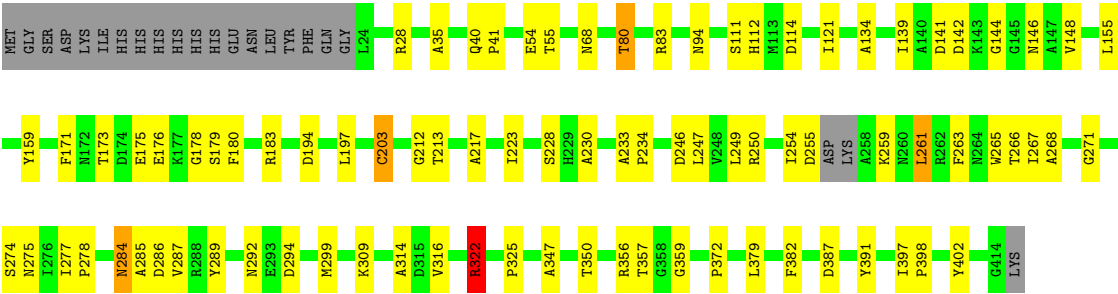
- Molecule 2: Carboxypeptidase G2

Chain F:

74%

20%

• 5%



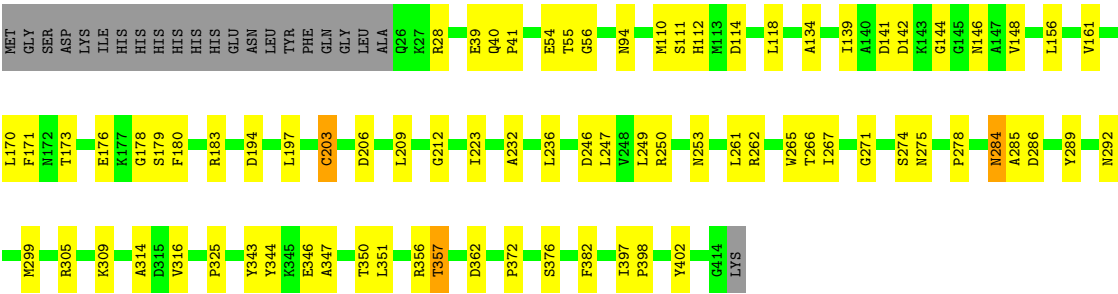
● Molecule 2: Carboxypeptidase G2

Chain H:

75%

18%

• 5%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	72.12Å 188.46Å 124.50Å 90.00° 90.17° 90.00°	Depositor
Resolution (Å)	41.50 – 3.11 41.50 – 3.11	Depositor EDS
% Data completeness (in resolution range)	99.8 (41.50-3.11) 99.0 (41.50-3.11)	Depositor EDS
R_{merge}	0.39	Depositor
R_{sym}	0.39	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.43 (at 3.12Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.271 , 0.309 0.271 , 0.305	Depositor DCC
R_{free} test set	2981 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	74.9	Xtriage
Anisotropy	0.080	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 41.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	0.340 for h,-k,-l	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	21541	wwPDB-VP
Average B, all atoms (Å ²)	72.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.25% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: SO4, V44, ZN

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	1.02	0/2741	1.51	0/3732
1	C	1.03	0/2709	1.51	0/3697
1	E	1.04	0/2692	1.53	0/3677
1	G	1.04	0/2686	1.52	0/3667
2	B	1.04	0/2710	1.50	0/3698
2	D	1.04	0/2657	1.51	0/3628
2	F	1.04	0/2651	1.53	0/3620
2	H	1.02	0/2727	1.52	0/3714
All	All	1.03	0/21573	1.52	0/29433

There are no bond length outliers.

There are no bond angle outliers.

