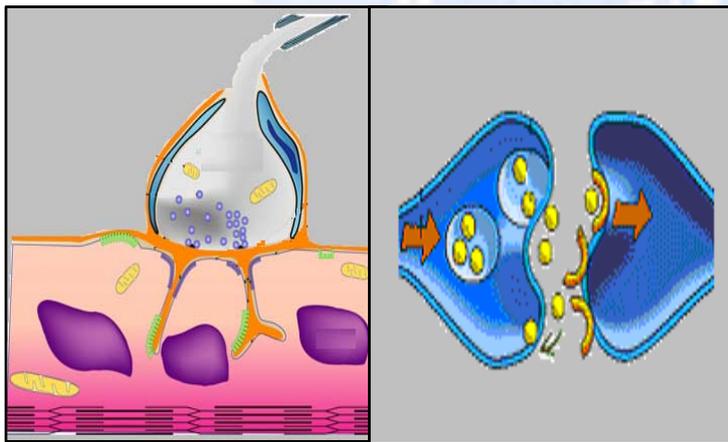


)
) (.(
)

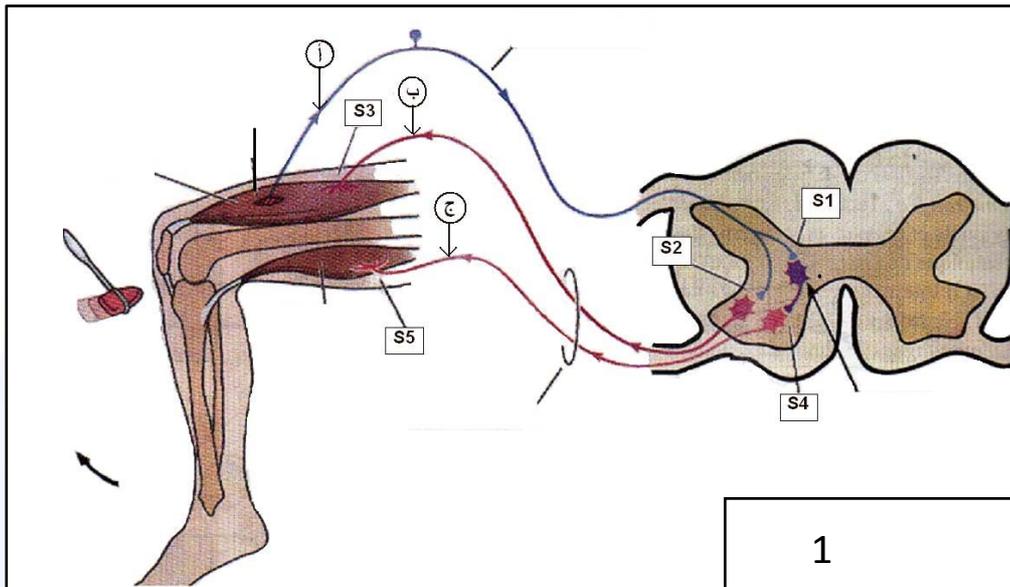
:

تصميم الدرس



- 1
- 2
- 3
- 4
- 5
- 6
- 7

(1)



1

(1)

.SI

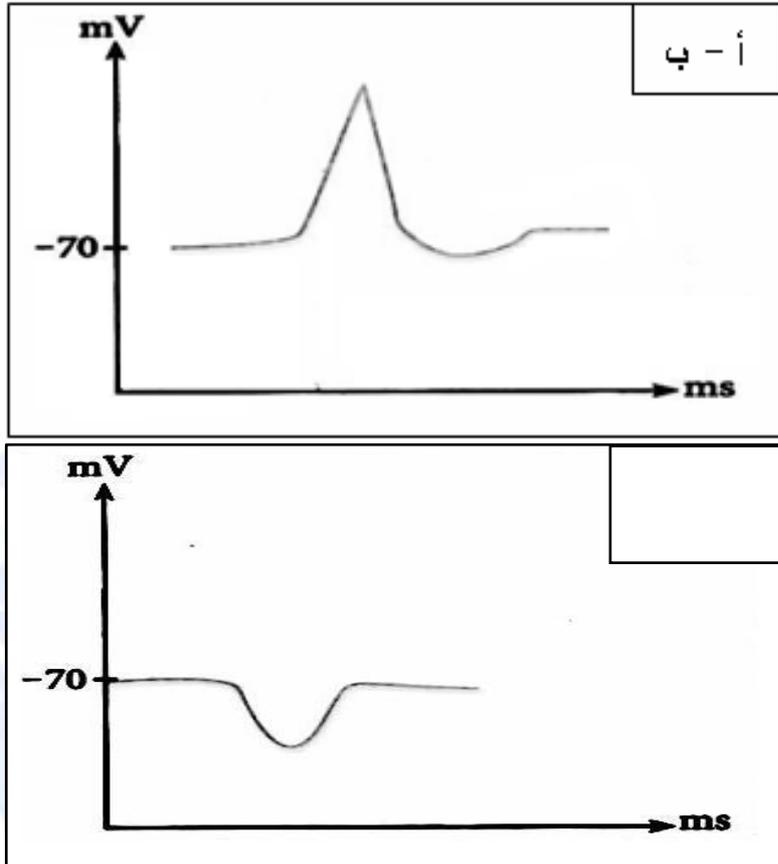
SE

2

3



1

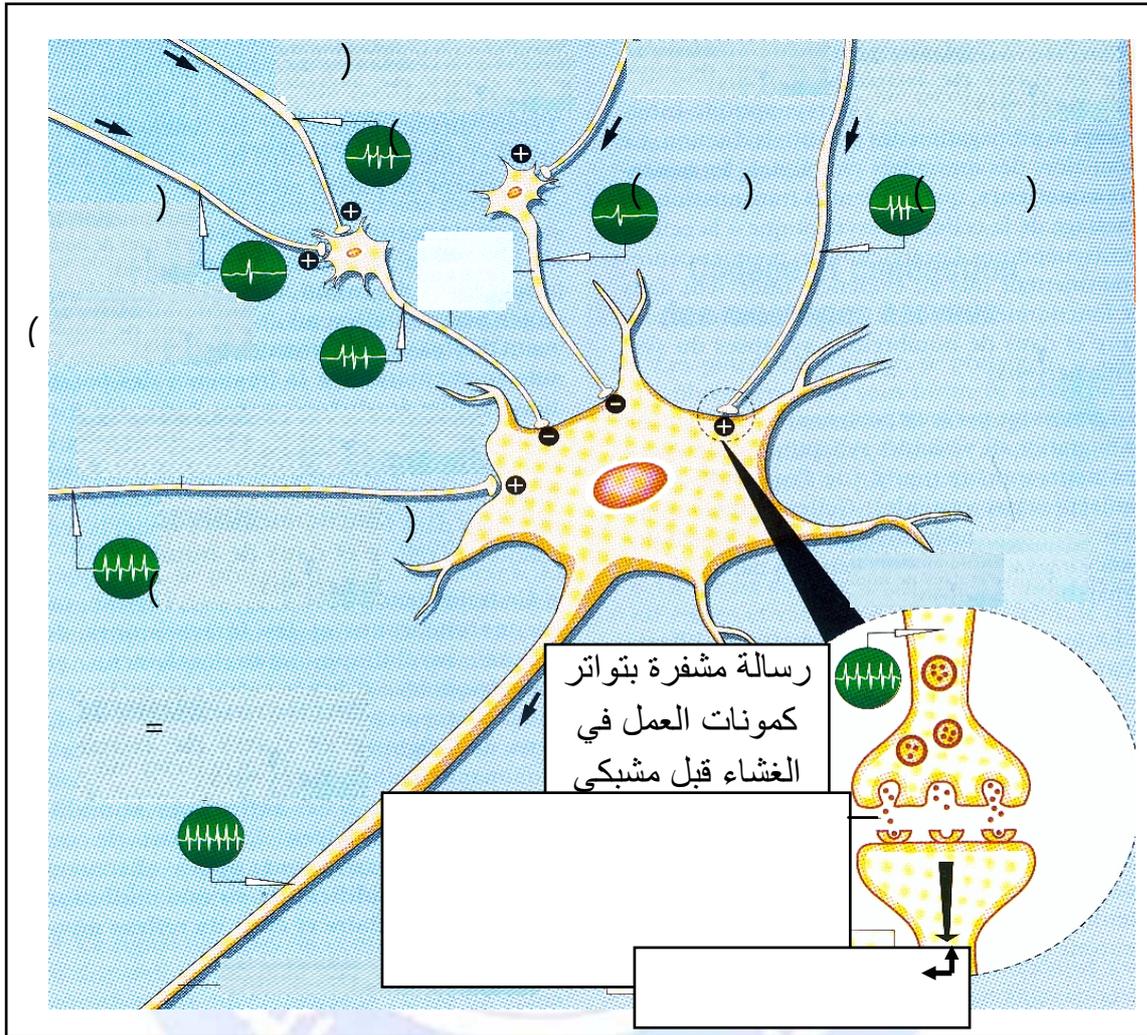


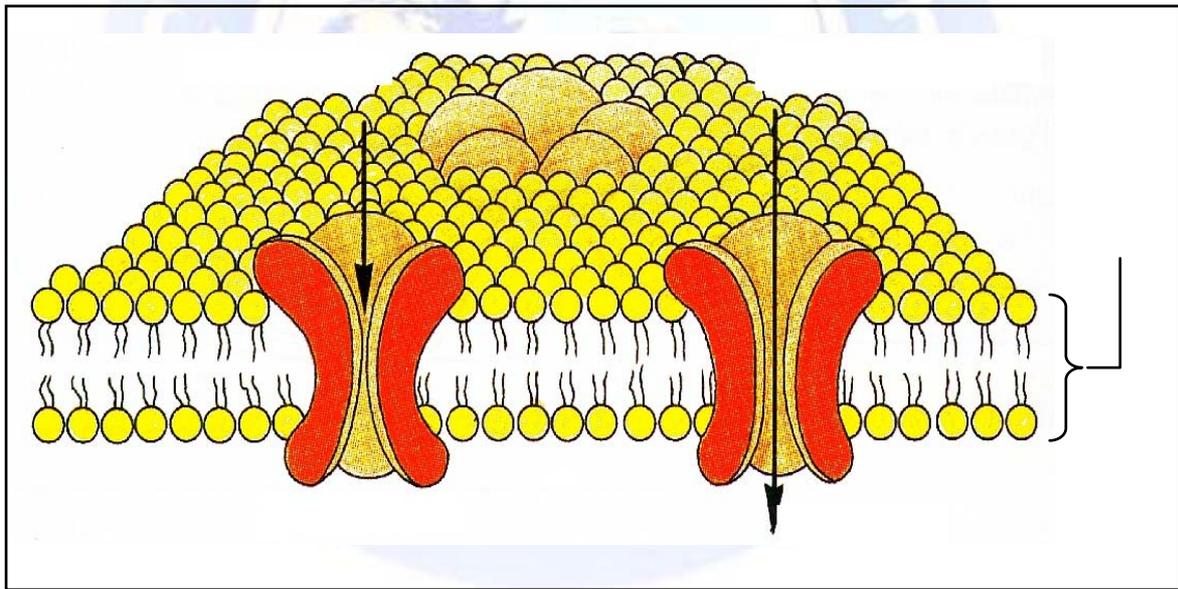
. SE₁ ,SE₂ ,SE₃ : SE

2

. SI₄ , SI₅ :

