wwPDB X-ray Structure Validation Summary Report ⓘ

Jan 28, 2024 – 03:05 PM EST

PDB ID	:	1DS5
Title	:	DIMERIC CRYSTAL STRUCTURE OF THE ALPHA SUBUNIT IN COMPLEX WITH TWO BETA PEPTIDES MIMICKING THE ARCHITECTURE OF THE TETRAMERIC PROTEIN KINASE CK2 HOLOENZYME.
Authors	:	Battistutta, R.; Sarno, S.; De Moliner, E.; Marin, O.; Zanotti, G.; Pinna, L.A.
Deposited on	:	2000-01-07
Resolution	:	3.16 Å(reported)

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

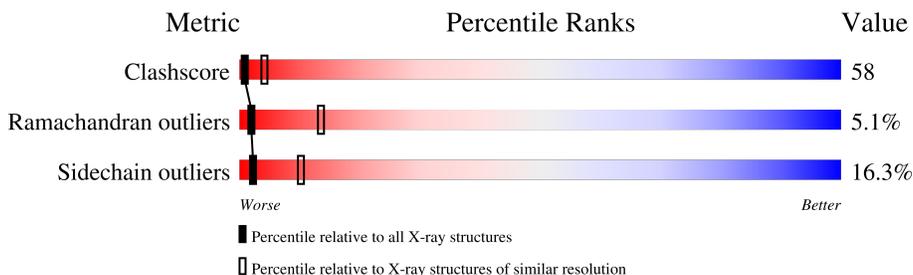|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 3.16 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
Clashscore		58
Ramachandran outliers		5.1%
Sidechain outliers		16.3%

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))
Clashscore	141614	1804 (3.20-3.12)
Ramachandran outliers	138981	1770 (3.20-3.12)
Sidechain outliers	138945	1769 (3.20-3.12)

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%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	332	33% 48% 15% ··
1	B	332	27% 55% 16% ··
1	C	332	28% 53% 17% ··
1	D	332	29% 52% 15% ··
2	E	23	· 9% 35% 22% 30%
2	F	23	· 22% 35% 17% 22%
2	G	23	· 30% 26% 9% 30%
2	H	23	· 17% 35% 13% 30%

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	AMP	A	501	X	-	-	-
3	AMP	B	801	X	-	-	-
3	AMP	C	601	X	-	-	-
3	AMP	D	701	X	-	-	-

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 11932 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 CASEIN KINASE, ALPHA CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	328	Total	C	N	O	S	0	0	0
			2735	1762	471	490	12			
1	B	328	Total	C	N	O	S	0	0	0
			2735	1762	471	490	12			
1	C	328	Total	C	N	O	S	0	0	0
			2735	1762	471	490	12			
1	D	328	Total	C	N	O	S	0	0	0
			2735	1762	471	490	12			

- Molecule 2 is a protein called CASEIN KINASE, BETA CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	16	Total	C	N	O	S	0	0	0
			135	90	22	22	1			
2	F	18	Total	C	N	O	S	0	0	0
			154	102	27	24	1			
2	G	16	Total	C	N	O	S	0	0	0
			135	90	22	22	1			
2	H	16	Total	C	N	O	S	0	0	0
			135	90	22	22	1			

- Molecule 3 is ADENOSINE MONOPHOSPHATE (three-letter code: AMP) (formula: $C_{10}H_{14}N_5O_7P$).

