The discovery of Avemar

An interview by Sandra Cascio with Mate Hidvegi

Photo by Noa Schiller, Tel-Aviv

Professor Hidvegi, how did you come up with the idea of working on the wheat germ and the original fermentation process?

Drug research has always been fundamental in my family. My Transylvanian-Armenian grandfather, Professor Lajos David was the organizer of the Department of Pharmacy of the University of Szeged in the 1920's. He was elected as the Dean of the Faculty of Medicine, the first and only pharmacist who has reached this highest position at the University since. My grandfather was a devout Roman catholic, who publicly opposed Nazi persecution of Jews during the Holocaust. One of his colleagues and, perhaps his best friend, was Albert Szent-Gyorgyi, the Nobel laureate who discovered vitamin C. After II. World War Szent-Gyorgyi moved to the United States where he made significant contributions to muscle biochemistry. In his later years he turned to cancer research with the goal to find a cure for cancer. Szent-Gyorgyi theorized that a revolutionary anticancer drug could be based upon vitamin C combined with methoxy-substituted benzoquinones, the precursors of which can be found in wheat germ.

I received my M.S. degree in bioengineering in 1980. Before that I had the opportunity to meet Albert Szent-Gyorgyi in person. I still keep, as a treasure, one of his books signed by him for me. My first job was quality assurance at the Hungarian Grain Trust. After completing my doctorate, I spent two years at the Basic Wheat Research Unit of the Grain Research Laboratory of the Canadian Grain Commission in Winnipeg. I returned to Budapest in 1990, and became associate professor of biochemistry at the Technical University. At that time, just following the peaceful democratic revolution which completely changed the political system in Hungary and gave so much hope for the people, I decided to develop a cancer drug. I also strongly felt that if I follow the intellectual pathway which Szent-Gyorgyi had just started to walk on, I will be able to complete my goals.

I telephoned to an old friend of mine, Gabor Fodor, a brilliant organic chemist in the United States, who had also been a collaborator with Szent-Gyorgyi in cancer research, to help me to start. Gabor told me that life was funny, because shortly before my call he had got a phone call from the late laboratory of Szent-Gyorgyi at Woods Hole, Massachusetts, if he wished to receive the reagents Albert had used in his cancer research work.

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Those reagents were about to be discarded otherwise. So it was about 6 years after Szent-Gyorgyi's death when, with the help of Dr. Fodor, I got those chemicals, together with Szent-Gyorgyi's publications, for the purpose to continue the Master's efforts discovering a cure for cancer. I remember how much I wished to talk to scientists who had worked with Dr. Szent-Gyorgyi. I desired to share my thoughts and my plans of making the drug Szent-Gyorgyi had dreamed on. I got encouragement from the great quantum-biochemist, Janos Ladik, from Jane MacLaughlin who had been the assistant of Dr. Szent-Gyorgyi in the lab and, most importantly, I was invited by Hermann Esterbauer, the head of the Institute of Biochemistry at the University of Graz, to work in his laboratory. Thanks to the generosity of Professor Esterbauer, myself together with Dr. Rita Farkas, a student of mine, made really valuable work at Graz.

I would also like to tell here how grateful I am to my late mentors, Gabor Fodor and Hermann Esterbauer without whom my dreams would have never come true.

My original goal was to develop wheat germ extracts with the highest free benzoquinone content. For this, I developed a fermentation process to liberate the benzoquinone moieties from the chemical bonds which keep them in natural forms: in glycosides. I still remember the experience of seeing for the first time the liberation of the active molecules of purple color in the fermentation liquid.

Fermentation is a gentle method to carry out chemical changes. Not chemicals but living cells with their exo- and endo-enzymes are used to split bonds and make new molecules. This is also true for the manufacturing process of Avemar: this extract contains new molecules which can not be found elsewhere however, their precursors are natural compounds, and their synthesis is also done by natural way.

To develop the fermented wheat germ extract, over 7 years of research were necessary, what were your motivations during these long years of research?

Favorable outcome of research: this was (and still is) the most important motivation to keep me going.

After the completion of the development of the manufacturing process for the fermented wheat germ extract, I spoke a friend of mine who worked as a cancer researcher at the Semmelweis Medical University in Budapest. I told him that I believe to have a non-toxic powder which is beneficial in the treatment of cancer. Being also a scientist myself, he gave credits to my words and promised to do an animal test. The Experimental Cancer Research Institute, where my friend has worked, was an internationally recognized cancer research site. After some month I got a call from the Institute that my "powder" seemed being more effective than the majority of drugs which had been under testing at that time. During the next two years, a great deal of in vitro and in vivo experiments with Avemar had been done at the Semmelweis. In December 12, 1995, the Institute issued a written opinion stating that the "extract ... supplied by Dr. Hidvegi ... is a potential remedy to inhibit the progression of cancer".

Later on the results were published and the papers convinced several scientists in Hungary and worldwide and, the Avemar research program has started to grow exponentially. I think that this growing interest alongside with my passion for cancer research were also key motivating drives.

Why did you name the active ingredient Avemar?

I wanted to introduce my results to the scientific community worldwide, but more importantly, I was eager to help the people affected by cancer and provide my preparation to them. The experiments were expensive and my funds were limited, so to say, very limited. I have to admit that although I inherited the passion for research from my family and for several years I could not even imagine giving it up, but unfortunately I was running out of money. I sold my car, and I also spent the great amount of money which my art history teacher mother got when she received the highest scientific prize of Hungary.

Being a religious person, I prayed for Divine help, with a promise to name the extract after the Virgin Mary. The next day my wish came through, and I received the financial support I needed. From this, I was able to complete the experiments and get the approval for the registration. The time arrived when I really had to give a name to the product which had only had a code name. One late night it just came: Avemar, from the Latin prayer: Ave Maria.

