

The Journal of Biological Chemistry commemorates an important 1987 discovery

November 19 2012, by Danielle Gutierrez

It has been 25 years since the identification of two proteins that facilitate communication between nerve cells – a significant achievement that revealed a group of related proteins. In recognition of this advancement, the *Journal of Biological Chemistry* has published a series of articles that assess what we know about each family member in this group and where that research is headed.

This superfamily was recognized in 1987 with the discoveries of the genes that encode two of its members, the GABA_A and glycine receptors, and of the similarity of these proteins to the first characterized family of this group, nicotinic acetylcholine receptors. F. Anne Stephenson of the University College London School of Pharmacy, an author on one of the two 1987 articles, explains that these findings, in addition to revealing the new superfamily, led to the discovery of multiple protein subtypes within each family. Since that time, two other protein families have been added to the group – the serotonin-3 receptors and the glutamate-gated chloride [ion channels](#).

Proteins in this group, known as the cys-loop ligand-gated ion channel superfamily, are targeted by specific [biological molecules](#) (neurotransmitters) to allow the passage of ions across cell barriers, ultimately affecting functions such as [muscle contraction](#), anxiety, pain, vision and food digestion and passage. For example, mutations in GABA_A receptor subunits are involved in some forms of epilepsy. Also, certain anti-anxiety drugs target these receptors, and drugs that affect serotonin-3 receptors treat the [nausea and vomiting](#) associated with

chemotherapy and [irritable bowel syndrome](#).

The JBC series chronicles the history of this field, highlighting the many advances scientists have made over the past 25 years. Each review focuses on a different member of the group, covering its structure, regulation and functions. The roles of some of these proteins in diseases and therapeutics are also discussed.

Since 1987, scientists have overcome major challenges and learned where particular protein subtypes of a family are located and what functions they perform. Stephenson emphasizes that the advancements in this field were a boost for the pharmaceutical industry in terms of finding selective drugs that lack undesirable side effects, such as non-sedating anti-anxiety drugs.

The JBC series was convened by Stephenson, who today is an associate editor of the journal and whose lab continues to investigate the structures and functions of neurotransmitter receptors, including the GABA_A receptors, in health and disease.

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