Developing a Strategic Roadmap To Establish New Approaches for Evaluating the Safety of Chemicals and Medical Products in the United States

Warren Casey, PhD, DABT

Director, NICEATM

NTP Interagency Center for the Evaluation of Alternative Toxicological Methods

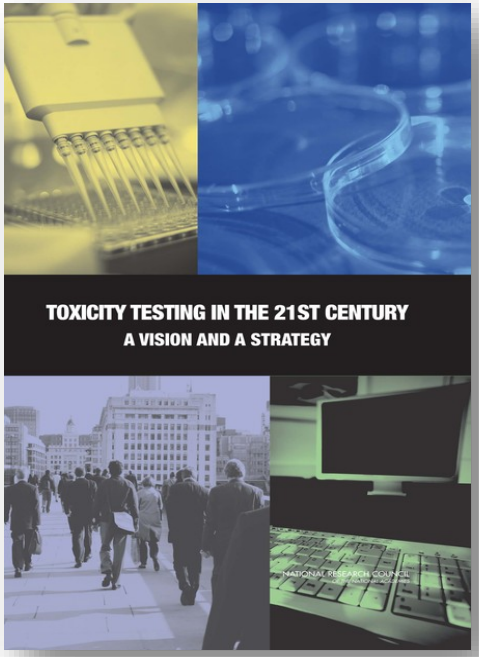
Agency for Toxic Substances and Disease Registry • Consumer Product Safety Commission • Department of Agriculture
Department of Defense • Department of Energy • Department of the Interior • Department of Transportation
Environmental Protection Agency • Food and Drug Administration • National Institute for Occupational Safety and Health
National Institutes of Health • National Cancer Institute • National Institute of Environmental Health Sciences
National Library of Medicine • Occupational Safety and Health Administration

FAQ

- International harmonization is critically important, why is this a “US” effort?

FAQ

- How is this different?



2007

2016

FAQ

- How is this different?
  - Driven by Federal agencies (”top down” vs “bottom up”)
  - Includes both chemicals and medical products
  - Paired with implementation plans that will be tracked and publically reported

Why do we need new approaches?

Drivers for Change

- Ethics

- Efficiency

- Public Health (Human Relevance)

- Legislation

United States Senate Committee on
APPROPRIATIONS

ABOUT THE COMMITTEE | NEWS | SUBCOMMITTEES | HEARINGS | LEGISLATION | Search

Subcommittee Hearing

Hearing on FY2017 National Institutes of Health Budget Request

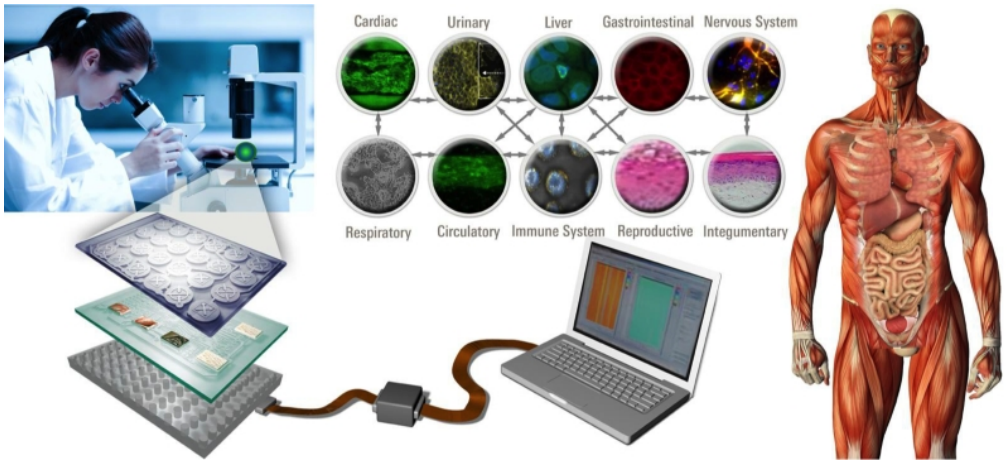
Labor, Health and Human Services, Education, and Related Agencies
Date: Thursday, April 7, 2016
Time: 10:00 AM
Location: Dirksen Senate Office Building 138

