



Full wwPDB NMR Structure Validation Report ⓘ

Apr 27, 2016 – 07:38 PM BST

PDB ID : 2KU2
Title : Dynamic Regulation of Archaeal Proteasome Gate Opening as Studied by TROSY-NMR
Authors : Religa, T.L.; Sprangers, R.; Kay, L.E.
Deposited on : 2010-02-11

This is a Full wwPDB NMR Structure Validation Report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at
<http://wwpdb.org/validation/2016/NMRValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

Cyrange : NOT EXECUTED
NmrClust : NOT EXECUTED
MolProbity : 4.02b-467
Mogul : unknown
Percentile statistics : NOT EXECUTED
RCI : NOT EXECUTED
PANAV : NOT EXECUTED
ShiftChecker : NOT EXECUTED
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20027457

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

SOLUTION NMR

The overall completeness of chemical shifts assignment was not calculated.

There are no percentiles available for this entry.

The table below summarises the geometric issues observed across the polymeric chains and their fit to the experimental data. The red, orange, yellow and green segments indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. A cyan segment indicates the fraction of residues that are not part of the well-defined cores, and 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 $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	237	 100%
1	B	237	 100%
1	C	237	 100%
1	D	237	 100%
1	E	237	 100%
1	F	237	 100%
1	G	237	 100%

2 Ensemble composition and analysis ⓘ

This entry contains 50 models. The atoms present in the NMR models are not consistent. Some calculations may have failed as a result. All residues are included in the validation scores.

Cyrange was unable to find well-defined residues.

Error message: Cyrange did not run

NmrClust was unable to cluster the ensemble.

Error message: NmrClust did not run

3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 25802 atoms, of which 13027 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Proteasome subunit alpha.

Mol	Chain	Residues	Atoms						Trace
1	A	237	Total	C	H	N	O	S	0
			3686	1153	1861	312	354	6	
1	B	237	Total	C	H	N	O	S	0
			3686	1153	1861	312	354	6	
1	C	237	Total	C	H	N	O	S	0
			3686	1153	1861	312	354	6	
1	D	237	Total	C	H	N	O	S	0
			3686	1153	1861	312	354	6	
1	E	237	Total	C	H	N	O	S	0
			3686	1153	1861	312	354	6	
1	F	237	Total	C	H	N	O	S	0
			3686	1153	1861	312	354	6	
1	G	237	Total	C	H	N	O	S	0
			3686	1153	1861	312	354	6	

There are 42 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	EXPRESSION TAG	UNP P25156
A	-2	ALA	-	EXPRESSION TAG	UNP P25156
A	-1	MET	-	EXPRESSION TAG	UNP P25156
A	0	GLY	-	EXPRESSION TAG	UNP P25156
A	8	GLY	TYR	ENGINEERED	UNP P25156
A	9	GLY	ASP	ENGINEERED	UNP P25156
B	-3	GLY	-	EXPRESSION TAG	UNP P25156
B	-2	ALA	-	EXPRESSION TAG	UNP P25156
B	-1	MET	-	EXPRESSION TAG	UNP P25156
B	0	GLY	-	EXPRESSION TAG	UNP P25156
B	8	GLY	TYR	ENGINEERED	UNP P25156
B	9	GLY	ASP	ENGINEERED	UNP P25156
C	-3	GLY	-	EXPRESSION TAG	UNP P25156
C	-2	ALA	-	EXPRESSION TAG	UNP P25156
C	-1	MET	-	EXPRESSION TAG	UNP P25156
C	0	GLY	-	EXPRESSION TAG	UNP P25156
C	8	GLY	TYR	ENGINEERED	UNP P25156
C	9	GLY	ASP	ENGINEERED	UNP P25156
D	-3	GLY	-	EXPRESSION TAG	UNP P25156

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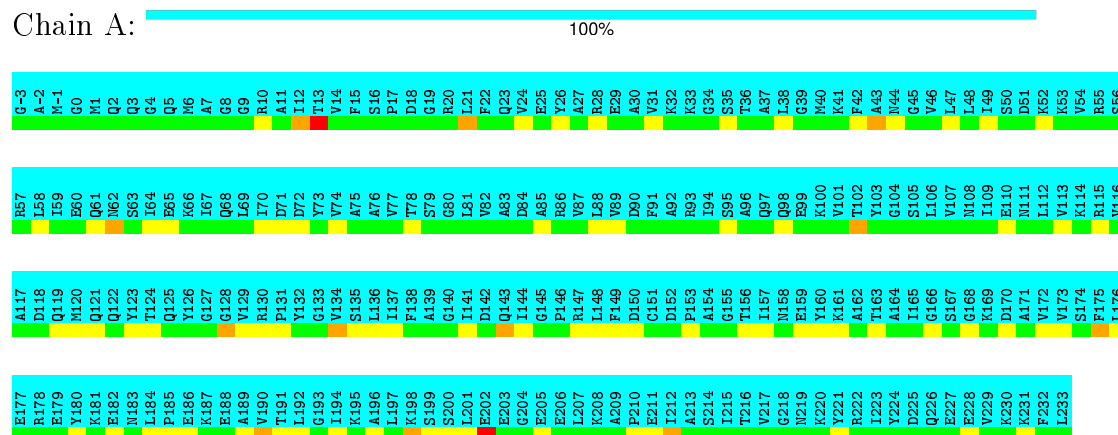
Chain	Residue	Modelled	Actual	Comment	Reference
D	-2	ALA	-	EXPRESSION TAG	UNP P25156
D	-1	MET	-	EXPRESSION TAG	UNP P25156
D	0	GLY	-	EXPRESSION TAG	UNP P25156
D	8	GLY	TYR	ENGINEERED	UNP P25156
D	9	GLY	ASP	ENGINEERED	UNP P25156
E	-3	GLY	-	EXPRESSION TAG	UNP P25156
E	-2	ALA	-	EXPRESSION TAG	UNP P25156
E	-1	MET	-	EXPRESSION TAG	UNP P25156
E	0	GLY	-	EXPRESSION TAG	UNP P25156
E	8	GLY	TYR	ENGINEERED	UNP P25156
E	9	GLY	ASP	ENGINEERED	UNP P25156
F	-3	GLY	-	EXPRESSION TAG	UNP P25156
F	-2	ALA	-	EXPRESSION TAG	UNP P25156
F	-1	MET	-	EXPRESSION TAG	UNP P25156
F	0	GLY	-	EXPRESSION TAG	UNP P25156
F	8	GLY	TYR	ENGINEERED	UNP P25156
F	9	GLY	ASP	ENGINEERED	UNP P25156
G	-3	GLY	-	EXPRESSION TAG	UNP P25156
G	-2	ALA	-	EXPRESSION TAG	UNP P25156
G	-1	MET	-	EXPRESSION TAG	UNP P25156
G	0	GLY	-	EXPRESSION TAG	UNP P25156
G	8	GLY	TYR	ENGINEERED	UNP P25156
G	9	GLY	ASP	ENGINEERED	UNP P25156

4 Residue-property plots [i](#)

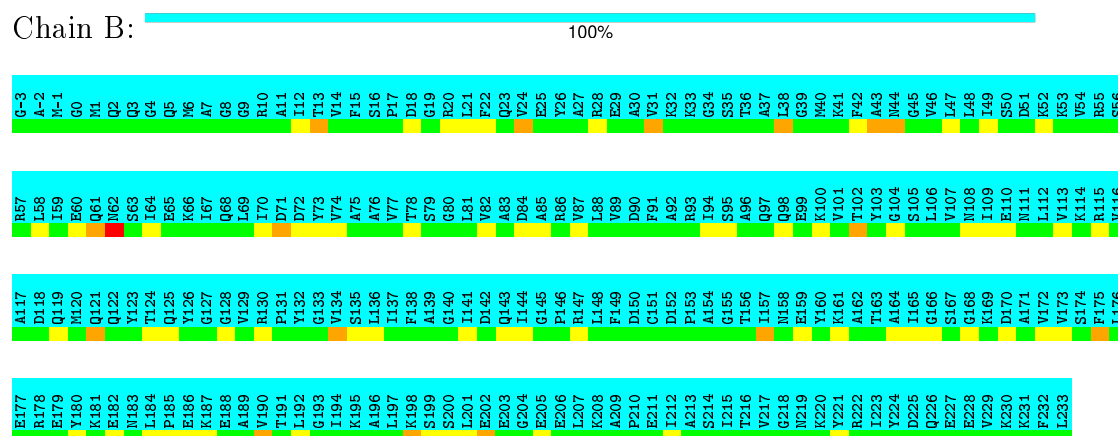
4.1 Average score per residue in the NMR ensemble

These plots are provided for all protein, RNA and DNA chains in the entry. The first graphic is the same as shown in the summary in section 1 of this report. The second graphic shows the sequence where residues are colour-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 outliers are shown as green connectors. Residues which are classified as ill-defined in the NMR ensemble, are shown in cyan with an underline colour-coded according to the previous scheme. Residues which were present in the experimental sample, but not modelled in the final structure are shown in grey.

- Molecule 1: Proteasome subunit alpha

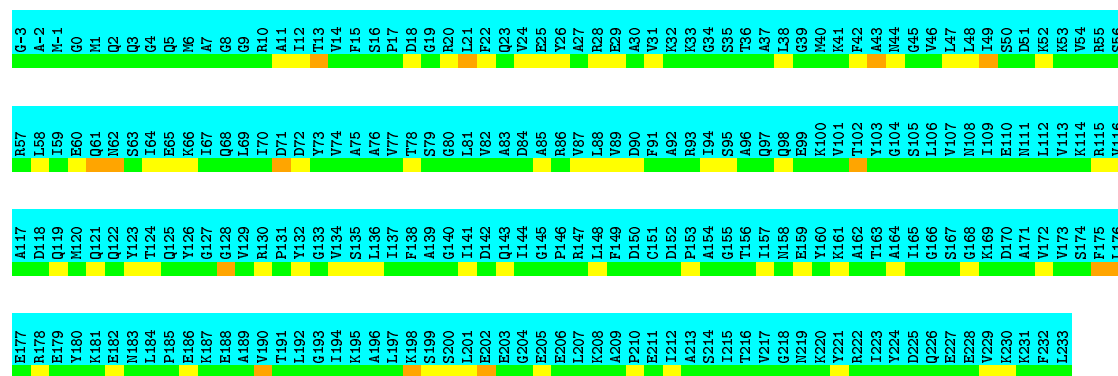


- Molecule 1: Proteasome subunit alpha



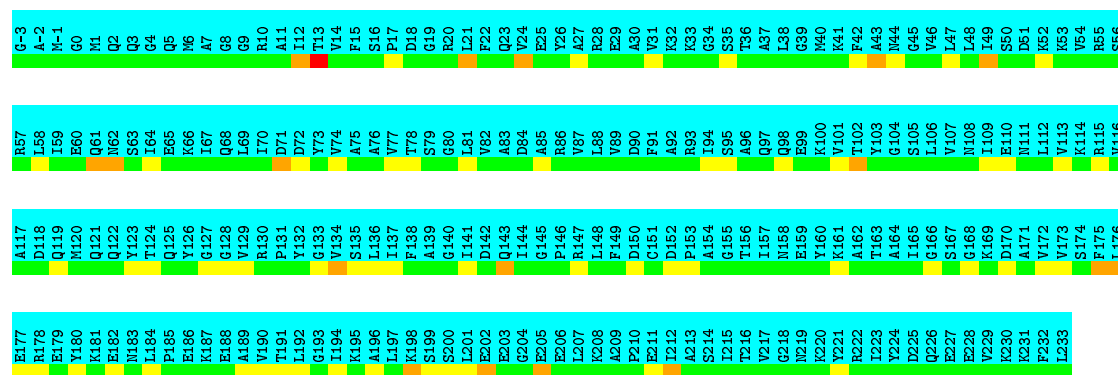
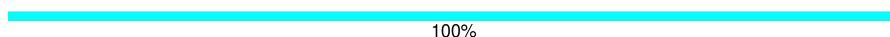
- Molecule 1: Proteasome subunit alpha





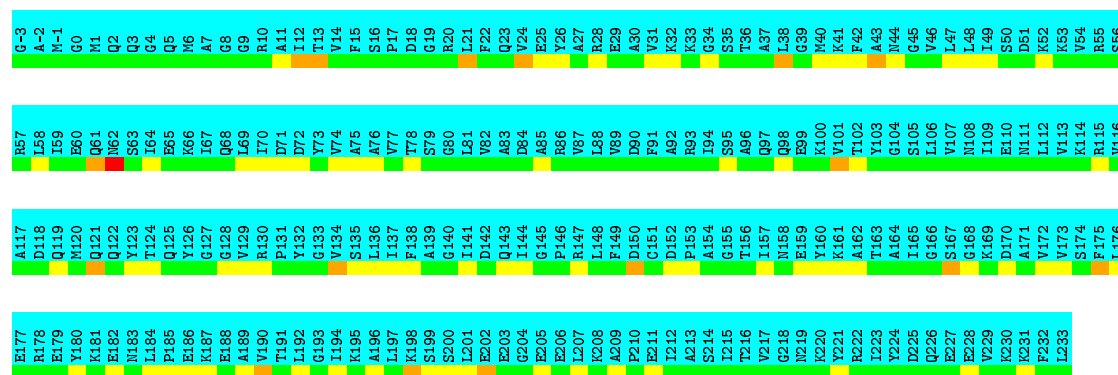
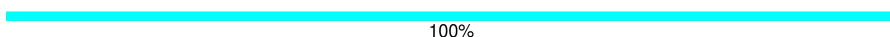
• Molecule 1: Proteasome subunit alpha

Chain D:



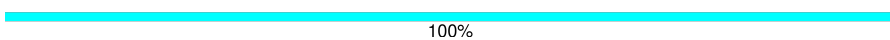
• Molecule 1: Proteasome subunit alpha

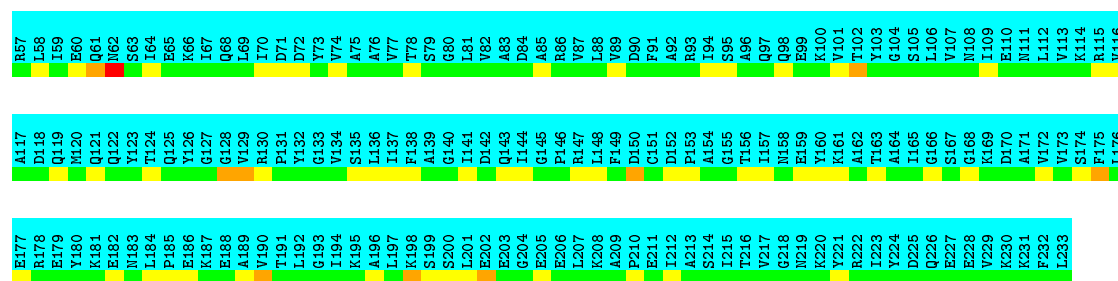
Chain E:



• Molecule 1: Proteasome subunit alpha

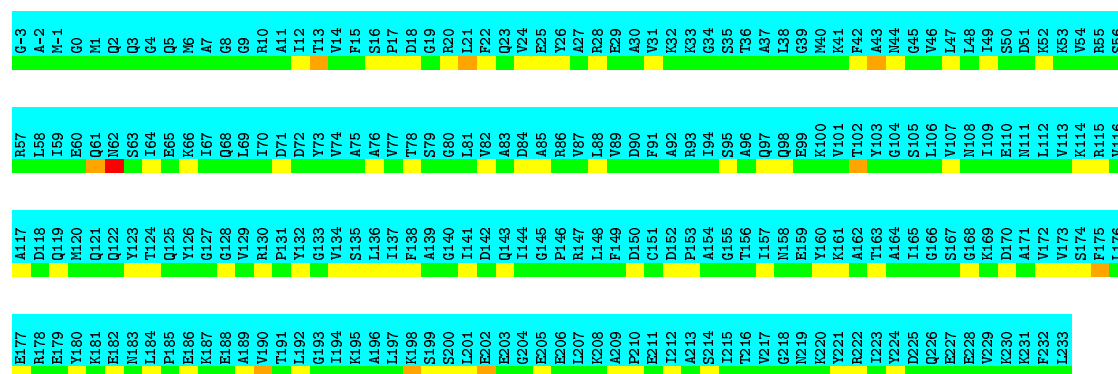
Chain F:





- Molecule 1: Proteasome subunit alpha

Chain G: 100%



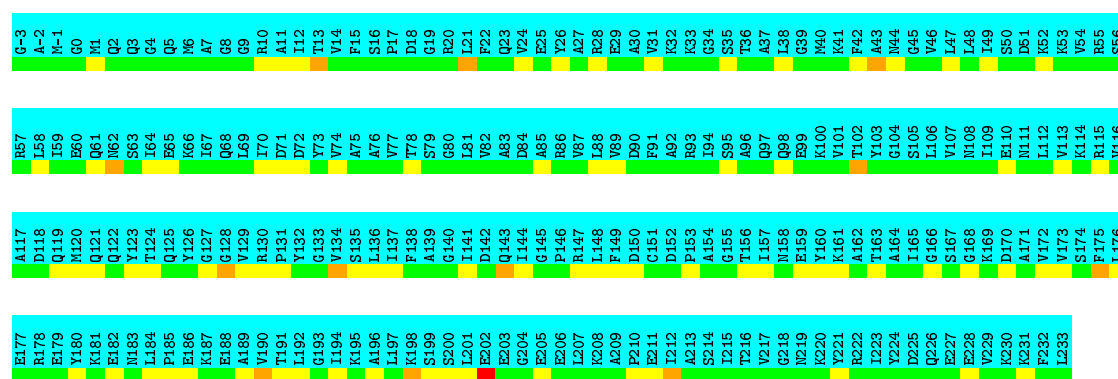
4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

4.2.1 Score per residue for model 1

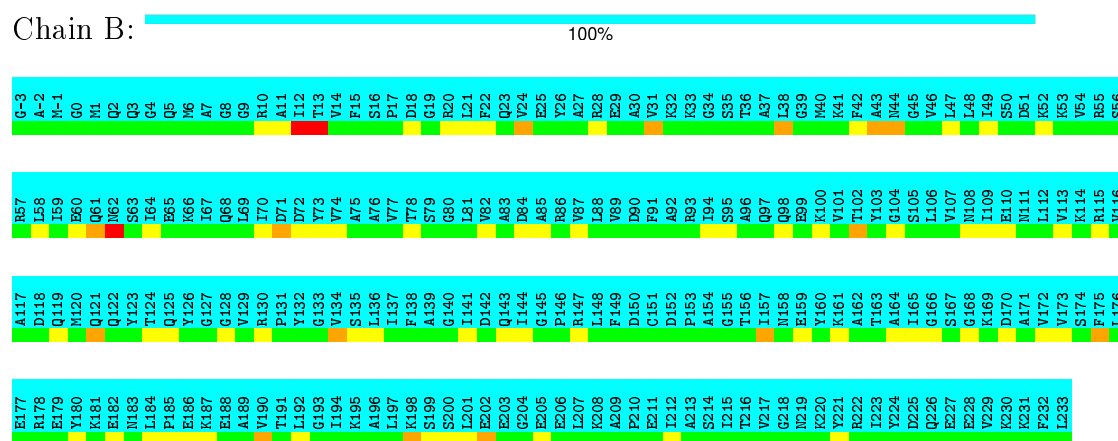
- Molecule 1: Proteasome subunit alpha

Chain A: 100%



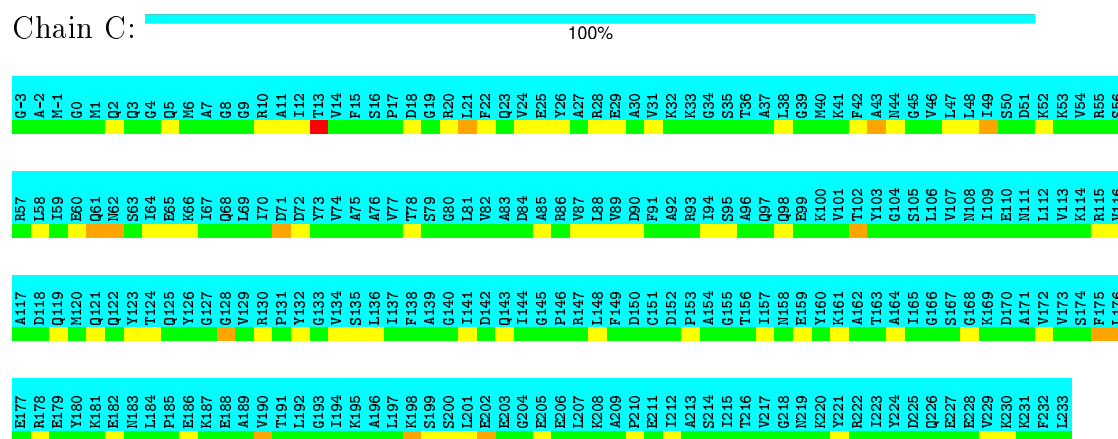
- Molecule 1: Proteasome subunit alpha

Chain B:



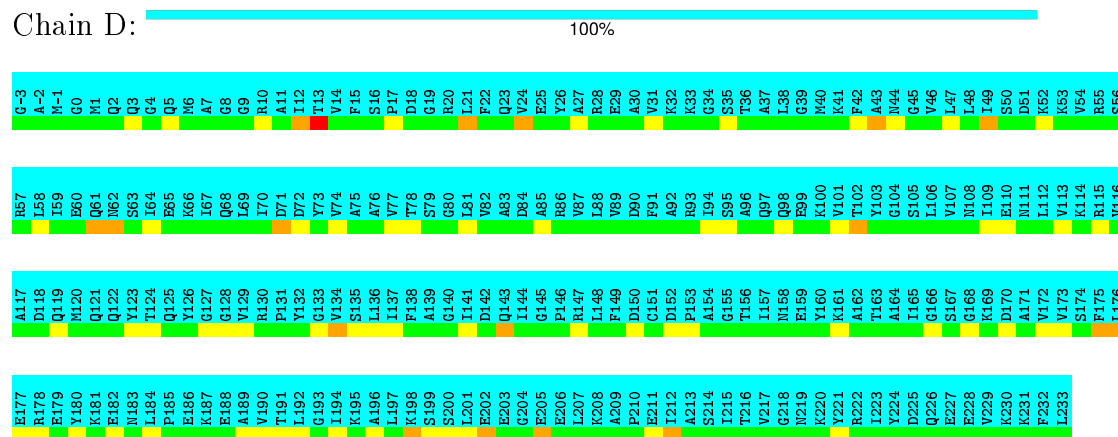
- Molecule 1: Proteasome subunit alpha

Chain C:



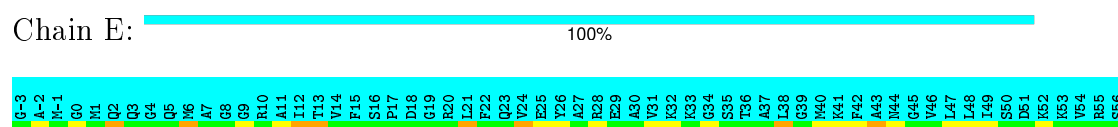
- Molecule 1: Proteasome subunit alpha

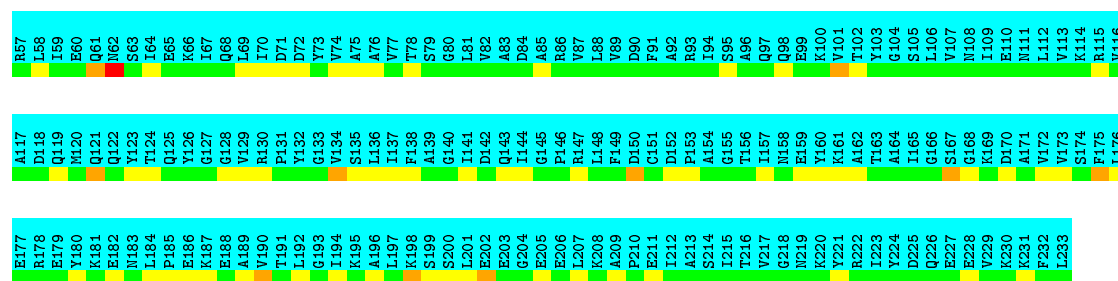
Chain D:



- Molecule 1: Proteasome subunit alpha

Chain E:

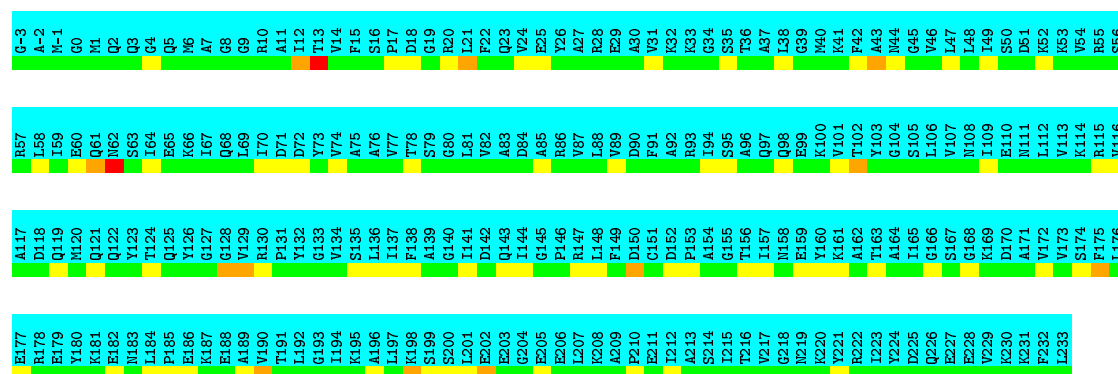




- Molecule 1: Proteasome subunit alpha

Chain F:

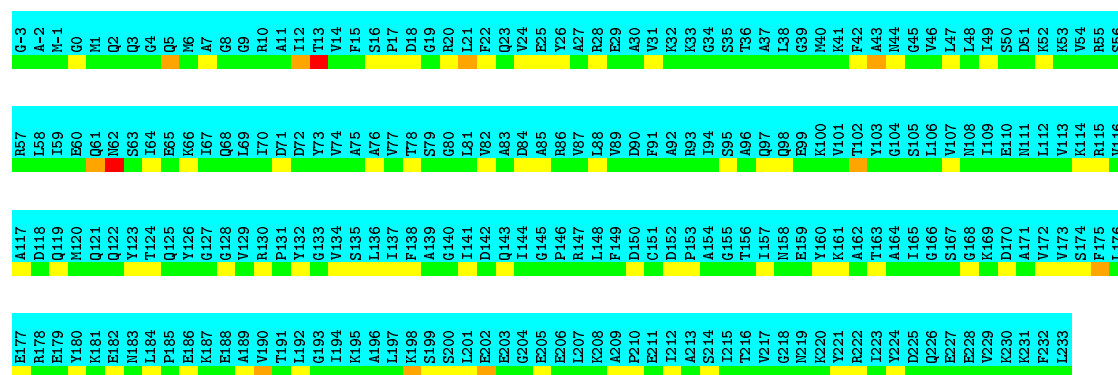
100%



- Molecule 1: Proteasome subunit alpha

Chain G:

100%



4.2.2 Score per residue for model 2

- Molecule 1: Proteasome subunit alpha

Chain A:

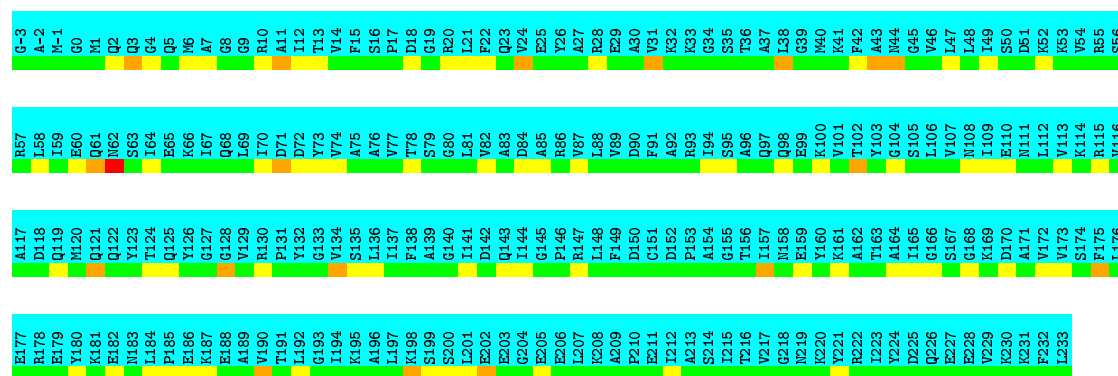
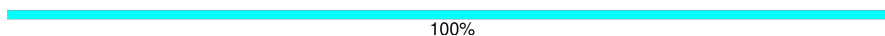
100%





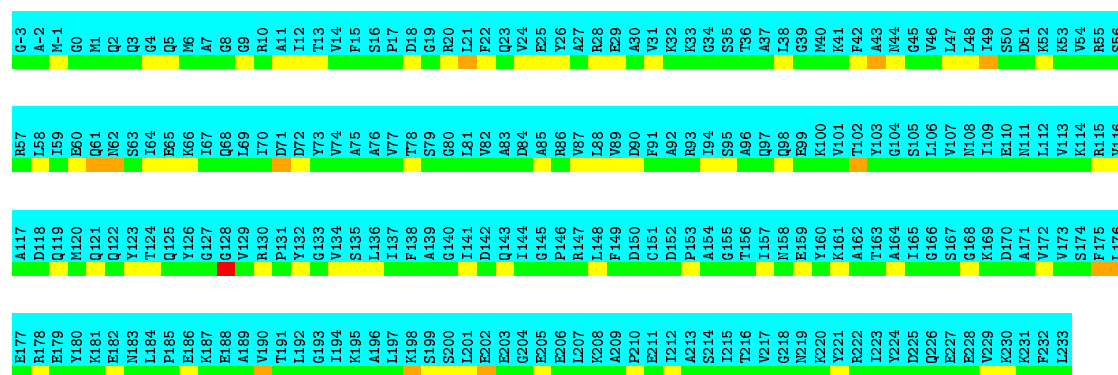
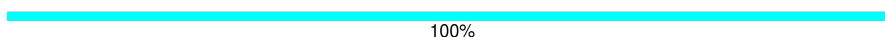
- Molecule 1: Proteasome subunit alpha

Chain B:



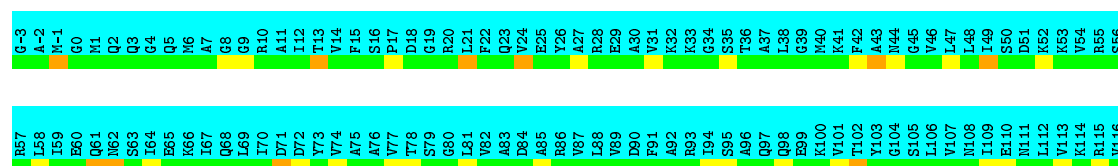
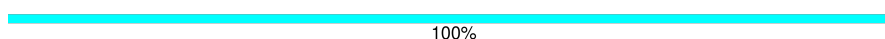
- Molecule 1: Proteasome subunit alpha

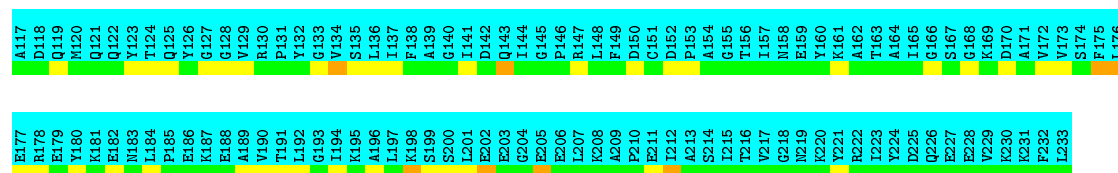
Chain C:



- Molecule 1: Proteasome subunit alpha

Chain D:

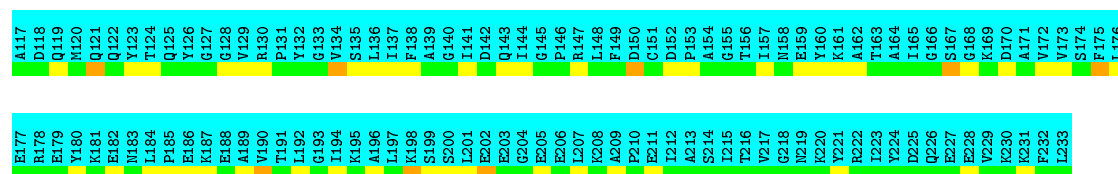
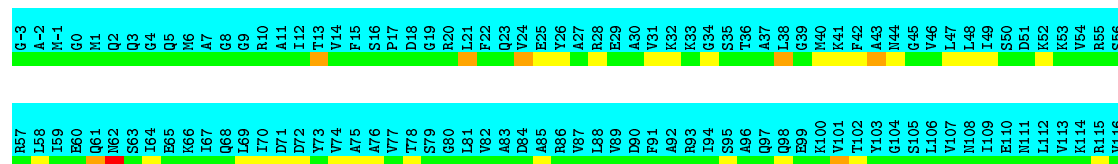




• Molecule 1: Proteasome subunit alpha

Chain E:

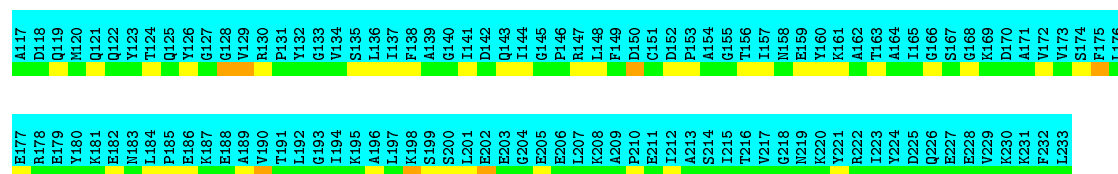
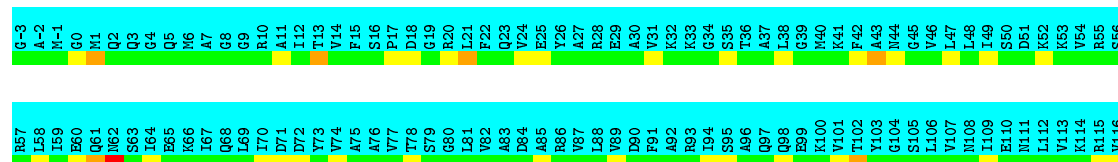
100%



• Molecule 1: Proteasome subunit alpha

Chain F:

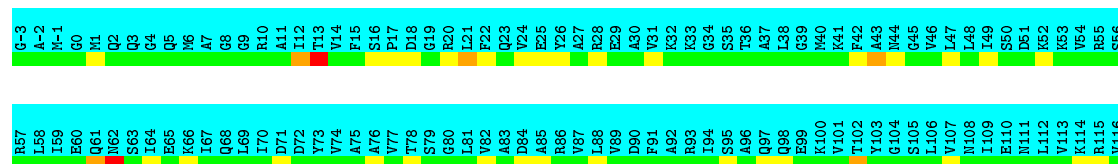
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• Molecule 1: Proteasome subunit alpha

Chain G:

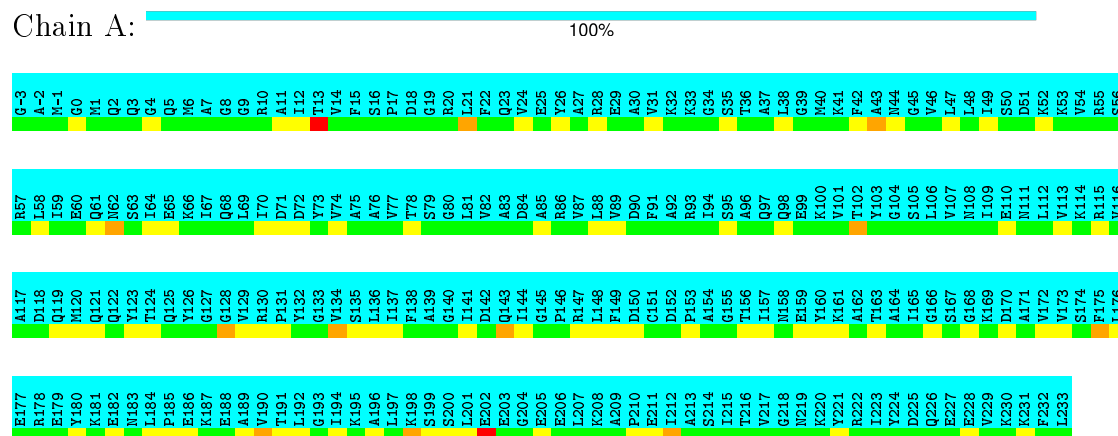
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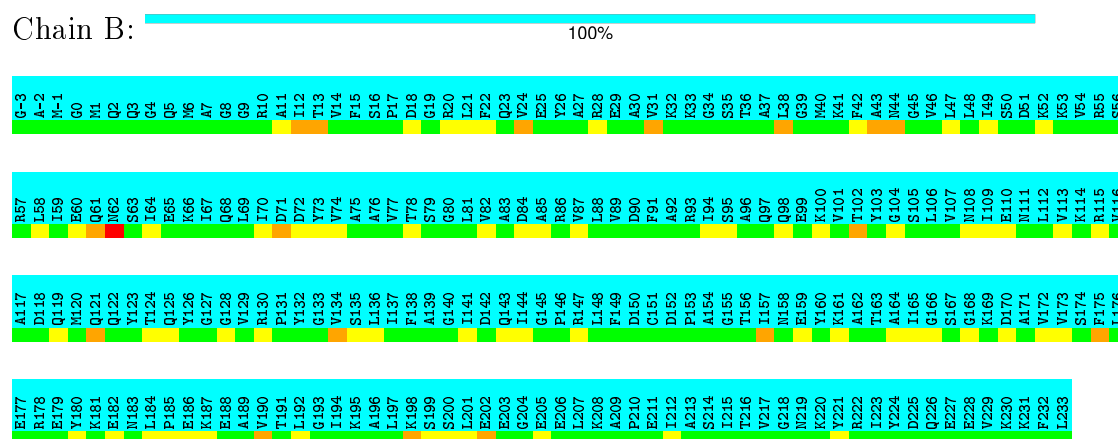


4.2.3 Score per residue for model 3

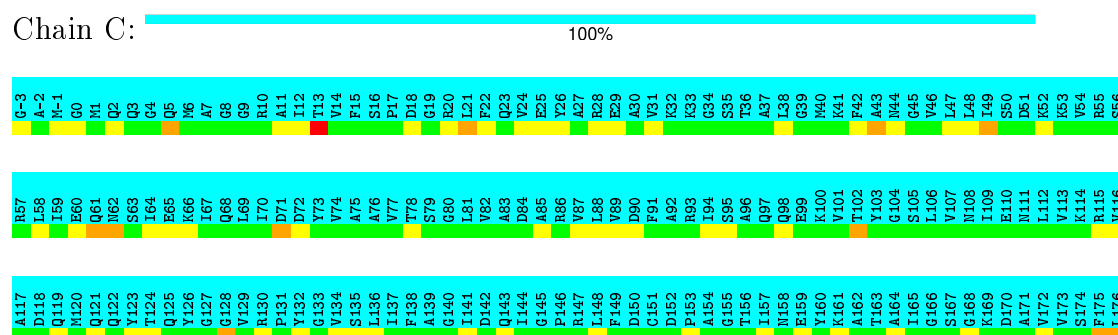
- Molecule 1: Proteasome subunit alpha

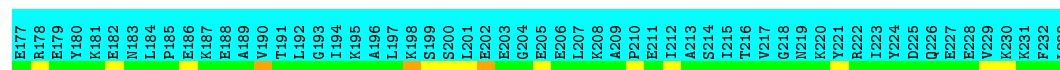


- Molecule 1: Proteasome subunit alpha



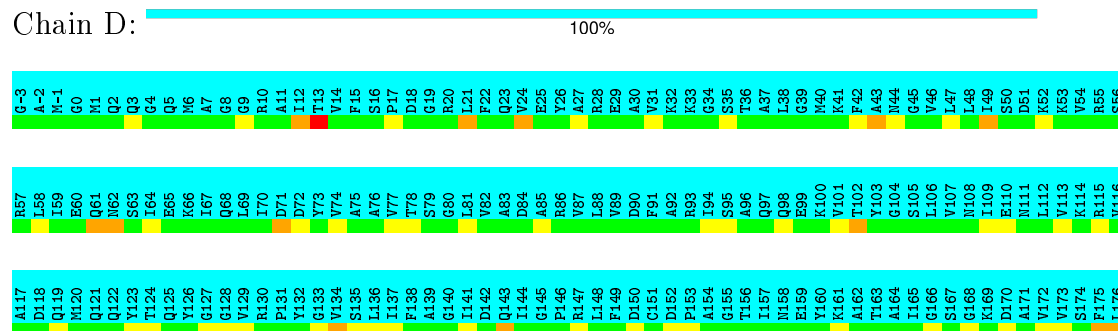
- Molecule 1: Proteasome subunit alpha





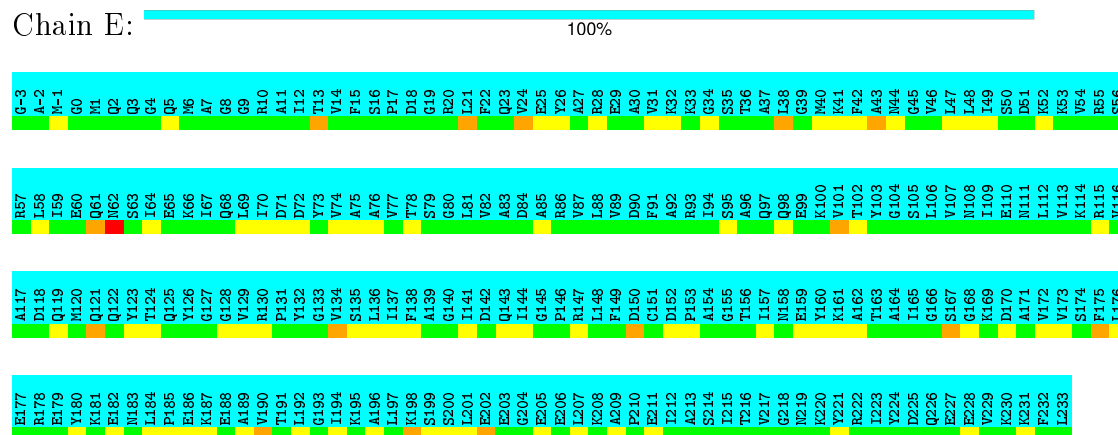
- Molecule 1: Proteasome subunit alpha

Chain D:



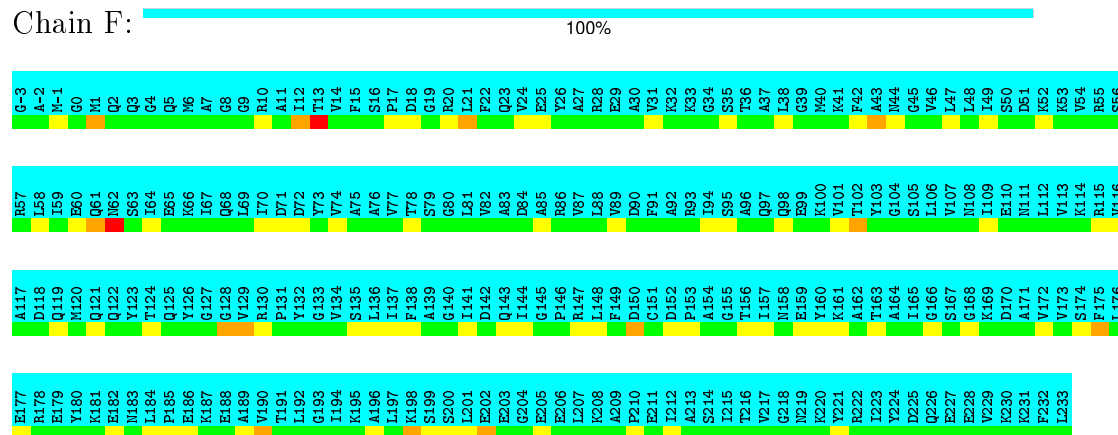
- Molecule 1: Proteasome subunit alpha

Chain E:



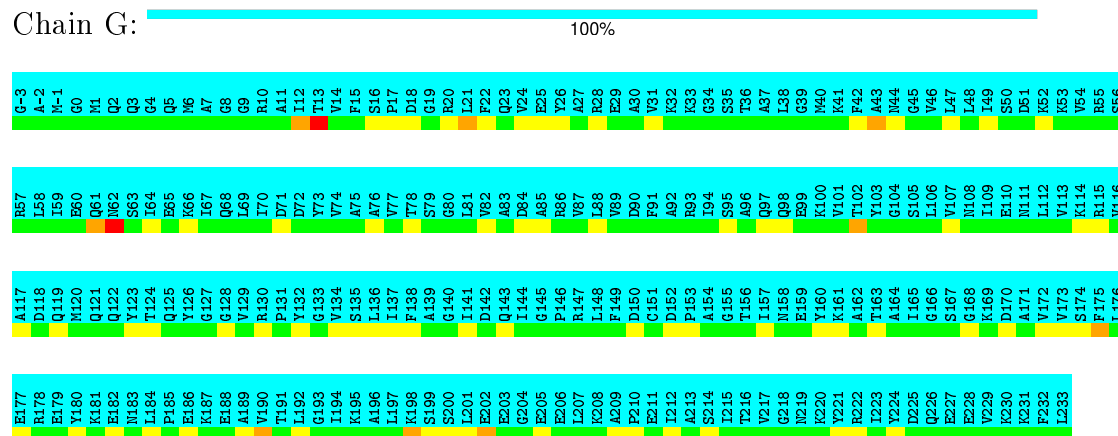
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

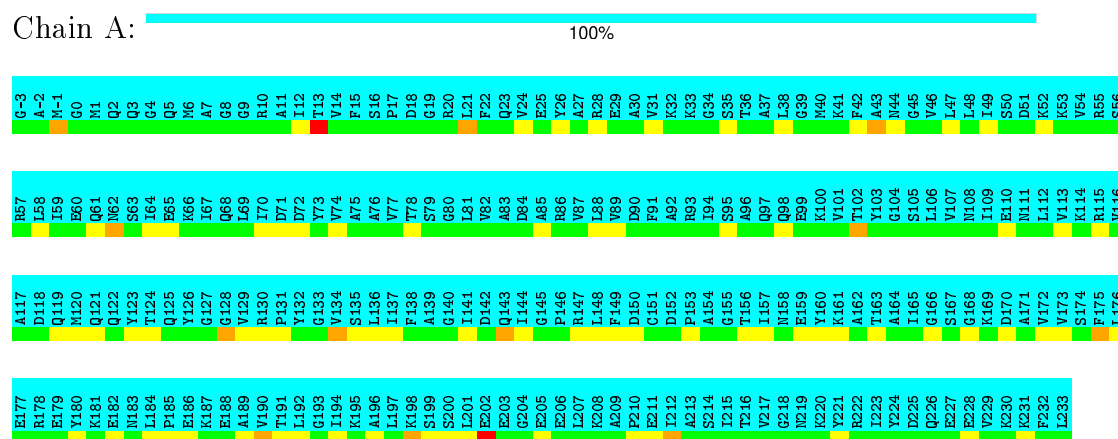
Chain G:



4.2.4 Score per residue for model 4

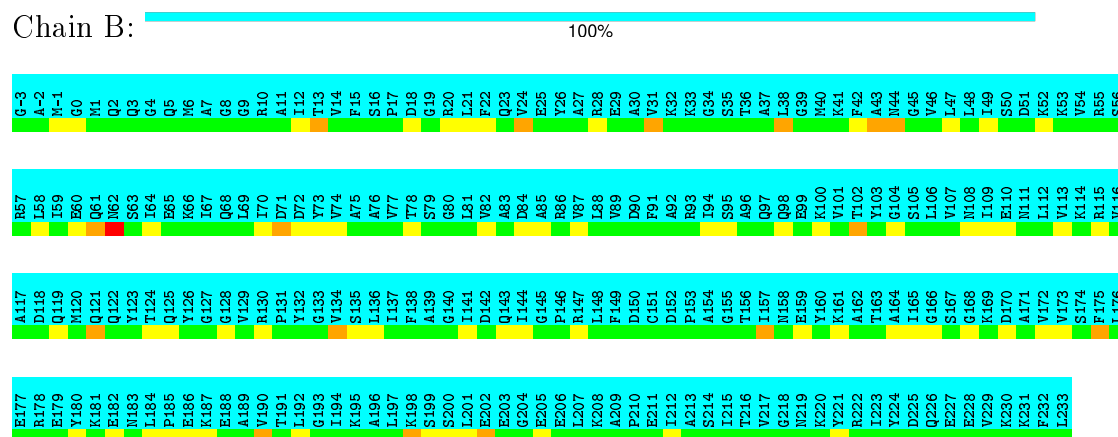
- Molecule 1: Proteasome subunit alpha

Chain A:



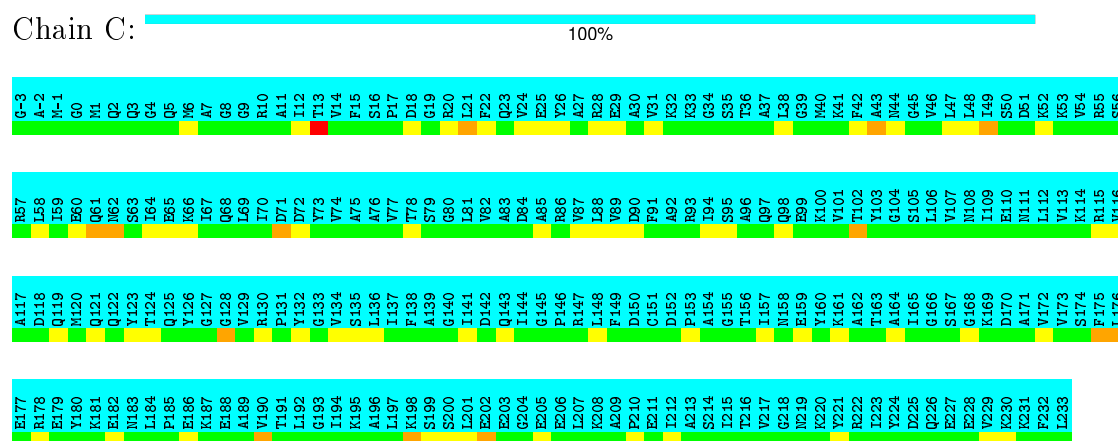
- Molecule 1: Proteasome subunit alpha

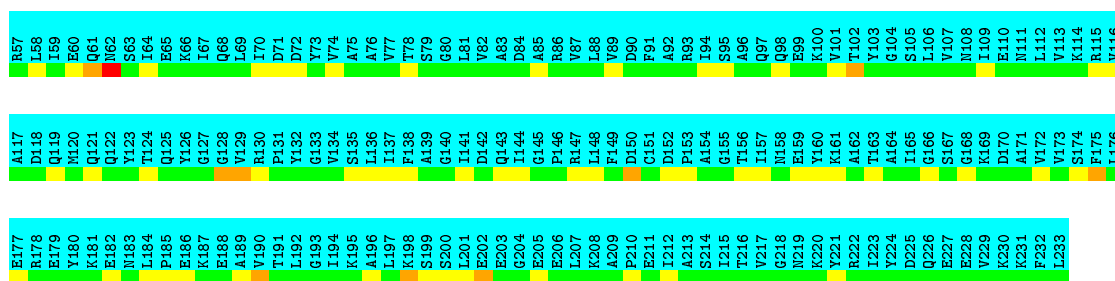
Chain B:



- Molecule 1: Proteasome subunit alpha

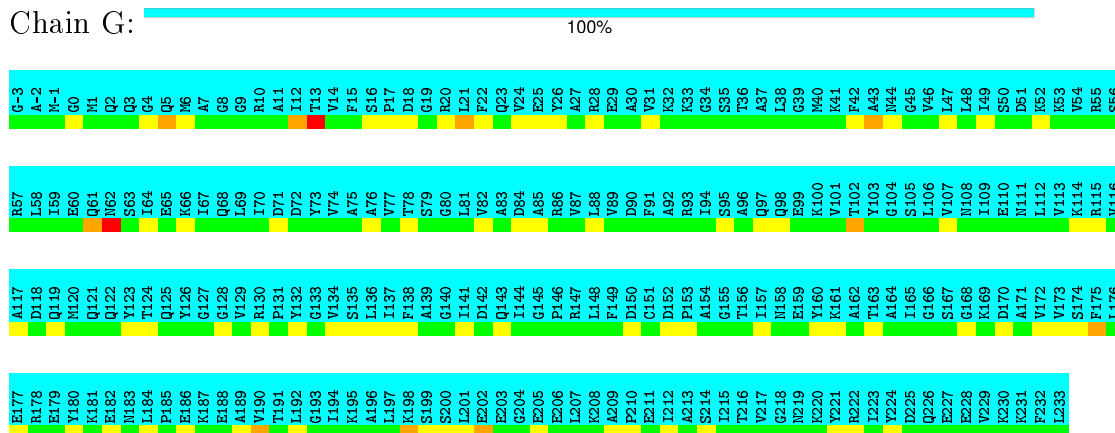
Chain C:





- Molecule 1: Proteasome subunit alpha

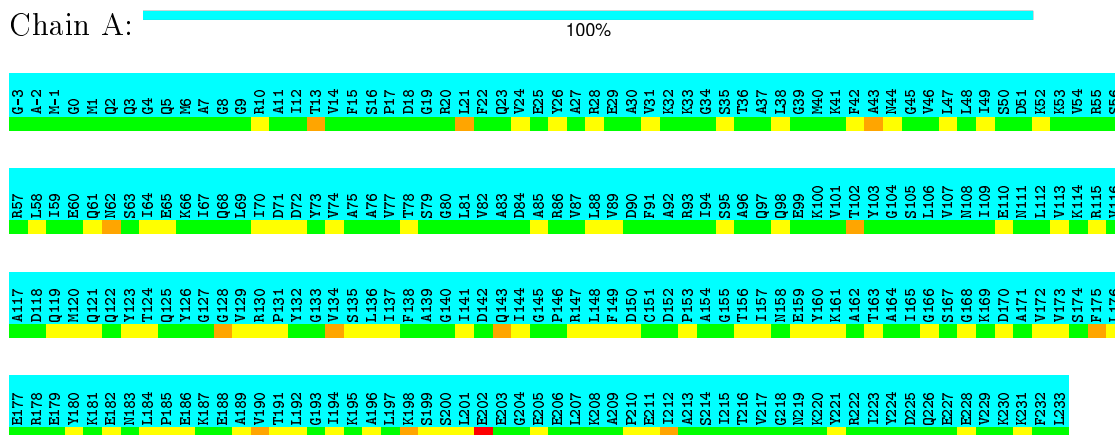
Chain G:



4.2.5 Score per residue for model 5

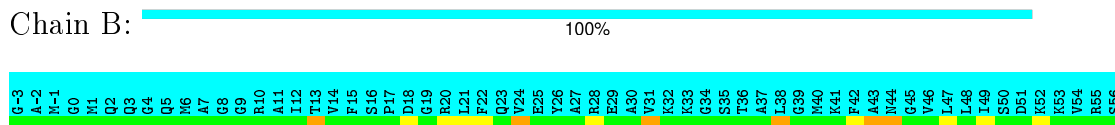
- Molecule 1: Proteasome subunit alpha

Chain A:



- Molecule 1: Proteasome subunit alpha

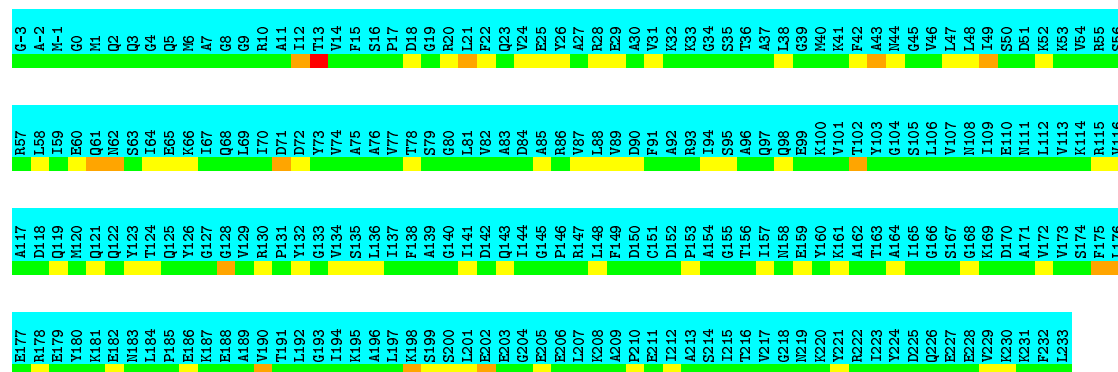
Chain B:





