Enzyme Deficiencies: Missing parts in our machine

Enzymes control all critical chemical reactions, from energy production to blood clotting. Their dysfunction is the cause of many serious and even not-so-serious medical conditions. For example, most people are familiar with lactose intolerance, a condition in which ingesting milk and milk products causes great digestive distress. The problem is caused by a deficiency in the enzyme *lactase*, which breaks down lactose (milk sugar). Lactose is a combination of two simple sugars: glucose and galactose. Normally, these simple sugars can be absorbed into the bloodstream after lactase divides lactose to liberate them, but lactose as a whole cannot be absorbed through the intestinal wall. Without the enzyme lactase, the accumulation of lactose in the intestines attracts water and causes the diarrhea associated with this condition. The unused lactose then becomes food for the intestinal bacteria, which may produce gas and discomfort. It is not a life-threatening enzyme deficiency like hemophillia, but a very unpleasant situation for someone only missing one out of 10,000 of their normal enzymes.