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# INNOVATION REVIEW CRITERION

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# AGENDA ITEMS

- ◆ DEFINE INNOVATION
- ◆ NIH EFFORTS TO PROMOTE RECEIPT AND REVIEW OF INNOVATIVE APPLICATIONS (e.g., R21, RFAs/PAs)
- ◆ POSSIBLE NEW INITIATIVES

# INNOVATIVE (HIGH-RISK) RESEARCH: A CHALLENGE FOR THE NIH

- ◆ Excessively conservative peer review process that places more emphasis on feasibility than innovation
- ◆ NIH seen as risk-averse
- ◆ Funding decisions are too conservative and slow
- ◆ Many innovative applications are not submitted to the NIH
- ◆ This threatens to deplete the NIH of a vital set of investments that are critical to its future successes

# NIH RESPONSE TO THIS CHALLENGE

- ◆ NIH Roadmap for Medical Research
- ◆ NIH Neuroscience Blueprint

# INNOVATION DEFINED

**Innovation<sup>1</sup>:** 1. the action of innovating; the introduction of novelties; the alteration of what is established by the introduction of new elements or forms. 2. A change made in the nature or fashion of anything; something newly introduced; a novel practice, method, etc. 3. *Comm.* The action of introducing a new product into the market; a product newly brought into the market.

<sup>1</sup>Oxford Dictionary

# Definitions

## Creativity

- ◆ Ability to solve problems, generate possibilities, create products
- ◆ Within a specific domain (e.g. cooking, engineering, law, music, science)
- ◆ Initially novel but eventually broadly accepted

The definitions are provided by Merton C. Flemings, Toyota Professor Emeritus, MIT and Director, Lemelson-MIT Program. The definitions are based on William Middendorf's, *What Every Engineer Should Know About Inventing*, Marcel Dekker, New York, New York, 1981 and Howard Gardner's, *Intelligence Reframed: Multiple Intelligences for the 21st Century*, Basics Books, New York, New York, 1999.

# Definitions

## Invention

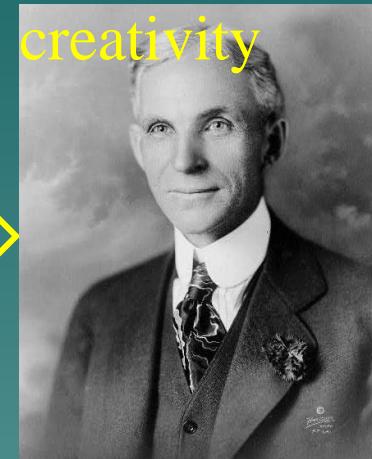
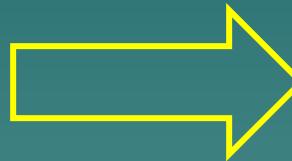
- ◆ Process of devising & producing something which is useful and not previously known or existing
- ◆ Developed through independent investigation, experimentation, & mental activity

# Definitions

## Innovation

- ◆ Process of introducing novel ideas into use or practice
- ◆ Includes entrepreneurship as integral part
- ◆ Usually considered noteworthy if commercially successful
- ◆ May or may not include invention

# INNOVATION IS A PROCESS



# INNOVATION DEFINED - NIH

- ◆ **Innovation** – Is the project original and innovative? For example: Does the project challenge existing paradigms or clinical practice; address an innovative hypothesis or critical barrier to progress in the field? Does the project develop or employ novel concepts, approaches, methodologies, tools, or technologies for this area?

# NIH Promotion of Innovative Science

## Interviews with ICs/Centers

- ◆ How does NIH promote receipt and review of innovative science?
- ◆ 13 ICs interviewed
- ◆ Completed by Chana Rabiner, PhD (Emerging Leaders Program) and David Armstrong, PhD

# INTERVIEW STRUCTURE

- ◆ Current/past efforts to promote receipt and review of innovative grant applications
- ◆ Future initiatives being considered to promote innovation
- ◆ Major impediments
- ◆ Recommendations

# Summary of Interviews

- ◆ RFAs and PAs
  - Used to invigorate underserved areas or solicit innovative applications
  - Reviewed in-house and resulting from IC-sponsored workshops
- ◆ Trans-NIH R21 may fall short of intended goal
- ◆ IC authority to fund poorly scored applications rarely used

# Interview Conclusions and Recommendations

- ◆ Need more explicit language in PAs
- ◆ CSR perceived as conservative
- ◆ SRAs should educate reviewers on different mechanisms' emphasis on innovation
- ◆ NIH generally needs to be seen as willing to take greater risks

“A highly structured bureaucracy is innovation’s worst enemy.”

# INITIATIVES FOR CONSIDERATION

- ◆ Establish a working group to develop new language for the trans-NIH R21 grant mechanism with greater emphasis on innovation and paradigm shifting research.
- ◆ Increase communication in the area of innovation (e.g., workshops, seminar series, national meetings)
- ◆ Establish working group to evaluate scoring of individual review criterion (e.g., innovation)

# Project Innovation

- ◆ Trans-NIH initiative to promote funding of high-risk, potentially high-impact grant applications that fail to meet the payline
- ◆ Involves collaboration between CSR and all funding ICs
- ◆ Nominations evaluated and prioritized by Innovation Committee specific for each IC

# Project Innovation

- ◆ Using the R56 mechanism and/or “discretionary” funds each IC/Center will provide partial support for a limited period of time to one highly innovative, paradigm shifting application/round.
- ◆ The goal of **PROJECT INNOVATION** is to provide limited support to circa 75 highly innovative grant applications per year which otherwise would have gone unfunded.

# PROJECT INNOVATION: BENEFITS

- ◆ Provide strong encouragement to investigators particularly if new to the NIH
- ◆ Unprecedented collaboration between CSR and the ICs/Center.
- ◆ Increase awareness of innovation within NIH and extramural scientific communities
- ◆ Important step to changing public perception about NIH and its willingness to take risk, accept failure and support truly paradigm shifting research.