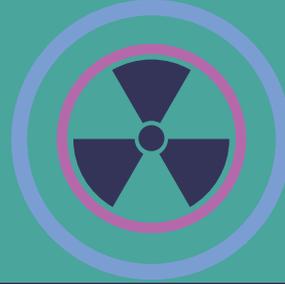


Radiation

External Irradiations



Countermeasures Program

Lovelace has developed animal models and research capabilities for evaluating medical countermeasures to mitigate the health effects from exposure to both internal radionuclides and external irradiation.

Lovelace has a clinical linear accelerator (LINAC), a Philips RT-250 orthovoltage X-ray therapy unit, and Grenz x-Ray irradiator that can perform whole-body or partial-body irradiation in large (swine, nonhuman primates [NHP]), small (mice, rats) animals, and dermal wound exposures, respectively. Differing degrees of supportive care define models for hematopoietic and gastrointestinal syndromes. Understanding these models is essential to define the mechanisms of injury and assist in developing targeted therapeutics. These acute effects models are used to evaluate therapies for ameliorating or preventing the biological effects from high doses of external irradiation. Lovelace has full GLP pharmaceutical R&D capability to bring drugs to approval under the FDA "animal rule" or for standard clinical indications.

Linear Accelerator (NHP & Swine)

- GLP validated (6.8 Gy) LD_{50/60} in NHPs (Rhesus, M); field supportive care; full hematopoietic syndrome; GI complications
- Qualified LD_{50/60} in Göttingen (1.94 Gy) and Sinclair (2.55 Gy) Minipigs supportive care (M/F); GI complications
- Qualified PBI Sinclair Swine GI model (14Gy)
- Combined irradiation thermal burn and wound healing model in Göttingen Minipigs

Philips RT-250 (Mice & Rats)

- LD_{50/60} mice (C57B, M/F)
- Radiation-induced lung fibrosis

Grenz X-Ray

- Radiation induced wound healing model (Yorkshire Swine)



- **Chemical, Biological, Radiological, and Nuclear threat** animal model and countermeasure testing
- Full range of pharmaceutical R&D activities
- Wide Species Range: rodents, rabbits, ferrets, dogs, nonhuman primates, swine
- Pharmacology

- Analytical chemistry
- Bioanalytical chemistry
- ADME
- Pharmacokinetics
- PMPK modeling
- GLP Safety Studies (acute, 3-8 day, 14-28 Day, 60-90 Day, 6mo-2yr chronic)
- Phase I-IV Clinical Studies

Internal Radionuclides



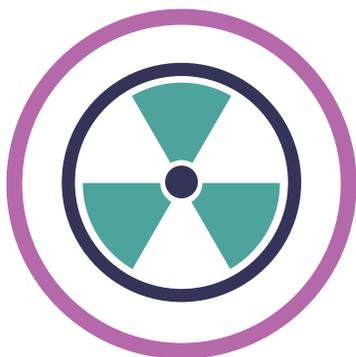
Countermeasures Program

Lovelace has developed animal models and research capabilities for evaluating medical countermeasures to mitigate the health effects from exposure to both internal radionuclides and external radiation.

These animal models are used to understand the unperturbed biokinetics of internally deposited radionuclides in the body with time, whether exposure occurs by inhalation, ingestion, wounds, or absorption through intact skin. Knowing where a radionuclide is retained in the body is essential for understanding the effectiveness of drugs given to decorporate and remove radionuclides from the body. Such models have been developed for internal contamination from the radioactive heavy metals plutonium, americium, cesium, cobalt, and strontium which are both associated with nuclear power and nuclear weapons. Other radionuclides can also be evaluated based on the decorporation of the strategy being tested.

Our Capabilities

- Animal models of metabolism and biokinetics for a large variety of radionuclides
- Exposure to radionuclides by inhalation, ingestion, percutaneous wounds, intravenous, intraperitoneal, intratracheal delivery, and absorption through intact skin
- Broad range of animal species: mice, rat, dog, swine
- Material balance study designs including complete excreta collection and analysis of biological samples from blood to tissues to organs
- Analytical radiochemistry capabilities for measuring radionuclides in biological samples
- Biokinetic and dosimetric modeling of experimental animal data, with or without the effects of medical countermeasures
- Capability for measuring radionuclides in living animals (whole-body counting)



- **Chemical, Biological, Radiological, and Nuclear threat** animal model and countermeasure testing
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