-

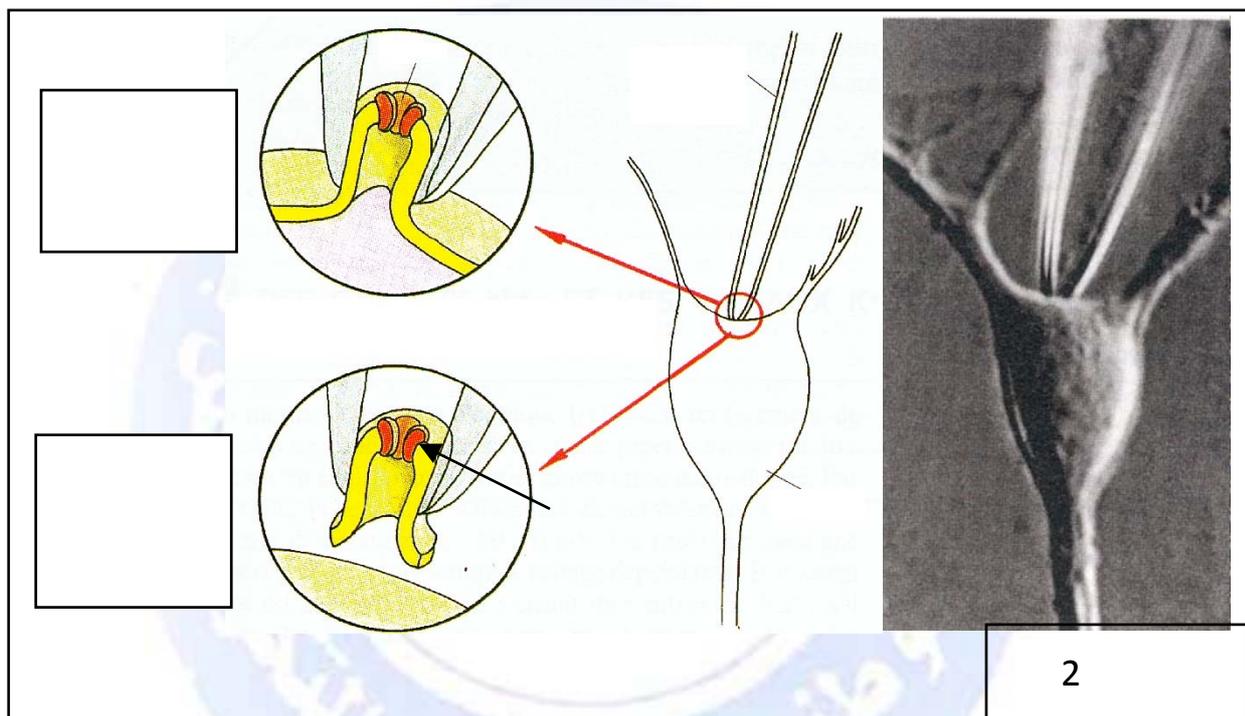




Patch – clamp

Patch – clamp

.(2)

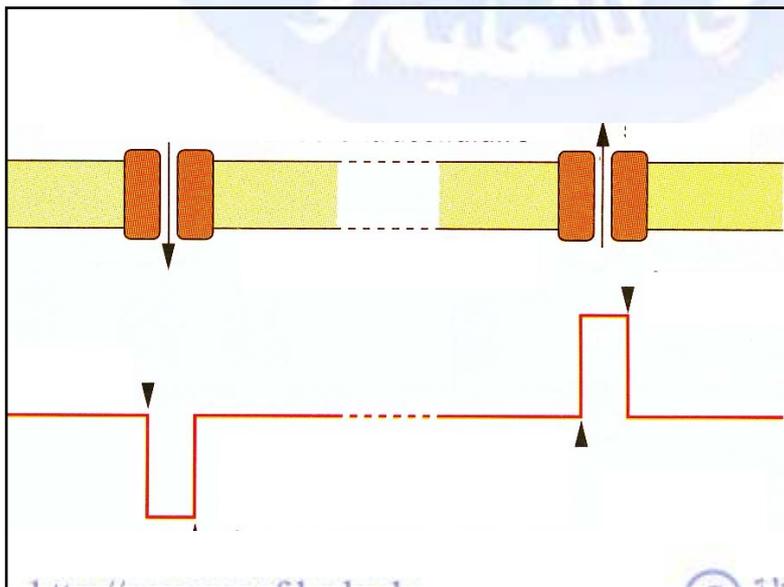
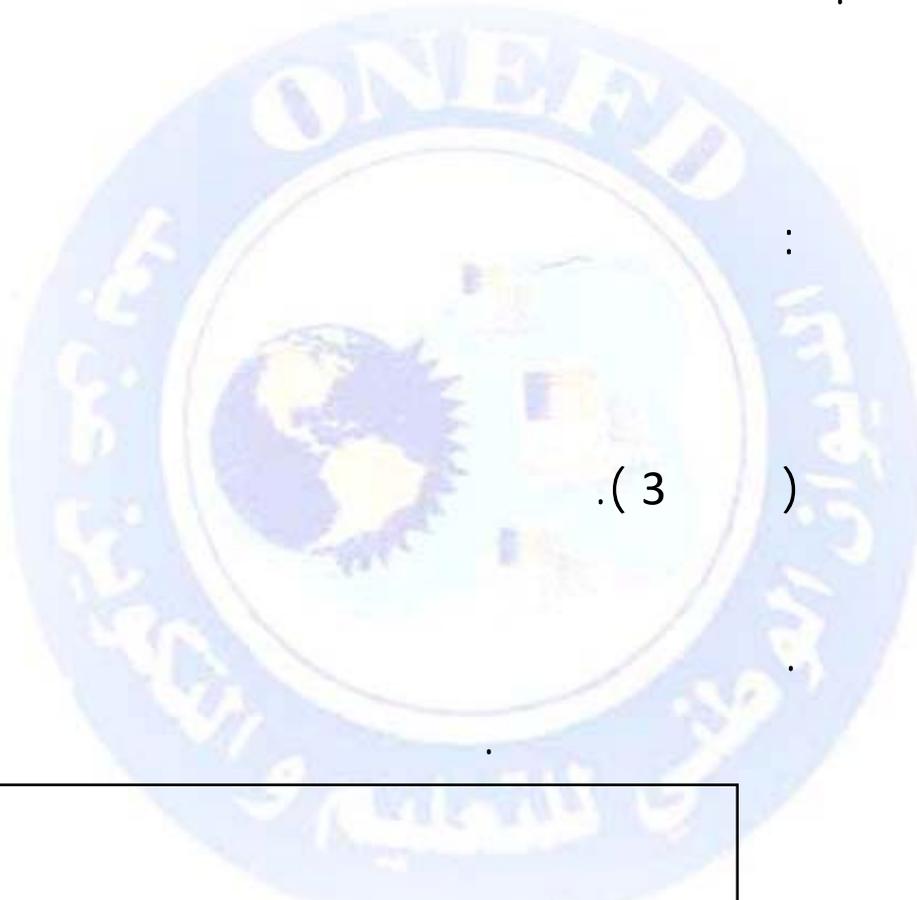


(Patch)

()

(2)

()



3

: Patch -clamp

:Patch -

:clamp -

Patch Clamp

mv 0

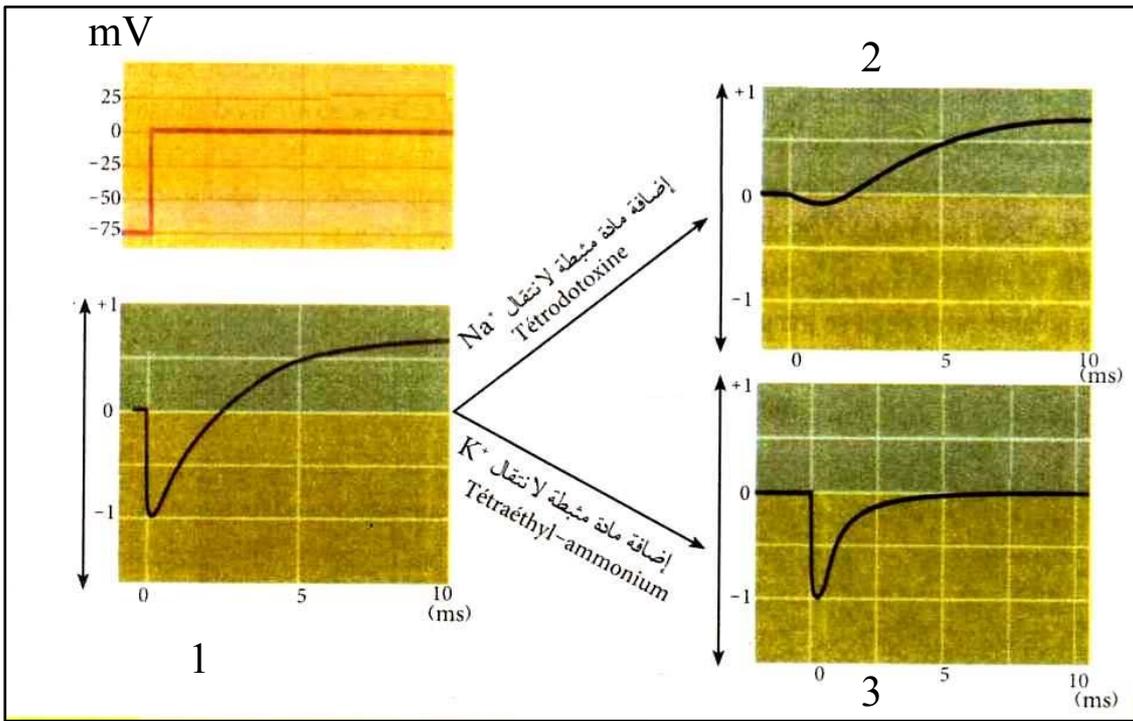
:1

(4).