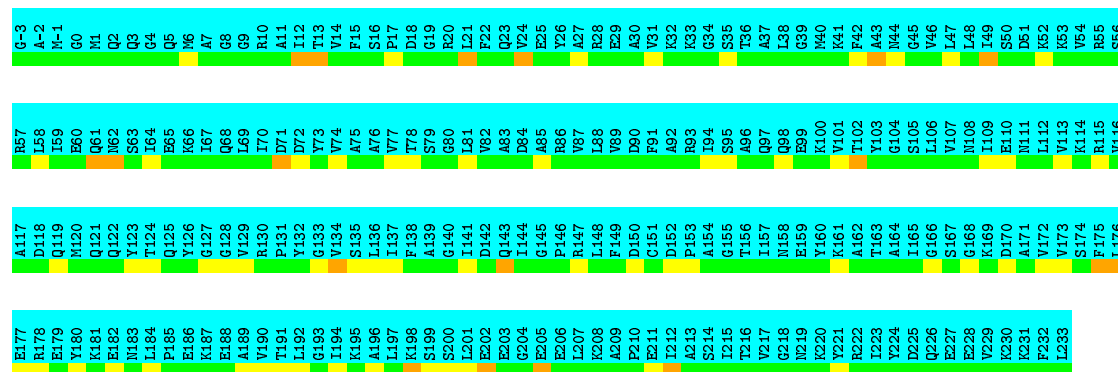
- Molecule 1: Proteasome subunit alpha

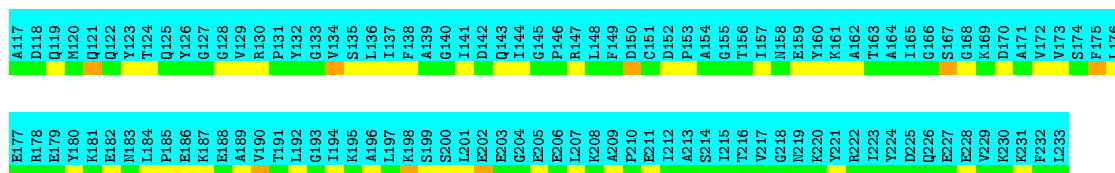
Chain C: 



- Molecule 1: Proteasome subunit alpha

Chain D: 

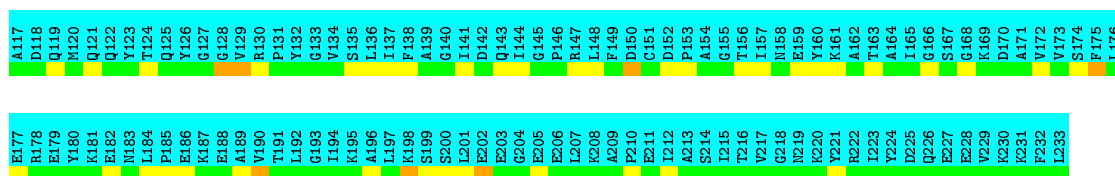
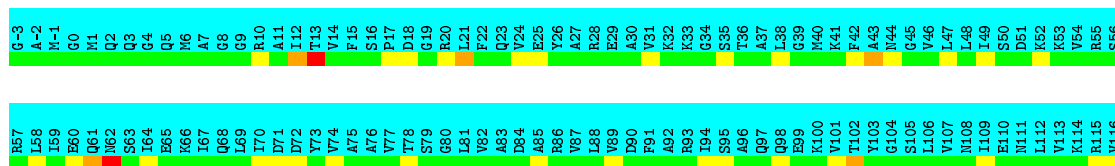




- Molecule 1: Proteasome subunit alpha

Chain F:

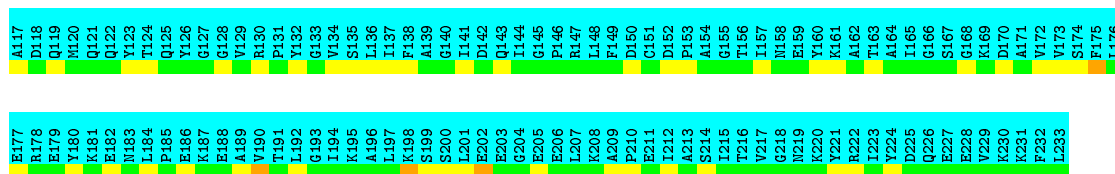
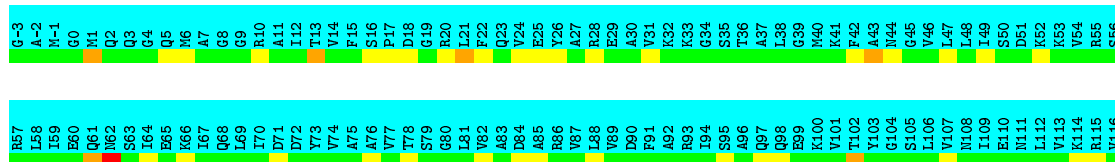
100%



- Molecule 1: Proteasome subunit alpha

Chain G:

100%

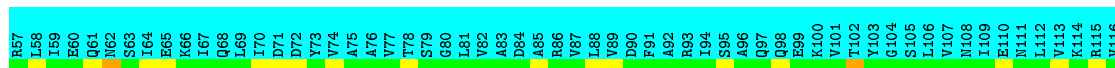
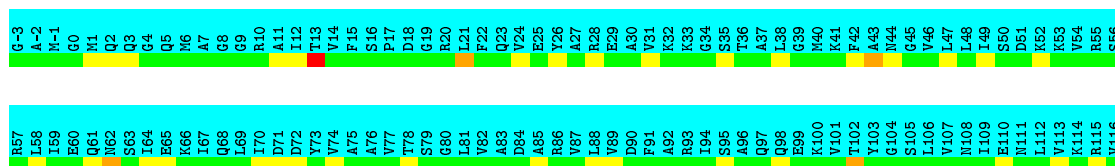


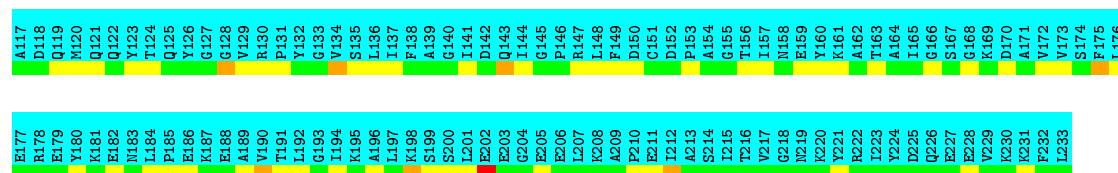
4.2.6 Score per residue for model 6

- Molecule 1: Proteasome subunit alpha

Chain A:

100%

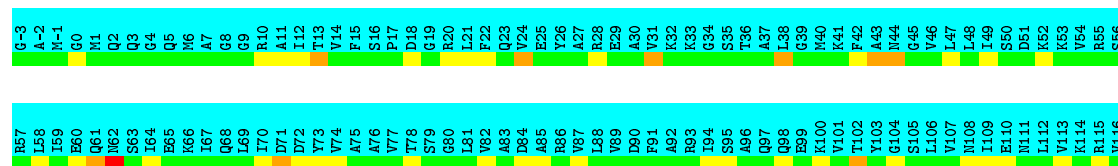




• Molecule 1: Proteasome subunit alpha

Chain B:

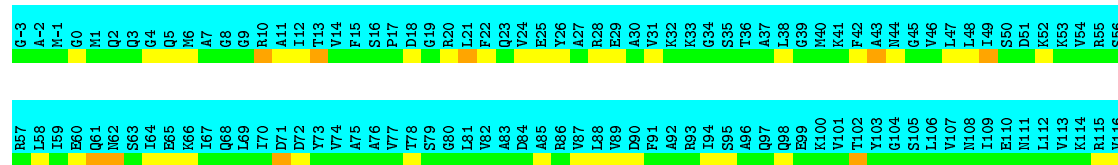
100%



• Molecule 1: Proteasome subunit alpha

Chain C:

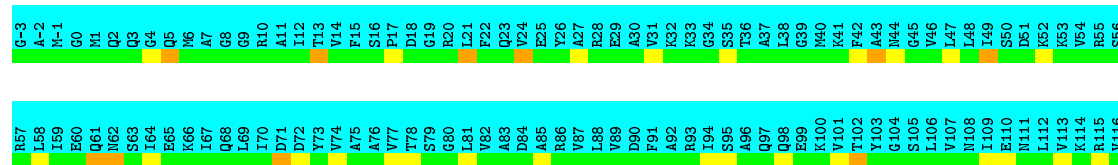
100%

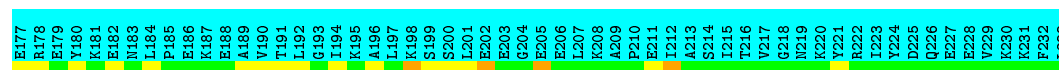


• Molecule 1: Proteasome subunit alpha

Chain D:

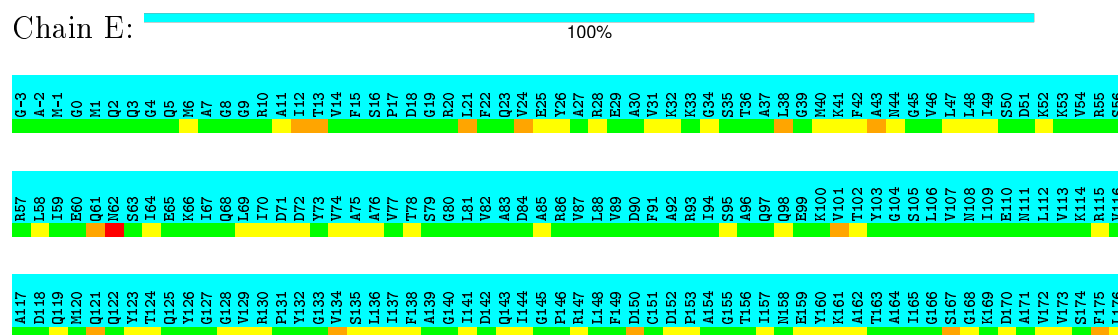
100%





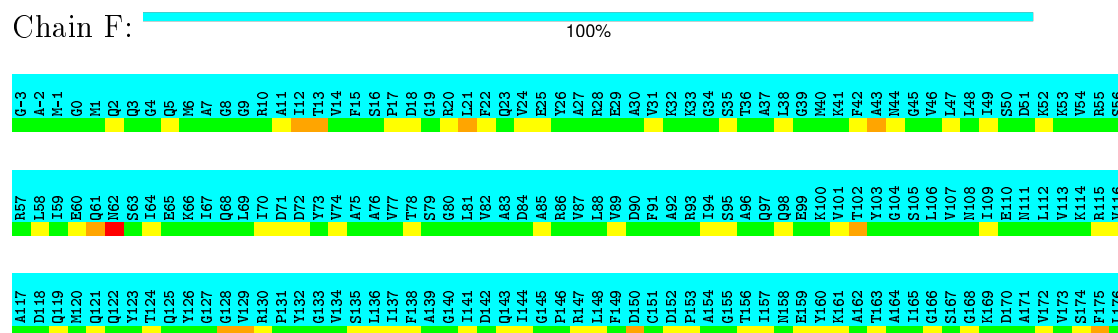
• Molecule 1: Proteasome subunit alpha

Chain E:



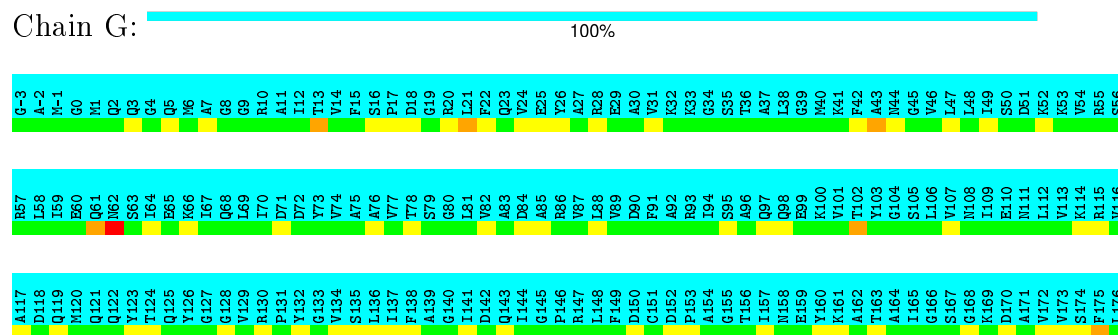
• Molecule 1: Proteasome subunit alpha

Chain F:



• Molecule 1: Proteasome subunit alpha

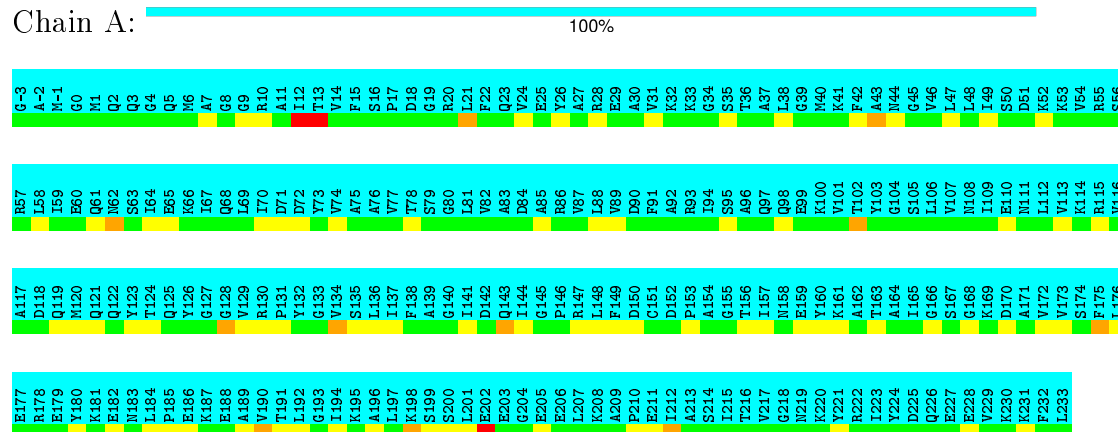
Chain G:



4.2.7 Score per residue for model 7

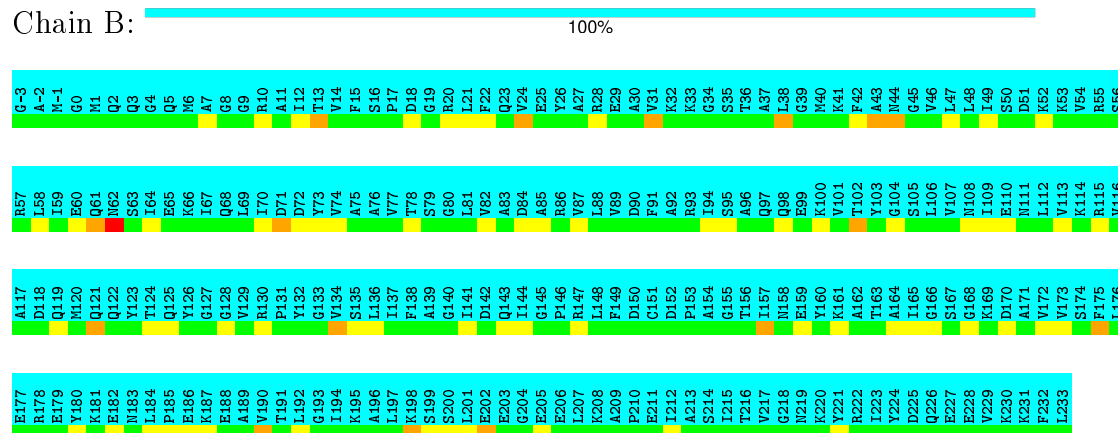
- Molecule 1: Proteasome subunit alpha

Chain A:



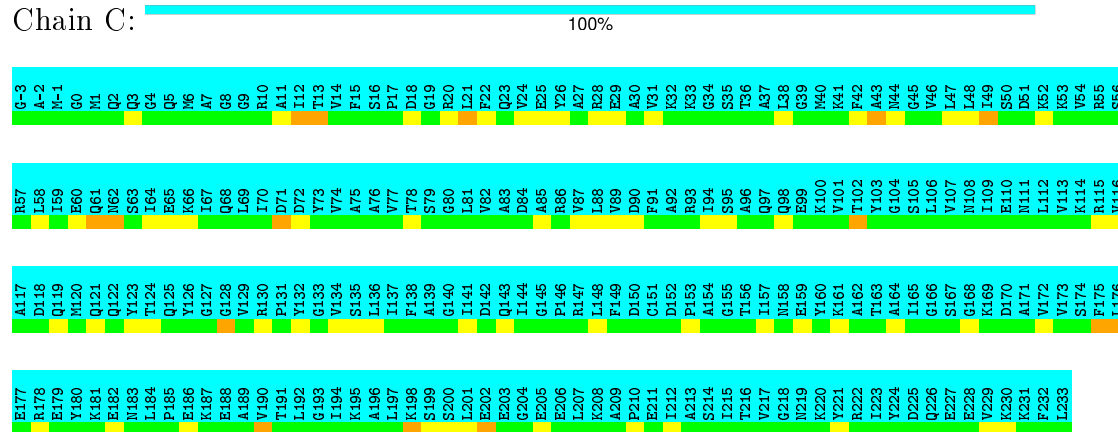
- Molecule 1: Proteasome subunit alpha

Chain B:



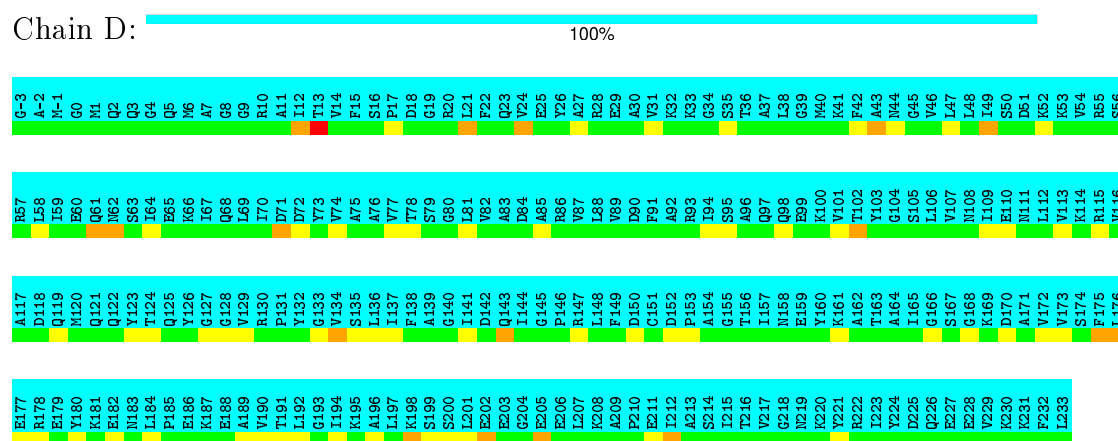
- Molecule 1: Proteasome subunit alpha

Chain C:



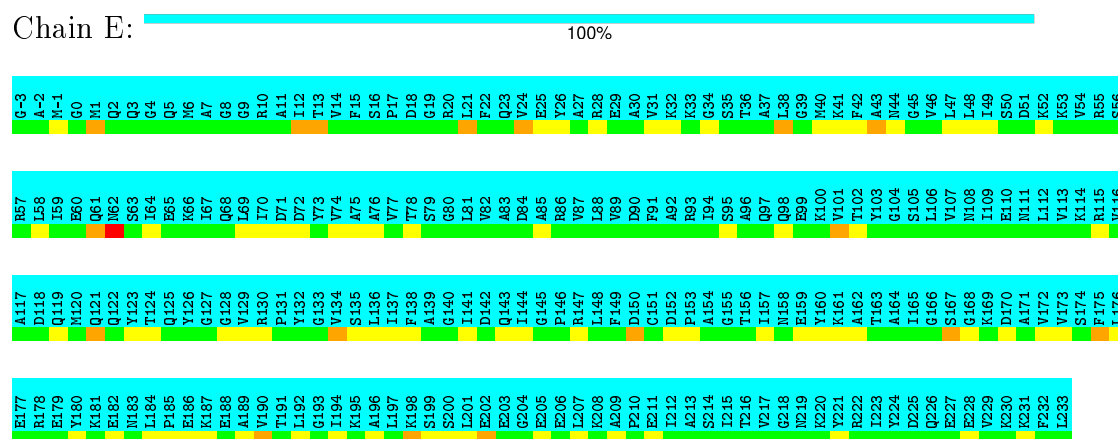
- Molecule 1: Proteasome subunit alpha

Chain D:



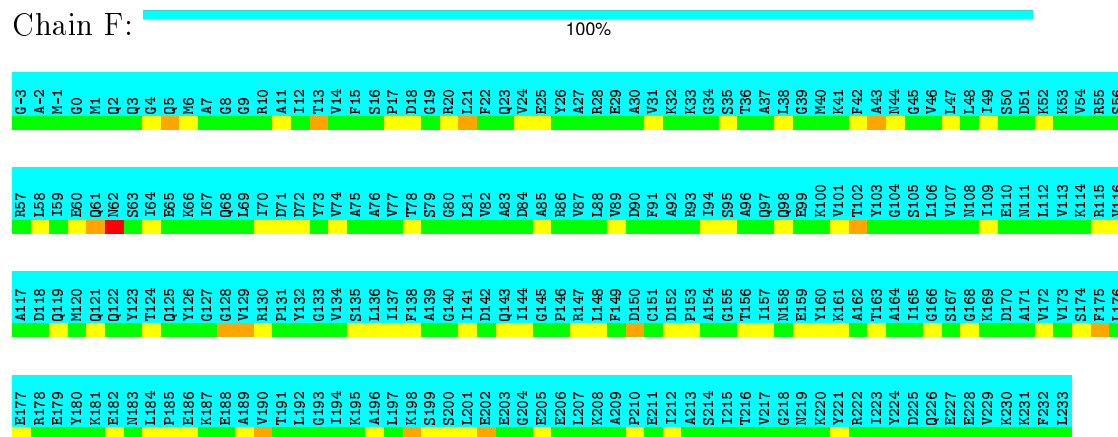
- Molecule 1: Proteasome subunit alpha

Chain E:



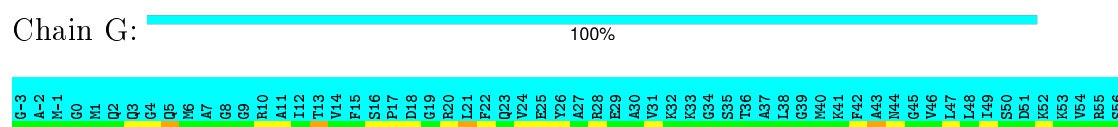
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

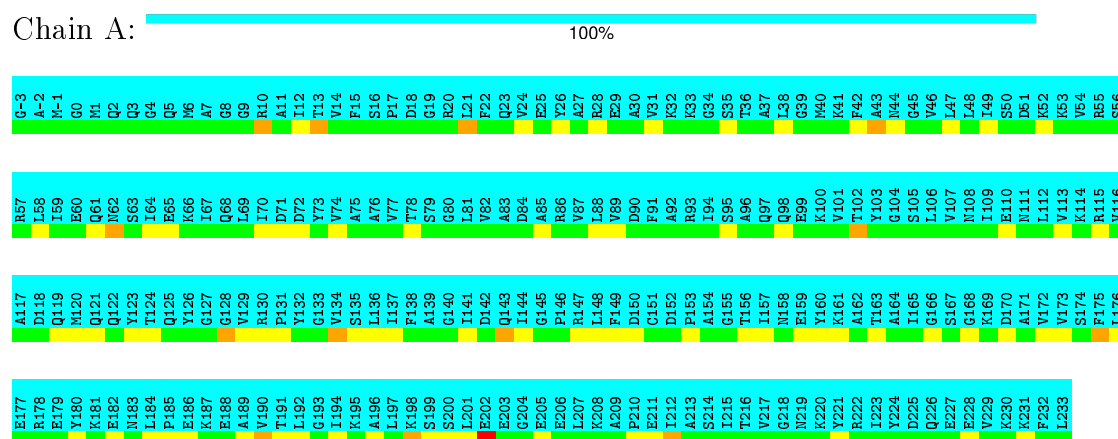
Chain G:



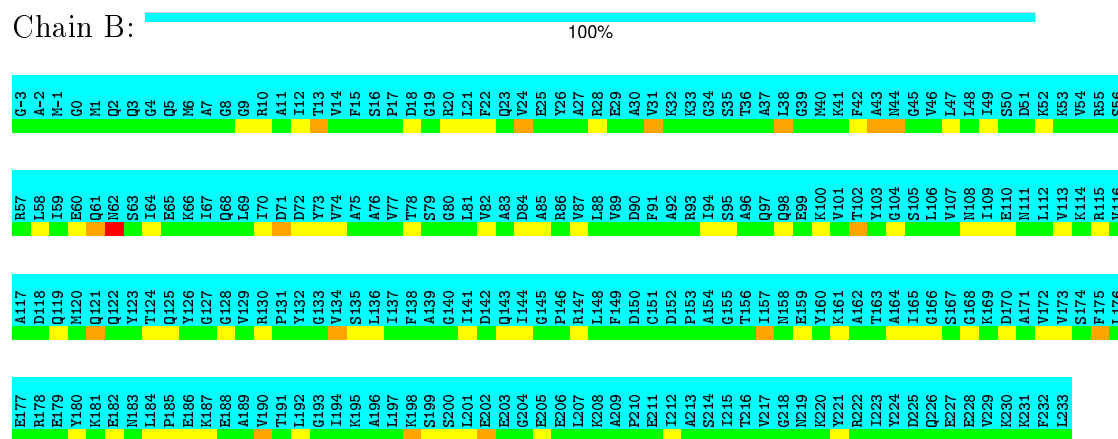


4.2.8 Score per residue for model 8

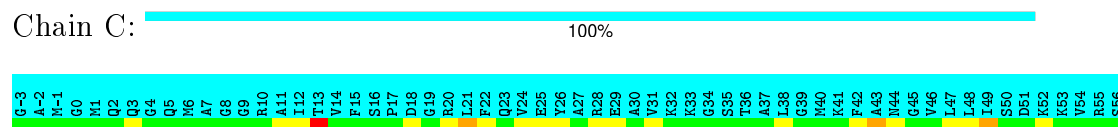
- Molecule 1: Proteasome subunit alpha



- Molecule 1: Proteasome subunit alpha



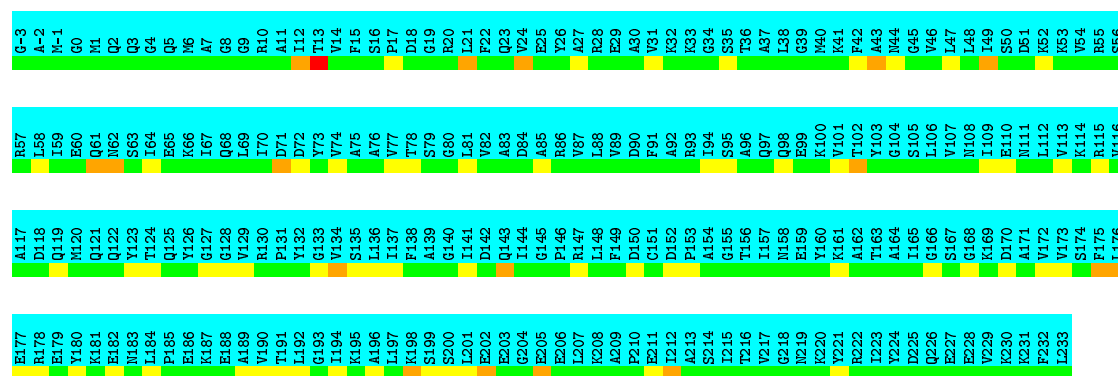
- Molecule 1: Proteasome subunit alpha





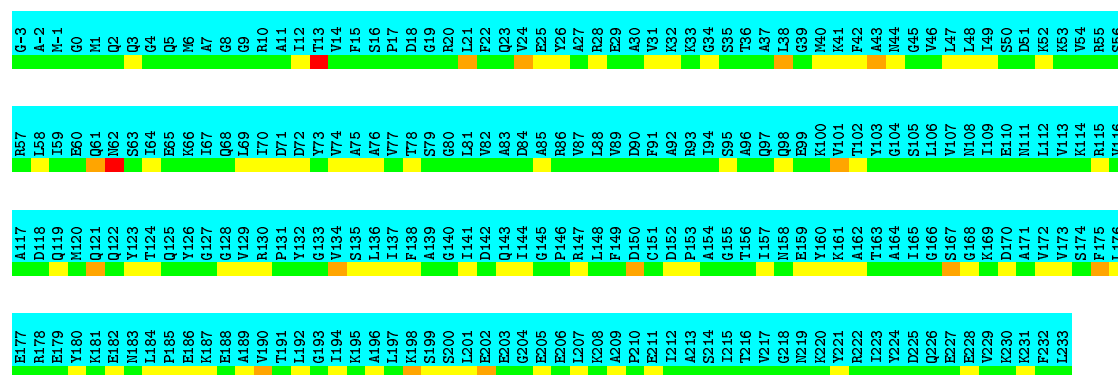
- Molecule 1: Proteasome subunit alpha

Chain D:



- Molecule 1: Proteasome subunit alpha

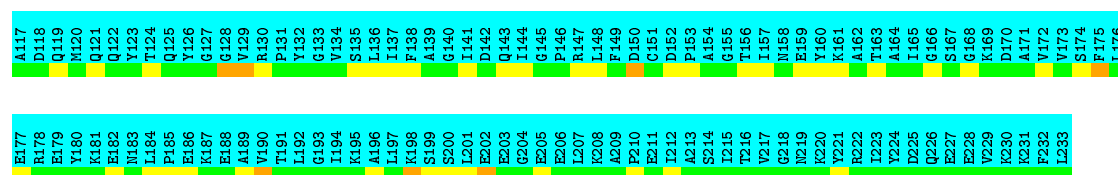
Chain E:

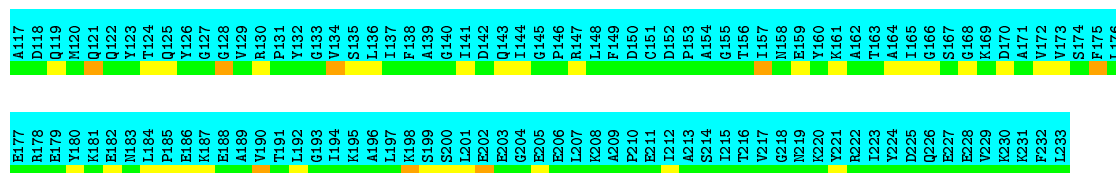


- Molecule 1: Proteasome subunit alpha

Chain F:



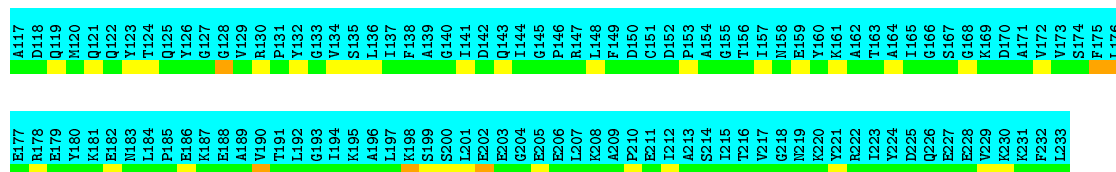
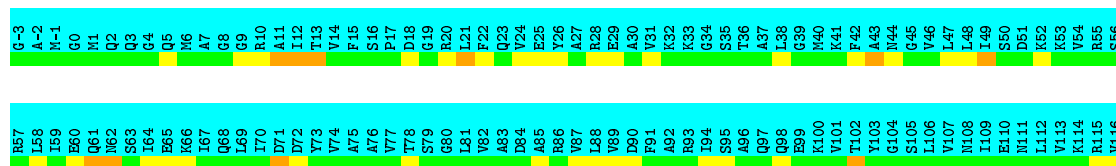




• Molecule 1: Proteasome subunit alpha

Chain C:

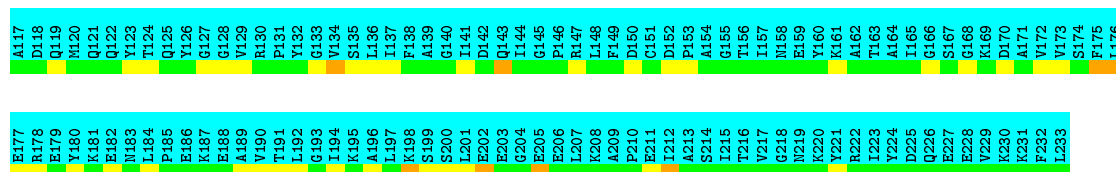
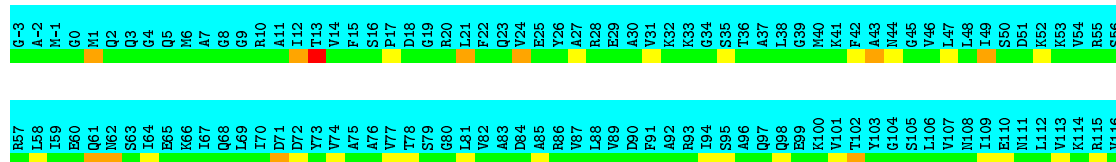
100%



• Molecule 1: Proteasome subunit alpha

Chain D:

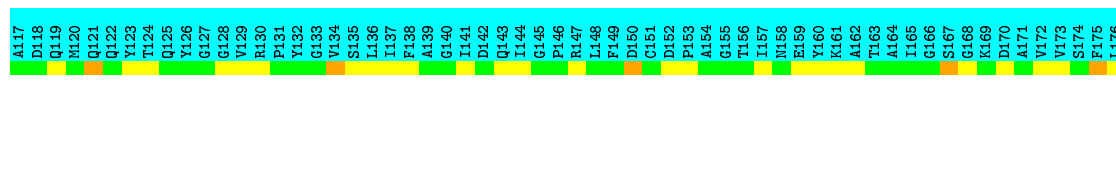
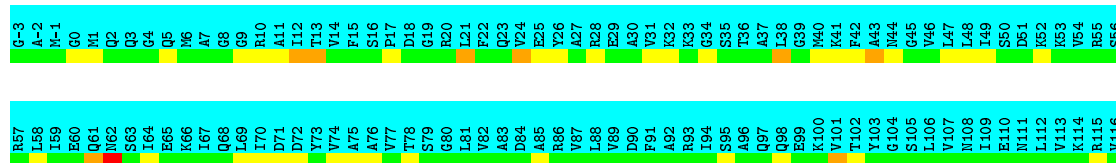
100%

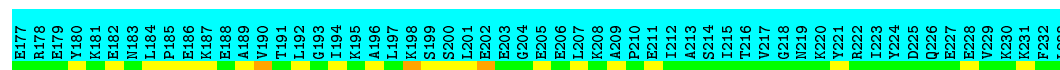


• Molecule 1: Proteasome subunit alpha

Chain E:

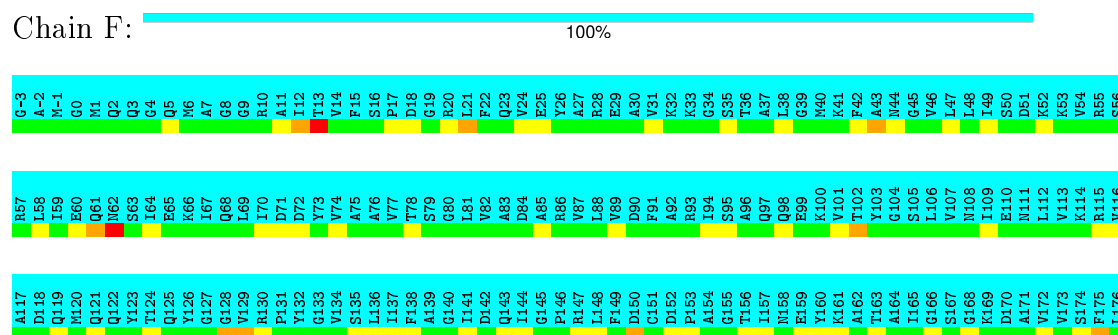
100%





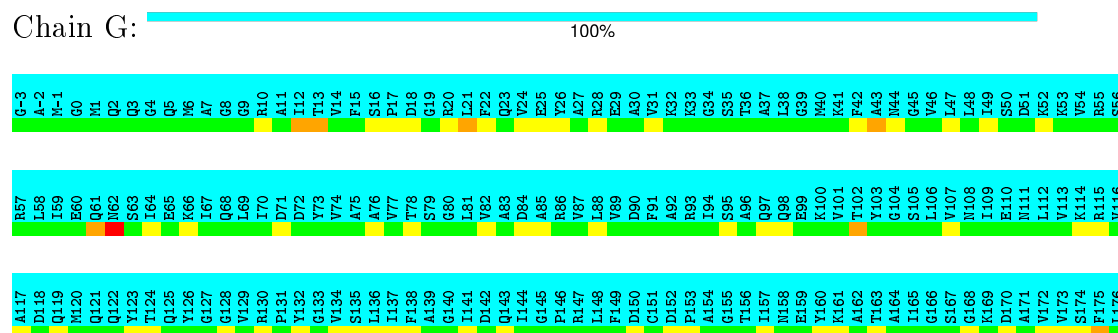
• Molecule 1: Proteasome subunit alpha

Chain F:



• Molecule 1: Proteasome subunit alpha

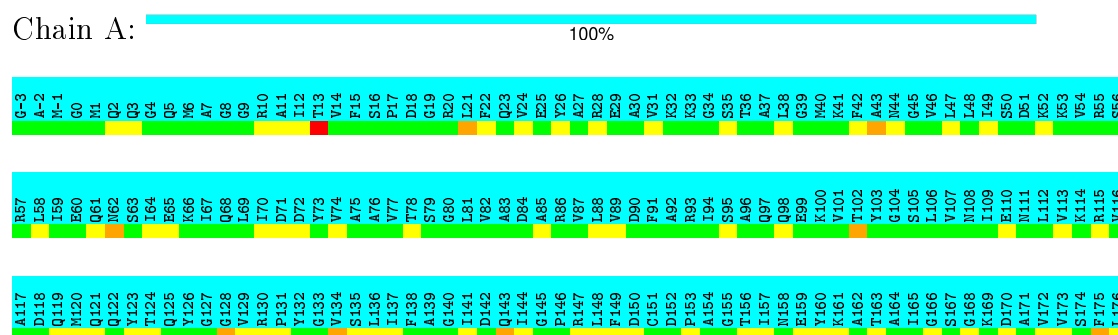
Chain G:

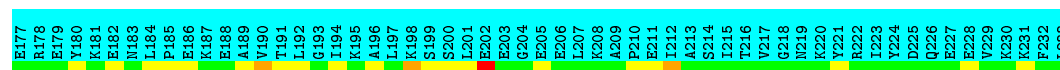


4.2.10 Score per residue for model 10

• Molecule 1: Proteasome subunit alpha

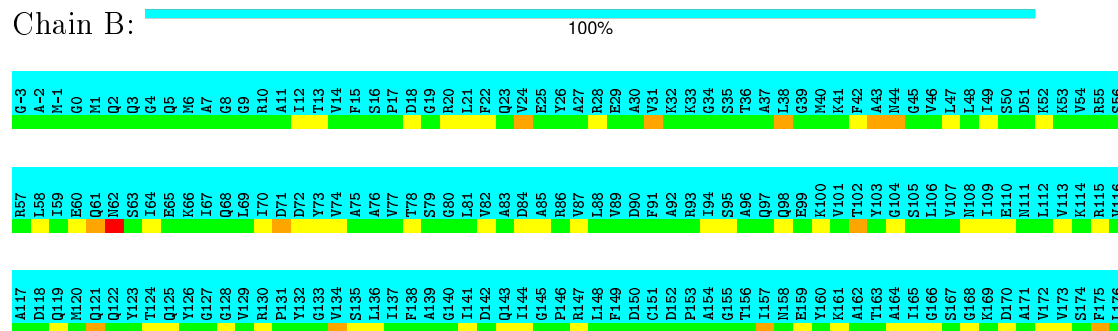
Chain A:





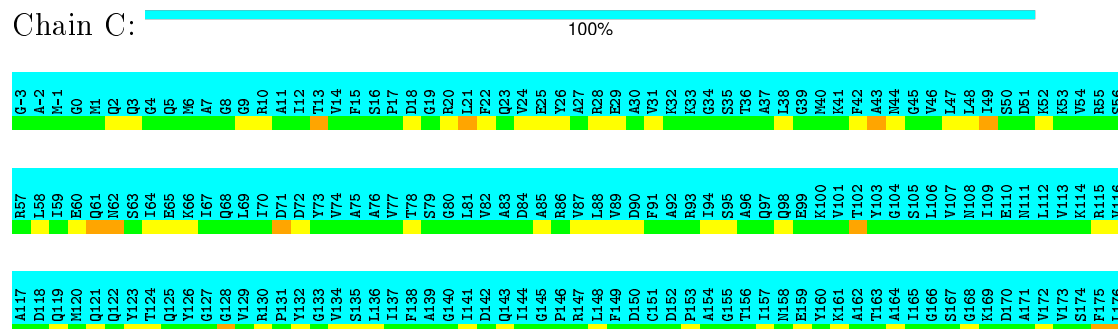
• Molecule 1: Proteasome subunit alpha

Chain B:



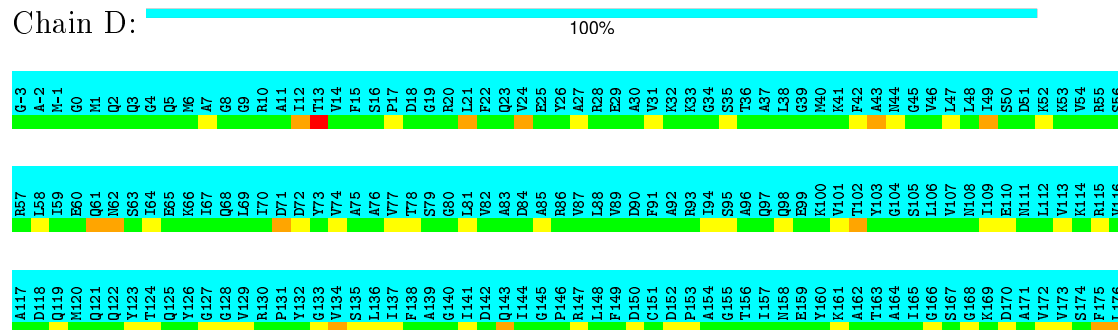
• Molecule 1: Proteasome subunit alpha

Chain C:



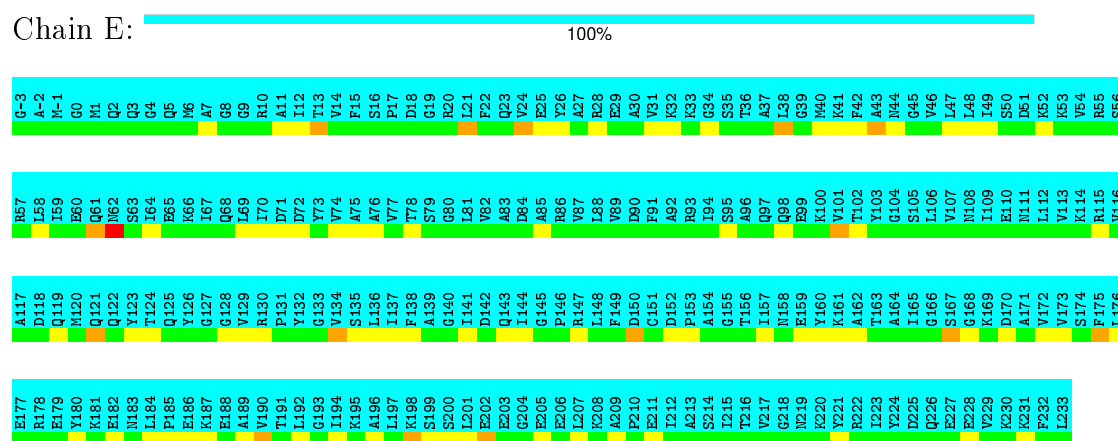
• Molecule 1: Proteasome subunit alpha

Chain D:



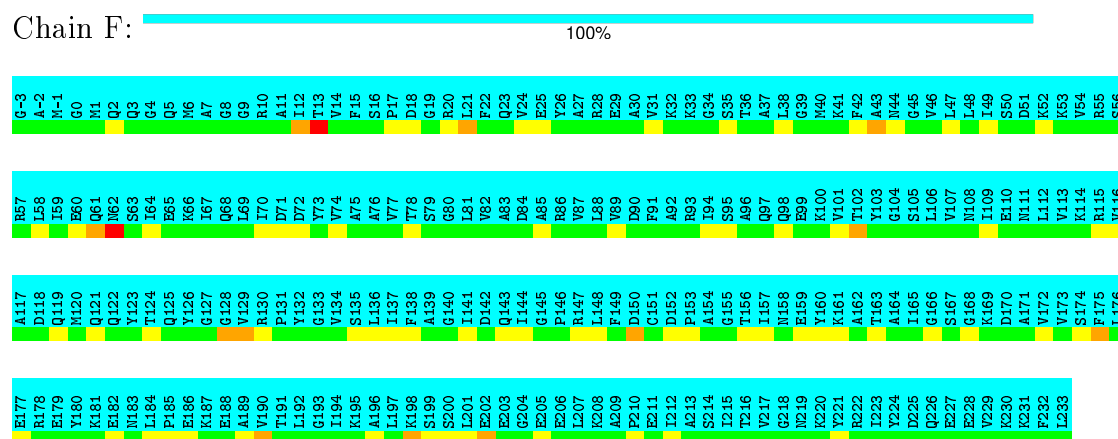
• Molecule 1: Proteasome subunit alpha

Chain E:



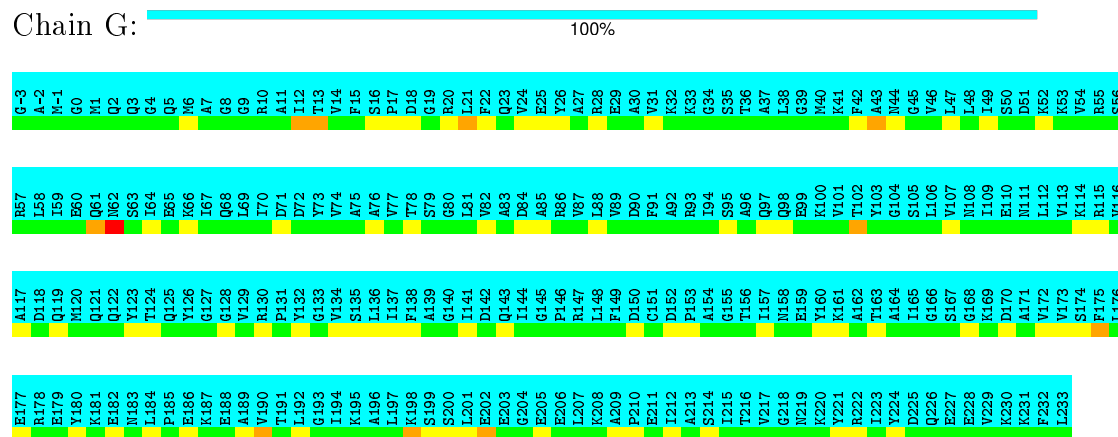
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

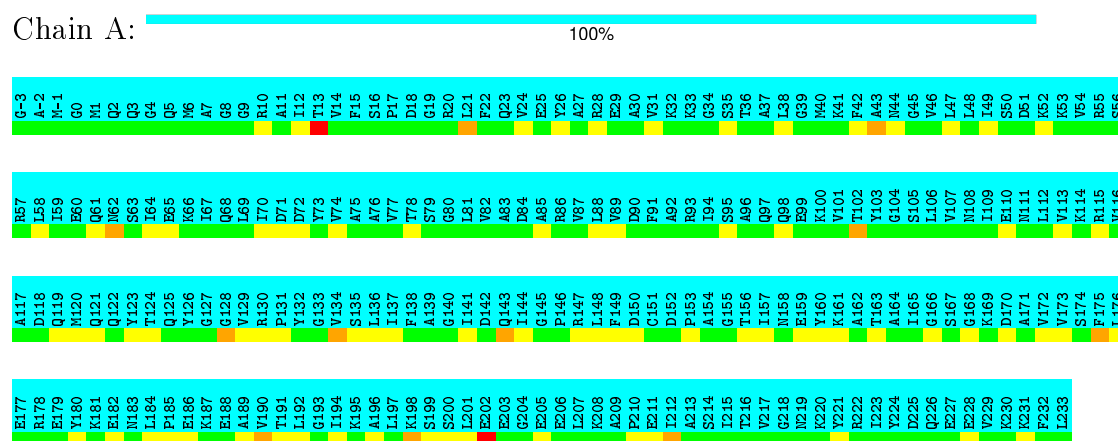
Chain G:



4.2.11 Score per residue for model 11

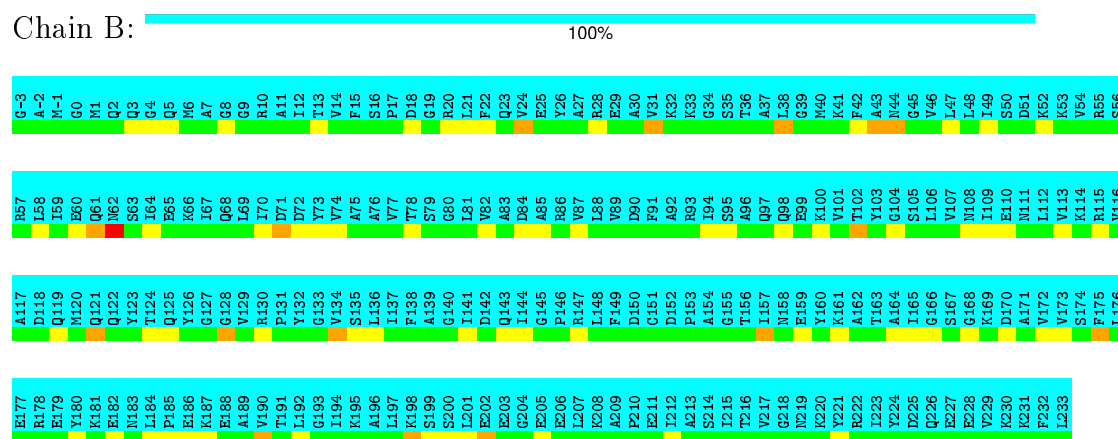
- Molecule 1: Proteasome subunit alpha

Chain A:



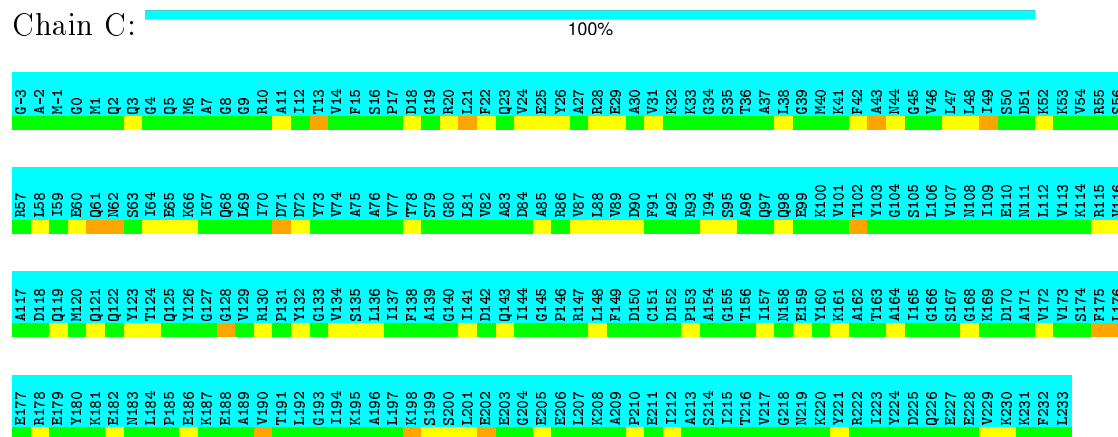
- Molecule 1: Proteasome subunit alpha

Chain B:



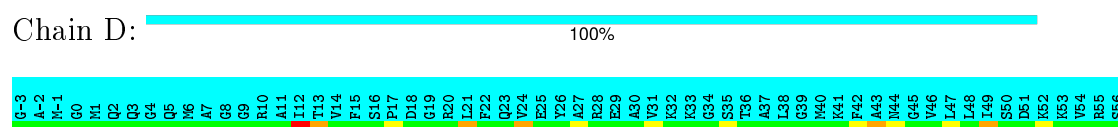
- Molecule 1: Proteasome subunit alpha

Chain C:



- Molecule 1: Proteasome subunit alpha

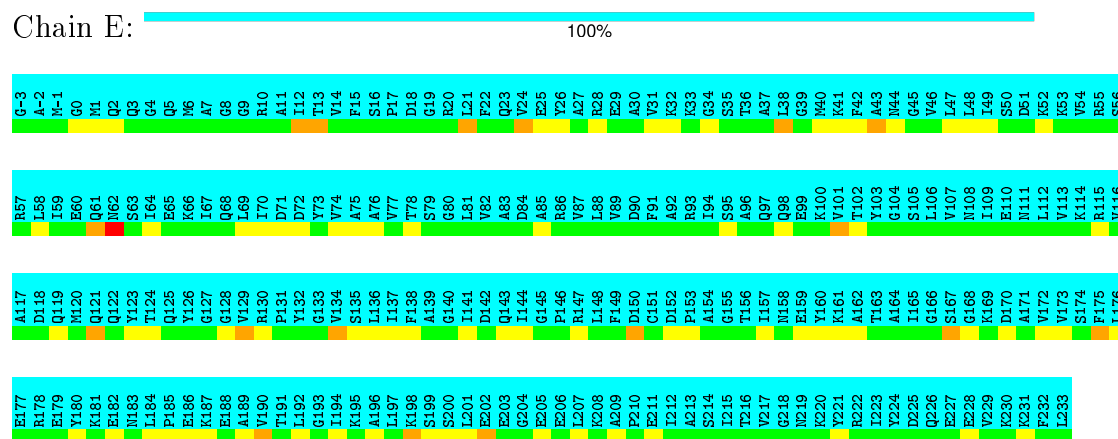
Chain D:





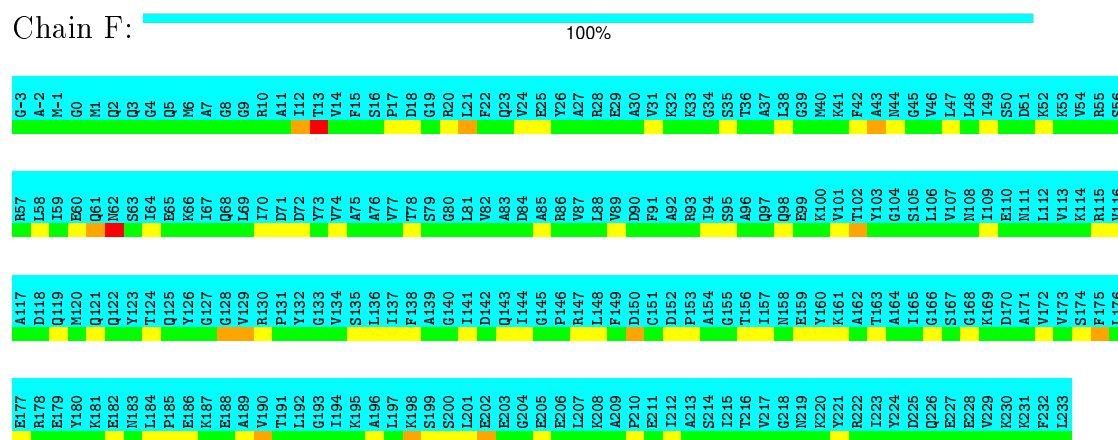
• Molecule 1: Proteasome subunit alpha

Chain E:



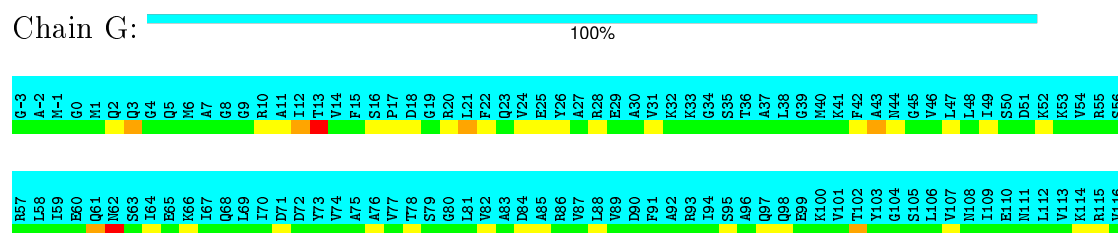
• Molecule 1: Proteasome subunit alpha

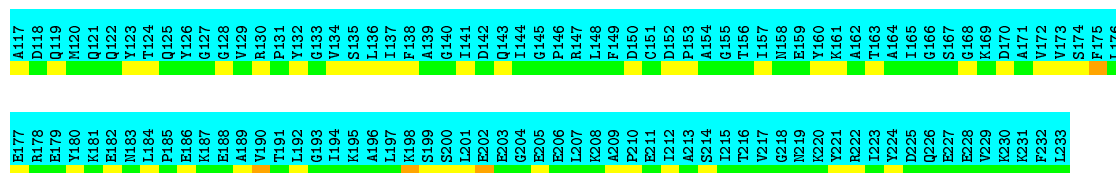
Chain F:



• Molecule 1: Proteasome subunit alpha

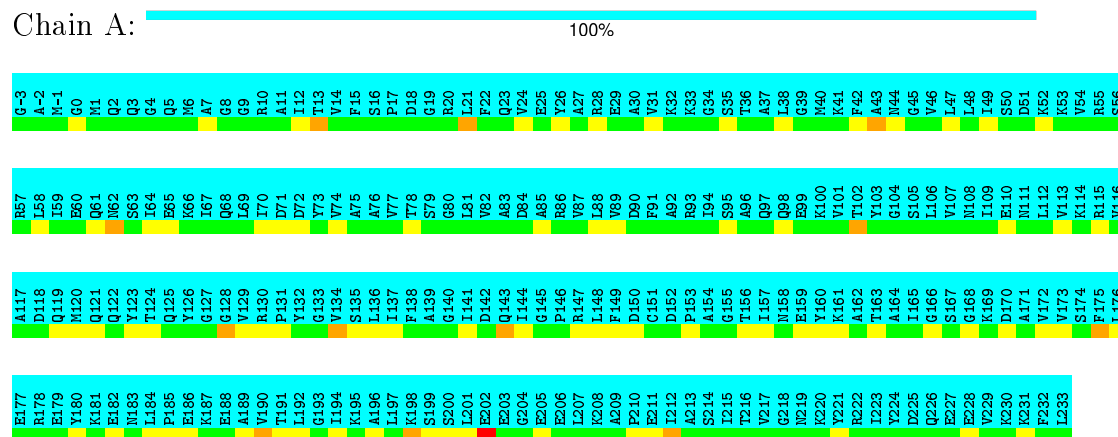
Chain G:



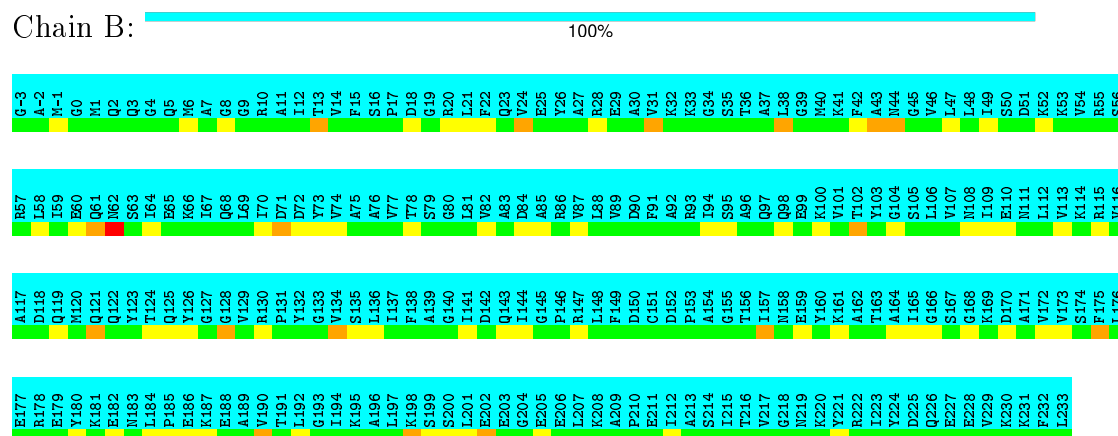


4.2.12 Score per residue for model 12

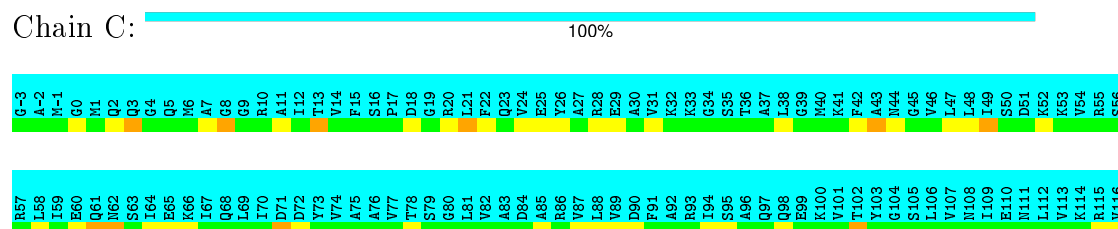
- Molecule 1: Proteasome subunit alpha

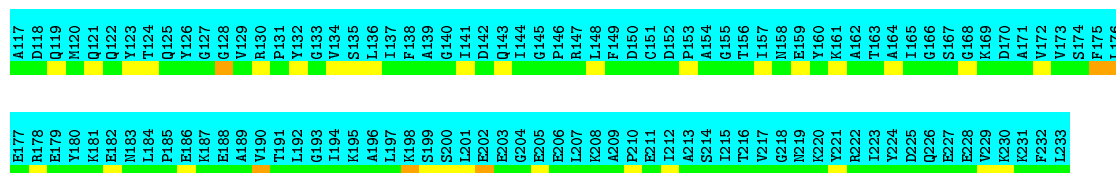


- Molecule 1: Proteasome subunit alpha



- Molecule 1: Proteasome subunit alpha

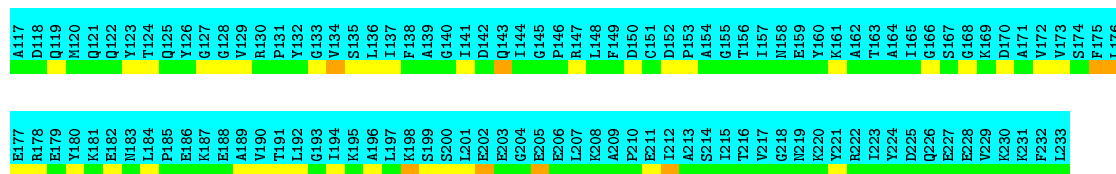
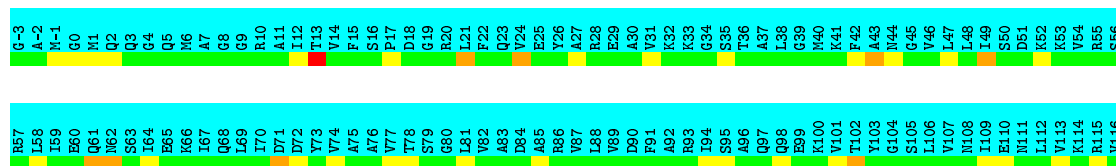




• Molecule 1: Proteasome subunit alpha

Chain D:

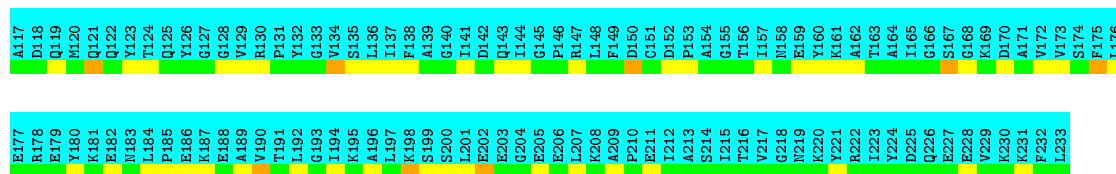
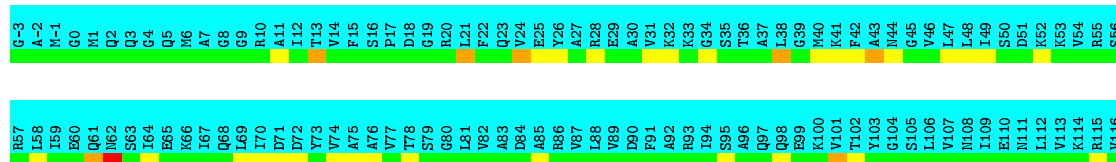
100%



• Molecule 1: Proteasome subunit alpha

Chain E:

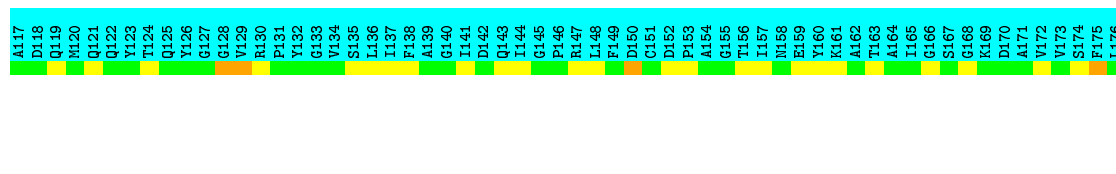
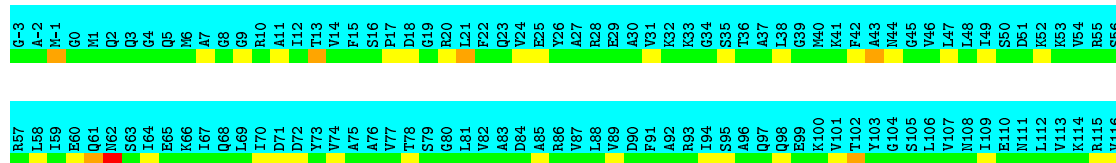
100%

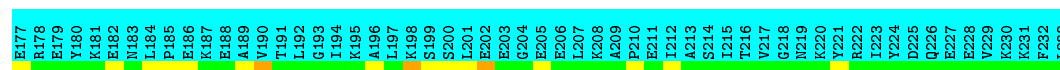


• Molecule 1: Proteasome subunit alpha

Chain F:

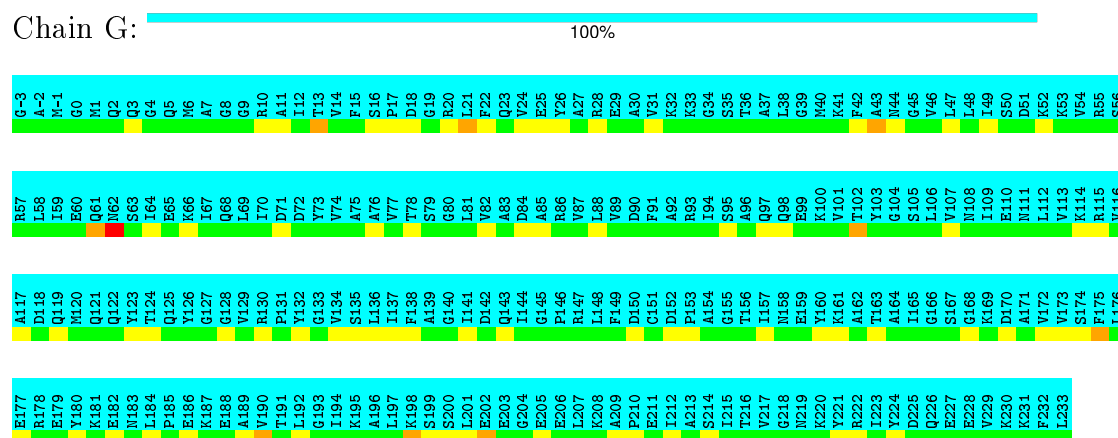
100%





- Molecule 1: Proteasome subunit alpha

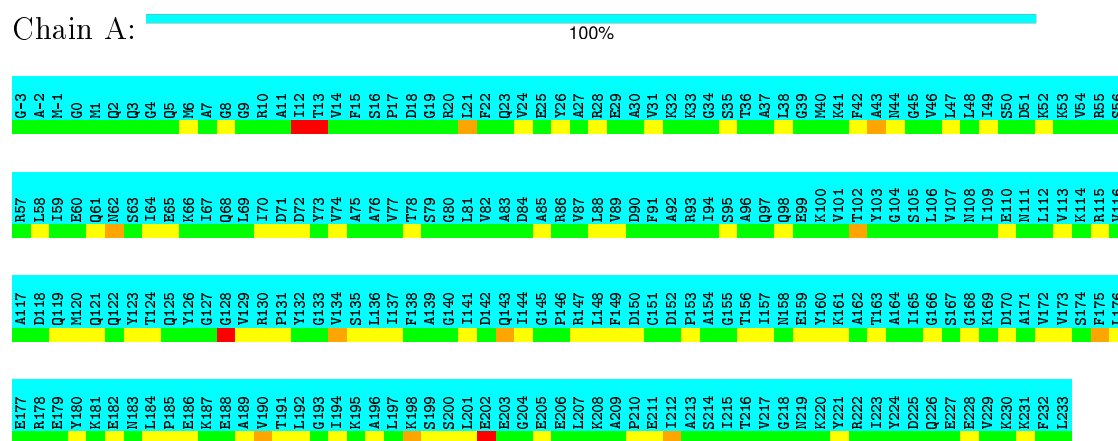
Chain G:



4.2.13 Score per residue for model 13

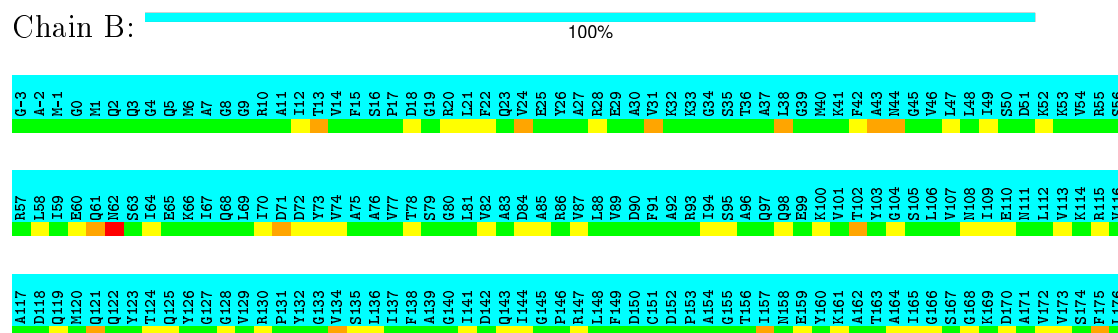
- Molecule 1: Proteasome subunit alpha

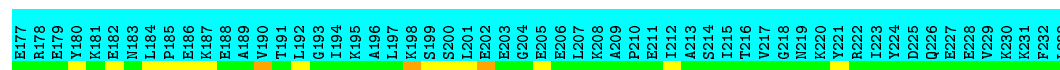
Chain A:



- Molecule 1: Proteasome subunit alpha

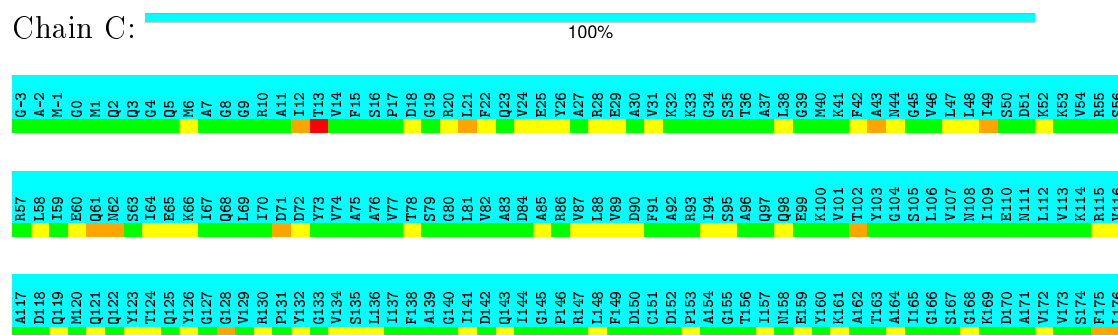
Chain B:





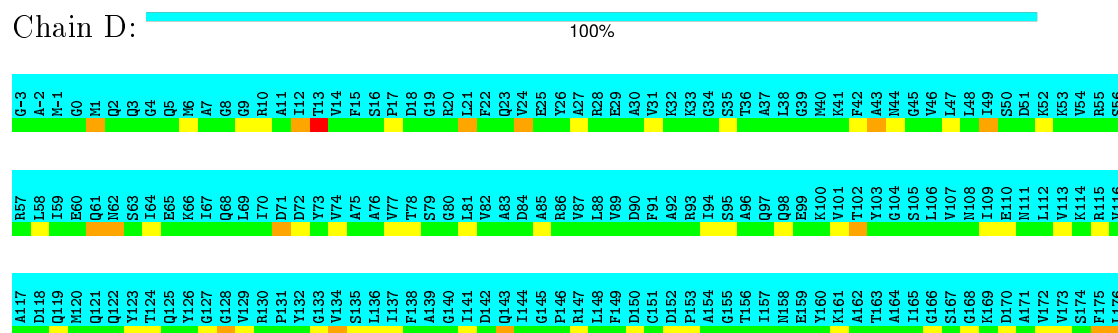
• Molecule 1: Proteasome subunit alpha

Chain C:



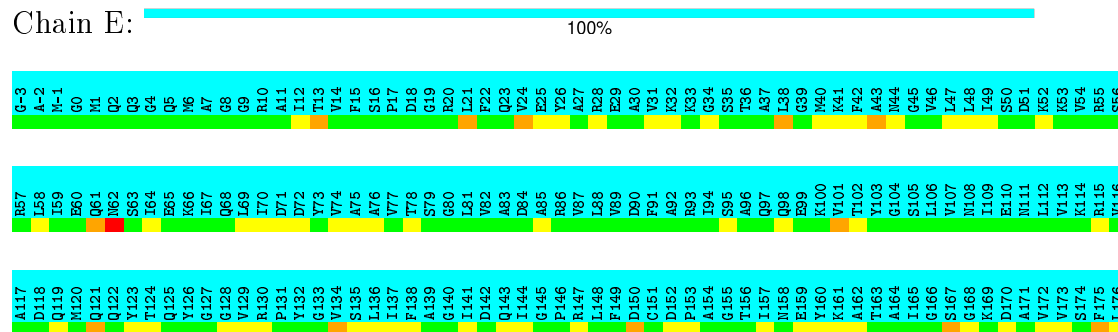
• Molecule 1: Proteasome subunit alpha

Chain D:



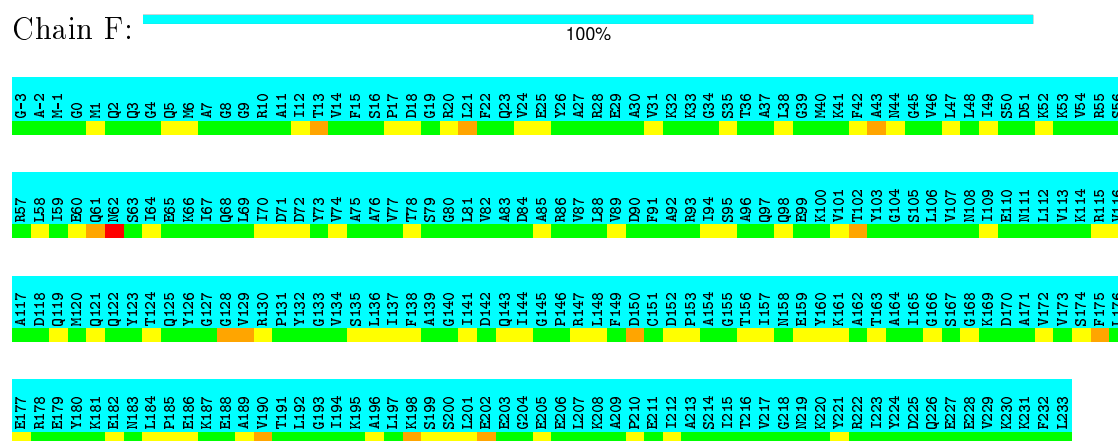
• Molecule 1: Proteasome subunit alpha

Chain E:



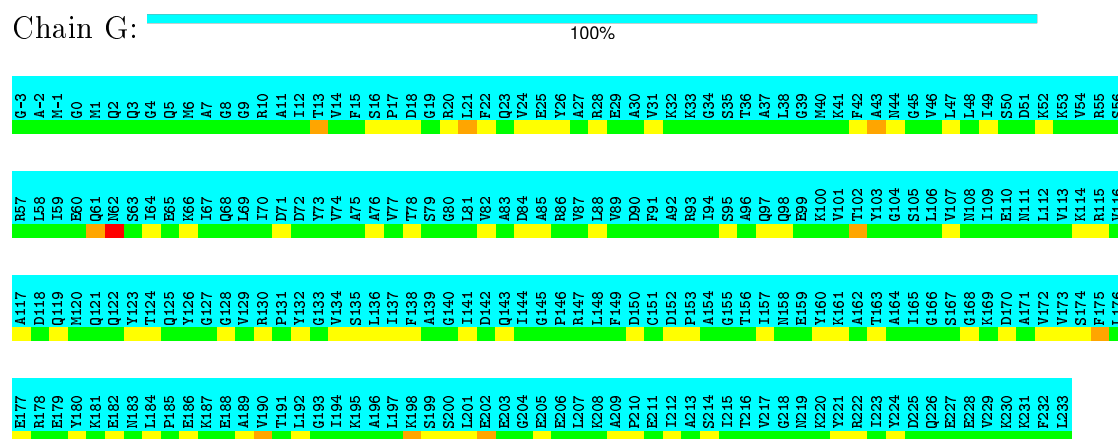
• Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

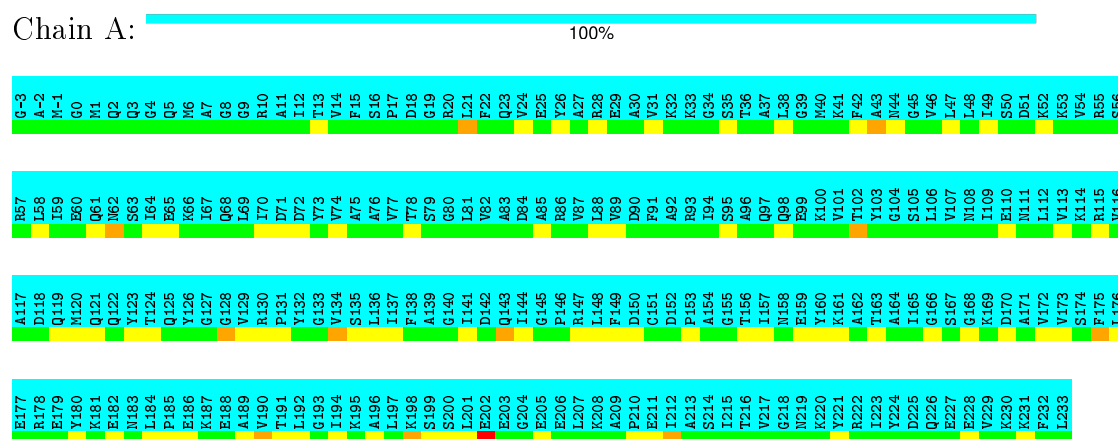
Chain G:



4.2.14 Score per residue for model 14

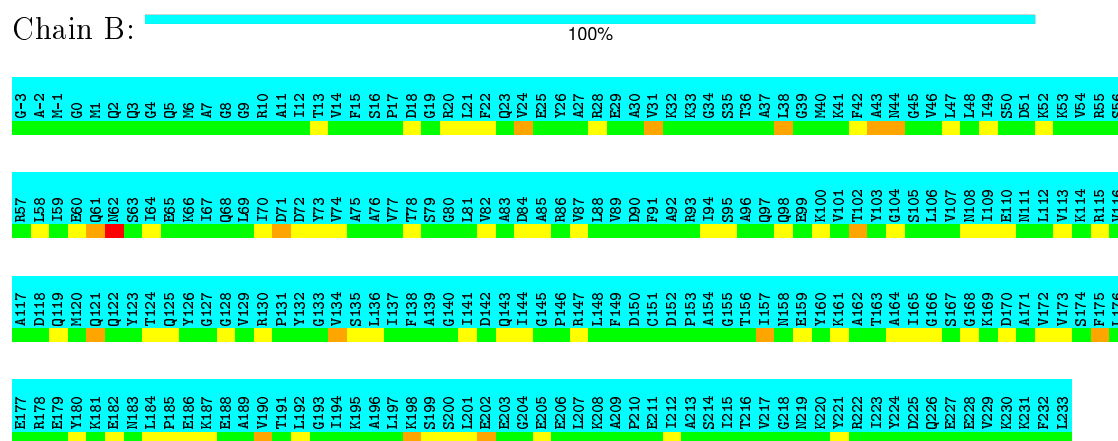
- Molecule 1: Proteasome subunit alpha

Chain A:



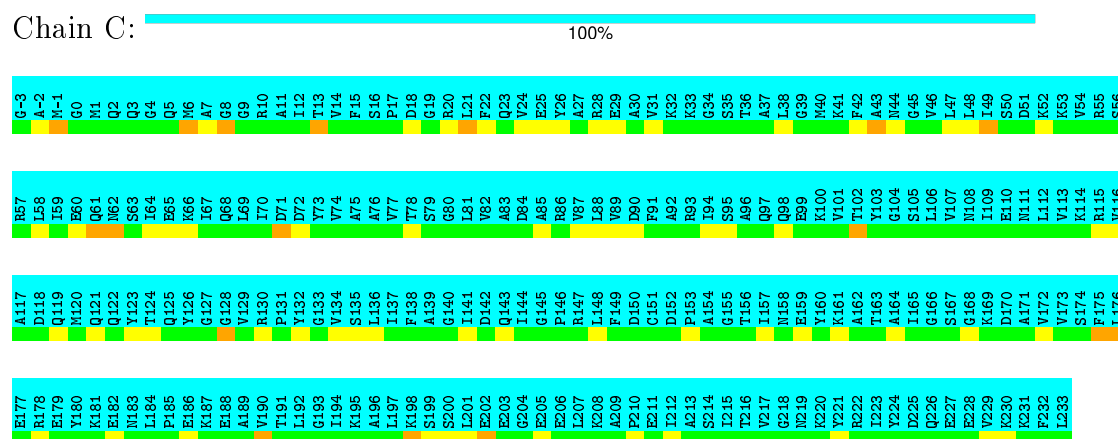
- Molecule 1: Proteasome subunit alpha

Chain B:



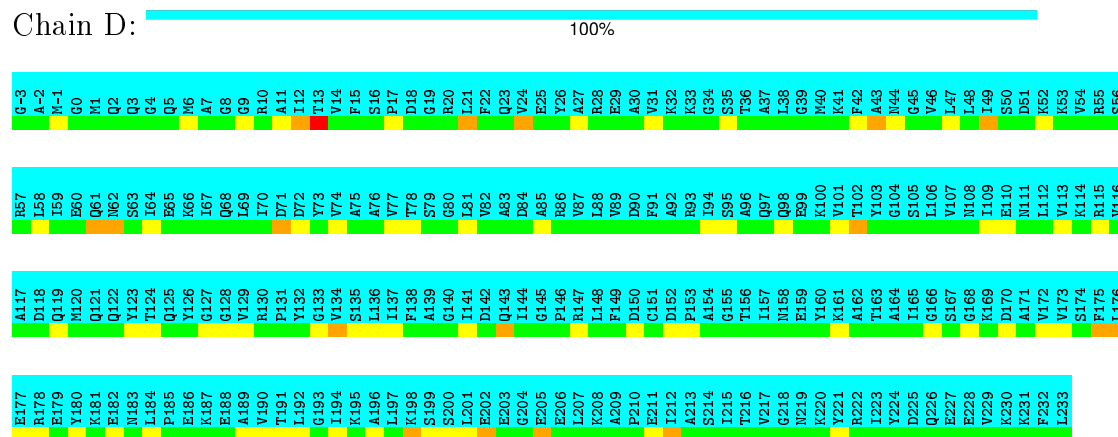
• Molecule 1: Proteasome subunit alpha

Chain C:



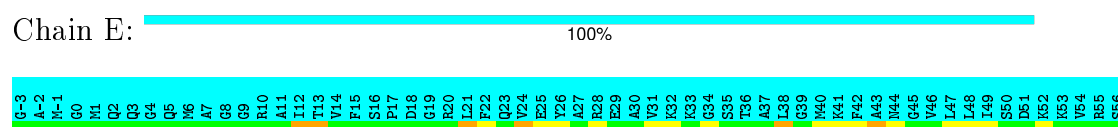
• Molecule 1: Proteasome subunit alpha

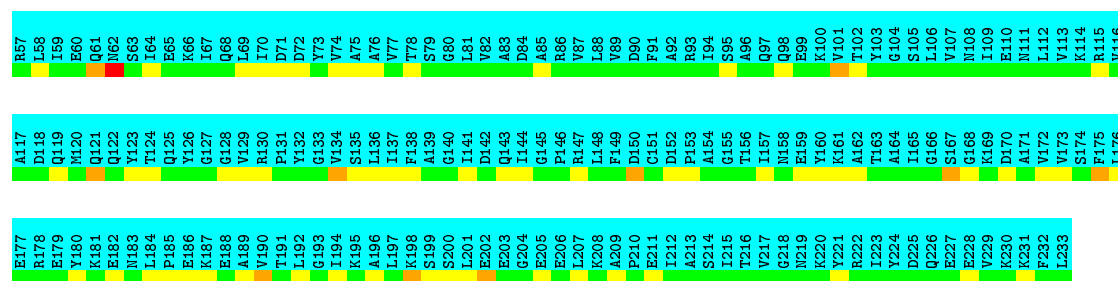
Chain D:



• Molecule 1: Proteasome subunit alpha

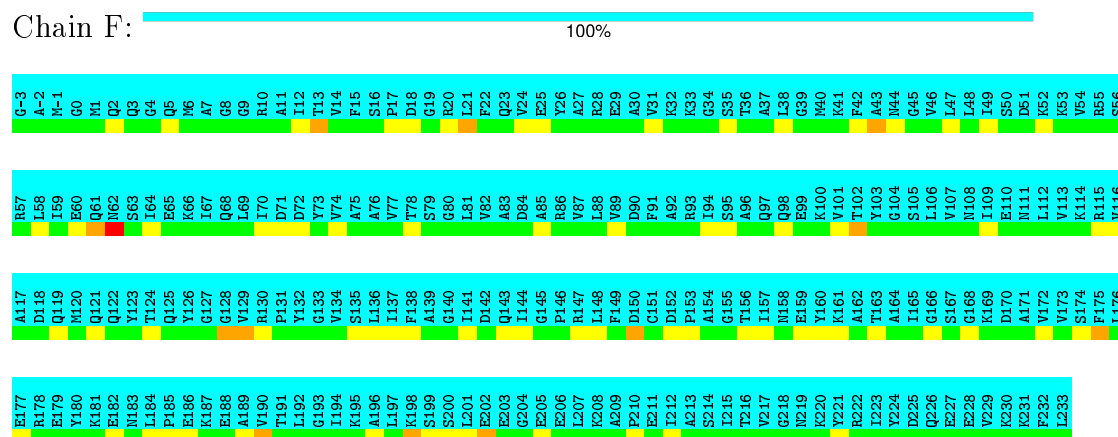
Chain E:





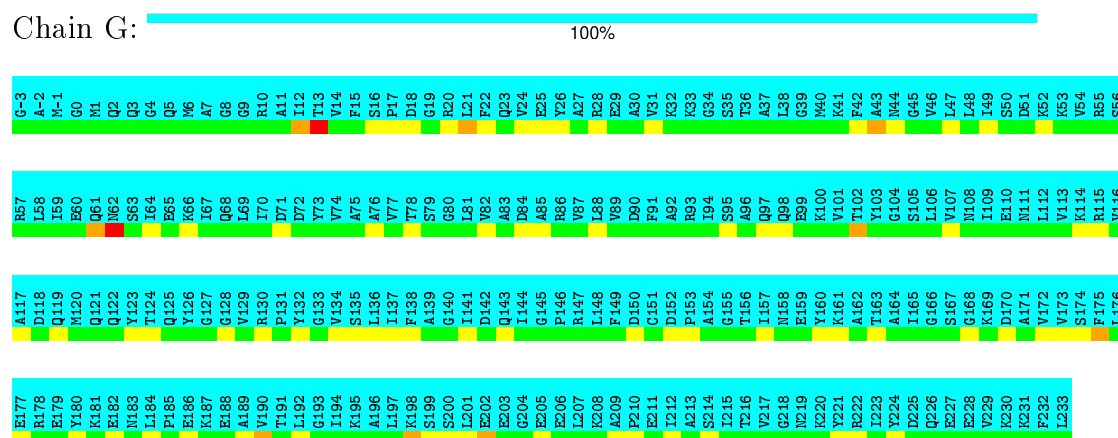
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

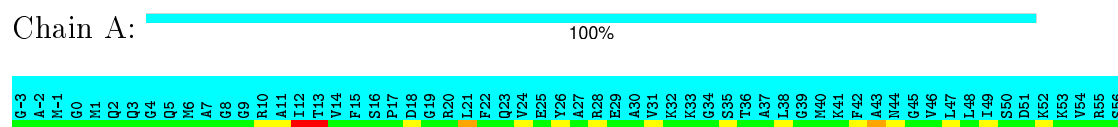
Chain G:



4.2.15 Score per residue for model 15

- Molecule 1: Proteasome subunit alpha

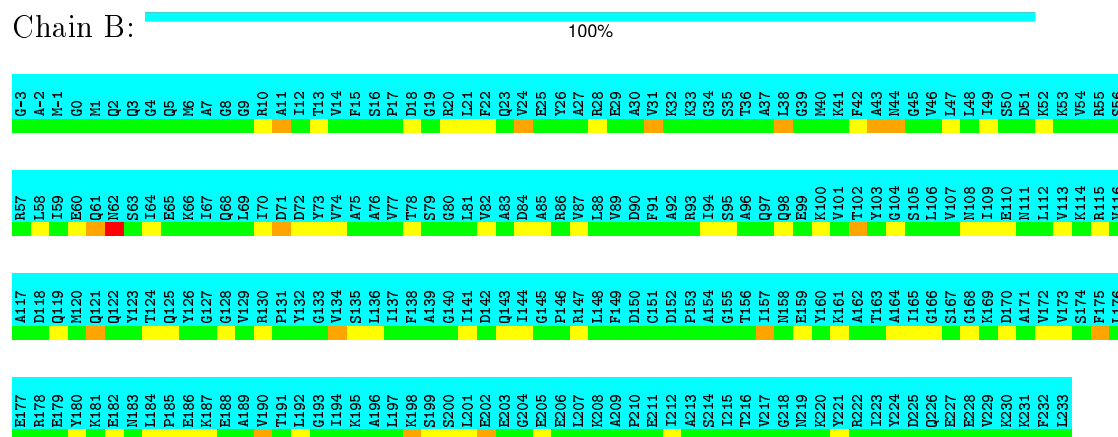
Chain A:





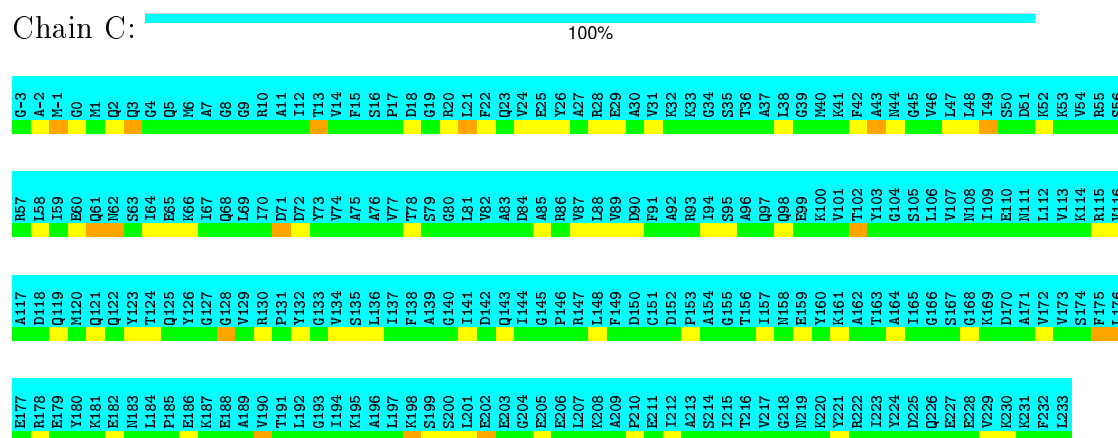
- Molecule 1: Proteasome subunit alpha

Chain B:



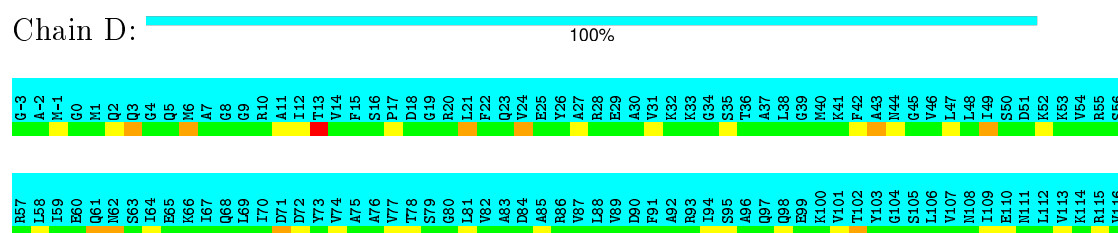
- Molecule 1: Proteasome subunit alpha

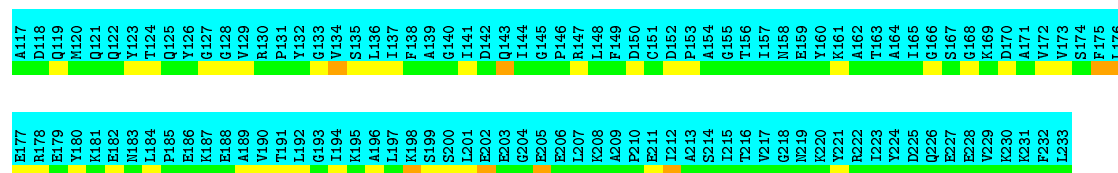
Chain C:



- Molecule 1: Proteasome subunit alpha

Chain D:

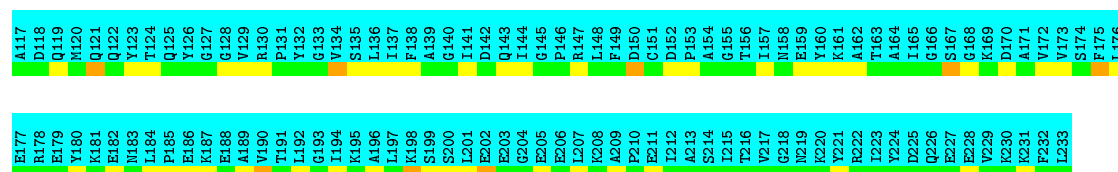
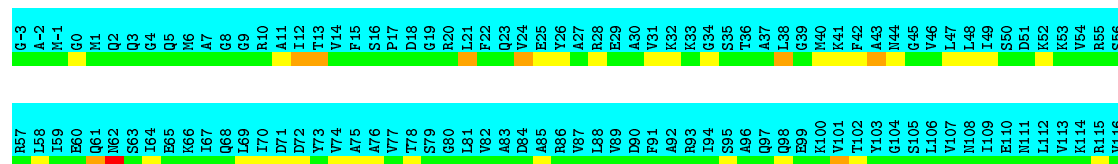




• Molecule 1: Proteasome subunit alpha

Chain E:

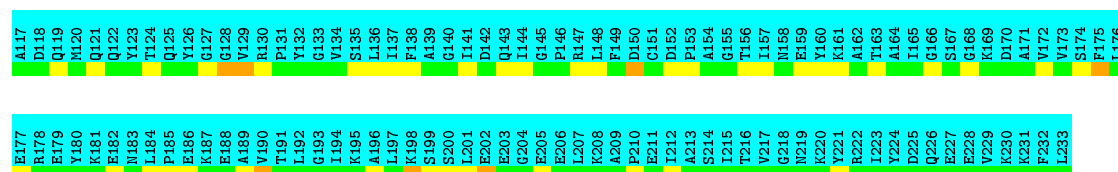
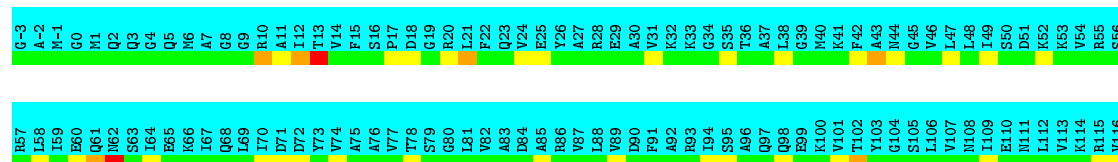
100%



• Molecule 1: Proteasome subunit alpha

Chain F:

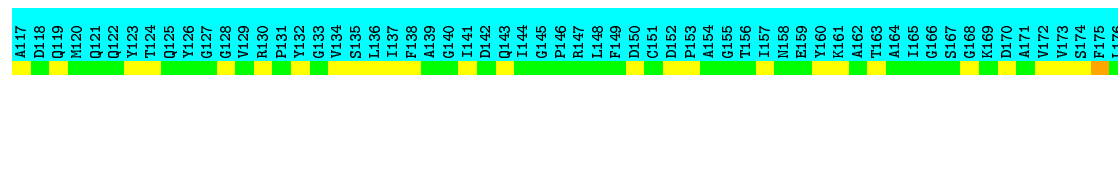
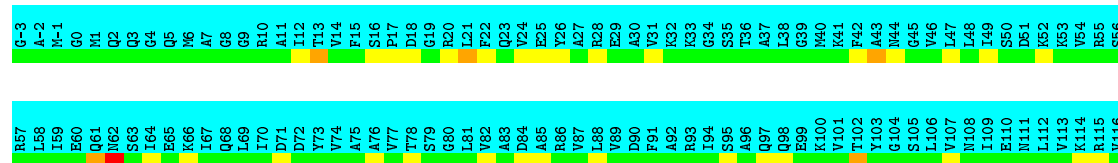
100%



• Molecule 1: Proteasome subunit alpha

Chain G:

100%

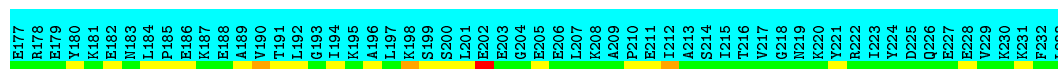
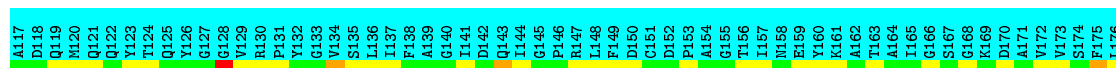
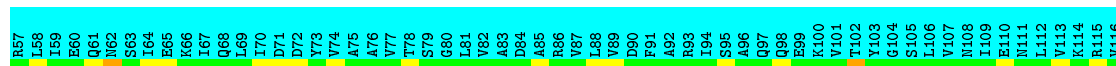




4.2.16 Score per residue for model 16

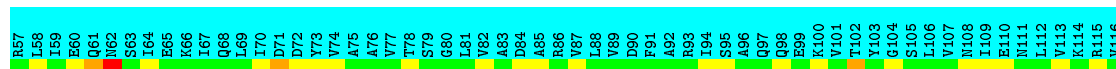
- Molecule 1: Proteasome subunit alpha

Chain A: 100%



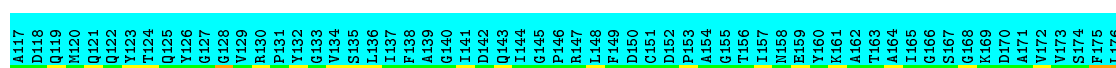
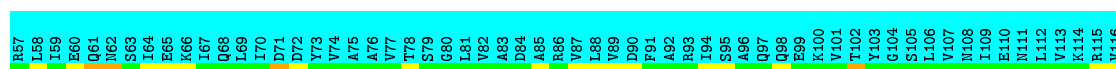
- Molecule 1: Proteasome subunit alpha

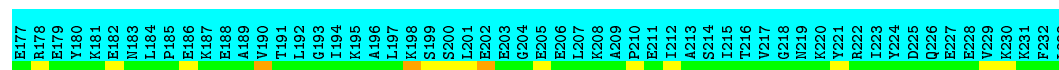
Chain B: 100%



- Molecule 1: Proteasome subunit alpha

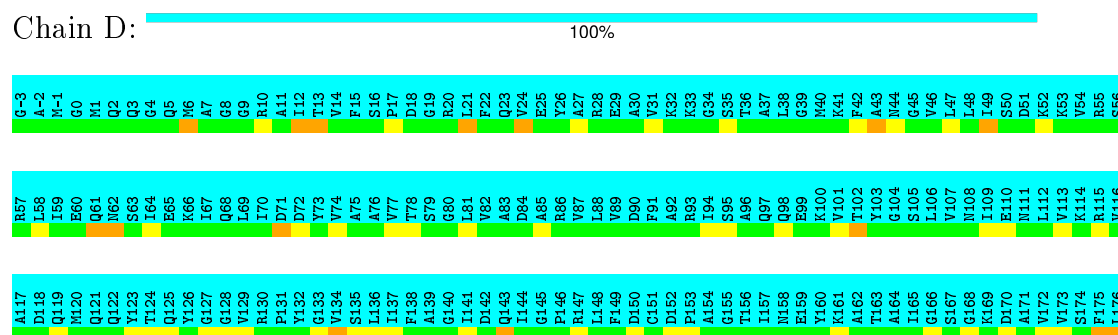
Chain C: 100%





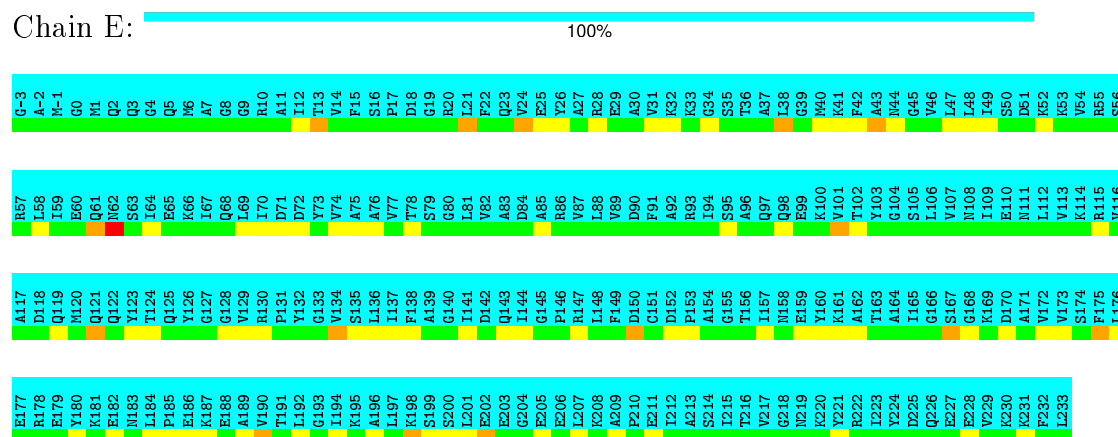
- Molecule 1: Proteasome subunit alpha

Chain D:



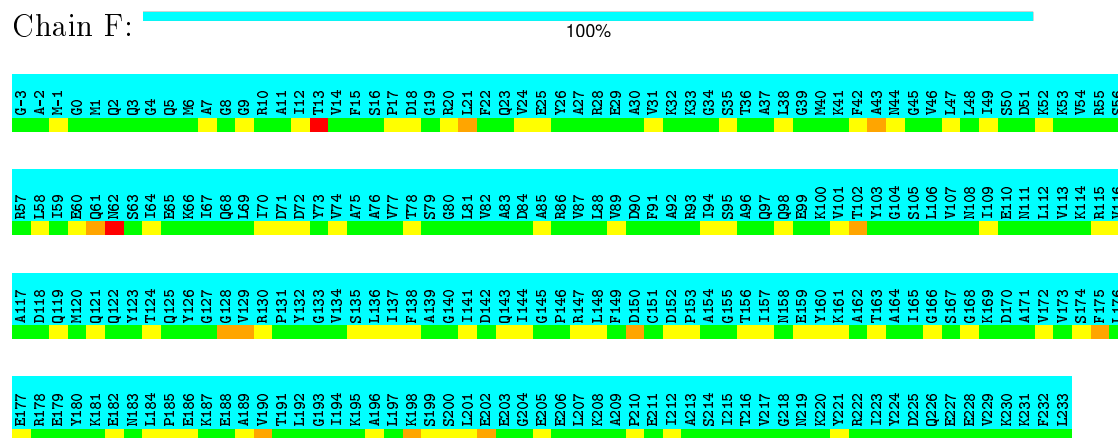
- Molecule 1: Proteasome subunit alpha

Chain E:



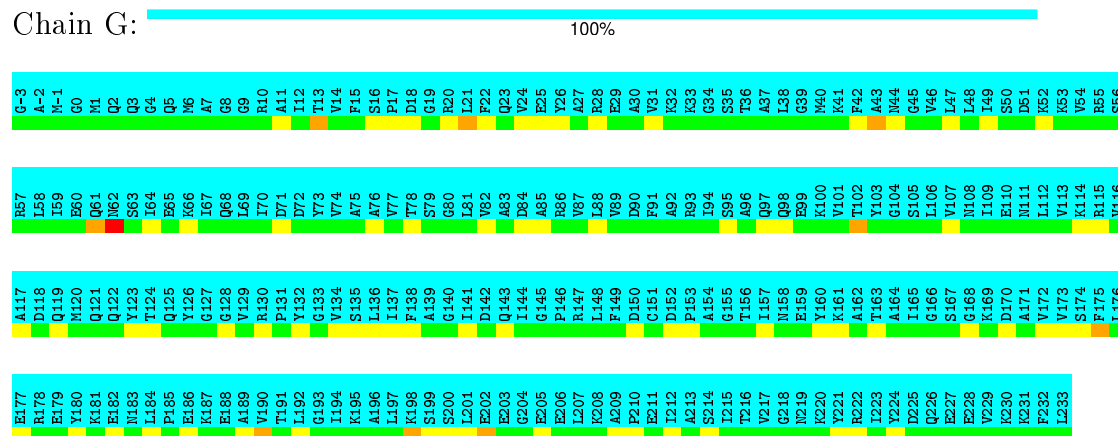
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

Chain G:



100%



100%



100%



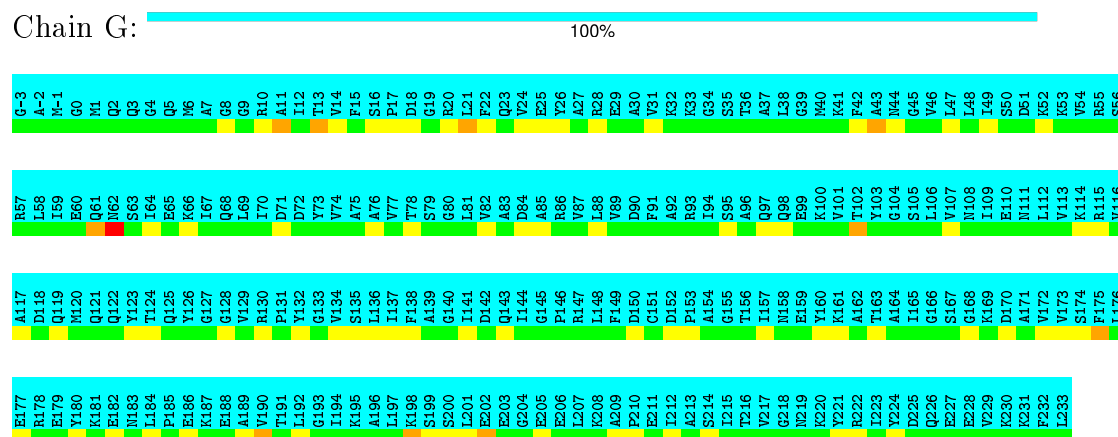
100%





• Molecule 1: Proteasome subunit alpha

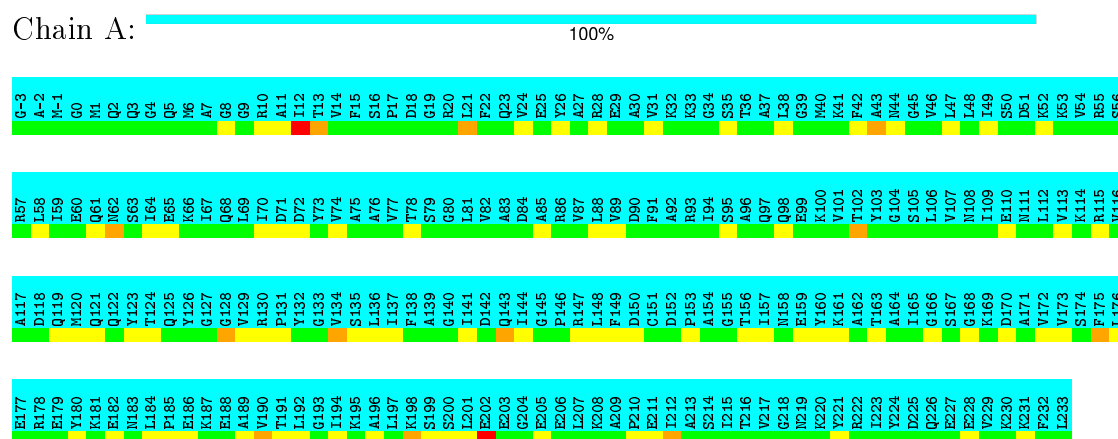
Chain G:



4.2.18 Score per residue for model 18

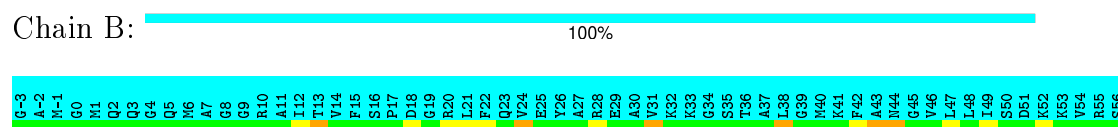
• Molecule 1: Proteasome subunit alpha

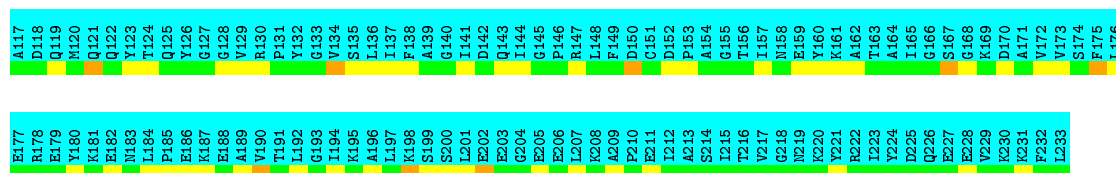
Chain A:



• Molecule 1: Proteasome subunit alpha

Chain B:

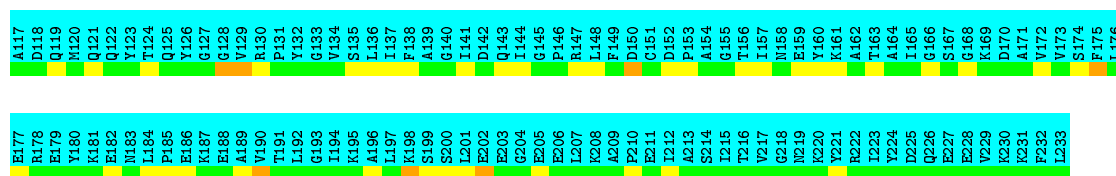
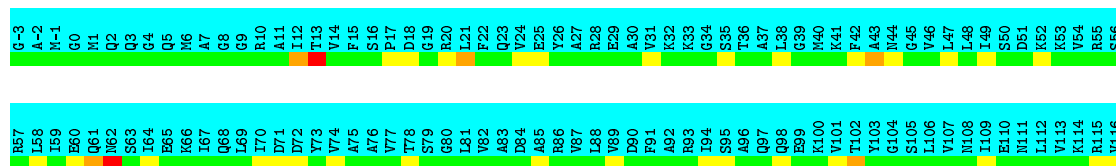