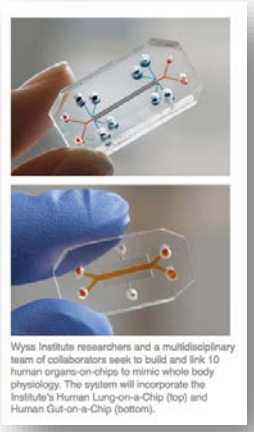
In Francis Collins' recent testimony to the congressional subcommittee with NIH budget oversight responsibility, he offered that :

> "Animal safety testing for environmental chemicals and drugs will largely be replaced by tissue chips and iPS cells in 10 years."
>
> "…..giving results that are more accurate, at lower cost and higher throughput."

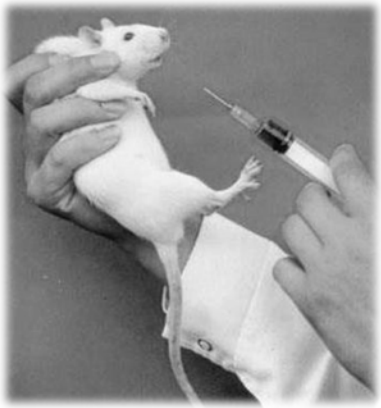
http://www.appropriations.senate.gov/hearings/hearing-on-fy2017-national-institutes-of-health-budget-request

It is difficult for evolving *institutional practices* to keep pace with revolutionary advances in science and technology




Wyss Institute researchers and a multidisciplinary team of collaborators seek to build and link 10 human organs-on-chips to mimic whole body physiology. The system will incorporate the Institute's Human Lung-on-a-Chip (top) and Human Gut-on-a-Chip (bottom).

Barrangou & Doudna, Nat. Biotech 933–941 (2016)

1928	2017
	
	
	

Method Development → Validation → Regulatory Acceptance

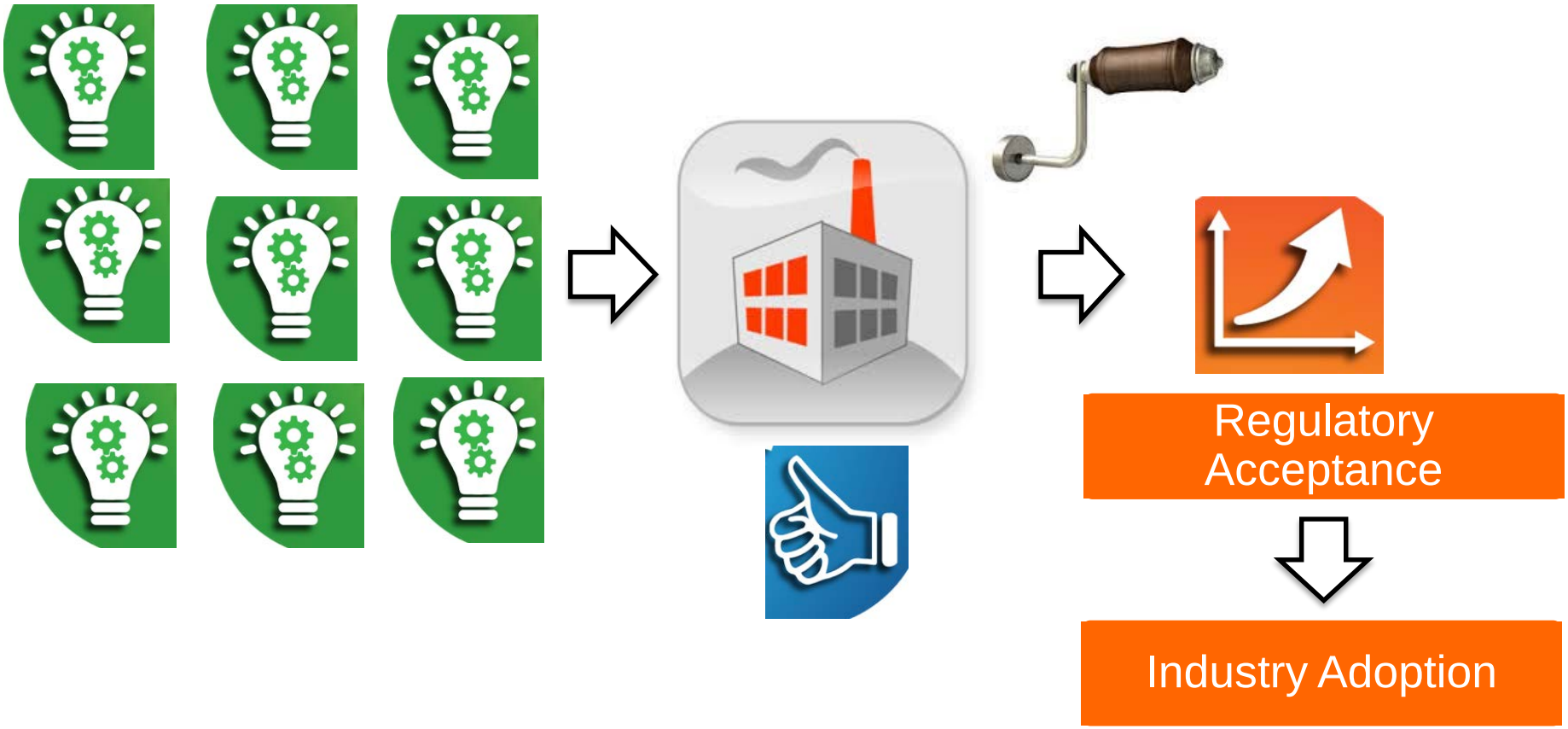
Method Development → Validation → Regulatory Acceptance

