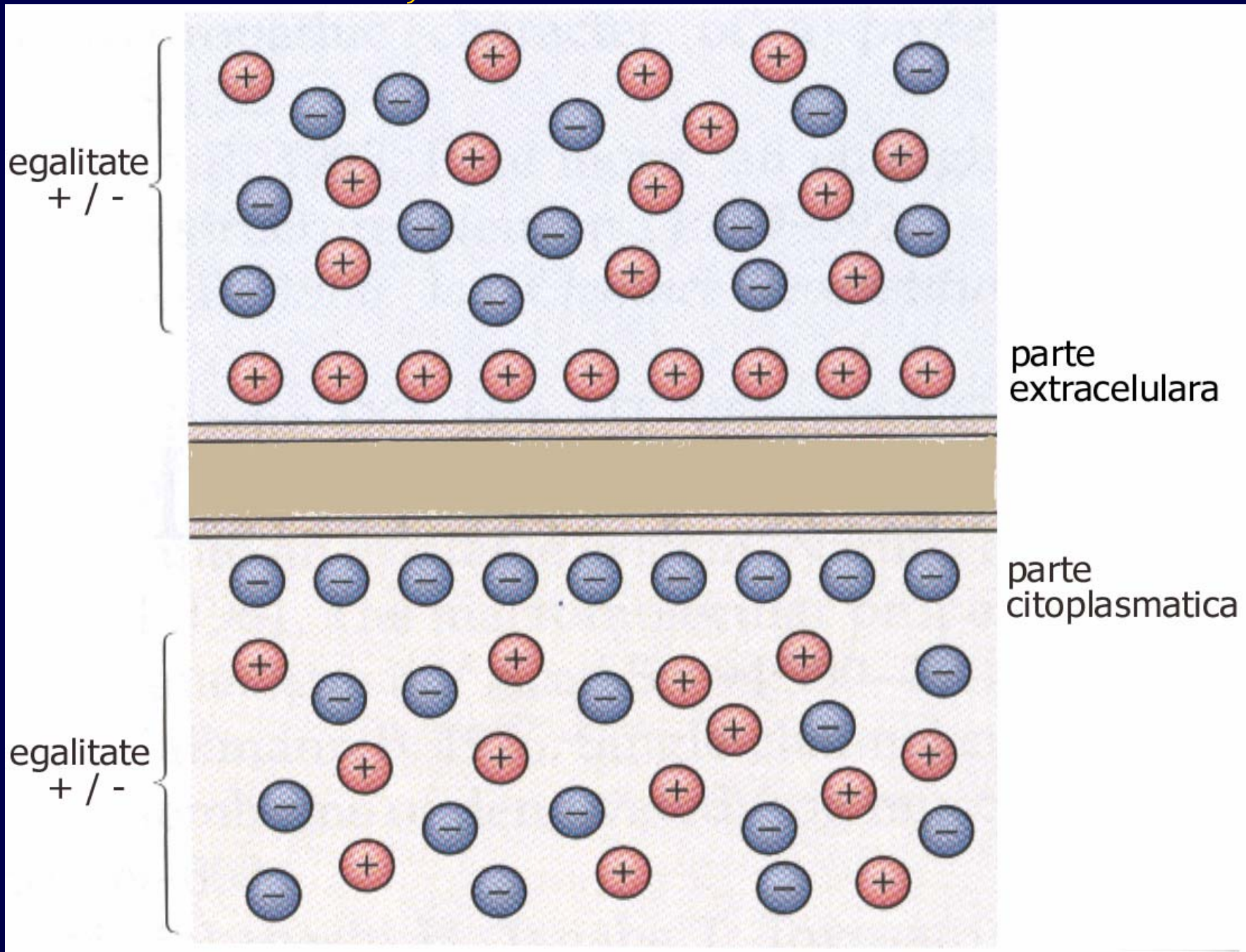
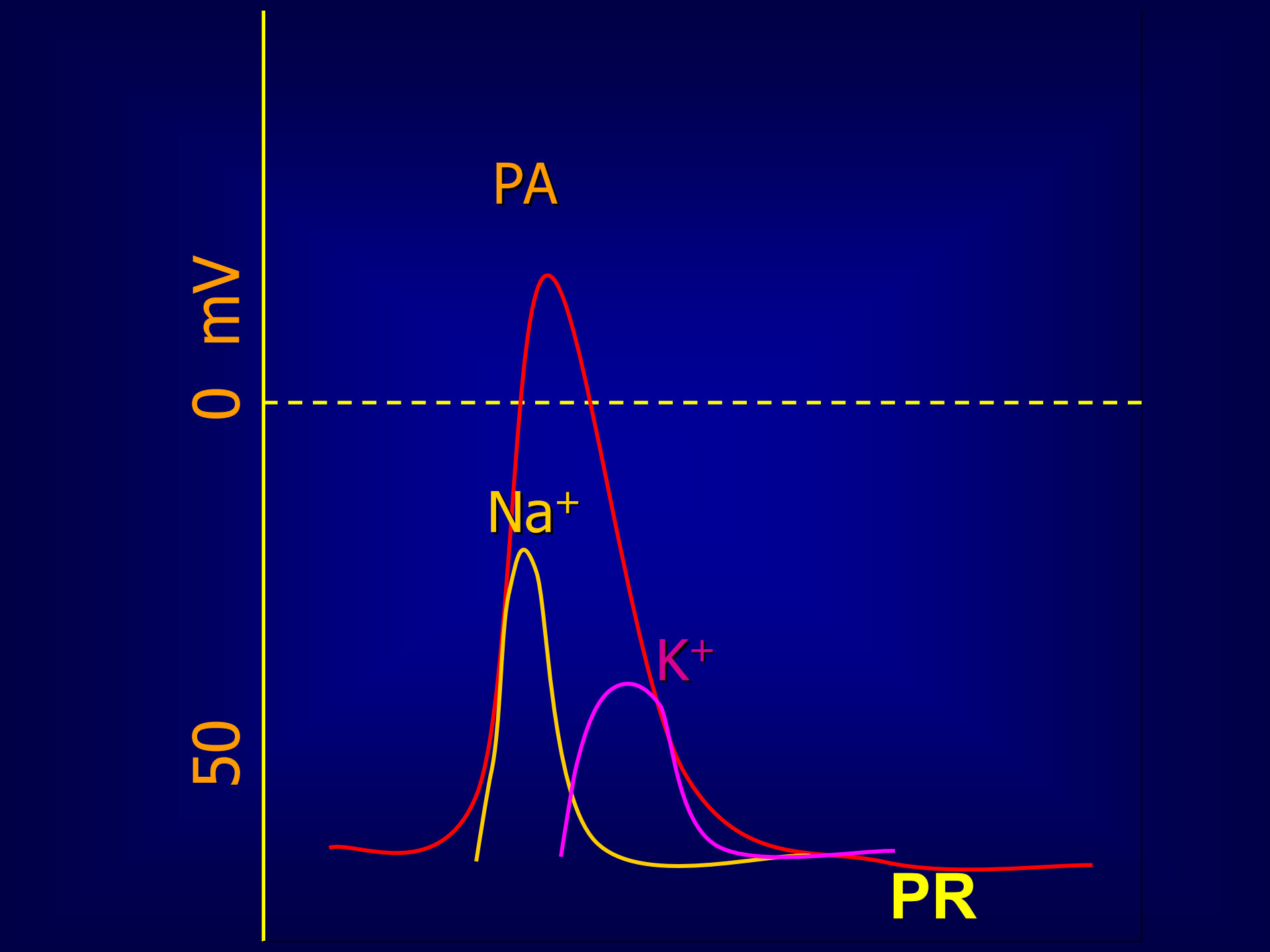