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	2703	0	2529	54	0
1	C	2671	0	2484	74	0
1	E	2654	0	2407	96	0
1	G	2648	0	2422	56	0
2	B	2692	0	2435	63	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	2642	0	2392	59	0
2	F	2635	0	2363	72	0
2	H	2710	0	2505	68	0
3	A	7	0	0	0	0
3	B	5	0	0	0	0
3	C	5	0	0	0	0
3	D	9	0	0	0	0
3	E	8	0	0	0	0
3	F	9	0	0	0	0
3	G	3	0	0	0	0
3	H	10	0	0	0	0
4	C	10	0	0	1	0
5	A	18	0	0	1	0
5	B	14	0	0	1	0
5	C	13	0	0	0	0
5	D	15	0	0	0	0
5	E	14	0	0	1	0
5	F	18	0	0	1	0
5	G	8	0	0	0	0
5	H	20	0	0	3	0
All	All	21541	0	19537	514	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 13.

The worst 5 of 514 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:E:255:ASP:HB2	1:E:258:ALA:HB2	1.11	1.11
1:E:28:ARG:HH11	1:E:28:ARG:HB2	1.09	1.06
1:E:255:ASP:CB	1:E:258:ALA:HB2	1.86	1.05
1:C:112:HIS:CD2	1:C:175:GLU:HG2	2.01	0.96
1:E:255:ASP:HB2	1:E:258:ALA:CB	1.96	0.94

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	387/411 (94%)	354 (92%)	30 (8%)	3 (1%)	16	45
1	C	387/411 (94%)	346 (89%)	34 (9%)	7 (2%)	6	26
1	E	387/411 (94%)	352 (91%)	33 (8%)	2 (0%)	24	55
1	G	383/411 (93%)	353 (92%)	29 (8%)	1 (0%)	36	65
2	B	386/411 (94%)	348 (90%)	35 (9%)	3 (1%)	16	45
2	D	381/411 (93%)	347 (91%)	31 (8%)	3 (1%)	16	45
2	F	384/411 (93%)	349 (91%)	33 (9%)	2 (0%)	24	55
2	H	386/411 (94%)	355 (92%)	29 (8%)	2 (0%)	24	55
All	All	3081/3288 (94%)	2804 (91%)	254 (8%)	23 (1%)	18	47

5 of 23 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	206	ASP
1	C	255	ASP
1	C	257	LYS
1	E	28	ARG
2	F	322	ARG

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	239/315 (76%)	233 (98%)	6 (2%)	42	66

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	231/315 (73%)	224 (97%)	7 (3%)	36	63
1	E	227/315 (72%)	215 (95%)	12 (5%)	20	49
1	G	228/315 (72%)	225 (99%)	3 (1%)	61	75
2	B	229/314 (73%)	221 (96%)	8 (4%)	32	60
2	D	225/314 (72%)	215 (96%)	10 (4%)	25	54
2	F	215/314 (68%)	209 (97%)	6 (3%)	38	64
2	H	236/314 (75%)	232 (98%)	4 (2%)	53	72
All	All	1830/2516 (73%)	1774 (97%)	56 (3%)	35	62

5 of 56 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	D	302	LEU
2	H	357	THR
1	E	183	ARG
2	H	286	ASP
1	G	198	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 42 such sidechains are listed below:

Mol	Chain	Res	Type
2	F	220	GLN
1	G	284	ASN
2	F	275	ASN
1	G	146	ASN
2	H	146	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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
2	V44	H	203	2,3	19,21,22	2.57	5 (26%)	19,28,30	3.79	11 (57%)
2	V44	B	203	2,3	19,21,22	2.49	4 (21%)	19,28,30	4.05	9 (47%)
2	V44	D	203	2,3	19,21,22	2.46	4 (21%)	19,28,30	4.05	10 (52%)
2	V44	F	203	2,3	19,21,22	2.52	5 (26%)	19,28,30	4.39	10 (52%)