“VAMs”

Pre Validation → Validation (Ring Trial) → Peer Review

Regulatory Acceptance

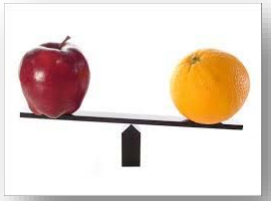
Industry Adoption


Regulatory Acceptance
Industry Adoption

"Myth of Many Methods"

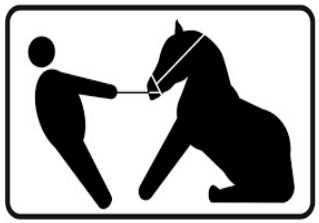
The 4th R; RETHINK

- Animal Data as the Reference for Validation



- Insufficient Human Data

- Institutional Resistance



- Harmonization

ehp ENVIRONMENTAL HEALTH PERSPECTIVES

15 Years Out: Reinventing ICCVAM

February 1, 2013 Editorials Comments Off

Linda S. Birnbaum

Director, NIEHS and NTP, National Institutes of Health, Department of Health and Human Services, Research Triangle Park, North

The interagency agenda now be *driven by agencies* that will ultimately implement and utilize the recommended methods

Fit for purpose / Context of Use

Background

- **2015 SACATM** – Identified Roadmap as a priority activity
- **2016 SACATM** – Meeting focused on Roadmap
- **Feb 2017** – 2-day face-to-face Interagency meeting to start process of establishing mission / vision / goals / objectives

