
Physiological Evidence for Quantal Transmitter Release [Abstract Only]

Bernard Katz

Phil. Trans. R. Soc. Lond. B 1971 **261**, 381

doi: 10.1098/rstb.1971.0069

Email alerting service

Receive free email alerts when new articles cite this article - sign up in the box at the top right-hand corner of the article or click [here](#)

To subscribe to *Phil. Trans. R. Soc. Lond. B* go to: <http://rstb.royalsocietypublishing.org/subscriptions>

Physiological evidence for quantal transmitter release

BY SIR BERNARD KATZ, SEC.R.S.

Department of Biophysics, University College, University of London

(Abstract only)

Electric recording from end-plates and neuronal synapses indicates that transmitter substances are secreted in minimal 'quantal' packets of large multimolecular size. Single packets are released spontaneously at random intervals. During stimulation, the same packets are discharged at much higher frequency. Following the arrival of a nerve impulse, the rate of release increases momentarily by a factor of nearly 10^6 . Present evidence suggests the following sequence: depolarization of axon membrane \rightarrow entry of calcium \rightarrow acceleration of quantal release. Two alternative mechanisms have been proposed for the discharge of transmitters in standard packets: (a) diffusion of cytoplasmic contents through a membrane gate which opens for a standard interval of time; (b) 'exocytosis' from an intracellular organelle which contains the transmitter quantum in pre-packaged form. The fact that experimental alterations of the surface membrane induce very large changes in the frequency of discharge, but not in the size, of the quantal packet favours the concept of intracellular prepackaging, and is complementary to biochemical and ultrastructural evidence which suggests that the transmitter is parcelled up in synaptic vesicles. For a review see Katz (1969).

REFERENCE

Katz, B. 1969 *The release of neural transmitter substances*. Liverpool University Press.