

## *At a Glance*

### What is it?

■ ONR's Undersea Medicine Program supports the U.S. Navy's and Joint Service's diving, submarine, and Special Forces communities by seeking innovative biomedical approaches to reducing the medical risks of operation in the hostile undersea environment, improving undersea mission flexibility and efficiency and decreasing the medical logistic burden of undersea operations.

### How does it work?

■ The program explores novel interventions against decompression sickness; hyperbaric oxygen toxicity; new approaches to improve the health, safety and performance of submarine forces and divers; and innovations to decrease the medical logistic burden for undersea operations.

### What will it accomplish?

■ The capability to operate deeper, longer, safer and cheaper- worldwide- depends on our ability to develop novel approaches to undersea biomedical issues.

### Point of Contact

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The Office of Naval Research has funded research in Undersea Medicine since the early 1950's. and in 2007, Undersea Medicine was designated as a National Naval Responsibility (NNR). Efforts have shifted from defining safety/performance windows for undersea operations to leveraging new biomedical and electrophysiological technologies to directly address and explore novel approaches to undersea disorders and performance challenges.



The Undersea Medicine Program is working on specific technologies to predict/prevent hyperbaric oxygen toxicity, ensure safe submarine escape and rescue, ensure safe diving in contaminated water, monitor submarine atmospheric conditions, monitor carbon dioxide levels in re-breathers, and interventions against underwater sound/blast effects.

Payoffs may be significant by allowing the capability to operate safely in a hostile environment, increase mission flexibility/efficiency and decrease the logical burden of treating injuries while decreasing the morbidity and mortality of undersea operations.

### Research Challenges:

#### Decompression Sickness:

- Prediction of onset
- Prevention of onset
- Non-recompressive therapies
- Accelerated decompression

#### Hyperbaric Oxygen Toxicity:

- Prediction of onset
- Prevention of onset

#### Submariner and Diver Health:

- Improved performance
- Improved submarine crew selection
- Safe diving in contaminated waters
- Improved trauma management in submarine-special forces operations