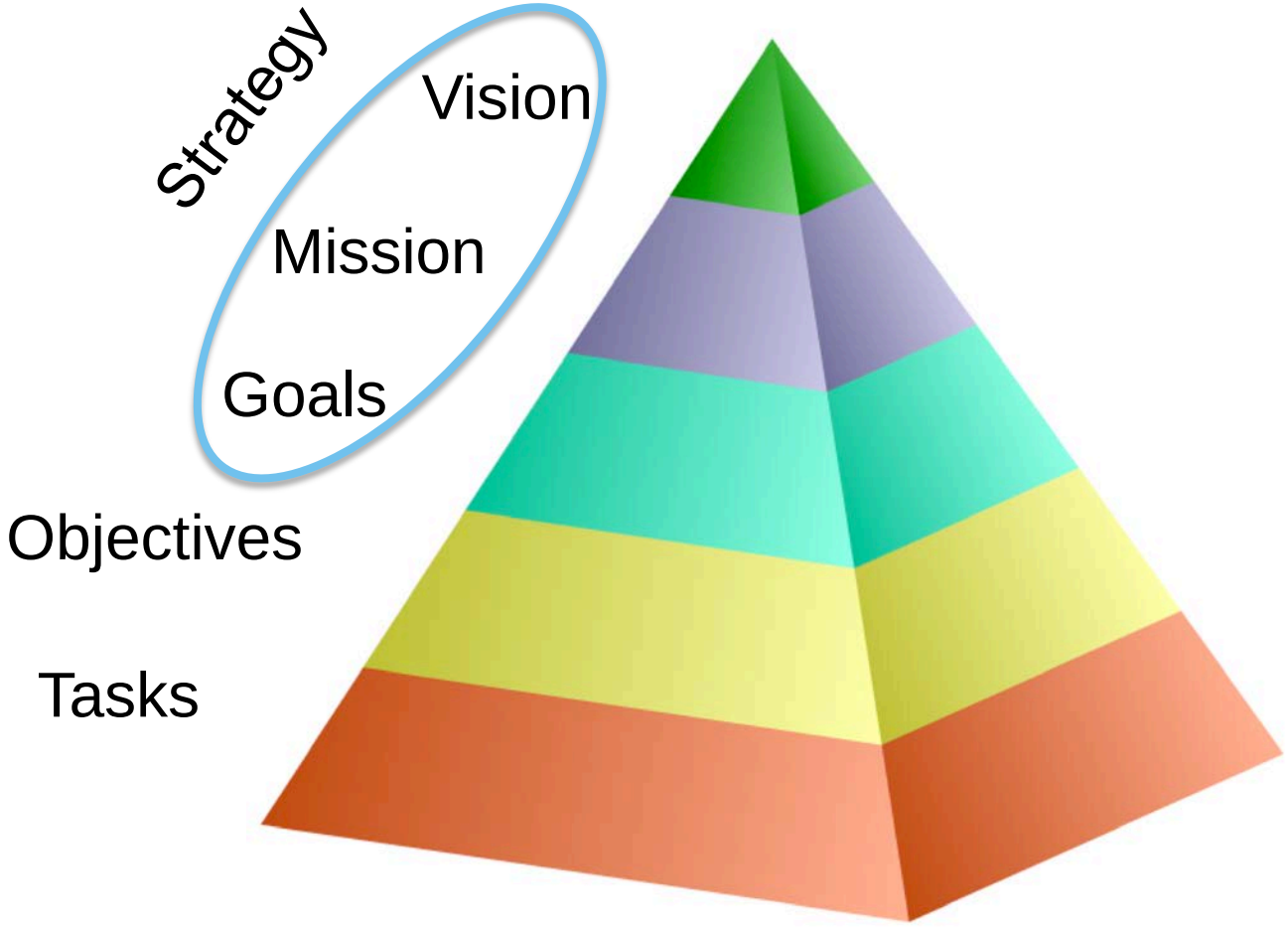
65 participants + 20 WebEx / Professional Facilitation

Agency for Toxic Substances and Disease Registry
Consumer Product Safety Commission
Department of Agriculture
Department of Energy
Department of the Interior
Department of Transportation
Environmental Protection Agency
Food and Drug Administration
Occupational Safety and Health Administration
National Institute for Occupational Safety and Health
National Cancer Institute
National Institute of Environmental Health Sciences
National Library of Medicine
National Institutes of Health
National Institute of Standards and Technology
Department of Defense
Department of Energy

A strategic roadmap is a plan that defines where we are, where we want to go, and how to get there