- Molecule 1: Proteasome subunit alpha

Chain F:

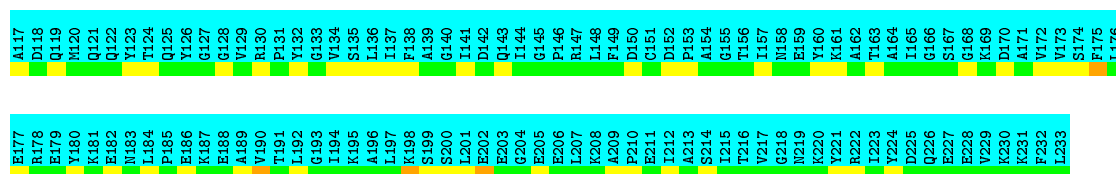
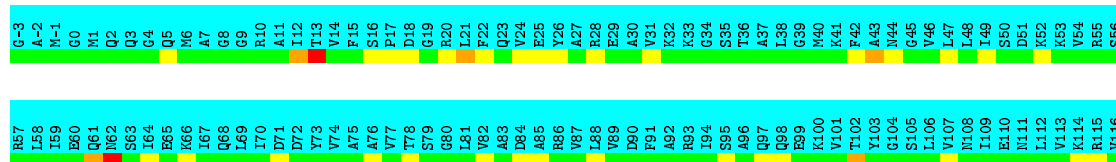
100%



- Molecule 1: Proteasome subunit alpha

Chain G:

100%

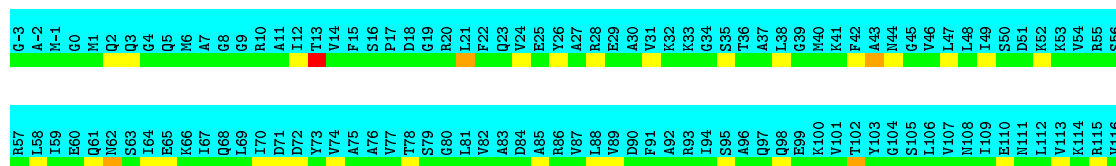


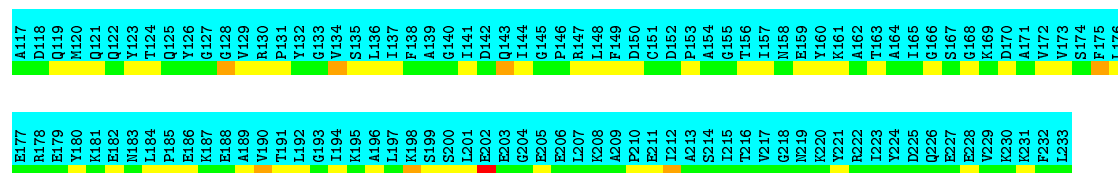
4.2.19 Score per residue for model 19

- Molecule 1: Proteasome subunit alpha

Chain A:

100%

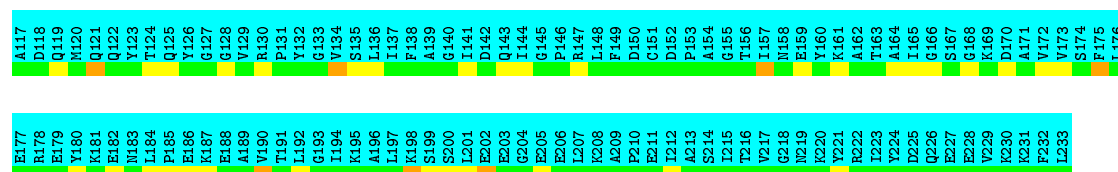




• Molecule 1: Proteasome subunit alpha

Chain B:

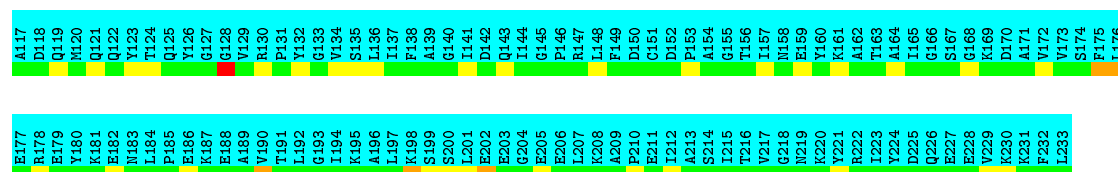
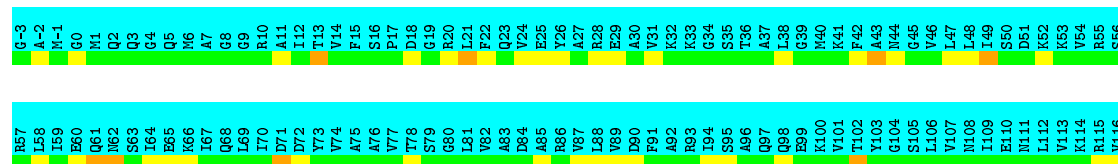
100%



• Molecule 1: Proteasome subunit alpha

Chain C:

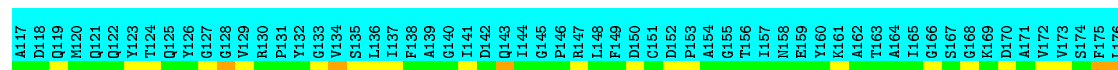
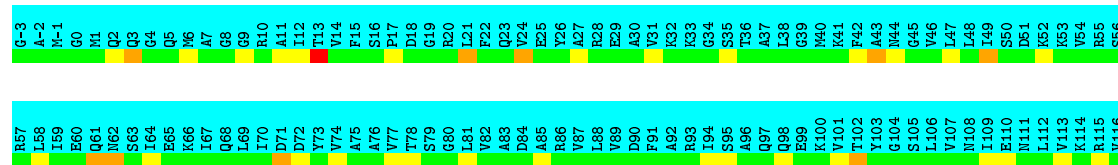
100%

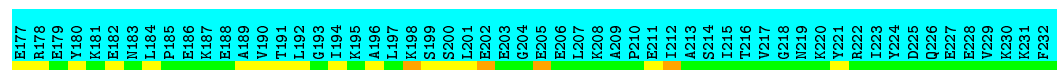


• Molecule 1: Proteasome subunit alpha

Chain D:

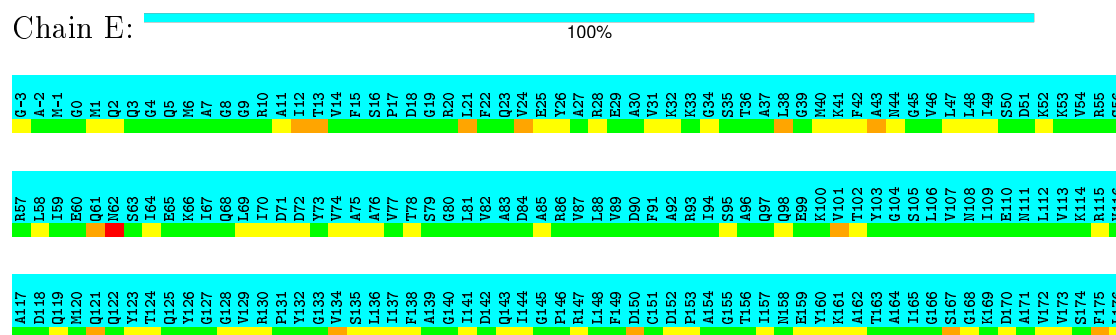
100%





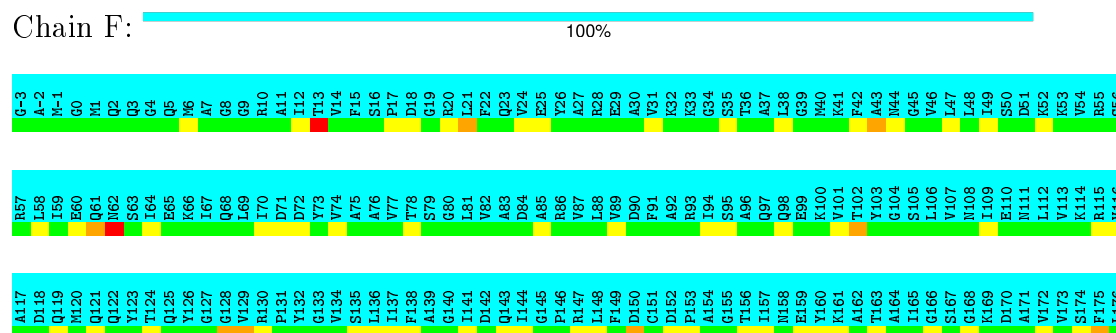
• Molecule 1: Proteasome subunit alpha

Chain E:



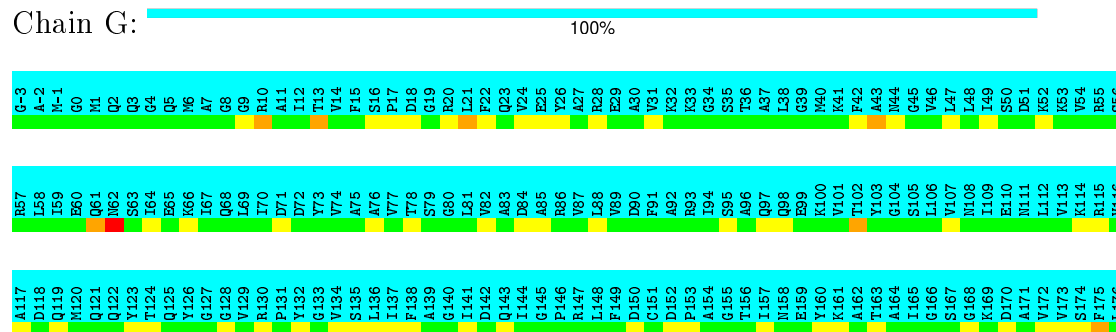
• Molecule 1: Proteasome subunit alpha

Chain F:



• Molecule 1: Proteasome subunit alpha

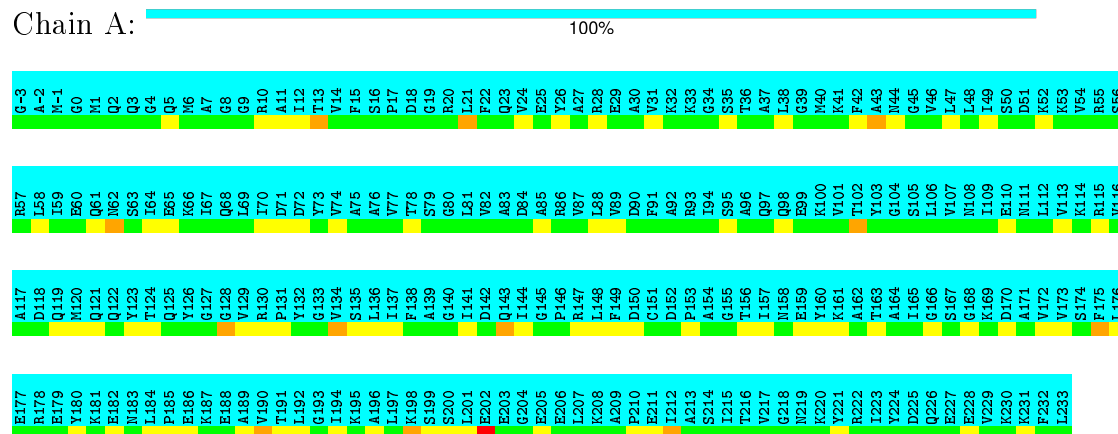
Chain G:



4.2.20 Score per residue for model 20

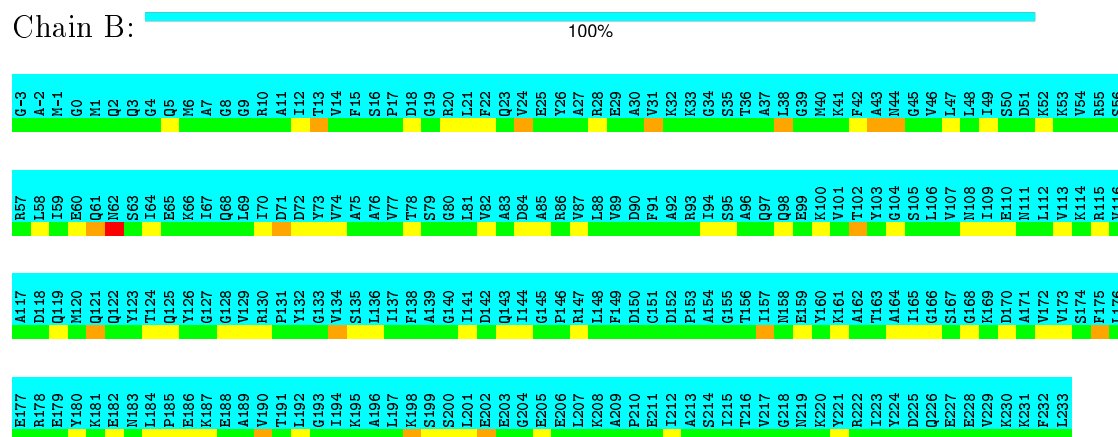
- Molecule 1: Proteasome subunit alpha

Chain A:



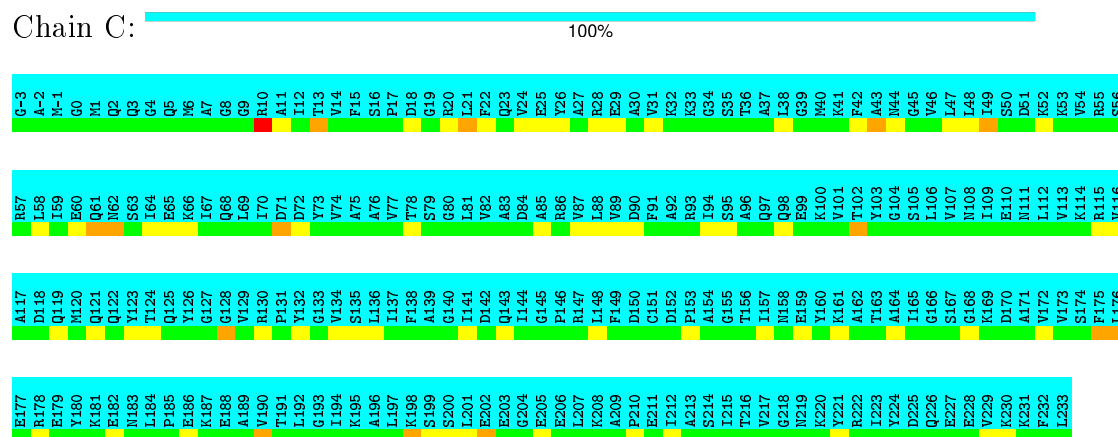
- Molecule 1: Proteasome subunit alpha

Chain B:



- Molecule 1: Proteasome subunit alpha

Chain C:



- Molecule 1: Proteasome subunit alpha

100%



100%



100%



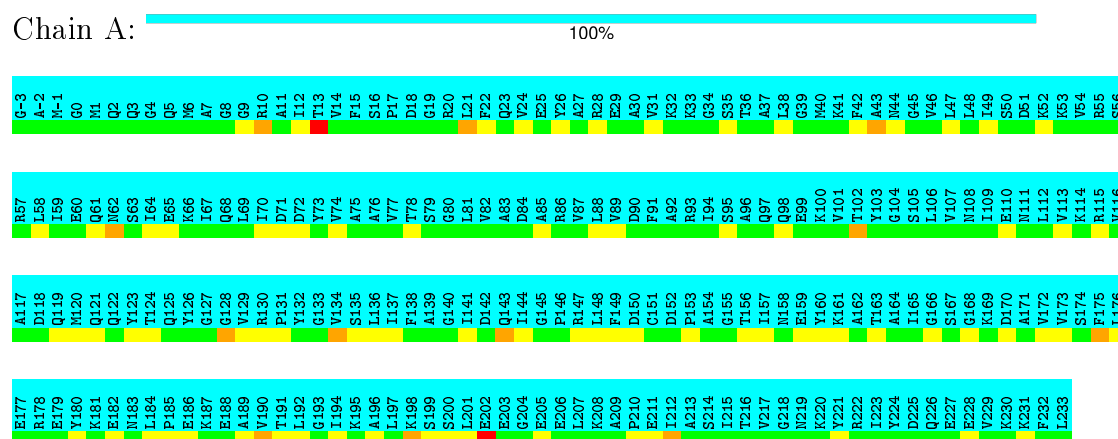
100%



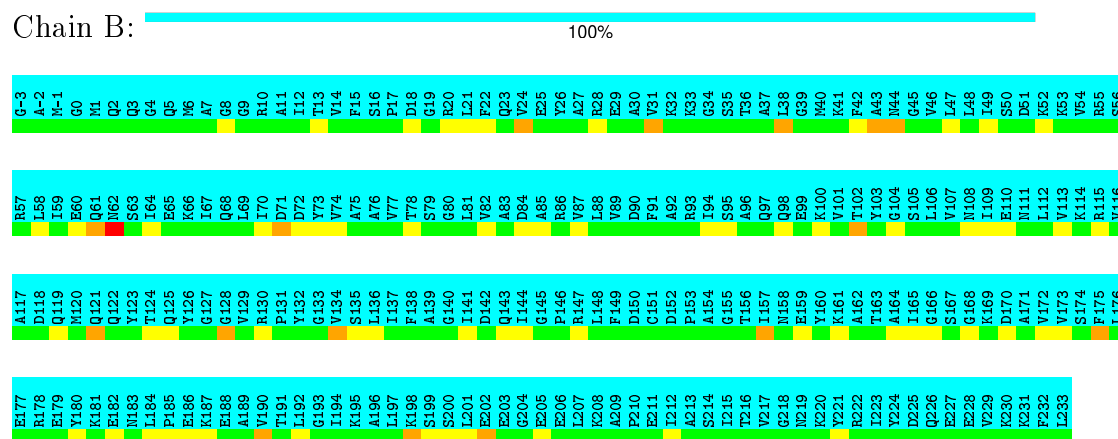


4.2.21 Score per residue for model 21

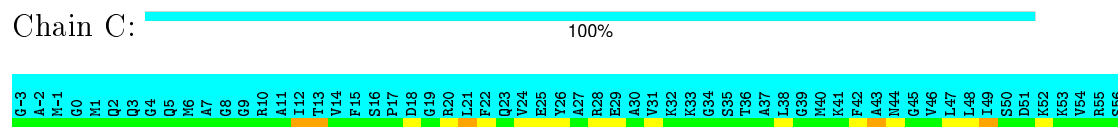
- Molecule 1: Proteasome subunit alpha



- Molecule 1: Proteasome subunit alpha



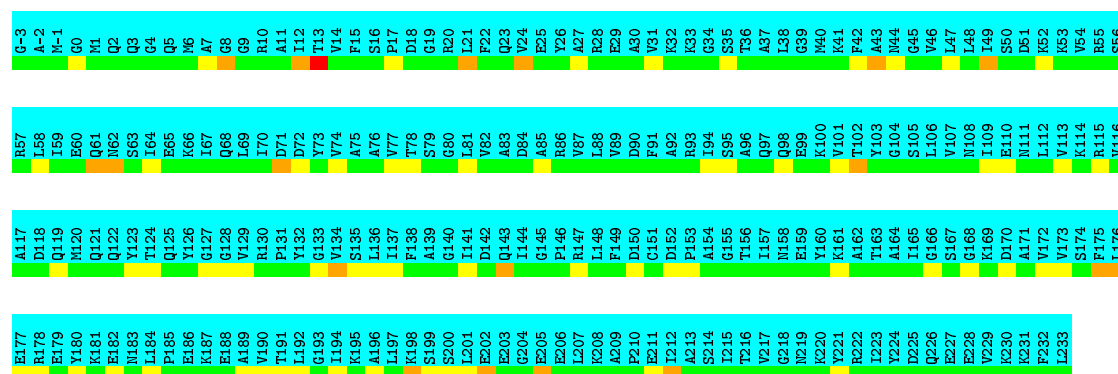
- Molecule 1: Proteasome subunit alpha





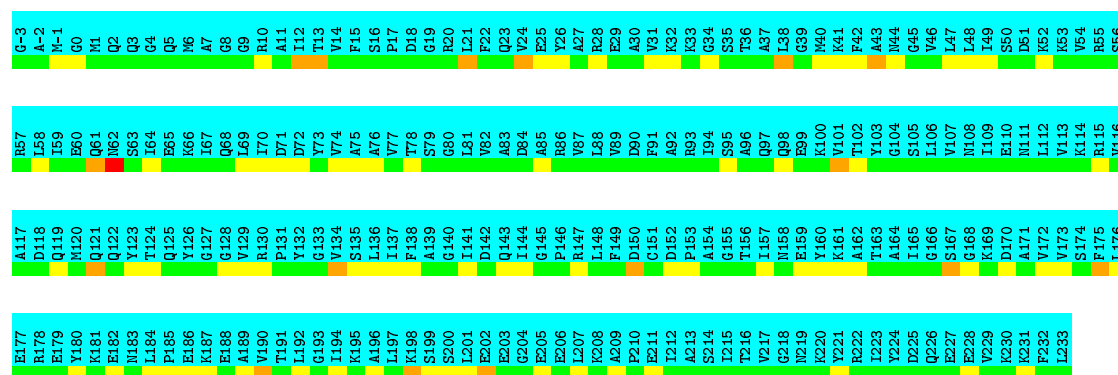
• Molecule 1: Proteasome subunit alpha

Chain D: 100%



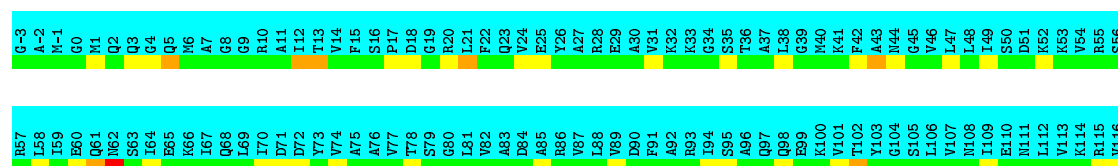
• Molecule 1: Proteasome subunit alpha

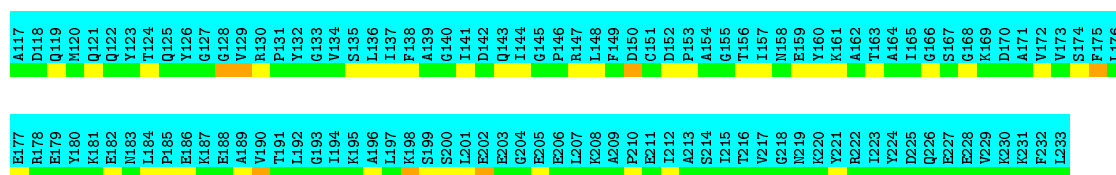
Chain E: 100%



• Molecule 1: Proteasome subunit alpha

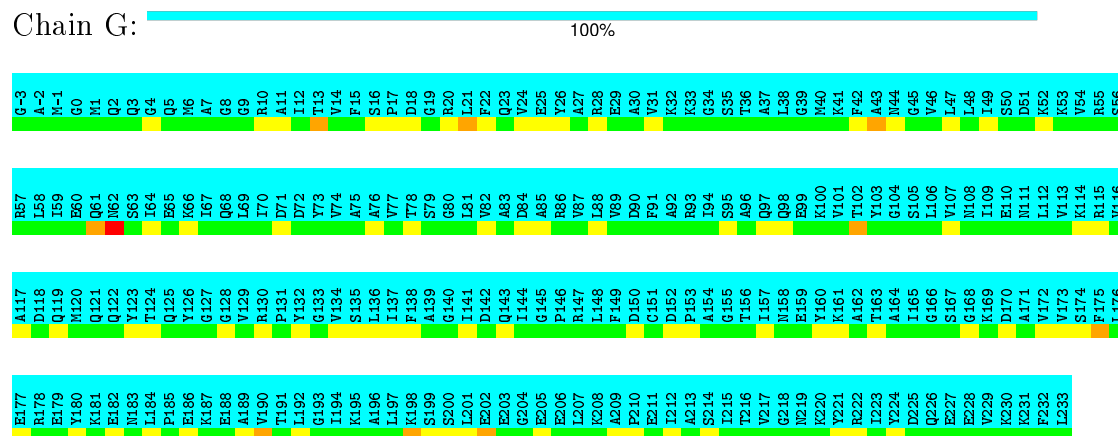
Chain F: 100%





- Molecule 1: Proteasome subunit alpha

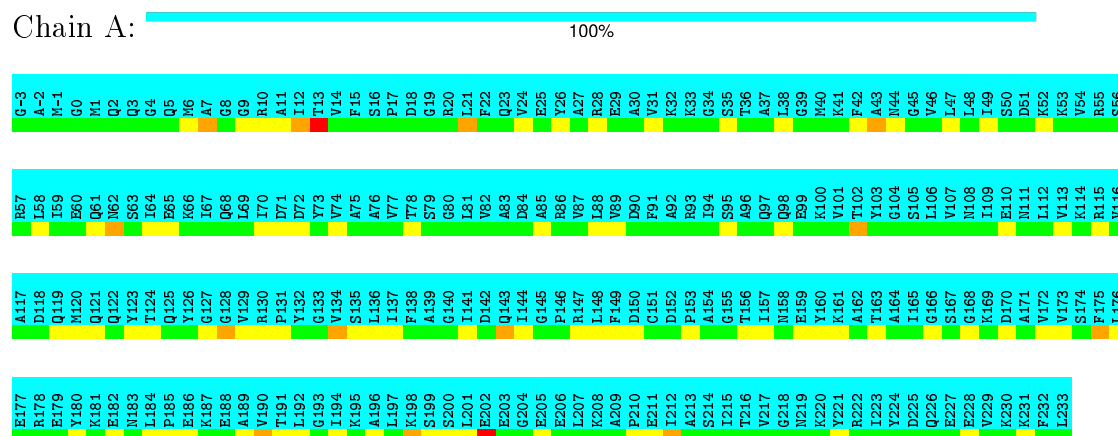
Chain G:



4.2.22 Score per residue for model 22

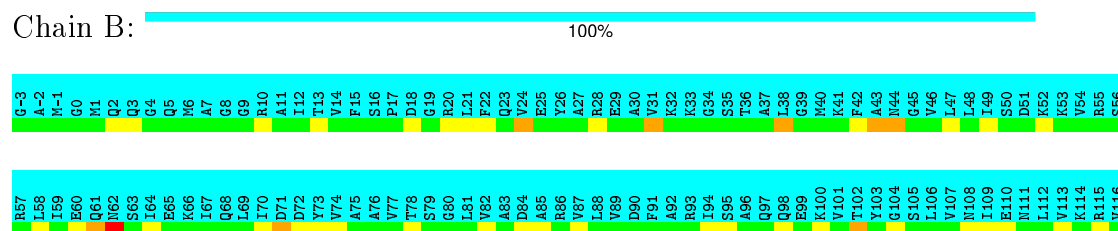
- Molecule 1: Proteasome subunit alpha

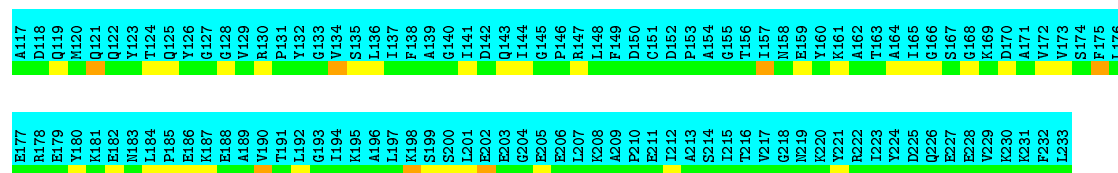
Chain A:



- Molecule 1: Proteasome subunit alpha

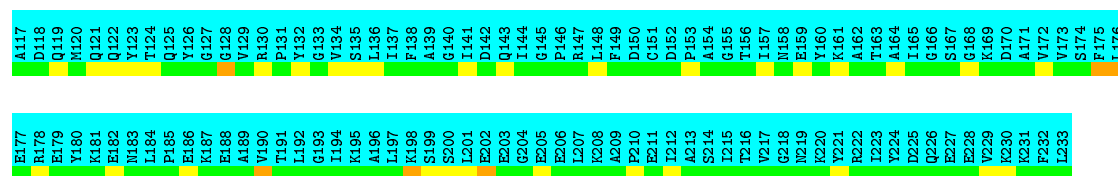
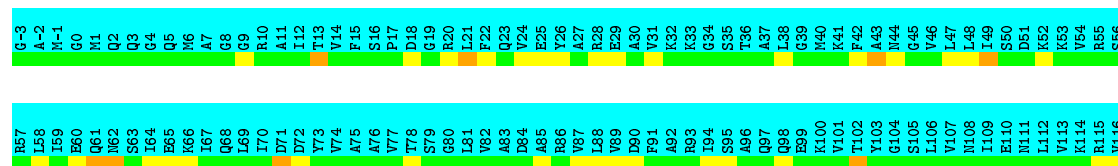
Chain B:





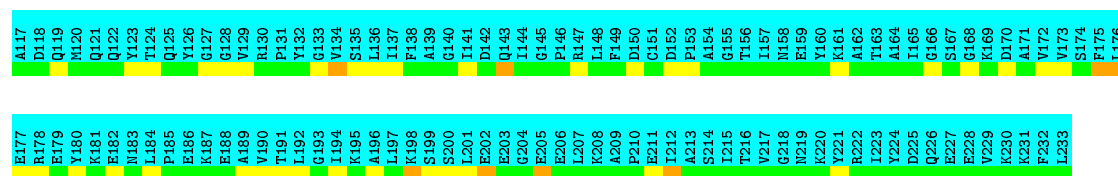
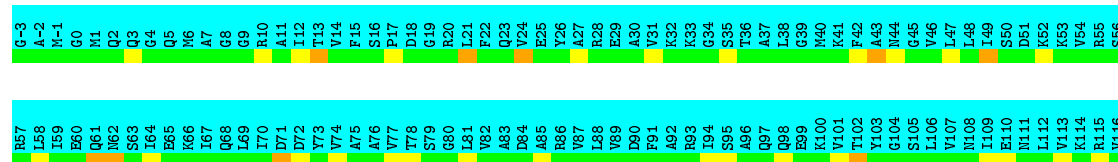
- Molecule 1: Proteasome subunit alpha

Chain C:



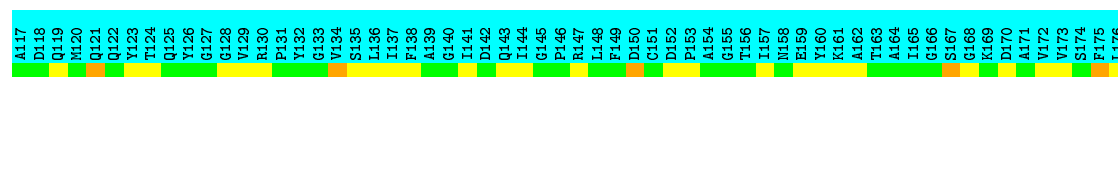
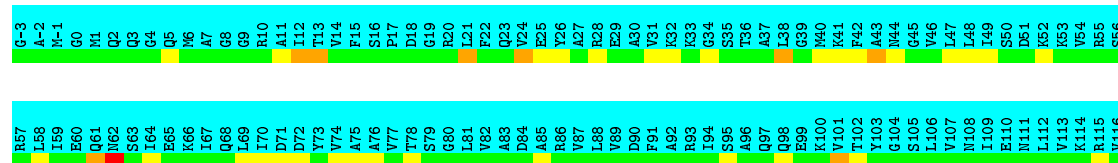
- Molecule 1: Proteasome subunit alpha

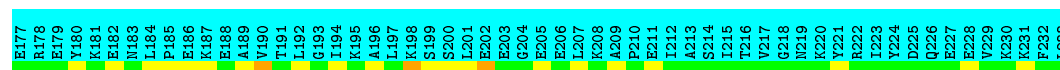
Chain D:



- Molecule 1: Proteasome subunit alpha

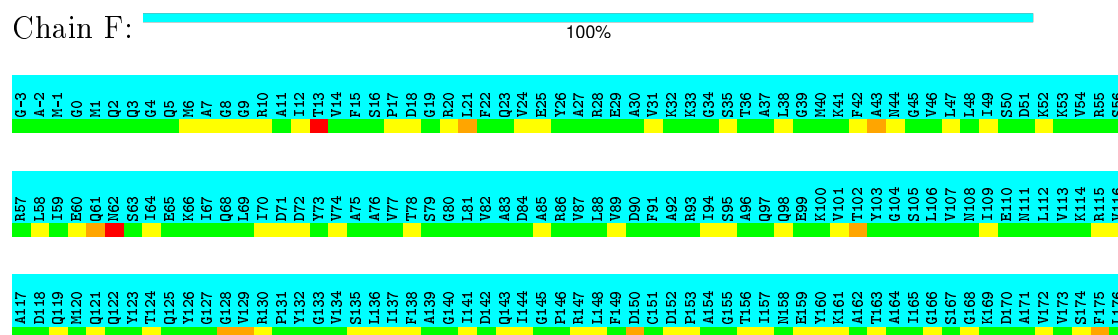
Chain E:





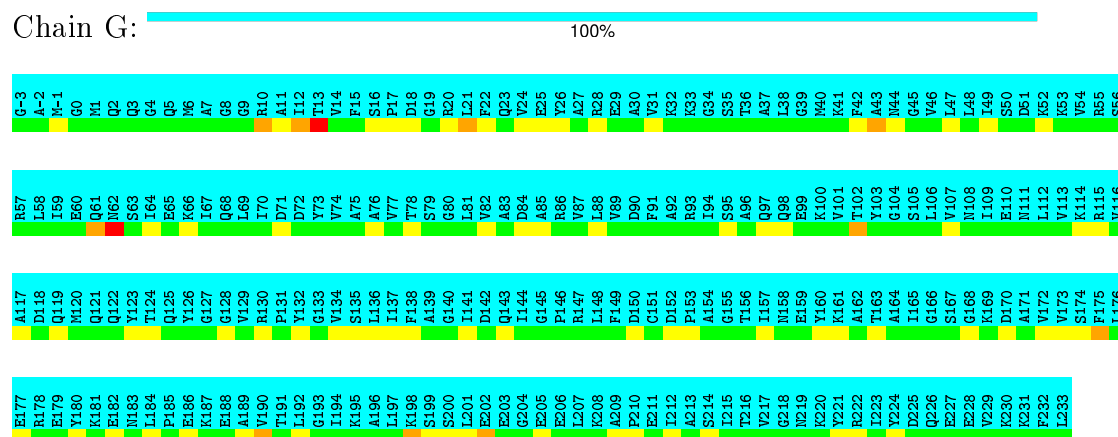
• Molecule 1: Proteasome subunit alpha

Chain F:



• Molecule 1: Proteasome subunit alpha

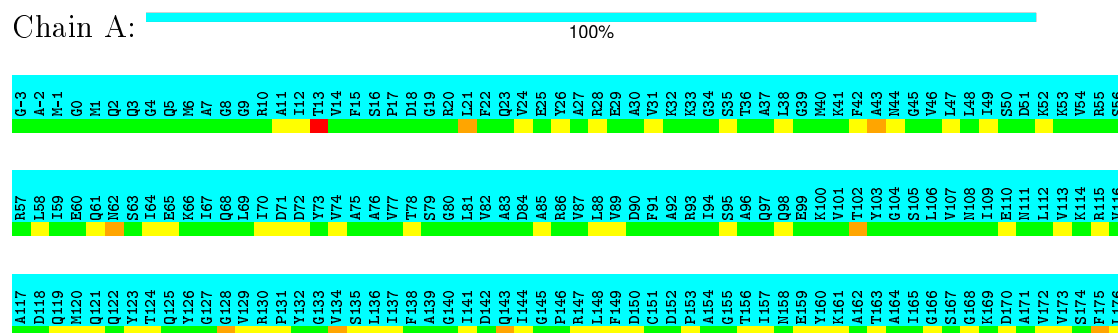
Chain G:

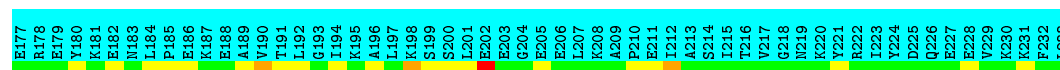


4.2.23 Score per residue for model 23

• Molecule 1: Proteasome subunit alpha

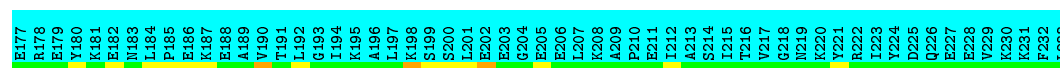
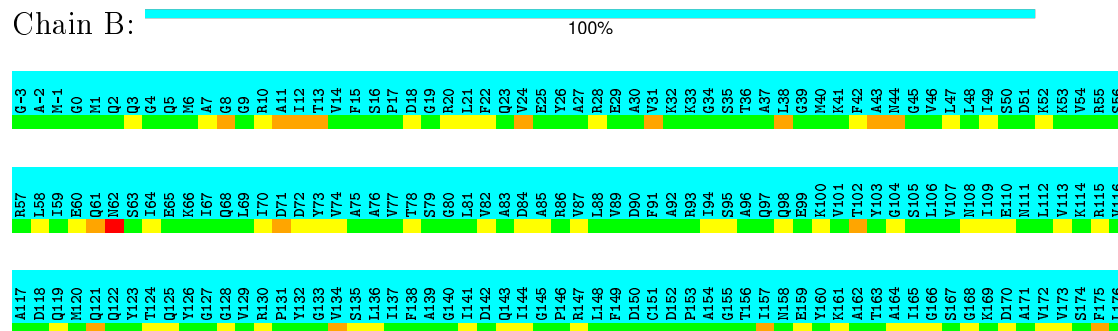
Chain A:





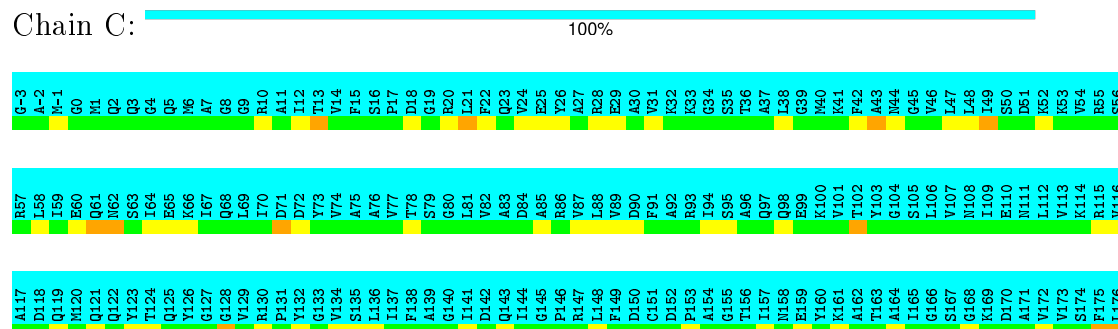
• Molecule 1: Proteasome subunit alpha

Chain B:



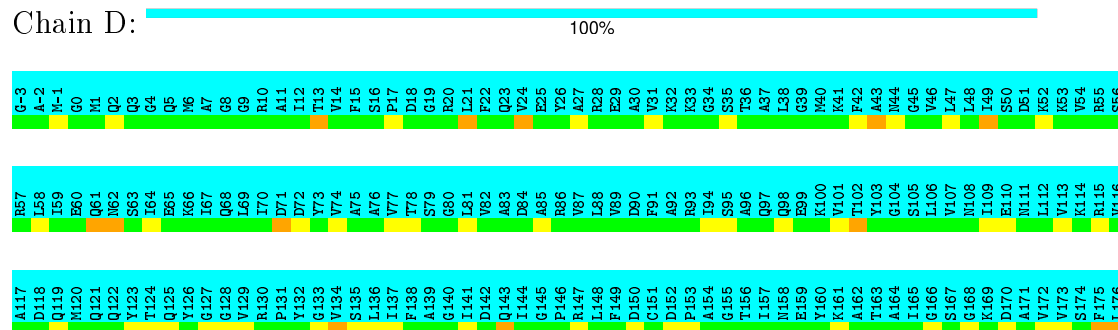
• Molecule 1: Proteasome subunit alpha

Chain C:



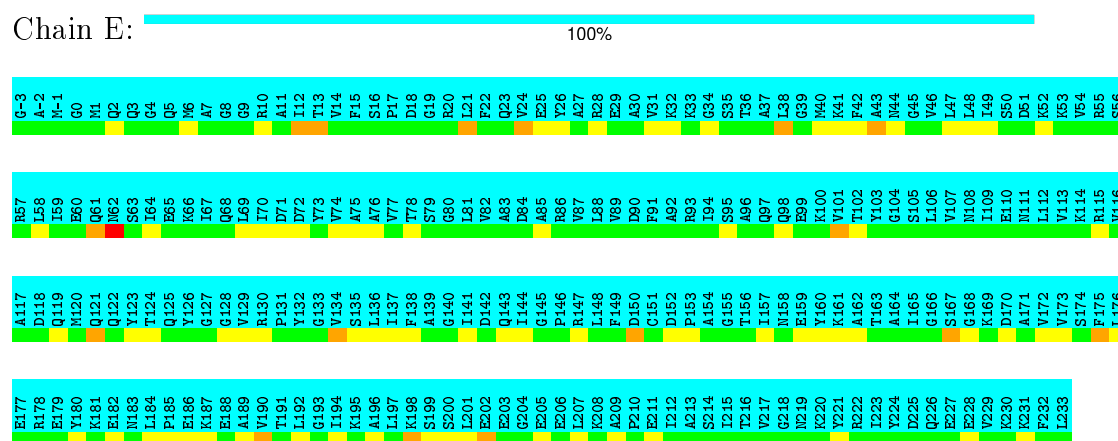
• Molecule 1: Proteasome subunit alpha

Chain D:



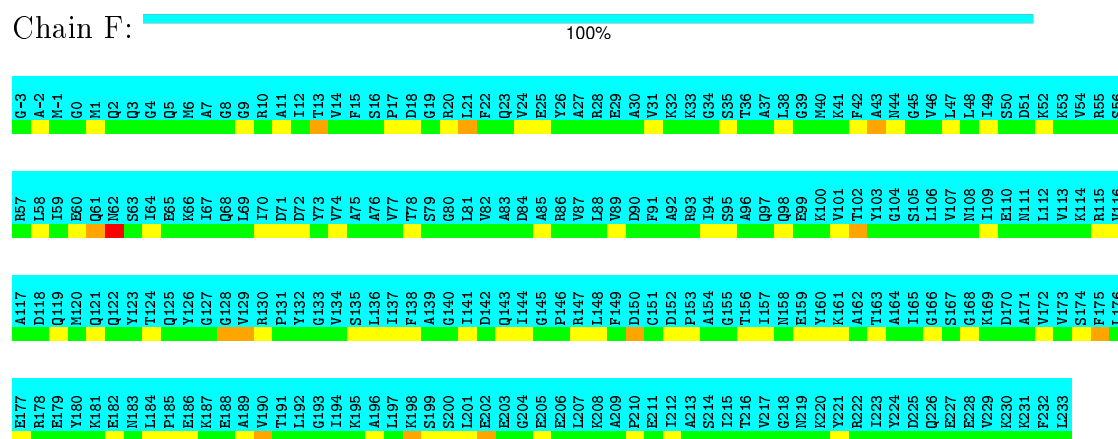
• Molecule 1: Proteasome subunit alpha

Chain E:



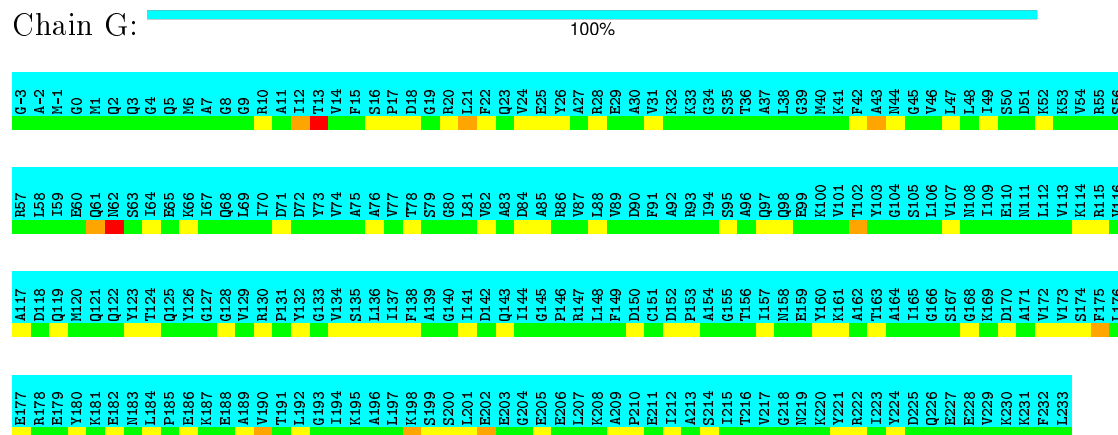
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

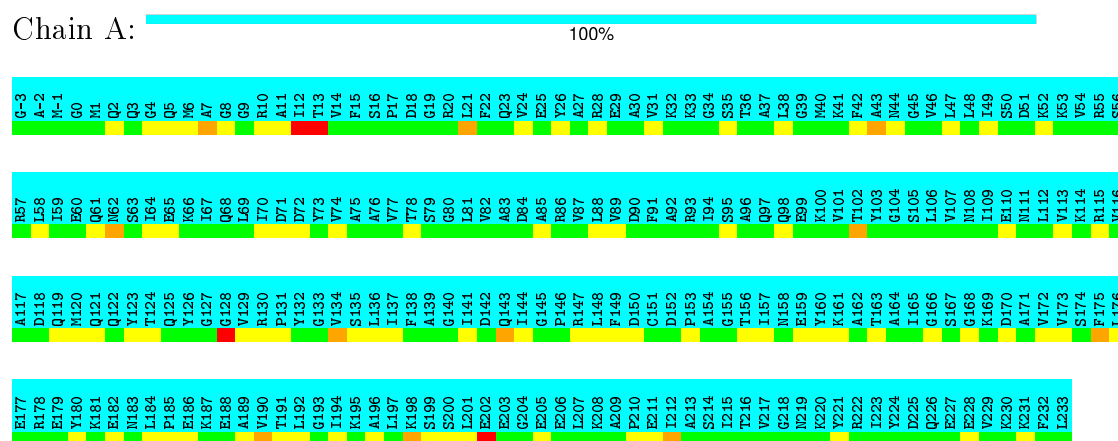
Chain G:



4.2.24 Score per residue for model 24

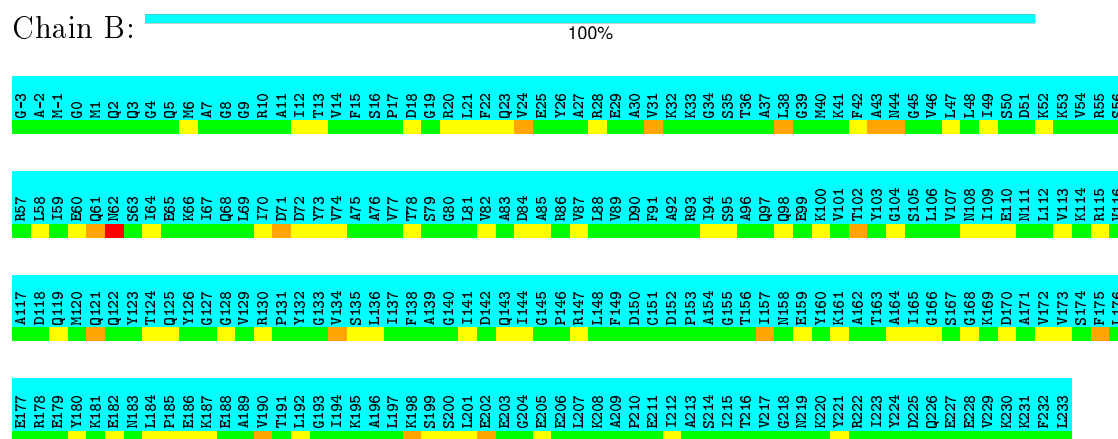
- Molecule 1: Proteasome subunit alpha

Chain A:



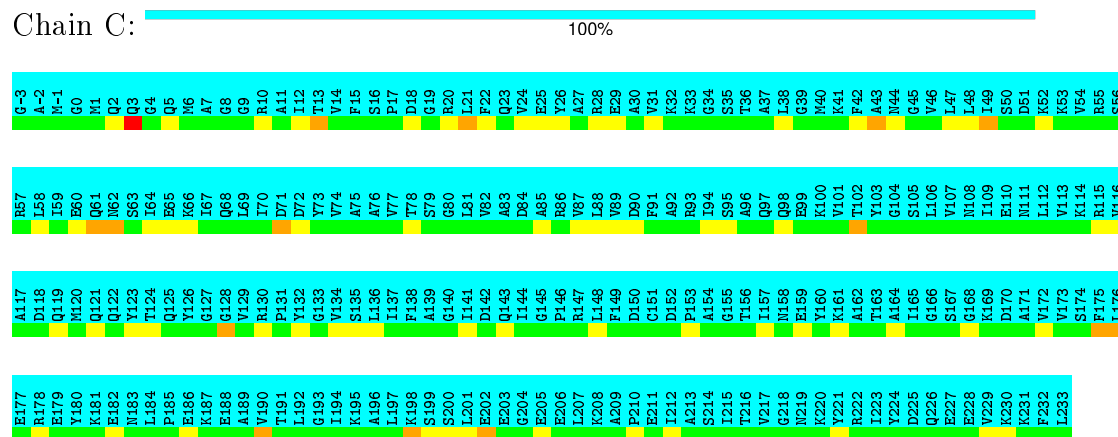
- Molecule 1: Proteasome subunit alpha

Chain B:



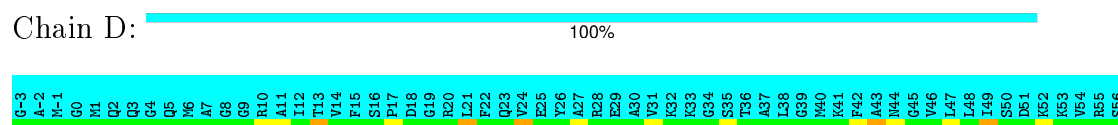
- Molecule 1: Proteasome subunit alpha

Chain C:



- Molecule 1: Proteasome subunit alpha

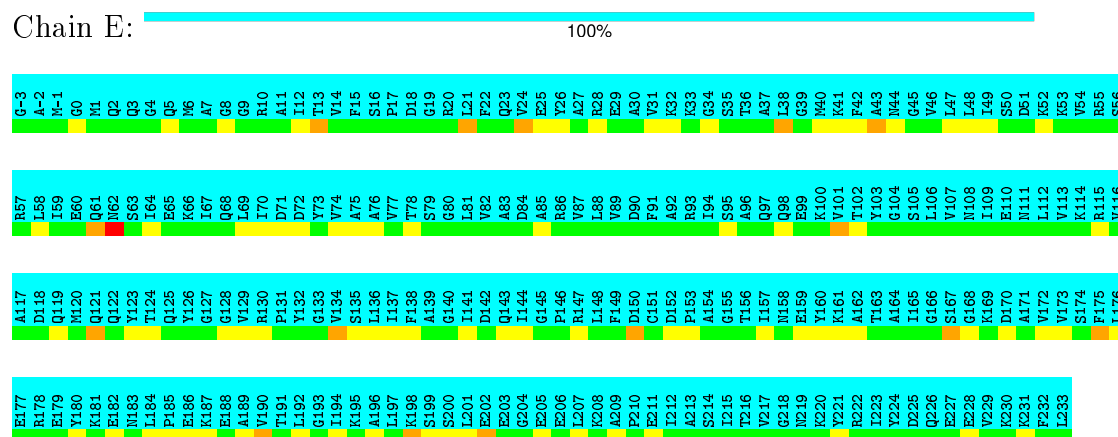
Chain D:





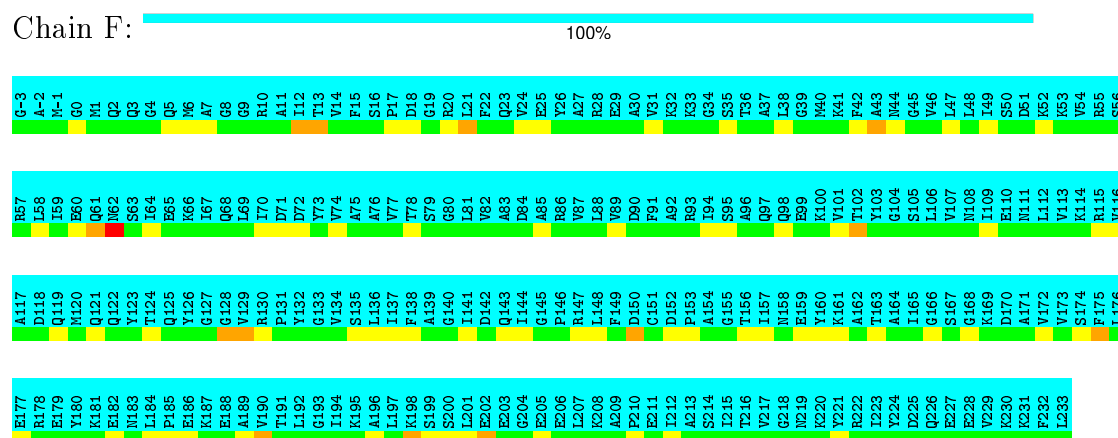
- Molecule 1: Proteasome subunit alpha

Chain E:



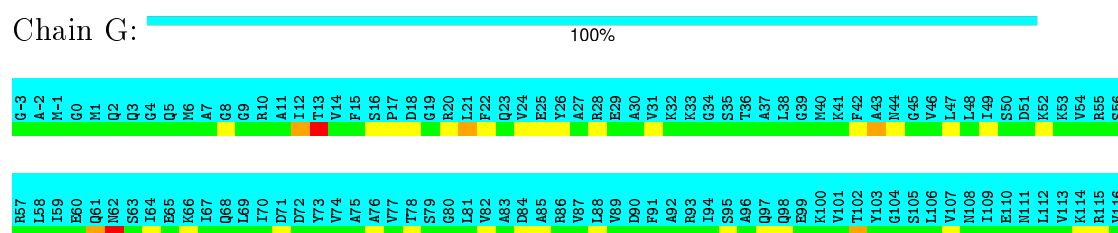
- Molecule 1: Proteasome subunit alpha

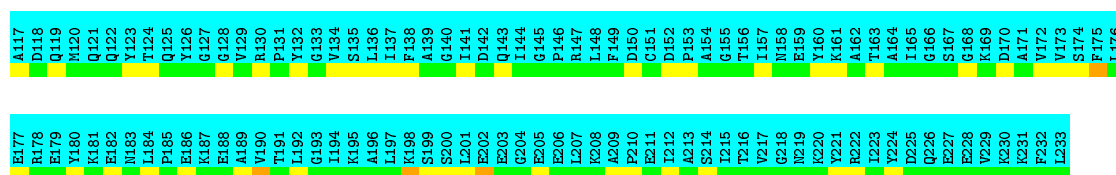
Chain F:



- Molecule 1: Proteasome subunit alpha

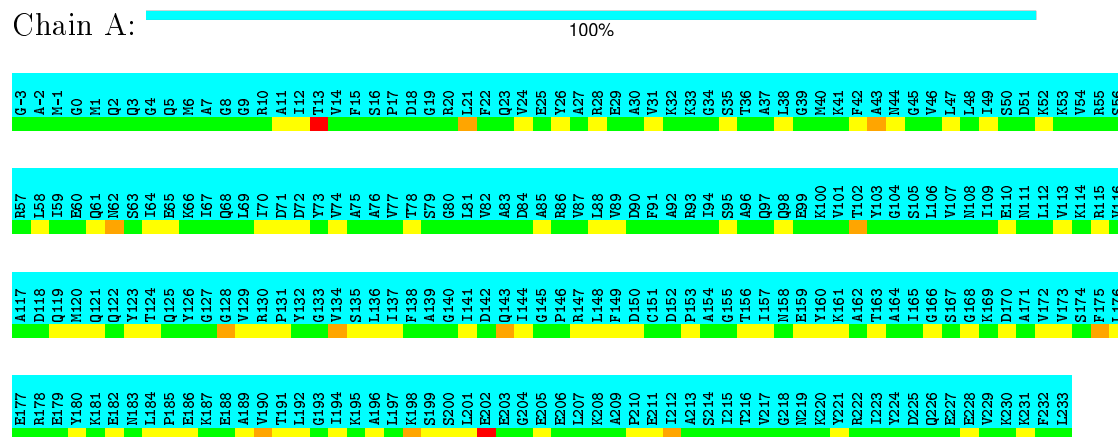
Chain G:



