

DIRECT FROM THE DIRECTOR

Dear Registrant and Families,

Certainly, 2020 has been an unexpected year for all of us, and together, we are facing a truly unprecedented situation. During this time, I am reaching out to you to update on how we are approaching the situation at the Registries.

Due to coronavirus pandemic restrictions declared in March, the USTUR staff has largely worked from home since late March. This has produced unique challenges and opportunities. Radiochemistry laboratory operations suffered the most. Due to the lockdown, we had been unable to conduct any analyses until October, when Richland progressed to Phase 2 reopening, and limited laboratory operations resumed. Despite such challenges, pandemic restrictions have not diminished our commitment to producing high-quality research and service that will improve radiation protection for workers and the general public. The USTUR faculty have been busy preparing journal articles for publication. We continue actively collaborating with the Million Person Study (MPS) and Los Alamos National Laboratory, and serve on the Herbert M. Parker Foundation's advisory board. We also continue serving as council and scientific committee members at the National Council on Radiation Protection & Measurements. We were invited to present our research findings at NASA (National Aeronautics and Space Administration) and MPS meetings. Using all these avenues, we have widely shared and disseminated the unique knowledge gained at the USTUR. In addition to research, professional, and public services, the Registries contributes to education of the next generation of professionals in various fields. This year, we have initiated a study to compare underlying causes of death on death certificates with those listed in autopsy reports. This is a graduate project with Tulane University, School of Public Health and Tropical Medicine to meet Master of Public Health degree requirements. During these challenging times, when zoom video meetings replace in-person conversations, the USTUR team is doing its best to keep the program successful and meaningful for all of us. All of this could not happen without your generous contribution, and I would like to thank all of you who have remained with the Registries for so many years.

I wish all of you good health and joy over this holiday season, and continued good health in the years to come.

Sincerely,

Sergei Tolmachev

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*Best Wishes for a
Happy Holiday
Season and a
Healthy and Happy
New Year!*



LEARNING FROM PLUTONIUM AND URANIUM WORKERS

CONTACT US

The USTUR research team continues to be available to answer any questions that you may have during these unusual times. Margo Bedell answers the phones during regular business hours (8-5 pacific time). She is happy to update your address, answer questions related to tissue donations, and to transfer more technical questions to Stacey McComish. And, as always, our 800 number is available for after hours calls, such as notification of a Registrant death.



Toll free: 1-800-375-9317 Direct line: 1-509-946-7972

2020 RESEARCH: PAPER TOPICS

- Long-term retention of plutonium in the respiratory tracts of two acutely-exposed workers (published)
- Inhalation of soluble plutonium: 53-year follow up of Manhattan project worker (accepted)
- Modelling of long-term retention of high-fired plutonium oxide in the human respiratory tract: importance of scar-tissue compartments (accepted)
- Long-term retention of plutonium in the respiratory tract of a person exposed to high-fired plutonium oxide: Analysis using scar-tissue compartments (in preparation)
- Long-term retention and distribution of highly enriched uranium in occupationally exposed female (in preparation)
- Forty-eight-year follow-up of a female worker exposed to highly enriched uranium via chronic and acute inhalation (in preparation)
- Estimation of total skeletal concentrations of $^{239,240}\text{Pu}$, ^{238}Pu and ^{241}Am from limited sets of measured bones (in preparation)
- Determination of the transverse distribution of ^{241}Am in human bone samples by extraction chromatography and alpha spectroscopy (in preparation)

2020 Papers

1 Published

2 Accepted

5 In preparation

URINE SAMPLING REQUEST

The USTUR plans to ask each living Registrant to submit a urine sample to the Registries. We have the results of actinide-in-urine measurements that were obtained while our Registrants were working with or around radioactive materials, but we have few, if any, post-employment measurements of actinides in urine. This urine sample would improve our ability to test the long-term accuracy of models. It would also help us with our efforts to refine existing models and/or develop new models that will give radiation protection personnel the best possible tools for protecting future workers. The USTUR anticipates mailing more information about this effort to our living Registrants in 2021. It is important to note that submission of a urine sample would be completely voluntary, and would not impact a person's status as a Registrant.

A LITTLE BACKGROUND

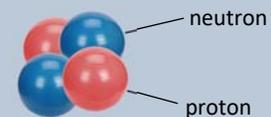
National laboratories often screen radiation workers for intakes of radioactive material by requiring that they periodically submit urine samples. This is particularly important for workers who may have been exposed to alpha-emitting radionuclides, such as plutonium, because alpha particles can only travel a few microns in human tissue before they deposit all of their energy. This means alpha particles that are inside the human body cannot be detected using a detector placed outside of the body. Measuring how much of an alpha emitter is excreted in urine (or feces) is the most sensitive way to identify intakes of alpha emitters. Collecting and measuring a series of urine samples is also an important tool for determining how large a worker's intake was, and what dose he/she will accumulate from that intake over a lifetime.

Similarly, the USTUR uses urine data to model plutonium biokinetics in the human body and to estimate how much of it, and other actinides, Registrants took into their bodies. We also use it to test the mathematical (biokinetic) models that are used by national laboratories and other employers to determine a worker's intake of, and dose from, radioactive materials. Urine samples collected soon after an intake tell us how accurate the models are in the short term, and urine samples collected many years after an accident give us insight into the accuracy of the models in the long term, which has implications for calculating the dose received by a worker over a lifetime.

ALPHA PARTICLE FACTS

An alpha particle...

- Is the same as a helium nucleus (2 protons and 2 neutrons)



- Has a positive charge
- Cannot penetrate a sheet of paper, or the dead layer of skin on the human body
- Is not a hazard if it is outside the body
- Is a significant hazard if inhaled or otherwise taken into the body.

LUIZ BERTELLI GIVES PARKER LECTURE

A USTUR Scientific Advisory Committee member, Luiz Bertelli, discussed the radiological accident at Goiânia, Brazil during the Fall 2020 Herbert M. Parker Lecture. In 1987, a cesium-137 source was removed from an abandoned medical facility, partially dismantled, and sold to a junk yard. This resulted in serious radiation injuries to people who came into close contact with the cesium source, and contamination of both houses and public areas in Goiânia.

Dr. Bertelli, who was involved in the response to this incident, described the accident as well as monitoring people for internal and external exposures to cesium-137, and decontamination during the following months.

Dr. Bertelli's lecture was livestreamed on the WSU Tri-Cities YouTube channel, and has been viewed 480 times. We invite you to watch his presentation, which can be accessed from our website:

<https://ustur.wsu.edu/parker2020/>

The Radiological Accident in Goiânia

Parker Lecture Series



Wednesday, Oct. 21

5 p.m. via YouTube
youtube.com/wsutricities

Dr. Luis Bertelli
Internal Dosimetrist
Los Alamos National Laboratory

E-BOOK OF USTUR PUBLICATIONS

The USTUR is compiling an electronic book of USTUR publications, which lists all of the USTUR's peer-reviewed journal articles, conference proceedings, scientific presentations, book chapters, and editorial notes in journals. In 2018, the USTUR initiated four activities to honor 50 years of actinide research at the Registries. This is the fourth and final '50 years' commemorative activity, and it will be completed during 2021. The e-book is an interactive pdf publication that includes links to publication websites and presentation materials when available. Abstracts will also be included for most publications. Upon completion, the e-book will be freely available from the USTUR's website.

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