Pancreatic Enzymes: Not Just for Digestion

by Linda L. Isaacs, MD

You may have heard of enzymes before or had them recommended to you by a health practitioner to improve your digestion. But do you know what they are, how they have been used historically to improve health, and how they can help you in other ways?

WHAT ARE ENZYMES?

Enzymes are proteins made by a living being (animal or plant) to initiate chemical reactions that would not occur without them. For example, if you mix starch into water, then add the enzyme amylase by spitting into the solution, the starch is broken down into glucose. But without the enzyme, the change will not occur; the starch will just sit there.

Plants and animals have many different enzymes to manage all the chemical reactions that make life possible. Each type of enzyme is specific for a certain kind of chemical and/or reaction. Using our example above, starch fits neatly into a specific area in the amylase enzyme. The amylase then changes its shape, turning the starch into glucose as it does so. As the glucose is released from the starch, the amylase goes back to its original shape, waiting for the next starch molecule to come along.

Here are the major classes of enzymes made by the pancreas and then secreted into the intestine to digest food:

- Protease: breaks down proteins (trypsin and chymotrypsin are examples)
- Amylase: breaks down starch
- Lipase: breaks down fat

Early investigators called digestive enzymes "ferments," because they recognized the similarities between fermentation and the actions of digestive enzymes. In fermentation, enzymes produced in microorganisms change the properties of food. Mankind was fermenting food for millennia, making beer, yogurt, and sauerkraut, before the underlying mechanisms were discovered.

USE FOR DIGESTIVE DISTURBANCES

As might be expected, once the existence of digestive enzymes was established, preparations of them were used for digestive disorders. The 1892 book *Fairchild's Hand-Book of the Digestive Ferments* describes a number of preparations and their uses for complaints referred to as dyspepsia and intestinal indigestion.[1]

In current medical practice, pancreatic enzyme supplementation is typically reserved for patients with overt pancreatic insufficiency, caused by damage to the pancreas from cystic fibrosis or chronic alcohol overuse. These patients lose weight because they cannot digest their food properly, especially fat. They report loose stool with an oily character, and pancreatic insufficiency is usually easy to confirm by laboratory testing.

However, various investigators throughout the 20th century studied whether enzyme supplements could help with milder digestive symptoms, such as distension, bloating, and gas after meals. In a 2018 article, the authors reviewed 60 years' worth of such studies and concluded that there is good reason to believe that enzyme supplementation can be helpful for these conditions.[2]

RATIONALE FOR USE IN CANCER

While I recommend that enzymes be taken with meals to aid digestion, the main thrust of

the work I do involves utilizing them in the management of cancer. In the early 20th century, John Beard, DSc, Professor at the University of Edinburgh, was the first to propose that pancreatic enzymes could play a role in cancer treatment. His theory had its roots in his own field, embryology, the study of the very early stages of life. Many before him had noted that cancer under the microscope looks much like the cells of the developing embryo.

Beard suggested that cancer arises from a very specific type of embryonic cell, the trophoblast, the early stage of the placenta. The trophoblast's job is to create a firm anchor between mother and baby, and a blood supply for the exchange of nutrients and wastes. The trophoblast invades the maternal womb, acting much like cancer, which also invades tissue and creates a blood supply. But there is one key difference between cancer and the trophoblast: cancer keeps invading, but the trophoblast stops. At a certain point early in the pregnancy, the trophoblast changes from an invasive tissue into the mature placenta. Beard found that in a number of species, this change took place when the baby's pancreas began making proteolytic enzymes—months before they would be needed to digest food.[3]

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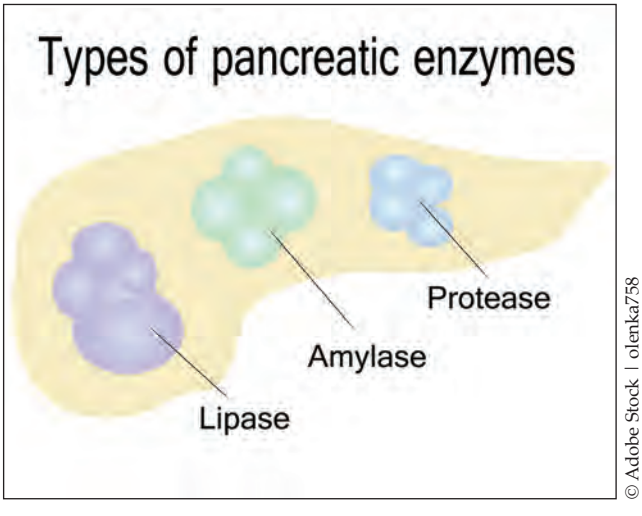
Pancreatic enzymes were subsequently tested in a mouse model of cancer, then tried in humans, with some successes and some failures. In his 1911 book, *The Enzyme Treatment of Cancer and Its Scientific Basis*, Beard exhaustively reviewed these early cases, along with the wide variation in the quality of available enzymes that explained why sometimes the treatment was unsuccessful.[4] But the medical world decided that Beard was wrong, and by the time he died in 1924, interest in his work had gradually trickled away to almost nothing.