AMP
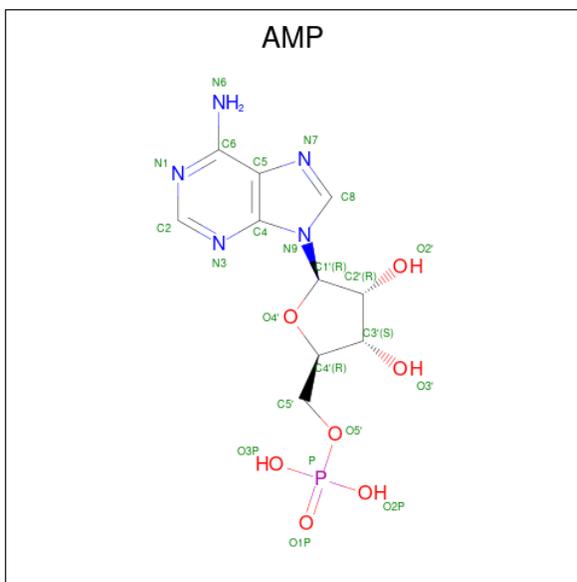
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
3	B	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
3	C	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
3	D	1	Total	C	N	O	P	0	0
			23	10	5	7	1		

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	2	Total	Mg	0	0
			2	2		
4	D	2	Total	Mg	0	0
			2	2		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	77	Total	O	0	0
			77	77		
5	B	74	Total	O	0	0
			74	74		
5	C	89	Total	O	0	0
			89	89		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	D	73	Total 73	O 73	0	0
5	E	6	Total 6	O 6	0	0
5	F	4	Total 4	O 4	0	0
5	G	6	Total 6	O 6	0	0
5	H	8	Total 8	O 8	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. 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: CASEIN KINASE, ALPHA CHAIN

• Molecule 1: CASEIN KINASE, ALPHA CHAIN

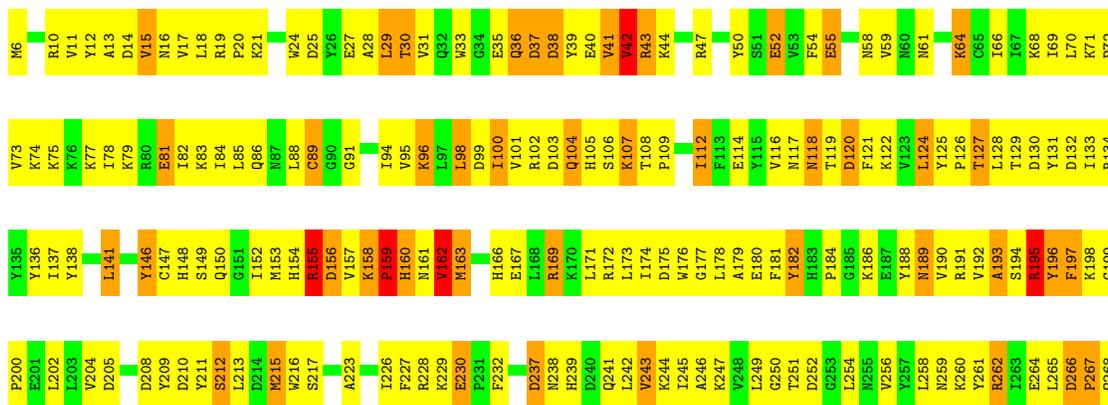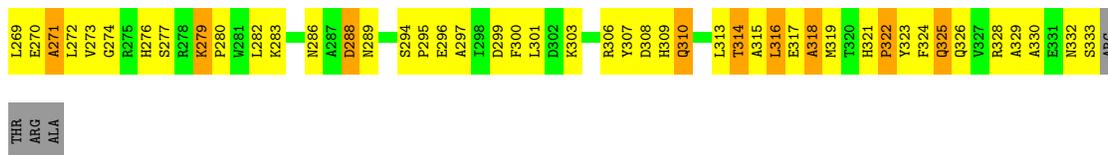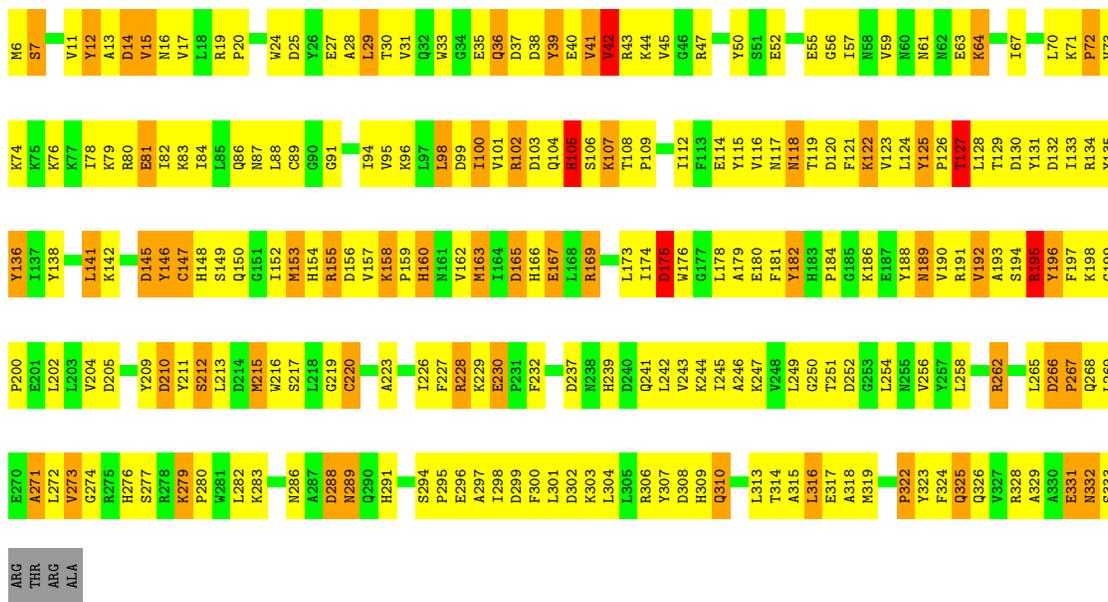L269 E270 A271 L272 V273 G274 R275 H276 S277 R278 K279 P280 W281 L282 K283 N286 A287 D288 N289 S294 P295 E296 A297 I298 D299 F300 L301 D302 K303 R306 Y307 D308 H309 Q310 L313 T314 A315 L316 E317 A318 M319 T320 H321 P322 Y323 F324 Q325 Q326 V327 R328 A329 A330 E331 N332 S333 ARG

