

A brief history: 'dual use' research...

- The Cold War; nuclear weapons paradigm
- 1982 NAS: *Scientific Communication & National Security*, "Corson Report" -bright line?, "gray zone"
- 1985 Reagan: NSDD-189 "to maximum extent possible, products of fundamental research remain unrestricted...where national security requires control, mechanism...is classification"
- Ongoing revolution in life sciences...and Sept 11, 2001
- 2004 NRC *Biotechnology Research in an Age of Terrorism*
- 2005 National Science Advisory Board on Biosecurity
- 2006 NRC, *Globalization, Biosecurity, and the Future of the Life Sciences*
- 2011 NSABB *Recommendations on Communication of Experimental Adaptation of Avian Influenza A/H5N1*

Biotechnology Research in an Age of Terrorism (2004)



(aka, Fink Committee Report)

- Recognized potential for misuse of biological sciences
- 7 classes of "experiments of concern"
- "System...of filters...to protect against misuse"
- Emphasized importance of self-governance by scientific community
- Journal editors as gate-keepers
- "National Science Advisory Board for Biodefense" for guidance, review of risky experiments
- "International Forum on Biological

National Science Advisory Board for Biosecurity (NSABB)

- Advisory to the Secretary of Health and Human Services, Director of National Institutes of Health, and heads of all US federal departments and agencies that conduct or support life science research
- Recommend specific strategies for efficient and effective oversight of U.S. federally conducted or supported dual use biological research
- 25 voting members + *ex officios*
- Charter signed March 4, 2004
- First meeting June 30-July 1, 2005

NSABB Charge

NATIONAL
SCIENCE
ADVISORY
BOARD FOR
BIOSECURITY

Recommend:

- Criteria for identifying dual use research of concern
- National guidelines for oversight of dual use research at both local and federal levels, including
 - Local review and approval processes
 - Criteria/processes for referral of issues to NSABB
- Strategies for oversight of new classes of experiments and technologies

NSABB Charge

NATIONAL
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Advise on:

- Program for biosecurity education and training for all scientists and laboratory workers at federally funded institutions
- A code of conduct for scientists and laboratory workers in life sciences research
- National guidelines on communication and dissemination of dual use research methodology and research results
- Strategies for promoting international dialogue on dual use research issue

"Dual Use Research of Concern"

Research that, based on current understanding, can be reasonably anticipated to provide knowledge, products, or technologies that could be **directly misapplied** by others to pose a threat to public health and safety, agricultural crops and other plants, animals, the environment, or materiel

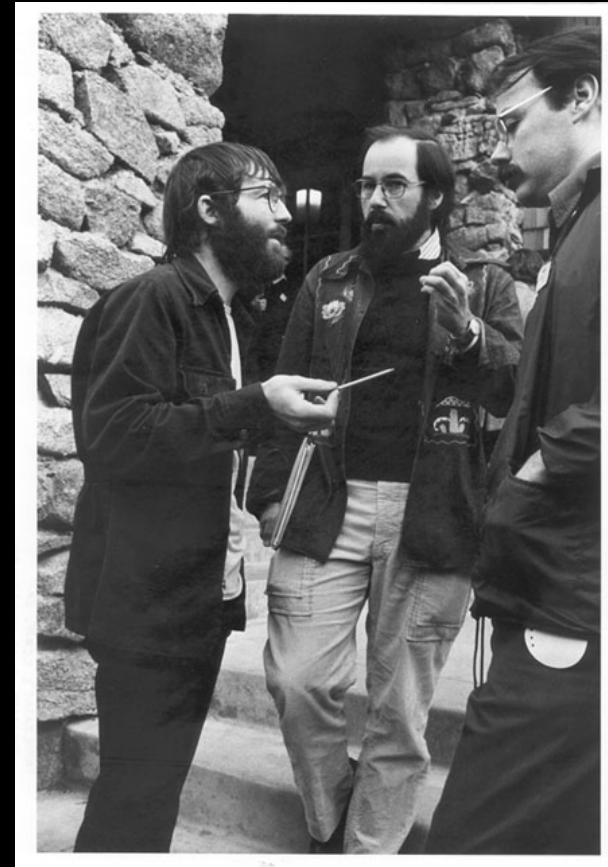
<http://oba.od.nih.gov/biosecurity/biosecurity.html>

Back to the Future?