CLINICAL RESULTS

Over the following decades, a few physicians heard of Beard's theories and implemented cancer treatment with proteolytic enzymes.[5,6] In the 1950s and 1960s, Franklin L. Shively, MD, a surgeon in Ohio, administered various pancreatic enzymes, purified by the methods available at the time, intravenously to cancer patients. In response, in 1964, the Food and Drug Administration outlawed intravenous and injectable enzymes, so Shively stopped his work, turned his research notes into a book, *Multiple Proteolytic Enzyme Therapy of Cancer*, and sent copies free of charge to medical libraries throughout the United States.[7,8]

Shively described multiple cases where masses or fluid collections resolved. Diagnostic methods such as CT scans did not exist then, so assessments were based on physical examination only. Sometimes, after an initial success, the treatment was stopped and then the disease recurred, suggesting that neither Shively nor the patient understood that maintenance therapy might be needed to keep the disease under control.

Around the time Shively's work was ending, in Texas, William Donald Kelley, DDS, was told he had terminal cancer. He never had a formal tissue diagnosis—not unusual in the era prior to scans and needle biopsies—but he had lost



massive amounts of weight and had a tumor in his abdomen. In desperation, Kelley created a protocol for himself that included a plant-based diet and coffee enemas, as well as large amounts of oral pancreatic enzymes. When he got better, others with cancer came to him to find out how he did it, and his practice gradually migrated from orthodontics to controversial cancer treatment.

Kelley did not know of Beard's work when he started taking large amounts of enzymes; he did that to help with his digestion, and then noted a change in the tumor he could feel in his abdomen. Beard and others believed that pancreatic enzymes would be destroyed in the digestive tract if swallowed, and so had to be given by injection. But Kelley found that if the enzymes were administered away from meals, patients responded positively.

Nick found that many patients with appropriately diagnosed cancer whom Kelley had treated were still alive years after they should have died.

In the early 1980s, Nicholas J. Gonzalez, MD, conducted a multi-year review of Kelley's methods and records. I met Nick Gonzalez while he was in the middle of this project, and the cases he found in Kelley's files convinced both him and me that we needed to dedicate our careers to following up on these methods. As an example, one of Kelley's patients had a hysterectomy for uterine cancer in 1969, but in 1975 she had a pelvic mass removed that was found to be recurrent disease. Multiple masses were seen on a chest X-ray, indicating spread to the lungs. She then started the Kelley program, and years later, a repeat chest X-ray demonstrated that the masses were no longer there. She died in 2009 at age 95, more than 30 years after a diagnosis that usually kills within months.

Nick found that many patients with appropriately diagnosed cancer whom Kelley had treated were still alive years after they should have died. There were far too many to be explained away as spontaneous remissions.[9] Fifty of these cases are included in Nick's monograph about Kelley's results, which is available under the title *One Man Alone*.[10]

In 1987, Nick opened a practice in New York City to recreate Kelley's methods, hoping to eventually proceed with formal research. I helped administratively for two years, took a break to finish my internal medicine training, then rejoined him in 1991. In 1993, after only six years in practice, Nick presented 25 "best cases"—patients he treated who had unusually good outcomes—to the National Cancer Institute.[11] A monograph Nick and I put together for him to hand out at the session, with details of the patients' histories and medical records, is available, entitled *Proof of Concept*.[12]

Subsequently, Nick and I completed a pilot study with 11 patients suffering from pancreatic cancer, with an 81% survival rate at one year and a 45% survival rate at two years, well above the usual statistics for this particularly dismal cancer.[13] We then embarked on a controlled clinical trial comparing our methods to chemotherapy, administered through one of the major medical centers in New York City. The academics involved published their version of the results in 2010, but their article does not mention that adherence to our arm of the protocol had been a huge problem, acknowledged by a representative of the governmental funding agency as "clouding the interpretation of the data."[14,15] While a detailed explanation of the problems with the study is beyond the scope of this article, as an example, we calculated that 11 of 38 patients assigned to the nutritional arm of the study never started or quit within seven days.

