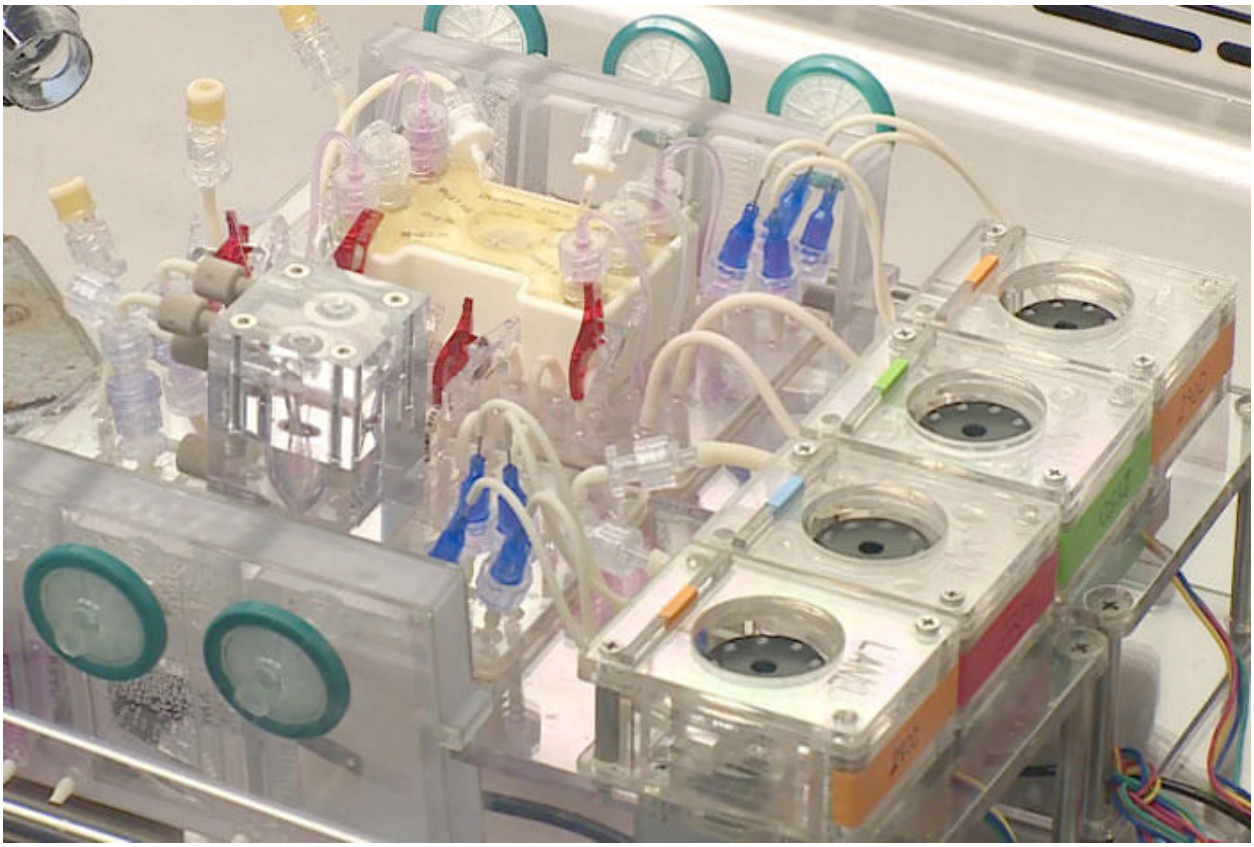
ATHENA surrogate human organ system approaches milestone

July 1, 2015



ATHENA, the “Advanced Tissue-engineered Human Ectypal Network Analyzer” project, is nearing the full integration of four human organ constructs: Liver, heart, lung and kidney. Each organ component is about the size of a smartphone screen, and the whole ATHENA “body” of interconnected organs is designed to fit neatly on a desk.

The development of miniature surrogate human organs, coupled with highly sensitive mass spectrometry technologies, could one day revolutionize the way new drugs and toxic agents are studied.

The ATHENA model may seem improbable and futuristic, but finding alternatives to toxicity testing on animals and studying anatomy with cadavers has never been more important. Scientists continue to raise questions about the effectiveness of animal response to drugs, and cadavers are in ever-increasing short supply.

A central advantage of the ATHENA model is the opportunity to screen new drugs quickly and efficiently and get them to market in a short amount of time.

“By developing this ‘homo minutus,’ we are stepping beyond the need for animal or Petri dish testing," said Rashi Iyer, a senior scientist at Los Alamos National Laboratory. "There are huge benefits in developing drug and toxicity analysis systems that can mimic the response of actual human organs."

Some 40 percent of pharmaceuticals fail their clinical trials, and the effects of thousands of chemicals on humans are simply unknown. Providing a realistic, cost-effective and rapid screening system such as ATHENA could provide major benefits to the medical field by allowing for more accurate screening and offering a greater chance of clinical trial success.

ATHENA is funded by the Defense Threat Reduction Agency and is a collaboration of Los Alamos National Laboratory; Harvard University; Vanderbilt University; Charité Universitätsmedizin in Berlin, Germany; the University of California at San Francisco; and CFD Research Corporation, a technology company based in Huntsville, Alabama.

To learn more, consider watching the Project ATHENA Creates Surrogate Human Organ Systems video on YouTube.

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