A Primer on Glycobiology

GLYCOBIOLOGY: The Study of Sugar Nutrients

Glycobiology is the study of "sugar." However, not the kind of sugar you are most familiar with!

Harper's Biochemistry textbook has a chapter dedicated to this subject, but it has only been taught in medical school since 1996. It is so new that most doctors and other healthcare professionals know nothing of its existence—let alone the tremendous impact it is having in the lives of many hundreds of thousands of people.

There are approximately two hundred simple sugars found in nature but only eight are normally found surrounding every cell in the body. They include:

- mannose
- galactose
- glucose
- fucose
- xylose
- N-Acetylneuraminic Acid (Sialic Acid)
- N-Acetylgalactosamine
- N-Acetylglucosamine

These sugars are found in mother's breast milk. While there are enzymes in human tissue that can make these sugars from glucose, Harper's Biochemistry states,

"there is evidence that the other sugars may be beneficial in some circumstances when added to the diet. This has led to the development of glyconutrient supplements containing either members of the sugars listed in Table 46-4 (excluding glucose) or precursors of them."

Since so much of these sugars are processed out of our modern, highly-refined diet, or missing due to green harvesting, it is our experience that the addition of these types of sugars can have extremely positive effects on the human immune system and overall well-being.
Glyconutrients Are VITAL for Proper Body Function

While glyconutrients do not treat specific disease states, they do allow for the cells to send proper messages within the body. When your cells can do the job they were designed to do, it's amazing what the body is capable of doing. Our bodies know how to make corrections and restore proper functioning, given the raw materials they need. It seems so simple and yet so profound. These critical nutrients are like the vowels in our alphabet. If we just took out a few of the vowels and you tried to read this page you would have trouble. That is very much like what these particular sugars do. They are like the vowels in the communication system of our body. When they are in abundance they allow the communication to take place properly. When that happens the body understands what to do and how to direct the immune system to do its job.


The NAS noted a “widespread lack of understanding and appreciation of glycoscience in the scientific and medical communities and among the general public.” They noted that every living cell on the planet (human, animal, plant, and microbe) have these sugars (glycans) surrounding them and that every molecule, cell, or organism that interacts with a cell must do so through these sugars. In addition, “every disease that affects humans significantly involves these glycans.” They concluded that “integrating glycoscience into relevant disciplines in high school, undergraduate, and graduate education” was imperative towards increasing public awareness and professional expertise.

In 1983 Dr. Bill McAnalley, a pharmacologist, in his search for the primary component in Aloe Vera that promotes rapid healing in the body, discovered this to be a long-chain sugar molecule called Mannose (glyconutrient). This initial scientific breakthrough later led to the discovery that there are 8 glyconutrient sugars required in diet to promote cell to cell communication which turns out to be crucial to the support of a healthy immune system.

These glycans, or glyconutrients, were discovered by Dr McAnalley when he was attempting to locate the active ingredient in aloe vera. It took several years for his research to gain momentum, but the outcome continues to resonate around the scientific world, according to the Glyconutrients Reference website. It took a number of years for Dr McAnalley to establish that the active ingredient in aloe vera was a very complex sugar consisting of a matrix of innumerable mannose sugar molecules.

Once the mannose was stabilized it was possible to extract it. From this study came one of the more resounding breakthroughs of modern times: how living cells interact with each other. As reported in a 1990 editions of the "Glycobiology Journal" and the "Journal of Biotechnology," this interaction was shown to be cell surface carbohydrates.

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There is only one research and development company that has successfully incorporated 8 glyconutrient sugars into one patent protected supplement. Dr McAnalley has developed two core products that incorporate these 8 glyconutrients for Mannatech, Inc. an international Dallas-based company. The product is distributed in 23 countries.

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\(^1\) (p. 524, italics added)