Nick and I each published our reservations about the administration and outcome of the trial, he as the book *What Went Wrong*, I as an article about trial design.[16,17] A patient of mine with appropriately diagnosed pancreatic cancer was refused entry to the trial because she technically could have undergone surgery to remove it. She followed our treatment outside of the trial and is still alive, more than 20 years since her diagnosis, never having had surgery, chemotherapy, or radiation. [See patient's story, page 9.]

After the bitter disappointment of the failed clinical trial, Nick and I returned to writing up case reports discussing patients with lengthy—and in many cases, continuing—survival.[18-21] These case reports are available as downloadable articles on my website (drlindai.com) or in book form. Since his death in 2015, I have continued this effort, publishing two more case reports in 2019.[22]

Others have used the oral enzyme product Wobe-Mugos to treat cancer; a review of studies using Wobe-Mugos has been published elsewhere.[8] Pancreatic enzymes have also been administered rectally, as described in a 2017 article that includes discussion of a series of patients with a variety of cancer types.[23] Nineteen of 46 patients reportedly survived longer than expected.

HOW THEY WORK SYSTEMICALLY: PROTEASE-ACTIVATED RECEPTORS

From Beard's time until recently, scientists believed that proteases digested food, nothing more. But with the discovery that proteases make up more than 2% of the human genome, it is becoming clear that protease systems regulate a lot of different activities in the body.[24] There is a complex web formed by proteases and other proteins that inhibit them, as the enzymes work on the different proteins that carry out the processes on which life depends.

A Patient's Story: Backpacking and Rafting at Age 69

In 1995, I was diagnosed with stage 4 non-Hodgkin lymphoma, and my brother had been diagnosed six months earlier with basically the same thing. A friend of our sister-in-law was on the Gonzalez program for pancreatic cancer and had had some success. After learning about the program, I decided that this might be the best approach for me because I really didn't want to face chemo or radiation therapy.

I went on the program in the fall of that year after meeting with Dr. Isaacs, Dr. Gonzalez' colleague. It's a program of diet, nutrition, pancreatic enzymes, vitamin supplements, and detoxification. I was put on a moderate carnivore diet—one of the approximately 50 diets that they had. I was supposed to eat lots of fatty, red meat, and mostly root vegetables.

In addition, I followed a very rigorous supplementation schedule, taking about 150 pills a day, including the pancreatic enzymes. It's a very strenuous program, but I told myself that no matter what Dr. Isaacs said to do, I was going to do it. I was thoroughly committed to the program.

When I was first diagnosed, I had all kinds of ailments and no energy whatsoever. I could barely walk a hundred yards without having to sit down and rest. But once I got on the program, I experienced improvements very quickly, and was soon back to my old self and able to do all kinds of physical activities. Within the year, I climbed one of the 14ers [mountain peaks with an elevation of at least 14,000 feet] in Colorado.

In 2001, I was still on the program, and I had a CT scan that came back "unremarkable," which means the tumors were gone. I was feeling great and performing the way I used to—and I never did any chemo or radiation.

My brother had started on the Gonzalez program with Dr. Isaacs, too. He'd had initial success, but he started questioning the protocol and doing things he shouldn't have done, and he got sick again. Due to his inability to follow the program completely, he decided to pursue another type of treatment. He underwent chemo, and he died from his cancer. A week or so before he passed away, he told me to make sure to stick with the program—that he'd made a big mistake by not following it.

Meanwhile, I continued to improve. I've had two kids since then who are now 22 years old, and the program has been a blessing to me and my family.

