NIAID Radiation/Nuclear Medical Countermeasures
Product Research and Development Program

56th Annual Meeting of the Radiation Research Society

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NIAID Radiation/Nuclear Medical Countermeasures Development Program

• The R & D Program supports basic and translational research leading to development and licensure of drugs to treat radiation exposure; devices and techniques for biodosimetry to triage and monitor exposed individuals; and decorporation agents to remove radionuclides from the body.

• For more information, please consult the website below:

- [http://www.niaid.nih.gov/topics/radnuc/Pages/default.aspx](http://www.niaid.nih.gov/topics/radnuc/Pages/default.aspx)
Radiation Countermeasures Mission Space

- **ARS/DEARE**
  - Hematopoietic ARS:
    - Neutropenia
    - Thrombocytopenia
    - Anemia
    - Lymphopenia
  - GI ARS
  - CNS Injury
  - Lung Injury
  - Cutaneous Injury
  - Kidney Injury
  - Combined Injuries

- **Radionuclide Threats**
  - Co-60
  - Cs-137
  - Sr-90
  - I-131
  - Ir-192
  - Po-210
  - U-235
  - Pu-239
  - Am-241

- **Biodosimetry methods and devices**
MCM Tissue Specific Injury Mitigation Grant Programs:

- Investigator-initiated awards (R01s); 11 grants through FY2012
- Radiation Combined Injury (R21/R33s); 11 grants through FY2012
- Thrombocytopenia; 7 grants through FY2010
- Lung Radiation Injury; 9 grants through FY2010
- Cutaneous Radiation Injury; 4 grants through FY2010
- RC2 GO Grants; 5 GI and 1 Decorporation Agent through FY2010
NIAID Product Development Support Services Contract – FY10- FY14

Contractor – University of Maryland

Goal: Support specific IND-enabling product development activities leading to an IND submission package to FDA

<table>
<thead>
<tr>
<th>CMCRs/Univ/Pharma</th>
<th>NIAID Product Development Program</th>
<th>HHS/BARDA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic Research</td>
<td>Clinical Development, Pivotal Trials</td>
</tr>
<tr>
<td></td>
<td>Nonclinical Development</td>
<td>IND</td>
</tr>
<tr>
<td></td>
<td>IN D</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pivotal Trials</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regulatory Affairs</td>
<td></td>
</tr>
</tbody>
</table>

- Discovery
- Initial efficacy studies
- Animal model development
- Determine lead compound
- Mechanism of action

- Protocol writing
- IND preparation
- Pre-IND meeting
- IND submission
- FDA review

- Screen efficacy rodent/NHP
- Optimize dose, route and schedule of administration
- Tox/Safety Pharm/PK/PD, ADME, cGMP manufacture

- Phase I safety/PK studies in humans
- Large scale cGMP manufacture
- GLP pivotal animal efficacy studies
- Phase II safety/efficacy in humans
- Phase III pivotal efficacy studies in humans

- NDA/BLA preparation
- NDA/BLA submission
- FDA review
Oral DTPA Contract Programs FY2010-2012

■ University of North Carolina
  – Pro-drug formulation with oral bioavailability and demonstrated decorporation efficacy
  – GMP formulation, bioavailability, efficacy in rodent and non-rodent species, and toxicity evaluation

■ SRI International
  – Formulation with gastrointestinal absorption enhancers
  – Bioavailability and demonstrated decorporation efficacy
  – Refine formulation, bioavailability and efficacy evaluation in rodents and non-rodents
Ten institutions – 5 in Japan and 5 in the U S

- To study the effects of atomic bomb radiation and aging on the human immune system (immunesenescence)

- To determine how the observed immune changes are related to disease and infection

- To understand how exposure to ionizing radiation and aging affect a person’s ability to respond to vaccination
Other Collaborations

- Inter and Intra Agency Agreements
  - DOD/AFRRI
  - NIH/NCI
  - NIH/NIA
  - NIH/NIDDK

- Company collaborations
  - Contacts and presentations
  - Candidate efficacy evaluation and screen (under Product Development Support Services Contract)
Current Open Funding Opportunities

- SBIR – Radiological/Nuclear Medical Countermeasures product development: PA-09-093

- NIH-RAID – National Institutes of Health Rapid Access to Interventional Development: PAR-09-027
NIAID Radiation/Nuclear Medical Countermeasures Development Program Team

- Richard Hatchett, MD, Associate Director for Radiation Countermeasure Research and Emergency Preparedness
- Bert Maidment, Ph.D., Associate Director for Product Development
- David Cassatt, Ph.D., Program Officer
- Andrea DiCarlo, Ph.D., Program Officer
- Erika Lamb, Ph.D., AAAS Fellow, Health Scientist
- Francesca Macchiarini, Ph.D., Program Officer
- Mai-Kim Norman, M.S., Health Specialist
- Narayani Ramakrishnan, Ph.D., Senior Program Officer
- Christine Czarnieckl, Ph.D., Chief, Regulatory Affairs
- Jui Shah, Ph.D., Senior Regulatory Affairs Officer
- Lawrence Prograis, MD, Special Programs and Bioethics

http://www.niaid.nih.gov/topics/radnuc/Pages/default.aspx
Accomplishments (2005-2010)

- 225+ Publications
- 25+ Patents
- 124 Pilot research projects
- Screened over 120,000 compounds and identified 100+ potential candidates for further evaluation and confirmation
- Confirmed efficacy of 8 promising MCMs for ARS in rodent screen
- GLP, non-pivotal efficacy of Neupogen in NHPs
- RABIT system demonstrated a milestone throughput of 30,000 samples per day
- GLP radionuclide resources and rodent biokinetic models and screened efficacy of 4 candidate decorporation agents
- Interacted with 130+ pharmaceuticals companies