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	V44	H	203	2,3	-	7/14/16/18	0/2/2/2
2	V44	B	203	2,3	-	4/14/16/18	0/2/2/2
2	V44	D	203	2,3	-	4/14/16/18	0/2/2/2
2	V44	F	203	2,3	-	6/14/16/18	0/2/2/2

The worst 5 of 18 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	203	V44	C5-N3	6.15	1.40	1.32
2	B	203	V44	C1-N1	5.97	1.39	1.32
2	D	203	V44	C1-N1	5.75	1.39	1.32
2	B	203	V44	C5-N3	5.74	1.39	1.32
2	H	203	V44	C5-N3	5.65	1.39	1.32

The worst 5 of 40 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	203	V44	N4-C5-N3	-10.62	105.37	111.44
2	F	203	V44	N2-C1-N1	-9.96	105.75	111.44
2	B	203	V44	N2-C1-N1	-9.73	105.88	111.44
2	D	203	V44	N2-C1-N1	-9.53	106.00	111.44
2	D	203	V44	N4-C5-N3	-9.32	106.12	111.44

There are no chirality outliers.

5 of 21 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	203	V44	SG-C10-C9-C1
2	B	203	V44	SG-C10-C9-C5
2	B	203	V44	C-CA-CB-SG
2	B	203	V44	N-CA-CB-SG
2	D	203	V44	SG-C10-C9-C1

There are no ring outliers.

4 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	H	203	V44	7	0
2	B	203	V44	3	0
2	D	203	V44	5	0
2	F	203	V44	2	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 58 ligands modelled in this entry, 56 are monoatomic - leaving 2 for Mogul analysis.

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	$\# Z > 2$
4	SO4	C	604	-	4,4,4	0.32	0	6,6,6	0.05	0
4	SO4	C	605	-	4,4,4	0.33	0	6,6,6	0.05	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	605	SO4	1	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	389/411 (94%)	-1.24	0 100 100	55, 68, 80, 90	0
1	C	389/411 (94%)	-1.20	0 100 100	56, 70, 87, 102	0
1	E	389/411 (94%)	-1.18	0 100 100	55, 77, 92, 99	0
1	G	387/411 (94%)	-1.20	0 100 100	54, 74, 88, 99	0
2	B	388/411 (94%)	-1.21	0 100 100	55, 73, 86, 97	0
2	D	385/411 (93%)	-1.18	0 100 100	54, 76, 94, 102	0
2	F	388/411 (94%)	-1.22	0 100 100	51, 69, 83, 88	0
2	H	388/411 (94%)	-1.20	0 100 100	54, 69, 83, 94	0
All	All	3103/3288 (94%)	-1.21	0 100 100	51, 72, 88, 102	0

There are no RSRZ outliers to report.

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. 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	V44	B	203	20/21	0.97	0.09	91,112,114,114	0
2	V44	D	203	20/21	0.98	0.07	93,108,110,111	0
2	V44	F	203	20/21	0.98	0.05	83,104,107,107	0
2	V44	H	203	20/21	0.98	0.06	82,101,102,102	0