In 2018, I did a 917-mile backpacking trip on the Pacific Crest Trail, and I'm still very active. This year, I did a 40-mile backpacking trip and four multi-day rafting trips. It's been 26 years since my diagnosis, and I'm quite sure I wouldn't be here today if it wasn't for the Gonzalez program. I'm 69 years old, and I've had a lot of people comment on how physically active and strong and healthy I am. When I tell them I'm a cancer survivor, they just can't believe it. —*Michael M.*

Proteases can affect metabolism by their action on protease-activated receptors (PARs) on the surface of cells. These receptors exist inside the cell membrane, and have bits of protein sticking out that can be clipped off in different ways by different proteases.[25,26] The mechanisms are extremely complicated and are still being worked out; studies show that differences in concentration, the presence of inhibitors and other proteases, or repetitive treatments can modify the effects.[27,28]

PARs have been found on the surface of both cancer cells and trophoblast cells, and this may explain how proteases could have an effect on both types of cells (as Beard predicted).[29,30] Current review articles mainly state that activation of PARs stimulates cancer growth.[25,29,31] However, there is conflicting data.[32-34] In any case, the key components in the pancreas products used by clinicians in Beard's era, as well as by all the practitioners who have followed afterwards, may not be the same compounds that have been used by researchers to study PARs.[35,36]

All this says to me that orally administered pancreatic enzymes and precursors *are* absorbed.

Pancreatic enzymes such as trypsin and chymotrypsin are stored in the pancreas as precursors (for example, trypsinogen and chymotrypsinogen); otherwise, the pancreas would digest itself. In response to a meal, the pancreas secretes these precursor forms, which are then activated by other enzymes in the intestine.

Beard advised that the best product to treat cancer was an extract made from freshly minced pancreas, which would have contained enzymes in both their active and precursor forms. Shively used crystallized enzymes intravenously that were as pure as the standards of the day allowed, but the preparation methods were fairly crude by today's standards and the final product would quite possibly have included precursors.[37]

Kelley used a product made by removing the fat and water from pancreatic tissue, with the enzymes activated to a greater or lesser degree.[38] After his review of Kelley's files, Nick came to believe that Kelley's best results occurred when the product he used had more than half its potential enzymatic activity from the precursor form.[39] Nick and I designed and used a less processed pancreas product that should have had almost all of the enzymes as precursors.

In support of a wider role for enzyme precursors in physiology, I would add that trypsinogen is produced early in fetal life, well before trypsin is needed to digest food.[40] Also, precursor forms of trypsin are present in the blood serum of healthy adults.[41]

CAN ENZYMES BE ABSORBED?

One question other practitioners and prospective patients frequently ask: Can enzymes taken by mouth be absorbed into the body? Conventional wisdom would say that such products would be destroyed in the digestive tract, and even if they were not, the enzyme molecules would be too big to be moved across the lining of the intestine.

From my point of view, oral pancreatic products have been used by Kelley, Nick, and myself with multiple positive case reports, and the enzyme product Wobe-Mugos has also been used orally with some success.[8,10,13,18,19,22,42] The pancreas product Nick and I used was tested, again orally, in a mouse model of pancreatic cancer with positive results.[43] All this says to me that orally administered pancreatic enzymes and precursors *are* absorbed.

Experiments on this subject have shown conflicting results.[44-46] A 2004 article has been touted to prove that orally administered pancreatic enzymes are not systemically absorbed.[47] In this study, pigs that had their pancreas removed were given pancreatic enzymes with their food, and no changes in blood levels of enzymes were seen. Since the product was administered with food, it may have been used up in digestion with little to none left for systemic absorption, or the food could have slowed absorption and made increases in blood levels shallow and not easy to recognize. Kelley, Nick, and I all stressed that patients should take their pancreas doses on an empty stomach.

A 2020 article discussing PAR signaling in the gut suggests that proteases may interact with PARs in the intestinal tract cells to facilitate absorption of large molecules such as proteases, and that PARs impact gut permeability regulation.[48] While reading this particular article, I had an image of proteases using the PARs to knock on the door of the gut lining, and then being allowed inside.

Are enzyme or proenzyme products stable when they encounter stomach acid or duodenal juices? One experiment showed that 70% of trypsin activity remains after storage in duodenal juice at room temperature for four days.[49] In 1965, Heizer and colleagues looked at the stability of trypsin in gastric juice.[50] The product was fairly stable at a pH of 4 but was degraded if the pH went below that, especially if pepsin, an enzyme secreted by the stomach, was present. Kelley, Nick, and I all directed patients to take their pancreas product away from meals, thus potentially limiting the amount of acid in the stomach, the amount of pepsin secreted, and the time spent in the stomach.