* -1 -

Na⁺ : -2 - *

k⁺ : -3 - *



4

2

"3" "2"

"1"

1

"1"

3

Patch

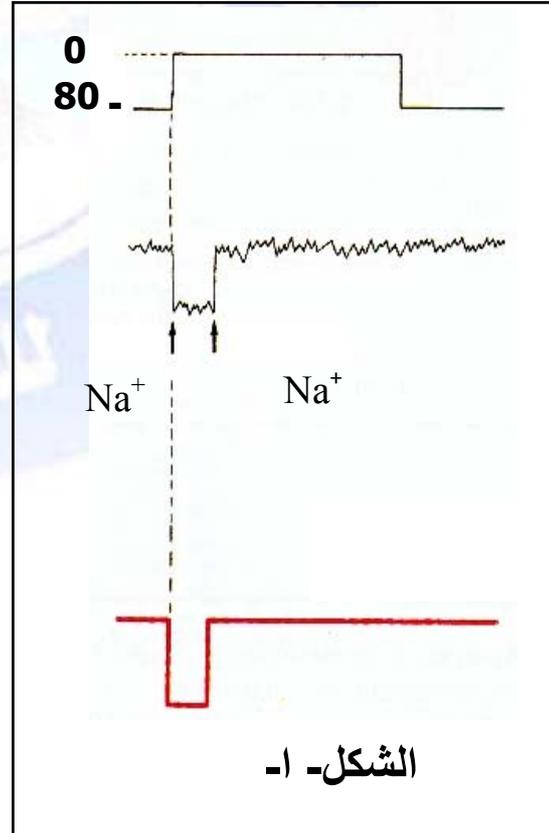
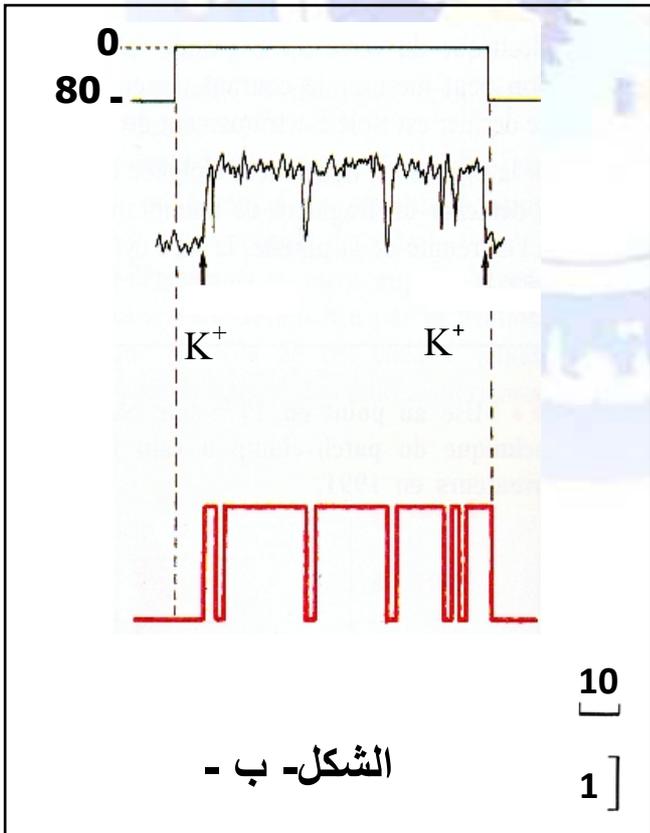
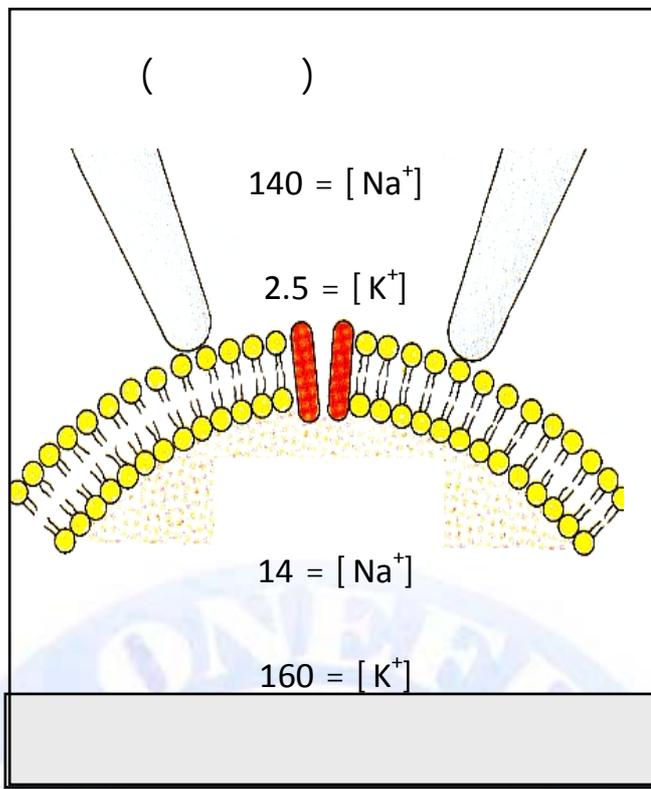
:2

❖

0 80 -

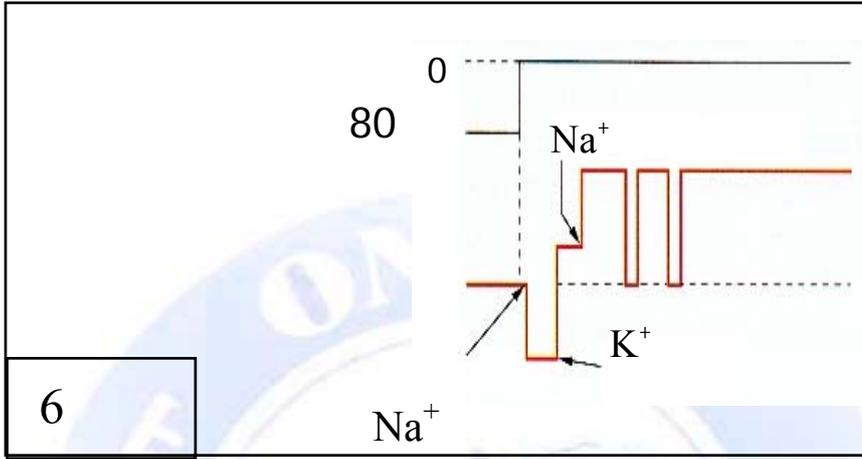
Clamp

(5)



(6)

. K^+ Na^+



6

(5) ()

Na^+

(6) K^+

1

2

3

أقيم الجابتي



:1



:(1)

1

2



:



3

:



: 2

❖

1

:

: ()

(0 =

)

)

(

1

)



(

0.7=

.(



. (

(

)



: ()

7



2

() :
K⁺ Na⁺
K⁺ Na⁺

3



2

(ACh)

-

❖

1:

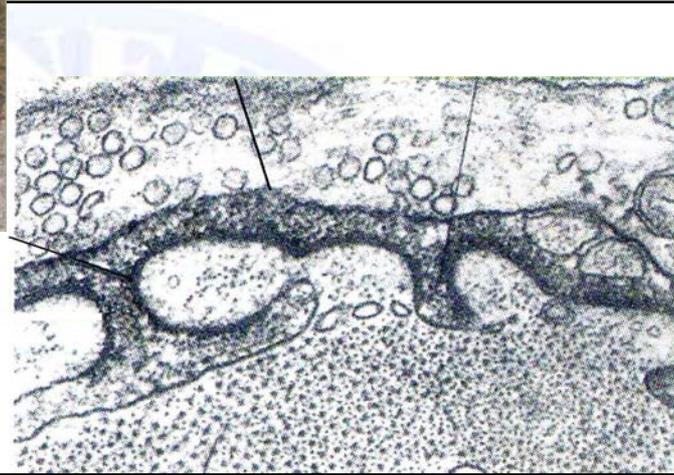
α -bungarotoxine (α - bungarotoxine)

()

(7)

α -bungarotoxine

صورة الثعبان *Bungarus multicinctus*
الذي استخلصت منه مادة الألفا بنغاروتوكسين

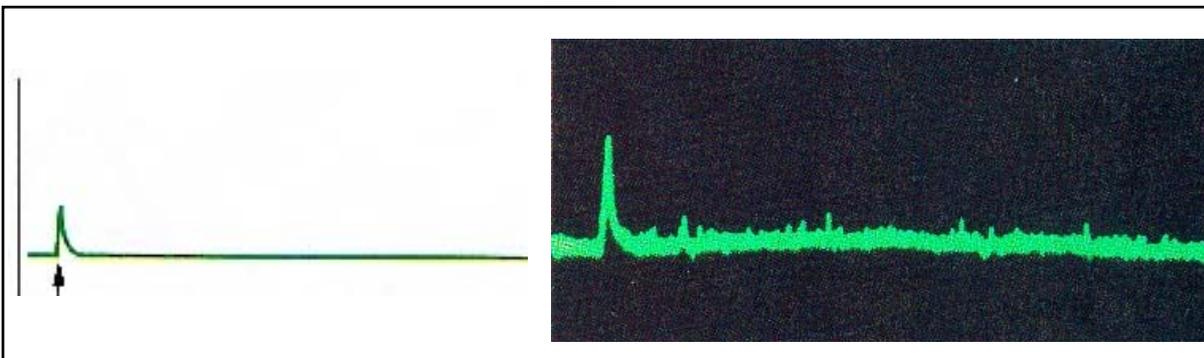


7

:2

(8)

α -bungarotoxine



❖ - 3 :

:

:

()

) (Anti - récepteurs)

(

()

.(9)



9

(1)

1

.(2)

(3) (1)

2

3

4

Béladone

Atropine

أقيم الجابري



1

()

α -bungarotoxine

(2)

(3 1)

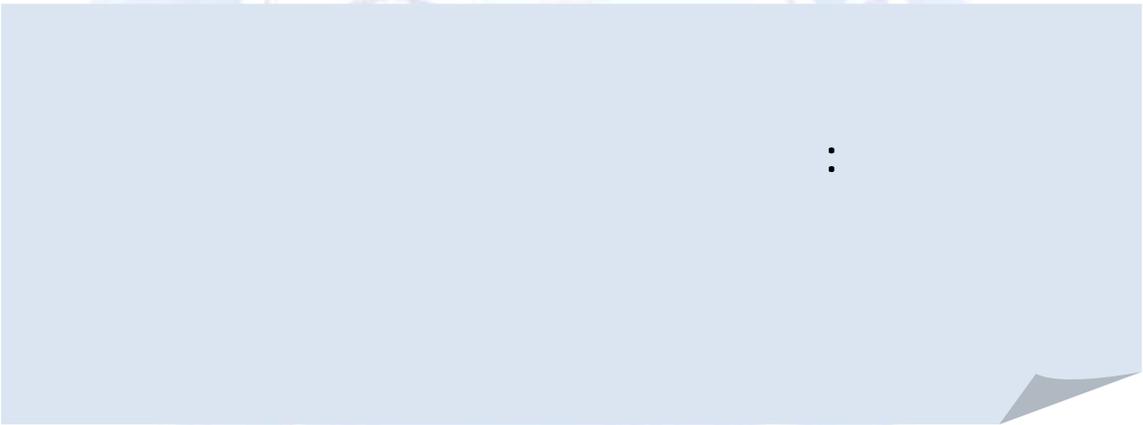
2

(7)

(9)