- Helps federal agencies identify consensus goals and coordinate key activities
- Provides a framework to support the planning and coordination of technology development
- Facilitates communication and collaboration within and between government agencies, stakeholders, and international partners

Agencies Strategic Plans are aligned…


Strategy
Vision
Mission
Goals
Objectives
Tasks

Disclaimer: *"The draft outline was developed by representatives from ICCVAM agencies along with other Federal partners and interagency workgroups. The text represents a generalized perspective that does not reflect opinions or policy of any specific agency and may not be applicable to all Federal agencies.“*

VISION: To establish new approaches for evaluating the safety of chemicals and medical products in the United States that will increase confidence in alternative methods and improve their relevance to human health outcomes while maximizing efficiency and maintaining a commitment to replace, reduce, and refine animal use.

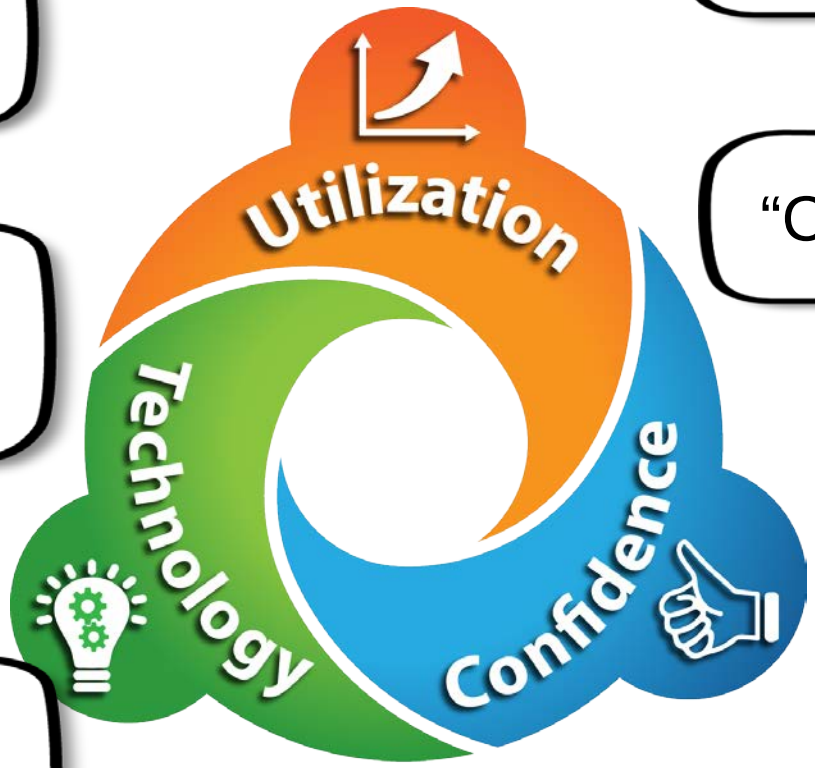
MISSION: Federal agencies, the regulated community, non-governmental organizations and other technical experts will work together to explore new approaches for evaluating the safety of chemicals and medical products that will **(1)** help guide the development of new tools to support regulatory and research needs **(2)** use knowledge of human and animal biology as appropriate to help establish confidence in new approaches, and **(3)** facilitate and encourage the implementation and use of these new approaches by Federal agencies and regulated industries.

Start Here!

"Communication"

"Commitment"

"Collaboration"



"Fit for Purpose"

"Context of use"

"Success breeds success"

Example Draft Goals

Regularly assess the plan and communicate both the progress and challenges in its implementation

Example Draft Goals

Identify and communicate the decision contexts and needs of Federal agencies

Example Draft Goals

Create resources that will foster development and utilization of new or enhanced approaches