Both Wobe-Mugos and the enzymes Kelley used were enterically coated, protecting the contents from stomach acid and pepsin. However, other experts have pointed out that enteric coatings do not always dissolve properly and can sometimes cause intestinal problems in and of

A Patient's Story: Giving Hope to People with Cancer

It is now 21 years since a tumor measuring 3.2 cm was found in the head of my pancreas. I was shocked, especially because it had been discovered as the result of a routine checkup. I had told my doctor that I was having diarrhea after eating, and she ordered a CAT scan of my abdomen and found the tumor. Two months later, a biopsy confirmed that I had pancreatic cancer.

After meeting with two surgeons, I realized that I was facing a life-threatening disease. Both wanted me to have a Whipple procedure, which removes the head of the pancreas along with part of the duodenum, the gallbladder, and the bile duct. If I survived the surgery, chemo and radiation would follow. They told me that without the surgery, my life expectancy would be three to six months.

I was determined not to have the surgery, so I read and investigated everything I could find on cancer, including some prominent books on alternative medicine. I learned enough to begin a vitamin and herb regimen, and I asked for prayers from family and church leaders. I also spoke with a gentleman named William Donald Kelley, a dentist who had had pancreatic cancer and cured himself and numerous patients with pancreatic enzymes.

Then, a doctor told me about a research trial being conducted on Dr. Gonzalez and Dr. Isaacs's enzyme therapy. I submitted the required medical documentation and went to New York on my own, only to be told by an administrator that I was not eligible for the trial because I could have surgery. I said, "You're dooming me to die because I don't want surgery and I'm not going to have it."

Dr. Isaacs showed compassion and offered me her services, outside of the study, if I could pay for the pills and other items needed to follow the protocol. I jumped at the chance. I did my enemas and my juicing, and took about 150 pills a day—the enzymes as well as various vitamins and minerals. It was time consuming, but it wasn't that hard. And, although people usually don't believe this, I never felt sick.

After I went onto the protocol, I stopped running to the bathroom and I got my energy back—although I really hadn't lost that much energy. I felt good. I went to Mexico with my husband for two weeks, and then I went on a trip with each of my children. I kept faithfully on my regimen; the only thing I didn't do on the trips was the enemas.

I stayed on the program for 13 or 14 years, and I am still taking my enzymes. The last time I had the tumor checked, six years ago, it was still there, although it had shrunk a bit and it had not metastasized. My blood tests continue to come back absolutely fantastic, especially for an 80-year-old.

Over the years, I have been in good health and have spoken to groups, given classes about alternative medicine, and appeared on radio and TV talk shows to give cancer patients hope. I have also started writing a book that I hope will be an inspiration to all who are diagnosed with cancer.

—Sarah Ann Cooper

themselves.[51] Nick and I used a pancreas product without an enteric coating and were happy with the clinical results.

CANCER AND THE TROPHOBLAST

There is some modern support for Beard's concept that "vagrant" trophoblast cells are present in tissues throughout the body as a reservoir for cell renewal but can develop into a cancer. A similar principle in recent theories about cancer involves the cancer stem cell.[52]

Normal stem cells are self-renewing cells that can morph into various mature cell types, allowing for development in the embryo or replacement of aging or damaged cells in the adult. Cancer stem cells are responsible for cancer initiation as well as its growth and spread. Similar markers are found on the surfaces of cancer stem cells, adult stem cells, and human embryonic stem cells.[53]

A Patient's Story: Experiencing a Renewed Sense of Energy

I was 58 years old in May 2014 when I noticed blood in my stool one evening. I went for a colonoscopy, and then my doctor advised me to see a surgeon, who confirmed stage 3 colon cancer with a few lymph nodes involved. The surgeon recommended that I immediately have surgery, which I did, and then wanted me to undergo chemotherapy.

My wife and I have always been somewhat nonconventional, and we weren't advocates of chemotherapy. We created our own nutritional cocktail, and we took that and monitored my cancer antigen levels instead. After a while, my levels seemed to be rising, which forced us to go to an oncologist to discuss the situation. Out of apprehension, we agreed to chemotherapy. I went through that for six months, and it was probably the worst experience I've ever had—constant nausea, pain, and ultimately a severe case of neuropathy.

Soon after the course of chemotherapy ended, I had a CT scan that showed a recurrence of the cancer, in my liver. But we were very blessed because, one day, while we were at home, a television program came on about Dr. Gonzalez. This program described a nontraditional program for dealing with cancer that had a proven record of effectiveness. We got online and learned that Dr. Gonzalez had recently passed away, but his colleague, Dr. Isaacs, was still in the business of saving lives.

