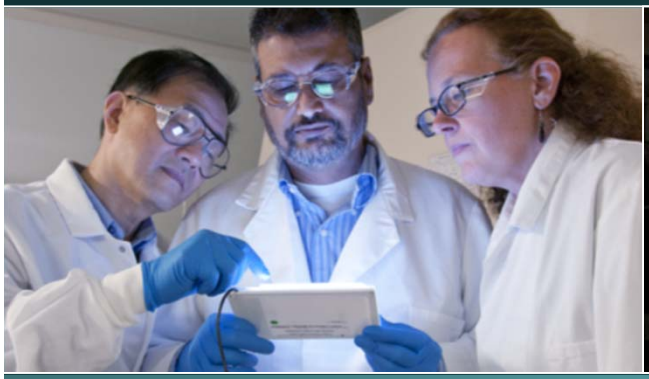
Frederick National Laboratory
for Cancer Research



Frederick National Laboratory for Cancer Research

Presentation to the Board of Scientific Advisors

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CEO, SAIC-Frederick, Inc.

Nov. 5, 2012

DEPARTMENT OF HEALTH AND HUMAN SERVICES • National Institutes of Health • National Cancer Institute
Frederick National Laboratory is a Federally Funded Research Center, operated by SAIC-Frederick, Inc., for the National Cancer Institute.

Frederick National Laboratory

Presentation Outline

- Our Identity and Mission
- Exemplifying the impact of Frederick National Laboratory programs
- NCI-Frederick Advisory Committee guidance for the future of Frederick National Laboratory

Overview of Frederick National Laboratory for Cancer Research

- **FNLCR is the Federally Funded Research and Development Center**
  - Established in 1972
  - Only FFRDC dedicated to biomedical research
- **Proudly operated by SAIC-Frederick, Inc. on behalf of the National Cancer Institute**
- **Main campus on 70 acres at Ft. Detrick, MD**
  - Co-located with intramural NCI researchers and other NCI activities
  - Additional FNLCR scientists at Bethesda and Rockville sites
- **Mission**: Pursue innovative basic, applied, and translational research leveraging technical expertise, physical infrastructure, and FFRDC status

Defining Characteristics of Frederick National Laboratory for Cancer Research

- **Unique combination** of scientific expertise & operational capability to support all aspects of applied biology and translational medicine
- **Agile :** adapt to changes in NCI priorities
- **Honest Broker :** integrate with government agencies, extramural community, and industry partners
- **Accessible:** technologies and contractor expertise is available to intramural, academic, and industrial biomedical concerns

FNLCR Partnership Development Priorities

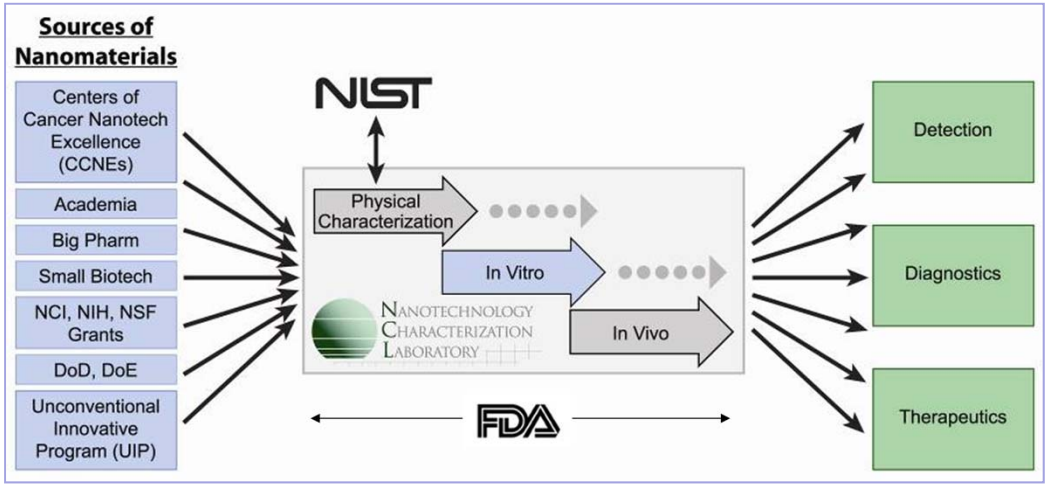
Focus Areas

Supporting the NCI Mission in Cancer and AIDS Research

- **Technology Development and Application**
  - Genomics, Proteomics, Advanced biomedical computing, Biomedical imaging & microscopy, Laboratory animal sciences, Small animal imaging, Clinical Assay technology
- **Accelerate Preclinical Development**
  - Nanotechnology (NCL), Genetically Engineered Mouse Models of cancer (CAPR)
- **Clinical development support**
  - Clinical Assay Development Center, Biopharmaceutical Development Program, Diagnostics and Pharmacodynamics
- **AIDS & Cancer Virus Program**