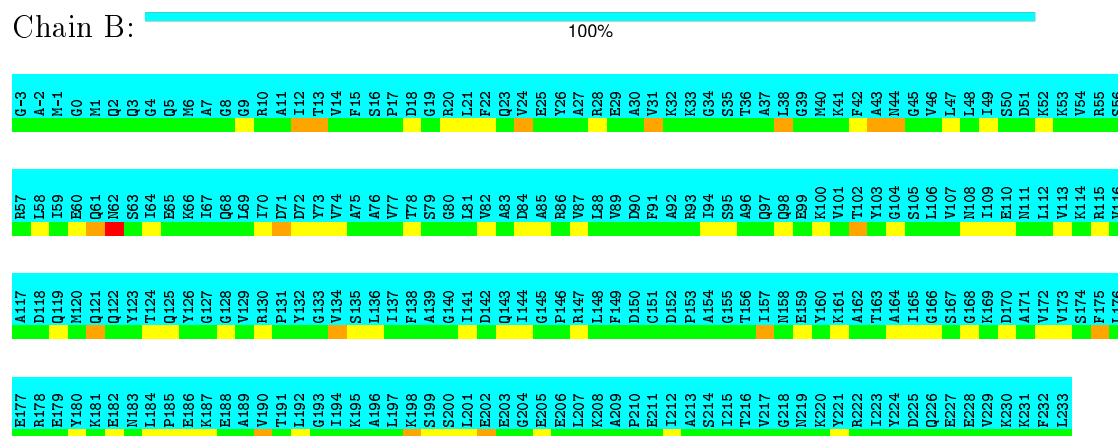


4.2.25 Score per residue for model 25

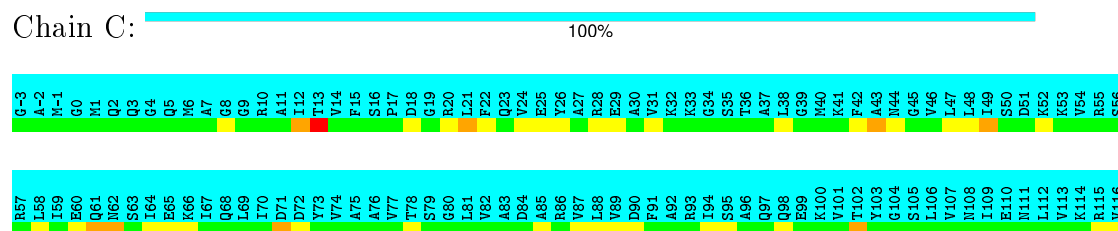
- Molecule 1: Proteasome subunit alpha

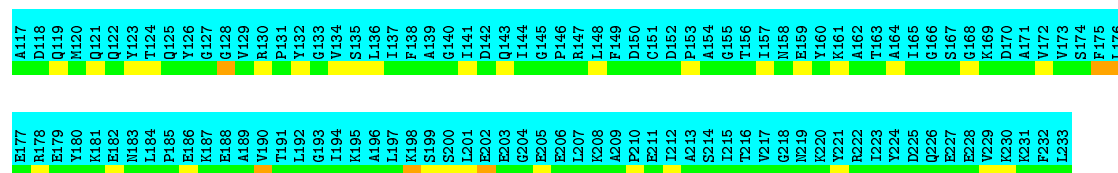


- Molecule 1: Proteasome subunit alpha



- Molecule 1: Proteasome subunit alpha

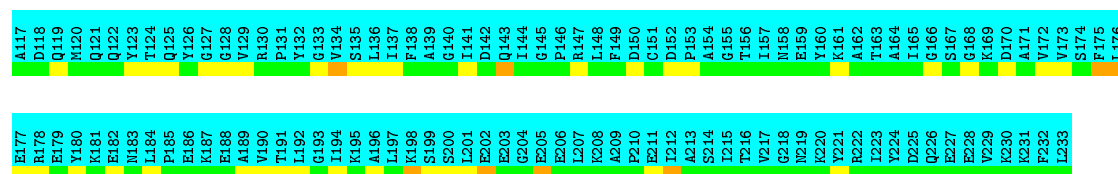
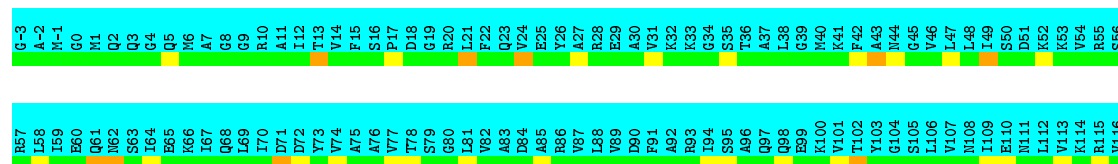




• Molecule 1: Proteasome subunit alpha

Chain D:

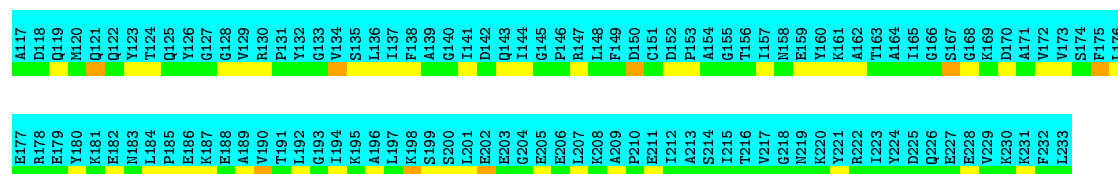
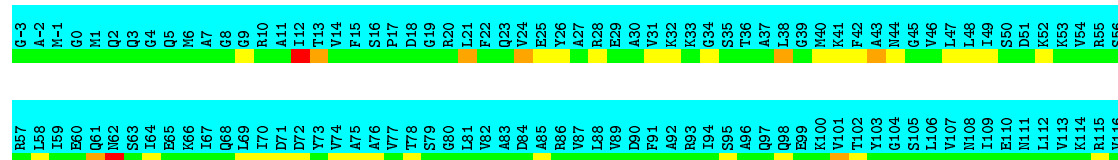
100%



• Molecule 1: Proteasome subunit alpha

Chain E:

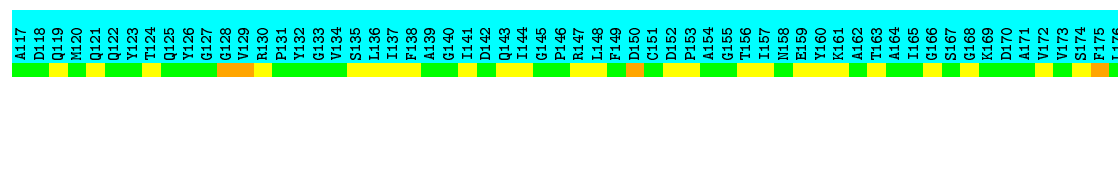
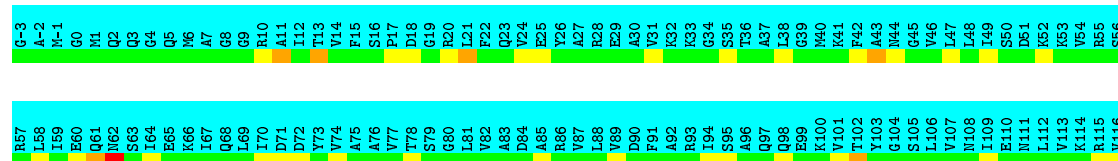
100%

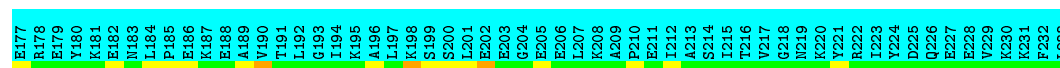


• Molecule 1: Proteasome subunit alpha

Chain F:

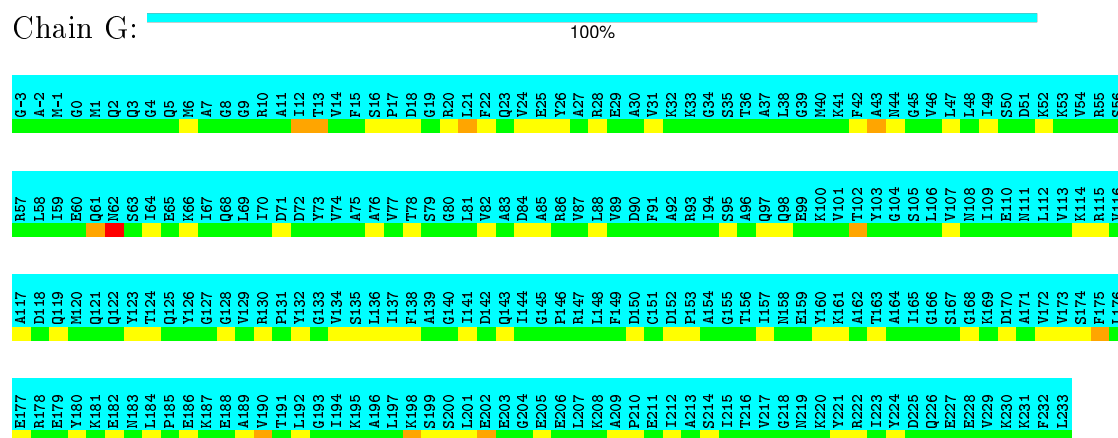
100%





- Molecule 1: Proteasome subunit alpha

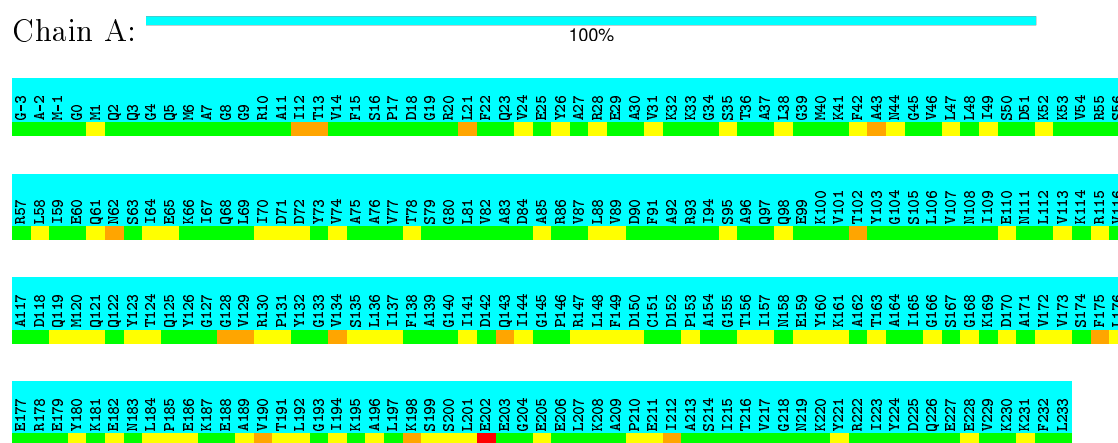
Chain G:



4.2.26 Score per residue for model 26

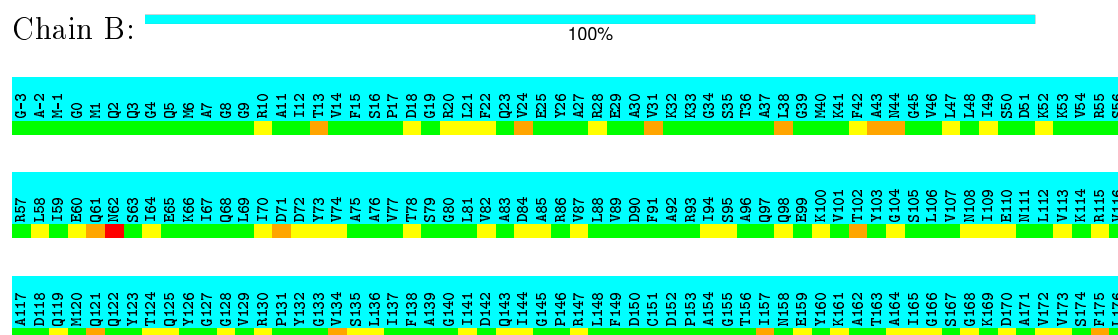
- Molecule 1: Proteasome subunit alpha

Chain A:



- Molecule 1: Proteasome subunit alpha

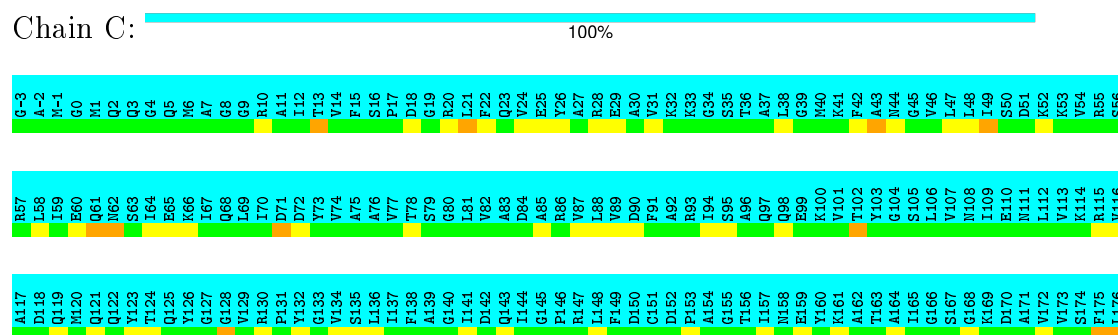
Chain B:





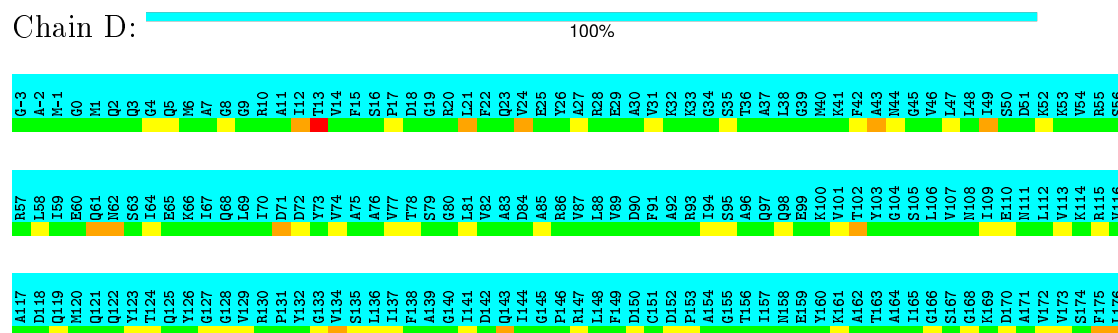
• Molecule 1: Proteasome subunit alpha

Chain C:



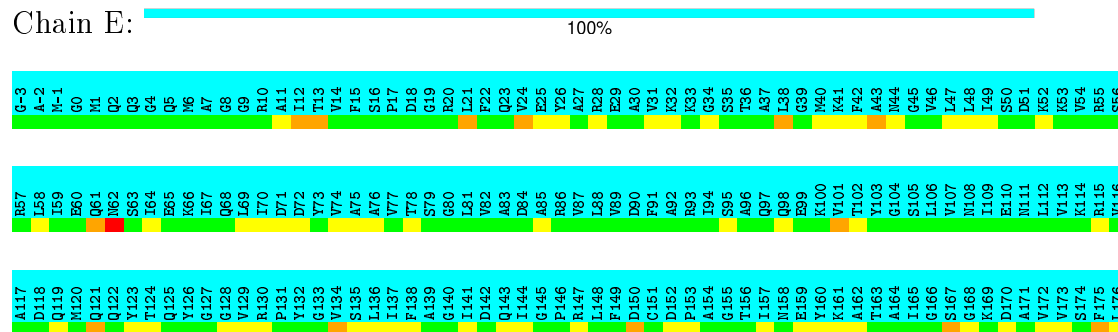
• Molecule 1: Proteasome subunit alpha

Chain D:



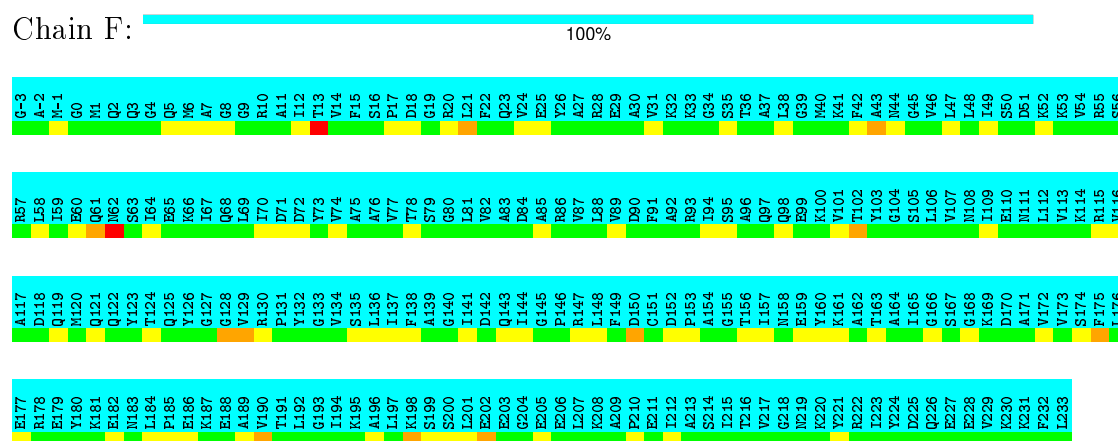
• Molecule 1: Proteasome subunit alpha

Chain E:



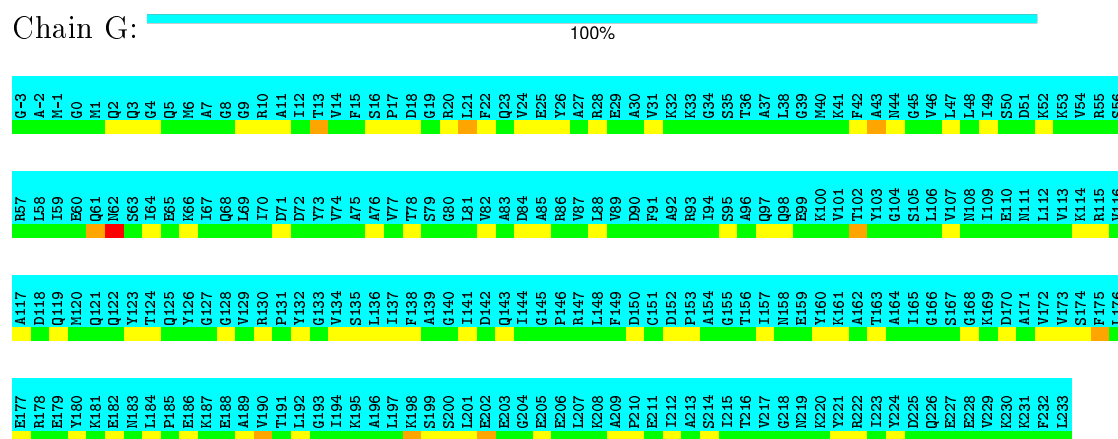
• Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

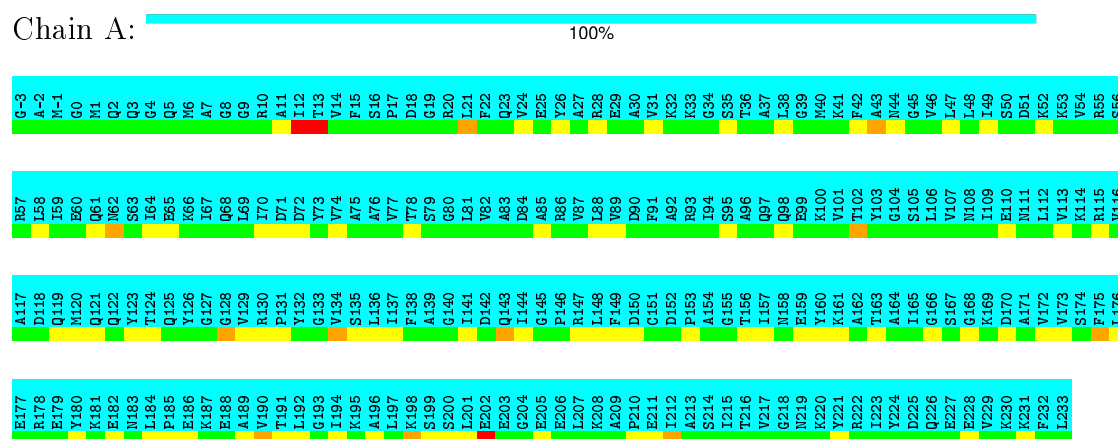
Chain G:



4.2.27 Score per residue for model 27

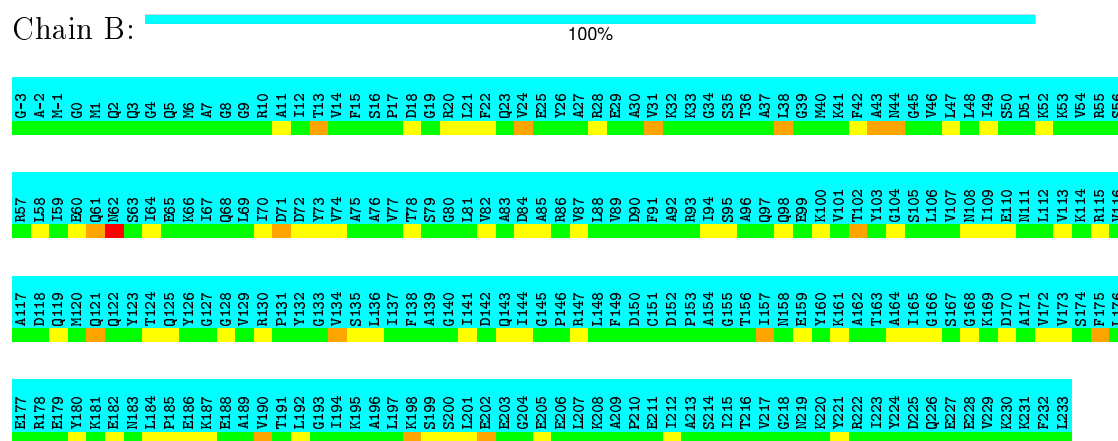
- Molecule 1: Proteasome subunit alpha

Chain A:



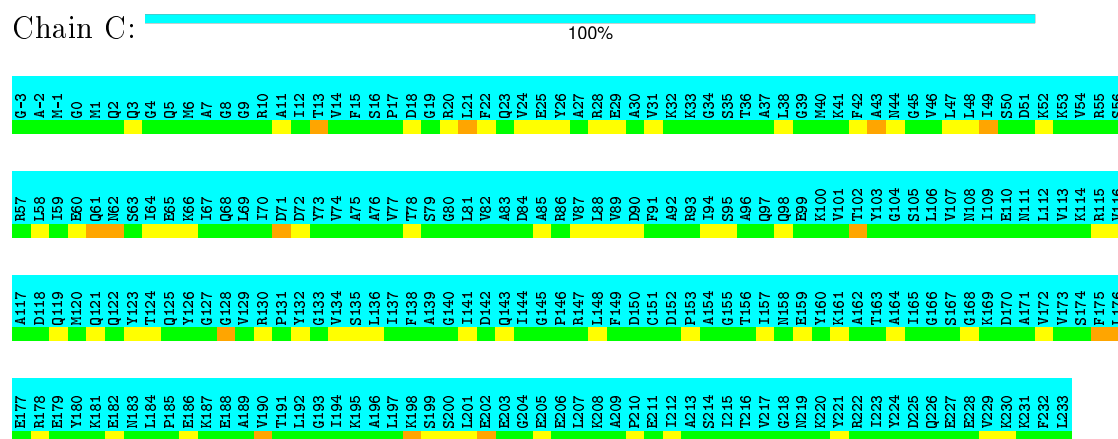
- Molecule 1: Proteasome subunit alpha

Chain B:



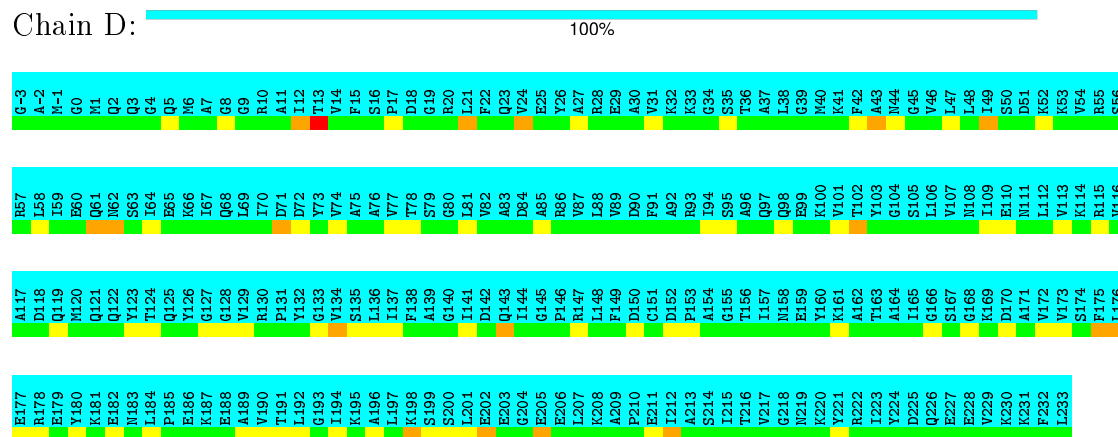
- Molecule 1: Proteasome subunit alpha

Chain C:



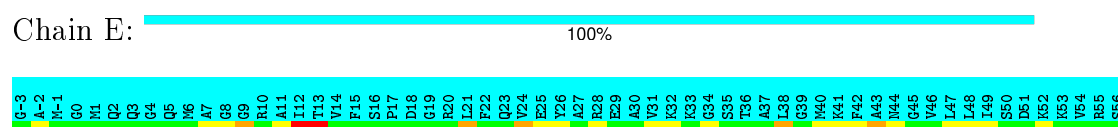
- Molecule 1: Proteasome subunit alpha

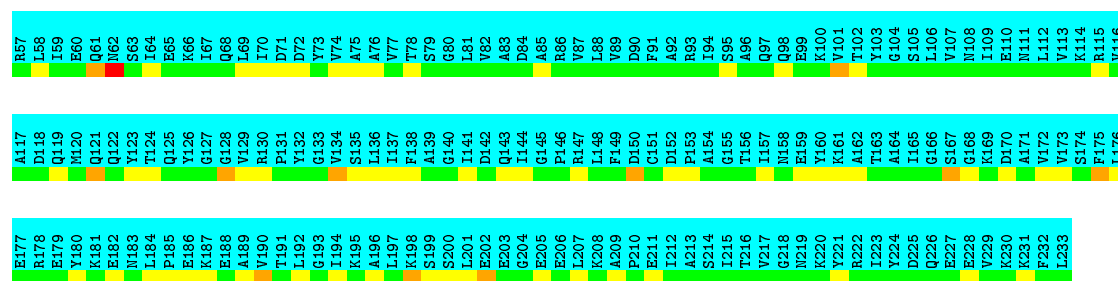
Chain D:



- Molecule 1: Proteasome subunit alpha

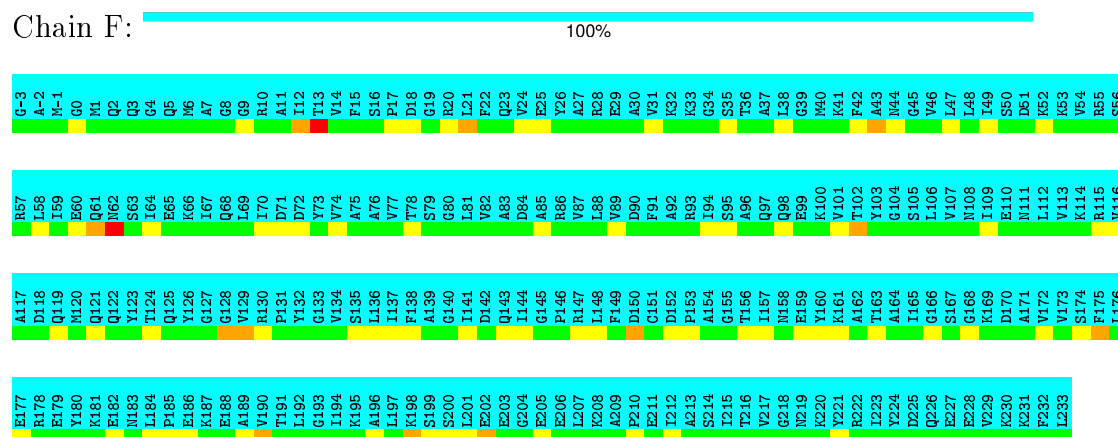
Chain E:





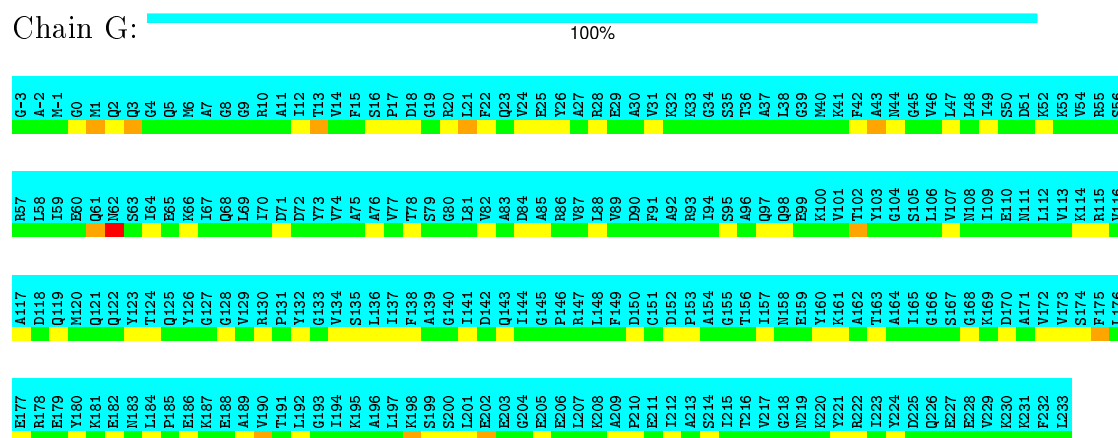
• Molecule 1: Proteasome subunit alpha

Chain F:



• Molecule 1: Proteasome subunit alpha

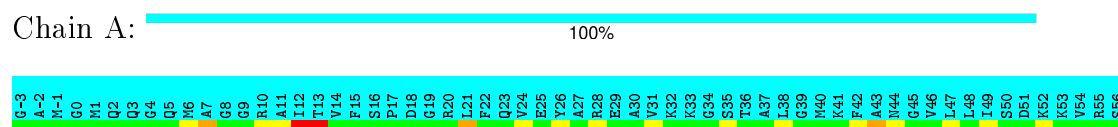
Chain G:

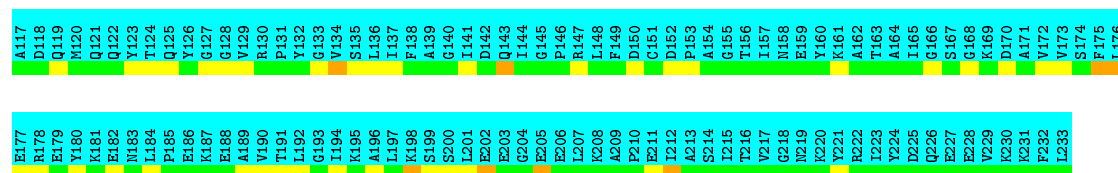


4.2.28 Score per residue for model 28

• Molecule 1: Proteasome subunit alpha

Chain A:

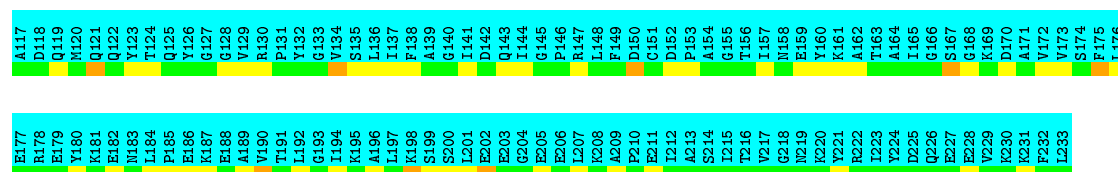
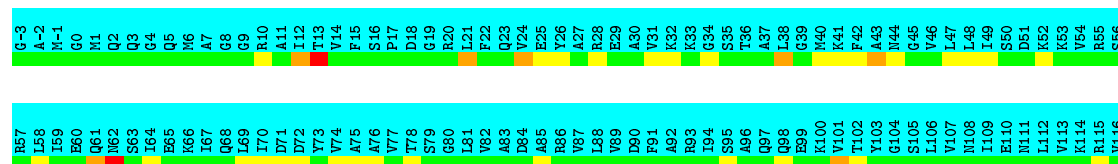




• Molecule 1: Proteasome subunit alpha

Chain E:

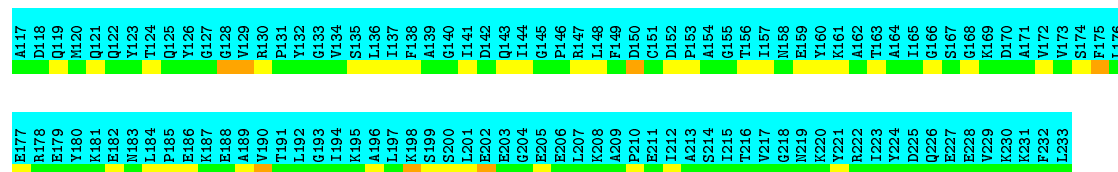
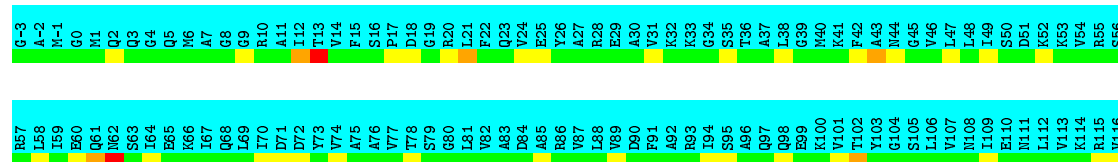
100%



• Molecule 1: Proteasome subunit alpha

Chain F:

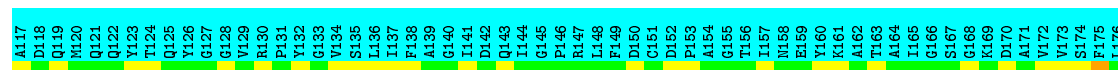
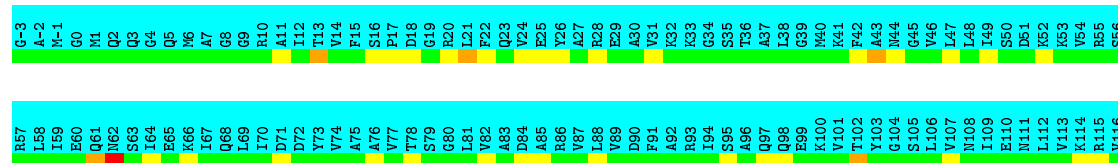
100%



• Molecule 1: Proteasome subunit alpha

Chain G:

100%

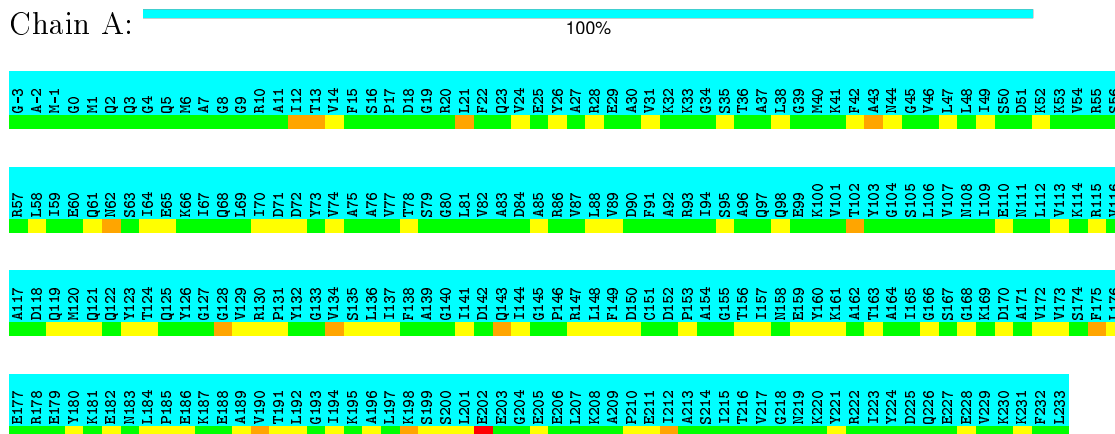




4.2.29 Score per residue for model 29

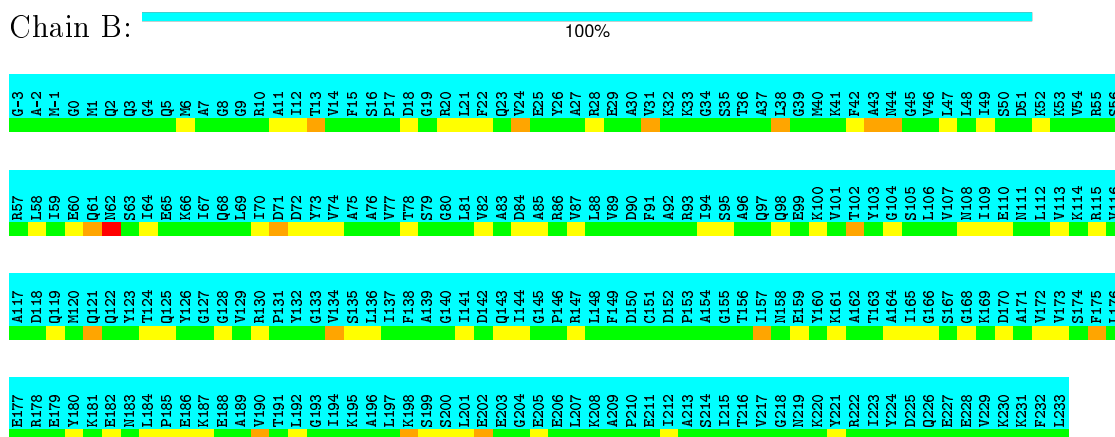
- Molecule 1: Proteasome subunit alpha

Chain A:



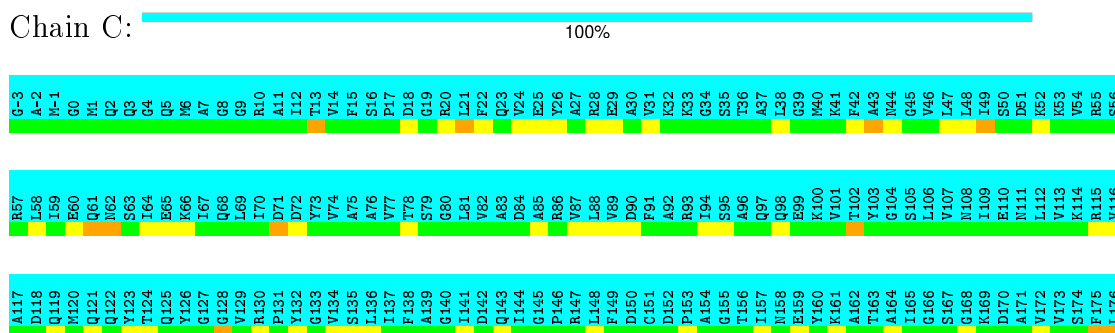
- Molecule 1: Proteasome subunit alpha

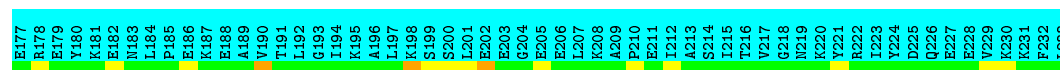
Chain B:



- Molecule 1: Proteasome subunit alpha

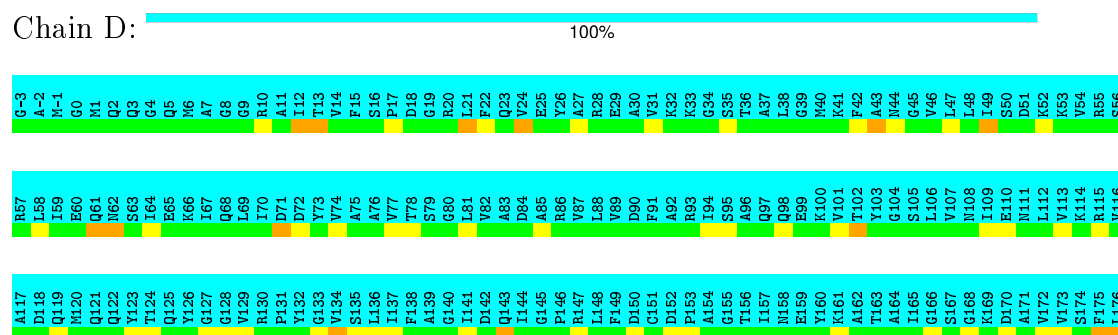
Chain C:





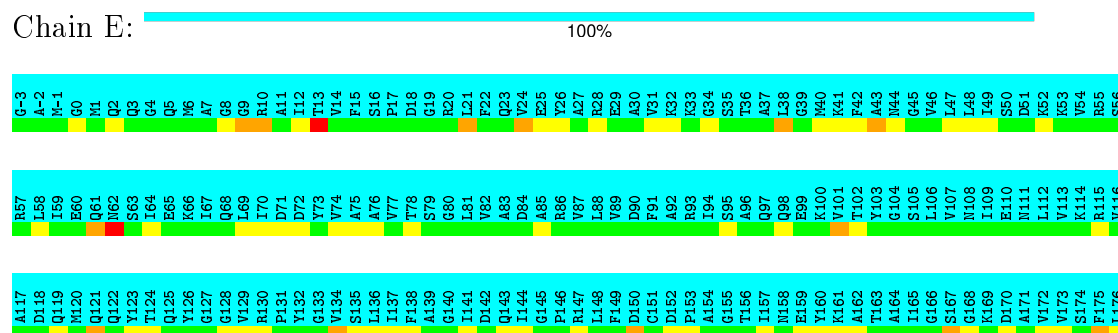
- Molecule 1: Proteasome subunit alpha

Chain D:



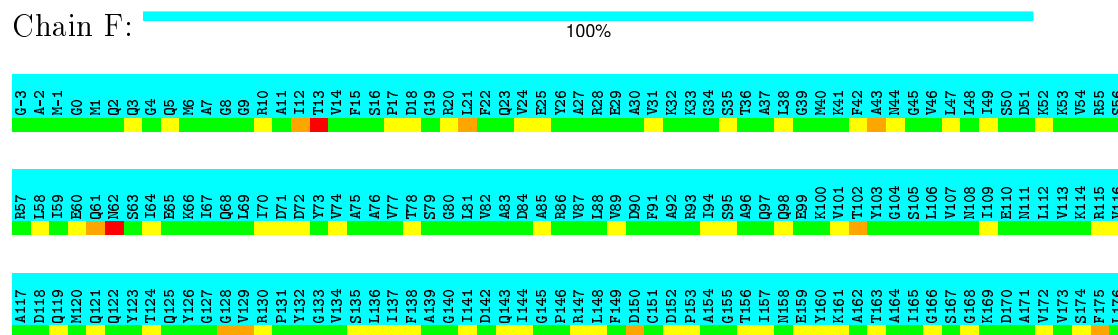
- Molecule 1: Proteasome subunit alpha

Chain E:



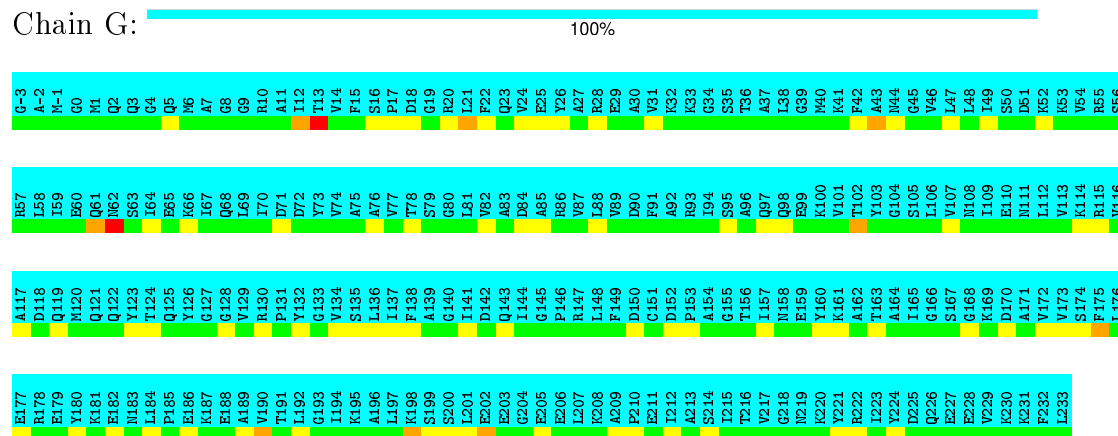
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

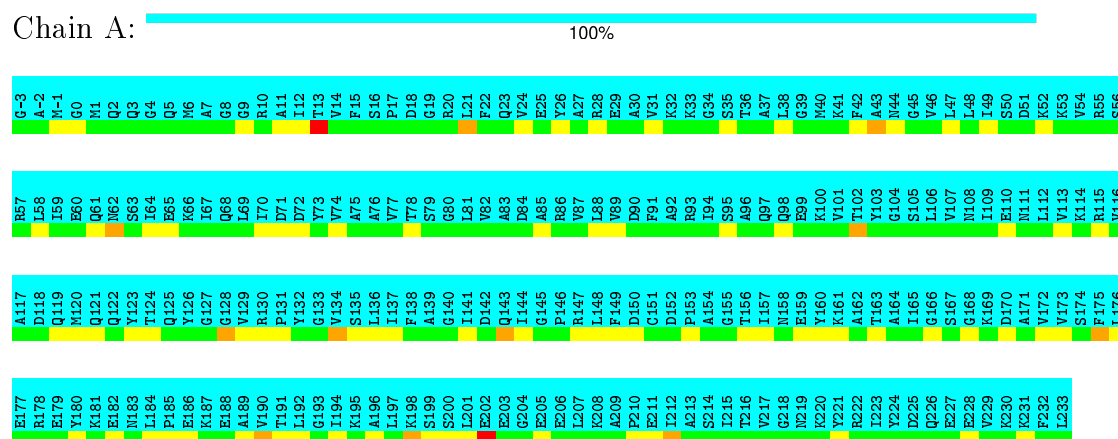
Chain G:



4.2.30 Score per residue for model 30

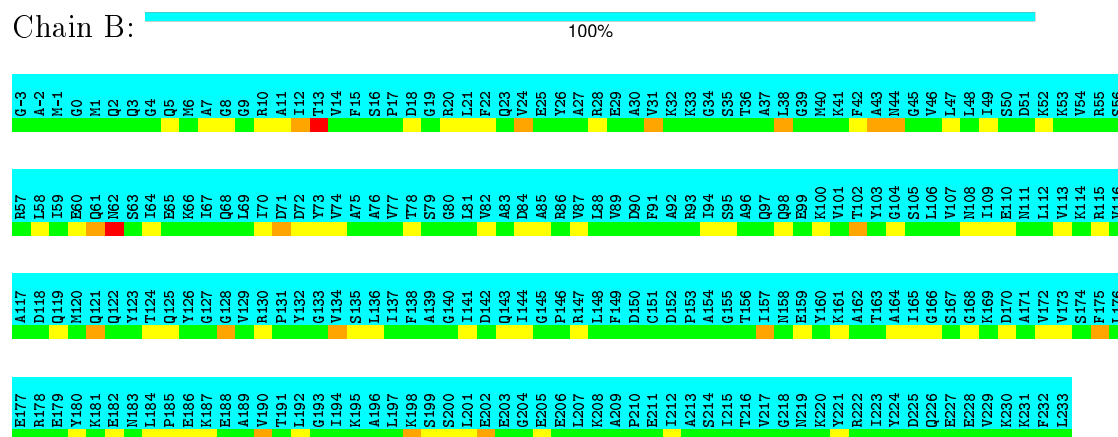
- Molecule 1: Proteasome subunit alpha

Chain A:



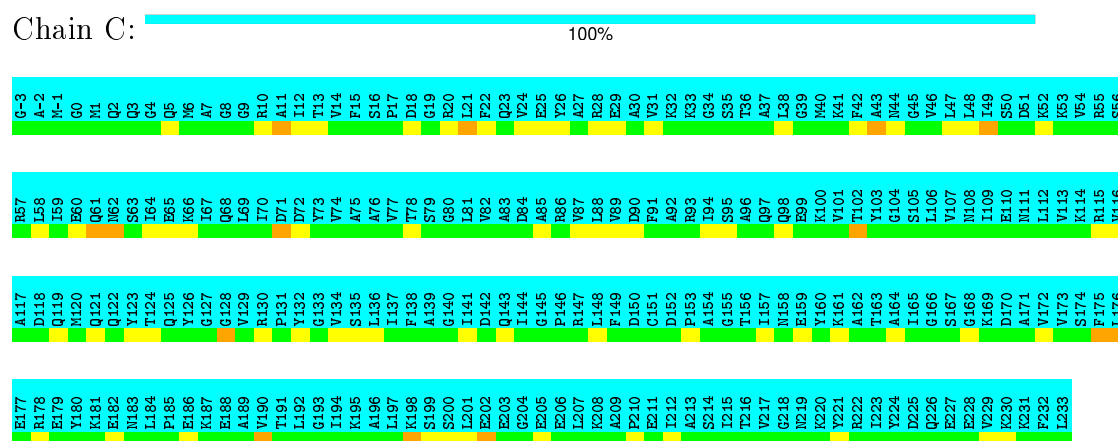
- Molecule 1: Proteasome subunit alpha

Chain B:



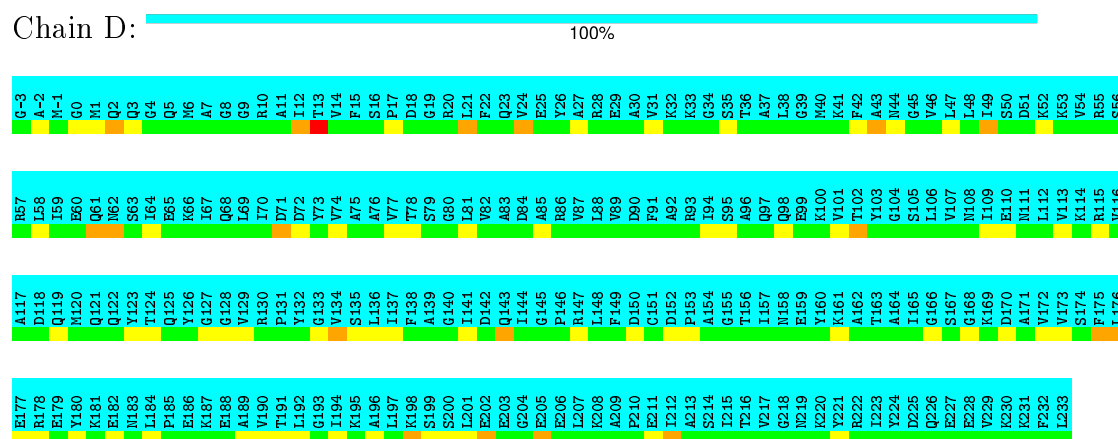
- Molecule 1: Proteasome subunit alpha

Chain C:



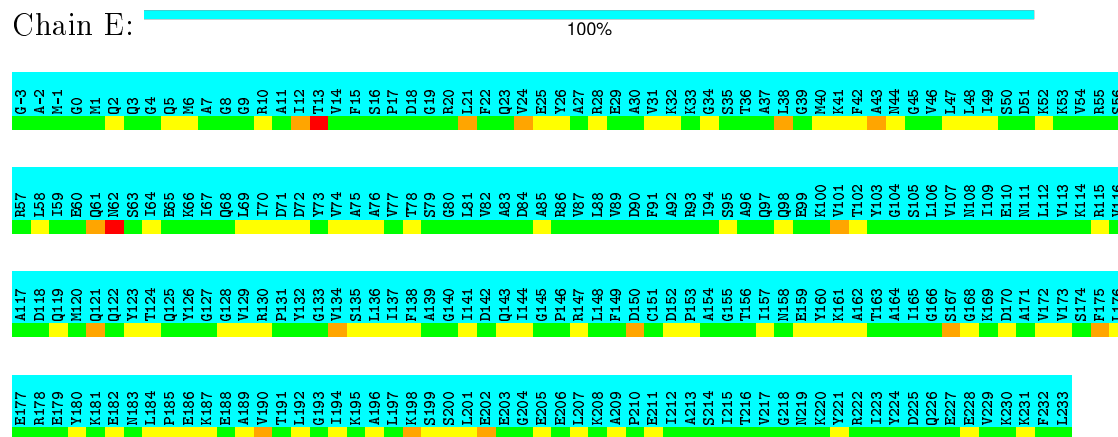
- Molecule 1: Proteasome subunit alpha

Chain D:



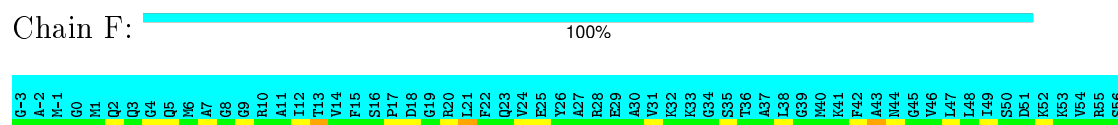
- Molecule 1: Proteasome subunit alpha

Chain E:



- Molecule 1: Proteasome subunit alpha

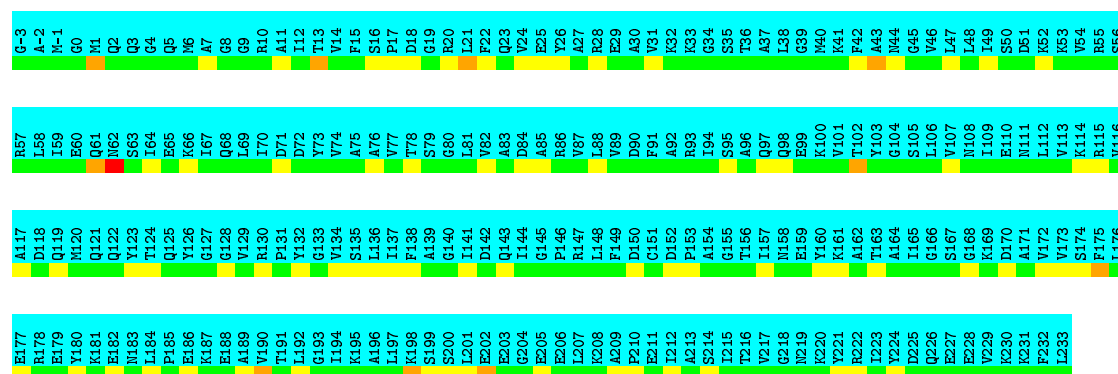
Chain F:





