

## Robotic Fish Could Monitor Water Quality

[Back to Previous Page](#)

**NSF Award:** [CAREER: Dexterous Biomimetic Micromanipulation Using Artificial Muscles: Modeling, Sensing, and Control](#) (Michigan State University)

**State:** [Michigan](#)

**Congressional Districts:**  
Michigan District 08

**Research Areas:** [Engineering](#)

Using artificial muscle materials, engineers at Michigan State University (MSU) have developed a robotic fish.

The research has resulted in innovative ideas for developing energy-efficient robotic fish, which could potentially revolutionize the way aquatic environments, drinking water reservoirs and aquafarms are monitored.

Under his NSF-funded Faculty Early Career Development (CAREER) award, Xiaobo Tan and colleagues modeled, designed and constructed fish that use electro-active ionic polymer-metal composites (IPMCs) for locomotion.

Similar to muscle tissue, the IPMCs change shape when a voltage is applied. The fish fins are integrated with a control system to provide the robot with energy-efficient, fish-like maneuverability.

Tan has partnered with zoologist Elena Litchamn at MSU's Kellogg Biological Station to explore monitoring applications in ecosystems. The team foresees using the fish as an environmental data collection platform by adding communication, navigation and environmental monitoring sensors.

### Image



## Recent Award Highlights



### Combustion Vessel Tests Energy Efficiency

Tool helps improve engine technologies without leaving the lab.

**Research Areas:** [Engineering](#), [Earth & Environment](#)

**Locations:** [Michigan](#)



### Researchers Find Striking Similarities between Nanoparticles and Proteins

Nanoparticles, small particles of inorganic materials, can behave like proteins--the building blocks for living systems

**Research Areas:** [Engineering](#), [Chemistry & Materials](#), [Nanoscience](#)

**Locations:** [Michigan](#)