

# **18th Workshop on Targetry and Target Chemistry (WTTC18)**

## **Report of Contributions**

Contribution ID: **10**

Type: **Contributed Oral**

## **A Reverse $^{230}\text{U}/^{226}\text{Th}$ Radionuclide Generator for Targeted Alpha Therapy Applications**

*Tuesday, 23 August 2022 13:40 (20 minutes)*

### **Funding Agency**

US DOE

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**Primary author:** FASSBENDER, MICHAEL (Los Alamos National Laboratory)

**Presenter:** FASSBENDER, MICHAEL (Los Alamos National Laboratory)

Contribution ID: 11

Type: **Contributed Oral**

## **Preliminary Results of Zinc-68 Recycling in Gallium-68 Liquid Target Routine Production**

*Friday, 26 August 2022 08:20 (20 minutes)*

### **Funding Agency**

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**Primary authors:** UHLENDING, Antje (Herz-und Diabeteszentrum NRW); Dr GRIMM, Geroline; HUGENBERG, Verena

**Presenter:** UHLENDING, Antje (Herz-und Diabeteszentrum NRW)

Contribution ID: 12

Type: **Contributed Oral**

## **Development of Enriched Gadolinium Target for Cross Section Measurement and Future Production of Terbium**

*Tuesday, 23 August 2022 09:40 (20 minutes)*

### **Funding Agency**

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**Presenter:** WANG, Yizheng (Subatech Laboratory)

Contribution ID: 13

Type: **Contributed Oral**

## Production of $^{67}\text{Cu}$ at the TR-FLEX Cyclotron

*Monday, 22 August 2022 08:00 (20 minutes)*

### Funding Agency

Helmholtz-Zentrum Dresden-Rossendorf, Institute of Radiopharmaceutical Cancer Research

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**Presenter:** Mr BRÜHLMANN, Santiago (Helmholtz-Zentrum Dresden-Rossendorf, Institute of Radiopharmaceutical Cancer Research)

Contribution ID: 14

Type: **Poster**

## **Designing a Solid Target Station to Produce Astatine-211**

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**Presenter:** Dr OH, Seyoung

Contribution ID: 15

Type: **Poster**

## **Development of a Bismuth-209 Target for the Production of Astatine-211**

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**Presenter:** Dr MUN, Sang Chul (KIRAMS)

Contribution ID: 16

Type: **Contributed Oral**

## **Cyclotron Based Production of Zr-89 & Other Radiometals Using a Newly Designed Solid Target Insert**

*Monday, 22 August 2022 08:20 (20 minutes)*

### **Funding Agency**

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**Presenter:** Prof. PANDEY, Mukesh (Mayo Clinic Rochester MN USA)



Contribution ID: 17

Type: **Contributed Oral**

# **Synthesis, Purification, and Dosing Systems to Localize Nitrogen and Carbon Fixation by Biological Soil Crusts from a Glacier Foreland**

*Friday, 26 August 2022 10:30 (20 minutes)*

## **Funding Agency**

NSERC, Federated Cooperatives Limited (FCL)

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Contribution ID: 18

Type: **Contributed Oral**

## **<sup>68</sup>Ga Production in Liquid Target: Determination of Solubility of ZnCl<sub>2</sub> in Hydrochloric-Acid Solutions**

*Friday, 26 August 2022 08:40 (20 minutes)*

### **Funding Agency**

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**Presenter:** MÁTYÁS, Fodor (University of Debrecen, Doctoral School of Chemistry, PO Box 400, H-4002 Debrecen, Hungary)

Contribution ID: 19

Type: **Contributed Oral**

## **Failure of the Isotope Production Facility Beam Window Assembly at Los Alamos National Laboratory**

*Wednesday, 24 August 2022 08:00 (20 minutes)*

### **Funding Agency**

DOE Isotope Program

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**Presenter:** Dr O'BRIEN, Ellen (LANL)

Contribution ID: 20

Type: **Contributed Oral**

## Spark Plasma Sintering Technique for Cyclotron Solid Target Manufacturing

*Monday, 22 August 2022 08:40 (20 minutes)*

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Contribution ID: 21

Type: **Contributed Oral**

## **Production of $^{55}\text{Co}$ Using Pressed Nickel and Magnesium Foils**

*Monday, 22 August 2022 09:00 (20 minutes)*

### **Funding Agency**

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**Presenter:** Dr SIIKANEN, Jonathan (Karolinska Institutet, Department of Oncology and Pathology)

Contribution ID: 22

Type: **Contributed Oral**

## **Investigation of Subcooled Flow Boiling at the LANL Isotope Production Facility**

*Wednesday, 24 August 2022 09:40 (20 minutes)*

### **Funding Agency**

The U.S. Department of Energy Isotope Program, managed by the Office of Science for Isotope R&D and Production

