

## Theory of neurotransmitter release moves on

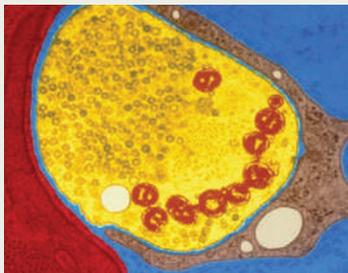
Neurobiologist Henri Korn at the Pasteur Institute in Paris published a series of papers on the dynamics of synapses (the junctions between nerve cells, pictured) that helped to establish a new field.

Korn and his co-workers' major claim was that each synaptic bouton (the terminus of a nerve cell) releases just one vesicle at a time, each containing a fairly constant number of neurotransmitter molecules. This 'one-release site/one-vesicle' theory had a string of major functional implications for synapse dynamics.

A reanalysis of their papers by Jacques Ninio, a bioinformatician at the Ecole Normale Supérieure in Paris, now questions their results.

Yet much of the research

that seems to confirm single-vesicle release itself has problems, say experts. Multiple-vesicle release has been observed in many systems, so univesicular release is at best limited to certain synapses and



activities, they add. More broadly, models of both single and multiple release are now considered too simplistic, and there is growing recognition of the great functional heterogeneity among synapses.

"Nothing that I know of has emerged in the 25 years or so since the analyses under question to confirm that such uniformity of discharge exists at the single-bouton level," says one US neuroscientist, who wishes to remain anonymous.

The focus now is on the molecular mechanisms of transmitter release, and statistical analyses can say little about this," he adds.

The field has generally moved on, but several groups still cling to such techniques, agrees John Clements, a former

neuroscientist now with Sydney-based AxoGraph Scientific, a data-analysis software firm. "Ninio's paper may help cement the paradigm shift by highlighting and cleaning out some of the historical mess." **D.B.**

London. In 2004, Ropert submitted a 25-page report to the Pasteur Institute's research integrity committee detailing allegations of "events contrary to scientific ethics". But the committee last year opted to close the matter without an independent investigation. A similar request made by Turin to the CNRS in 1989 was also not taken forward.

Ninio's challenge is dismissed in an accompanying response<sup>3</sup> by Korn, Faber and statistician Alain Mallet of the Pierre and Marie Curie University in Paris, who was a co-author on several of the papers. They criticize Ninio's approach, describing it as "qualitative assessments of second-order representations of the data".

"Although we may have made some mistakes — inherent in any scientific inquiry — none of the putative errors invalidates the major findings in our papers," they write. The research, they write, "changed the nature of the scientific discussion about structure–function correlations at synapses". They also add: "Subsequent research carried out independently by a number of eminent scientists supported our proposal of the 'One-Vesicle Hypothesis'."

*Nature* has obtained the referees' reports on Ninio's paper. One referee comments that Ninio "demonstrates convincingly" that claims in some of Korn and his colleagues'

papers are unsupported. They "are at best erroneous, and at worst deliberate falsifications of the results of the mathematical analysis", the referee alleges. The second referee's report argues that Ninio raises "a disquieting number of discrepancies" and that Ninio "ventures to say what many experienced observers have politely evaded: that at least one of the emperors of French neuroscience has no clothes".

**"The 'sheep' mentality is alive and well even at the summits of neuroscience."**

*Nature* put these allegations and referees' comments to Korn, who says he answered the scientific queries raised by Ninio in his published response.

But that rebuttal is "unconvincing, though artful", claims Paul Adams, a neurobiologist at Stony Brook University in New York. "Ninio did the best he could in view of the fact that he did not have access to the original data." Adams describes the Ninio paper as "very useful", saying that published discussions of this issue have not been as sceptical as they should have been. "The 'sheep' mentality is alive and well even at the summits of neuroscience," he says. ■

**Declan Butler**

1. Ninio, J. *J. Neurophysiol.* **98**, 1827–1835 (2007).
2. Korn, H. *et al. Science* **213**, 898–901 (1981).
3. Mallet, A. *et al. J. Neurophysiol.* **98**, 1836–1840 (2007).

## ON THE RECORD

**"The American people, our friends, and our potential adversaries must be confident that the highest standards are in place when it comes to our nuclear arsenal."**

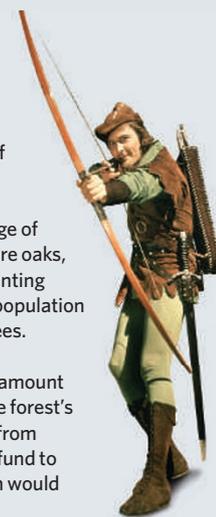
Ike Skelton, chair of the House Armed Services Committee, reacts to the news that B52 bombers accidentally flew nuclear warheads over several states last week with some comforting, yet also strangely chilling, words.

## NUMBER CRUNCH

**5** is the average number of oak trees now succumbing to old age each year in Britain's Sherwood Forest, home of the fabled Robin Hood.

**300** is the minimum age of most of the forest's mature oaks, because of a hiatus in planting that has left the forest's population skewed towards older trees.

**£50 million** is the amount (US\$100 million) that the forest's managers are asking for from Britain's national lottery fund to plant more trees — Robin would surely have approved.



## SCORECARD

**Smile recognition**  
Japanese companies  
**Omron and Sony** have both developed camera software that can recognize smiling and laughing faces.

**Video games**  
A rare breed of beetle is in danger of being wiped out from its habitat in Turkey after a video game called *Mushiking* ('Insect King') sparked a Japanese craze for the real-life version.

## WORDWATCH

**Dino-Opoly**  
With Christmas fast approaching (sort of), a reworking of the classic board game Monopoly aims to combine the thrill of palaeontology with the magic of capitalism.

Sources: *Forbes.com*, *Reuters*, *The Japan Times*, *AFP*, *The Times*, *LiveScienceStore.com*