THR ARG ALA

• Molecule 1: CASEIN KINASE, ALPHA CHAIN

Chain C: 28%   53%   17%   ··

M6 S7 V11 Y12 A13 D14 V15 N16 V17 L18 R19 P20 W24 D25 Y26 E27 A28 L29 T30 V31 Q32 W33 G34 E35 Q36 D37 D38 Y39 E40 V41 V42 R43 K44 V45 G46 R47 Y50 S51 E52 E55 G56 I57 N58 V59 N60 N61 N62 E63 K64 I67 L70 K71 P72 V73

K74 K75 K76 K77 I78 K79 R80 E81 I82 K83 I84 L85 Q86 N87 L88 C89 G90 G91 I94 V95 K96 L97 L98 D99 I100 V101 R102 D103 Q104 H105 S106 K107 T108 P109 I112 F113 E114 Y115 V116 N117 N118 T119 D120 F121 K122 V123 L124 Y125 P126 T127 L128 T129 D130 Y131 D132 I133 R134 Y135

Y136 I137 Y138 L141 K142 D145 Y146 C147 H148 S149 Q150 G151 I152 M153 H154 R155 D156 V157 K158 P159 H160 N161 V162 M163 I164 D165 H166 E167 L168 R169 L173 I174 D175 W176 G177 L178 A179 E180 F181 Y182 H183 P184 G185 K186 E187 Y188 N189 V190 R191 V192 A193 S194 R195 Y196 F197 K198 G199

P200 E201 L202 L203 V204 D205 Y209 D210 Y211 S212 L213 D214 M215 W216 S217 L218 G219 C220 A223 I226 F227 R228 K229 E230 P231 F232 D237 N238 H239 D240 Q241 L242 V243 K244 I245 A246 K247 V248 L249 G250 T251 D252 G253 L264 N255 V256 Y257 L258 R262 L265 D266 P267 Q268 L269

