

## CACT Helps R&D at Cerion

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Two common challenges for the nanotechnology industry are being able to rapidly create new materials, and to manufacture them at an industrial scale. In 2011 Dr. Alastair Cormack of Alfred University's Center for Advanced Ceramic Technology teamed up with Cerion, a global producer of nanomaterials whose clients are primarily multinational chemical companies, to advance their research & development efforts.

"Each year Cerion develops dozens of potential new materials for use in industrial applications," said Dr. Kenneth Reed, co-founder of Cerion. "For certain projects, the landscape of potential solutions is too broad to empirically test in a cost-effective manner. When this occurs, we look to Alfred University's computer-aided atomistic modeling as a means to test our hypotheses and gain valuable insights before moving our work in to the lab."

The work undertaken by Alfred University has indeed provided results. As Professor Cormack, Ph.D. of Alfred University's Center for Advanced Ceramic Technology stated, "One of the very first projects we worked on was to model the performance of a nano-crystalline metal oxides. Our models provided deep insight in to the theoretical function of the nanoparticle under certain operating conditions, thus allowing Cerion to optimize their design for maximum reactivity. This nanoparticle has since gone on to be commercialized by the Company for combustion enhancement and emissions reductions in diesel engines." As Dr. Reed stated, "A number of the predictions made by Professor Cormack, have shaped our fundamental understanding of nanoparticle performance as a function of various critical physical properties."

More recently, Dr. Cormack has undertaken a new project to understand the mechanism of action that underlies a biologically compatible nanoparticle Cerion has created. As Dr. Reed states, "We've developed a material shown to significantly alleviate clinical symptoms and motor deficits in mice models for Multiple Sclerosis and Amyotrophic Lateral Sclerosis that is well tolerated by the body. Our goal now is to use the unique capability provided by Alfred University and Professor Cormack to obtain a deeper understanding of the potential mechanism of action of the nanoparticle." In success, both Alfred University and Cerion believe atomistic modeling may provide new insights that could lead to the discovery of additional disease indications where Cerion's nanoparticle may bring value.

"We are fortunate to have solved the challenge that has been pervasive in the field of nanotechnology for decades... being able to manufacture nanomaterials for industry at a truly global scale," said Landon Mertz, Cerion's Chief Executive Officer. "Where we focus our efforts today are in the lab. We're always looking for innovative and cost effective ways to rapidly prototype new materials so we can move them in to the hands of our industrial partners as quickly as possible. Our collaboration with Dr. Cormack and Alfred University has provided key technical insights and cost savings that have been invaluable to our firm."

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