



Bob Eisenberg <bob.eisenberg@gmail.com>

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## Transporters

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**Bob Eisenberg** <beisenbe@rush.edu>

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Reply-To: beisenbe@rush.edu

To: Allen Zzy-Leng Horng 2 <tlhorng123@gmail.com>, Bob Eisenberg <beisenbe@rush.edu>

Dear Allen

I have an idea how (NON ATP driven) transporters might work.

Would you like to run a few 1D calculations to check out my ideas?

Key idea

- a) transporters have SMALL currents
- b) transporters have current that goes DOWN when the concentration the current is flowing into is decreased. This is the opposite of channels. There, a decrease in "trans" concentration (concentration current is flowing into) increases the driving force and increases current
- c) transporter flux of one ion is more or less proportional to the flux of another ion (they are "coupled")

My idea

consider an entirely hypothetical Na Cl or KCl transporter.

Make a channel which has large positive fixed charge in a collar on one side of the channel. Then a region with zero fixed charge. Then a region with large negative fixed charge on the other side.

This will not pass much current since only the co-ions can move. The flux of Na will be coupled to that of Cl by Kirchoff's law (I think).

I do not know about the concentration dependence.

What do YOU think?

As ever  
Bob

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Return Address for email: [beisenbe@rush.edu](mailto:beisenbe@rush.edu)  
but [bob.eisenberg@gmail.com](mailto:bob.eisenberg@gmail.com) works better sometimes

Bob Eisenberg (more formally: Robert S. Eisenberg)

Bard Endowed Professor and Chairman

Dept of Molecular Biophysics & Physiology  
Rush University  
1653 West Congress Parkway  
Chicago IL 60612 USA  
Office Location: Room 1291 of  
Jelke Building at 1750 West Harrison

**Email [beisenbe@rush.edu](mailto:beisenbe@rush.edu)**

Voice: +312-942-6467

FAX: +312-942-8711

Alternative email: [bob.eisenberg@gmail.com](mailto:bob.eisenberg@gmail.com)

Skype name **beisenbe**

Department WebSite: <http://www.phys.rush.edu/>

Personal WebSite:

<http://www.phys.rush.edu/RSEisenberg/>

Bob FAX to Email: [1 801 504 8665](tel:18015048665)

Wife Ardyth FAX to Email: [+708-455-8542](tel:+7084558542)

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