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**ORAL HISTORY PROJECT**

**INTERVIEW WITH**

**ROBERT BEUKERS, DR., JR**

June 14, 2004

## **Dr. Robert Beukers**

### **Biographical Statement**

Dr. Beukers was born on September 9, 1932. In 1958 he earned an Engineering degree in Biochemistry and Biophysics at the Technical University, Delft, The Netherlands, and in 1960 he obtained his Ph.D. in Technical Sciences there. He spent the next year on a NATO (North Atlantic Treaty Organization) fellowship working with Albert Szent-Györgyi in the Institute for Muscle Research at Woods Hole, Massachusetts. At that point his and Szent-Györgyi's work was focusing on submolecular biology.

In 1961 Dr. Beukers returned to The Netherlands where he obtained a research position at the Technical University in Delft. In 1966 he became head of the Department of Microbiological Research at Gist-brocades, an early biotech company specializing in food products and agriculture. For the next 31 years he conducted research in various Gist-brocades' departments, including the Veterinary, Pharmacological, and Biological Science departments. After retiring in 1997 he continued to serve as an advisor to Gist-brocades, which was purchased by another Dutch company, DSM, in 1998.

### **Interview Synopsis**

The interview was conducted by e-mail and is brief and to-the-point. Dr. Beukers answered several questions by collapsing them into a single question, then writing a summary answer. Dr. Beukers describes his NATO fellowship year (1960-1961) with Albert Szent-Györgyi at Woods Hole, Massachusetts, as well as his subsequent visits to that institution in the summers and other meetings with Szent-Györgyi over the years. He covers his work at Woods Hole as well as Szent-Györgyi's approach to science and research, highlighting Szent-Györgyi's sense of humor, his high standards for scientific rigor, and his emphasis on pursuing research because it is personally interesting rather than for funds, prestige, or other benefits.

**National Library of Medicine**  
**Internet Interview with Robert Beukers, Dr., Ir.**  
**Conducted on June 14, 2004, by Adrian Kinnane**

**AK:** Tell me how you learned of the Institute of Muscle Research at Woods Hole, and why you accepted a NATO fellowship there?

**RB:** To obtain my engineers—Ir—degree in technological sciences at the Technical University in Delft I carried out an investigation in the department of biochemistry headed by Professor W. Berends, who happened to be a very good friend of Dr. Szent-Györgyi. The subject was to determine the chemical effects of UV radiation on the components of nucleic acids. In one of his books, Bioenergetics, Dr. Szent-Györgyi had described that in a cell biological substances are surrounded by water as if in a frozen solution. This brought me to irradiate frozen solutions of the nucleic acid components, which led to the discovery of the dimerization of thymine. After my graduation I continued this work and obtained in 1960 a Ph.D. degree on this subject.

Around this time an announcement came in that young doctors could apply for a NATO grant for a year of scientific work in an American laboratory and as I was very much impressed by the way Dr. Szent-Györgyi explained even very difficult matter in an understandable way, I asked Professor Berends to introduce me to him. I was astonished to receive a reply in perfect Dutch telling me that I would be welcome in his laboratory.

**AK:** [questions combined for a single answer by RB] Could you describe your first meeting with AS-G? Had you known of him before? What were your first impressions of Szent-Györgyi? Could you describe him? Was he as you had expected him

to be, or were you surprised in any way?

**RB:** When I arrived in Woods Hole in 1960 I was welcomed as if he had known me for years and it rapidly felt that way. Again he surprised me with his fluent Dutch—it turned out that he spoke many languages fluently; he had learned to speak and write Dutch during the few years he was in the Netherlands. Almost the first thing he asked was how much the NATO grant was and he immediately gave me a monthly extra of \$50. He had arranged for a pleasant lodging place and gave me a bicycle to use. He was always full of stories and anecdotes and very pleasant with everybody. As he told me once he was very close to the wealthy people in town because he had a Cadillac and with the not wealthy people because he rode a moped!

**AK:** What contacts did you have with Szent-Györgyi after your fellowship year was finished?

**RB:** In the beginning we were in contact because of publishing the research I had carried out in his lab. Later on, when I was married, we went back to the IMR several times to meet him and the other people in his and the other labs with whom I had become good friends. In 1965, we went to Paris, France, to meet him when he was there for a meeting—at that time he spoke fluent French. We still correspond with many of the people whom I met during this time.

**AK:** Tell me about your work with AS-G at the IMR. What kinds of projects or research problems were you working on?

**RB:** At that time he was very interested in intra and inter molecular charge transfer and asked

me to study the interaction of a number of biologically active compounds, among which several carcinogenic substances he had in his laboratory to do his cancer research. This work has been published.

**AK:** Who were some of the other people who worked in Szent-Györgyi laboratory when you were there?

**RB:** Apart from him and his wife—“Profne”—at that time there was among a few others: Jane McLaughlin, Irvin Isenberg, Bob Middlebrook, Benny Kaminer, and his [Szent-Györgyi’s] cousin Andrew with his wife Eva.

**AK:** [questions combined for a single answer by RB] How did a week spent in Szent-Györgyi’s laboratory differ from a week spent in any other lab at Woods Hole? Was there a different or a special atmosphere in his laboratory?

