

Nom : Prénom :

Examen de Rattrapage en Bioinformatique [Durée = 06h:00 - 20h :00]

Exercice 1 : (10 pts)

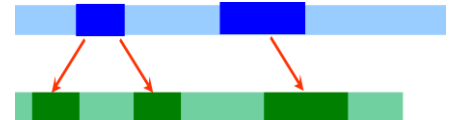
- On cherche d'aligner les séquences suivantes :



Alignement (a)



Alignement (b)



Alignement (c)

1- Que signifie chacun de ces types d'alignement ? (6 pts = 2*3)

Alignement (a) :

Alignement (b) :

Alignement © :

2- Qu'elle est le programme informatique qu'on peut appliquer pour faciliter l'alignement (b) ? (2 pts)

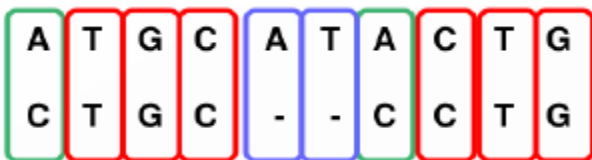
.....

3- Qu'elle est l'importance biologique de l'alignement © ? Donnez un exemple ? (2 pts)

.....

Exercice 2 : (6 pts)

1- Voici l'alignement obtenu pour deux séquences : (2 pts)



- Calculez le score de cet alignement dans les cas suivants : Match= 2, Mismatch= -1, Gap= -2

.....

2- Donnez le score de l'alignement ci dessous en utilisant la matrice de substitution BLOSUM 62 (donnée en annexe). 2pt

A	R	N	D	P	W	A
G	K	M	H	C	W	A

.....

3- Aligner entre les deux séquences protéiques ci-dessous par l'utilisation de la méthode **Dot plot** ? (2 pts)

	A	D	S	T	A	R	Y	E	K	L	E	R	M	Q	S	D	Q	I	Y	T	Q	N	
A																							
D																							
S																							
T																							
A																							
R																							
Y																							
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Séq1 :

Séq2 :

Exercice 3 : (4 pts)

La Figure (1) représente une vue schématique du chromosome humain numéro 20 (source: [Ensembl](#)), tandis que la Figure (2) représente la Structure 3 D d'une protéine obtenue par la banque PDB.

- En se basant sur votre connaissance et d'après les Figures (1) et (2), qu'elle est l'importance de ces deux banques (Qu'elles sont les informations qu'on peut constater d'après ces 2 banques : Ensembl et PDB) ??

Banque [Ensembl](#) : (2 pts)

.....

Banque [PDB](#) (2 pts)

.....

Figure (1)

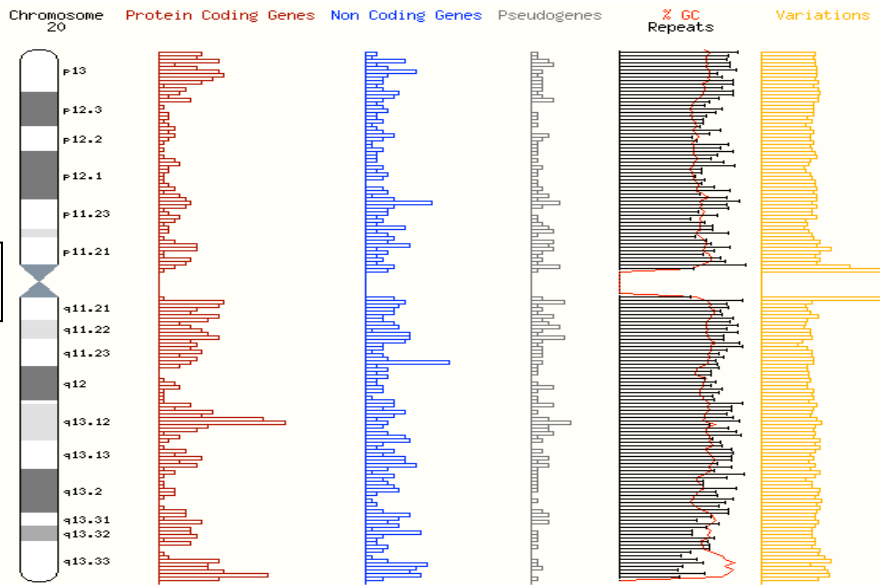


Figure (2)

RCSB PDB
PROTEIN DATA BANK

An Information Portal to Biological Macromolecular Structures
As of Tuesday Nov 25, 2008 there are 54466 Structures | PDB Statistics

CONTACT US | FEEDBACK | HELP | PRINT | PDB ID or keyword | Author | Site Search | Advanced Search

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- Acknowledgements
- Frequently Asked Questions

Quick Tips: Want to search by sequence? Click here.

