

# Jacob Elmer, PhD

Dicciani Endowed Professor of Chemical and Biological Engineering | College of Engineering at Villanova University

Villanova, PA, US

Jacob Elmer, PhD, is an expert in genetic engineering, GMOs, and gene therapy

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## 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.

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## Industry Expertise

Research, Education/Learning

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## Areas of Expertise

Blood Donation, CAR-T Cell Therapy, Cellular Engineering, CRISPR-Cas9, Gene Therapy, Genetic Engineering, GMOs, Hemoglobin, Immunotherapy

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## Education

Ohio State University

PhD

University of Missouri

BS

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## Select Accomplishments

### **2017 NSF Faculty Early Career Development (CAREER) Award**

The CAREER Program offers the National Science Foundation's most prestigious award in support of the early career-development activities of those teacher-scholars who most effectively integrate research and education within the context of the mission of their organization. Dr. Elmer's award will support the study of the innate immune response to non-viral gene therapy in non-immune cells (e.g. prostate or breast cancer cells).

### **2017 American Institute of Chemical Engineers (AIChE) Outstanding Faculty Award**

The Outstanding Faculty Award recognizes a faculty member, preferably within the first five years of his/her appointment, who has contributed to the profession through publications and presentations in his/her field, demonstrated commitment to teaching and students, and a strong record of service to the department, college, university and professional organizations.

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