3

4



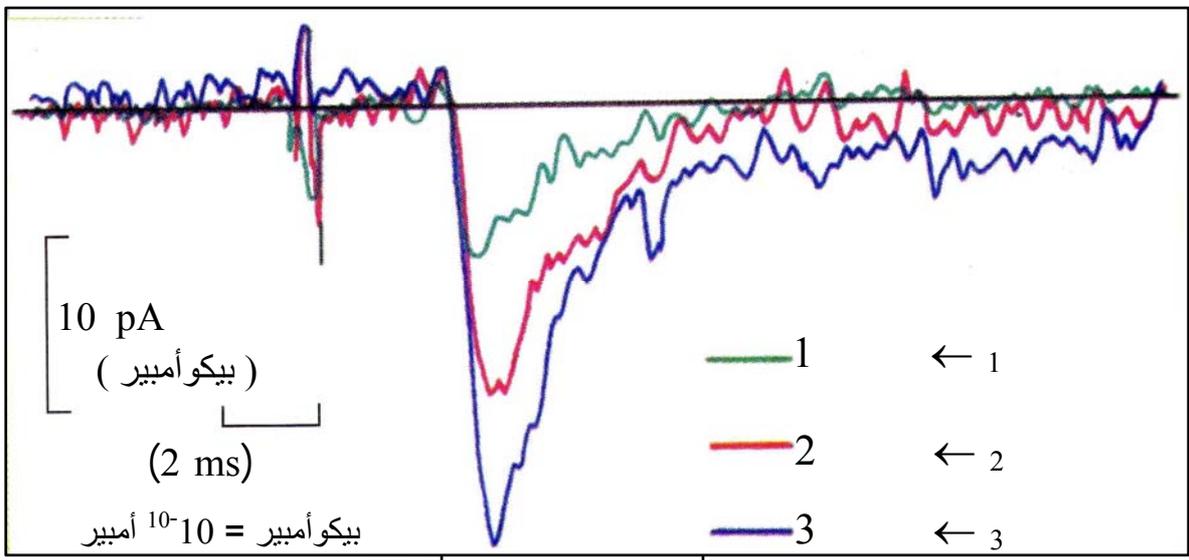
1



:1

(10)

Patch Clamp



10

: 2 ❖

Patch

(11)

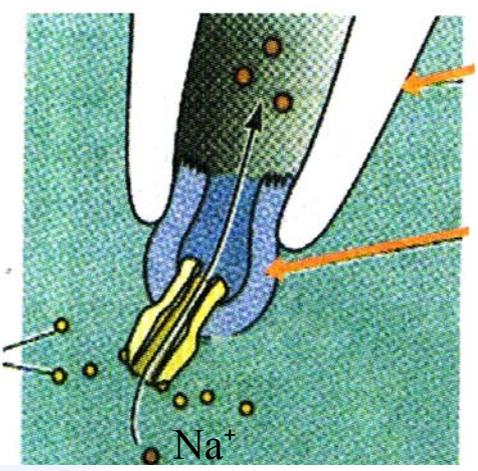
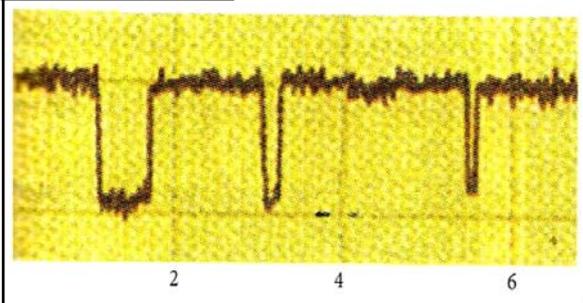
*

Clamp

2 μ g

"2"

11



2

(10)

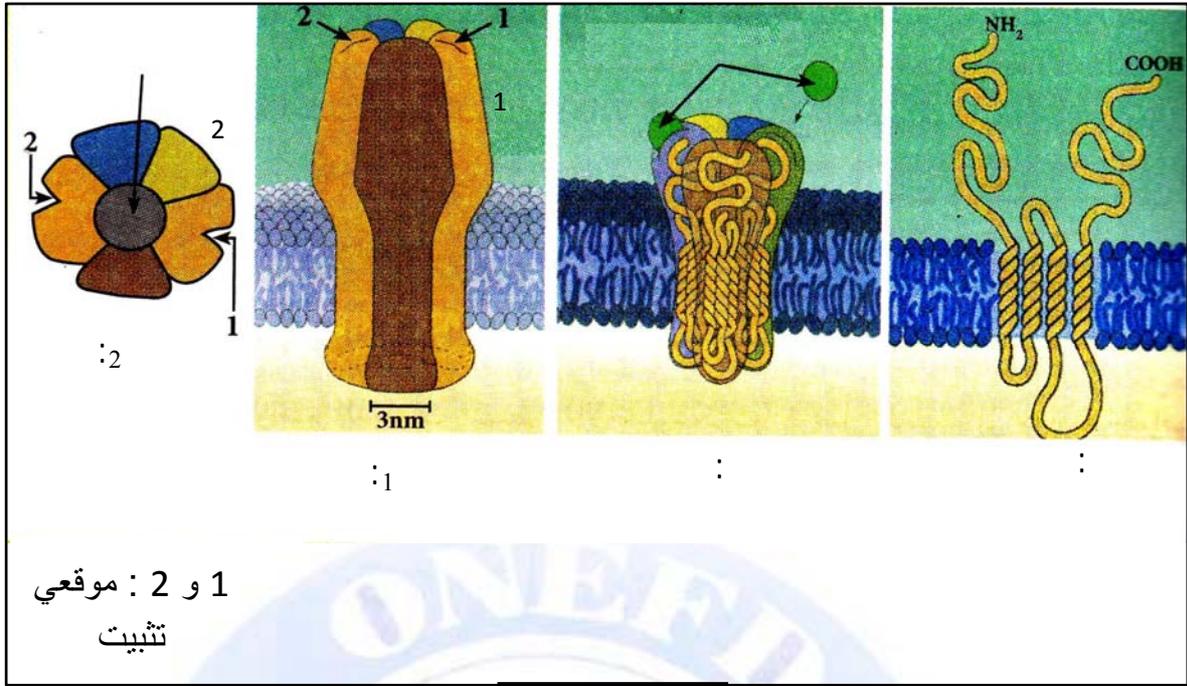
1

(11)

2

2

(12)

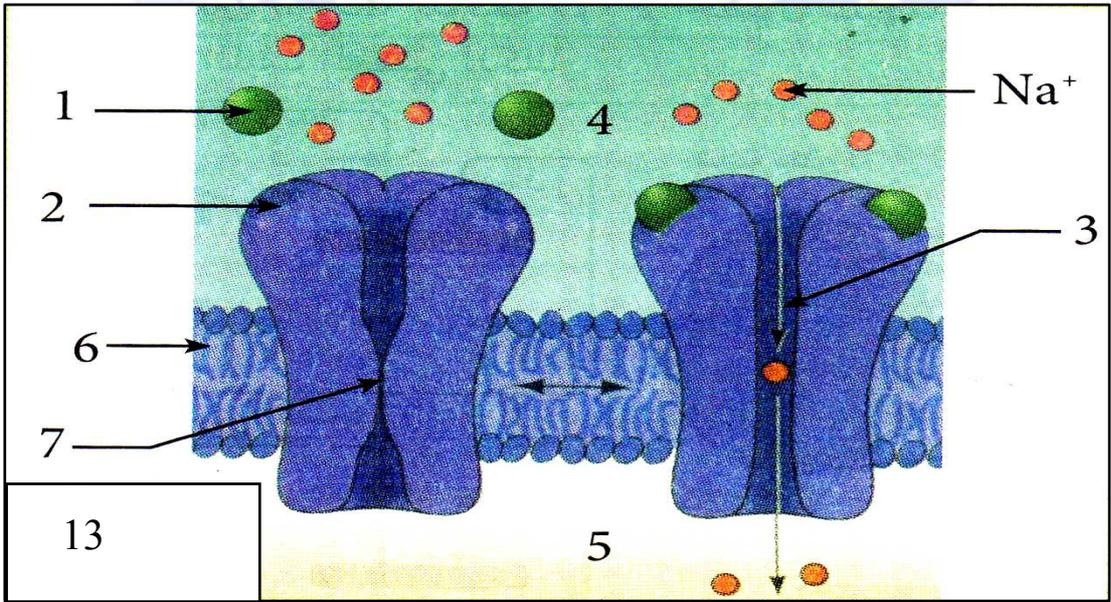


12

(12)

3

(13)



1

.(13) 1
. Na⁺

. 2

أقيم اجابتي



1

: (10) 1



Na⁺

2

2

5

3

: (13) 1

: 2 : 1

: 4

Na⁺ : 3

: 6

: 5

Na⁺ : 7

*

:

Na⁺

2



(14)

.(14)

<p>2 1</p> <p>:</p> <p>...</p> <p>:</p> <p>1</p> <p>:</p> <p>2</p>		<p>14</p>
--	--	-----------

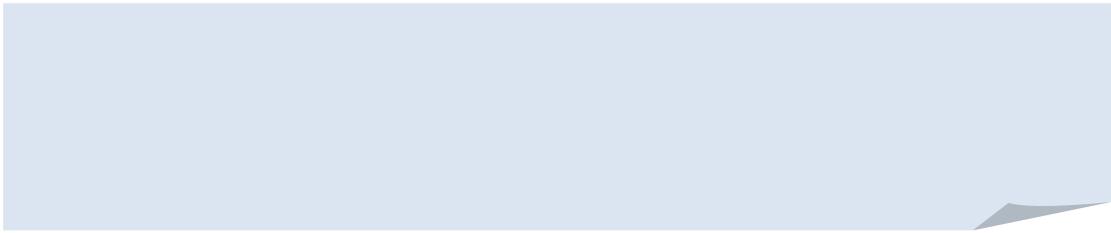
<p>2 1 : 0</p> <p>.</p> <p>1 : 1</p> <p>2</p> <p>.</p>		<p>14</p>
--	--	-----------

1

2

: -
 1000
 (3 1)
 .

: 1
 (0)
 1 0 2 1
 (1)
 2) (1
 ((60 -)
 : 2
 (+)
 . ()
 :



()

2

:



(15)

Cl ⁻	K ⁺	Na ⁺	(¹⁻ .)
40	410	49	
560	22	440	

15

Na⁺

(16)

2 1



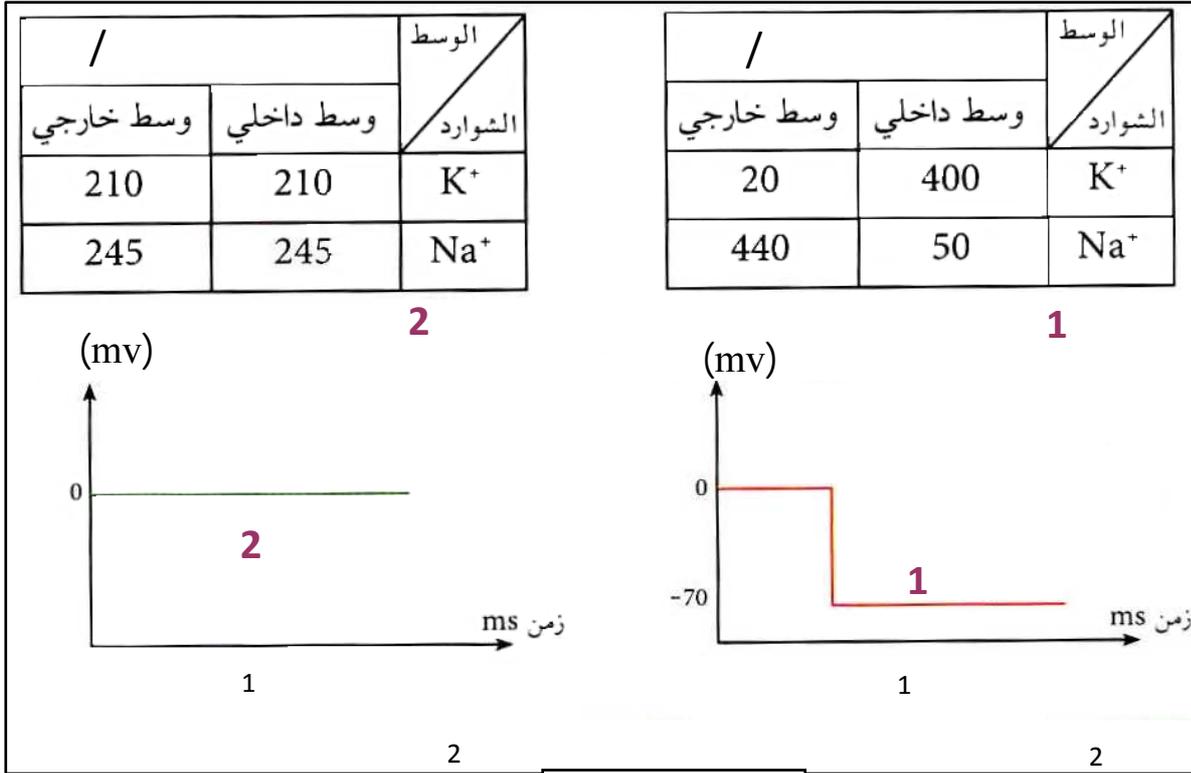
K⁺

2 1

(

<http://www.onefd.edu.dz>

2)
جميع الحقوق محفوظة ©



16

(15)