- Molecule 1: Proteasome subunit alpha

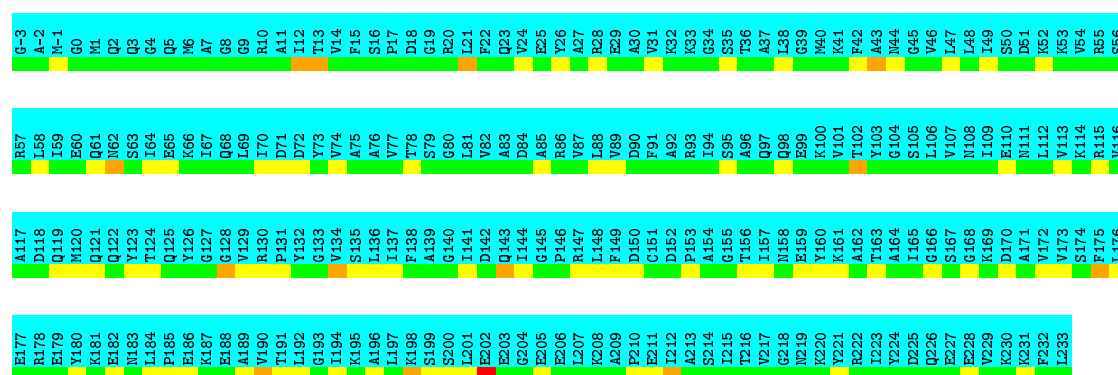
Chain G:



4.2.31 Score per residue for model 31

- Molecule 1: Proteasome subunit alpha

Chain A:



- Molecule 1: Proteasome subunit alpha

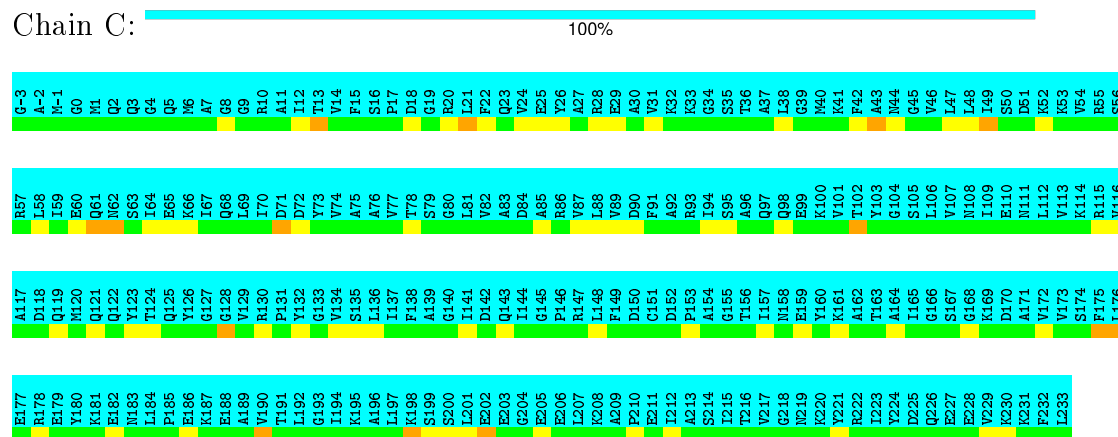
Chain B:





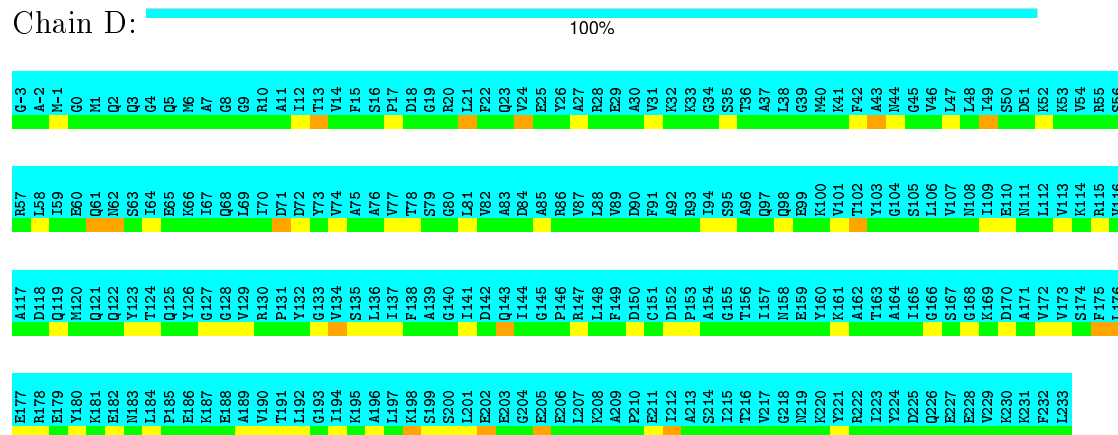
• Molecule 1: Proteasome subunit alpha

Chain C:



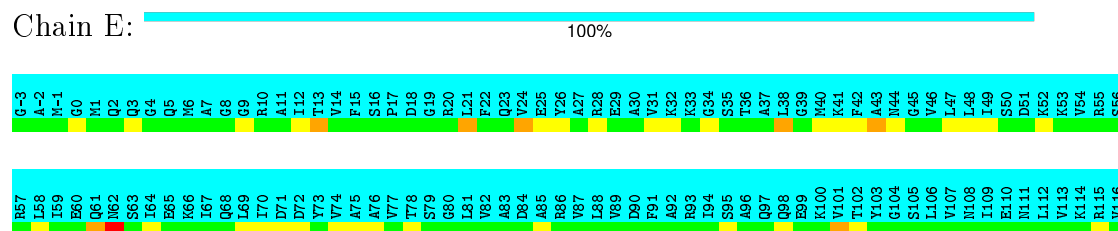
• Molecule 1: Proteasome subunit alpha

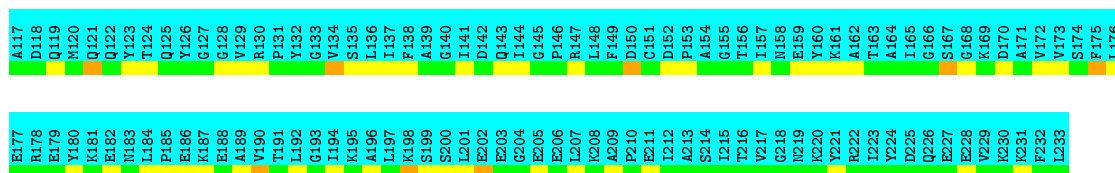
Chain D:



• Molecule 1: Proteasome subunit alpha

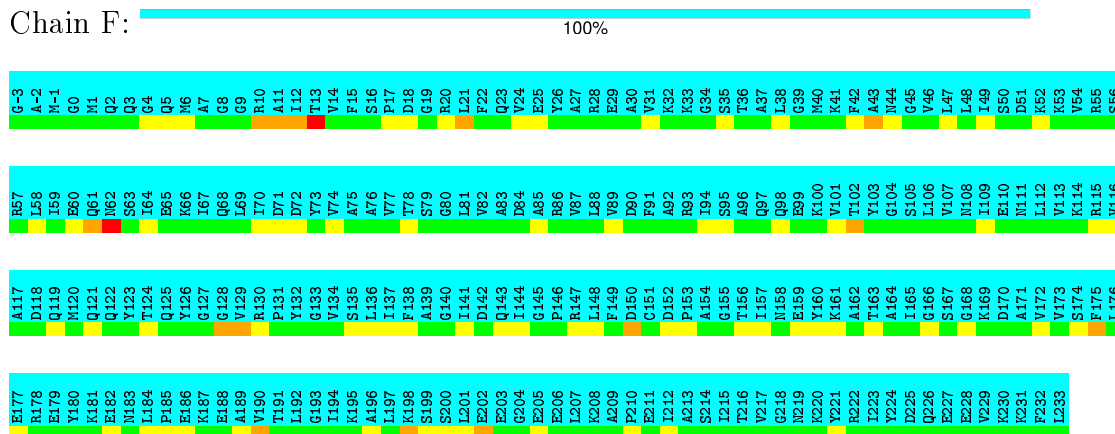
Chain E:





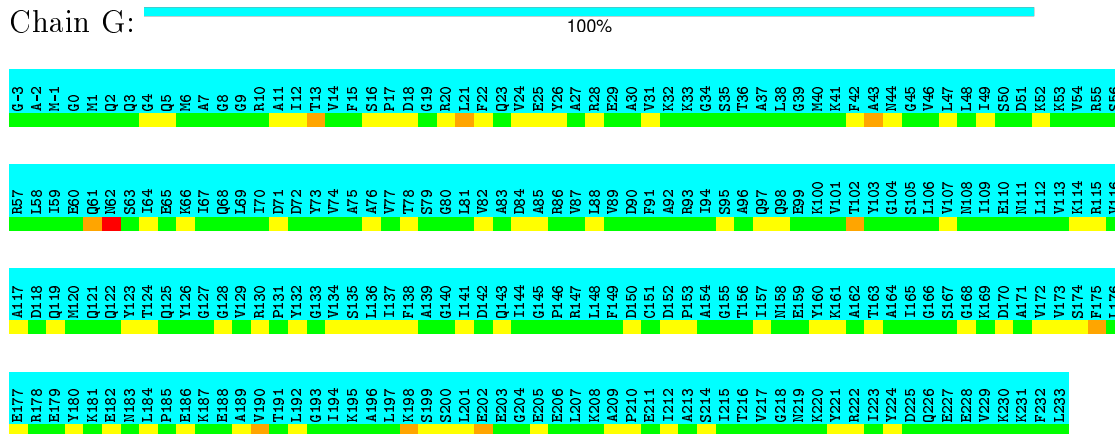
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

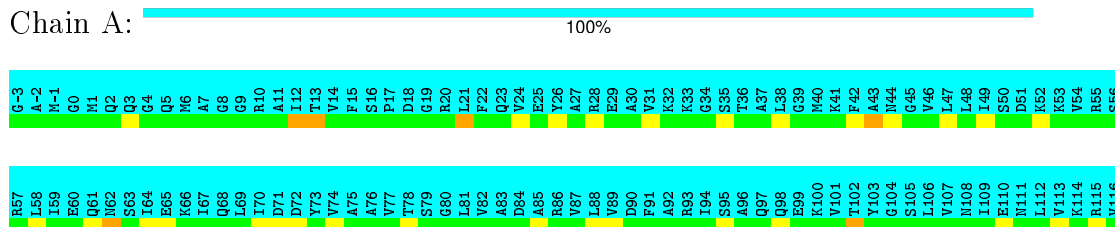
Chain G:

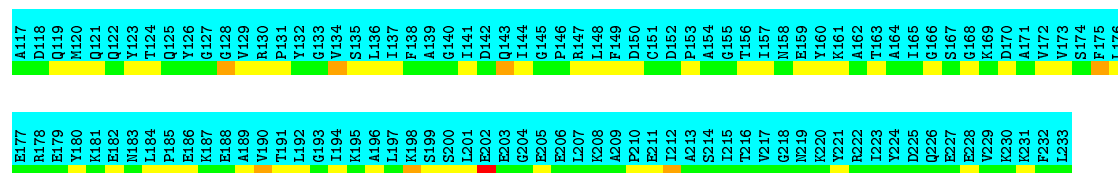


4.2.32 Score per residue for model 32

- Molecule 1: Proteasome subunit alpha

Chain A:

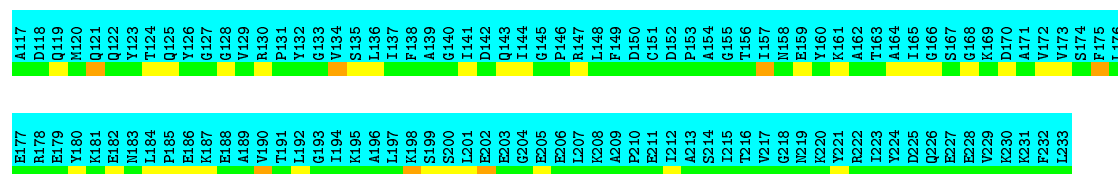
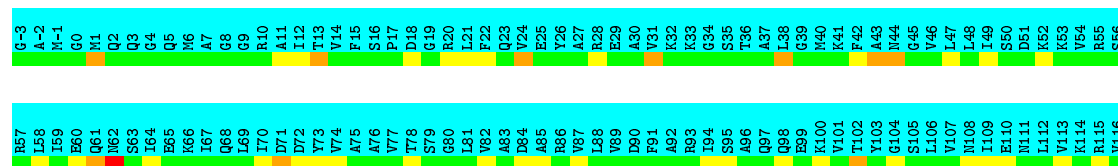




• Molecule 1: Proteasome subunit alpha

Chain B:

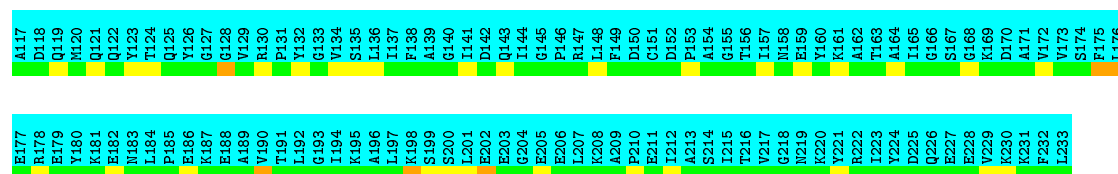
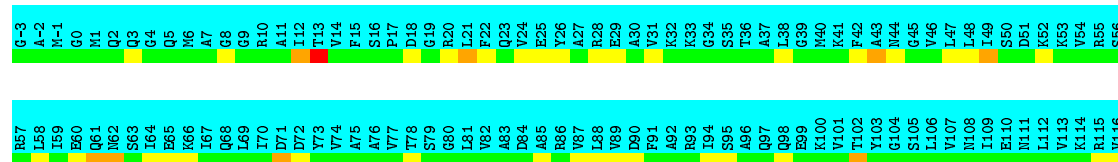
100%



• Molecule 1: Proteasome subunit alpha

Chain C:

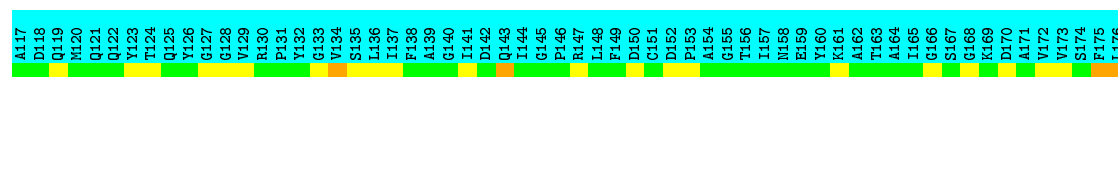
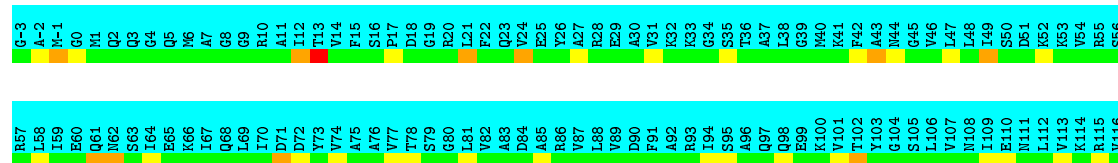
100%

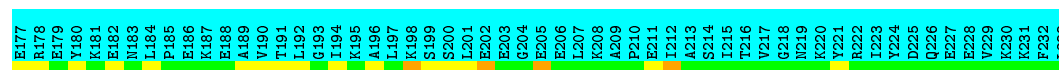


• Molecule 1: Proteasome subunit alpha

Chain D:

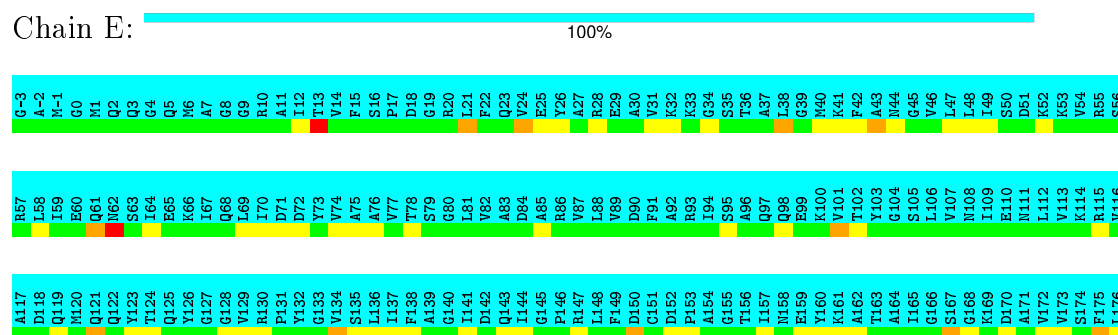
100%





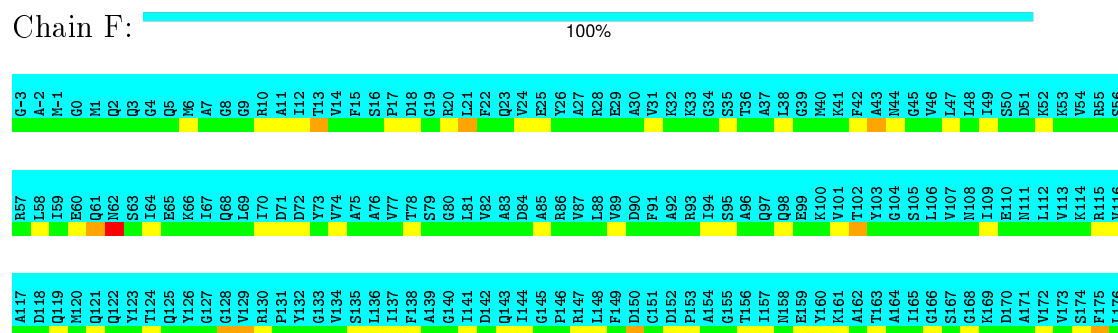
• Molecule 1: Proteasome subunit alpha

Chain E:



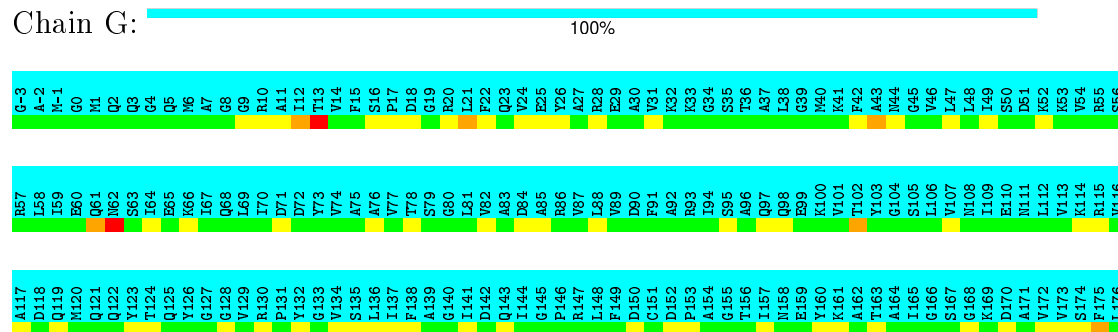
• Molecule 1: Proteasome subunit alpha

Chain F:



• Molecule 1: Proteasome subunit alpha

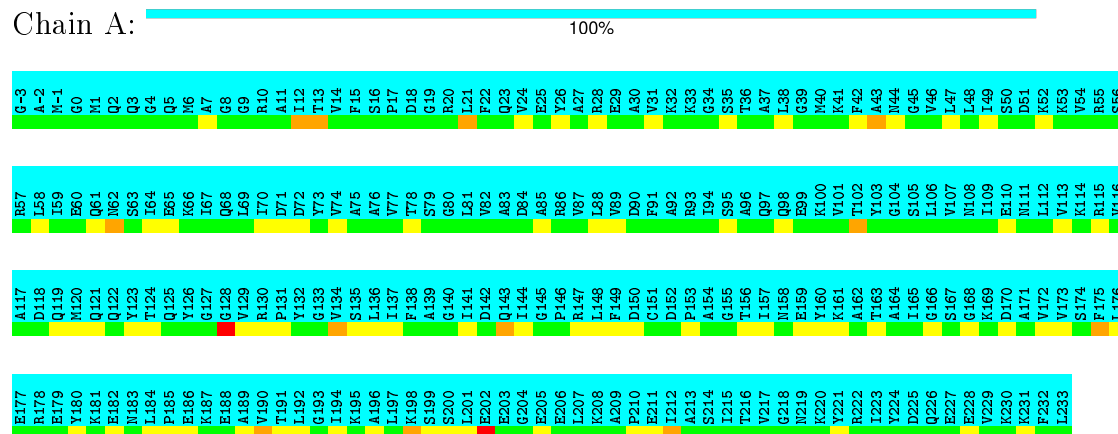
Chain G:



4.2.33 Score per residue for model 33

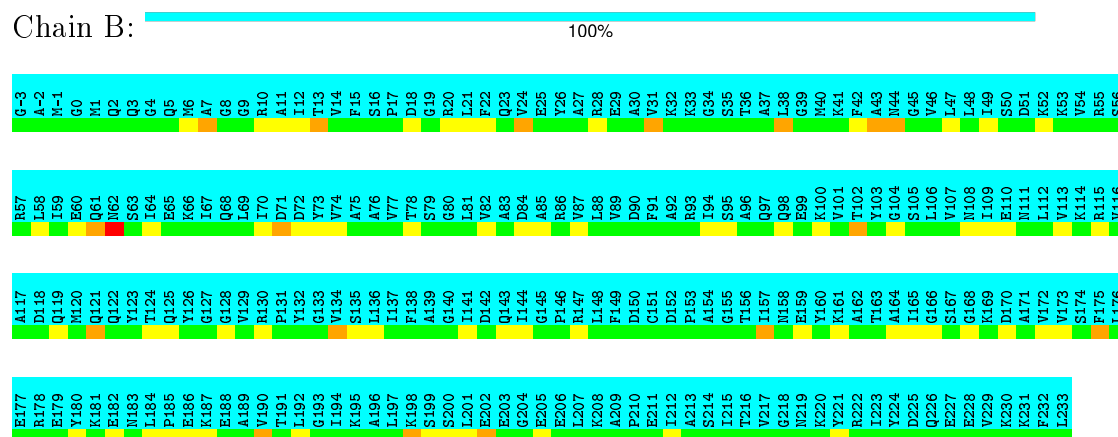
- Molecule 1: Proteasome subunit alpha

Chain A:



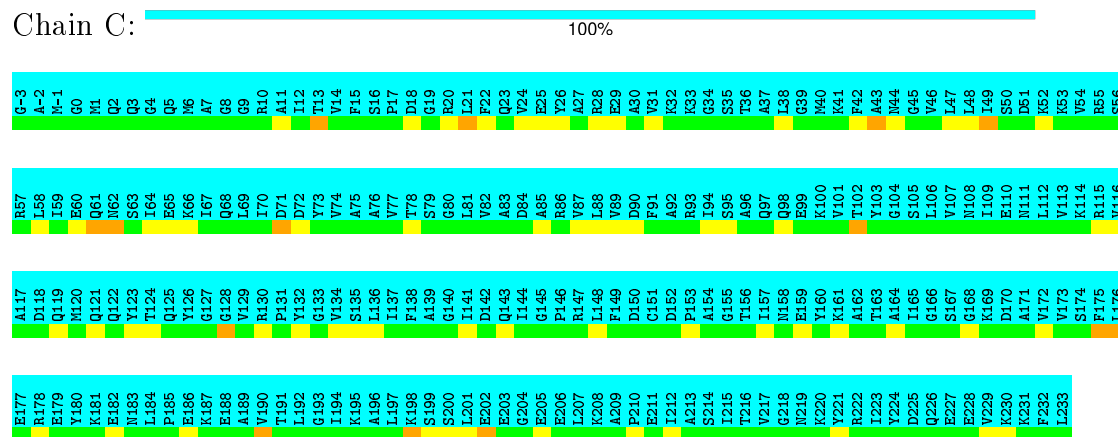
- Molecule 1: Proteasome subunit alpha

Chain B:



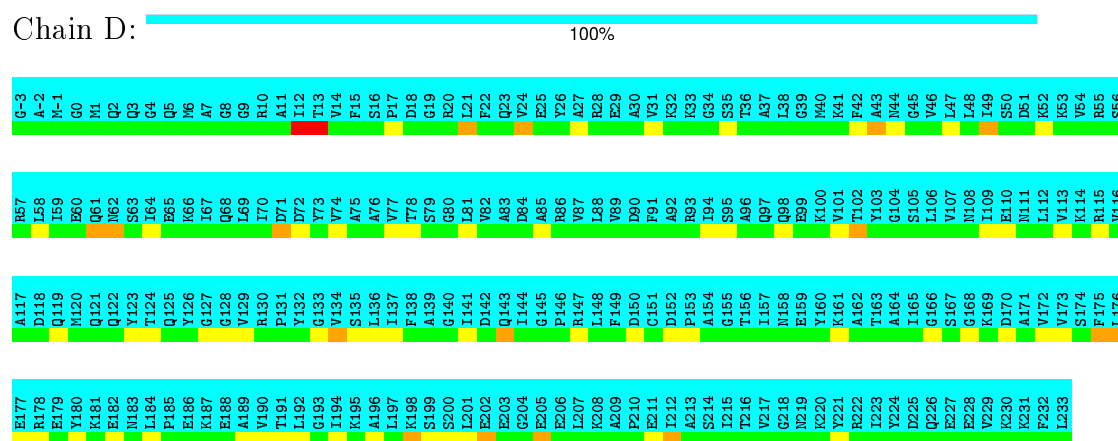
- Molecule 1: Proteasome subunit alpha

Chain C:



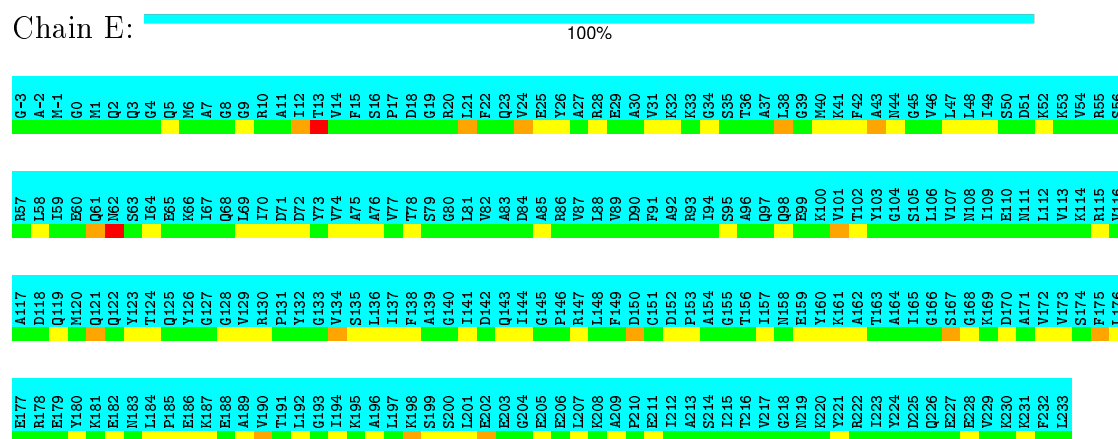
- Molecule 1: Proteasome subunit alpha

Chain D:



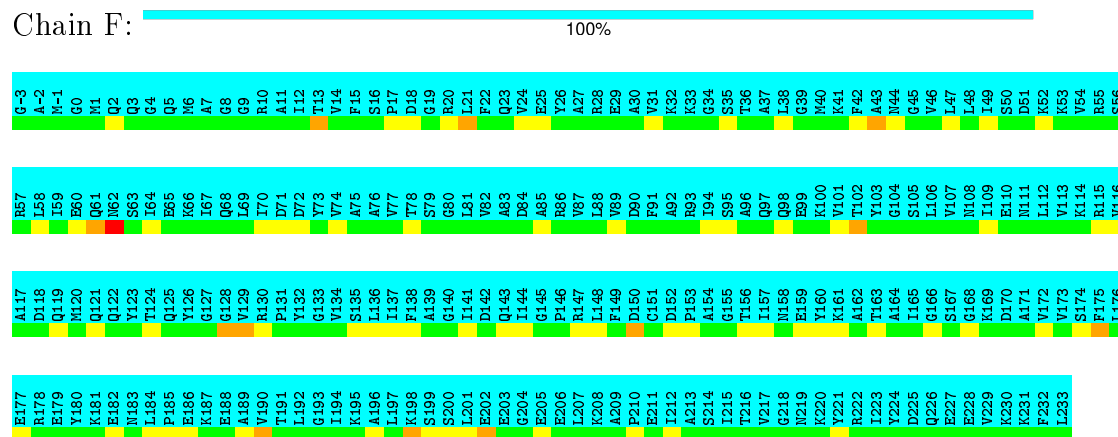
- Molecule 1: Proteasome subunit alpha

Chain E:



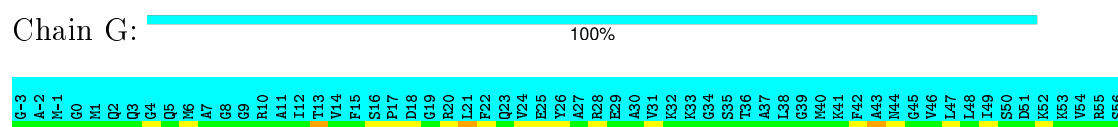
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

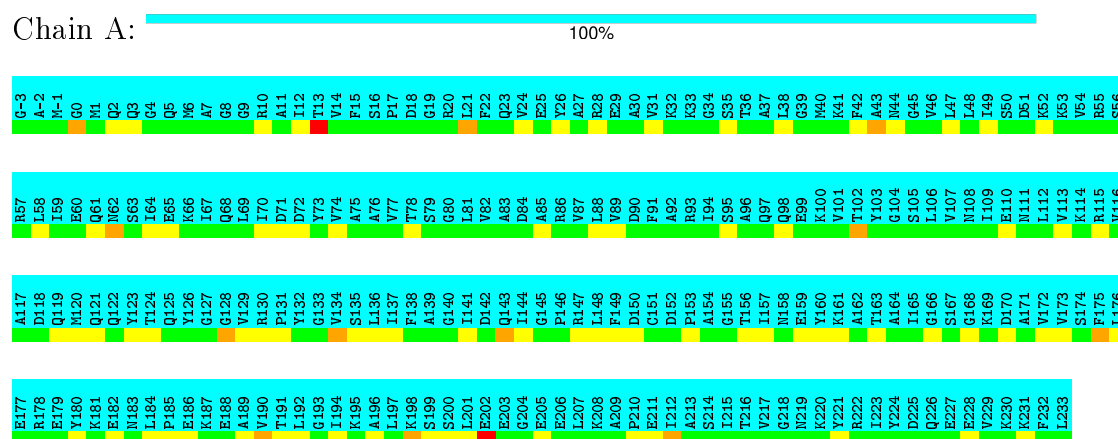
Chain G:



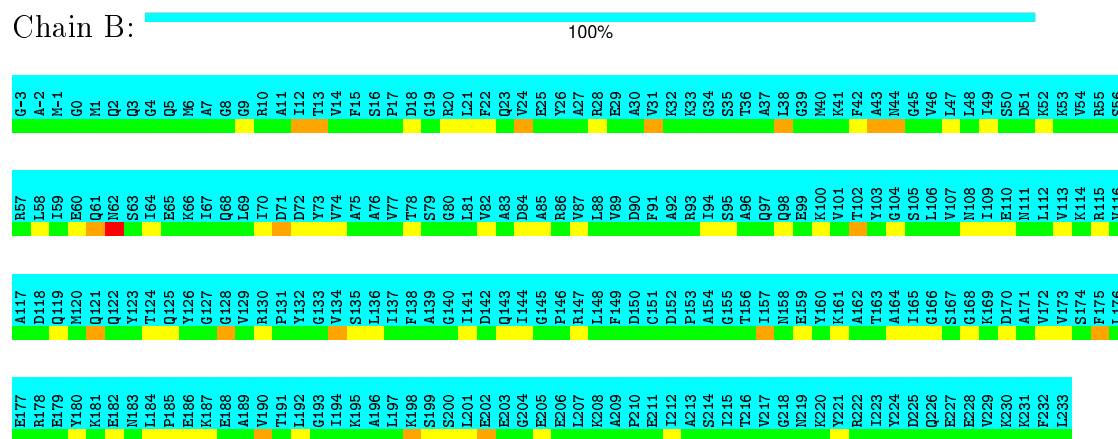


4.2.34 Score per residue for model 34

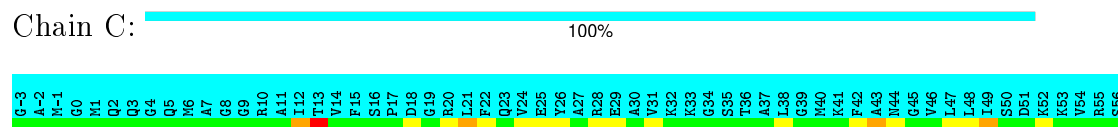
- Molecule 1: Proteasome subunit alpha

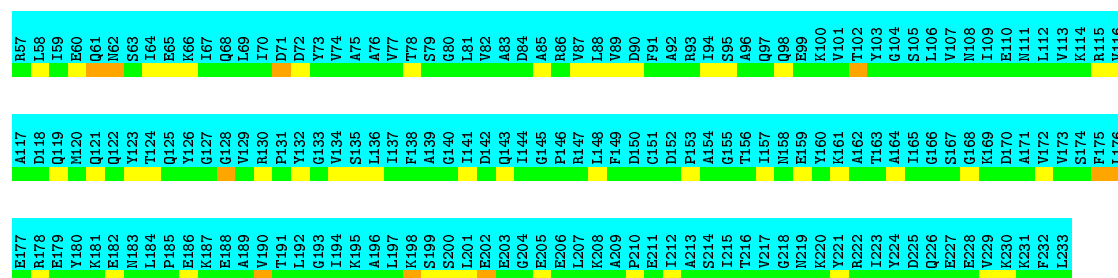


- Molecule 1: Proteasome subunit alpha



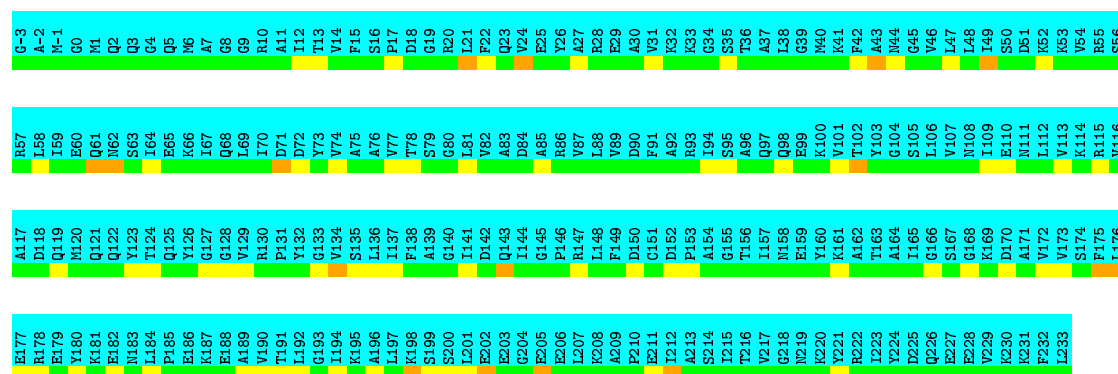
- Molecule 1: Proteasome subunit alpha





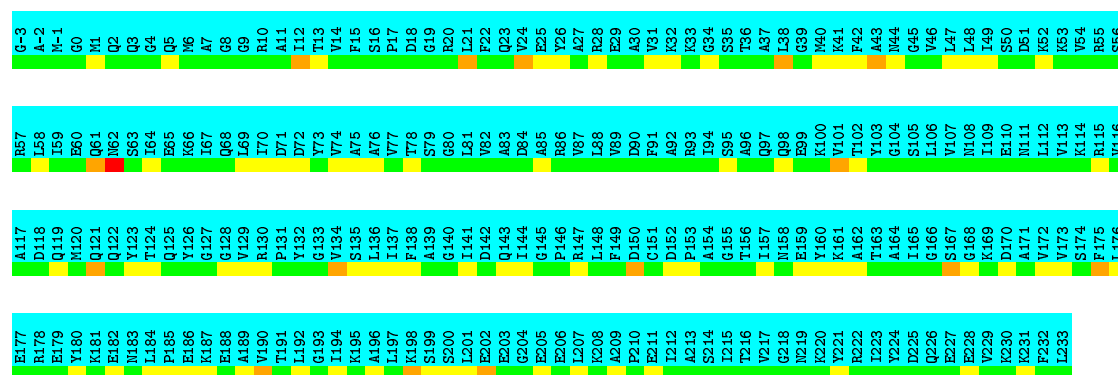
• Molecule 1: Proteasome subunit alpha

Chain D:  100%



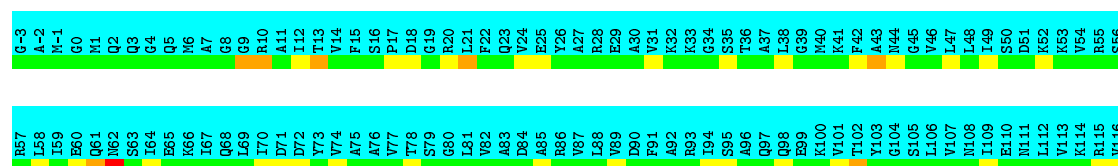
• Molecule 1: Proteasome subunit alpha

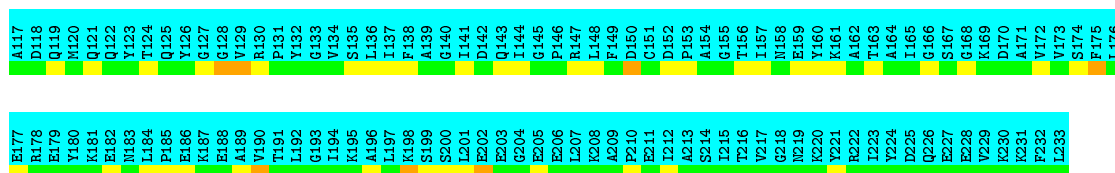
Chain E:  100%



• Molecule 1: Proteasome subunit alpha

Chain F:  100%

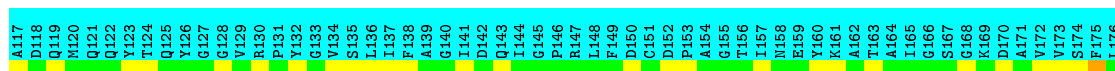
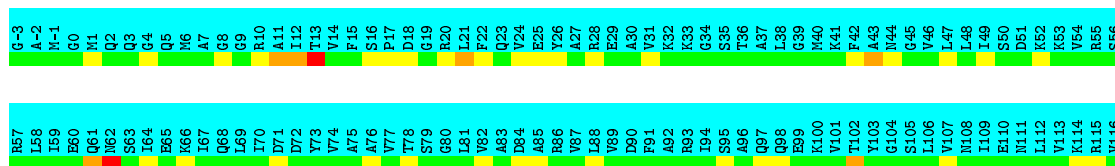




- Molecule 1: Proteasome subunit alpha

Chain G:

100%

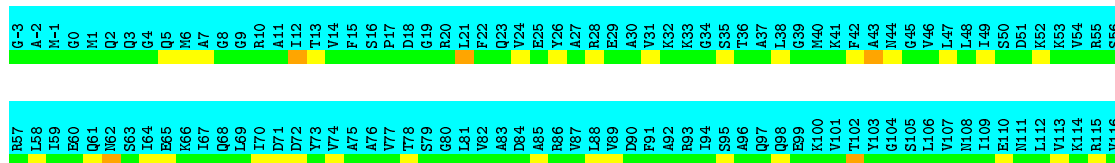


4.2.35 Score per residue for model 35

- Molecule 1: Proteasome subunit alpha

Chain A:

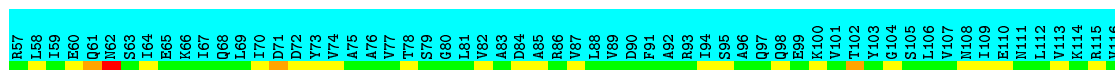
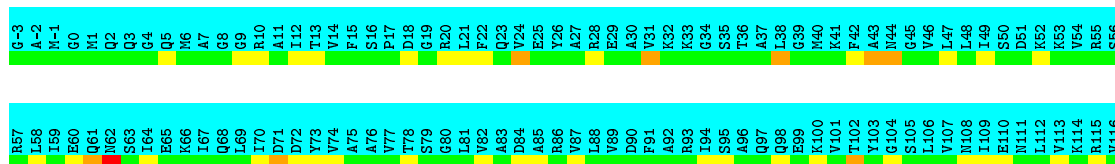
100%

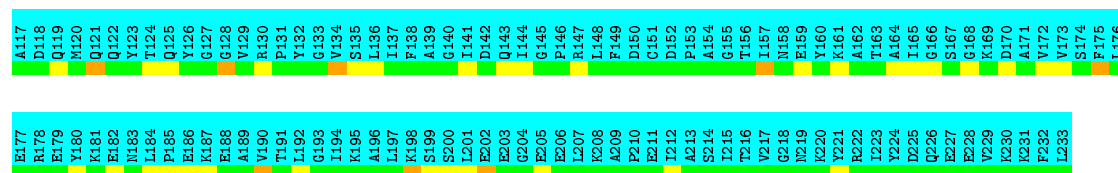


- Molecule 1: Proteasome subunit alpha

Chain B:

100%

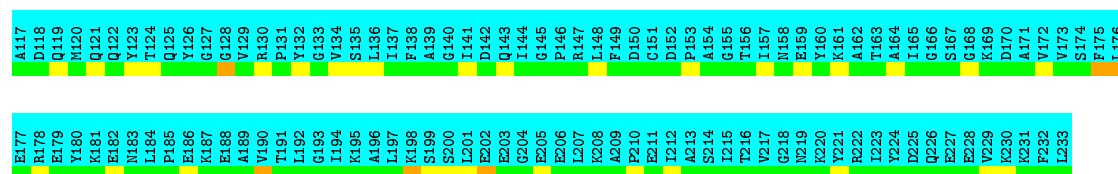
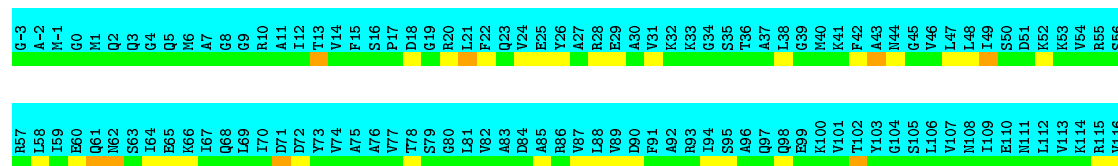




• Molecule 1: Proteasome subunit alpha

Chain C:

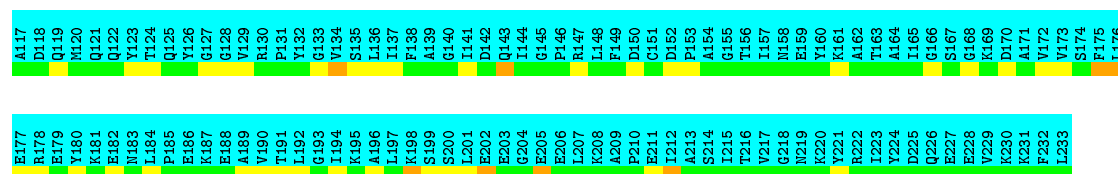
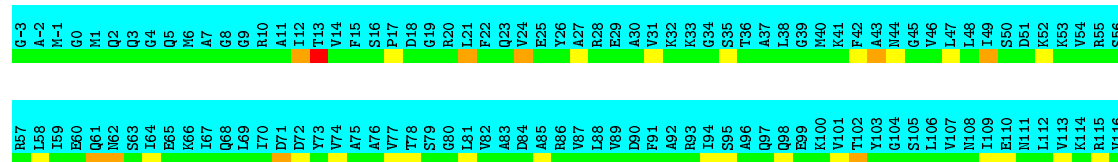
100%



• Molecule 1: Proteasome subunit alpha

Chain D:

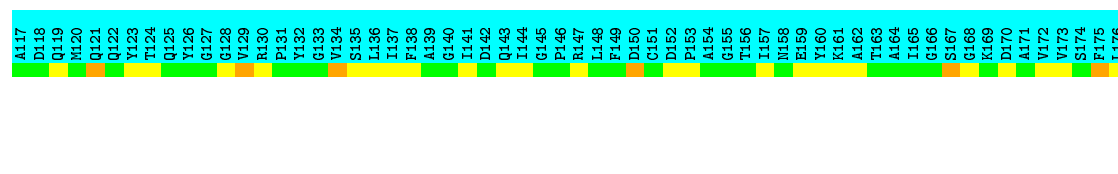
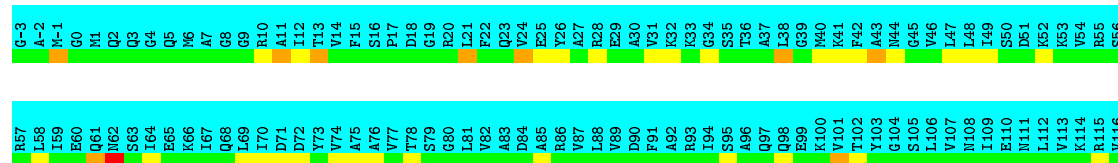
100%

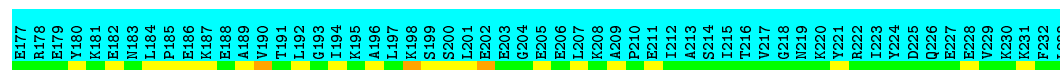


• Molecule 1: Proteasome subunit alpha

Chain E:

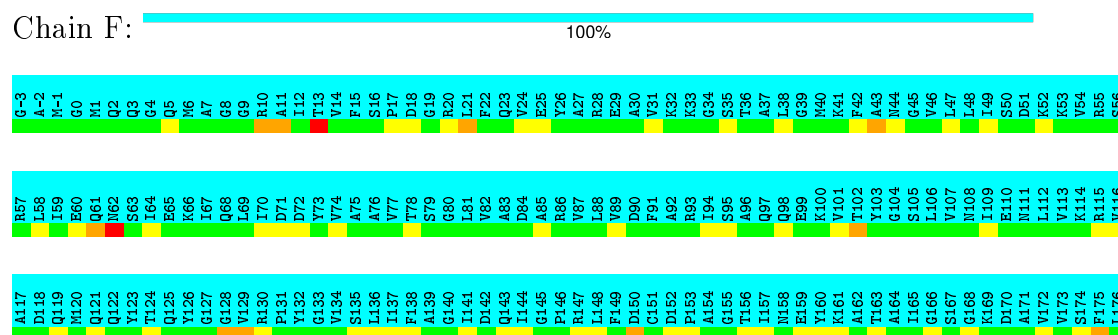
100%





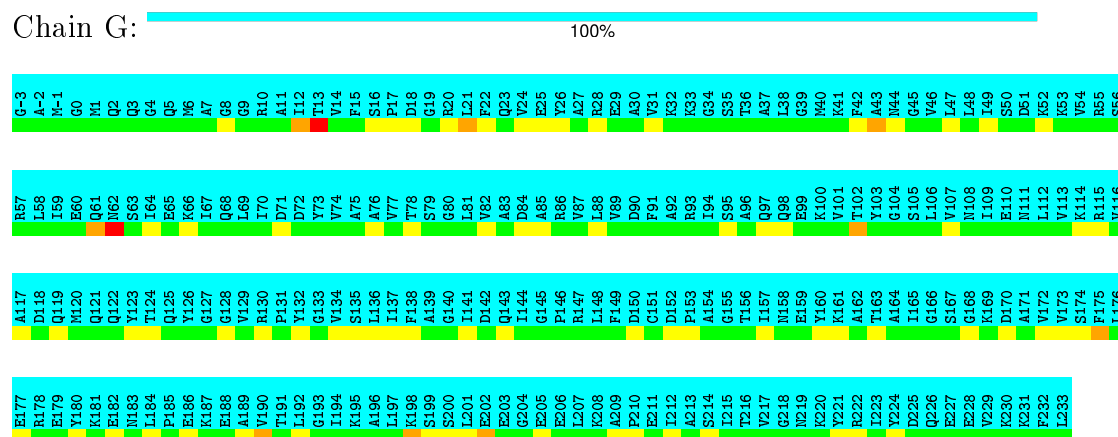
• Molecule 1: Proteasome subunit alpha

Chain F:



• Molecule 1: Proteasome subunit alpha

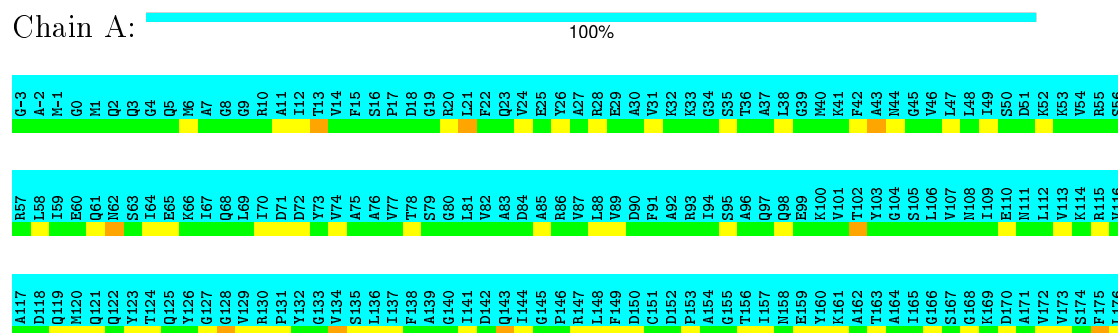
Chain G:

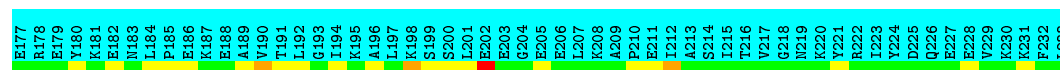


4.2.36 Score per residue for model 36

• Molecule 1: Proteasome subunit alpha

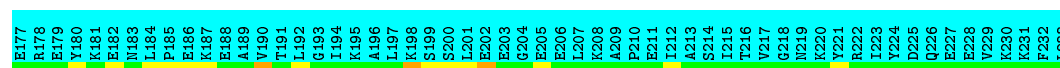
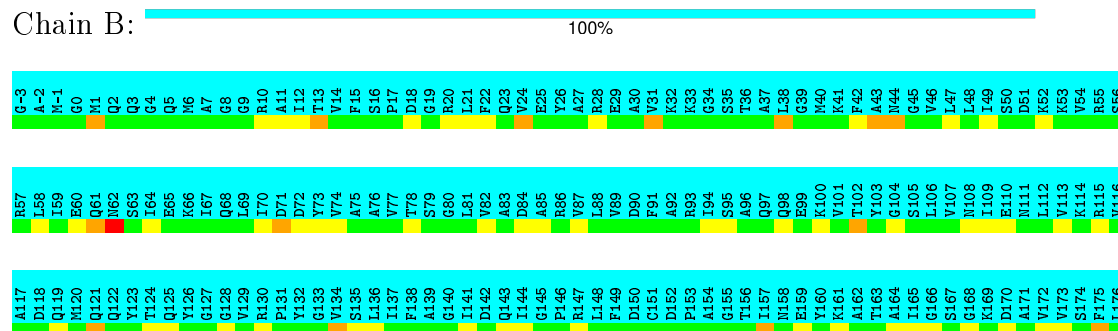
Chain A:





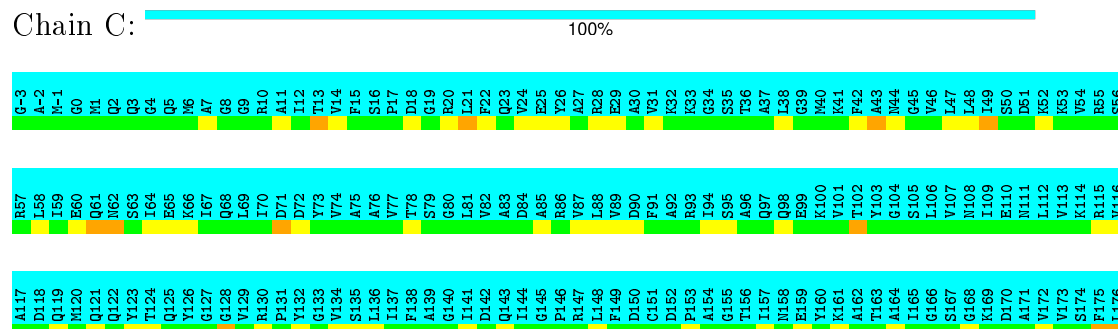
• Molecule 1: Proteasome subunit alpha

Chain B:



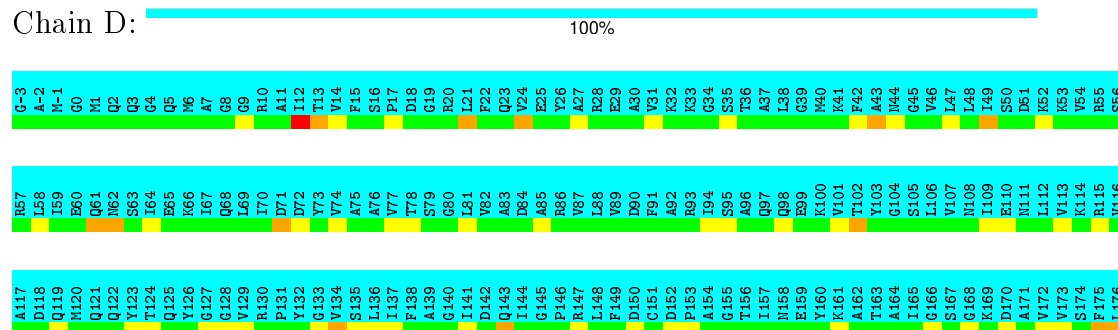
• Molecule 1: Proteasome subunit alpha

Chain C:



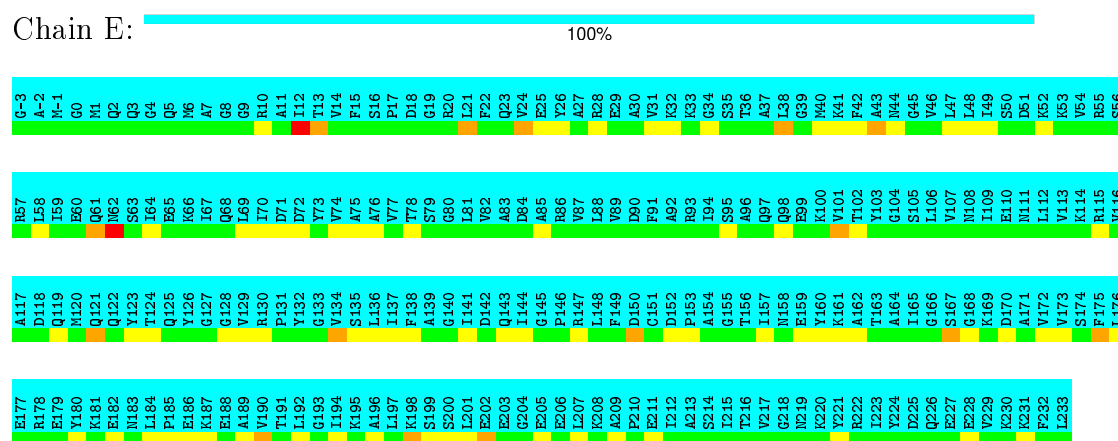
• Molecule 1: Proteasome subunit alpha

Chain D:



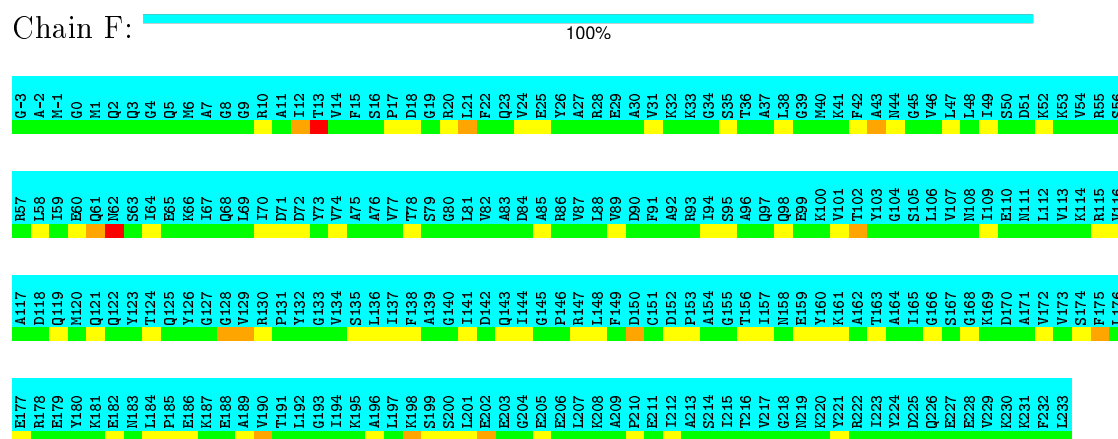
• Molecule 1: Proteasome subunit alpha

Chain E:



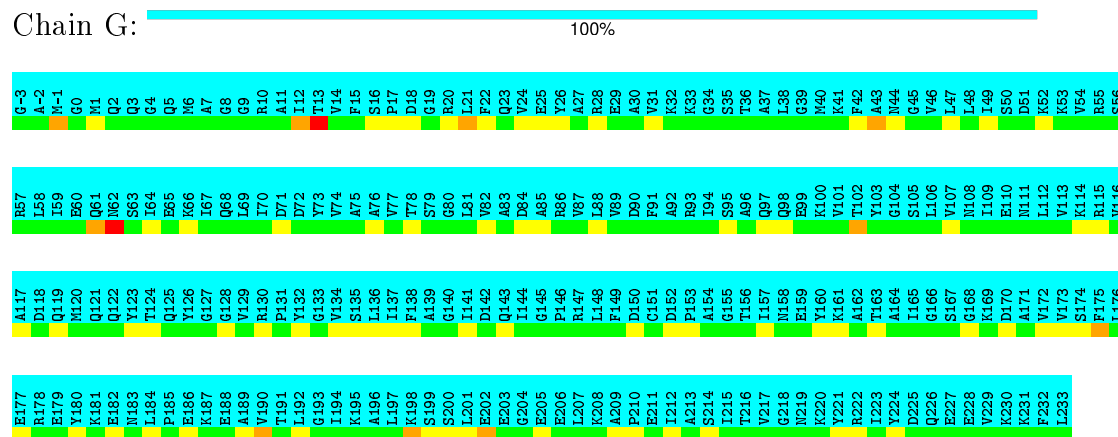
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

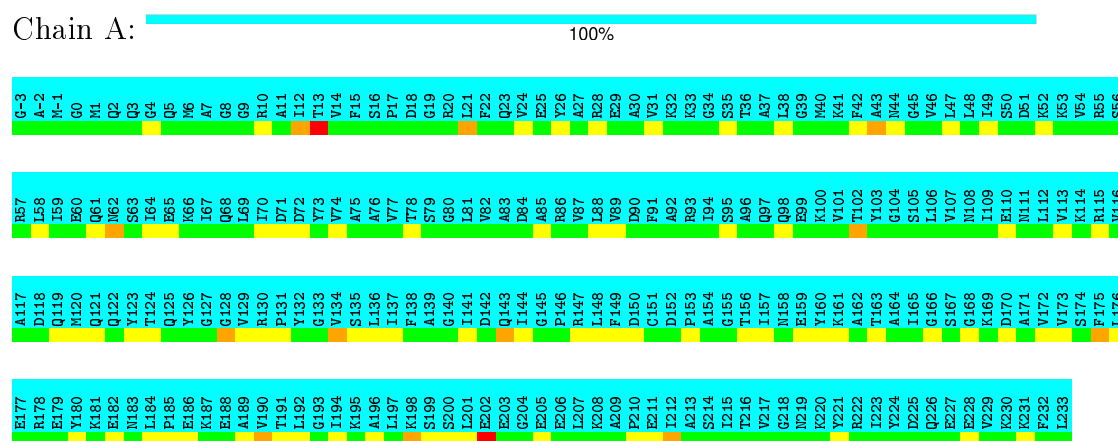
Chain G:



4.2.37 Score per residue for model 37

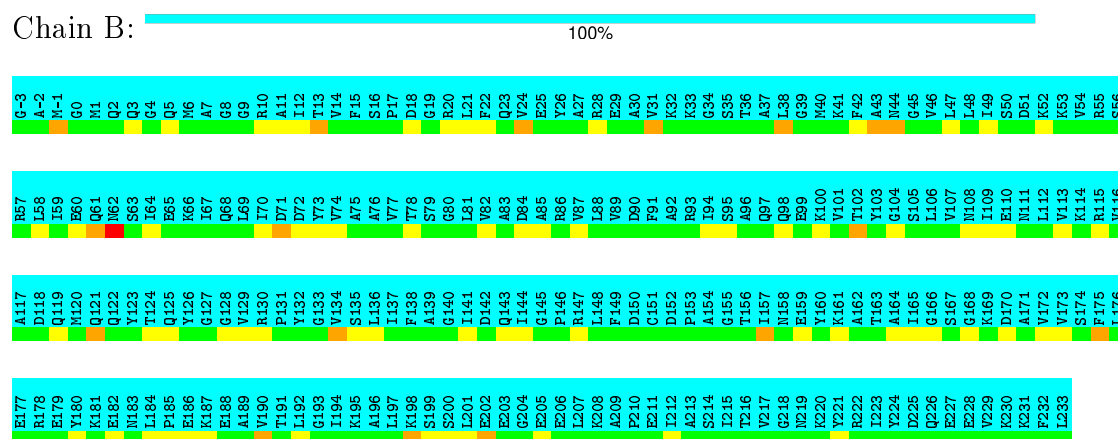
- Molecule 1: Proteasome subunit alpha

Chain A:



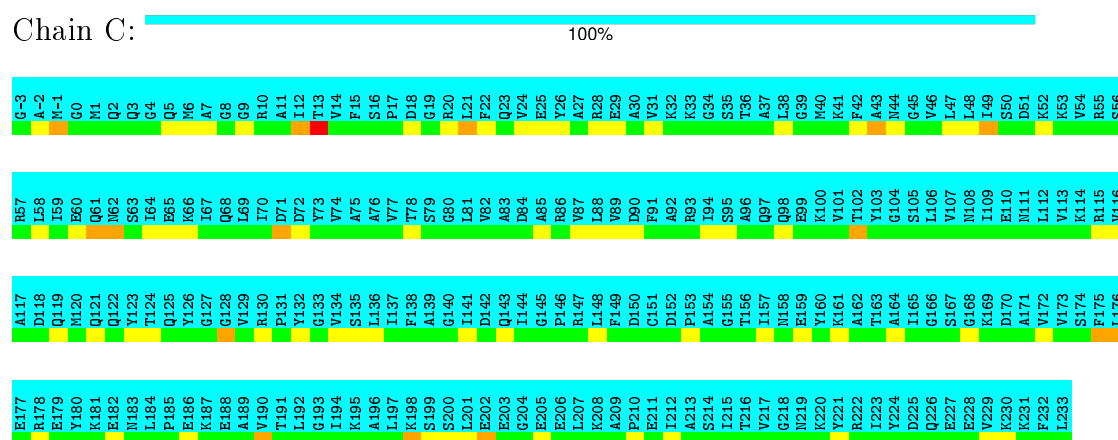
- Molecule 1: Proteasome subunit alpha

Chain B:



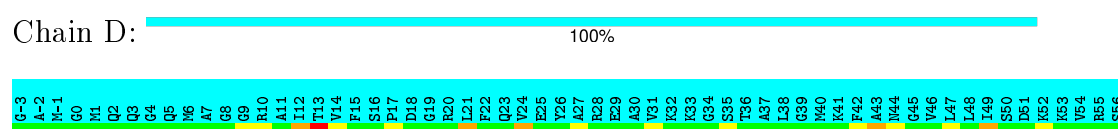
- Molecule 1: Proteasome subunit alpha

Chain C:

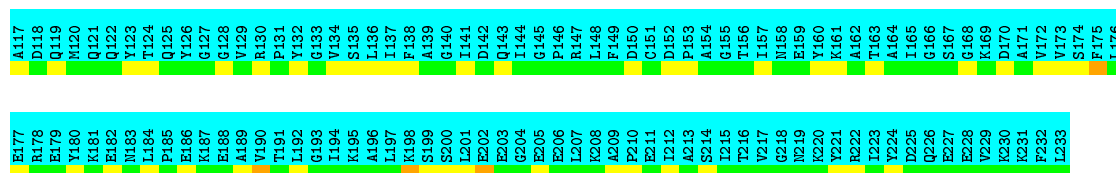


- Molecule 1: Proteasome subunit alpha

Chain D:

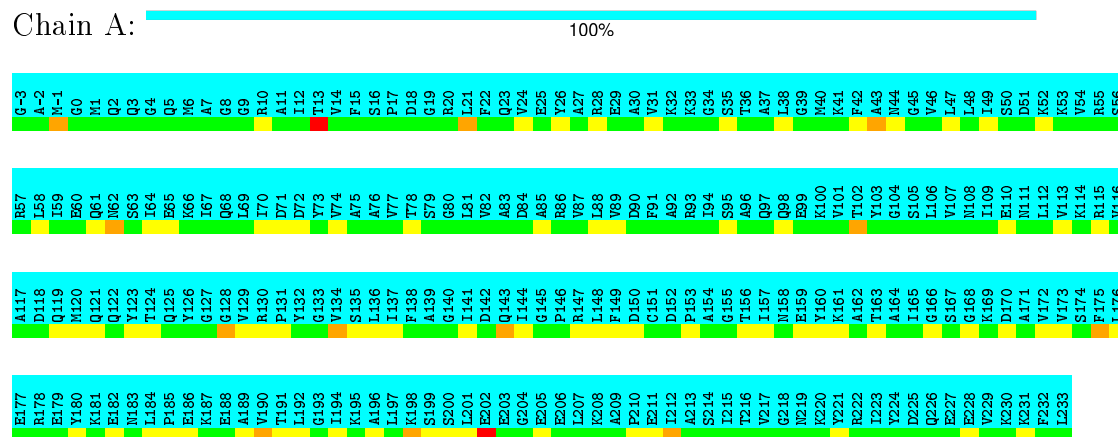




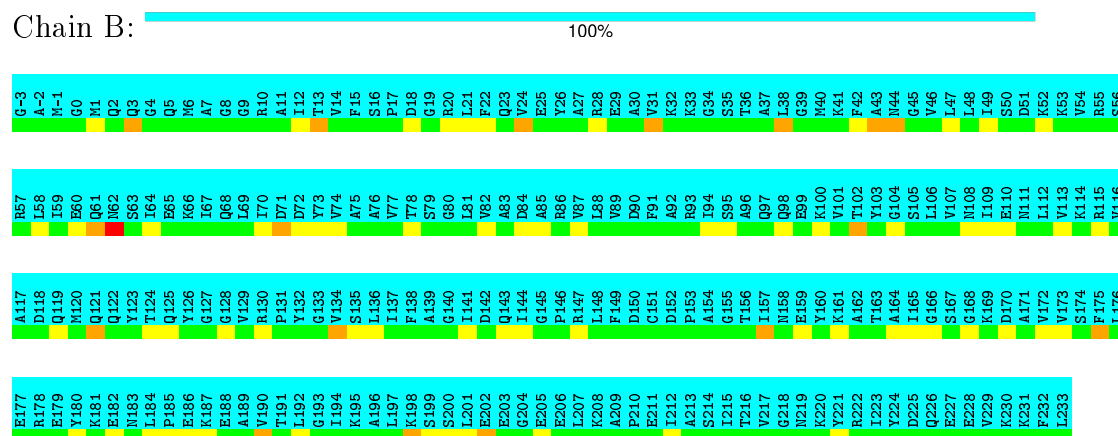


4.2.38 Score per residue for model 38

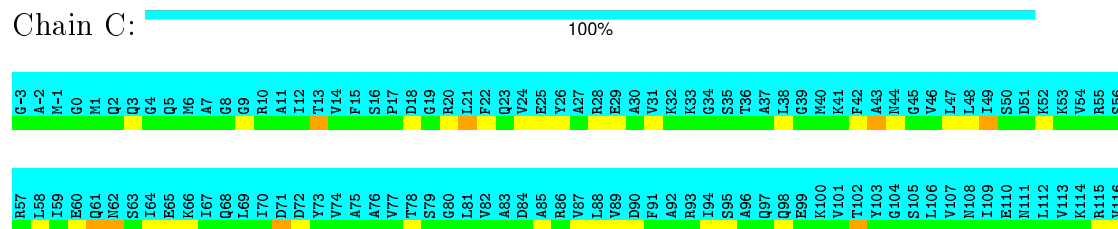
- Molecule 1: Proteasome subunit alpha

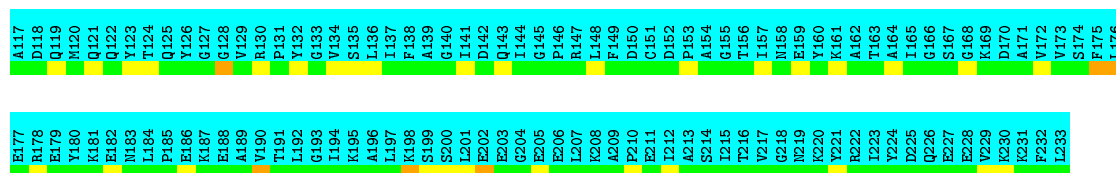


- Molecule 1: Proteasome subunit alpha



- Molecule 1: Proteasome subunit alpha

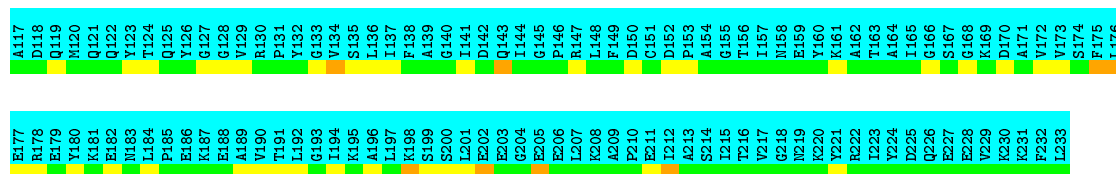
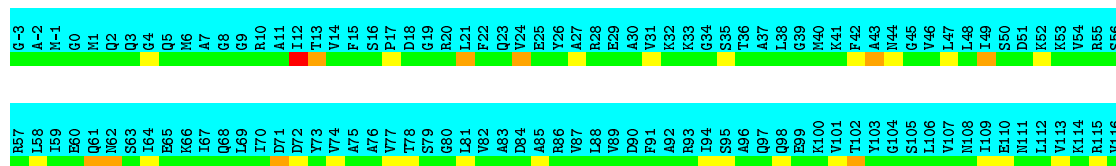




• Molecule 1: Proteasome subunit alpha

Chain D:

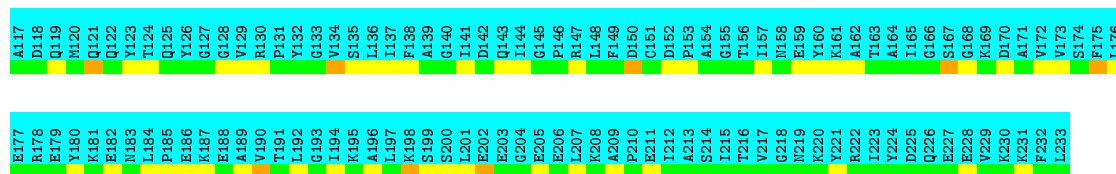
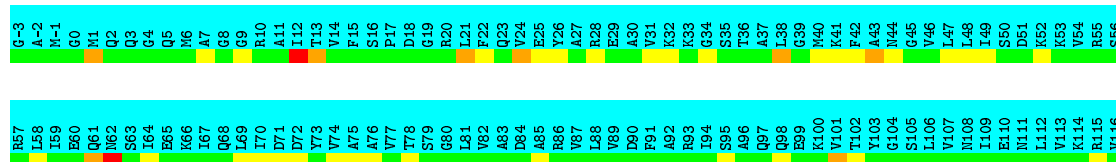
100%



• Molecule 1: Proteasome subunit alpha

Chain E:

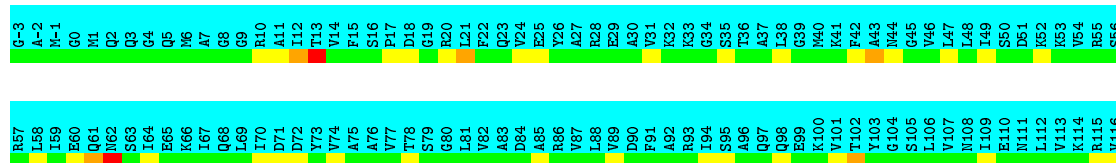
100%

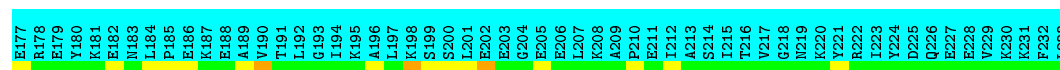


• Molecule 1: Proteasome subunit alpha

Chain F:

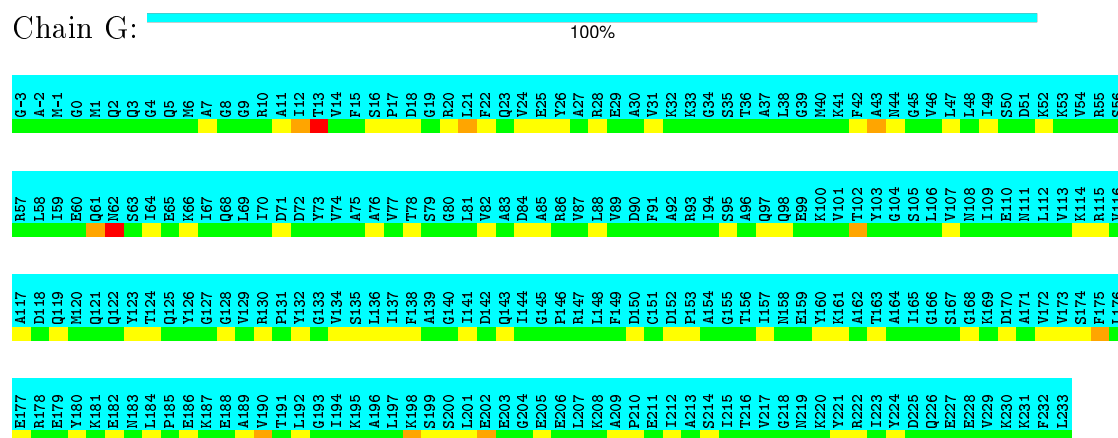
100%





- Molecule 1: Proteasome subunit alpha

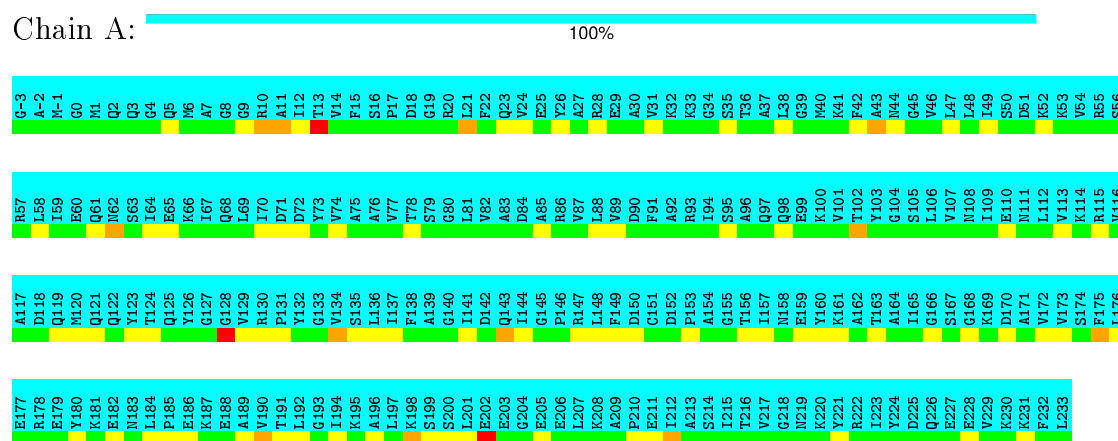
Chain G:



4.2.39 Score per residue for model 39

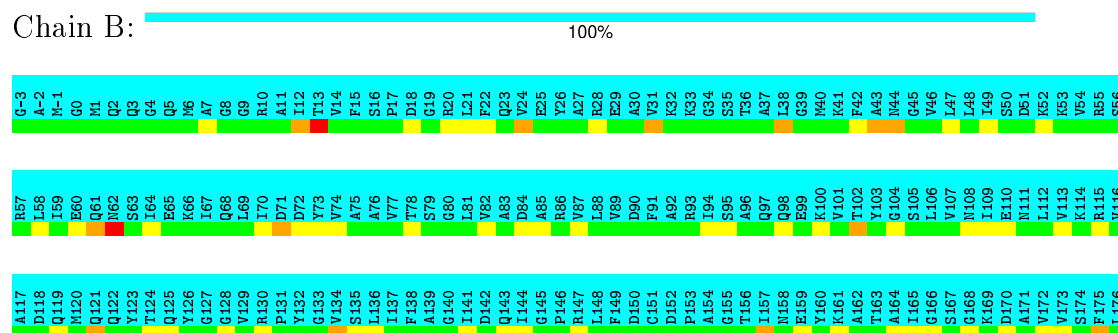
- Molecule 1: Proteasome subunit alpha

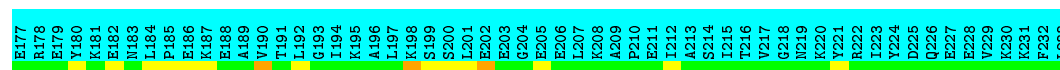
Chain A:



- Molecule 1: Proteasome subunit alpha

Chain B:

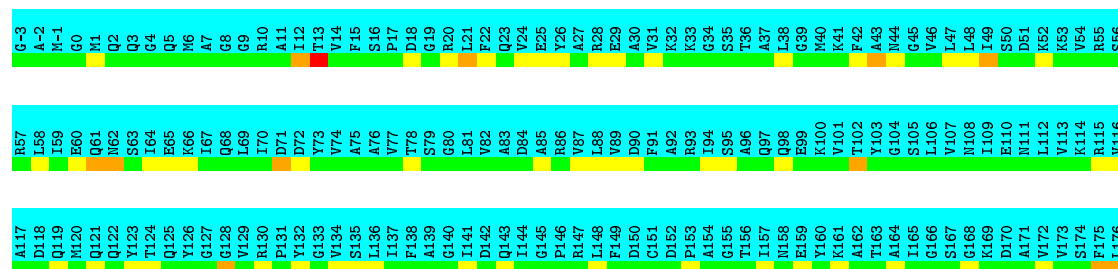




- Molecule 1: Proteasome subunit alpha

Chain C:

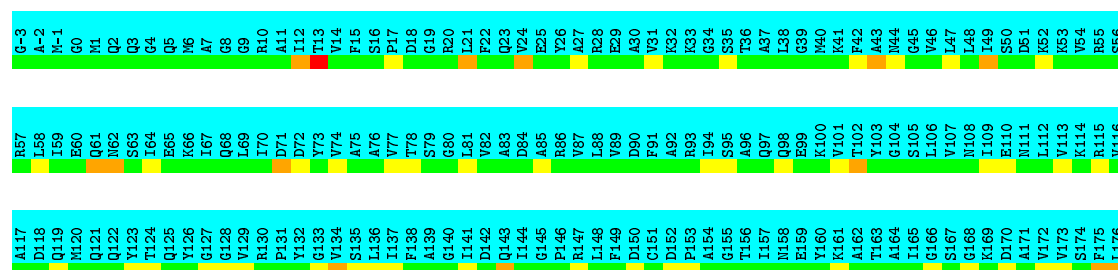
100%



- Molecule 1: Proteasome subunit alpha

Chain D:

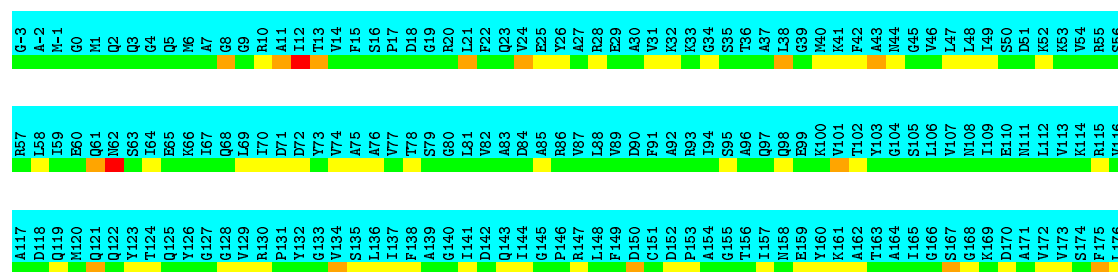
100%



- Molecule 1: Proteasome subunit alpha

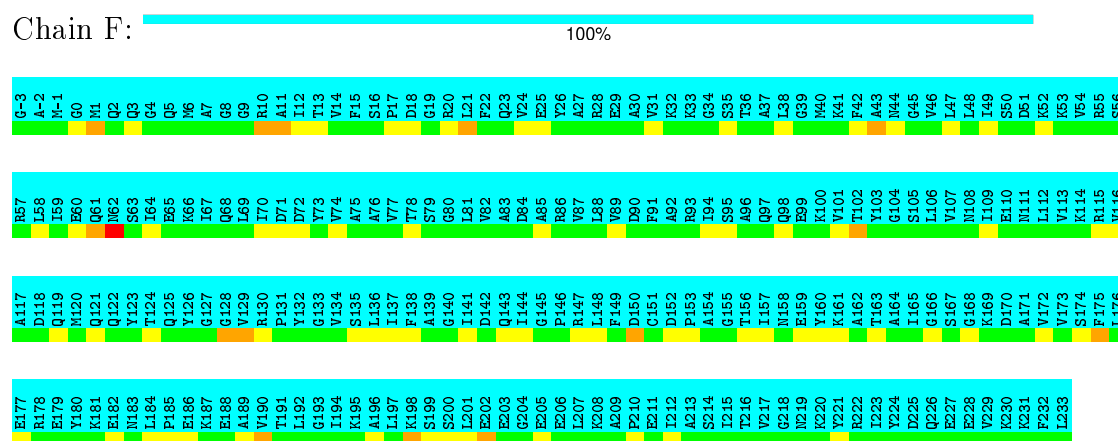
Chain E:

100%



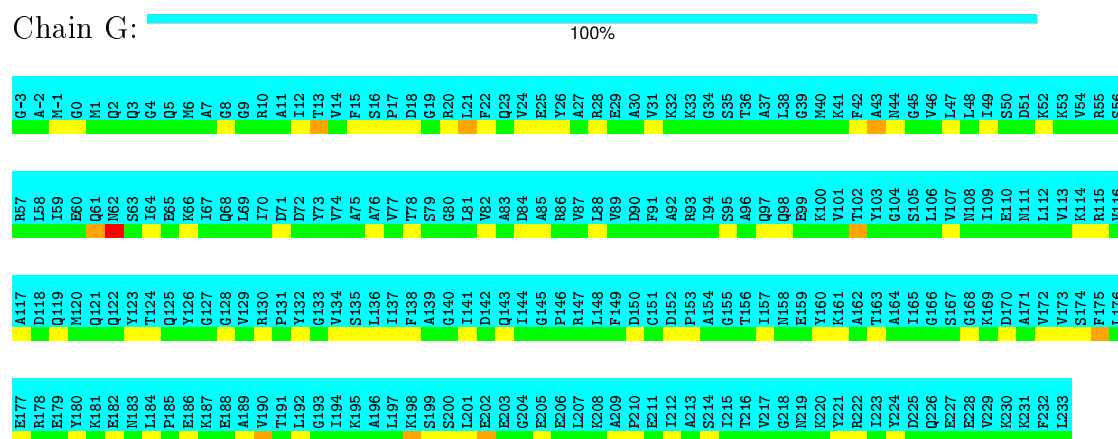
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

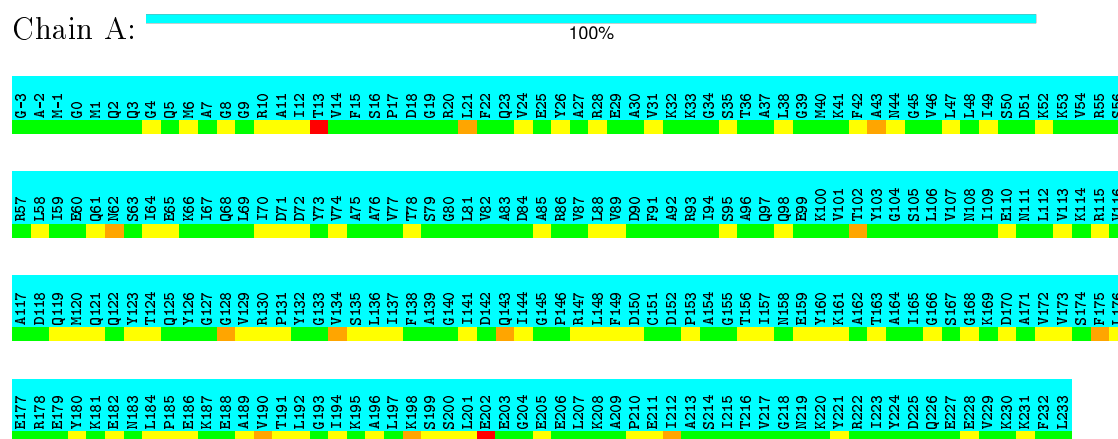
Chain G:



4.2.40 Score per residue for model 40

- Molecule 1: Proteasome subunit alpha

Chain A:



- Molecule 1: Proteasome subunit alpha

100%



Response	Percentage
Yes	100%

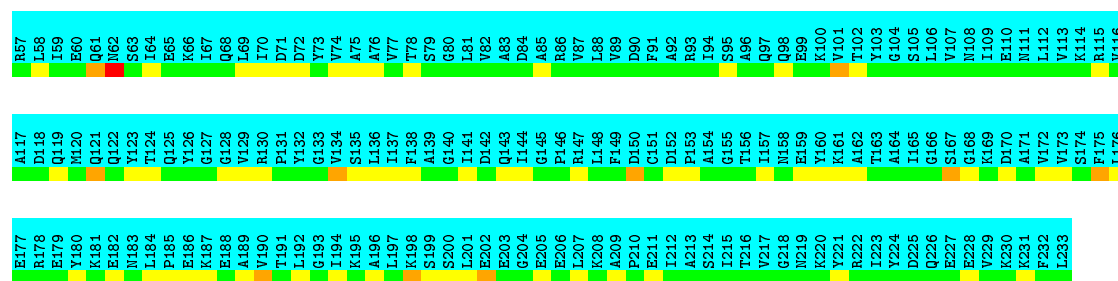


100%



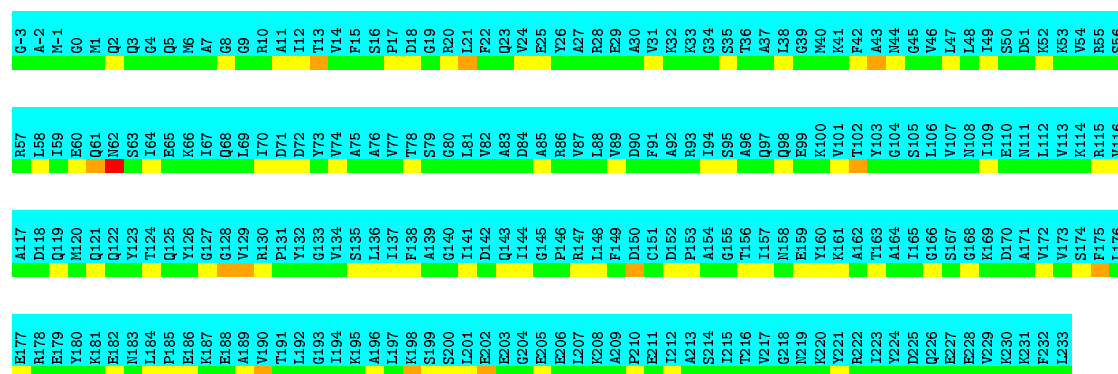
100%





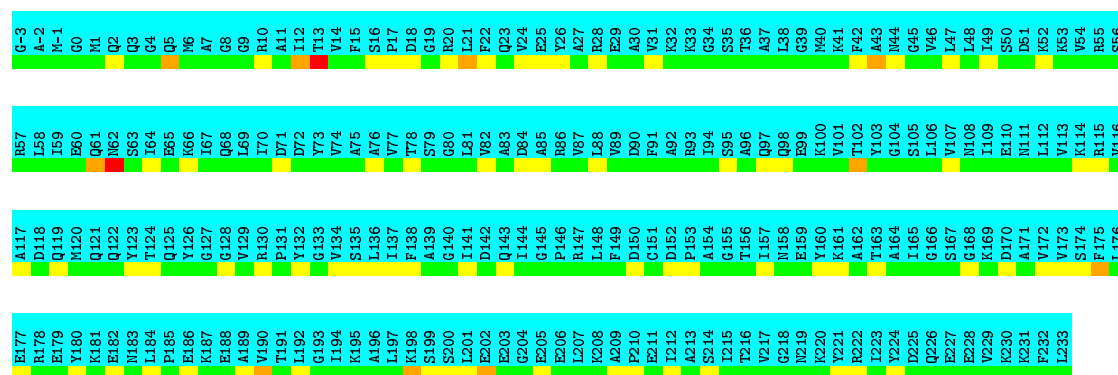
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

Chain G:



4.2.41 Score per residue for model 41

- Molecule 1: Proteasome subunit alpha

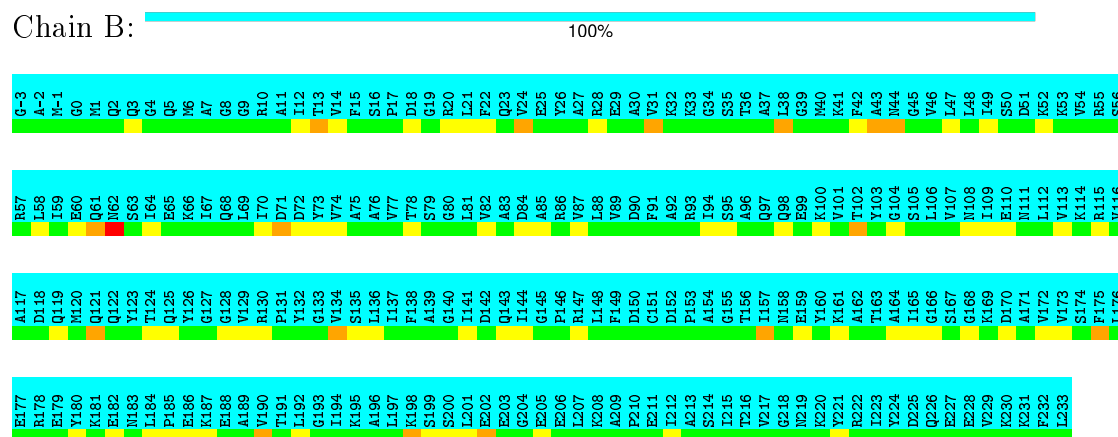
Chain A:





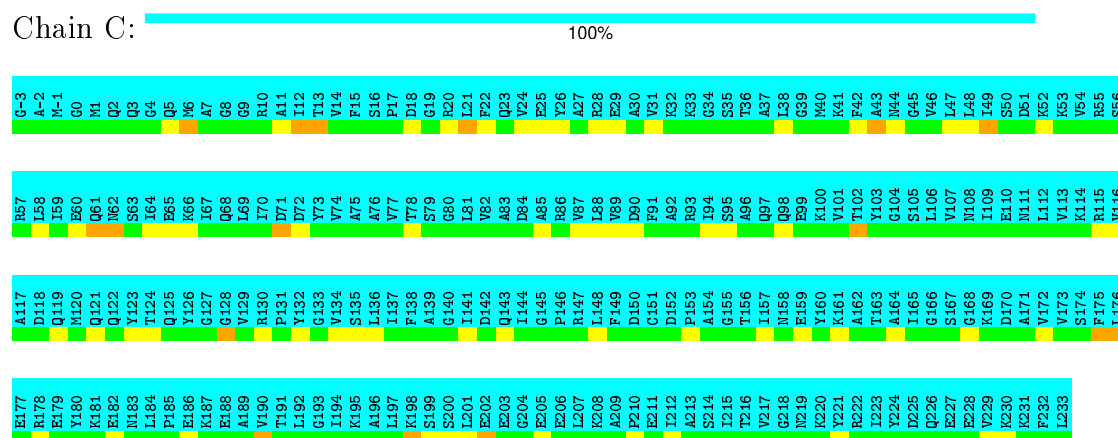
• Molecule 1: Proteasome subunit alpha

Chain B:



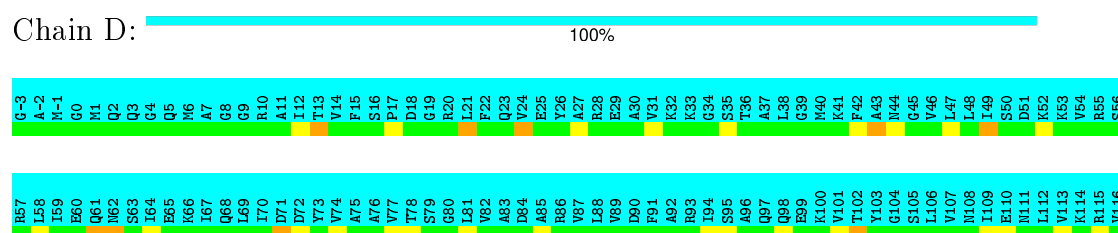
• Molecule 1: Proteasome subunit alpha

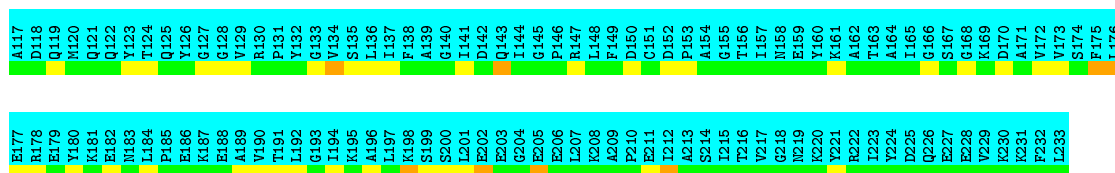
Chain C:

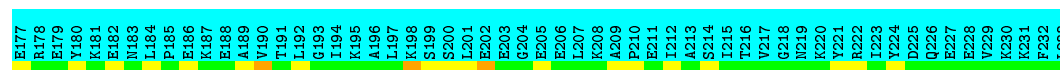


• Molecule 1: Proteasome subunit alpha

Chain D:

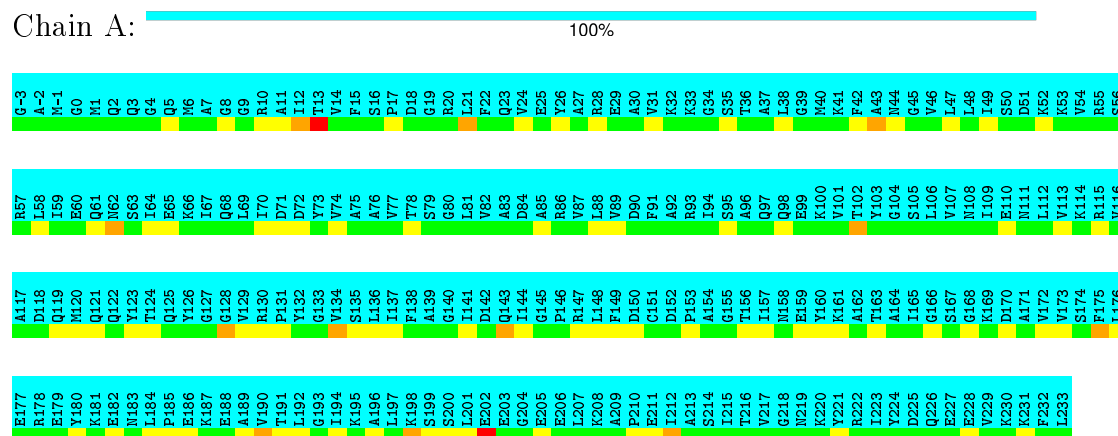




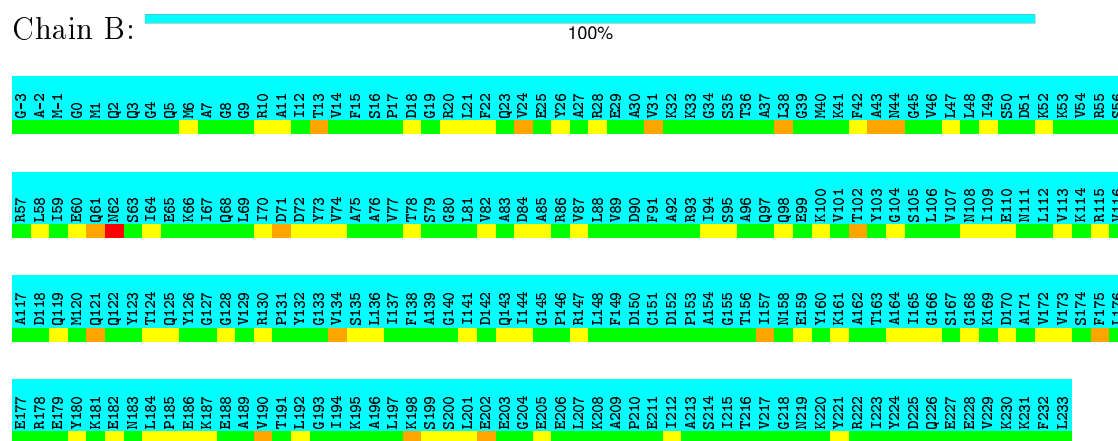


4.2.42 Score per residue for model 42

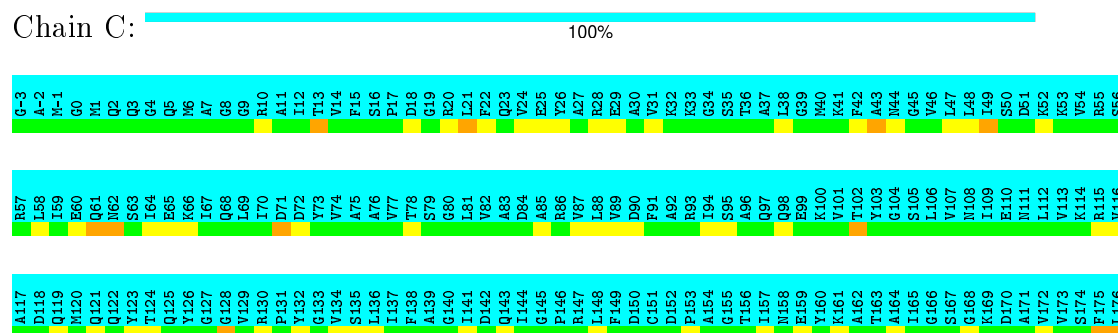
- Molecule 1: Proteasome subunit alpha

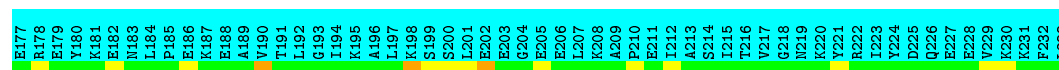


- Molecule 1: Proteasome subunit alpha



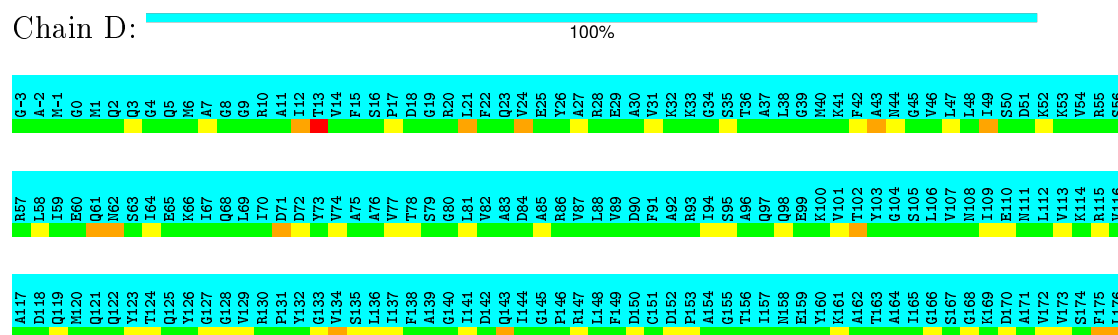
- Molecule 1: Proteasome subunit alpha





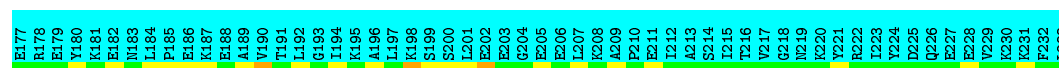
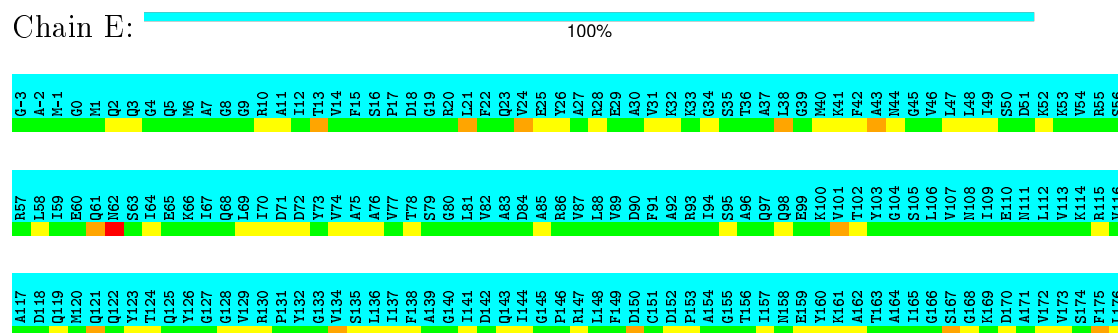
• Molecule 1: Proteasome subunit alpha

Chain D:



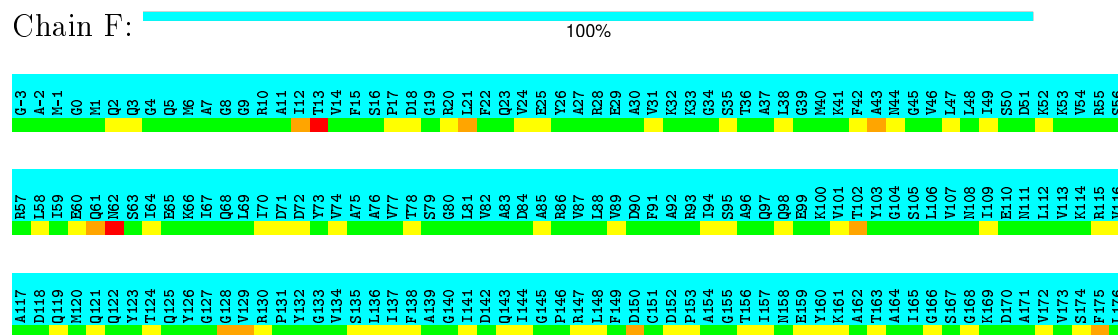
• Molecule 1: Proteasome subunit alpha

Chain E:



• Molecule 1: Proteasome subunit alpha

Chain F:



• Molecule 1: Proteasome subunit alpha

100%



- Molecule 1: Proteasome subunit alpha

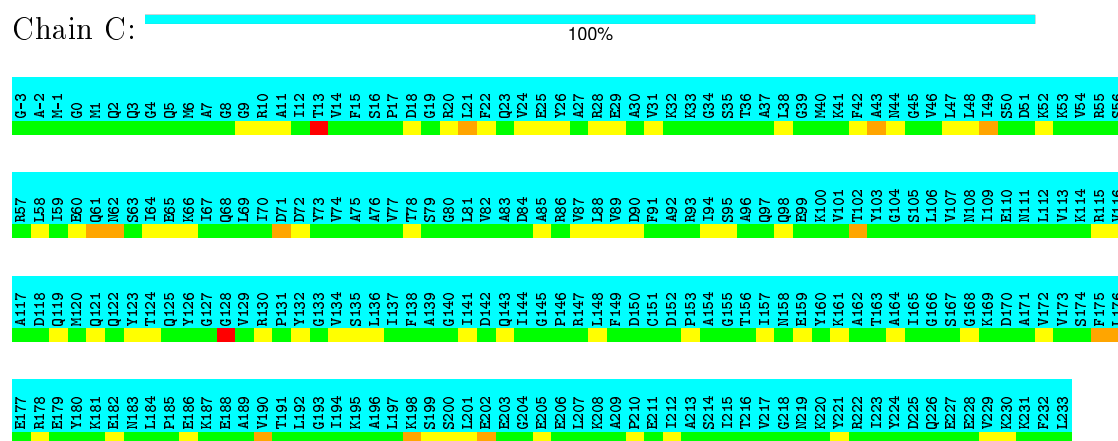
100%



100%

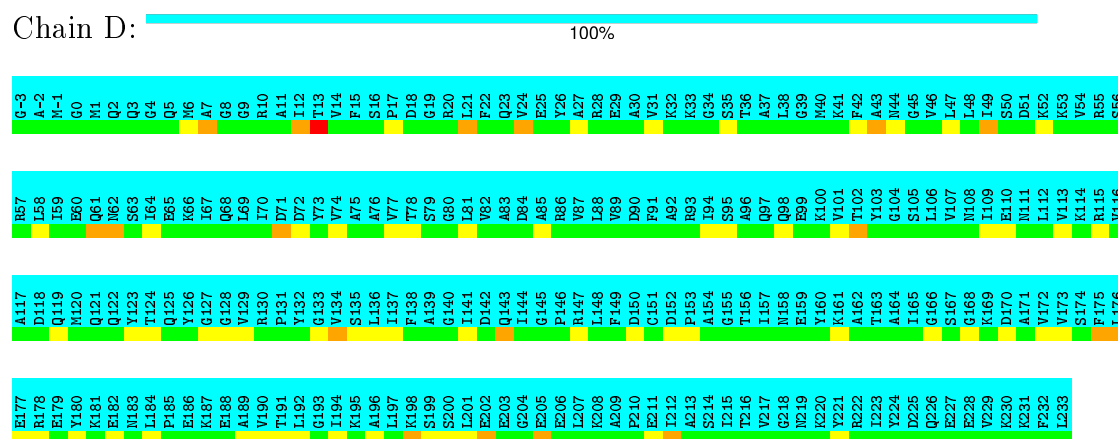


Chain C:



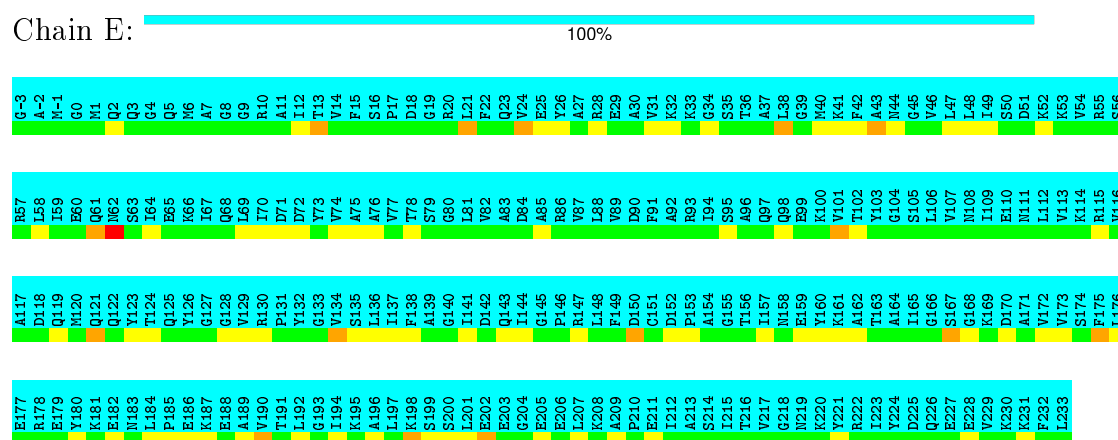
- Molecule 1: Proteasome subunit alpha

Chain D:



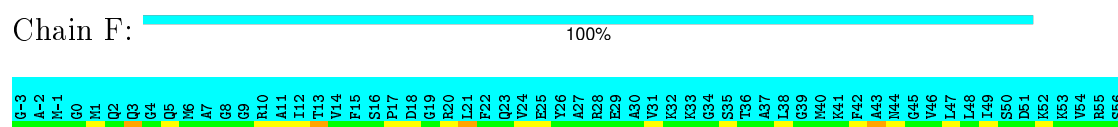
- Molecule 1: Proteasome subunit alpha

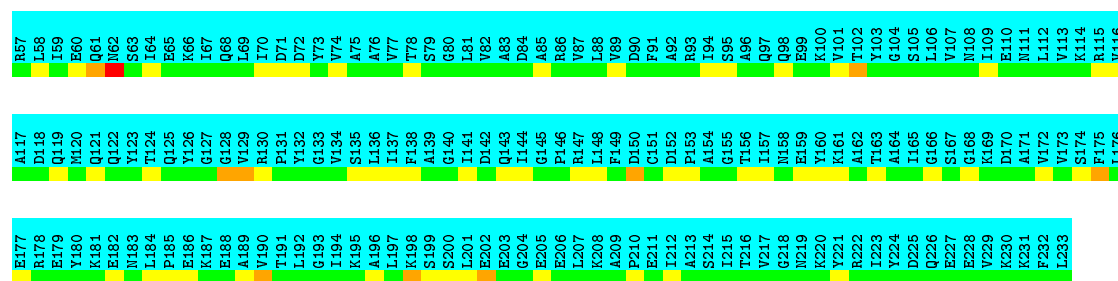
Chain E:



- Molecule 1: Proteasome subunit alpha

Chain F:

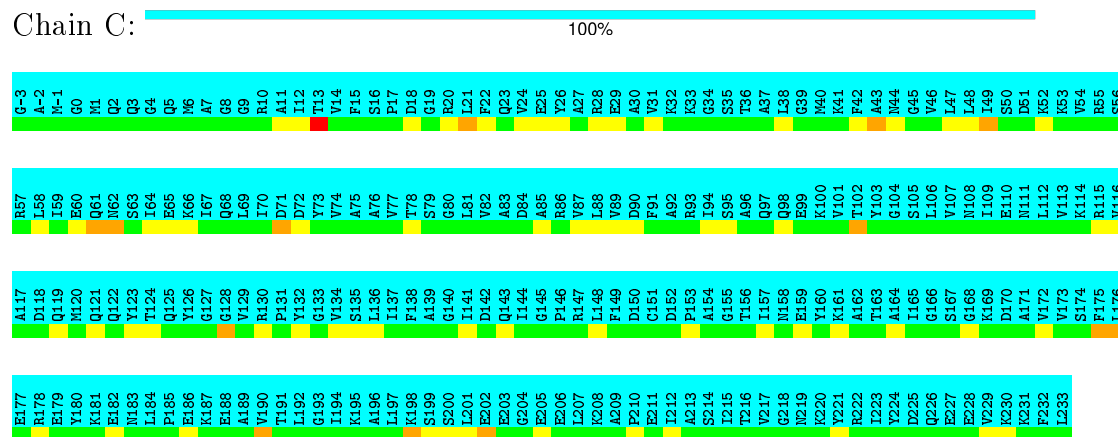






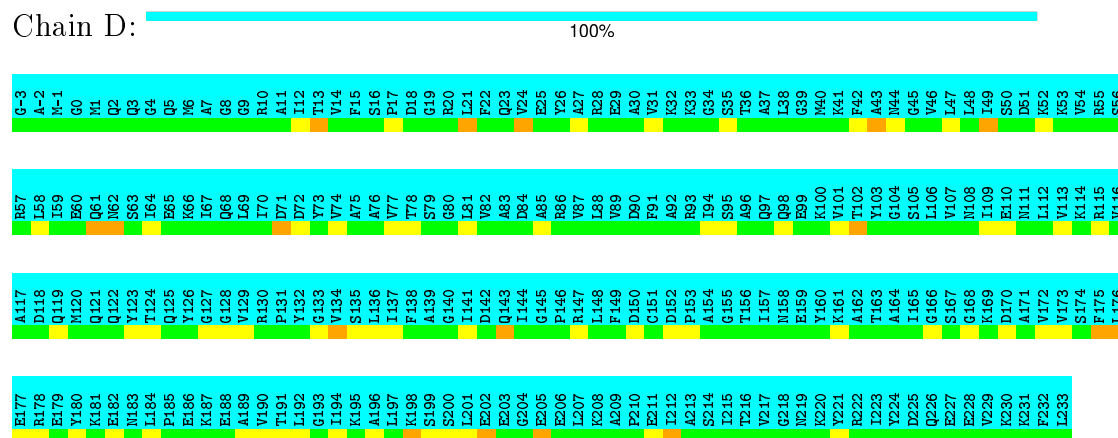
- Molecule 1: Proteasome subunit alpha

Chain C:



