

## **Biography**

Dr. Elmer leads the Drug Discovery and Development Laboratory at Villanova College of Engineering, which performs research in two major areas: Genetic Engineering and the development of Blood Substitutes.

### Genetic Engineering:

Decades of research have yielded several vehicles that can efficiently deliver genes to human cells (e.g. viruses, lipids, polymers), but most transgenes are recognized as foreign and quickly silenced after they reach the nucleus. Dr. Elmer's research focuses on enhancing and prolonging transgene expression to make gene therapy more effective - specifically, enhancing gene expression inside T cells, which can then be genetically reprogrammed and used to target and eradicate leukemia cells.

### Blood Substitutes:

A shortage in human blood donations is a serious and life-threatening issue that plagues developing countries, battlefields and healthcare facilities alike. Professor Elmer's research is focused on finding a universal donor "blood substitute" that is safe, stable for long periods of time, and is an effective oxygen carrier. His research is currently focused on developing invertebrate hemoglobins as novel blood substitutes.

## **Education**

**Ohio State University: PhD**

**University of Missouri: BS**

Dual BS degrees in Biochemical Engineering and Biological Sciences