1

(16) (2 1)

2

1

(16)

أقيم اجابتي



:(15)

1

:

Cl⁻ Na⁺

K⁺

20

:

:(16)

2

: (1)

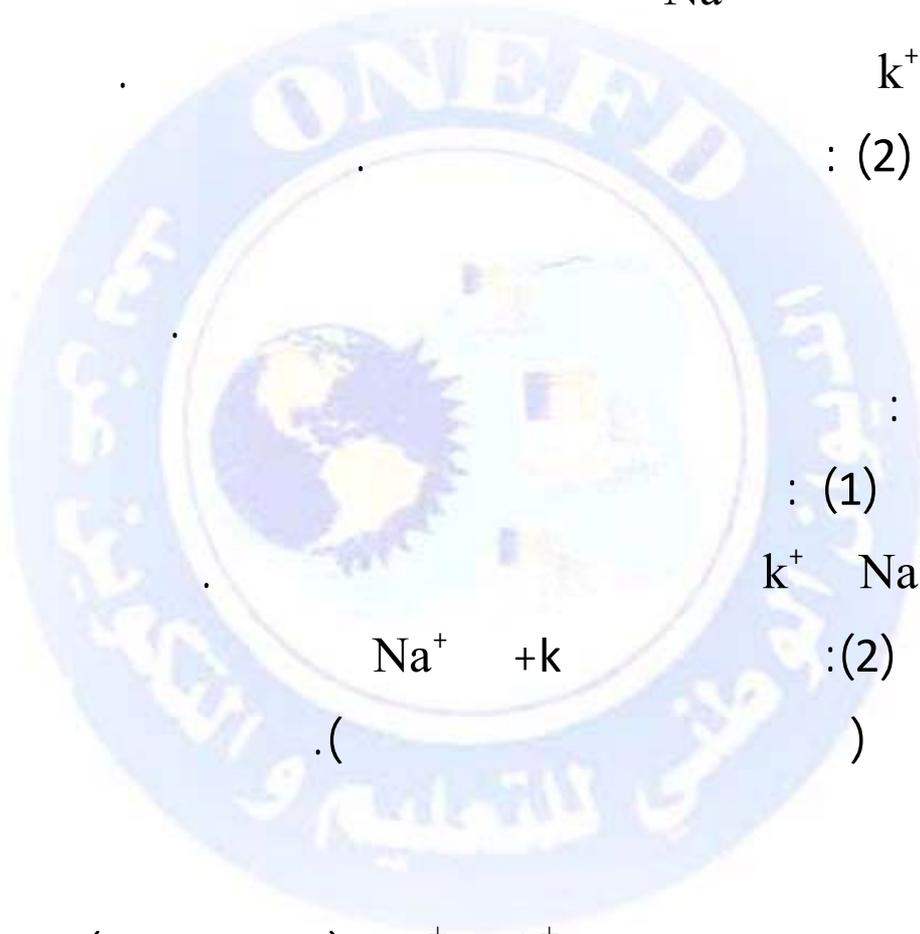
*

Na⁺

k⁺

: (2)

*



:
: (1)

*

k⁺ Na⁺

Na⁺ +k

: (2)

*

.()

❖

(:) Na⁺ k⁺

-3-

()

(17)

(Hodgkin- Baker- Stark)

k⁺

The diagram illustrates the distribution of ion channels in a cell membrane. On the left, a cross-section shows a blue channel protein embedded in a lipid bilayer, with orange dots representing ions. On the right, a cylindrical representation shows a K^+ channel on the left and a Na^+ channel on the right. Below the diagram is a graph showing the relationship between membrane potential (y-axis, from -10 to -60) and the concentration of K^+ ions (x-axis, from 0 to 500). The curve shows that as K^+ concentration increases, the membrane potential becomes more negative, approaching a plateau around -60 mV.

الشكل "أ": رسم تخطيطي يظهر توزيع القنوات الغشائية في وحدة مساحة غشائية للليف عصبي من المحور الأسطواني

17

Na^+ k^+

1

(17) ()

2

(17) ()

3

أقيم الجابتي



Na^+

k^+

1

$.Na^+$

k^+

2

-
-

: () 3

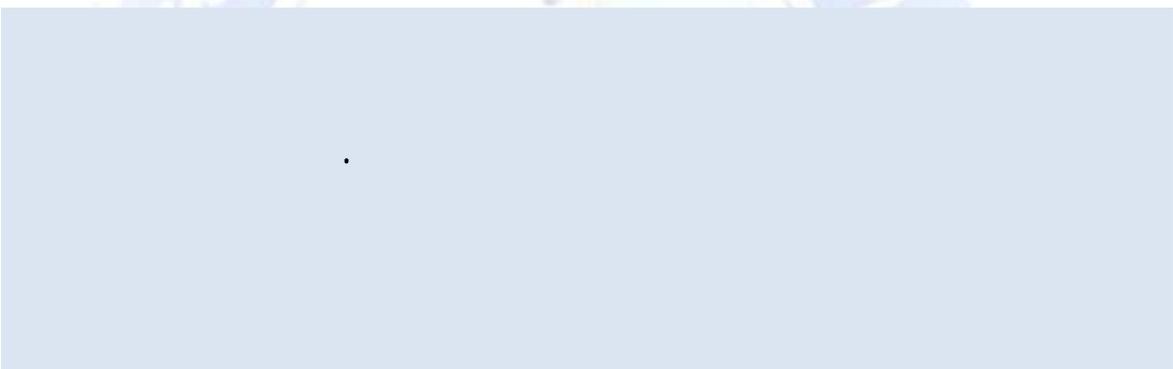
k^+

. -60 mv

:

k^+

. ()



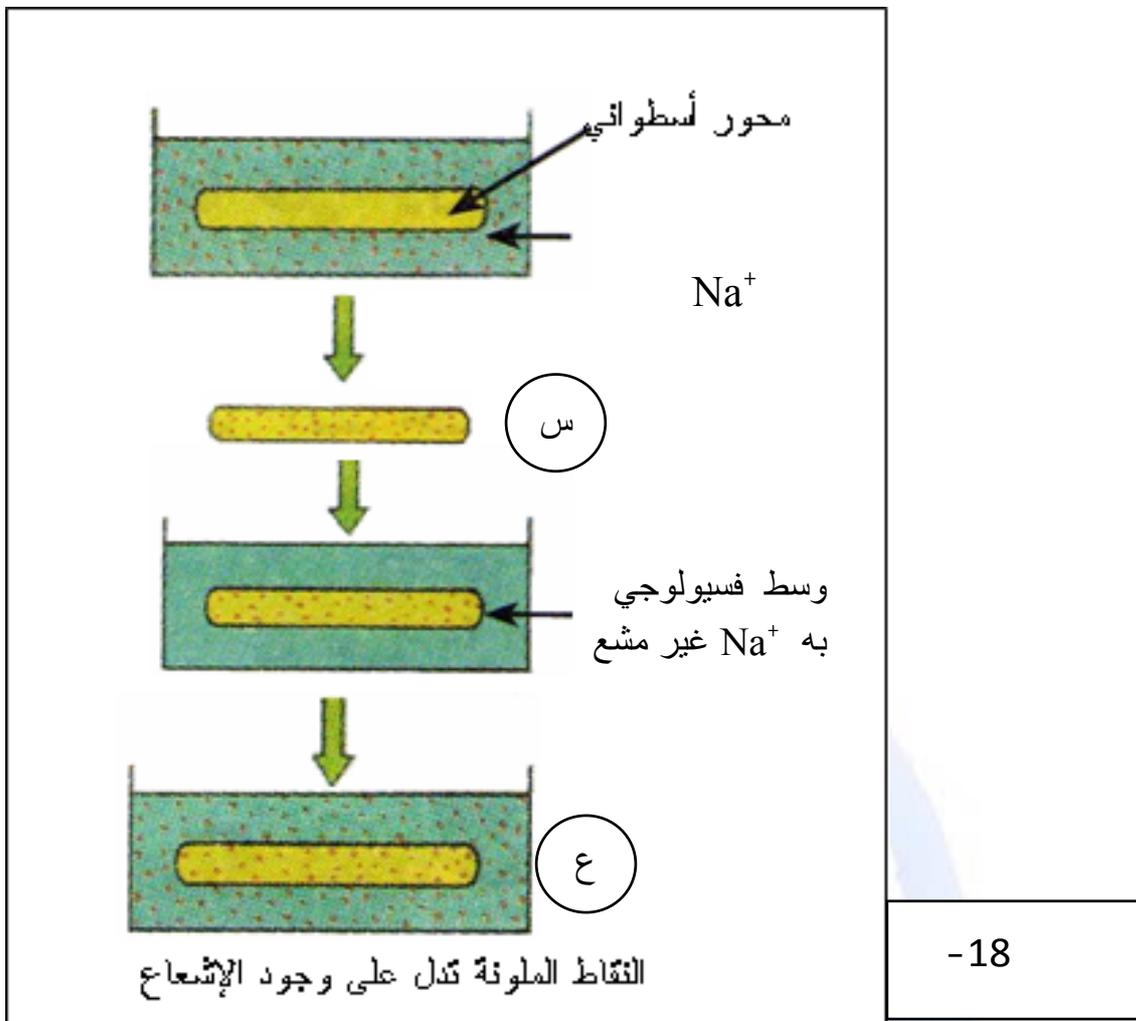
3

Na^+

: 1

*

. (-18)