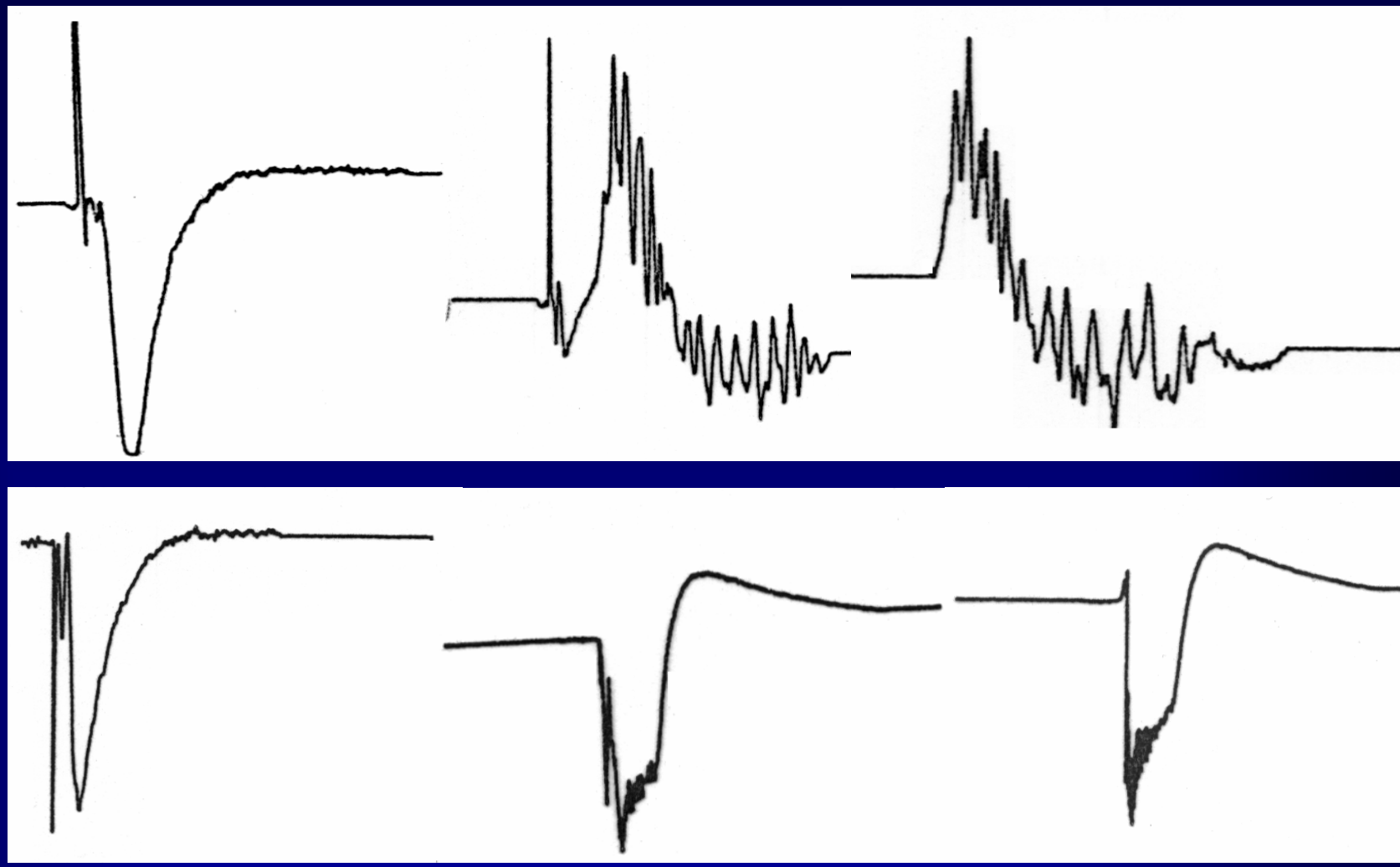
knowledge based society