Nanotechnology Characterization Laboratory (NCL)

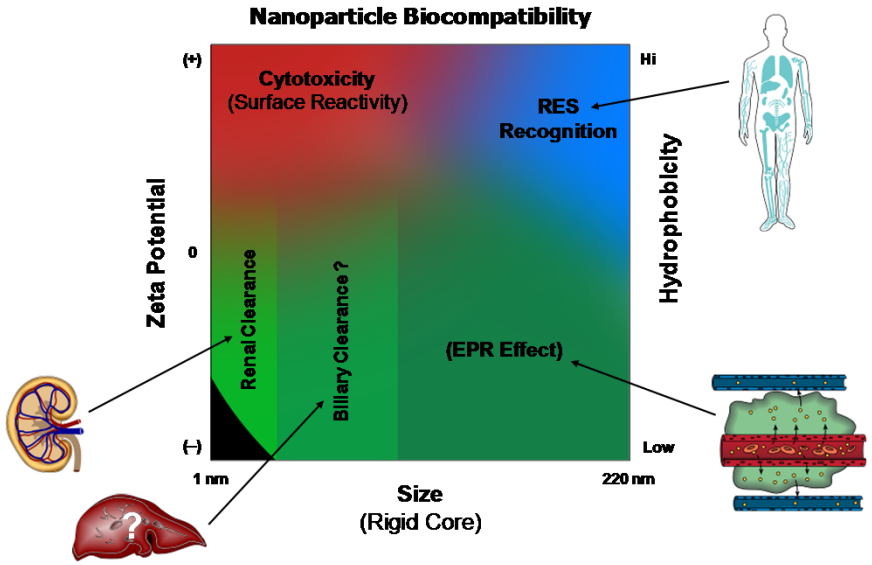
- NCL was established in 2004 as an interagency collaboration among NCI, NIST, and FDA. The lab's mission is to accelerate the translation of promising nanotech cancer drugs and diagnostics
- NCL performs preclinical characterization of nanomaterials, including:
  - physicochemical characterization
  - in vitro experiments
  - in vivo testing for safety and efficacy



90% of NCL's efforts support the extramural community

Why NCL Is Needed

- Most nanomaterials come from academic labs focused on materials science
  - Investigators have little experience with oncology, pharmacology, drug development, or regulatory requirements
- Collaboration with NCL allows investigators to take advantage of 'lessons learned':
  - Trends in biocompatibility
  - Gives investigators a heads-up on regulatory requirements



McNeil (2009), *Wiley Interdisciplinary Reviews: Nanomedicine and Nanobiotechnology*, 1:264-271.
Nel et al. (2009), *Nature Materials* 8: 543-557.
Cover of *Advanced Drug Delivery Reviews*, June, 2009.

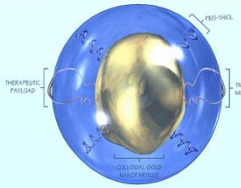
Success Stories:
NCL-aided Submissions to Clinic

AZAYA THERAPEUTICS

IND 2009

- **ATI-1123** : PEGylated nanoliposomal formulation of docetaxel
- Phase I safety study in patients with advanced solid tumors complete in 2012.

CYTIMMUNE SCIENCES INC



Phase 1 Completed 2008

- **AuImmune®** : PEGylated colloidal gold nanoparticle-TNFα conjugates
- Phase II study in combination with Taxotere to start in 2012.

- **BIND-014** : docetaxel-encapsulated PLGA nanoparticle-aptamer conjugates
- Binds PSMA expressed on prostate cancer cells
- Phase I safety study in patients with advanced or metastatic cancer ongoing.

