Research Highlights

Vesicular Neurotransmitter Transporters: Review article on novel approach by "Clean Biochemistry".

Vesicular storage and subsequent exocytosis of neurotransmitters are the key processes of chemical transmission. Vesicular neurotransmitter transporters play an essential role in this process and are responsible for loading the signaling molecules into secretory vesicles.

Although techniques such as gene disruption and gene targeting enabled us to conduct detailed analysis of the physiological functions of the vesicular neurotransmitter transporters, the molecular mechanisms of the vesicular loading are still not well understood because of the lack of innovative techniques to measure transport activity. Currently, heterologous expression in *Xenopus* oocytes and mammalian cells is widely used to measure the transport activity. However many factors such as presence of other proteins, targeting errors, difficulties to control driving forces, and the concentration of transporters hampers quantitative assays.

To resolve these problems, Hiroshi Omote and Yoshinori Moriyama developed the novel approach known as 'clean biochemistry', which includes overexpression of wild and mutant recombinant transporters in insect cells or bacteria, purification, and reconstitution in liposomes. Yoshinori's measurement of the activity of all transporters under any type of driving force, providing a powerful tool for indentifying novel vesicular transporters and for analyzing the molecular mechanisms of these transporters in detail. Successful applications of this approach are described in the paper and the authors believe that 'clean biochemistry' may open new fields in chemical transmission.

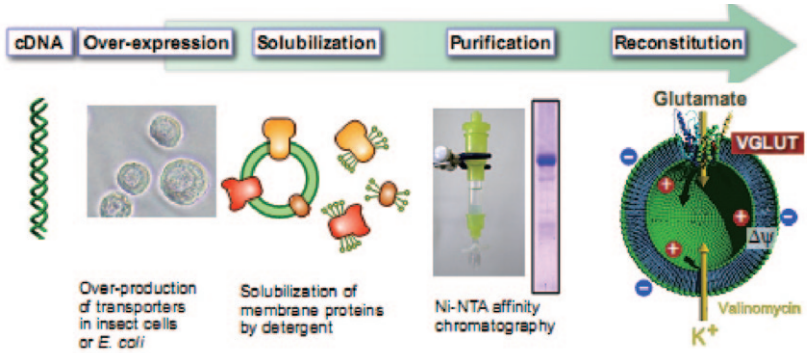

Figure : The 'clean biochemical' approach

Reference:

- Authors: Hiroshi Omote and Yoshinori Moriyama
- Title of original paper: Vesicular Neurotransmitter Transporters: An Approach for Studying Transporters With Purified Proteins
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