Distribuția sarcinilor electrice

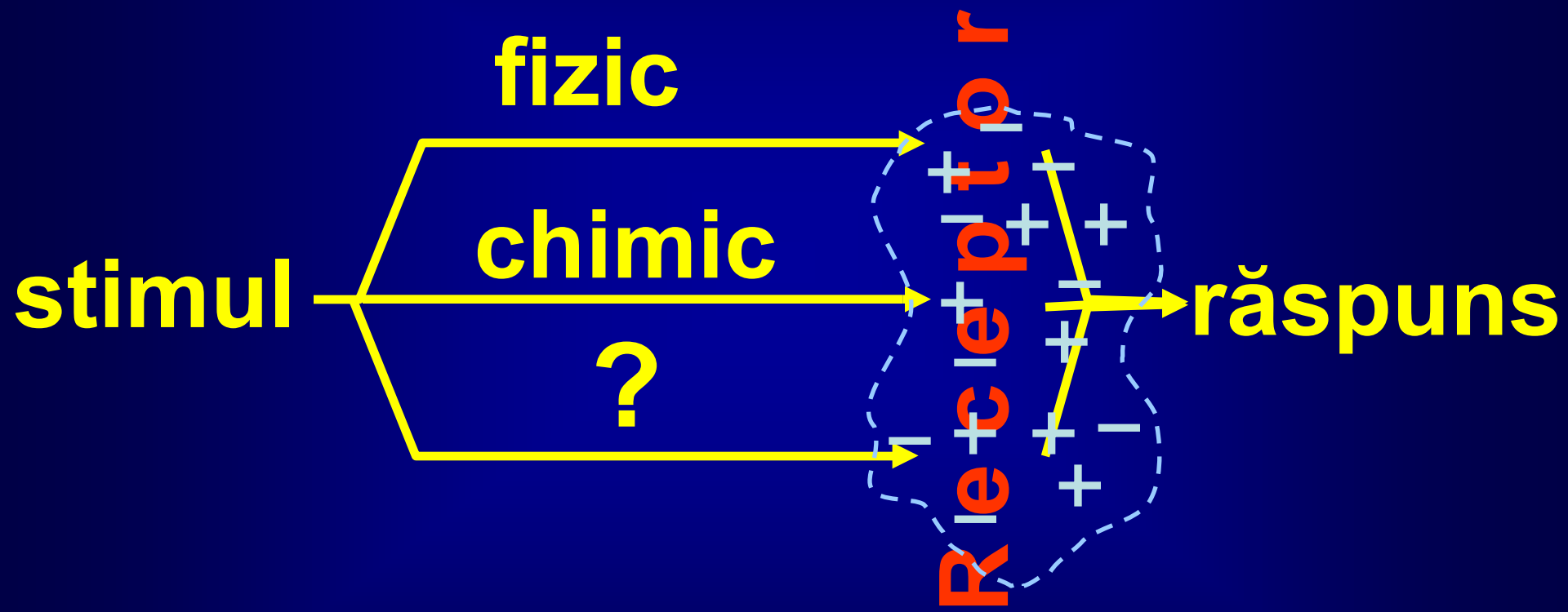



PA
0 mV
50
Na+
K+
PR


Kainat
200 nM, CA3
Bicuculină
20 μM, CA3
CONTROL
CRIZĂ EVOCATĂ
CRIZĂ SPONTANĂ

Bicuculina

Interacțiunea stimul - receptor



The EMBO Journal Vol. 22 No. 2 pp. 216±224, 2003

Absence epilepsy and sinus dysrhythmia in mice lacking the pacemaker channel **HCN2**

Andreas Ludwig[1,2], Thomas Budde[3],Juliane Stieber[1], Sven Moosmang[1],Christian Wahl[4], Knut Holthoff[5],Anke Langebartels[6], Carsten Wotjak[7],Thomas Munsch[3], Xiangang Zong[4],Susanne Feil[1], Robert Feil[1], Marike Lancel[6],Kenneth R.Chien[8], Arthur Konnerth[5],Hans-Christian Pape[3], Martin Biel[4] andFranz Hofmann[1]

We and others recently identified a family of four homologous hyperpolarization-activated cation channels, termed HCN1-4, by molecular cloning

Eur J Neurosci. 2004 Jun;19(11):2977-83.

Phasic bursts in rat magnocellular neurosecretory cells are not intrinsically regenerative in vivo.

Brown CH, Bull PM, Bourque CW.

…we conclude that phasic bursts are nonregenerative in vivo but rather require continued excitatory synaptic input activity superimposed upon a subthreshold plateau potential to sustain burst activity.

NATURE REVIEWS NEUROSCIENCE VOL.5, JANUARY 2004

BURST FIRING IN SENSORY SYSTEMS

Rüdiger Krahe and Fabrizio Gabbiani

Neurons that fire high-frequency bursts of spikes are found in various sensory systems. …bursts are often thought to represent a distinct mode of neuronal signalling. The firing of bursts in response to sensory input relies on intrinsic cellular mechanisms that work with feedback from higher centres to control the discharge properties of these cells. …These results provide strong evidence that bursts have a distinct function in sensory information transmission.