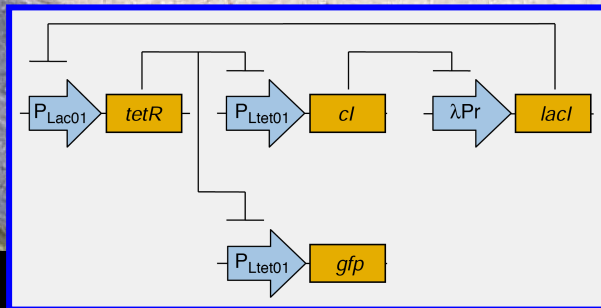
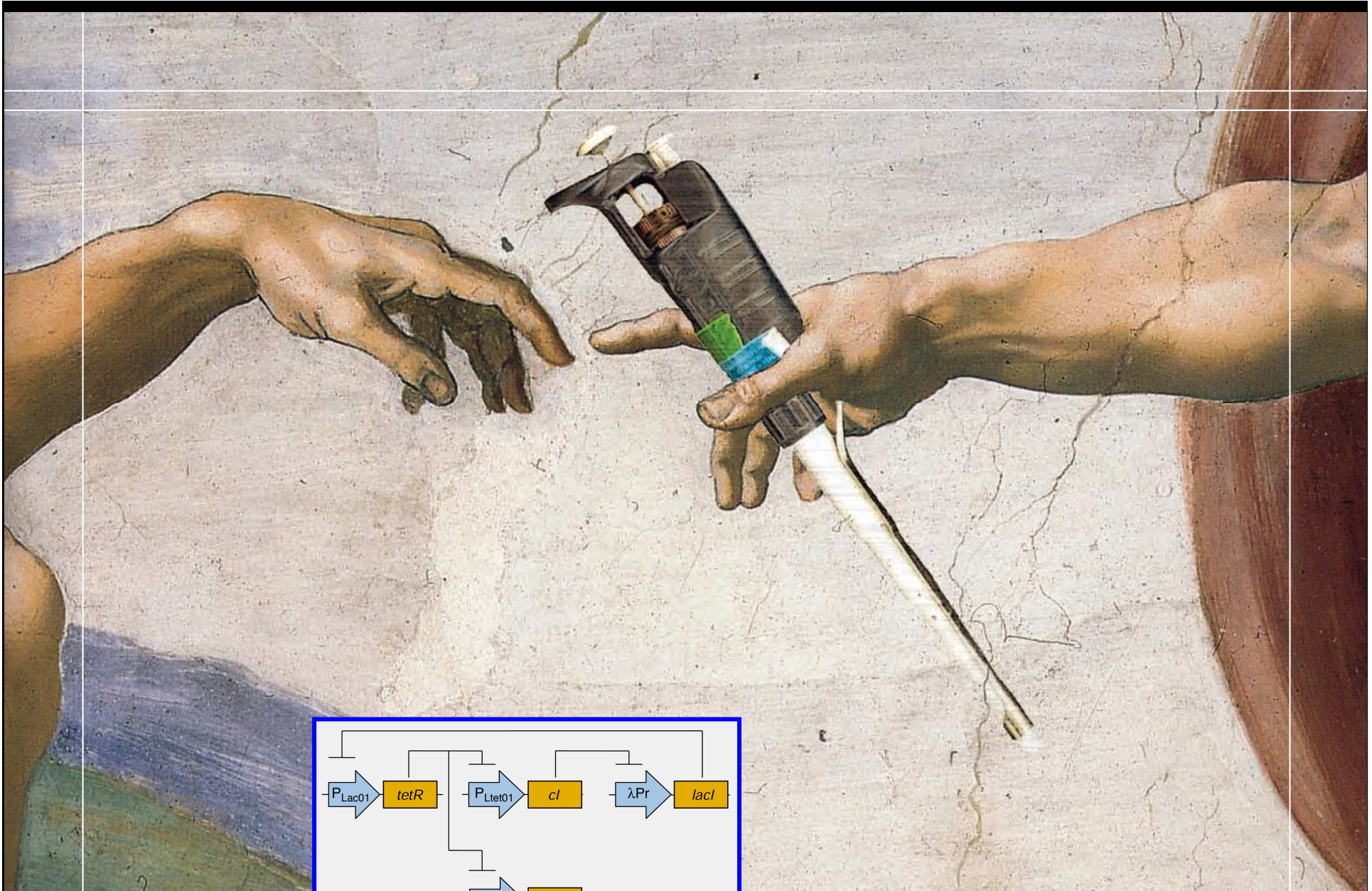
International Conference on Recombinant DNA Molecules
Asilomar Conference Center, Pacific Grove, California, February 1975



Maxine Singer, Norton Zinder, Sydney Brenner, Paul Berg



Philip Sharp, David Baltimore



Alan Moses, Berkeley Science Review

Elowitz, Leibler; Nature 403:335, 2000



Principles for Identifying Dual Use Research

- The “threshold” for the definition of “dual use research of concern” takes into account scope and immediacy of potential threat
 - Results can be directly misapplied (immediacy)
 - Misapplication would have broad consequences (scope)
- Evaluation of dual use potential should be based on:
 - Current understanding regarding the implications of the research results
 - Reasonable anticipation that research results could be misapplied

Research Areas of Special Concern

Careful consideration should be given to the potential for producing information, products, or technologies that could:

- ❑ Enhance the harmful consequences of a biological agent or toxin
- ❑ Disrupt immunity or the effectiveness of an immunization without a clinical and/or agricultural justification
- ❑ Confer to a biological agent or toxin, resistance to clinically and/or agriculturally useful prophylactic or therapeutic interventions against that agent or toxin, or facilitate their ability to evade detection methodologies

Research Areas of Special Concern

- Increase the stability, transmissibility, or the ability to disseminate a biological agent or toxin
- Alter the host range or tropism of a biological agent or toxin
- Enhance the susceptibility of a host population
- Generate a novel pathogenic agent or toxin, or reconstitute an eradicated or extinct biological agent