BIND BIOSCIENCES

IND 2011

Nanospectra

IDE 2008

- Silica-core gold-shell particle for photothermal ablation with NIR irradiation
- Pilot safety study in head and neck cancers ongoing; efficacy study in lung tumors to start in 2012.

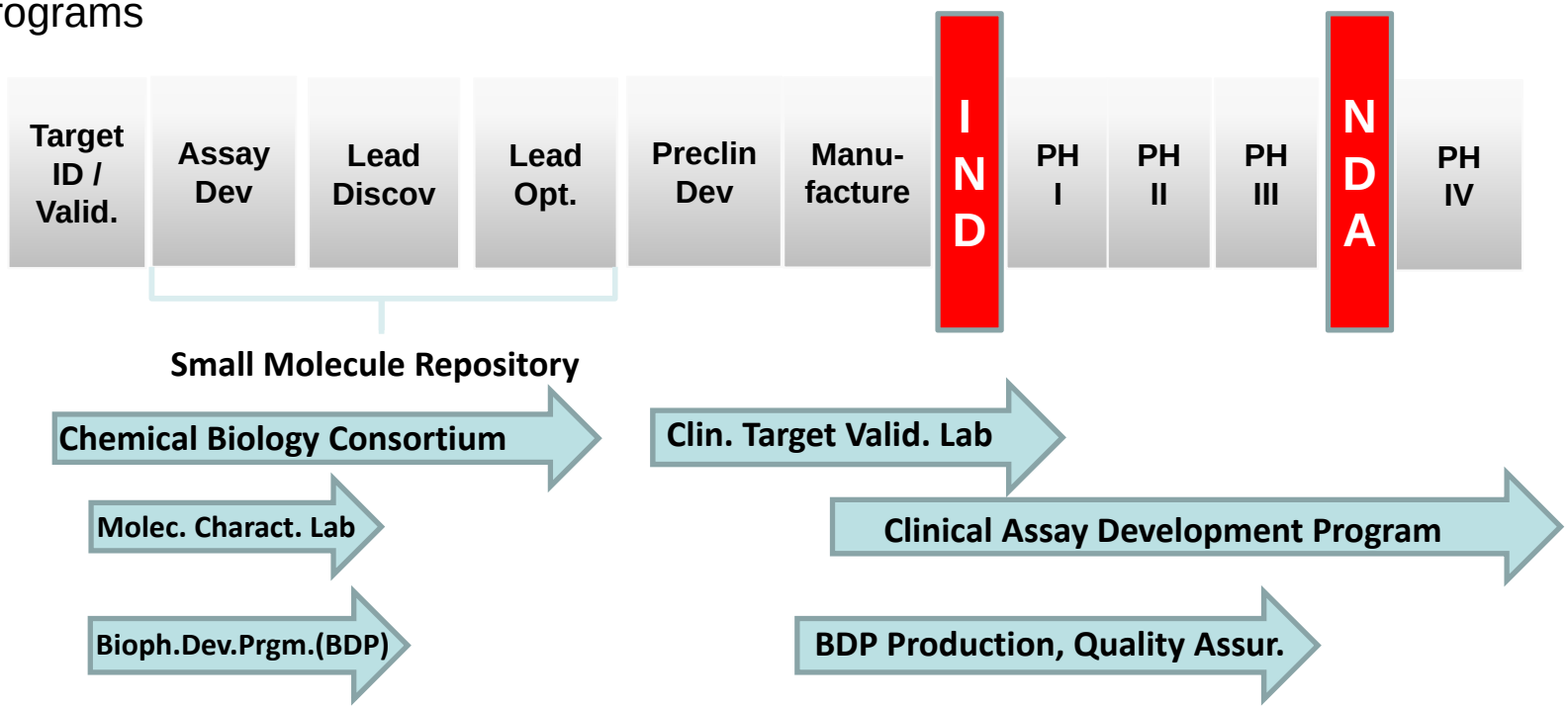
ProNAi

IND 2010

- **PNT2258 :** liposome-encapsulated oligonucleotide for breast and lung cancer.
- Phase I safety study in patients with advanced solid tumors ongoing.