E270 A271 L272 V273 G274 R275 H276 S277 R278 K279 P280 W281 L282 K283 N286 A287 D288 N289 Q290 H291 S294 P295 E296 A297 I298 D299 F300 L301 D302 K303 L304 L305 R306 Y307 D308 H309 Q310 L313 T314 A315 L316 E317 A318 M319 P322 Y323 F324 Q325 Q326 V327 R328 A329 A330 E331 N332 S333

ARG THR ARG ALA

• Molecule 1: CASEIN KINASE, ALPHA CHAIN

Chain D: 29%   52%   15%   ··

M6 S7 K8 A9 R10 V11 Y12 A13 D14 V15 N16 V17 L18 R19 P20 K21 W24 L29 T30 V31 Q32 W33 G34 E35 Q36 D37 D38 Y39 E40 V41 V42 R43 K44 V45 G46 R47 Y50 S51 E52 V53 F54 E55 G56 I57 N58 V59 K64 C65 I66 I67 K68 I69 L70 K71 P72 V73

K74 K75 K76 K77 I78 K79 R80 E81 I82 K83 I84 L85 Q86 N87 L88 C89 G90 G91 N93 I94 V95 K96 L97 L98 D99 I100 V101 R102 D103 Q104 H105 S106 K107 T108 P109 I112 F113 E114 Y115 V116 N117 N118 T119 D120 F121 K122 V123 L124 Y125 P126 T127 L128 T129 D130 Y131 D132 I133 R134

Y135 Y136 I137 Y138 E139 L140 L141 Y146 C147 H148 S149 Q150 G151 I152 M153 H154 R155 D156 V157 K158 P159 H160 N161 V162 M163 I164 D165 H166 E167 L168 R169 K170 L171 L178 A179 E180 F181 Y182 H183 P184 G185 K186 E187 Y188 N189 V190 R191 V192 A193 S194 R195 Y196 F197 K198 G199 P200 E201 L202

L203 V204 D205 L206 Q207 D208 D210 Y211 S212 L213 D214 M215 W216 S217 C220 M221 F222 A223 G224 M225 I226 F227 R228 K229 E230 P231 F232 D237 N238 H239 D240 Q241 L242 V243 K244 I245 A246 K247 G250 T251 D252 V256 Y257 L258 R262 I263 E264 L265 D266 P267 Q268 L269 E270 A271

L272 V273 G274 R275 H276 S277 R278 K279 P280 W281 L282 K283 N286 A287 D288 N289 Q290 H291 S294 P295 E296 A297 F300 L301 D302 K303 L304 L305 R306 Y307 D308 H309 Q310 L313 T314 A315 L316 E317 A318 M319 T320 H321 P322 Y323 F324 Q325 Q326 V327 R328 A329 A330 E331 N332 S333 ARG THR

ARG ALA

• Molecule 2: CASEIN KINASE, BETA CHAIN

Chain E:
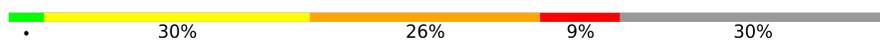

• Molecule 2: CASEIN KINASE, BETA CHAIN

Chain F:

• Molecule 2: CASEIN KINASE, BETA CHAIN

Chain G:

• Molecule 2: CASEIN KINASE, BETA CHAIN

Chain H:

4 Data and refinement statistics ⓘ

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

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	87.68Å 119.85Å 145.56Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.00 – 3.16	Depositor
% Data completeness (in resolution range)	95.3 (45.00-3.16)	Depositor
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS 0.9	Depositor
R, R_{free}	0.214 , 0.289	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	11932	wwPDB-VP
Average B, all atoms (Å^2)	26.0	wwPDB-VP