-18

K⁺ Na⁺

. Na⁺

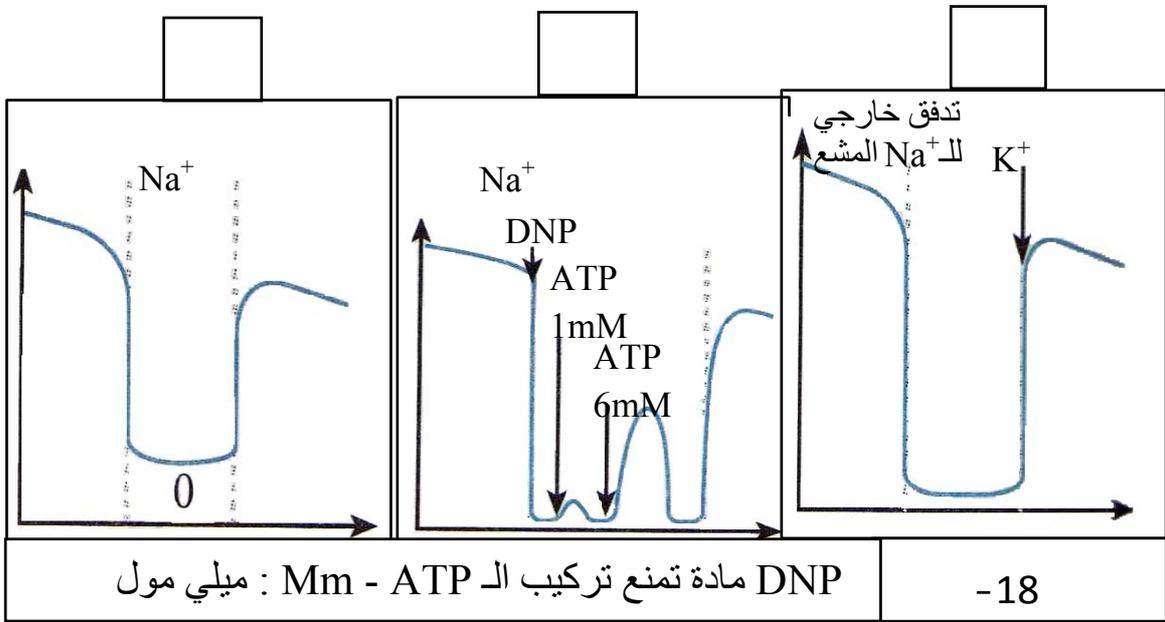
Na⁺ : 2 *

Na⁺ Na⁺

) DNP

. ATP (

.(-18)



(-18)

1

Na^+

" "

(-18)

" "

2

" "

(-18)

(-18)

()

3

K^+

Na^+

DNP

" »

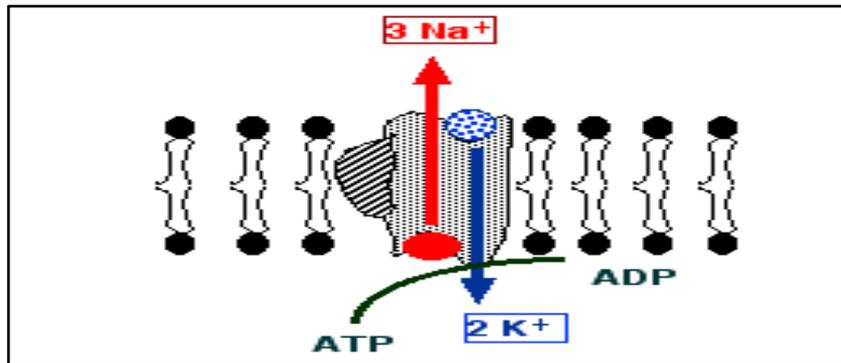
(-18)

(2 1)

4

5

6



7



أقيم اجابتي

Na⁺

(3)

Na⁺

Na⁺

Na⁺

-2

(Na⁺

)

:

:

3

ATP

DNP

-

()

.ATP

-

: نقل المزدوج : إخراج الصوديوم مرتبط بإدخال

البوتاسيوم.

4

K⁺ Na⁺

()

" " : " " 5

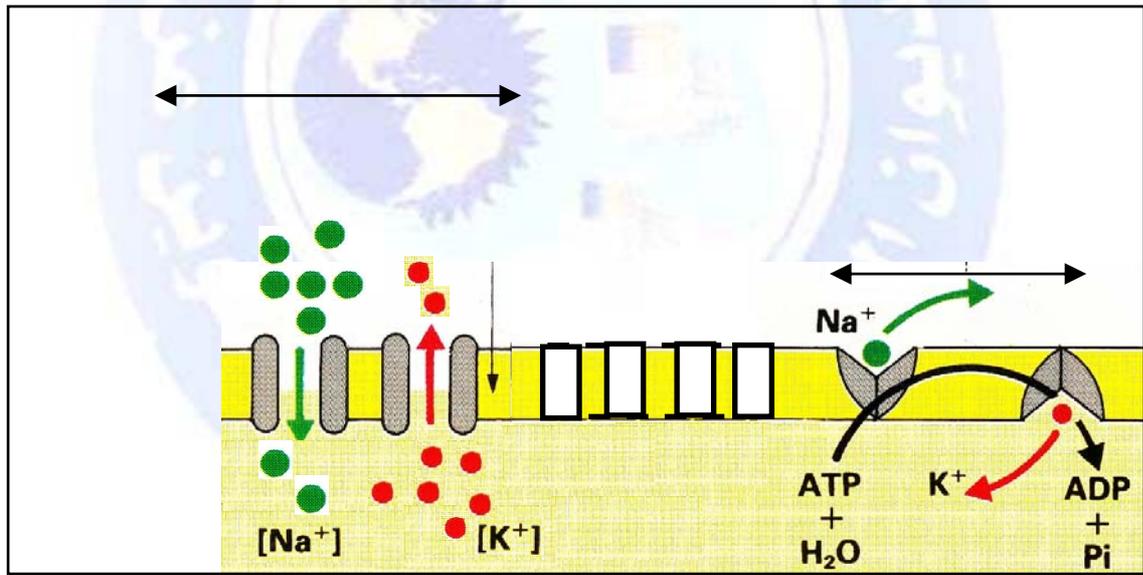
.()

: " " 6

3)

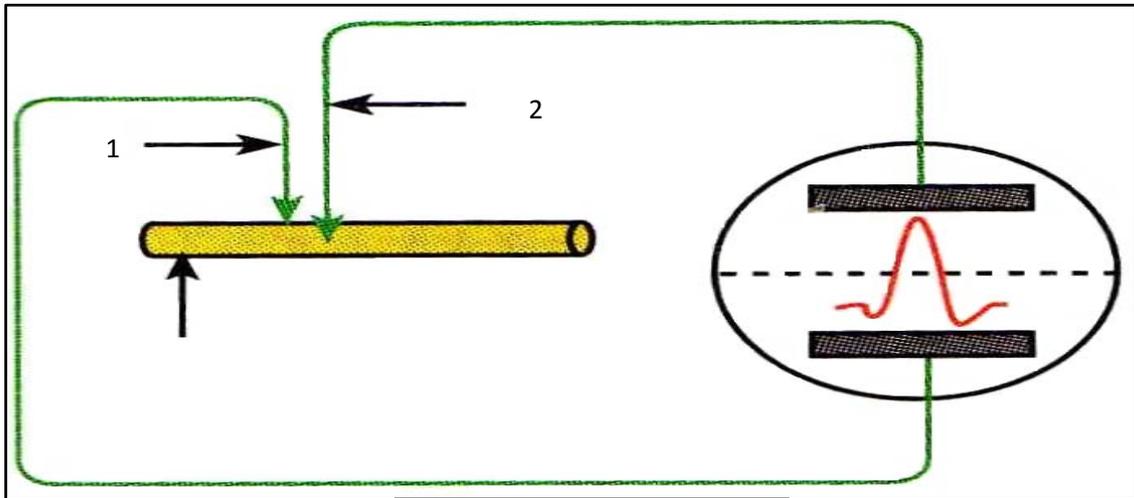
.(

7



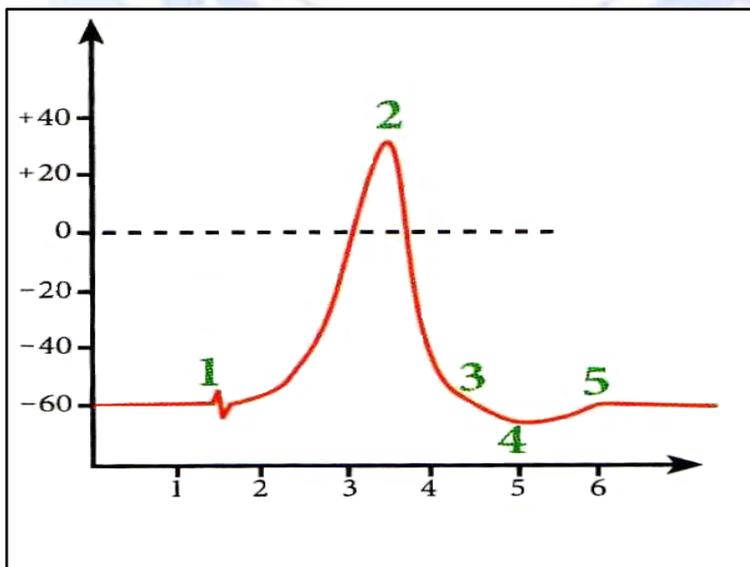
1

(-19)



-19

(-19)



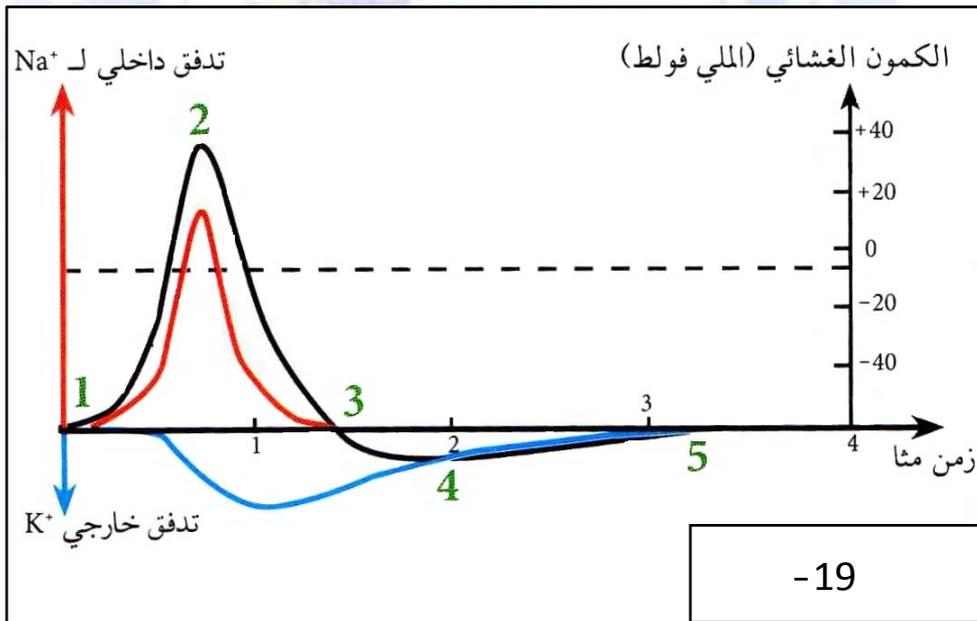
-19

(Huxley) (Hodgkin) ❖

K^+ Na^+ 1952

(-19)