The NCI Experimental Therapeutics Program (NExT)

- NExT is led by the Division of Cancer Treatment and Diagnosis to create a coordinated cancer therapeutics discovery and development pipeline with the external scientific community
  - Projects evaluated by extramural Special Emphasis Panel
- SAIC-F provides operational and dedicated technical support to all phases of NExT programs



Supporting Drug Development : Biopharm. Development Program

Sole Source of Monoclonal Antibody ch14.18

Concept : ch14.18 marks neuroblastomas for killing by the immune system by binding to an overexpressed antigen called GD2

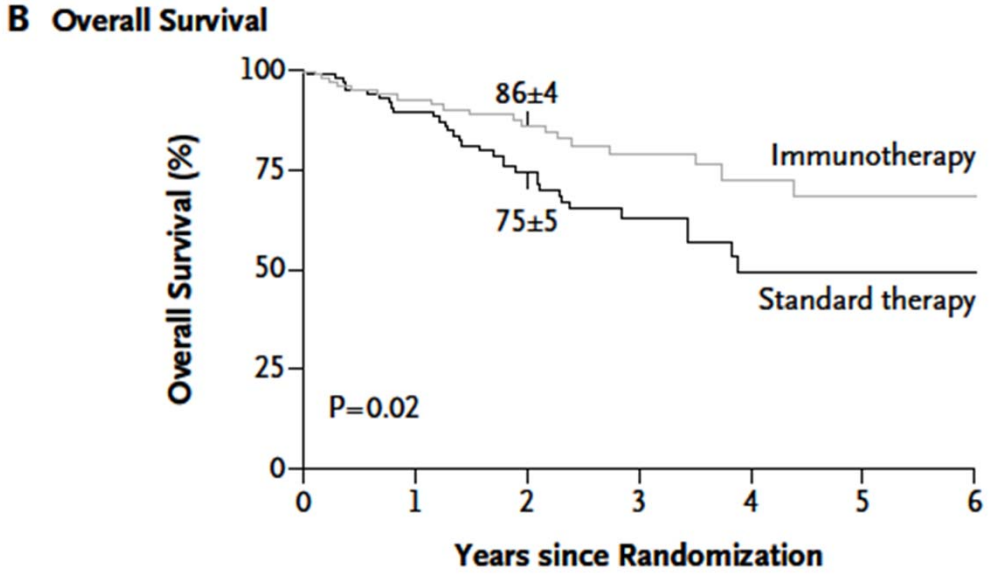
- Due to complexity of process and small market, no commercial vendor would make the antibody

Children's Oncology Group Phase III trial in patients with high-risk neuroblastoma demonstrated clear event-free survival benefit

With the success of the trial, a commercial vendor has been found and our process transferred

The NEW ENGLAND JOURNAL of MEDICINE

363 1324 (2010)



Collaborative Support of AIDS Vaccine Research at FNL

Quantitative Molecular Diagnostics Core

- State of the art capabilities for monitoring virus levels in blood and tissues in NHP models
  - Real-time qPCR/qRT PCR, droplet digital PCR)
- National reference lab
- Critical support of high impact AIDS vaccine studies

LETTER nature doi:10.1038/nature10003

Profound early control of highly pathogenic SIV by an effector memory T-cell vaccine

Scott G. Hansen[1], Julia C. Ford[1], Matthew S. Lewis[1], Abigail B. Ventura[1], Colette M. Hughes[1], Lia Coyne-Johnson[1], Nathan Whizin[1], Kelli Oswald[2], Rebecca Shoemaker[2], Tonya Swanson[1], Alfred W. Legasse[1], Maria J. Chiuchiolo[3], Christopher L. Parks[3], Michael K. Axthelm[1], Jay A. Nelson[1], Michael A. Jarvis[1], Michael Piatak Jr[2], Jeffrey D. Lifson[2] & Louis J. Picker[1]

