Focus on functional materials development shortchanges opportunities for discovery

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The current research focus on "functional polymers" can overlook the opportunity for important discoveries that can arise from basic research on how things work, said a distinguished chemist.

James McGrath, University Distinguished Professor of Chemistry at Virginia Tech, will deliver his remarks at the symposium honoring Herman Mark, an early polymer scientist, during the 232nd National Meeting of the American Chemical Society.

Asked to talk about how things have changed, McGrath said, "We use to do more fundamental studies – studies of reaction mechanisms, reaction kinetics, new molecule synthesis, and molecular structure. We might hope for an application but would not be held to a consequence. Now we have to focus on functional polymers and even multi-functional materials."

Such an admonition that research be tied to an application means it is harder to find funding for the fundamental studies. "You don't have failures when doing basic research because even so-called failures increase knowledge. That kind of work led to better understandings that resulted in important discoveries, such as of novel monomers and polymerization techniques.

McGrath, who has published more than 400 papers and holds patents for new fuel cell membranes and many important structural polymers, said "Functional polymers research doesn't allow for failure. But if you don't

do the basic research, you run out of seed corn."

McGrath said the attitude that focus should be applications is not limited to polymers research. "There is pressure in many fields to skip over basic research for applications. For example, in pharmaceutical chemistry, there is pressure to find a treatment for everything. But not understanding how things work isn't healthy."

He will also present at the ACS meeting on his group's breakthrough on a chlorine-resistant reverse osmosis membrane. The group's research also includes polymeric ionic soft transducers for sensors and actuators, separations of ethanol and water, and the possibility of biocompatible membranes.

Source: Virginia Tech