

Professor Betty Kutter

Elizabeth Kutter is a faculty member emerita at The Evergreen State College, Olympia, WA, where she still maintains a productive phage lab that is dedicated to studying various aspects of phage biology that are crucial to phage therapy. Particularly relevant is the ability of the chosen phages to successfully infect the bacteria under the actual conditions of the infection – where they may be in stationary phase, anaerobic or microaerobic, etc. She is also chairman of the board of the Phagebiotics Research Foundation, founded in 1997 to help support work towards phage therapy in Tbilisi and beyond, and spends time with the scientists and physicians there. She does a good deal of outreach, giving phage talks in places as disparate as Russia, Korea, Poland, Australia, India, Santiago, Kenya, Egypt, Bogota, San Francisco and Huston over the years. A number of her students are now actively involved in phage therapy-related fields.

Her work with phage has extended nearly 60 years. Building in 1962 on strong backgrounds in physics and math at the U. of Washington, Dr. Kutter and her husband Siegfried chose PhD programs at the University of Rochester, New York -- she in radiation biology and biophysics and he in astrophysics. That winter of 1963, John Wiberg came applying for a faculty position at Rochester. Wiberg was a postdoc with Salvador Luria, working on phage T4's enzymes of nucleic acid biosynthesis. Kutter was forever captivated by John's tales of these tiny ancient entities on the borderline of life which had just a few hundred genes, used hydroxymethylcytosine rather than cytosine in their DNA, and encoded their own enzymes. He and she quickly agreed he would come to Rochester and she would be his first student, using radioisotopes to focus on the transition from host to phage metabolism. They made much excellent progress in the field – progress which was even cited in Luria's 1969 Nobel Prize talk.

After finishing their PhDs in 1968, the Kutters and 2 young sons, born during their graduate studies, spent 4 years at the University of Virginia. There, she continued work on the 2 T4 endonucleases involved in breaking down the host DNA, working half time in the lab of Rolf Benzinger, complementing his strong early work on bacterial restriction enzymes. After the first year, she had her own NSF grant. Two years later, she was awarded an NIH grant and went to apply for one of 4 new biology faculty positions Virginia had just awarded them. The Chairman irately said that was totally inappropriate for mothers of young children – and he would no longer sign for her grant if she applied.

The Kutters moved back West to the Evergreen State College, an experimental 4-year college which just opened in 1971 in Olympia, WA. She managed to transfer her 3-year NIH grant there, and a large lab for her needs was included in the lab building under construction. The grant let her hire 2 wives of faculty – a microbiologist and a chemist – while she taught in a full-time 5-faculty program on human health and behavior. Another new faculty, Burt Guttman, also had phage experience and joined in. Later, most work was done by undergrads. In 1975, they held the first biennial West Coast phage meeting; the 23rd, held in 2019, drew 350 people from 52 countries, with much special focus on phage therapy – the meetings have been key in developing collaboration and cohesiveness.

Evergreen is an amazing small college. From 1975 to 1979, Dr. Kutter was added to the NIH Director's Recombinant DNA Advisory Committee as "coming from a college where studying the ethics and values of science was part of the study of science". In 1978-1979, she took a key sabbatical at UCSF with Bruce Alberts, later head of the US National Academy of Sciences, which led to her spearheading the sequencing of the T4 genome – the first of the larger phages -- with partners from Japan, Russia, Germany and Vanderbilt. In 1990, sequence completion was aided by 4 months in the USSR under a US-USSR Academy of Sciences exchange program, during which she made her first 2 visits to Tbilisi and discovered the Eliava Institute's phage therapy program. And her lab has done many key studies of infection in environmentally-relevant conditions – important in thinking about phage therapy.