K^+ Na^+

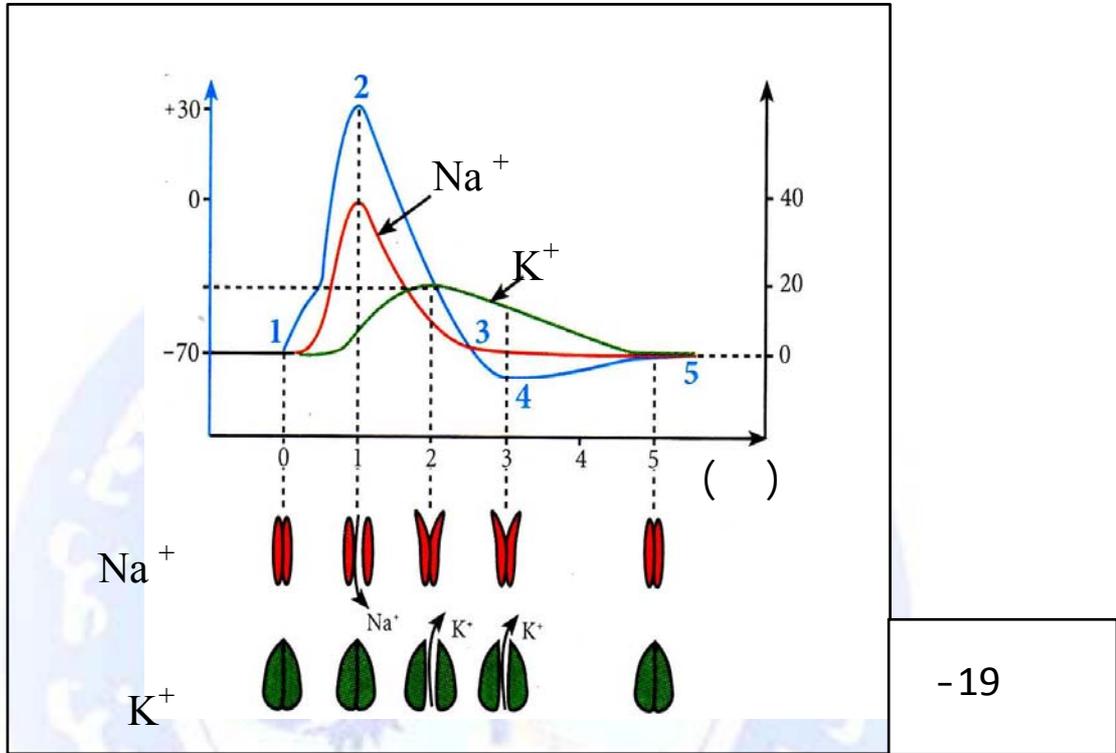


)

(-19)



(



-19

(1.5 - 0)

1

(-19)

(6-1.5)

(-19)

2

(2 - 1)

3

(-19)

(3 - 2)

(-19)

(4 - 3)

4

أقيم الجائزى ◀

1 (-19) :.

- (1.5 - 0) : -60

- (6 - 1.5) :

▪ 2-1 :

▪ 3-2 :

▪ 4-3 :

▪ 5-4 :

2 (-19) :

Na⁺

K⁺

Na⁺

K⁺

3 :

Na⁺

K⁺

(4 - 3) :

K⁺

:



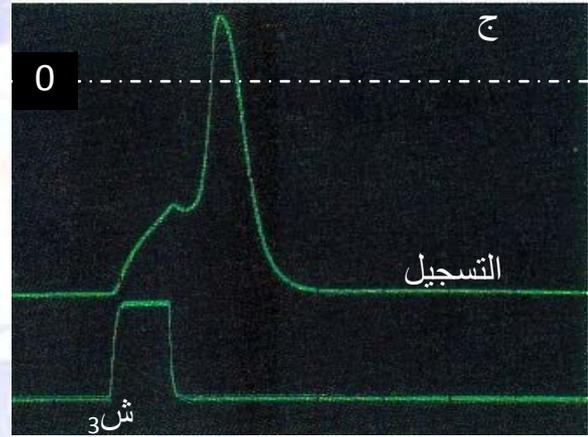
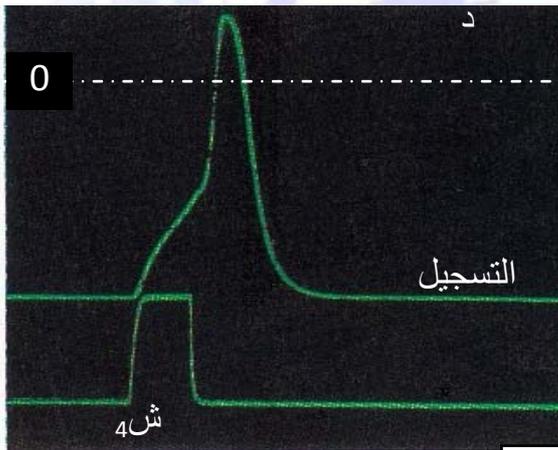
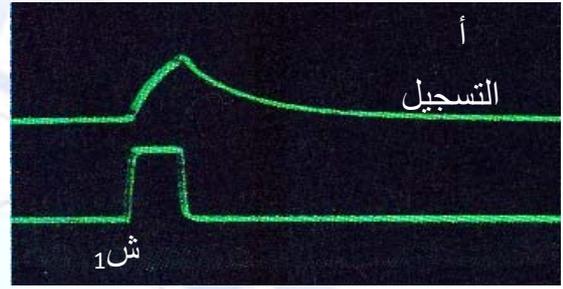
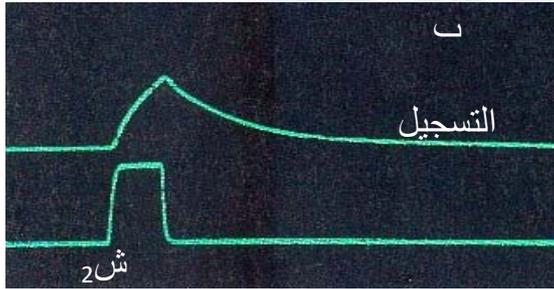
:



() ATP



(20)



20

-2-

- 1
- 2
- 3
- 4

أقيم اجابتي



1

2

3

4

1

2

3

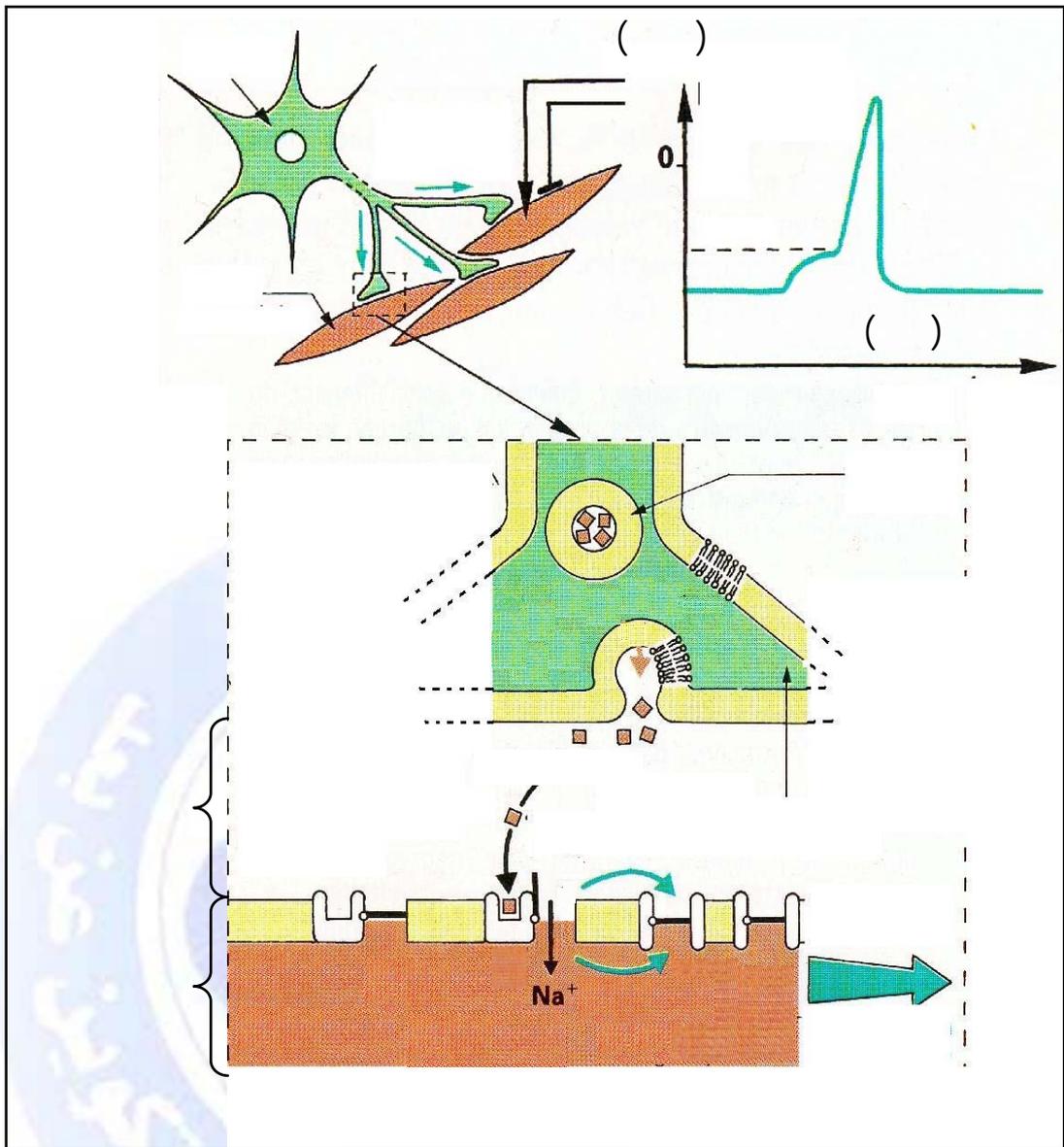
4

Na⁺

k⁺

(21)





21

(21)

أقيم اجابتي



:



3

''

.(22)

:1

(P_2, P_1)

.(22)

'' ''

)

-

(

. P_2

: 2

.()

: 3

)

(Pilocarpine)

.()

(

" "

30
0
-70

P₁ P₂

1 2 3 4 5 6

1 3

2

" "

" "

ك₁ ك₂ ك₃ ك₄

(22)

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1
2

أقيم اجابتي



: 1

◆ 1

(P₂).

