

**FROM DOXORUBICIN TO ANNAMYCIN: RATIONAL  
REDESIGN TO EXPAND ORGANOTROPISM  
AND THERAPEUTIC POTENTIAL**



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**ABSTRACT**

Drug discovery in academia is both feasible and deserving of strong support. Coordinated, long-term, and methodical academia research programs bridge basic science and translational investigations across disciplines and create a powerful framework for the discovery and development of novel therapeutics. These efforts complement pharmaceutical industry initiatives and expand the pipeline of treatments available to patients in need.

This presentation stems from the perspective of an academic scientist working toward the development of novel anticancer agents. To date, we have discovered five drug candidates that have successfully entered into clinical studies in patients. These drugs have a variety of molecular targets, including among others transcription factors, cancer metabolism, and DNA.

Specifically, we will examine the therapeutic limitations of doxorubicin especially related to its limited organotropism, which promoted the rationale design and development of Annamycin. Annamycin is a DNA-binding agent related to doxorubicin but structurally optimized at key biologically active critical sites to improve organotropism and broaden its therapeutic window. These enhancements support its development for the treatment of primary and metastatic tumors, including acute myeloid leukemia (AML; currently in Phase 3 clinical studies), pancreatic cancer, and lung and liver metastasis.

**BIO**

Waldemar Priebe, Ph.D., Professor of Medicinal Chemistry, Department of Experimental Therapeutics at The University of Texas M. D. Anderson Cancer Center. In addition to his position at The University of Texas M. D. Anderson Cancer Center, Prof. Priebe holds the title of Professor of Chemistry in the Republic of Poland. This title was awarded in 2004 in recognition of his seminal contributions to the field of Chemistry and was presented by the President of the Republic of Poland, Aleksander Kwasniewski. Prof. Priebe's research spans the chemistry and biology of cancer, as well as the rational design and preclinical development of new therapeutic agents for oncology and, more recently, infectious diseases. He has published more than 250 peer-reviewed journal articles, and his discoveries have led to over 60 patents and numerous pharmaceutical licenses. Lastly, he pioneered studies focusing on the design and development of novel drugs engineered for improved organotropism. In recent years, Prof. Priebe has pioneered investigations into the blood-pancreas barrier and driven the development of novel therapeutic strategies targeting pancreatic cancer and metastatic spread to distant organs.