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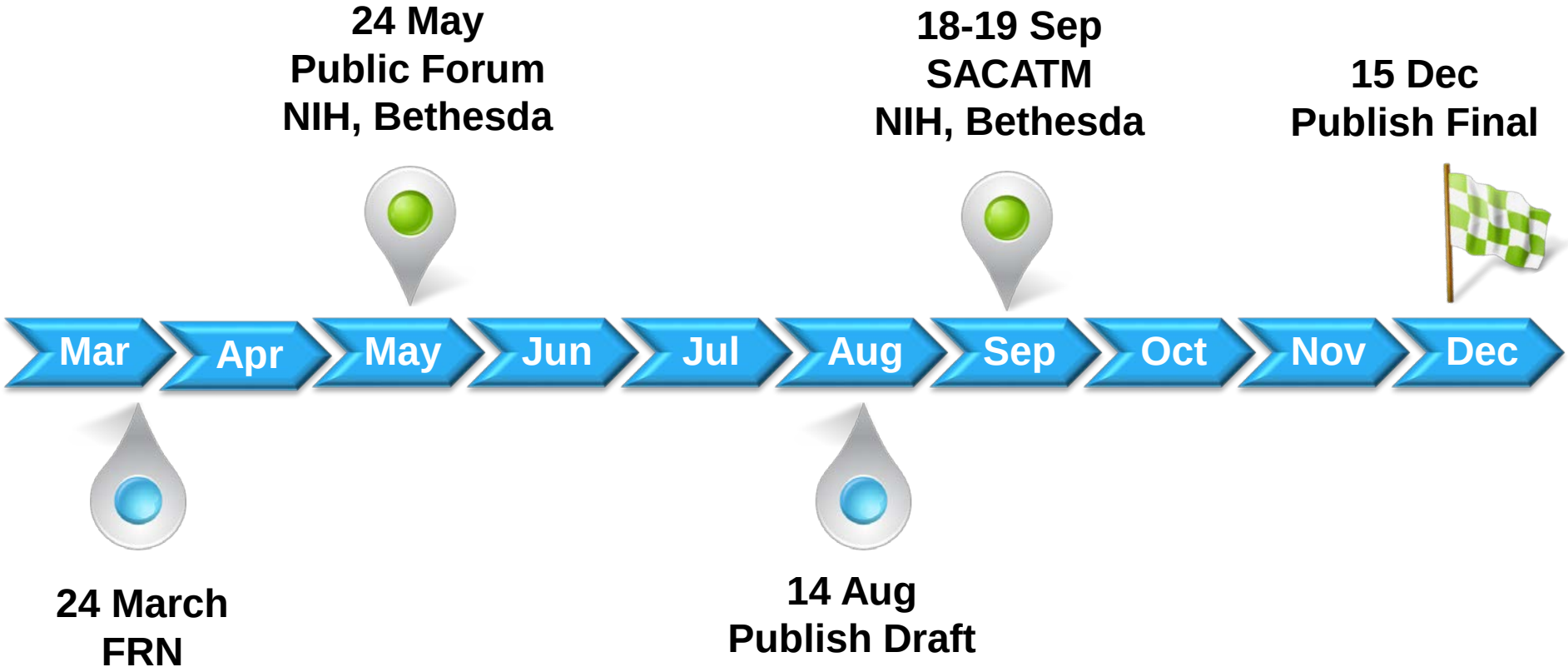