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: MG, AMP

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	1.40	18/2803 (0.6%)	1.23	13/3788 (0.3%)
1	B	1.30	7/2803 (0.2%)	1.21	11/3788 (0.3%)
1	C	1.34	10/2803 (0.4%)	1.24	18/3788 (0.5%)
1	D	1.29	10/2803 (0.4%)	1.20	11/3788 (0.3%)
2	E	1.78	2/139 (1.4%)	1.57	3/185 (1.6%)
2	F	1.74	4/158 (2.5%)	1.85	5/210 (2.4%)
2	G	1.55	1/139 (0.7%)	1.63	2/185 (1.1%)
2	H	1.84	3/139 (2.2%)	1.65	2/185 (1.1%)
All	All	1.35	55/11787 (0.5%)	1.25	65/15917 (0.4%)

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	4
1	B	0	2
1	C	0	4
1	D	0	3
2	F	0	1
2	G	0	1
2	H	0	1
All	All	0	16

The worst 5 of 55 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	41	VAL	CA-CB	-8.84	1.36	1.54
1	D	35	GLU	CB-CG	8.82	1.69	1.52
1	D	35	GLU	CG-CD	8.30	1.64	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	167	GLU	CG-CD	8.13	1.64	1.51
1	D	147	CYS	CB-SG	-8.10	1.68	1.82

The worst 5 of 65 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	G	198	GLN	N-CA-C	8.81	134.78	111.00
1	B	124	LEU	CA-CB-CG	-8.31	96.19	115.30
1	A	134	ARG	NE-CZ-NH1	-7.92	116.34	120.30
2	F	198	GLN	N-CA-C	7.59	131.50	111.00
1	C	108	THR	N-CA-C	-6.92	92.31	111.00

There are no chirality outliers.

5 of 16 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	12	TYR	Sidechain
1	A	125	TYR	Sidechain
1	A	182	TYR	Sidechain
1	A	307	TYR	Sidechain
1	B	182	TYR	Sidechain

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	2735	0	2721	280	0
1	B	2735	0	2721	342	0
1	C	2735	0	2721	301	0
1	D	2735	0	2721	309	0
2	E	135	0	132	49	0
2	F	154	0	156	58	0
2	G	135	0	132	57	0
2	H	135	0	132	48	0
3	A	23	0	11	6	0
3	B	23	0	11	5	0
3	C	23	0	11	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	23	0	11	3	0
4	B	2	0	0	0	0
4	D	2	0	0	0	0
5	A	77	0	0	1	0
5	B	74	0	0	2	0
5	C	89	0	0	2	0
5	D	73	0	0	0	0
5	E	6	0	0	0	0
5	F	4	0	0	1	0
5	G	6	0	0	3	0
5	H	8	0	0	4	0
All	All	11932	0	11480	1344	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 58.

The worst 5 of 1344 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:H:194:PRO:CG	2:H:194:PRO:CB	1.76	1.46
1:D:119:THR:HB	2:G:202:GLN:NE2	1.42	1.30
1:A:41:VAL:HG12	2:F:197:TYR:HB3	1.24	1.19
2:F:200:GLN:HB2	2:F:202:GLN:NE2	1.61	1.13
1:A:100:ILE:HD12	1:A:101:VAL:N	1.64	1.12

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	326/332 (98%)	271 (83%)	41 (13%)	14 (4%)	2	17

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	326/332 (98%)	270 (83%)	40 (12%)	16 (5%)	2	14
1	C	326/332 (98%)	268 (82%)	44 (14%)	14 (4%)	2	17
1	D	326/332 (98%)	268 (82%)	44 (14%)	14 (4%)	2	17
2	E	14/23 (61%)	8 (57%)	2 (14%)	4 (29%)	0	0
2	F	16/23 (70%)	12 (75%)	1 (6%)	3 (19%)	0	0
2	G	14/23 (61%)	10 (71%)	2 (14%)	2 (14%)	0	1
2	H	14/23 (61%)	10 (71%)	2 (14%)	2 (14%)	0	1
All	All	1362/1420 (96%)	1117 (82%)	176 (13%)	69 (5%)	2	13