Clasificarea medicamentelor anticonvulsivante (antiepileptice)

1. Modulatori canale ionice
2. Stimulatori ai inhibiției sinaptice
3. Inhibitori ai sinapselor excitatorii
4. Inductori ai acidozei cerebrale
5. Medicamente cu mecanism de acțiune necunoscut

1. Modulatori canale ionice

-inhibitori canale de Na^+ voltaj – dependente:

- fenitoin
- lamotrigine
- ac. Valproic
- carbamazepin
- topiramat

1. Modulatori canale ionice

-antagonişti canale de Ca^{++} voltaj – dependente:

- trimetadionă
- dimetadionă
- verapamil
- flunarizine
- levetiracetam

-agonişti canale de K+

- Reticabine

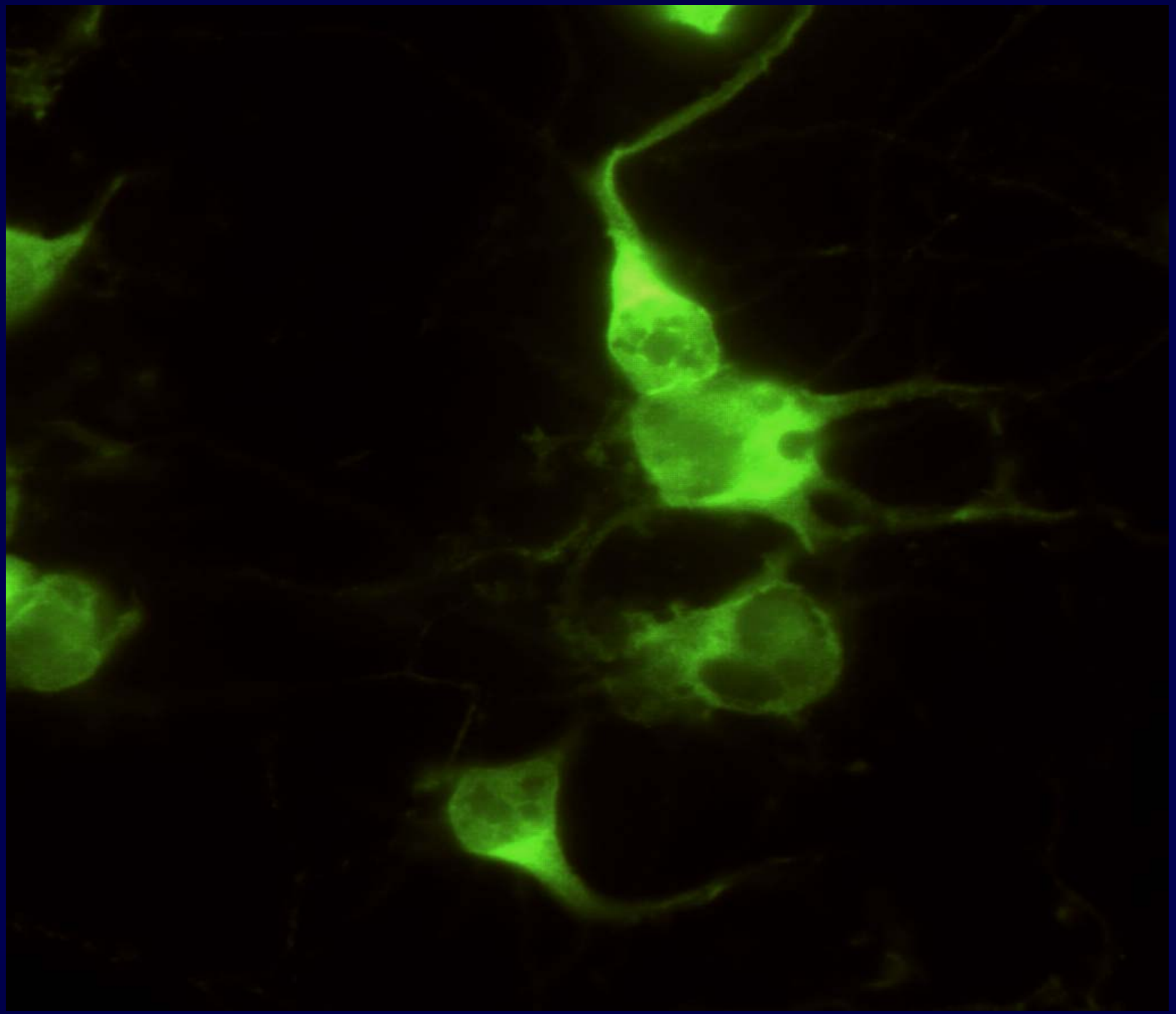
2. Stimulatori ai inhibiției sinaptice

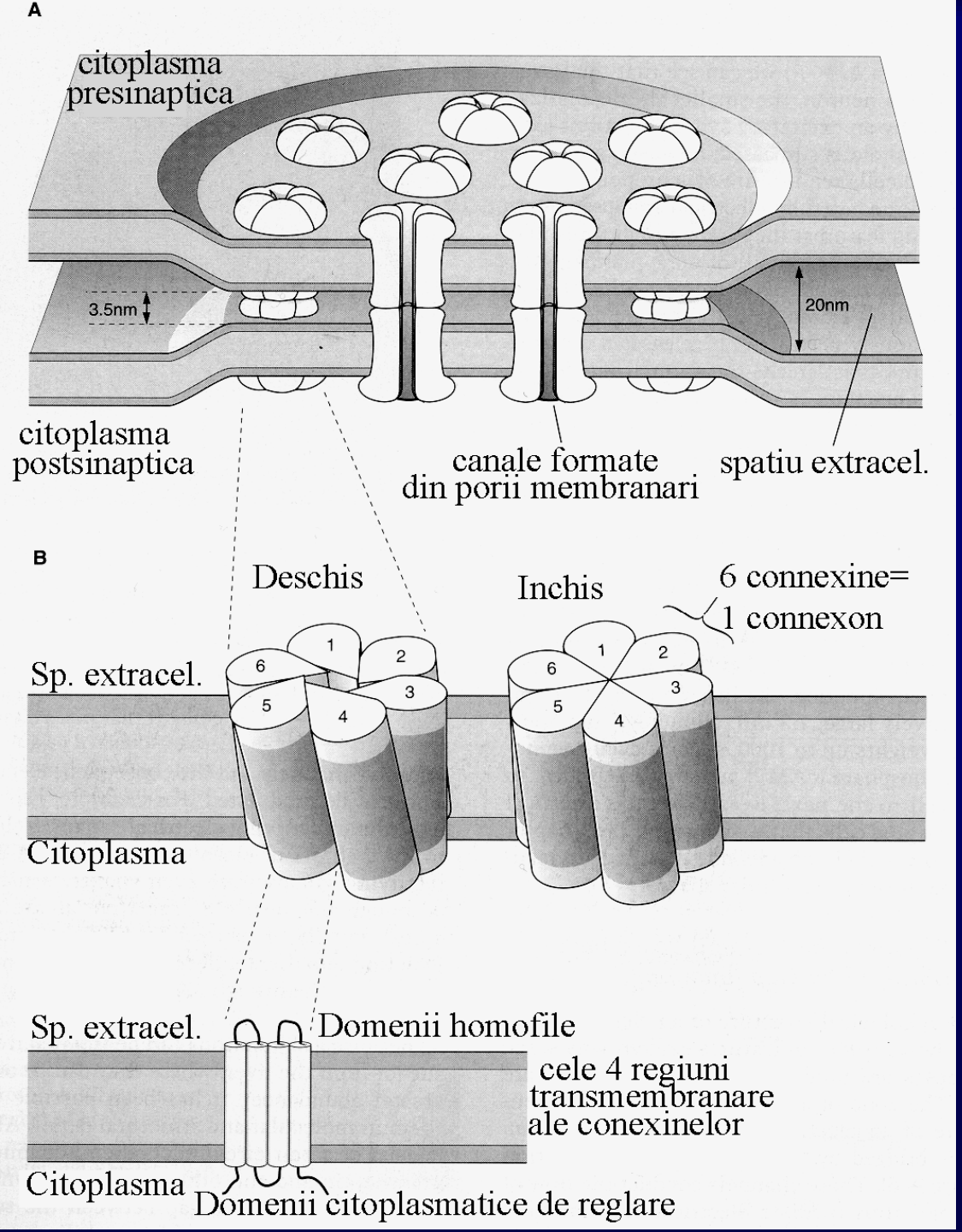
fenobarbital
benzodiazepine
gabapentin
felbamat (deprimă transmiterea NMDA)

4. Inductori ai acidozei cerebrale

acetazolamida
sulthiame
zonisamide
topiramate
amiloride

Dieta cetogenă ?