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**Presenter:** Dr SEONG, Jee Hyun (LANL)

Contribution ID: 23

Type: **Contributed Oral**

## **Installation and Testing of an ARTMS QIS™ at the Saskatchewan Centre for Cyclotron Sciences**

*Monday, 22 August 2022 09:20 (20 minutes)*

### **Funding Agency**

Fedoruk Centre

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**Presenter:** SCHICK-MARTIN, Dale (Fedoruk Centre)

Contribution ID: 24

Type: **Contributed Oral**

## **Production and Purification of Lead-203 ( $^{203}\text{Pb}$ ) for Radiochemistry and Preclinical Studies**

*Monday, 22 August 2022 13:40 (20 minutes)*

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**Presenter:** Ms SHEFALI, FNU (University of Alabama, Birmingham)



Contribution ID: 25

Type: **Contributed Oral**

## **Titanium-45 ( $^{45}\text{Ti}$ ) Radiochemistry for Development of PET Radiopharmaceuticals**

*Monday, 22 August 2022 14:40 (20 minutes)*

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Contribution ID: 26

Type: **Contributed Oral**

## **Nuclear Cross Section Measurements of the 48,49,50Ti(p,x)47Sc Reactions: Preliminary Results of the REMIX Project**

*Tuesday, 23 August 2022 09:20 (20 minutes)*

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**Presenter:** PUPILLO, Gaia (INFN-LNL)

Contribution ID: 27

Type: **Contributed Oral**

## **Thin Titanium Targets for Nuclear Cross Section Measurements of the $^{49,50}\text{Ti}(p,x)^{47}\text{Sc}$ Reactions**

*Monday, 22 August 2022 09:40 (20 minutes)*

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**Presenter:** CISTERNINO, Sara (INFN-LNL)

Contribution ID: 28

Type: **Poster**

## **Numerical Simulation of Subcooled Flow Boiling for Solid Targets Cooling**

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Contribution ID: 29

Type: **Contributed Oral**

## Long-Term Trends in [11C]Methyl Triflate

*Friday, 26 August 2022 10:50 (20 minutes)*

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**Presenter:** BARNHART, Todd (University of Wisconsin Madison)

Contribution ID: **30**

Type: **Poster**

## **Production of $^{95}\text{Nb}$ at the Cyclotron Cyclone 18/9**

**Funding Agency**

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Contribution ID: 31

Type: **Contributed Oral**

## **Possible Material-Saving Approach of Sputtering Techniques for Radiopharmaceutical Target Production**

*Monday, 22 August 2022 10:30 (20 minutes)*

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**Presenter:** Ms KOTLIARENKO, Alisa (LNL INFN)

Contribution ID: 32

Type: **Contributed Oral**

## **Cyclotron Beam Characterization for Radionuclide Production on Solid Targets**

*Monday, 22 August 2022 10:50 (20 minutes)*

### **Funding Agency**

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**Presenter:** Dr GEORGE, Keller (Medical Imaging, UWO; ARTMS)



Contribution ID: 33

Type: **Contributed Oral**

## **Flow Fields Generated by a Proton Beam in Medical Cyclotron Liquid Targets**

*Friday, 26 August 2022 08:00 (20 minutes)*

### **Funding Agency**

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**Presenters:** RAHMANI, Mona (University of British Columbia); Prof. MARTINEZ, D. Mark (University of British Columbia)

Contribution ID: 34

Type: **Contributed Oral**

## Estimating $^{225}\text{Ac}$ Yield in Thorium Targets

*Wednesday, 24 August 2022 08:20 (20 minutes)*

**Funding Agency**

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**Presenter:** MARTINEZ, D. Mark (University of British Columbia)

Contribution ID: 35

Type: **Contributed Oral**

## **Targetry and Purification of $^{52}\text{Mn}$ for PET/MR Imaging Agents**

*Monday, 22 August 2022 14:20 (20 minutes)*

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**Presenter:** Ms PYLES, Jennifer (University of Alabama at Birmingham)

Contribution ID: 36

Type: **Contributed Oral**

## **Ionic Liquids as Novel Extractants for Separation of Lanthanides and Actinides**

*Monday, 22 August 2022 14:00 (20 minutes)*

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**Presenter:** Dr CHAPLE, Ivis (Los Alamos National Laboratory)

Contribution ID: 37

Type: **Contributed Oral**

## **TRIGA Reactor Production and Synergistic Separation of Tb-161 from Enriched Gd-160 Targets**

*Tuesday, 23 August 2022 14:00 (20 minutes)*

### **Funding Agency**

U.S. Department of Energy Isotope Program, managed by the Office of Science for Isotope R&D