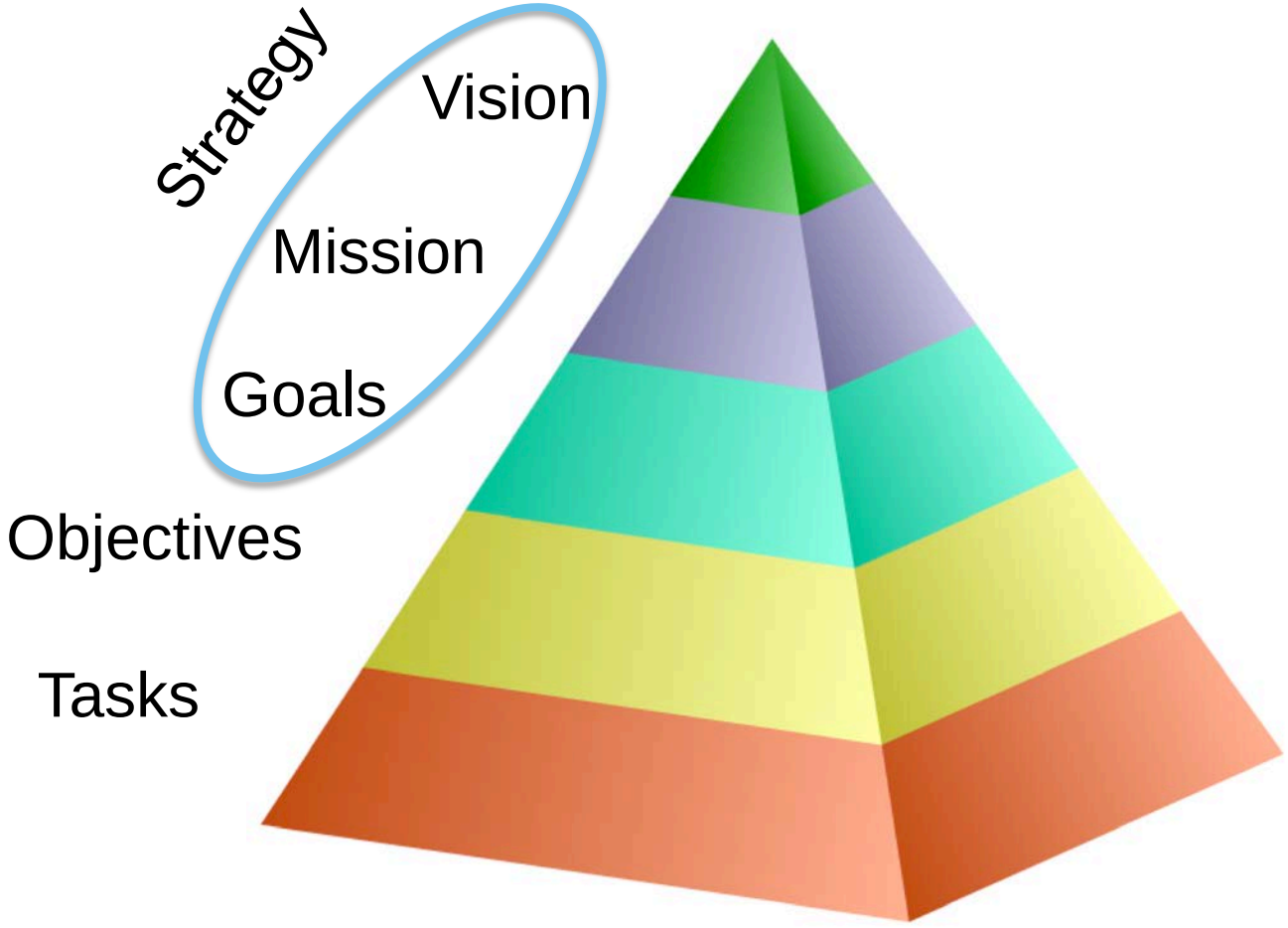
Create resources that will foster development and utilization of new or enhanced approaches

