United States Transuranium and Uranium Registries * Pharmaceutical Sciences
College of Pharmacy * Washington State University *509-372-7317 *800-375-9317

# USTUR Newsletter

December 2002
Issue 9
USTUR-0187-02

## Message from the Director

I'm frequently asked by friends, relatives, and new acquaintances what kind of work I do. My response is that I am the director of a research program called the U.S. Transuranium and Uranium Registries. This usually produces a blank stare and the next question is, "What is that!"

Over the years, I have developed a brief and, I hope, understandable explanation as follows. During our nation's work to produce nuclear weapons, a number of workers accidentally took some heavy radioactive metals such as uranium, plutonium, or americium into their bodies. We have agreements with a number of those workers that we will be permitted to perform an autopsy on them when the time comes. We collect organ samples at the autopsy and we chemically analyze the samples for the heavy metals. Our goal is to learn where in the body those metals went, to get some idea about how long they stayed there, and to determine if they did any damage while they were there.

The next question usually is "What have you learned?" My response is that a large fraction of the inhaled metals can stay in the lungs for long periods of time although they also migrate to other body organs, especially the liver and the skeleton. Of course, this was an expected finding because of early experiments with animals. We've also learned that, although much of the material will stay in an organ for a long time, there is some continued movement between organs. We've learned that those workers who had uranium, plutonium, or americium in their bodies for all this time and died, have died from the same causes that we all die from: strokes, heart attacks, and, yes, cancer. However, the rate of death from most kinds of cancer in the workers is not different from the rates in anyone else. To many of my listeners, this is an incredible statement. After all, the news media have been saying for years that plutonium is the most toxic material known to man and a speck too small to see can kill you!

More details about USTUR discoveries are included elsewhere in this Newsletter. This is our way of informing you, as USTUR Registrants, about what you have made possible through your unselfish donations to this program. Our thanks goes out to you as we wish you the very best of holiday seasons.

*Dr. Ronald E. Filipy*

**"We make a living by what we get, but we make a life by what we give."**

**Winston Churchill**

# What the data show!

Approximately four years ago, Gold and Kathren published a scientific paper in which the causes of death of 260 USTUR registrants were analyzed using information from death certificates and/or autopsy reports (Health Physics 75:236-240; 1998). They showed that, with a few exceptions, causes of death of Registrants were very similar to those of the general population of the United States. For example, approximately 90 of the 260 (35%) subjects died from heart disease and there were 87 (32%) deaths from various kinds of cancer. The USTUR population was expected to be biased toward a higher cancer incidence than that among the general population because many Registrants volunteered to participate in the USTUR after they had been diagnosed with cancer; however, the actual bias was not excessively great. There were 28 cases of lung cancer, which was a concern because most intakes of plutonium were by inhalation. It was also noted though, that the great majority of lung cancers were among the fraction of the USTUR Registrants who smoked cigarettes and there is no way to differentiate between lung cancers caused by plutonium and those caused by smoking. Also, many of them had only minimal depositions of plutonium in their lungs at death. Two other kinds of cancers considered to be in excess in the USTUR population were mesotheliomas (6 of 260) and brain cancers (7 of 260). Mesothelioma is a cancer that usually begins in the lining of the chest cavity and is strongly associated with intakes of asbestos particles. Examination of work histories showed that 5 of the 6 workers had a potential for asbestos exposure. Brain cancer is usually not associated with plutonium intakes as the fraction of plutonium reaching the brain has been shown by USTUR radiochemical analytical data to be very small. An examination of the records of the 7 workers showed no particular relationship between the cancer and radiation from internal or external sources; therefore, it was concluded that some other environmental causative factor might have been involved.

The computer database of results from analyses of organ samples collected at autopsy for all deceased USTUR cases is complete and will soon be available on the USTUR web site. This database contains the organ weights and concentrations of uranium, Pu-238, Pu-239, and Am-241 as well as other information such as the time between intakes of those elements and death. All of the major organs collected at autopsy are sampled and analyzed and, for whole body donations, representative samples from the body are analyzed. The table will be a very important resource for scientists involved in internal radiation dosimetry and it was designed so that the identities of the donors and their families are fully protected.

These analytical results have shown some interesting things about how plutonium and americium become distributed in the body. For example, they show that approximately 55% and 35% of systemic plutonium is