5 of 69 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	155	ARG
1	A	195	ARG
1	B	37	ASP
1	B	155	ARG
1	B	195	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	297/300 (99%)	249 (84%)	48 (16%)	2	10
1	B	297/300 (99%)	255 (86%)	42 (14%)	3	15
1	C	297/300 (99%)	257 (86%)	40 (14%)	4	17
1	D	297/300 (99%)	254 (86%)	43 (14%)	3	14
2	E	13/20 (65%)	3 (23%)	10 (77%)	0	0
2	F	15/20 (75%)	8 (53%)	7 (47%)	0	0
2	G	13/20 (65%)	8 (62%)	5 (38%)	0	0
2	H	13/20 (65%)	5 (38%)	8 (62%)	0	0
All	All	1242/1280 (97%)	1039 (84%)	203 (16%)	2	10

5 of 203 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	215	MET
1	D	107	LYS
2	H	198	GLN
1	C	277	SER
1	D	15	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 58 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	166	HIS
2	F	202	GLN
1	C	332	ASN
2	F	200	GLN
1	D	326	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 ⓘ

Of 8 ligands modelled in this entry, 4 are monoatomic - leaving 4 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
3	AMP	A	501	-	22,25,25	1.97	6 (27%)	25,38,38	1.69	5 (20%)
3	AMP	C	601	-	22,25,25	1.67	7 (31%)	25,38,38	1.80	6 (24%)
3	AMP	D	701	-	22,25,25	1.87	7 (31%)	25,38,38	1.75	6 (24%)
3	AMP	B	801	-	22,25,25	1.65	5 (22%)	25,38,38	1.91	8 (32%)

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	AMP	A	501	-	1/1/5/5	3/6/26/26	0/3/3/3
3	AMP	C	601	-	1/1/5/5	4/6/26/26	0/3/3/3
3	AMP	D	701	-	1/1/5/5	5/6/26/26	0/3/3/3
3	AMP	B	801	-	1/1/5/5	4/6/26/26	0/3/3/3

The worst 5 of 25 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	501	AMP	C4-N3	5.68	1.43	1.35
3	D	701	AMP	O5'-C5'	3.89	1.59	1.44
3	D	701	AMP	C3'-C4'	3.45	1.61	1.53
3	B	801	AMP	O5'-C5'	3.14	1.56	1.44
3	C	601	AMP	O4'-C1'	-3.10	1.36	1.41

The worst 5 of 25 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	601	AMP	O4'-C1'-C2'	4.65	113.72	106.93
3	B	801	AMP	C3'-C2'-C1'	-4.44	94.30	100.98
3	D	701	AMP	O4'-C1'-C2'	4.25	113.14	106.93
3	A	501	AMP	O4'-C1'-C2'	4.14	112.97	106.93
3	B	801	AMP	C5-C6-N6	3.27	125.32	120.35

All (4) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	A	501	AMP	C1'
3	B	801	AMP	C1'
3	C	601	AMP	C1'

Continued from previous page...

Mol	Chain	Res	Type	Atom
3	D	701	AMP	C1'

5 of 16 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	801	AMP	C5'-O5'-P-O2P
3	B	801	AMP	O4'-C4'-C5'-O5'
3	B	801	AMP	C3'-C4'-C5'-O5'
3	C	601	AMP	C5'-O5'-P-O2P
3	D	701	AMP	C5'-O5'-P-O1P

There are no ring outliers.