We immediately contacted her and went through a rigorous screening process. Before Dr. Isaacs would admit me into the program, she said I had to get surgery on my liver, which I did in 2016. I was then admitted and prescribed a comprehensive, enzyme-based nutrition program.

However, we soon found out that the surgeon had made a mistake and left some cancer behind. We went to another doctor, who did the surgery flawlessly but recommended more chemotherapy, telling my wife I had six months to live if I did not do it. I had already decided I was not going to do chemotherapy again. Then, another doctor noticed a couple of nodules on my lung and recommended immediate surgery, which I declined.

By that time, I had grown very confident in Dr. Isaacs's protocol. I continued following it and, in subsequent CT scans, those nodules got progressively smaller. The last several scans have been absolutely clean, and I take them twice a year. I never told my oncologist what we were doing, but he lauded my improvement as somewhat miraculous, saying that he had seen nothing like it before.

I was very diligent in following the protocol. It is very demanding—200 pills a day, enemas, and all kinds of things—but it was worth it. Having the right support structure is absolutely critical, and I was lucky to have my wife help me with preparing the pills and doing all the other necessary things. Ultimately, we were able to do this very effectively in spite of the demands that we both had in our lives. The outcome has just been extraordinary.

I'm still on the protocol today, and it is giving me a renewed sense of energy. I'm an avid runner, and even when I was on chemotherapy, I was running. But with the pills—nutrients and other supplements, as well as enzymes—it's amazing. I'm 65, and I'm still running 12 or 13 miles a week.

The program has also had a lot of unintended benefits. It has brought us closer together as a family and helped us to trust our decisions. But I would say the biggest thing is that it has given me more time with my family. I have a ten-year-old son, and it has enabled me to be in his life. My dad wasn't around for me, and it has given me the opportunity to change that cycle.—*Name Withheld*

Beard also claimed that in normal prenatal development, the aggressive trophoblast changed into the mature placenta when the baby began making pancreatic enzymes, in the first trimester. Others have confirmed that the fetus makes pancreatic enzymes months before delivery, and well before the baby would see food.[40,54] Trophoblast cells also have PARs. One intriguing article reports that the relative amounts of different PARs on the surfaces of trophoblast cells change over the course of the first trimester, during the time when, Beard suggested, fetal pancreatic enzymes would influence the behavior of trophoblast cells.[29,30,55,56]

The molecular mechanisms used by cancer cells and by the trophoblast to invade tissue and create a blood supply are the same.[57,58] Recent review articles discuss this and mention the possibility that study of the trophoblast could inform efforts to address cancer.[59,60]

HOW DO I USE PANCREATIC ENZYMES IN MY PRACTICE?

Between Nick's monograph about Kelley's work, the case reports Nick was writing at the time of his death (since posthumously published in two volumes), and those I have published since, there are more than 200 case reports available about patients successfully treated with this method.[10,18,20-22] Our standards for what constitutes a good case report are high, so there are many more patients who have had good outcomes but are not included.[61,62] Many different types of cancers are documented among these case reports, including common ones, such as breast and colon, as well as less common ones, such as rare sarcomas. Nick and I offered a free screening process prior to setting up appointments, so that we could assess whether a patient's particular situation was a good fit for our treatment program. I have continued this.

I also see patients with other conditions and find that our pancreas product taken away from meals can be helpful for patients with autoimmune disorders. In addition, I recommend that all patients take a few capsules of pancreatic enzymes with their meals to aid digestion.

WHAT CAN YOU DO WITH THIS?

More than a century ago, Beard stated that pancreatic proteolytic enzymes could have a therapeutic effect on cancer. Case reports in the medical literature, including some about patients I have treated, have kept this possibility alive.

I believe, based on Beard's work and my own, that pancreatic enzymes do more than digest food; they are part of the surveillance system for cancer. If you have any digestive distress such as gas or bloating, or even if you don't, a few capsules of digestive enzymes taken with meals can help you utilize your food better and also free up some of your body's own enzymes to look for abnormal cells in your system. Of course, you should also consult with a physician about any symptoms or problems you are having. 🕮

Editor's note: The three patient stories that accompany this article are based on personal interviews conducted by the* Price-Pottenger Journal. *These narratives are not a guarantee of similar outcomes.

ABOUT THE AUTHOR

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