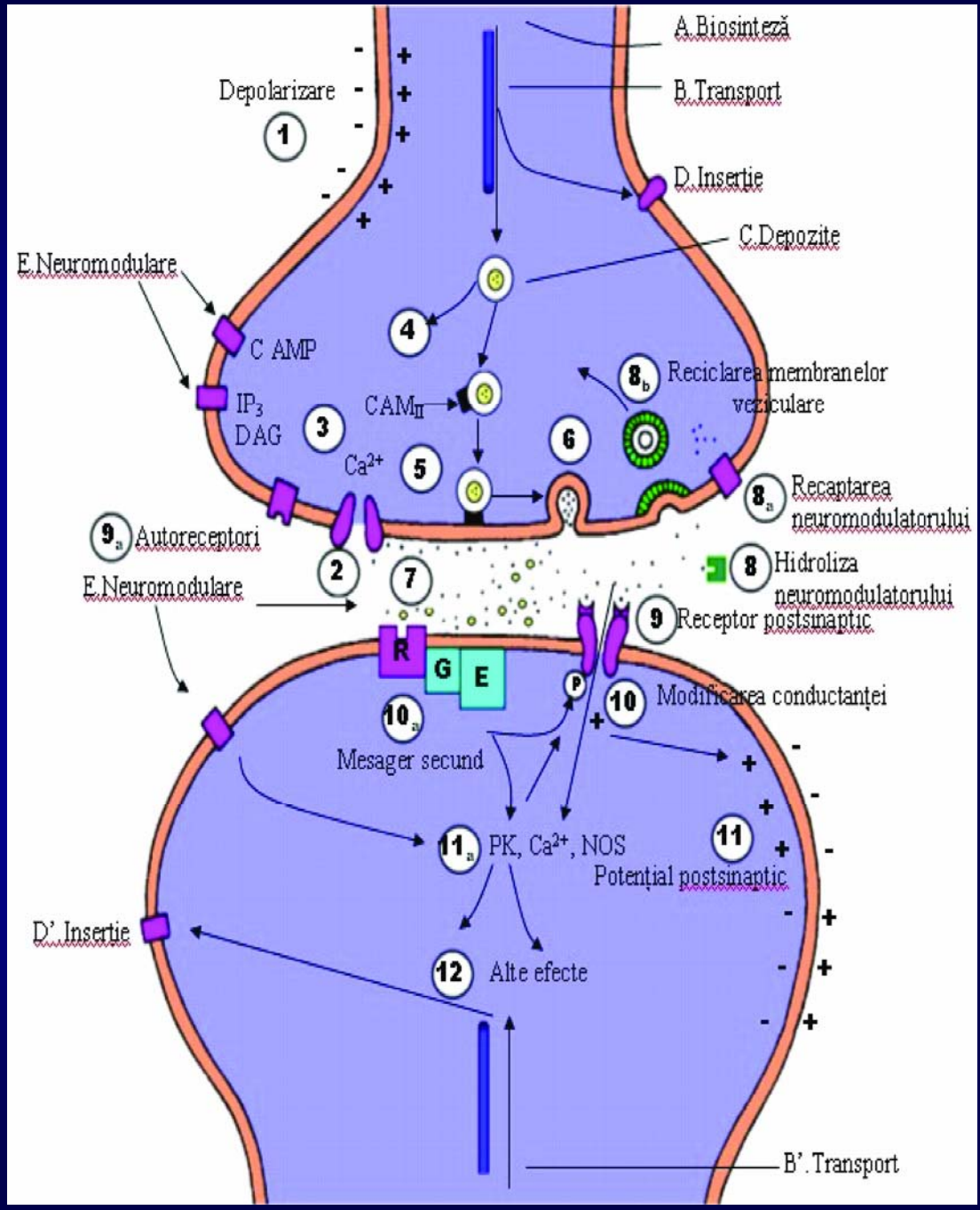


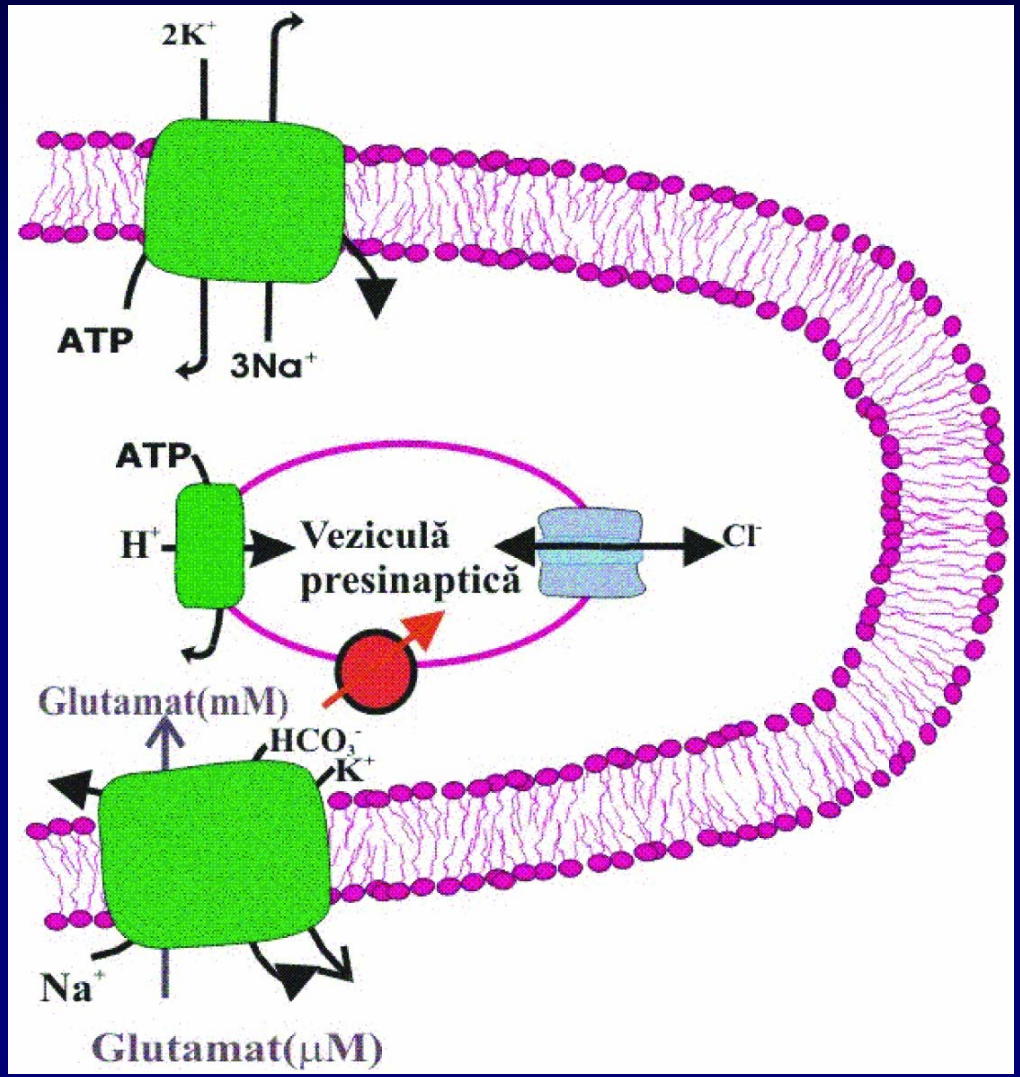
Un model tridimensional al sinapsei electrice:

