ONR develops capability to understand effects of underwater pressure on divers

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US Navy divers assigned to Mobile Diving and Salvage Unit (MDSU) 2 are lowered into the water to conduct dive operations from aboard the Military Sealift Command rescue and salvage ship USNS Grasp (T-ARS 51). MDSU-2 and Navy archeologists, scientists, and historians are in the North Sea conducting diving operations verifying the sites of suspected shipwrecks. The researchers hope to find *USS Bonhomme Richard*, the historic ship commanded by John Paul Jones. Credit: Mass Communication Specialist 1st Class Ja'lon A. Rhinehart

Reaching a new threshold in underwater medical studies, the Office of Naval Research (ONR), today announced a novel capability for examining how cells work at pressures far below the sea surface.

Researchers at the Navy Experimental Diving Unit (NEDU) have designed, built and validated a novel hyperbaric environment to study cellular behavior at greater depths. The joint ONR-NEDU effort is

designed to explore advances to protect Navy divers working at depths of up to 1,000 feet.

"This is a huge leap forward in our ability to understand cellular function at pressurized depths," said Cmdr. Matthew Swiergosz, ONR's undersea medicine program officer. "This capability will bridge a gap in our understanding of identifying potential applications for diving operations."

Using a laboratory technique called patch clamping, in which electrodes are attached to a cell membrane and clamped, scientists can now monitor, stimulate and record the cell's electrical activity in a pressurized environment.

Few studies have been performed to address the underlying molecular mechanisms of diving disorders such as decompression sickness.

In addition to providing future payoff for the Navy, the patch clamping method could also bring benefit to those in the commercial diving community, who are vulnerable to the same hazardous conditions associated with difficult underwater work.

Provided by Office of Naval Research