()

:2

◆

" 3 2 1 "

"4 "

:3

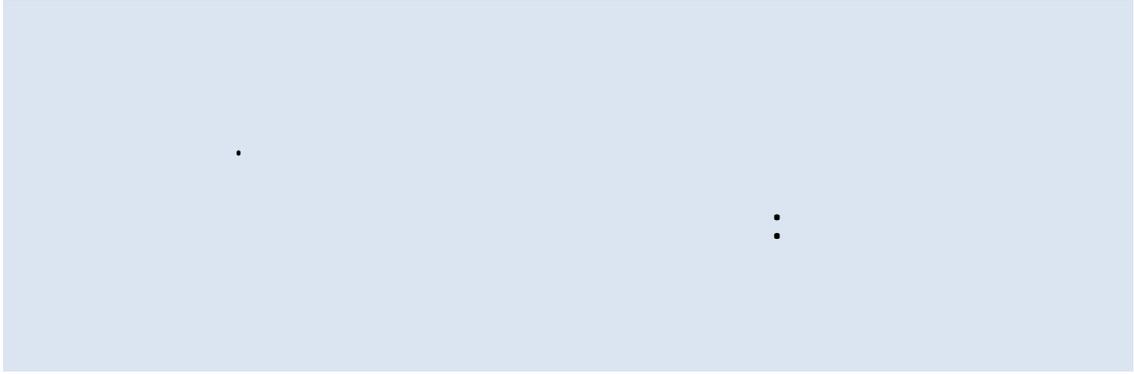
◆

Pilocarpine

()

: 2



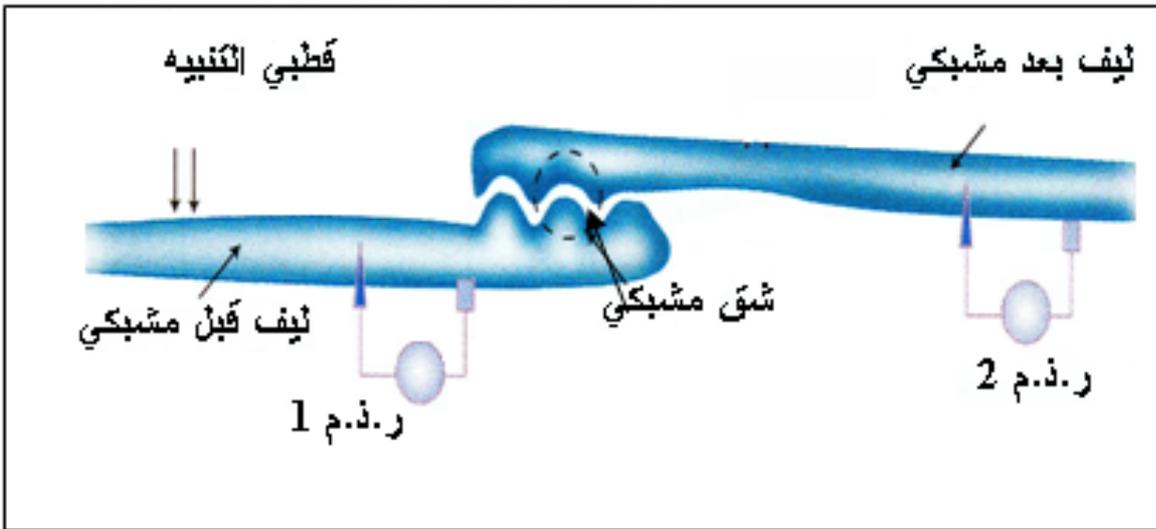


4

”

1

(22) .



(2 1)

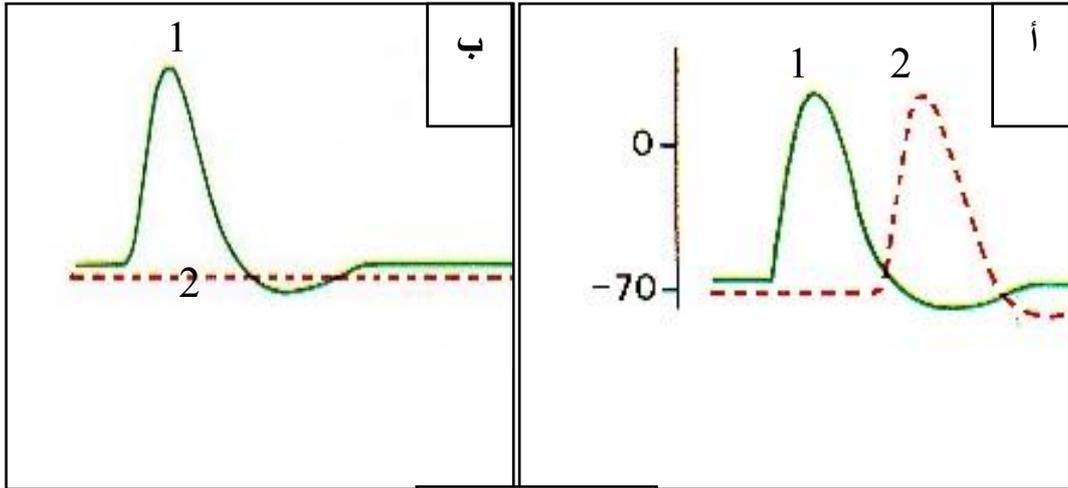
: . .

(- 23)

(2 . .) 2

(1 . .) 1

. (24)



23



(23)

. (24)

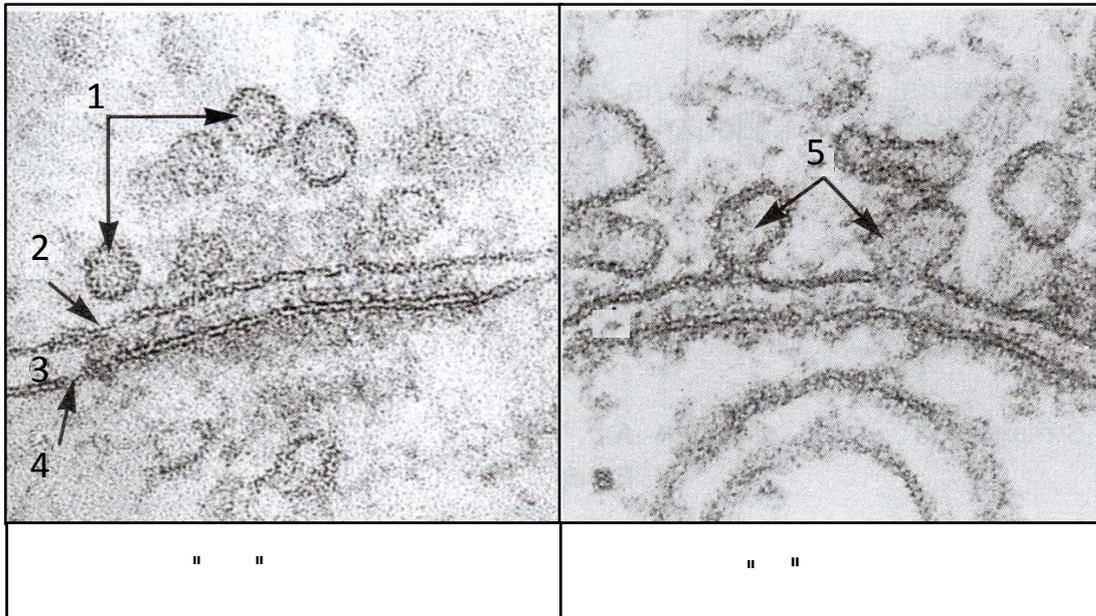
()

(23)

. (24)

2





24



(Ca^{2+})



.(24)



:

:3

:2

:1

:5

:4

*



■



■

*

(- 23 2)



.()

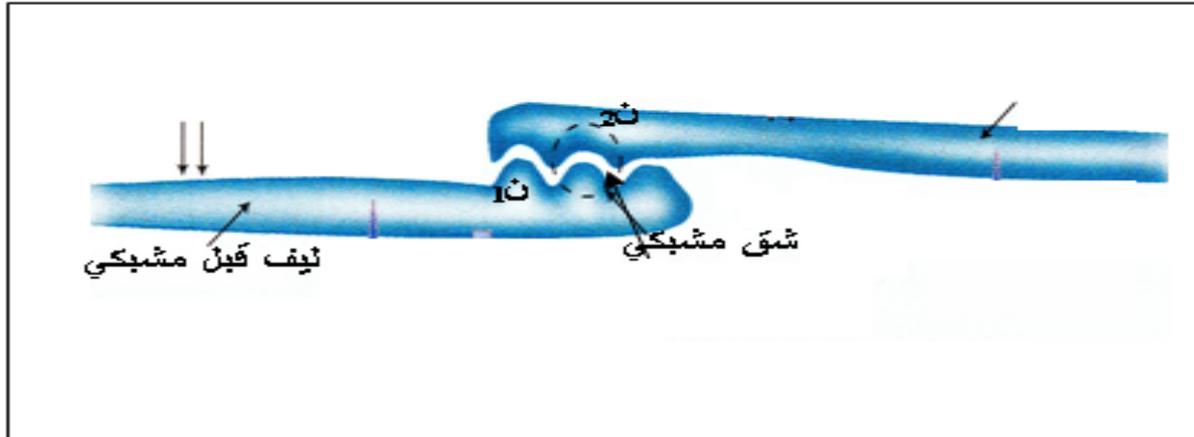


)

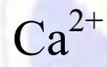
()

(





15

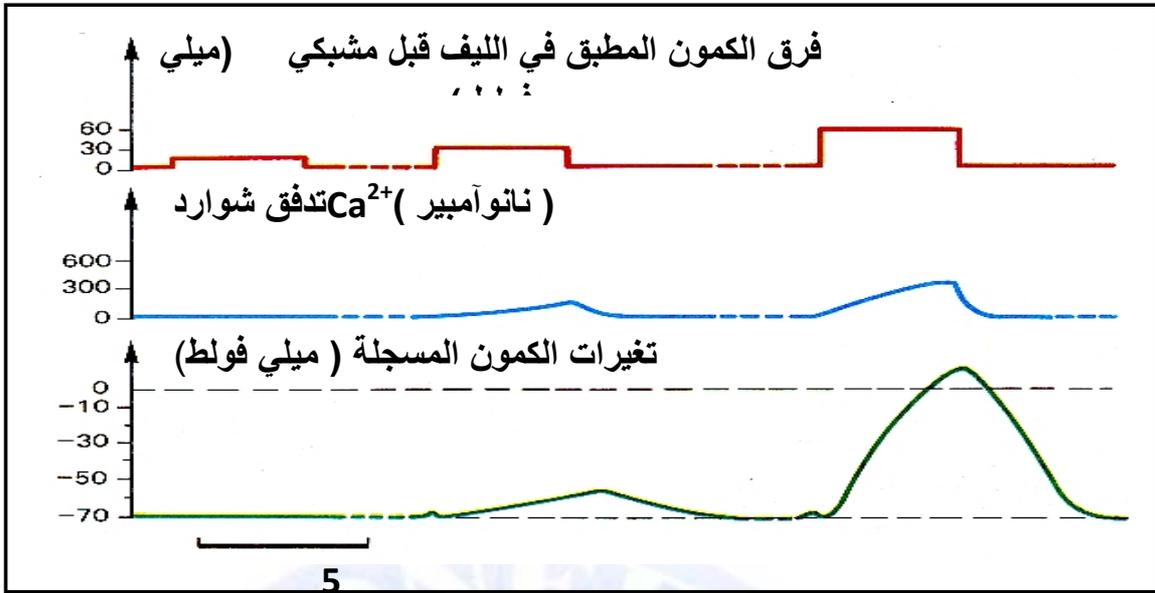


60 30

(1)

.(25)

(2)



25

Ca^{2+}

أقيم الجابتي

Ca^{2+}

15

Ca^{2+}

(150) Ca^{2+}

30

(600) Ca^{2+}

60