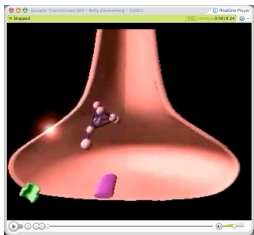


MEDIA REVIEW

***Synaptic Transmission: A Four Step Process* by Betty Zimmerberg**

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As evidenced by *Synaptic Transmission: A Four Step Process*, if a picture is worth a thousand words, three-dimensional animations are practically priceless. Dr. Betty Zimmerberg and her students at Williams College have constructed an extraordinary set of 39 color animations depicting synaptic transmission in virtual 3-D that typically run for less than 30 seconds apiece. I have had the opportunity to use the animations both as a beta tester and as a regular end-user in my undergraduate Behavioral Neuroscience course for the last two years.

The logic of the presentation and the topics chosen to illustrate fundamental concepts in synaptic transmission are perfectly suited for an introductory neuroscience course. The animations are organized into four sections or "Steps," each focusing on a different aspect of synaptic transmission: I. Synthesis and Storage; II. Release; III. Postsynaptic Receptors; IV. Inactivation. Each section includes from five to fifteen animations that guide the student through a clearly organized exposition of the processes under consideration. "Step I: Synthesis and Storage" focuses on two classes of neurotransmitter: small molecule neurotransmitters and neuropeptide neurotransmitters. "Step II: Release" includes five animations illustrating processes from calcium influx to vesicle recycling. "Step III: Postsynaptic Receptors" explores receptor function by focusing on the structure and function of ionotropic and metabotropic receptors in nine and six animations, respectively. Finally, "Step IV: Inactivation" illustrates the termination of synaptic transmission in two sets of animations focusing on enzymatic inactivation (four animations) and reuptake mechanisms (five animations).

An interesting feature of each animation set is a closing examination of the clinical implications of the topics that were considered. Topics ranging from Alzheimer's disease to schizophrenia to the action of nerve gas are discussed in some depth in the web-version of *Synaptic Transmission*. Students are sure to find the section on autism and neuropeptides particularly thorough and intriguing. My students found the animations on neurotransmitter release and postsynaptic receptors especially useful and informative. The quality of the animations used to depict vesicle fusion and second messenger processes is nothing short of breathtaking.

The animations may be accessed both through a CD that can be purchased for \$19 from Williams College (c/o Dr. Betty Zimmerberg, Department of Psychology, 18

Hoxsey St., Williamstown, MA 01267) as well as via the *Synaptic Transmission* website: (<http://www.williams.edu/imput/synapse/index.html>).

I recommend that the CD and the website be used in conjunction, particularly if an instructor intends to use the animations to supplement lecture material during a class. The vagaries of the internet may sometimes provide obstacles to seamless presentations of the animations as part of a lecture.

Several additional points should be noted when considering the two formats. Organizationally, both the website and the CD are easy to navigate. The website presents a useful map in a column appearing on the left that may be used to direct one's way through the site. The CD's opening page presents an index in a cascaded format; the user progresses through the sections sequentially (backward and forward progress with buttons; though one may go to the index at any time). Both the website and the CD present identical topics and animations, but the textual material accompanying the animations on the website is more substantive. The CD version provides both textual as well as vocal descriptions of the animations, whereas the web version only provides textual descriptions. Dr. Zimmerberg and her students are obviously aficionados of techno-pop music as the user has the option of listening to quite an arrangement of techno-pop while viewing the animations. Although I occasionally found myself snapping my fingers to the techno beat, others of us brought up on the Beach Boys, Marvin Gaye, or Tito Puente might elect to turn the music down.

Hyperlinks to relevant websites, sprinkled throughout the Four Steps, constitute another very appealing feature of the website. Unfortunately, a number of the links are no longer active. One shortcoming to be aware of is that neither the CD nor the website contains a bibliography or suggestions for further reading. Because students will presumably use *Synaptic Transmission* in conjunction with a course, the lack of suggestions for further study is certainly not a serious problem.

In *Synaptic Transmission: A Four Step Process*, Dr. Zimmerberg and her students have produced an outstanding collection of animations that dynamically reveal the mechanics underlying neural phenomena in ways that simple illustrations and verbal descriptions could never approach. I highly recommend *Synaptic Transmission* as a powerful tool to introduce undergraduates to fundamental aspects of nervous system functioning.

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