Hosted Session: **Tools for Validation and Regulatory Application of Alternative Methods** (Wednesday, March 15, 1:30-2:30 CC Room 337)

An Integrated Chemical Environment to Support 21st Century Toxicology Bell et al. Abstract 2935 P429 3/15/17 (Wed), 1:15-4:30.


24 May
Public Forum
NIH, Bethesda
18-19 Sep
SACATM
NIH, Bethesda
15 Dec
Publish Final
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
24 March
FRN
14 Aug
Publish Draft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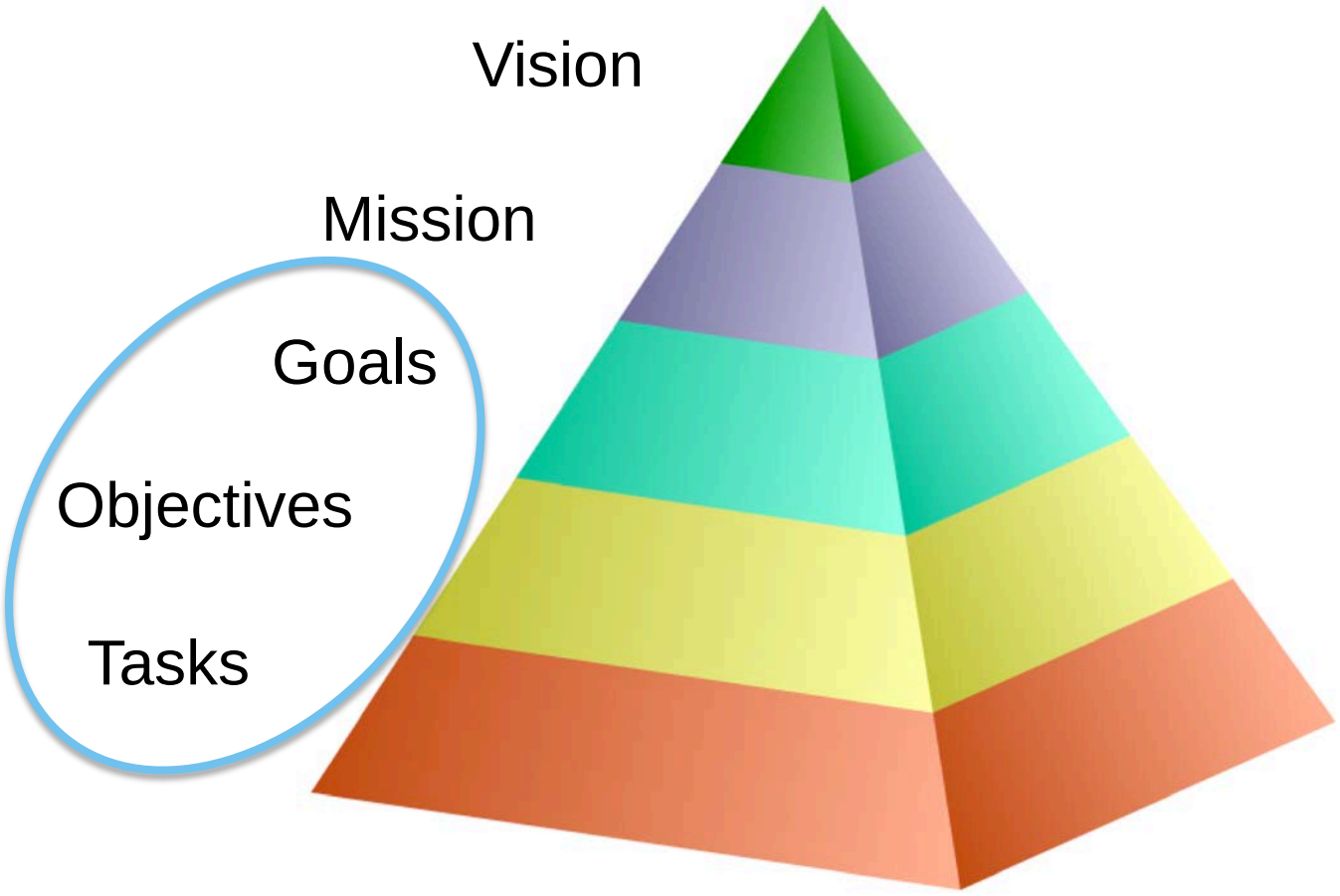
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Highlights for SOT 2017

- **Replacing Animals for Acute Systemic Toxicity Testing: A U.S. Strategy and Roadmap**
  - Poster Session on Regulation and Policy, Tuesday, March 14, 1:15-4:30 p.m.
- **ICCVAM Tools for Validation and Regulatory Application of Alternative Methods**
  - Exhibitor-hosted session, Wednesday, March 15, 1:30-2:30 p.m., CC Room 337
- **Prediction of Skin Sensitization Potency Using Machine Learning Approaches**

  Abstract 2195, P409, 3/15/17 (Wed), 1:15-4:30

Thank you!

Questions?