



An Update from the Department of Defense for the Interagency Coordinating Committee on the Validation of Alternative Methods

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Tasking



- Provide an update on the Department's activities related to alternative methods for toxicology testing for the Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM) Public Forum



Mission



- The Animal Protection Program’s mission is to ensure compliance with Department of Defense Instruction 3216.01, “Use of Animals in DoD Programs”
- This Instruction states that alternatives to animal use shall be used whenever possible to obtain the objectives of testing if such alternative methods produce scientifically valid or equivalent results



Implementation

- Relevant organizations have come together to form the Tri-Services Toxicology Consortium for the purpose of sharing knowledge and ideas, collaborating on projects, and implementing best practices
 - U.S Army Center for Environmental Health Research
 - U.S. Army Medical Research Institute of Chemical Defense
 - U.S. Army Edgewood Chemical Biological Center
 - Air Force Research Laboratories
 - Inclusive of the 711/Human Performance Wing
 - U.S. Army Corps of Engineers' Engineer Research and Development Center
 - U.S. Army Public Health Command, Army Institute of Public Health
 - Navy Medical Research Unit



Implementation

- Phased approach to evaluating new compounds assists in eliminating compounds prior to *in vivo* work
 - Quantitative Structure-Activity Relationships Analysis (QSAR)
 - *In vitro* methods such as Neutral Red Uptake, Microtox, and Ames assays
 - Further testing based upon outcomes of initial tests may include *in vitro* dermal penetration, irritation and sensitization, chromosome aberration and gene mutation tests, and *ex vivo* organ slice culture
- Organizational areas of focus
 - Adverse Outcome Pathways (AOP), Physiologically Based Pharmacokinetic (PBPK) modeling, QSAR approaches, toxicogenomics, proteomics, metabolomics, biomarker development, nanotoxicology, and developing *ex vivo*, 3-D or co-culture models for addressing DoD-specific concerns (e.g., fuels, munitions, nanoparticles)

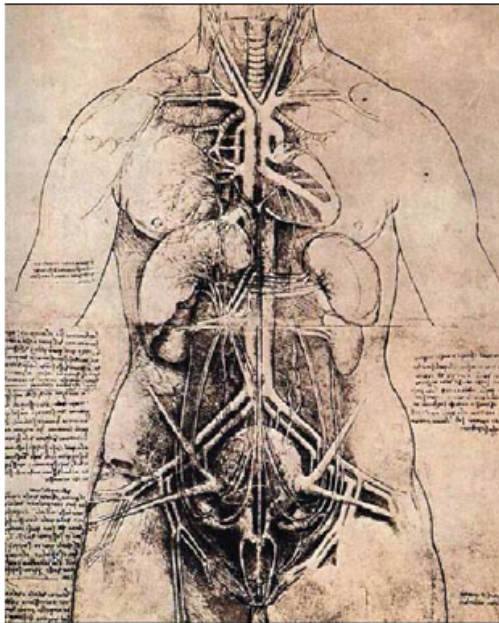


DARPA: Microphysiological Systems Program



Develop an *in vitro* platform that uses human tissues to evaluate the efficacy and toxicity of medical countermeasures.

In other words, build a human-on-a-chip:



- All ten human physiological systems will be functionally represented by human tissue constructs:
 - Circulatory
 - Endocrine
 - Gastrointestinal
 - Immune
 - Integumentary
 - Musculoskeletal
 - Nervous
 - Reproductive
 - Respiratory
 - Urinary
- Tissue viability for at least 4 weeks
- Commercialization plan



Questions