4 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	501	AMP	6	0
3	C	601	AMP	3	0
3	D	701	AMP	3	0
3	B	801	AMP	5	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 AMP A 501

Bond lengths

Bond angles

Torsions

Rings

Ligand AMP C 601

Bond lengths

Bond angles

Torsions

Rings

Ligand AMP D 701

Bond lengths

Bond angles

Torsions

Rings

Ligand AMP B 801

Bond lengths

Bond angles

Torsions

Rings
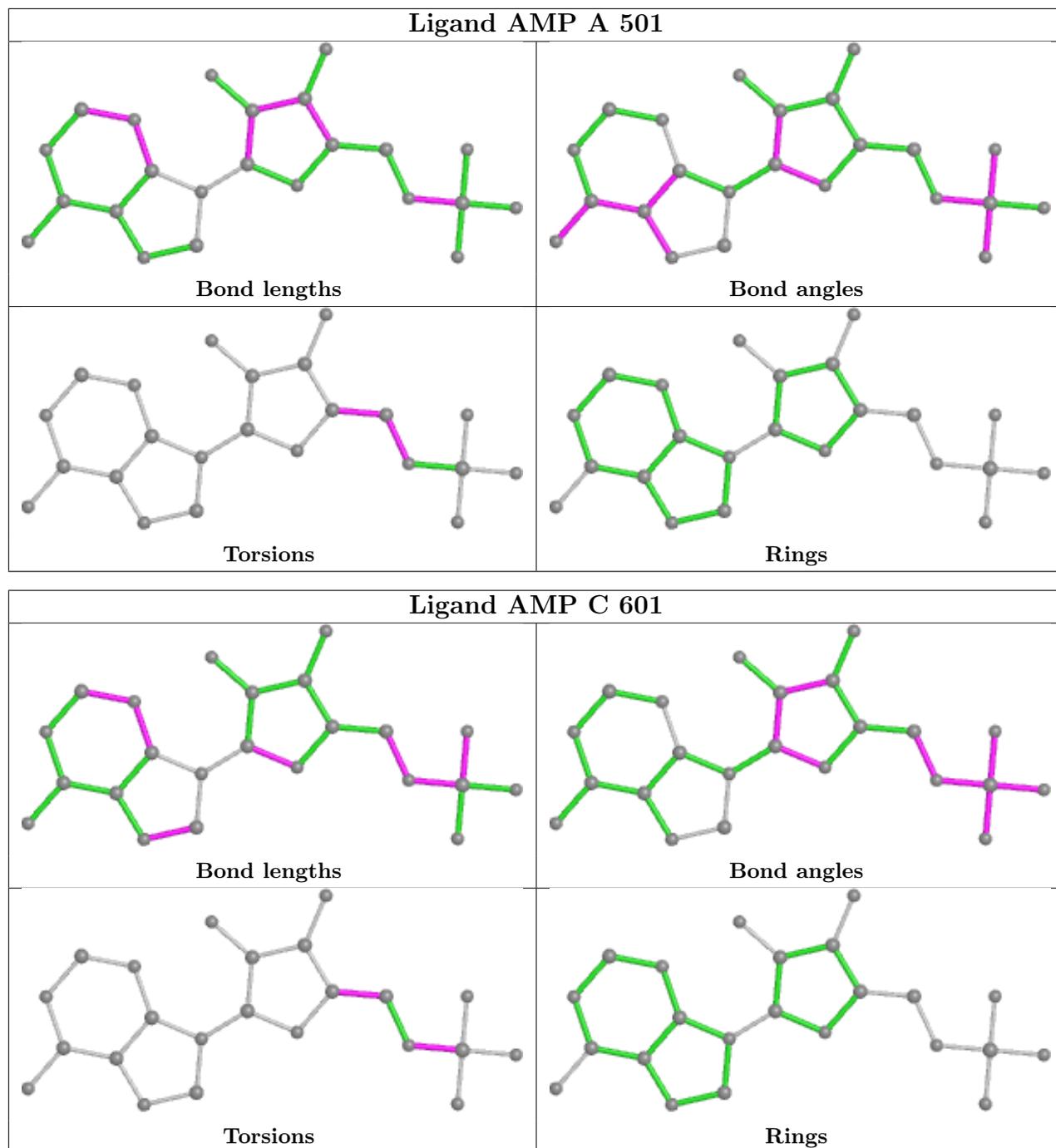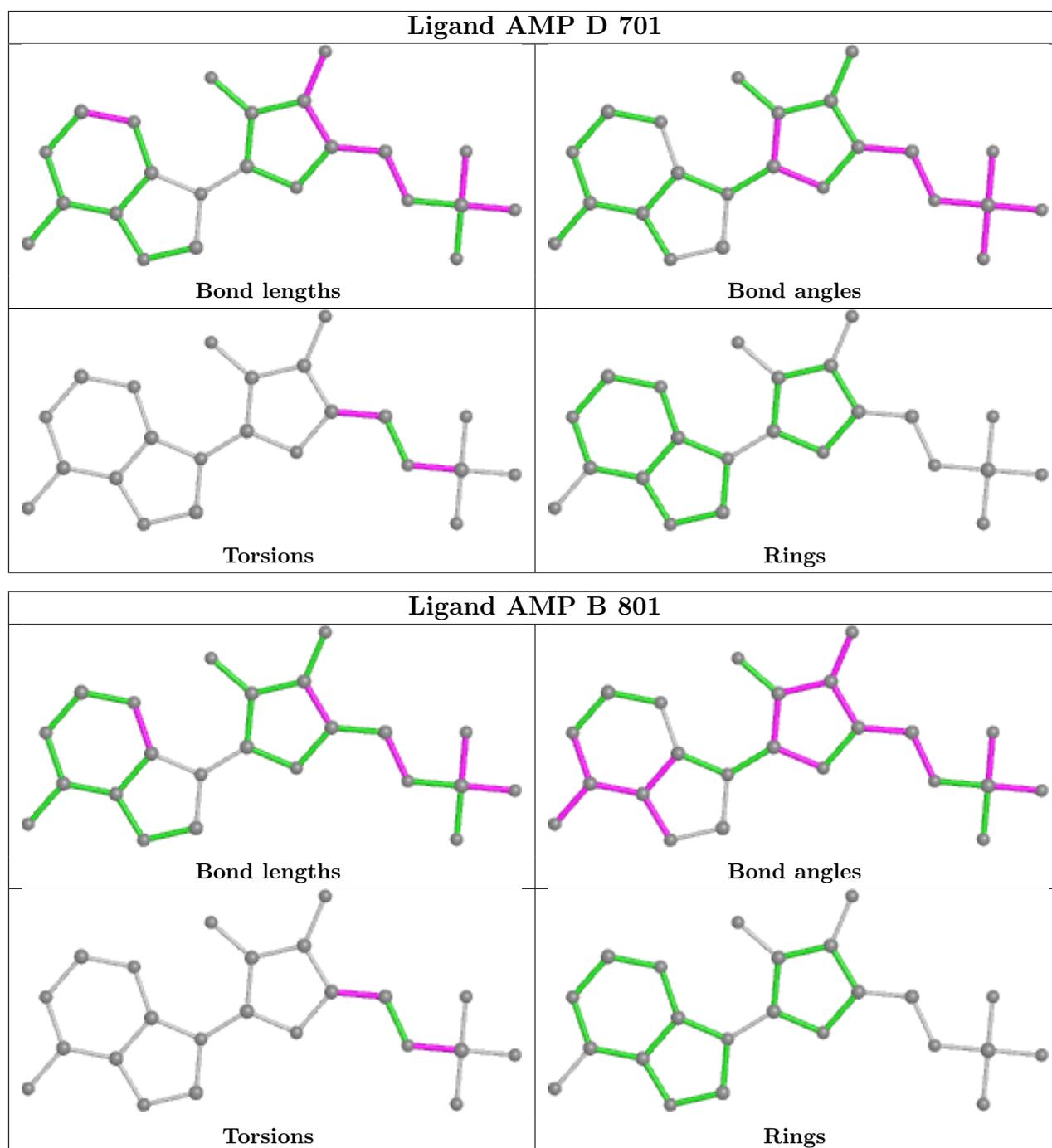
5.7 Other polymers ⓘ

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 ⓘ

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.