

**...tailoring surfaces with atomic precision, using large libraries to discover protein-mimics, turning chemical weapons into dirt, creating on-the-spot medicine...**

Welcome to DSO's 2016 Proposer's Day. My name is Tyler McQuade, and I am looking forward to interacting with each you today or in the future.

From small molecules to macromolecules to complex molecular systems, I am a huge fan of chemistry. DARPA has enabled me to explore a wide range of molecular efforts and has been a wonderful retirement activity from my former role as a Professor of Chemistry and Biochemistry.

My program portfolio consists of five active programs:

- LoCo (a surface coating program)
- Fold Fx (an exploration of non-natural polymers that can fold and function like proteins)
- ACDC (an effort to realize a portable chemical demilitarization system)
- Make-It (an initiative to realize a completely automated chemical synthesis platform)
- Battlefield Medicine (an effort to produce a 3-D printer-sized units to prepare medicines from raw materials).

A brief summary of each of these efforts can be found on the DARPA website. The LoCo and Battlefield Medicine programs are nearing the end of their period of performance, and new investments are unlikely in the near term. ACDC, Fold Fx, and Make-It, on the other hand, are earlier in their life cycle. While I do not anticipate making new investments in these areas in the next quarter, I might be more open to new ideas in the coming months. An area that I am particularly interested in is fast analytical tools for real-time determination of unknown compounds. While Mass Spec/Mass Spec (MS/MS) tools are valuable, I am interested in multiple low-cost tools that when integrated, yield reliable characterization of unknowns. This type of technology could fit very well into both ACDC and Make-It.

The best approach to engaging me is to help me craft future programs. I am currently exploring ideas at the intersection of evolution and advanced genetic engineering. The molecular tools that have recently emerged enable rapid and precise editing of genomes. The impact that these tools will have over the next 50 years is unclear. Defining research efforts that adhere to existing ethical frameworks while enabling a broad understanding of what these tools can achieve are of particular interest to me.

Interacting with DARPA program managers is different than other agencies. We often have specific objectives that we must meet and seek partners from the community to help us meet them. When you engage us be ready for a conversation instead of pitching your technology to us. Be ready to integrate your skill set or capability into our framework. We need new ideas and approaches all the time, but how you fit in might take you in wonderful and unexpected directions. I look forward to our future conversations.