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There are many other products made from wheat germ. Is your product different? In what way is it different?

When I talk about the wheat germ, it is a distinct anatomical part of the grain, and during the milling process, alongside with the bran, it is separated. This milling by-product is generally mixed into animal feed.

In the manufacturing process of Avemar, a hole bunch of molecules, extracted from wheat germ, are biotechnologically transformed during fermentation. These compounds are thus newly formed ones. You can not find such molecules in the wheat germ. One may consume a ton of wheat germ without taking a microgram of Avemar.

Avemar is not a "wheat germ product". It contains molecules which you can not find in nature but, their precursors are present in wheat germ.

During your research, what were the findings that impressed you the most?

It was a new discovery every time as the animal and clinical studies revealed the complex beneficial effects of Avemar. It was a breathtaking moment when we realized that in animal cancer experiments, the combination of Avemar with widely used chemotherapeutic drugs completely inhibited the development of metastases. I knew that we had a very promising product in our hands and exploring its whole activity profile might even take a lifetime of research. So far I have supervised Avemar research done in Hungary, Israel, the United States, Austria, Italy, Spain, Slovakia, the Czech Republic, Germany, the United Kingdom, Russia, Australia, Korea, Vietnam. It has been a good experience to see the scientific interest it generated worldwide. Researchers find me from all over the world and ask me to give them Avemar for their research.

Were these impressive results expected?

I visited the Ministry of Health to ask their permission to distribute my product as a dietary supplement. The health authority's Health Science Council found my research promising and permitted to conduct clinical studies in order to get Avemar registered as "dietary food for special medical purposes" for patients affected by cancer.

It was quite a surprise that Avemar suddenly gained such an international attention. In 2006, my colleagues who distributed Avemar in the United States, attended the annual Natural Products Expo in Anaheim, California, which is the largest gathering of the natural, organic and healthy products industry. For my great surprise Avemar was nominated for the "Best New Product of the Year". Only the best 400 products could participate in the annual NutrAward competition from the 15,000 products exhibited. The main criteria of getting NutrAward was to present a solid scientific evidence on the product. When Avemar was voted by the majority of the more than 50,000 professionals for NutrAward, it became obvious that this

product is unique in terms of biological efficacy plus safety, and it is based on good science.

Could you update us about the current status of the Avemar Research Program?

I dedicated my life for cancer research, and obviously Avemar has been important for me. I have been traveling around the world following the trails through the Avemar Research Program.

I consider myself a hybrid between an engineer and a scientist, and my aim is to things happen. I always admired the basic scientists, the devoted men and women who made pure research. They built the foundation of science and their remarkable work is essential for scientific evolution. Therefore I have always worked closely with basic researchers in order to have a better mechanistic understanding of Avemar's action.

In 2009, I received an invitation from the Nobel laureate, James Watson, co-discoverer of DNA's double helix, to give a speech on Avemar. It was a great honor standing in front of leading basic scientists, mostly cancer researchers, who all came to listen to me. Since my lecture, hosted by Dr. Watson, a collaboration to find the active molecules of Avemar has been started. The result, I hope, will be a significant cancer drug.

What is your advice for physicians who want to use the fermented wheat germ extract on their patients? And, what is your advice for patients?

For the medical community and for health care providers, oncologist, nurses, dieticians, naturopaths who are concerned about cancer patients, I recommend they should read more about Avemar to have a better understanding of its significant role in supportive therapy. Avemar was tested in most of the cancer types. The results confirmed the value of this extract as a natural product for cancer patients.

The title of a recent medical review paper on Avemar has turned into a question: is it a nutritional supplement or an anticancer drug? The authors, affiliated with a leading German oncological center, made the following conclusion: "The use of the fermented wheat germ extract as a non-prescription medical nutriment for cancer patients seems maintainable and combined use with chemotherapy appears feasible." This is the message what I may say to the health professional community whose mission is serving cancer patients.

The author, one of the best nutritionists of the United States, of another recent review on Avemar has interestingly used similar question as the title of his paper: "Fermented wheat germ extract – An adjunct treatment for cancer?" He concluded with an obvious yes, and referred to the advice of the late Robert C. Atkins: "it is crucial that both clinician and patient be vigilant and aggressive in treating cancer in a holistic fashion."

I am borrowing this great sentence as my message to cancer patients, who wish to use Avemar as one of the weapons in their fight against the disease.

Mate Hidvegi was born in Budapest, Hungary, on November 9, 1955. He studied, then taught at what is now Budapest University of Technology and Economics. After finishing university, he worked in the cereal industry and was co-developer of a patented feed advisory system based on near infrared ingredient data. In Hungary, Hidvegi was one of the pioneers in the development of technologies for lage-scale production of instantized herbal extracts for therapeutic use. Between 1988-1990 Hidvegi was Post-Doctoral Fellow at the Grain Research Laboratory of the Canadian Grain Commission, Winnipeg, MB. Returning to Hungary in 1990, Hidvegi started to work for enterprises in the natural medicine industry. His first blockbuster was the anti-cholesterol pill, Esterin, which was soon marketed worldwide. Also during these years, he developed various products for the health and food industry. He is the inventor of a proprietary fermented wheat germ extract (Avemar) with immune regulatory, anticancer and antimetastatic properties. Hidvegi holds a PhD, CSc and a DrHabil in chemistry, and a honorary full professorship at the Jewish University, Budapest. For his academic works he received the Gold Medal of the President of Hungary (2000), the Scheiber Prize of the Minister of Culture and Education, Hungary (2001), the NutrAward in the USA (2006) and the Jedlik Prize of the Hungarian Patent Office (2007). He is a member of the Equestrian Order of the Holy Sepulchre Jerusalem (Vatican).