**RB:** Although one was free to come and go as one pleased, everybody was working very hard and long. Still each day time was spent to drink coffee in the morning and tea in the afternoon—made by Profne—during which time stories were told or progress in the work was discussed.

**AK:** Albert Szent-Györgyi did not seek any formal academic appointments in the United States, yet many people describe him as an excellent teacher and lecturer. What were your own experiences with him as a teacher? What did he teach you, and how did he teach you?

**RB:** He taught me never to stop thinking. When an experiment did not give a result he came back the following morning with a new proposal. He lectured with passion and humour and as in his books knew how to explain the matter. The photos in the

issue in the Biological Bulletin, dedicated to his memory, pages 204-205 illustrate this very well.

**AK:** [questions combined for a single answer by RB] In March and April 1939, Szent-Györgyi gave a series of lectures at Vanderbilt University—the Abraham Flexner Lectures—on fermentation, oxidation, and other subjects, in which he made the following observation, which I would like you to comment on:

*“To the outside spectator, all this work of the biochemist in which he shifts little H atoms and the phosphate molecules from one substance to the other, must seem a little (like) play for big children. Thank heaven that this is really so, and that biochemistry is a lovely game of refined cookery, very fit for the amusement of big children. I often suspect my really good colleagues of being attracted to their working desk less by the desire to elucidate profound problems or save humanity than by the childish pleasure of playing about to make fluids boil, to pour them from one bottle into another, to see manometers sway right and left and to solve crossword-puzzles of Nature.”* —Did Szent-Györgyi seem to be enjoying himself in this way when he worked? He said that he suspected that his “really good colleagues” also had this attitude about their work. Do you think that is true, or was he describing something that was true mostly for himself? Do you recall any examples or instances when you observed Szent-Györgyi “playing” or enjoying himself at his work? On the opposite side, did you ever see him frustrated at his work?

**RB:** In my view only a few people possess this attitude. He was always working with very simple materials himself, indeed was playing along but constantly watching and looking for something unexpected. On the other hand he assembled around him very qualified persons like Isenberg to work with complicated instruments to

explain and find answers for what he had seen.

When he got stuck, he stopped working, went out and came back the next day or so with new ideas how to handle the problem. I remember one big frustration when he thought to have found a very powerful anticancer drug that unfortunately turned out to be the result of an overactive assistant palpating the rats in the treated group much more often than those in the control group.

This event he used to stress the importance of how to carry out proper research.

**AK:** There also was some play outside of the lab at Woods Hole. Could you describe some of that to me? [volleyball, swimming, parties, etc.]

**RB:** During the time I was there I participated in badminton and tennis. It was well known that Dr. Szent-Györgyi often went swimming in sea around the cape on which his house was built.

**AK:** I have an impression that Szent-Györgyi was not much different outside the lab than inside. Is that correct?

**RB:** True. Very humorous and tricky. As he told me when he was at a party and spotted a good-looking girl—for which he had a good eye—he sneaked around her and asked: Have you ever been kissed by a Noble Prize winner? He said to me: “Getting the Noble Prize is nice not because of the money but how it opens doors during your whole life.”

**AK:** Szent-Györgyi believed strongly in the universality of science, in science’s capacity to transcend cultures and national boundaries. But science sometimes can be

influenced by culture. For example, when Szent-Györgyi came to the United States in 1947 he discovered that finding money for his research was a problem. He encountered the practical demand by funding agencies that a researcher should predict what he is likely to find, in order to justify spending the money. “This is nonsense,” Szent-Györgyi said, “because research means going into the unknown.” As a result, he couldn’t bring himself to apply for research grants. Did he ever speak to you about this?

**RB:** No, not in so many words, but I was able to sense it from his attitude.

**AK:** [questions combined for a single answer by RB] Szent-Györgyi set a very high standard of dedication and commitment for the scientist. In 1943 he wrote, *“Scientific research is a passion. The real scientist is driven by this passion and is ready to bear privation and, if need be, starvation rather than let anyone dictate to him which direction his work must take.”* Partly, this statement reflected the political situation in Europe at the time, but even after the war Szent-Györgyi maintained this strict standard for researchers. He was willing to endure great privation to continue his work. Did he ever speak to you about this? When you worked with him, what examples did you see of his unusual degree of dedication to his work?

**RB:** It agrees with his working in his lab til the very end of his life even though he must have suffered a lot. I never heard him complain about some illness; such was not important.

**AK:** How would you describe Szent-Györgyi’s influence on you—on your work, or in any other way?



**RB:** Mostly the attitude to choose the work that you like to do, not what pays most.

**AK:** [questions combined for a single answer by RB] In his long career as a scientist in Europe and in the United States, Szent-Györgyi made two different kinds of contributions—one was *what* he discovered; the other was *the way that he discovered it*. To put it another way, one was the *substance* of his work; the other was his *style and his attitude* about research. Which of these two had the greatest influence on you? Which do you think had the greatest influence generally, on others and in the field of biochemistry?

**RB:** Differs. For most people it will be the *substance*, for me it was more the *style*.

**AK:** Is there anything you would like to add—an experience, an anecdote, or anything you think others interested in Szent-Györgyi's life and work might like to know?

**RB:** You probably have collected and received many items. I have spent only one year with him; much too short but still sufficient to recall him as one of the most pleasant and ingenious persons I have ever met.

**AK:** Thank you very much.

[End of Interview]

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