Are you missing data updates? The PDB archive has moved to [ftp://ftp.wwpdb.org](http://ftp.wwpdb.org). For more information click [here](#).

Welcome to the RCSB PDB

The RCSB PDB provides a variety of tools and resources for studying the structures of biological macromolecules and their relationships to sequence, function, and disease.

The RCSB is a member of the **wwPDB** whose mission is to ensure that the PDB archive remains an international resource with uniform data.

This site offers tools for browsing, searching, and reporting that utilize the data resulting from ongoing efforts to create a more consistent and comprehensive archive.

A list of **browsers** known to work with this site and a browser compatibility **check** are available.

A **narrated tutorial** illustrates how to search, navigate, browse, generate reports and visualize structures using this site. [Requires the Macromedia Flash player]

Comments?

Molecule of the Month: Mechanosensitive Channels

We are remarkably resistant to changes in our surrounding environment. Our bulky bodies allow us to weather extremes of heat and cold, and our skin protects us if we go for a swim in fresh water or salty water. If things get too uncomfortable, we can always get up and walk away, finding a warmer or cooler or drier place. Bacteria don't have as many options. They are tiny and they are immersed in water, so changes in the environment can pose life-threatening challenges. For instance, if it rains they may be suddenly surrounded by fresh water. This is dangerous because the water seeps into the cell through osmosis and increases the pressure inside. At other times, the bacterium may be shifted suddenly to salty conditions, which pulls water out and dehydrates the cell. Bacteria have methods for resisting these changes, so they can keep a steady, comfortable osmotic pressure inside.

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News

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25-November-2008
Announcement: New Releases to Follow Format Guide Version 3.20

Beginning December 2, 2008, all newly-released PDB entries will follow PDB File Format Contents Guide Version 3.20 (PDF | HTML).

- Full article ...

16-September-2008
Announcement: Comprehensive Format Guide Version 3.2

During the past year, the wwPDB annotators have collaborated on a project to clarify the details and procedures related to data processing and annotation.

- Full article ...

Annexe (Exercice 2)

	C	S	T	P	A	G	N	D	E	Q	H	R	K	M	I	L	V	F	Y	W	
C	9																				Cys
S	-1	4																			Ser
T	-1	1	5																		Tyr
P	-3	-1	-1	7																	Pro
A	0	1	0	-1	4																Ala
G	-3	0	-2	-2	0	6															Gly
N	-3	1	0	-2	-2	0	6														Asn
D	-3	0	-1	-1	-2	-1	1	6													Asp
E	-4	0	-1	-1	-1	-2	0	2	5												Glu
Q	-3	0	-1	-1	-1	-2	0	0	2	5											Gln
H	-3	-1	-2	-2	-2	-2	1	-1	0	0	8										His
R	-3	-1	-1	-2	-1	-2	0	-2	0	1	0	5									Arg
K	-3	0	-1	-1	-1	-2	0	-1	1	1	-1	2	5								Lys
M	-1	-1	-1	-2	-1	-3	-2	-3	-2	0	-2	-1	-1	5							Met
I	-1	-2	-1	-3	-1	-4	-3	-3	-3	-3	-3	-3	-3	1	4						Ile
L	-1	-2	-1	-3	-1	-4	-3	-4	-3	-2	-3	-2	-2	2	2	4					Leu
V	-1	-2	0	-2	0	-3	-3	-3	-2	-2	-3	-3	-2	1	3	1	4				Val
F	-2	-2	-2	-4	-2	-3	-3	-3	-3	-3	-1	-3	-3	0	0	0	-1	6			Phe
Y	-2	-2	-2	-3	-2	-3	-2	-3	-2	-1	2	-2	-2	-1	-1	-1	-1	3	7		Tyr
W	-2	-3	-2	-4	-3	-2	-4	-4	-3	-2	-2	-3	-3	-1	-3	-2	-3	1	2	11	Trp