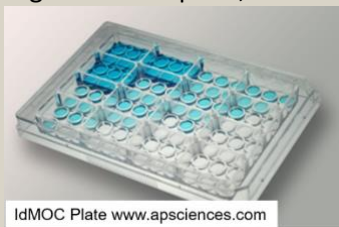


U.S. Army Engineer Research and Development Center – Environmental Laboratory Cell Biology Fact Sheet

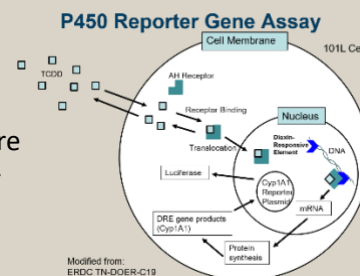
Background: Cell Biology at the U.S. Army Engineer Research and Development Center (ERDC) Environmental Laboratory includes a wide variety of capabilities — from evaluating cellular toxicological effects, to producing antibodies, to harnessing the power of cellular biology to create network models or to develop basic research about the structure and function of cellular materials. Combining our unique training backgrounds in general biology, immunology and biotechnology with over 20 years of hands-on cell assay experience gives us a unique perspective on cellular assay design in order to provide more physiologically relevant organism data.

IdMOC Culture System – The team has been using a multi-organ cell culture system to essentially recreate a whole organism on a plate, at a basic level, using normal (non-cancerous) animal cells. This technology has been used to evaluate the effects of Army compounds of interest on multiple cell types, as well as how each cell type may impact the others through cell signaling, metabolism of compounds, etc. The technology can also be developed to evaluate a variety of animal species.

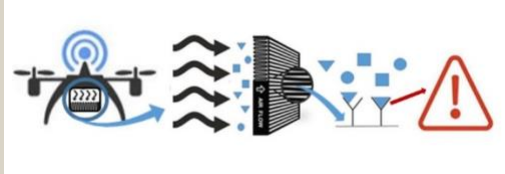


IdMOC Plate www.apsciences.com

p450 Reporter Gene Assay – The ERDC developed a screening assay that can rapidly (within 24 hours) detect the presence of polyaromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) in a sample. It allows an organization providing clean-up services to quickly evaluate if PAHs/PCBs are present at their site at one quarter of the cost, before undergoing expensive testing for specific compounds. Most recently this test was used by the U.S. Geological Survey to screen runoff from sites of interest.



Antibody Development – The team has the capability of developing and/or producing a variety of antibodies from different species. Antibodies can be produced for almost any carbohydrate or protein and for a variety of other compounds of interest. Affinity maturation (increased specificity) can also be performed on antibodies for which a hybridoma already exists. While there is a vast repository of antibodies, there are still gaps, especially in species of reptiles and fish, and antibodies for detecting a variety of emerging compounds have yet to be produced for any species.



Nematode Studies – A variety of nematode (microscopic soil worm) species are utilized by the cell team to evaluate the outcomes of synthetic biological constructs on populations. They are also used to evaluate acute, lifetime, reproductive, and population effects of various compounds. Nematode rapid development (egg to adult in 2 days) and short lifespan (2 weeks) makes them ideal for evaluating long-term and multi-generational effects in a short period of time. The cell team has also developed a new chronic, multi-generational exposure assay to evaluate several compounds of interest to the Army, using the hermaphroditic nematode *Caenorhabditis elegans*.



Image of adult *C. elegans* hermaphrodites in liquid axenic media