ARTICLES

nature medicine

Lymph node T cell responses predict the efficacy of live attenuated SIV vaccines

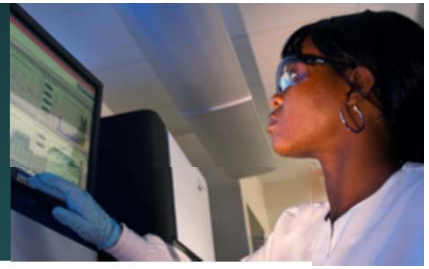
Yoshinori Fukazawa[1,2,8], Haesun Park[1,2,8], Mark J Cameron[3], Francois Lefebvre[3], Richard Lum[1,2], Noel Coombes[1,2], Eisa Mahyari[1,2], Shoko Hagen[1,2], Jin Young Bae[1,2], Marcelo Delos Reyes III[1,2], Tonya Swanson[1,2], Alfred W Legasse[1,2], Andrew Sylwester[1,2], Scott G Hansen[1,2], Andrew T Smith[3], Petra Stafova[3], Rebecca Shoemaker[4], Yuan Li[4], Kelli Oswald[4], Michael K Axthelm[1,2], Adrian McDermott[5], Guido Ferrari[6], David C Montefiori[6], Paul T Edlefsen[7], Michael Piatak Jr[4], Jeffrey D Lifson[4], Rafick P Sékaly[3] & Louis J Picker[1,2]

LETTER nature doi:10.1038/nature11443

Vaccine-induced CD8$^+$ T cells control AIDS virus replication

Philip A. Mudd[1,2], Mauricio A. Martins[3], Adam J. Ericsen[1], Damien C. Tully[4], Karen A. Power[4], Alex T. Bean[1], Shari M. Piaskowski[1], Lijie Duan[5], Aaron Seese[4], Adrianne D. Gladden[4], Kim L. Weisgrau[1], Jessica R. Furlott[1], Young-il Kim[6], Marlon G. Veloso de Santana[7], Eva Rakasz[8], Saverio Capuano III[8], Nancy A. Wilson[1,8], Myrna C. Bonaldo[7], Ricardo Galler[9], David B. Allison[10], Michael Piatak Jr[11], Ashley T. Haase[5], Jeffrey D. Lifson[11], Todd M. Allen[4] & David I. Watkins[3]

NCI-Frederick Advisory Committee
Building for the Future



- **NFAC charge - review the state of research at FNLCR and make recommendations for the best use of its capabilities and infrastructure**
- **15 member committee**

Zachary Hall, Ph.D. Former Director, NINDS Former President; Institute of Regenerative Medicine, UCSF
Emeritus Professor, UCSF

Chair

C. Barrett

D. Botstein

L. Garraway

J. Gray

B. Hahn

M. Justice

T. Look

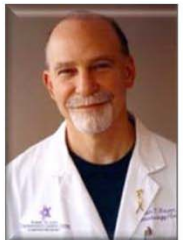
L. Marnett

J. Mesirov

G. Nolan

K. Olden

J. Pietenpol



S. Rosen

C. Willman

Expanding the Partnering Base

Development of Contractor Cooperative Research and Development Agreement (c-CRADA)

- **Enables SAIC-Frederick to partner directly with extramural scientists and organizations for access to our science and technology know-how**
- **Use full CRADA authority under CRADA statutes**
  - c-CRADAs for Research, Development, and Testing collaborations
  - “Technical Service Agreement” for tactical evaluation of proprietary partner materials, AIDS testing kits, etc.
- **Intellectual property rights**
  - SAIC-F is the custodian of joint or sole IP emerging from the CRADA
  - Streamlined assignment of exclusive commercialization rights
  - Any royalty streams support FFRDC R&D efforts
- **Processes**
  - Focus on speed
  - Local government review and approval with external input as appropriate

New Partnering Initiatives

Expanding access to FNLCR Resources

- **Cooperative Research and Development Agreements (cCRADA)**
  - Two partnerships received initial concept approval
  - Five additional agreements in development
- **Technical Service Agreement (TSA)**
  - Seven distinct assays approved for external offering
  - Three additional assays submitted for approval, 11 in preparation
  - One agreement signed with UCSF, 4 in progress
- **External-facing FNLCR website operational and evolving**
  - http://frederick.cancer.gov/

FNLCR Strategic Direction Initiatives

- **Identification and Implementation of "Big Ideas"**
  - Fulfill the "National Laboratory" vision
  - Variety of NCI, FNLCR, and external workgroups contributed ideas
    - "Hub-and-spoke" model likely
  - Funding strategies within the existing FNLCR budget under discussion
  - Communication plan under development

- **FNLCR Laboratory Director (NCI)**

Conclusions

- **Frederick National Laboratory for Cancer Research** is a unique resource within the national biomedical research community
- **Program partnerships** facilitate basic and translational research achievements
- **New partnering opportunities** expand the impact of FNLCR science
- **New "big idea" research programs** will strengthen the identity and impact of FNLCR as a National Laboratory