A. Secţiune prin sinapsă. Fiecare din cele două membrane conţine câte o jumătate din canalul sinaptic.

B. Conformaţia conexonului variază cu starea închis/deschis.

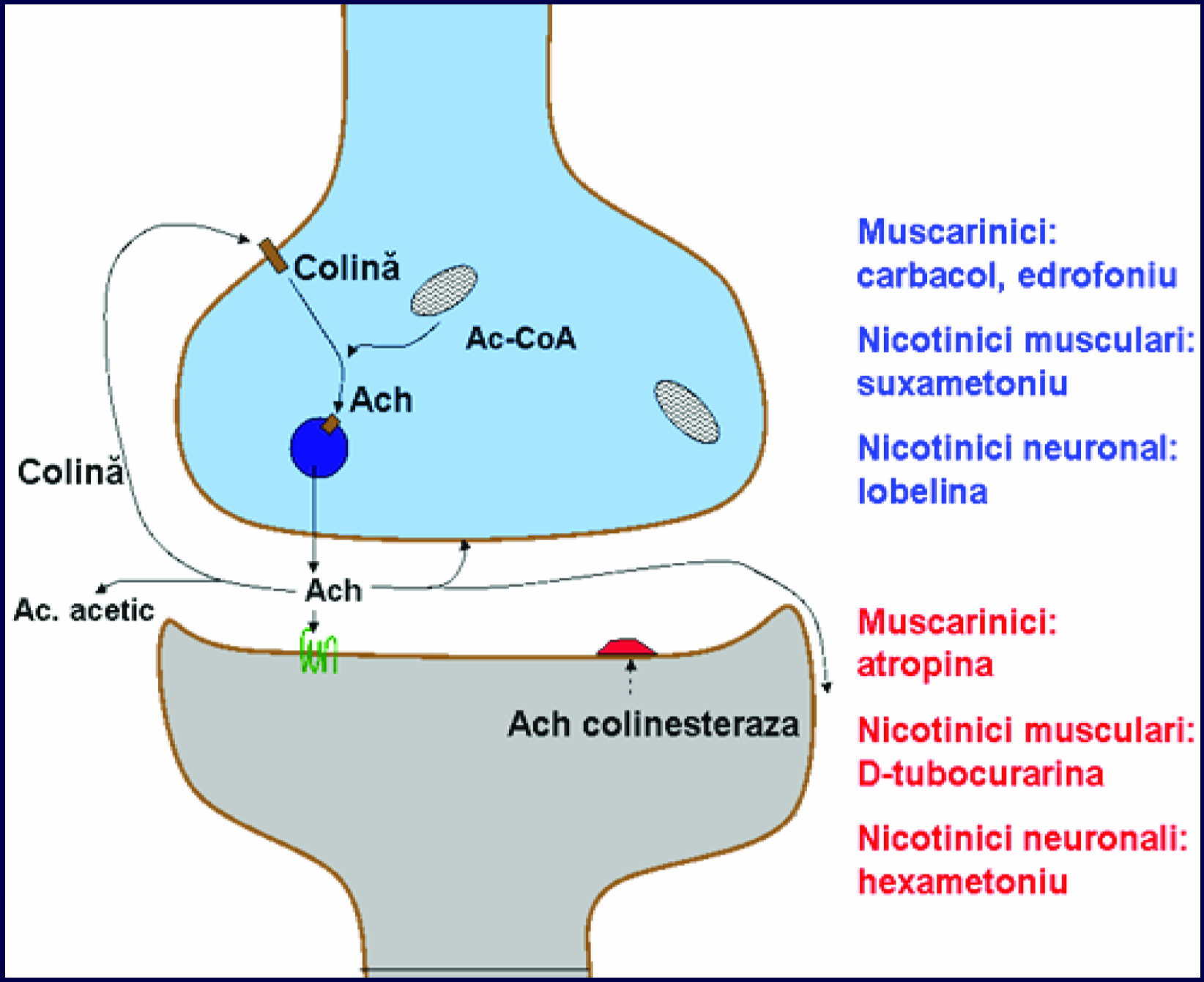
Schema generala a sinapsei chimice

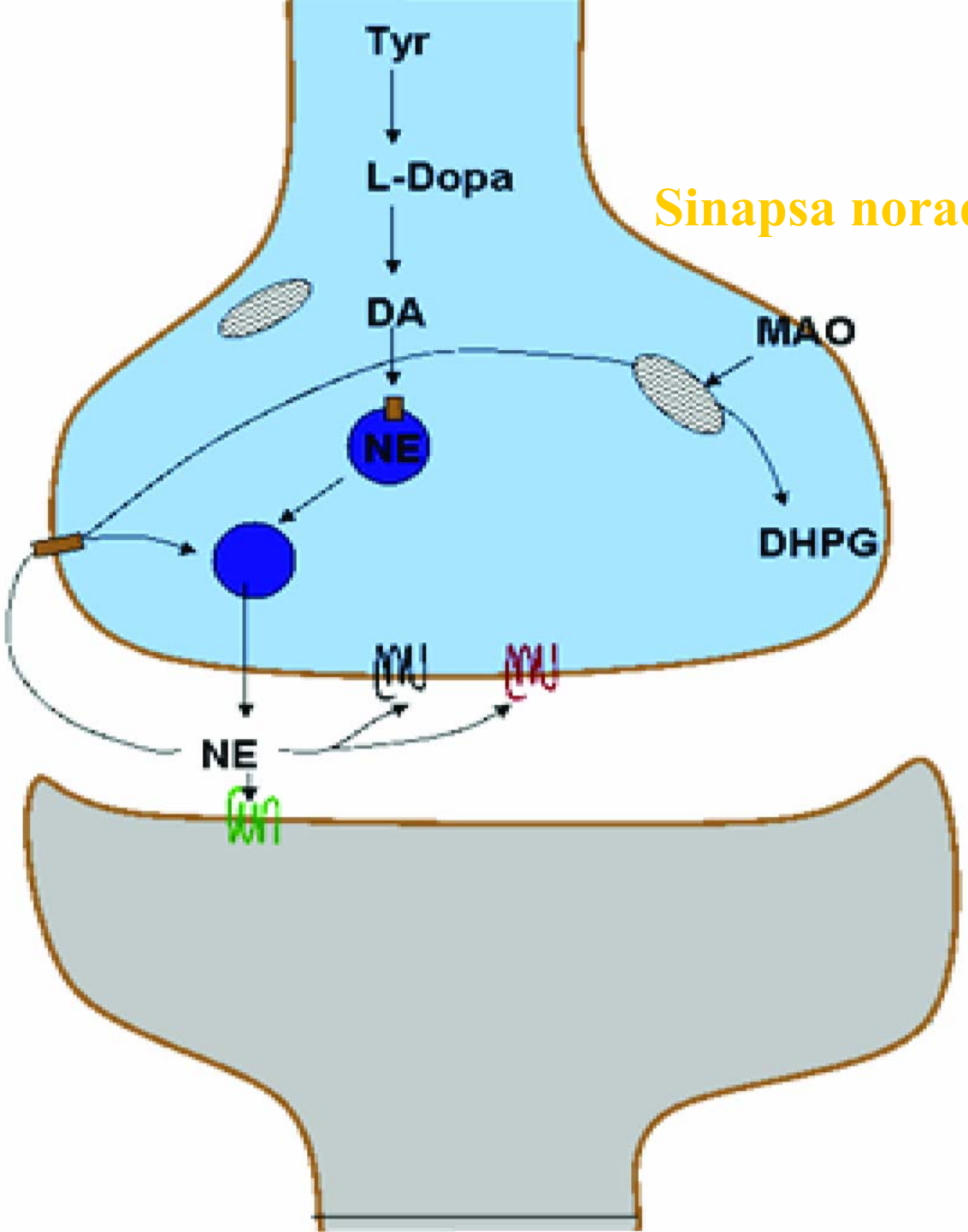




Transportori sinaptici

Sinapsa colinergica

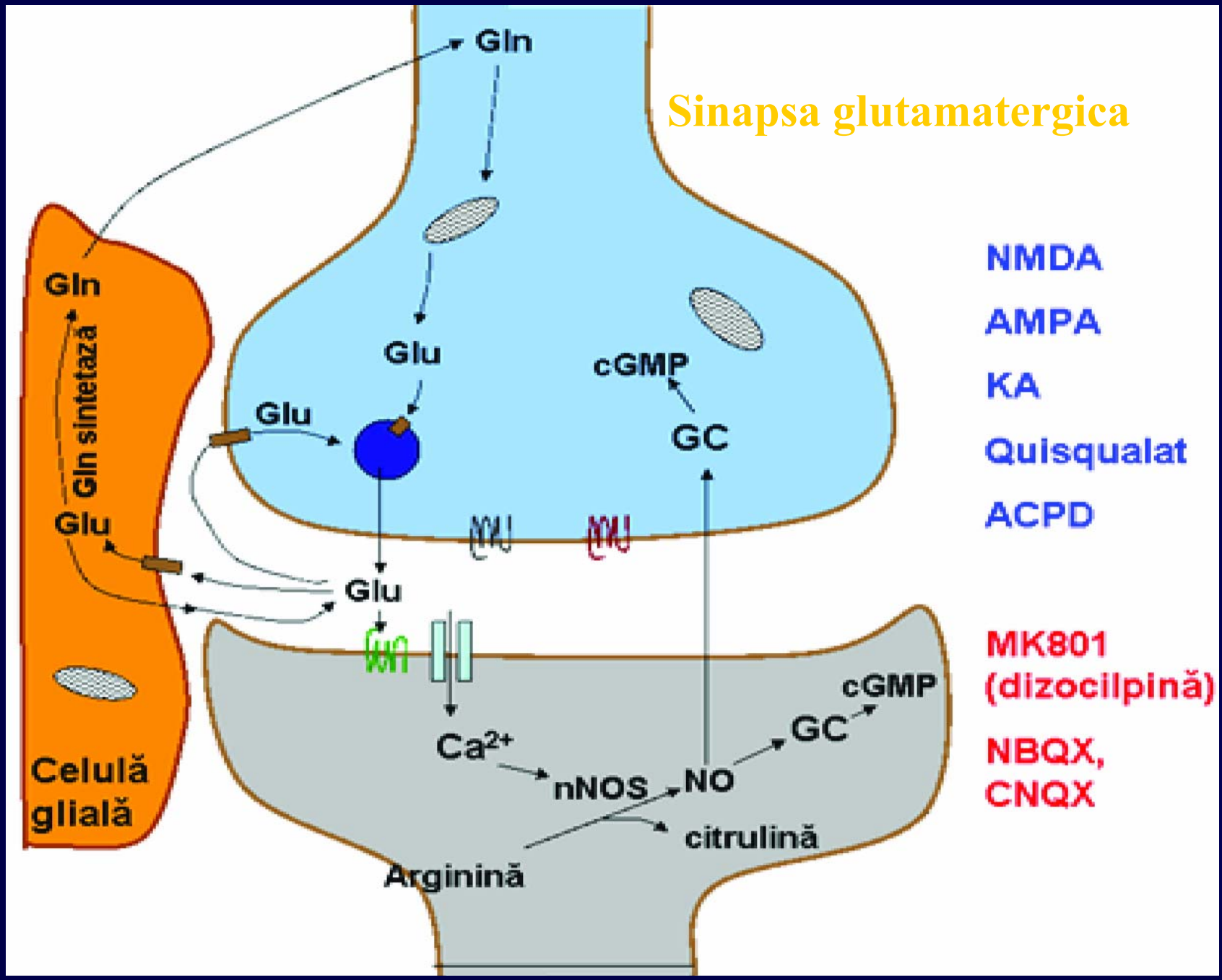




Sinapsa noradrenergica

Izoprenalina (β)
Dobutamina (β1)
Salbutamol (β2)
Metoxamina (α1)
Clonidina (α2)

Ergotamina (>α1)
Fentolamina (>α2)
Propranolol (β)
Metoprolol (β1)
Butoxamina (β2)


Sinapsa glutamatergica
Gln
Gln
Gln sintetază
Glu
Glu
Glu
Glu
cGMP
GC
NMDA
AMPA
KA
Quisqualat
ACPD
MK801
(dizocilpină)
NBQX,
CNQX
Ca2+
nNOS
NO
GC
cGMP
citrulină
Arginină
Celulă
glială

Sinapsa chimică