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Contribution ID: 38

Type: **Contributed Oral**

## Characterizing the Thermal Performance of Isotope Production Targets

*Wednesday, 24 August 2022 08:40 (20 minutes)*

### Funding Agency

US Department of Energy Isotope Program

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Contribution ID: 39

Type: **Poster**

## **Cyclotron Production and Purification of $^{52}\text{Mn}$ from Electroplated Cr Target**

**Funding Agency**

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Contribution ID: 40

Type: **Contributed Oral**

## **Microfluidic Solvent Extraction of $^{68}\text{Ga}$ from Zinc Nitrate Liquid Targets**

*Friday, 26 August 2022 09:00 (20 minutes)*

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NWO

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**Presenter:** TRAPP, Svenja (Delft University of Technology)



Contribution ID: 41

Type: **Contributed Oral**

## Towards Optimized Production of $^{155}\text{Tb}$ with Solid Targets at the Bern Medical Cyclotron

*Monday, 22 August 2022 11:10 (20 minutes)*

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SNSF

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**Presenter:** Ms DELLEPIANE, Gaia (Albert Einstein Center for Fundamental Physics (AEC), Laboratory for High Energy Physics (LHEP), University of Bern)

Contribution ID: 43

Type: **Contributed Oral**

## **First Impressions of a Multipurpose Solid Target Platform**

*Tuesday, 23 August 2022 14:20 (20 minutes)*

### **Funding Agency**

GE Healthcare

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**Presenter:** Mr SVEDJEHED, Johan (GE Healthcare)

Contribution ID: 44

Type: **Contributed Oral**

## **New Methods for Theranostic Radioisotope Production with Solid Targets at the Bern Medical Cyclotron**

*Tuesday, 23 August 2022 08:00 (20 minutes)*

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**Presenter:** Prof. BRACCINI, Saverio (AEC-LHEP University of Bern)

Contribution ID: 45

Type: **Contributed Oral**

## Targetry Advancements for Isotope Production at Texas A&M

*Monday, 22 August 2022 11:30 (20 minutes)*

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Contribution ID: 46

Type: **Poster**

## Set-Up of a Commercial 225Ac Production Facility

### Funding Agency

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**Presenter:** BERTRAND, SAMY (IBA)

Contribution ID: 47

Type: **Contributed Oral**

## Comparison of Dowex AG1-X8 and Poros XQ Anion Exchange Resins for $^{72}\text{Se}/^{72}\text{As}$ Generator Development

*Tuesday, 23 August 2022 14:40 (20 minutes)*

### Funding Agency

Department of Energy

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**Presenter:** Ms MUNINDRADASA, Chathurya (Department of Chemistry, University of Missouri, Columbia, MO, USA)

Contribution ID: 48

Type: **Poster**

## **225Ac Release from ThO<sub>2</sub> for Resonant Laser Ionization and Mass Separation at CERN-MEDICIS**

### **Funding Agency**

European Union's H2020 Framework Programme. Grant agreement no. 861198 (MSCA ITN LISA)

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**Presenter:** JOHNSON, Jake (KU Leuven)

Contribution ID: 49

Type: **Contributed Oral**

## **Producing High Purity 43,47Sc: Production, Purification, and Characterization Utilizing Enriched [46,50Ti]TiO<sub>2</sub> Targets**

*Monday, 22 August 2022 11:50 (20 minutes)*

### **Funding Agency**

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**Presenter:** CINGORANELLI, Shelbie (university of alabama at birmingham)



Contribution ID: 50

Type: **Contributed Oral**

## **Development of Radium-226 Targets for $^{226}\text{Ra}(\text{g},\text{n})^{225}\text{Ra}$ Nuclear Cross-Section Measurement and Actinium-225 Production at SCK CEN**

*Tuesday, 23 August 2022 10:30 (20 minutes)*

### **Funding Agency**

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**Primary authors:** SKLIAROVA, Hanna (SCK CEN); HEINITZ, Stephan (Project leader); MERMANS, Jasper (SCK CEN); MAERTENS, Dominic (SCK CEN); ELEMA, Dennis (SCK CEN)

**Presenter:** SKLIAROVA, Hanna (SCK CEN)

Contribution ID: 51

Type: **Poster**

## **Production and Separation of Ti-45 from a Liquid Sc Target**

### **Funding Agency**

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**Presenter:** Dr ADAMSEN, Tom Christian Holm (Centre for Nuclear Medicine, Department of Radiology, Haukeland University Hospital)

Contribution ID: 52

Type: **Contributed Oral**

## **Locally Inclined Target Holder with High-Efficiency Cooling for Nirta Solid Target Module**

*Tuesday, 23 August 2022 10:50 (20 minutes)*

### **Funding Agency**

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**Presenter:** DALLAKYAN, Ruben (A. I. Alikhanyan National Science Laboratory (Yerevan Physics Institute) Foundation)