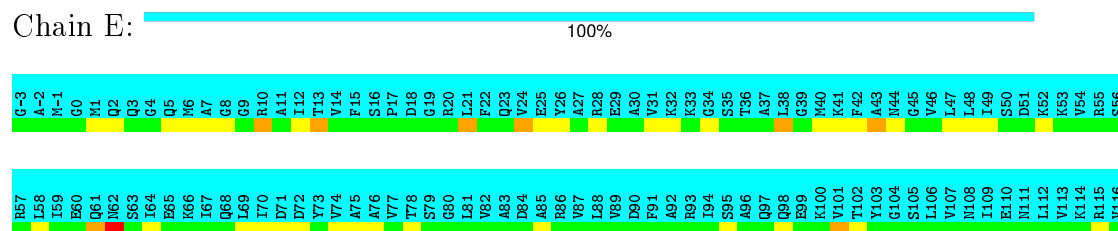
- Molecule 1: Proteasome subunit alpha

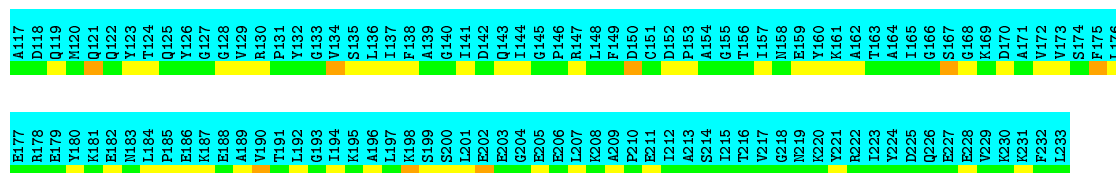
Chain D:



- Molecule 1: Proteasome subunit alpha

Chain E:

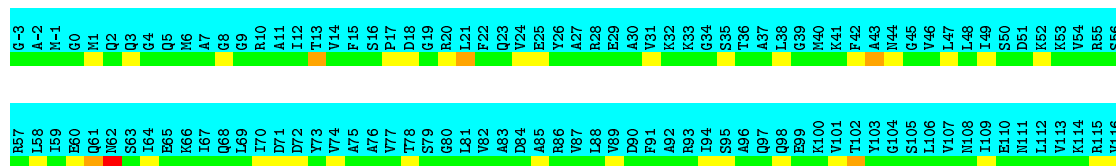




- Molecule 1: Proteasome subunit alpha

Chain F:

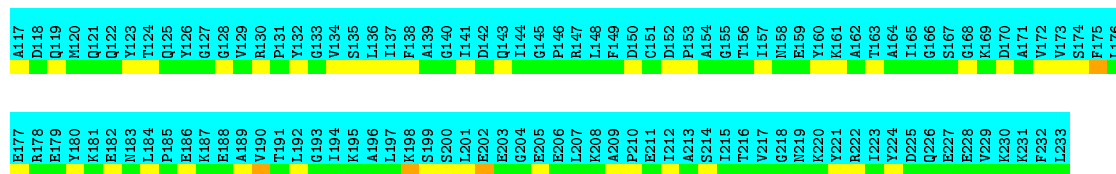
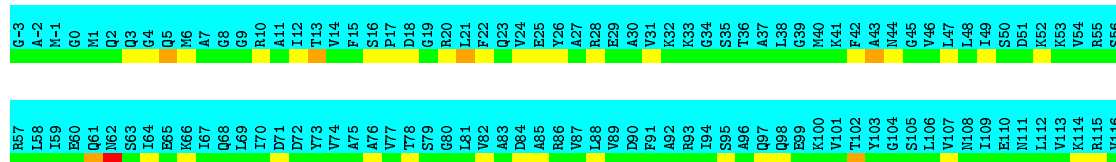
100%



- Molecule 1: Proteasome subunit alpha

Chain G:

100%

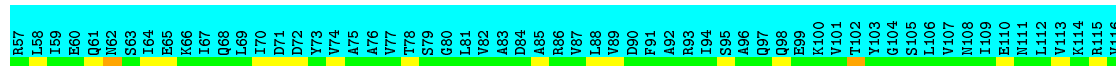
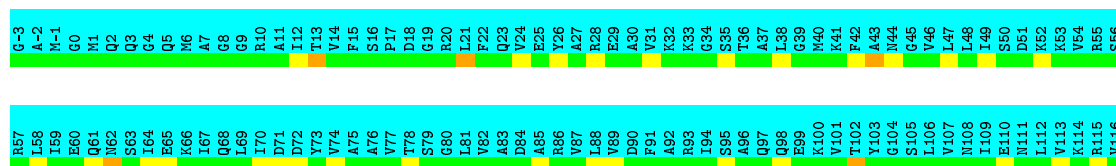


4.2.45 Score per residue for model 45

- Molecule 1: Proteasome subunit alpha

Chain A:

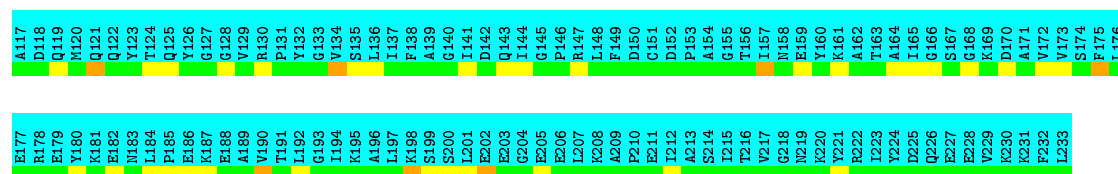
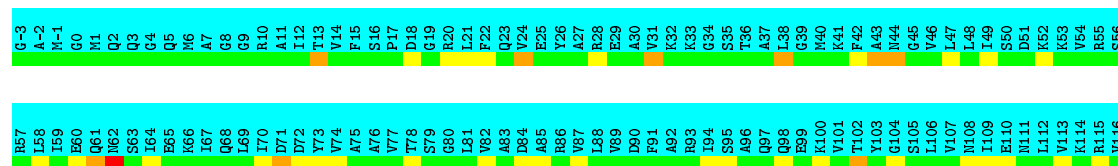
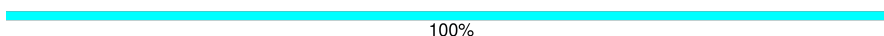
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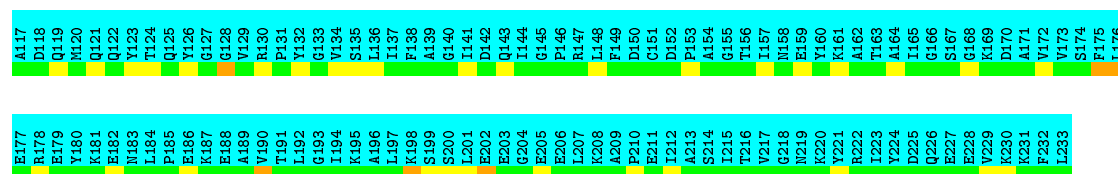
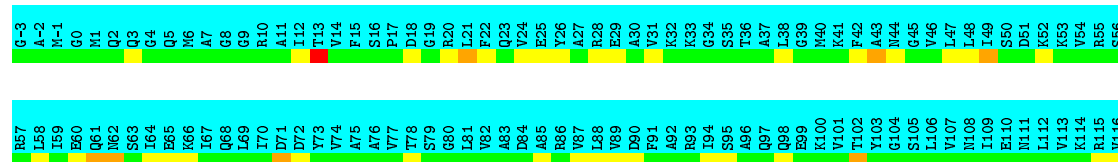
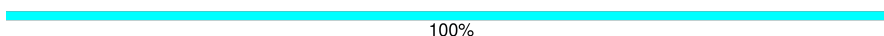
- Molecule 1: Proteasome subunit alpha

Chain B:



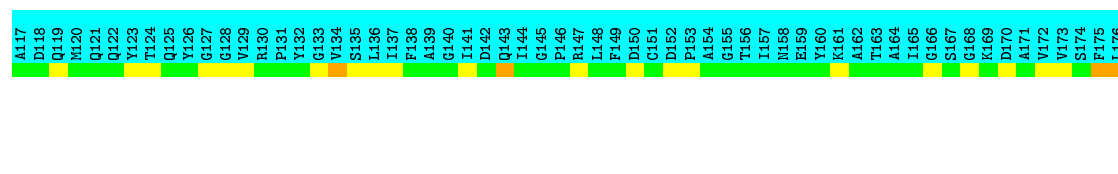
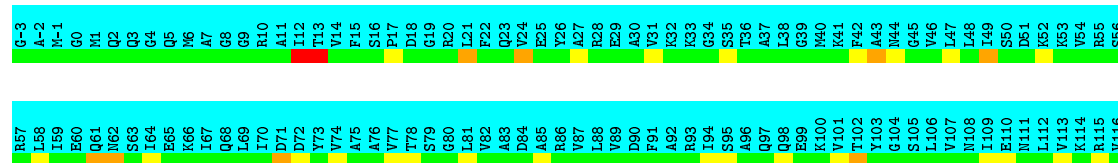
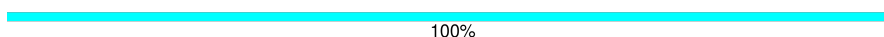
- Molecule 1: Proteasome subunit alpha

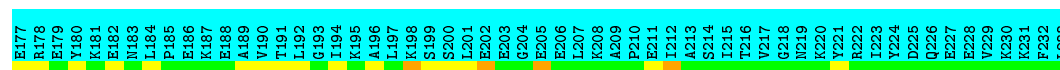
Chain C:



- Molecule 1: Proteasome subunit alpha

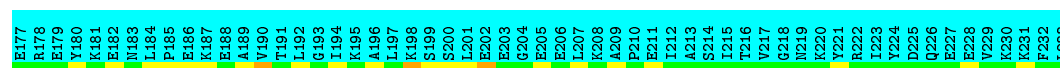
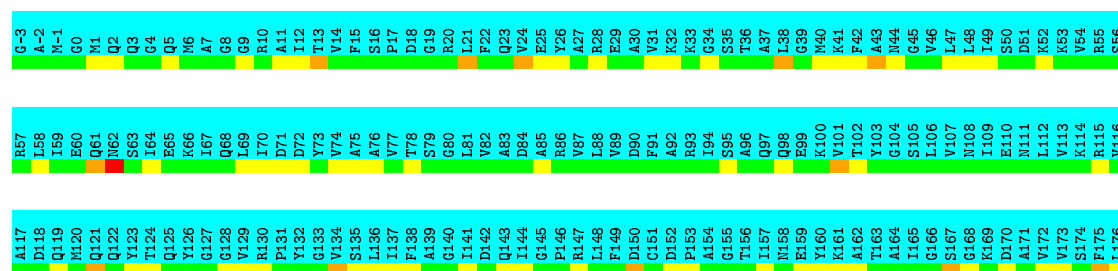
Chain D:





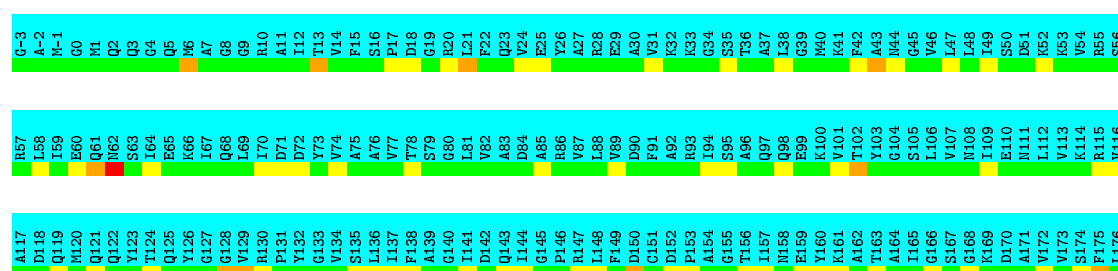
• Molecule 1: Proteasome subunit alpha

Chain E:



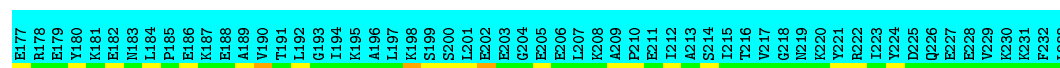
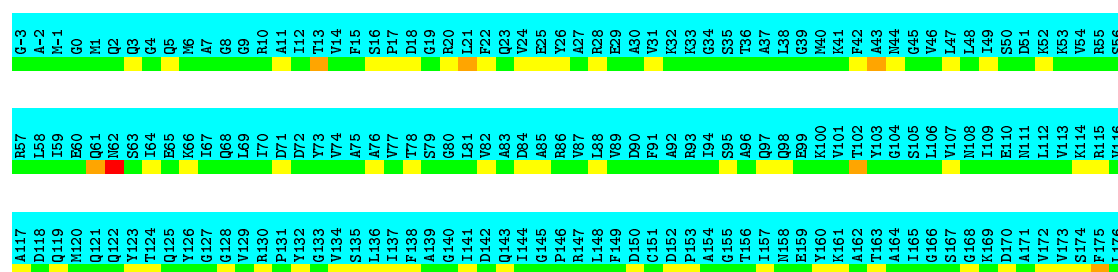
• Molecule 1: Proteasome subunit alpha

Chain F:



• Molecule 1: Proteasome subunit alpha

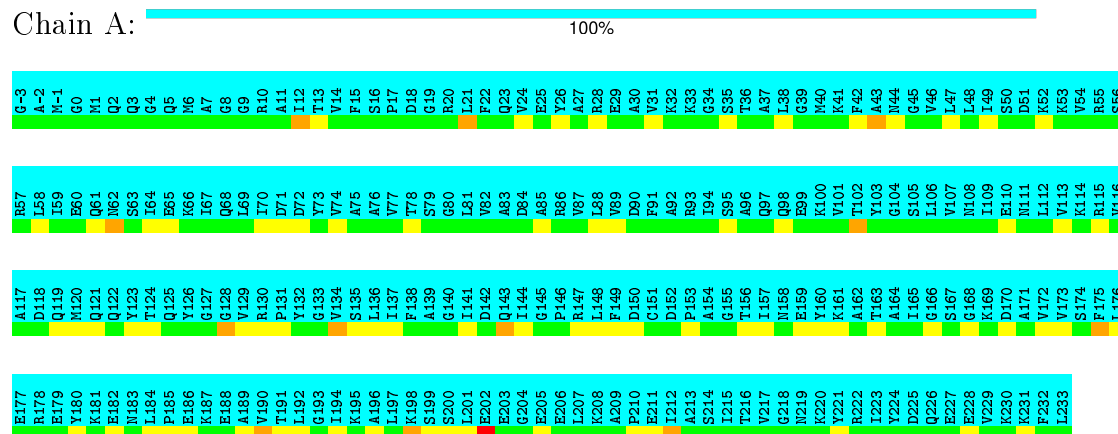
Chain G:



4.2.46 Score per residue for model 46

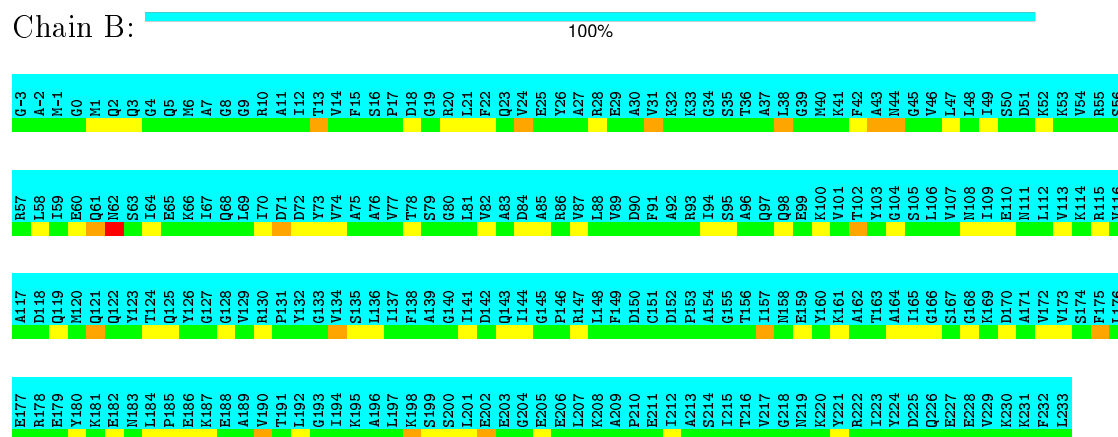
- Molecule 1: Proteasome subunit alpha

Chain A:



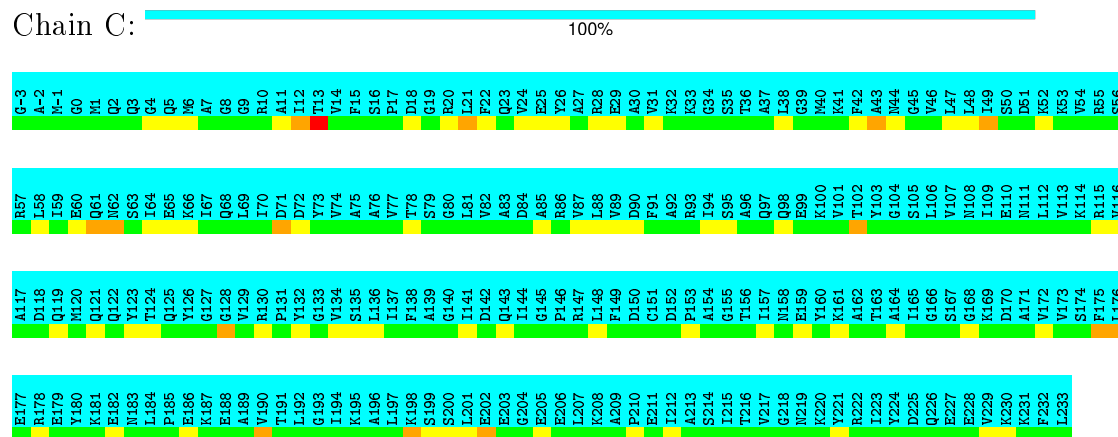
- Molecule 1: Proteasome subunit alpha

Chain B:



- Molecule 1: Proteasome subunit alpha

Chain C:



- Molecule 1: Proteasome subunit alpha

100%



100%



100%

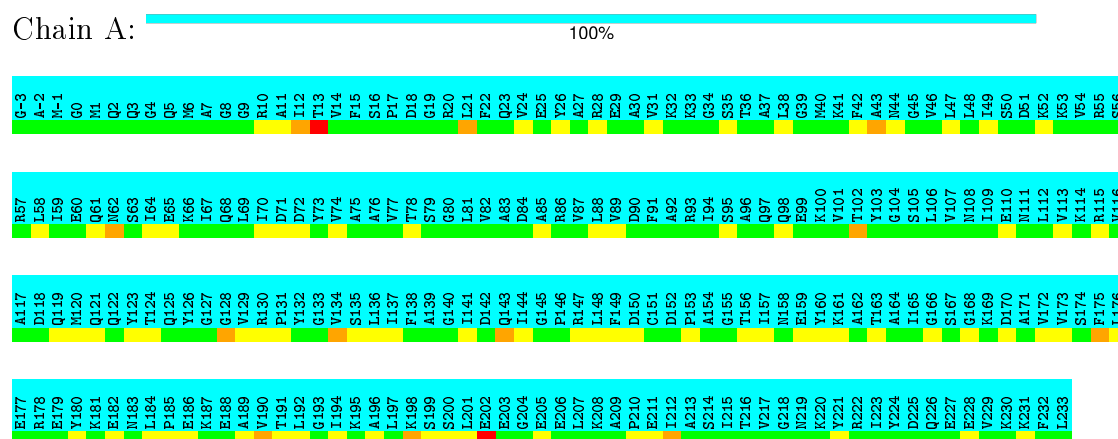


100%

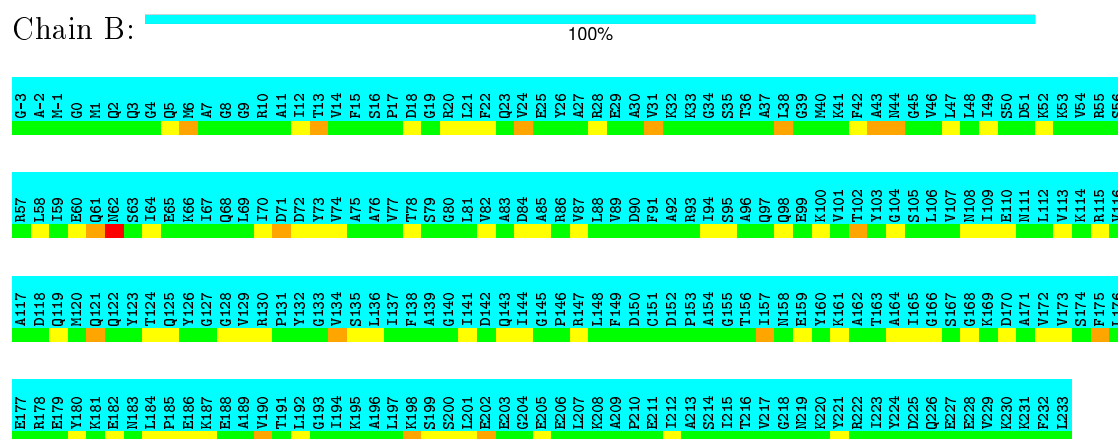


4.2.47 Score per residue for model 47

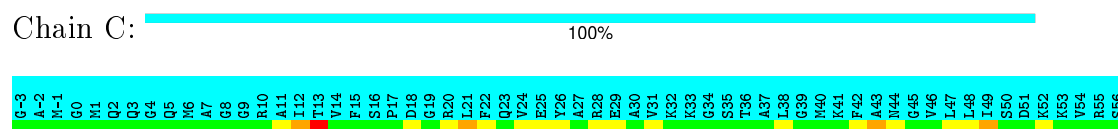
- Molecule 1: Proteasome subunit alpha



- Molecule 1: Proteasome subunit alpha



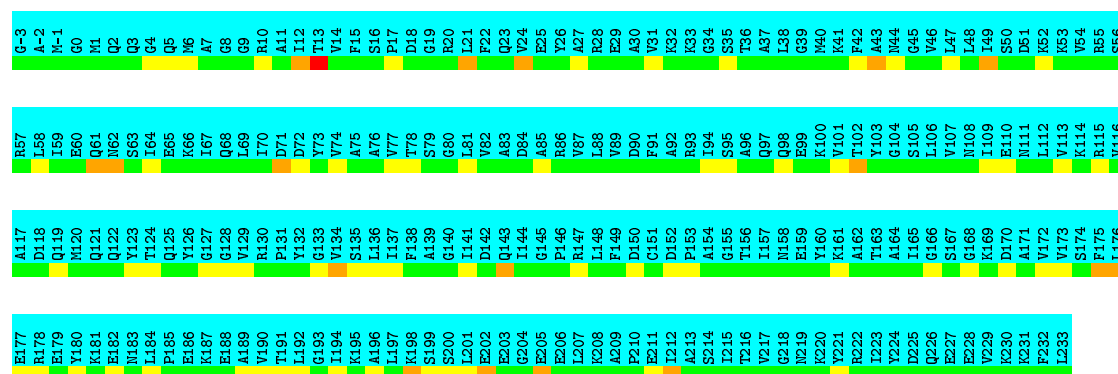
- Molecule 1: Proteasome subunit alpha





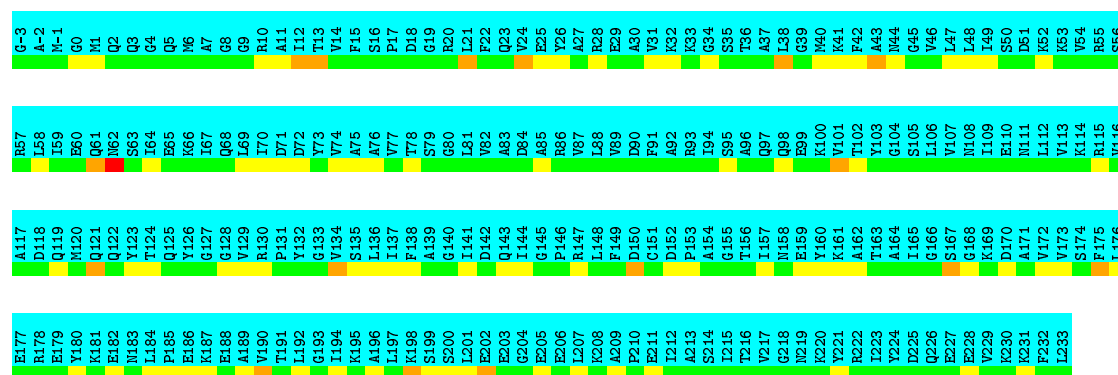
• Molecule 1: Proteasome subunit alpha

Chain D: 100%



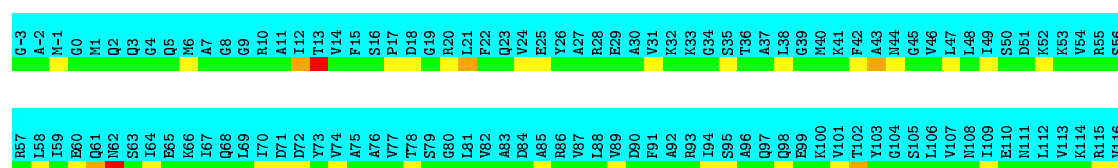
• Molecule 1: Proteasome subunit alpha

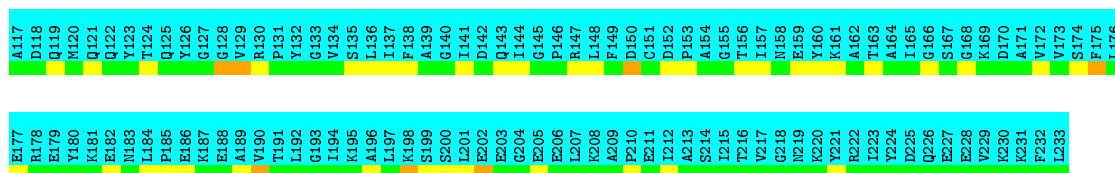
Chain E: 100%



• Molecule 1: Proteasome subunit alpha

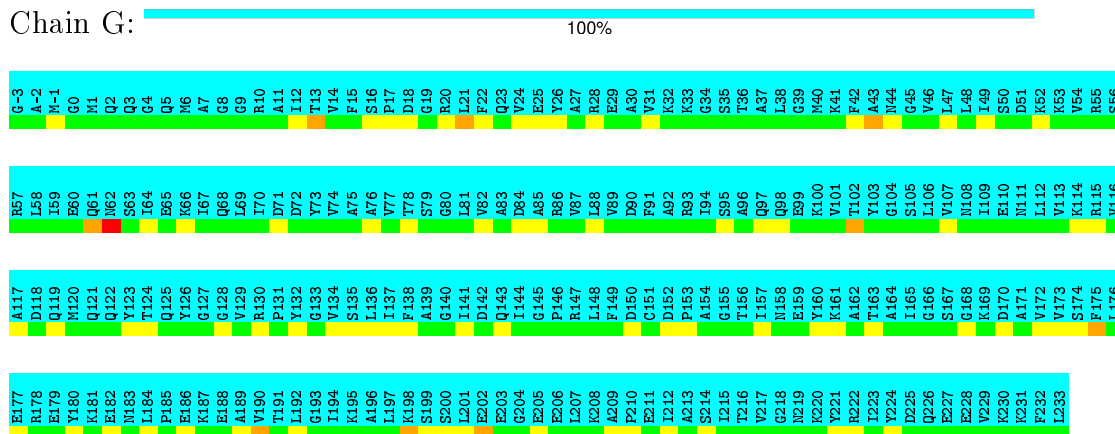
Chain F: 100%





• Molecule 1: Proteasome subunit alpha

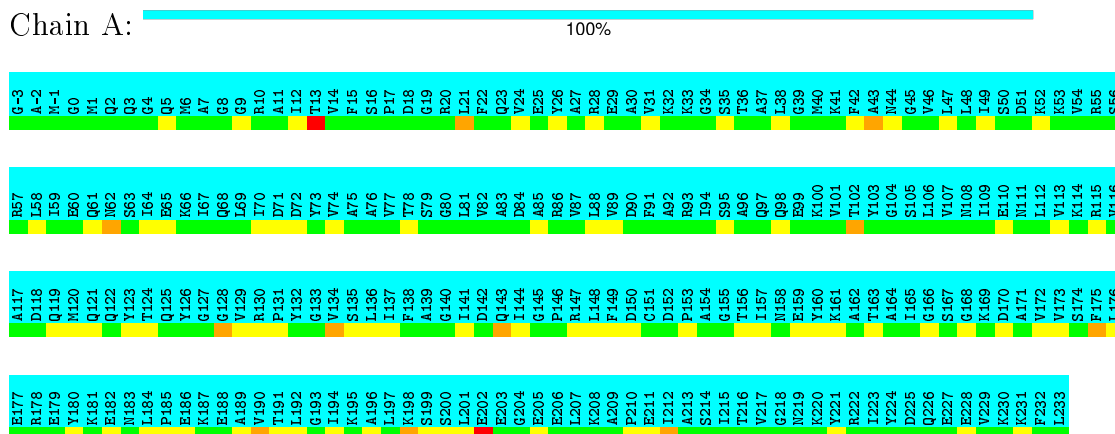
Chain G:



4.2.48 Score per residue for model 48

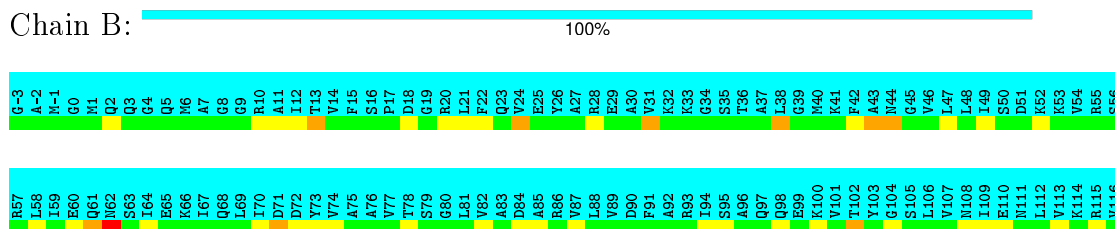
• Molecule 1: Proteasome subunit alpha

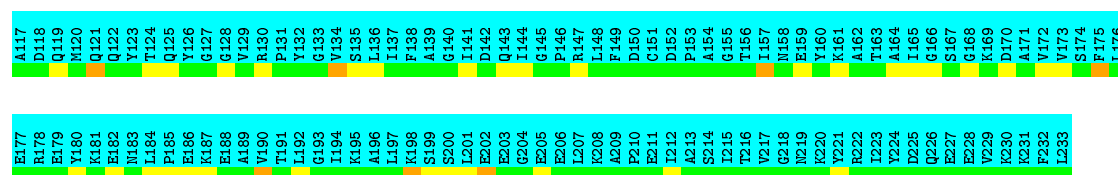
Chain A:



• Molecule 1: Proteasome subunit alpha

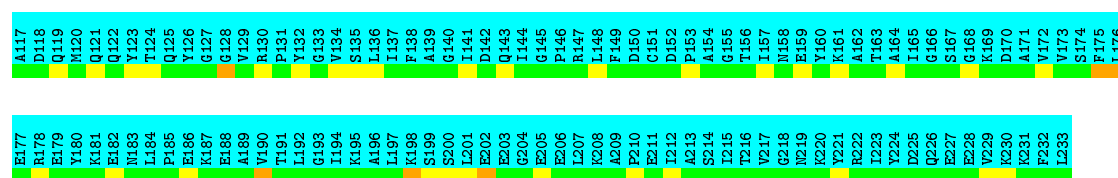
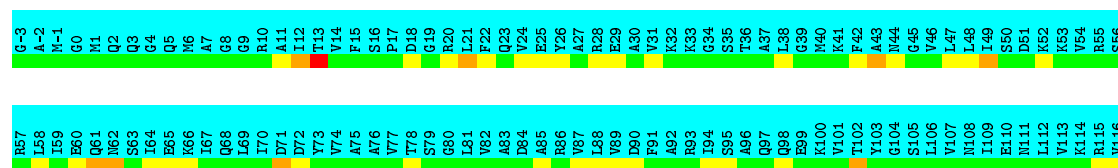
Chain B:





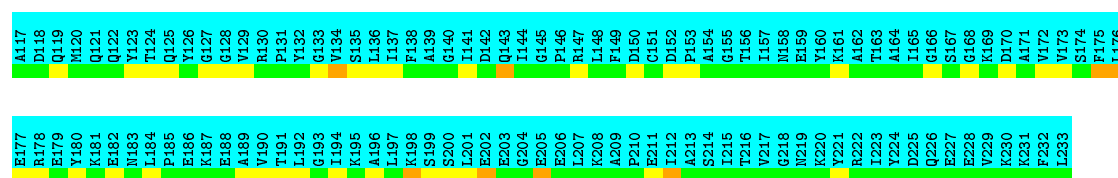
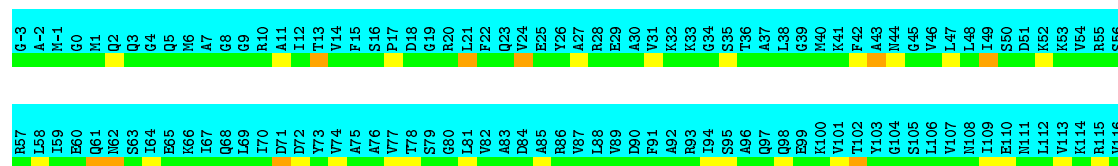
• Molecule 1: Proteasome subunit alpha

Chain C: 100%



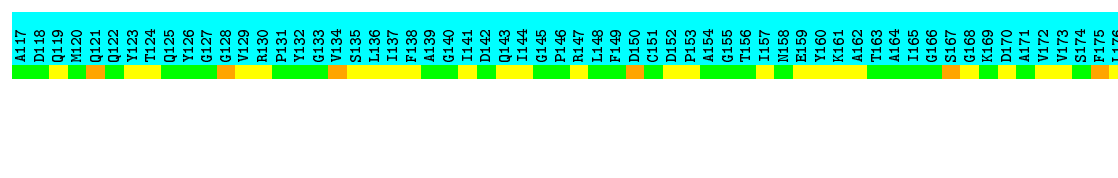
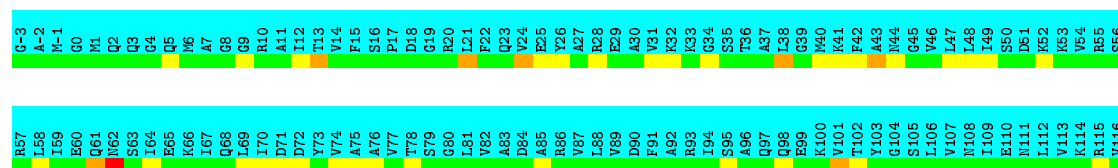
• Molecule 1: Proteasome subunit alpha

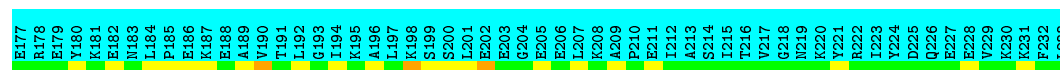
Chain D: 100%



• Molecule 1: Proteasome subunit alpha

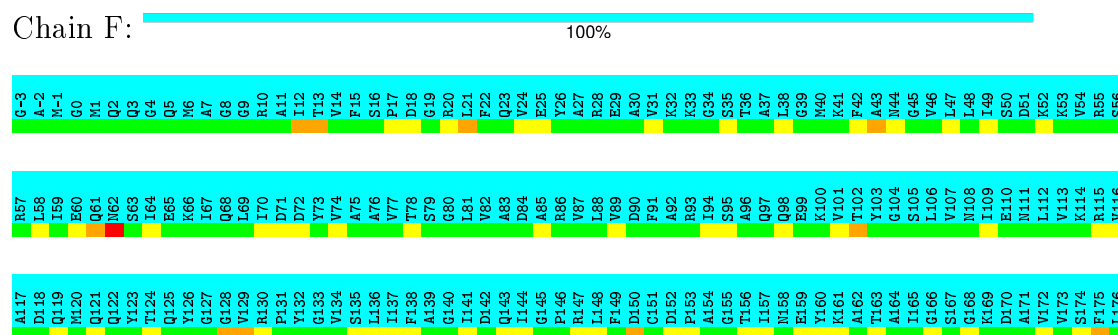
Chain E: 100%





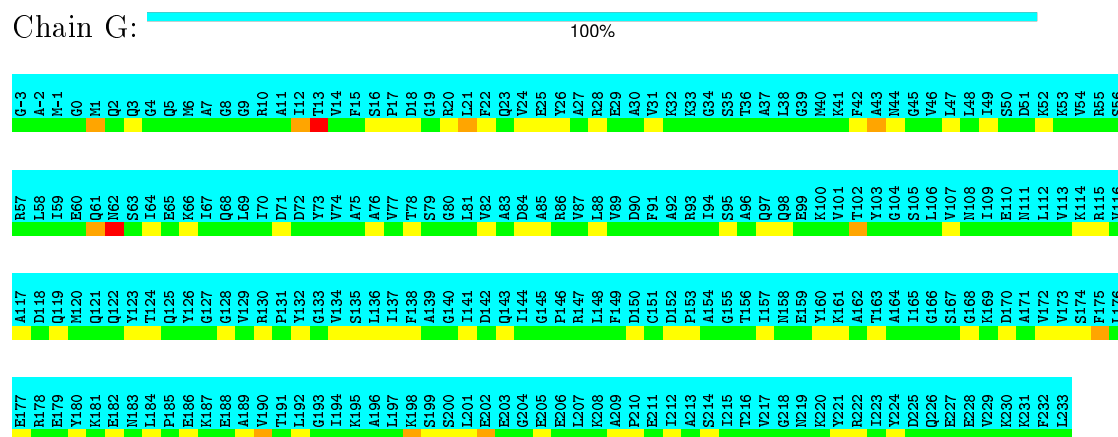
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

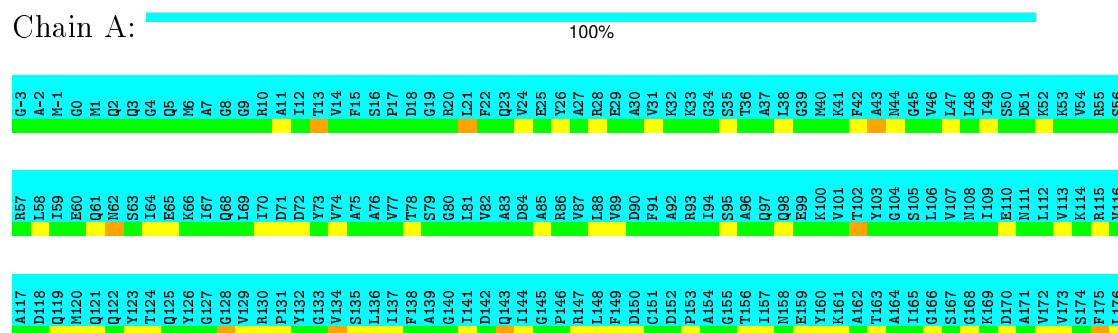
Chain G:

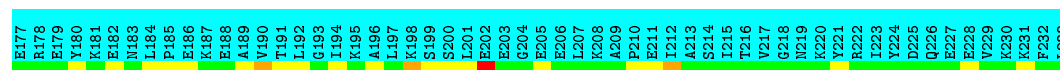


4.2.49 Score per residue for model 49

- Molecule 1: Proteasome subunit alpha

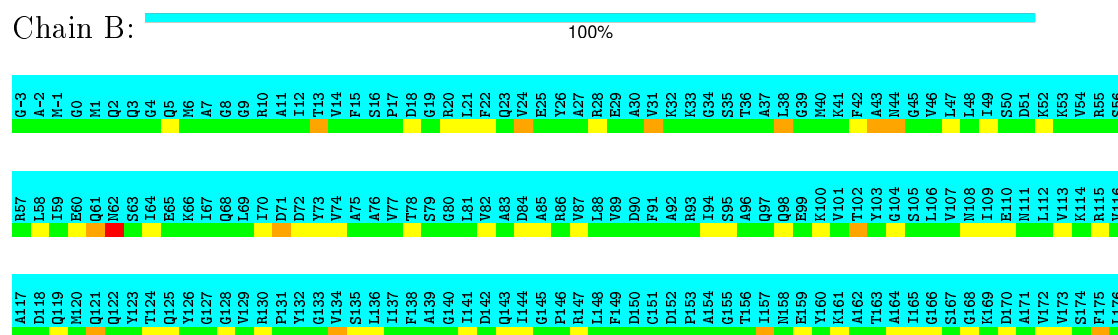
Chain A:





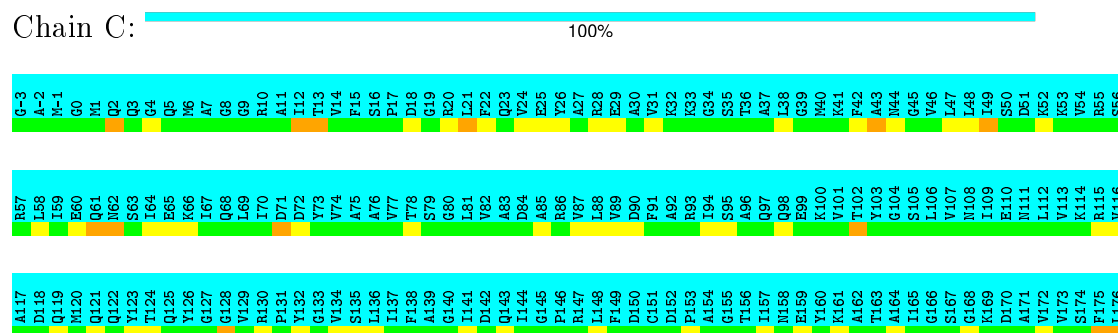
• Molecule 1: Proteasome subunit alpha

Chain B:



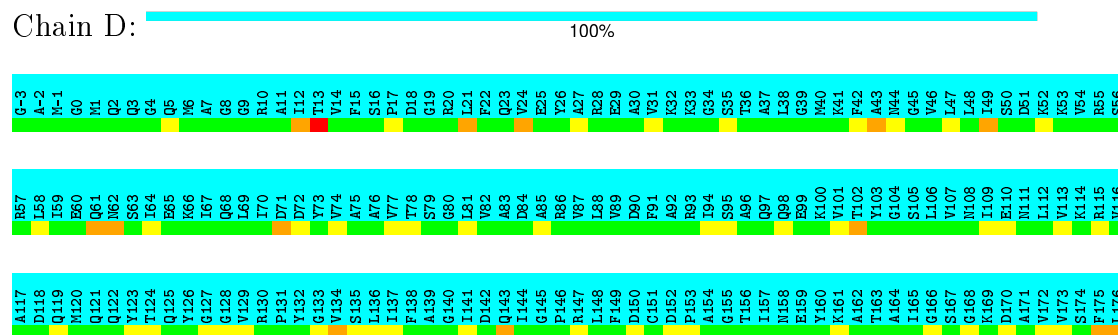
• Molecule 1: Proteasome subunit alpha

Chain C:



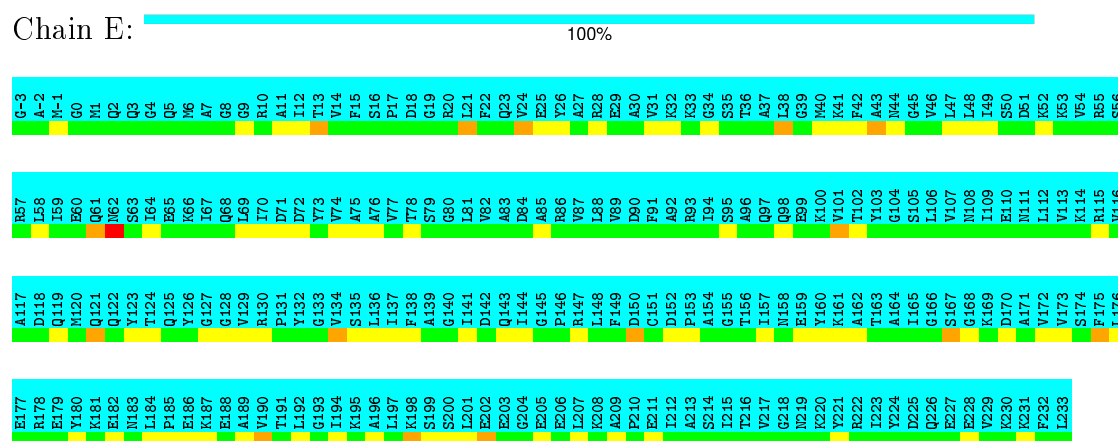
• Molecule 1: Proteasome subunit alpha

Chain D:



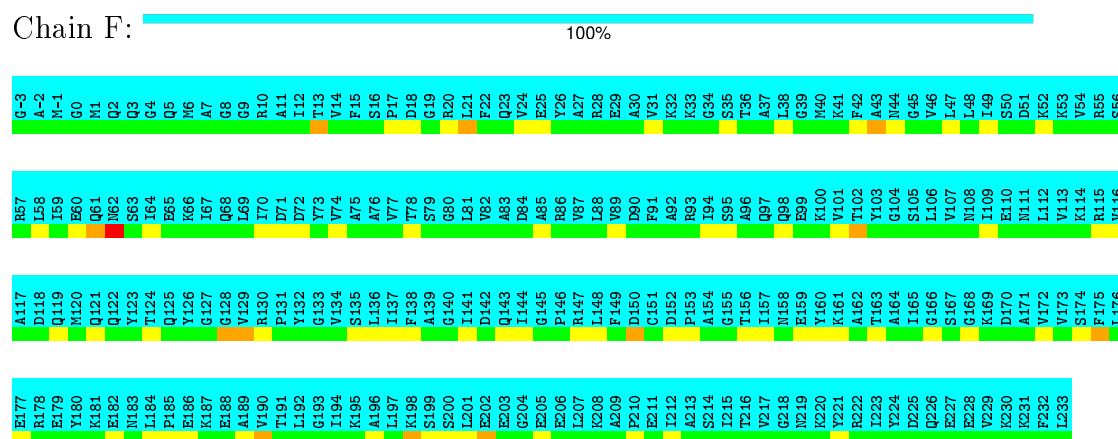
• Molecule 1: Proteasome subunit alpha

Chain E:



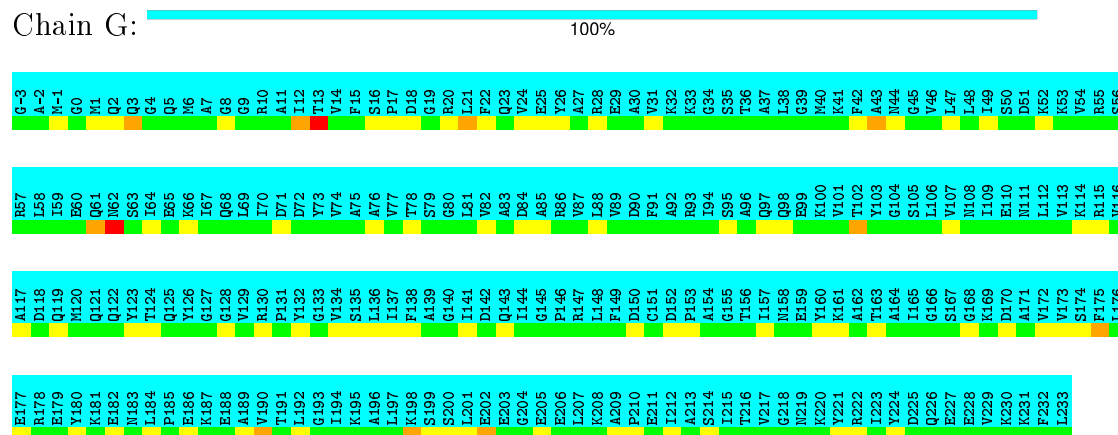
- Molecule 1: Proteasome subunit alpha

Chain F:



- Molecule 1: Proteasome subunit alpha

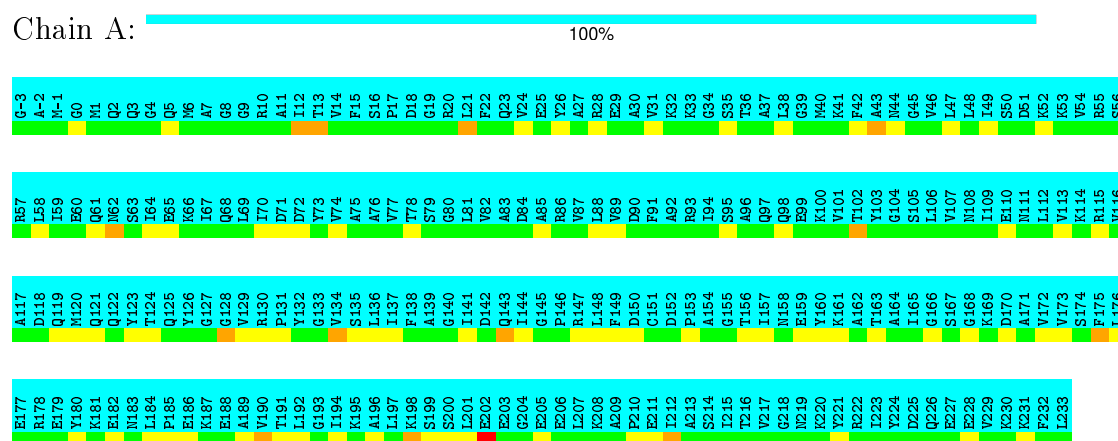
Chain G:



4.2.50 Score per residue for model 50

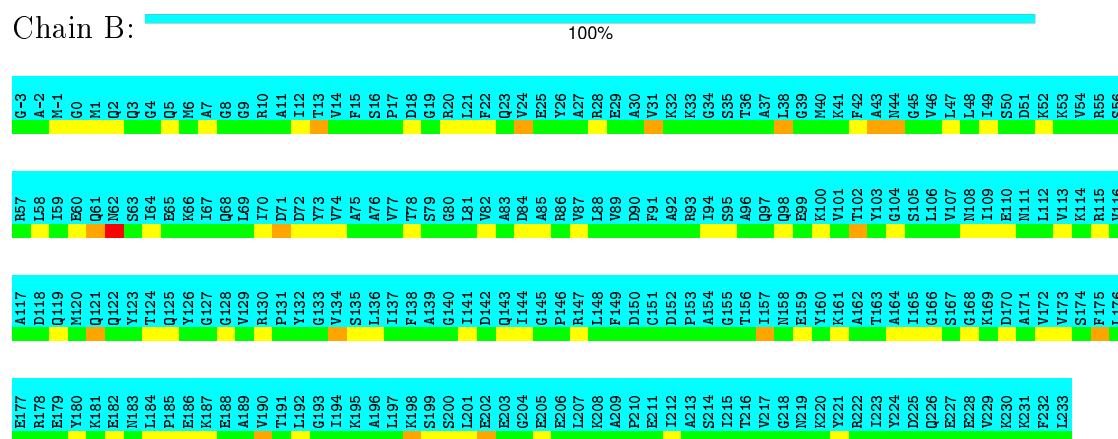
- Molecule 1: Proteasome subunit alpha

Chain A:



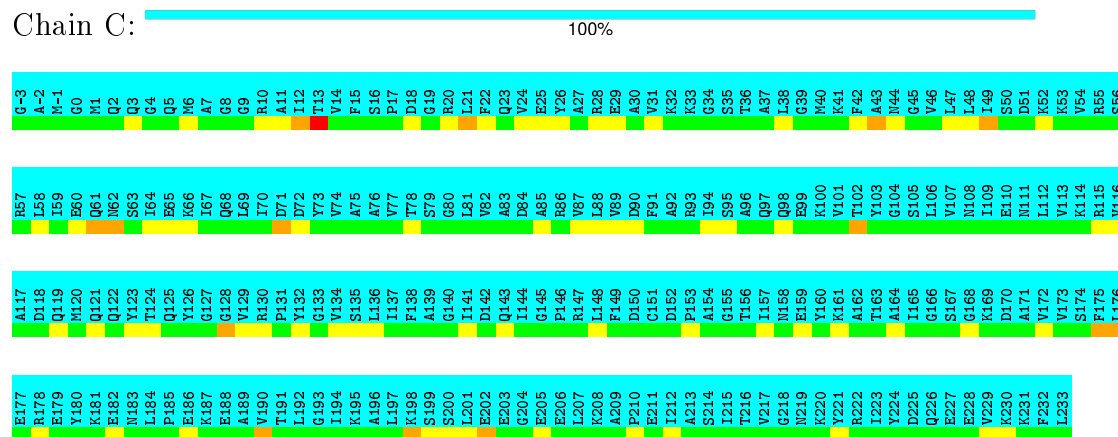
- Molecule 1: Proteasome subunit alpha

Chain B:



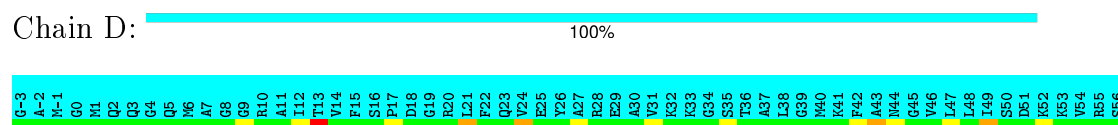
- Molecule 1: Proteasome subunit alpha

Chain C:



- Molecule 1: Proteasome subunit alpha

Chain D:





E117	A117
D118	D118
E119	Q119
Y120	M120
K121	Q121
Q122	Q122
Y123	Y123
L124	T124
E125	Q125
E126	Y126
K127	G127
E128	G128
A129	V129
W130	A130
T131	P131
L132	Y132
G133	G133
I134	V134
K135	S135
L136	L136
L137	L137
K138	F138
S139	A139
S200	G140
L201	I141
E202	D142
E203	Q143
G204	I144
E205	G145
E206	P146
L207	R147
K208	L148
A209	F149
P210	D150
E211	G151
I212	D152
A213	P153
S214	A154
L215	G155
T216	T156
V217	I157
G218	N158
N219	E159
K220	Y160
Y221	K161
R222	A162
I223	T163
Y224	A164
D225	I165
Q226	G166
E227	S167
E228	G168
V229	K169
K230	D170
K231	A171
F232	V172
L233	V173
	S174
	F175
	L176

5 Refinement protocol and experimental data overview ⓘ

The models were refined using the following method: *simulated annealing*.

Of the 166 calculated structures, 50 were deposited, based on the following criterion: *structures with the lowest energy*.

The following table shows the software used for structure solution, optimisation and refinement.

Software name	Classification	Version
X-PLOR NIH	structure solution	2.23
X-PLOR NIH	refinement	2.23

No chemical shift data was provided. No validations of the models with respect to experimental NMR restraints is performed at this time.

6 Model quality [i](#)

6.1 Standard geometry [i](#)

There are no covalent bond-length or bond-angle outliers.

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

There are no planarity outliers.

6.2 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 each 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 averaged over the ensemble.

Mol	Chain	Non-H	H(model)	H(added)	Clashes
1	A	0	0	0	0±0
1	B	0	0	0	0±0
1	C	0	0	0	0±0
1	D	0	0	0	0±0
1	E	0	0	0	0±0
1	F	0	0	0	0±0
1	G	0	0	0	0±0
All	All	0	0	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 -.

There are no clashes.

6.3 Torsion angles [i](#)

6.3.1 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 PDB entries followed by that with respect to all NMR entries. 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	0	-	-	-	-
1	B	0	-	-	-	-
1	C	0	-	-	-	-
1	D	0	-	-	-	-
1	E	0	-	-	-	-
1	F	0	-	-	-	-
1	G	0	-	-	-	-
All	All	0	-	-	-	-

There are no Ramachandran outliers.

6.3.2 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 PDB entries followed by that with respect to all NMR entries. 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	0	-	-	-
1	B	0	-	-	-
1	C	0	-	-	-
1	D	0	-	-	-
1	E	0	-	-	-
1	F	0	-	-	-
1	G	0	-	-	-
All	All	0	-	-	-

There are no protein residues with a non-rotameric sidechain to report.

6.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

6.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

6.6 Ligand geometry

There are no ligands in this entry.

6.7 Other polymers

There are no such molecules in this entry.

6.8 Polymer linkage issues

There are no chain breaks in this entry.

7 Chemical shift validation

No chemical shift data were provided