6.3 Carbohydrates [i](#)

There are no oligosaccharides 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
3	ZN	A	605	1/1	0.98	0.03	109,109,109,109	0
3	ZN	D	605	1/1	0.98	0.02	108,108,108,108	0
4	SO4	C	605	5/5	0.98	0.03	77,77,78,78	0
3	ZN	C	602	1/1	0.99	0.03	92,92,92,92	0
3	ZN	C	603	1/1	0.99	0.02	85,85,85,85	0
3	ZN	A	603	1/1	0.99	0.02	86,86,86,86	0
3	ZN	E	605	1/1	0.99	0.02	101,101,101,101	0
3	ZN	E	606	1/1	0.99	0.03	120,120,120,120	0
3	ZN	F	601	1/1	0.99	0.02	63,63,63,63	0
3	ZN	F	603	1/1	0.99	0.02	100,100,100,100	0
3	ZN	F	604	1/1	0.99	0.02	93,93,93,93	0
3	ZN	F	606	1/1	0.99	0.02	133,133,133,133	0
3	ZN	H	602	1/1	0.99	0.03	85,85,85,85	0
3	ZN	H	603	1/1	0.99	0.03	110,110,110,110	0
3	ZN	H	605	1/1	0.99	0.02	89,89,89,89	0
3	ZN	H	607	1/1	0.99	0.04	104,104,104,104	0
4	SO4	C	604	5/5	0.99	0.02	56,56,57,58	0
3	ZN	A	601	1/1	0.99	0.02	69,69,69,69	0
3	ZN	D	500	1/1	1.00	0.01	64,64,64,64	0
3	ZN	D	501	1/1	1.00	0.01	66,66,66,66	0
3	ZN	D	601	1/1	1.00	0.01	63,63,63,63	0
3	ZN	D	602	1/1	1.00	0.02	61,61,61,61	0
3	ZN	D	603	1/1	1.00	0.01	77,77,77,77	0
3	ZN	D	604	1/1	1.00	0.02	60,60,60,60	0
3	ZN	A	604	1/1	1.00	0.01	111,111,111,111	0
3	ZN	D	606	1/1	1.00	0.03	88,88,88,88	0
3	ZN	E	500	1/1	1.00	0.01	63,63,63,63	0
3	ZN	E	501	1/1	1.00	0.01	63,63,63,63	0
3	ZN	E	601	1/1	1.00	0.01	72,72,72,72	0
3	ZN	E	602	1/1	1.00	0.01	61,61,61,61	0
3	ZN	E	603	1/1	1.00	0.01	57,57,57,57	0
3	ZN	E	604	1/1	1.00	0.03	78,78,78,78	0
3	ZN	A	500	1/1	1.00	0.01	55,55,55,55	0
3	ZN	B	600	1/1	1.00	0.03	115,115,115,115	0
3	ZN	F	600	1/1	1.00	0.02	109,109,109,109	0
3	ZN	F	500	1/1	1.00	0.01	56,56,56,56	0
3	ZN	F	501	1/1	1.00	0.01	52,52,52,52	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	ZN	B	500	1/1	1.00	0.02	61,61,61,61	0
3	ZN	F	602	1/1	1.00	0.01	89,89,89,89	0
3	ZN	B	501	1/1	1.00	0.01	60,60,60,60	0
3	ZN	B	601	1/1	1.00	0.01	73,73,73,73	0
3	ZN	F	605	1/1	1.00	0.02	113,113,113,113	0
3	ZN	B	602	1/1	1.00	0.02	82,82,82,82	0
3	ZN	G	500	1/1	1.00	0.01	59,59,59,59	0
3	ZN	G	501	1/1	1.00	0.01	61,61,61,61	0
3	ZN	G	601	1/1	1.00	0.01	85,85,85,85	0
3	ZN	H	600	1/1	1.00	0.02	104,104,104,104	0
3	ZN	H	500	1/1	1.00	0.01	58,58,58,58	0
3	ZN	H	501	1/1	1.00	0.01	56,56,56,56	0
3	ZN	H	601	1/1	1.00	0.02	71,71,71,71	0
3	ZN	C	500	1/1	1.00	0.01	60,60,60,60	0
3	ZN	C	501	1/1	1.00	0.01	58,58,58,58	0
3	ZN	H	604	1/1	1.00	0.02	95,95,95,95	0
3	ZN	C	601	1/1	1.00	0.01	68,68,68,68	0
3	ZN	H	606	1/1	1.00	0.02	71,71,71,71	0
3	ZN	A	602	1/1	1.00	0.01	88,88,88,88	0
3	ZN	A	501	1/1	1.00	0.01	55,55,55,55	0
3	ZN	D	600	1/1	1.00	0.02	110,110,110,110	0

6.5 Other polymers [i](#)

There are no such residues in this entry.