**Special points of interest:**

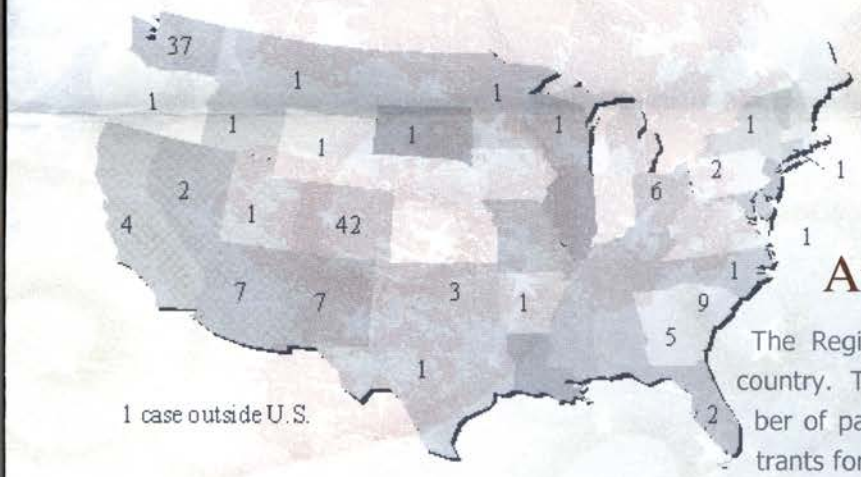
- Cause of death for Registrants are similar to general population
- Lung cancer was the most common type of cancer found
- Americium and plutonium are not distributed similarly in the body

**The United States Transuranium and Uranium Registries . . . Developing radiation standards and understanding possible health effets of radiation**

(continued from page 2)

found in the skeleton and liver, respectively, at long times after intake. (The systemic content is that of the whole body excluding the lungs and their associated lymph nodes.) This distribution is not far from what the dosimetry experts have predicted for plutonium; however, the distribution of americium is quite different from predictions. Approximately 75% and 10% of systemic americium is found in the skeleton and liver, respectively. The experts have previously predicted that americium and plutonium were distributed similarly in the human body. This information will be a significant contribution to the study of internal radiation dosimetry from those two elements.

| Site | # of Registrants | Average Age |
|---|---|---|
| Fernald | 1 | 73 |
| Hanford | 38 | 77 |
| Los Alamos | 14 | 80 |
| Mound | 6 | 68 |
| Oak Ridge | 3 | 81 |
| Rocky Flats | 52 | 76 |
| Savannah River | 14 | 71 |
| Uranium Mine Workers | 5 | 81 |
| Neveda Test Site | 1 | 66 |
| Other | 7 | 51 |




## Around the U.S.

The Registries have 141 living Registrants from all over the country. The table above shows the various DOE sites, the number of participants per site and the average age of the Registrants for each. The map to the left shows the number of Registrants residing in each state throughout the U.S.

## Events

The USTUR has an independent Advisory Committee that meets annually to review the program activities and progress. This year the annual meeting was held August 26-27 at the West Coast Hotel in Kennewick, Washington. The meeting was attended by the USTUR Advisory Committee: Joe Aldrich, Ron Brosemer, Isabel Fisenne, Kathryn Paxton-George, Bruce Lawson, Dennis Mahlum, and Bob Thomas. USTUR faculty and staff were present as well as William Fassett; Dean of College of Pharmacy, Barbara Brooks; Department of Energy Program Manager, and Melanie Fletcher; Department of Energy-Richland. The Advisory Committee will issue their report by year end and is anticipated to be a favorable review of the program.

To find this report and other USTUR publications, please visit our website at www.ustur.wsu.edu.

## Did you know?

The average age of living USTUR Registrants is 75 (range 31-93 years) and 56% of the Registrants are 75 years of age or older.

## From our family to yours

The United States Transuranium and Uranium Registries would like to thank you for your participation in the program and wishes all of you happy holidays and best wishes for the new year!

Visit us on the web at www.ustur.wsu.edu

WASHINGTON STATE UNIVERSITY TRI-CITIES

United States Transuranium and Uranium Registries
College of Pharmacy
Washington State University
2710 University Drive
Richland, WA 99352

# News to Use

Last year we featured an article about the Energy Employees Occupational Illness Compensation Program Act and gave you the contact information for the Richland, Washington resource center. Because we have Registrants all over the country, the Registries felt that it would be benefiting to our Registrants if we provided you with the location and toll-free number to the resource center closest to you.

Please note that the USTUR is not involved with the administration of the EEOICP and has provided this list as a resource tool for our Registrants.

Augusta Resource Center
North Augusta, SC 29841
Toll-free (866) 656-4606

Espanola Resource Center
Espanola, NM 87532
Toll-free (866) 272-3622

Idaho Falls Resource Center
Idaho Falls, ID 83404
Toll-free (800) 861-8608

Las Vegas Resource Center
Las Vegas, NV 89119
Toll-free (866) 697-0841

Oak Ridge Resource Center
Oak Ridge, TN 37830
Toll-free (866) 481-0411

Paducah Resource Center
Paducah, KY 42001
Toll-free (888) 654-9922

Portsmouth Resource Center
Portsmouth, OH 45662
Toll-free (866)363-6993

Richland Resource Center
Kennewick, WA 99336
Toll-free (888) 654-0014

Anchorage Resource Center
Anchorage, AK 99501
Toll-free (888) 908-4070

Rocky Flats Resource Center
Westminster, CO 80030
Toll-free (866) 540-4977