Dr. Grillo-López and his wife, Maria Marxuach-Grillo, were both born and raised in Puerto Rico. After medical school and fellowships in Hematology and Oncology, Dr. Grillo-Lopez worked at the University of Puerto Rico Hospital in San Juan, and the San Juan VA, where he started their Oncology service. He went into private practice but continued to do research as a member of the Southeastern Cancer Study Group of the National Institutes of Health.

In 1980, Antonio and Maria, along with their three children, left the island for the University of Michigan and Parke Davis, a pharmaceutical company, where he had a joint appointment doing research. Their next move took them to Delaware and Switzerland with DuPont Merck Pharmaceuticals, before finally landing permanently in San Diego and joining IDEC Pharmaceuticals (now Biogen), where he was Chief Medical Officer and Senior VP, Medical and Regulatory Affairs.

Over the course of his career, Dr. Grillo-Lopez has been instrumental in the clinical development of over 25 anticancer agents including five that are approved. Now retired, Dr. Grillo-López and María have made a second career of giving generously to support scholarships, endowments and research across the United States.