Contribution ID: 53

Type: **Contributed Oral**

## **Arsenic Recovery from Irradiated Germanium Targets**

*Thursday, 25 August 2022 08:00 (20 minutes)*

### **Funding Agency**

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**Presenter:** Dr DUTECH, Guy (Los Alamos National Laboratory)

Contribution ID: 54

Type: **Poster**

## The Jülich IBA Cyclone 30XP Facility

*Thursday, 25 August 2022 14:00 (20 minutes)*

### Funding Agency

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**Primary authors:** SPELLERBERG, Stefan (Forschungszentrum Jülich); SPAHN, Ingo (Forschungszentrum Jülich); NEUMAIER, Bernd (Forschungszentrum Jülich)

**Presenter:** SPELLERBERG, Stefan (Forschungszentrum Jülich)

Contribution ID: 55

Type: **Contributed Oral**

## **Automated and Hard-Wired Safety Systems for Radionuclide Production: the Jülich Cyclotron Interlock System**

**Funding Agency**

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**Presenter:** SPELLERBERG, Stefan (Forschungszentrum Jülich)

**Session Classification:** Instrumentation and Nuclear Data

Contribution ID: 56

Type: **Contributed Oral**

## **Radiochemical Separation of $^{230}\text{U}$ as a By-Product from $^{225}\text{Ac}$ Production to Evaluate Its Chelation for Potential Application in Targeted Alpha Therapy**

*Thursday, 25 August 2022 08:20 (20 minutes)*

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**Presenter:** Dr ENGUDAR, Gokce

Contribution ID: 58

Type: **Contributed Oral**

## 103Pd Production Utilizing Liquid Target Set-Up

*Friday, 26 August 2022 09:20 (20 minutes)*

### Funding Agency

NSERC Discovery Grant

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**Presenter:** KROL, Viktoria (TRIUMF, University of Edinburgh)



Contribution ID: 59

Type: **Contributed Oral**

## **Design, Construction, Installation, and Refinement of a New Compact Radioisotope Production Station at the University of Washington Medical Cyclotron Facility**

*Tuesday, 23 August 2022 09:00 (20 minutes)*

### **Funding Agency**

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**Presenter:** DORMAN, Eric (University of Washington Medical Cyclotron Facility)

Contribution ID: 60

Type: **Contributed Oral**

## **Isotope Production Activities at LBNL: The Tri-Lab Effort in Nuclear Data (TREND), and Novel Production Pathways for $^{225}\text{Ac}$**

*Wednesday, 24 August 2022 09:00 (20 minutes)*

### **Funding Agency**

DoE Isotope Program

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**Presenter:** VOYLES, Andrew (UC Berkeley / LBNL)

Contribution ID: 61

Type: **Contributed Oral**

## **Alpha Irradiation of Germanium Metal Targets for Production of High Specific Activity $^{72}\text{Se}/^{72}\text{As}$ : Challenges Associated with Thick Target Preparation**

*Tuesday, 23 August 2022 11:10 (20 minutes)*

### **Funding Agency**

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**Presenter:** TANZEY, Sean

Contribution ID: 62

Type: **Contributed Oral**

## **An Aluminum-Indium-Silver Sealed Solid Cyclotron Target for High Yield Radiometal Production**

*Thursday, 25 August 2022 08:40 (20 minutes)*

### **Funding Agency**

Natural Sciences and Research Council of Canada, Alberta Advanced Education

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**Presenter:** Mr NELSON, Bryce (University of Alberta)

Contribution ID: 63

Type: **Poster**

## **Theoretical Consideration of $^{68}\text{Ge}$ Manufacturing Using an $\alpha$ Beam at Beam Dump for an Educational Tool of a Low-Level Radioactive $^{68}\text{Ge}/^{68}\text{Ga}$ Generator**

### **Funding Agency**

JSPS KAKENHI, Japan

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**Presenter:** WASHIYAMA, Kohshin (Advanced Clinical Research Center, Fukushima Medical University)

Contribution ID: 65

Type: **Contributed Oral**

## Production of $^{119}\text{Sb}$ for Pre-Clinical Targeted Radionuclide Therapy

*Thursday, 25 August 2022 09:20 (20 minutes)*

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**Presenter:** OLSON, Aeli (University of Wisconsin-Madison)

Contribution ID: 66

Type: **Contributed Oral**

## Targetry and Purification of Tb from natGd Targets

*Wednesday, 24 August 2022 11:10 (20 minutes)*

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Contribution ID: 67

Type: **Contributed Oral**

## **Operations of a Multiuse Mid-Size Cyclotron Facility at the University of Alabama at Birmingham and the Impact of the RF System on Downtime**

*Thursday, 25 August 2022 14:40 (20 minutes)*

### **Funding Agency**

UAB Cyclotron Facility

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Contribution ID: 68

Type: **Contributed Oral**

# Characterization of a Cyclotron Liquid Target Using Thick Niobium Target Windows with Thermal Simulation Studies

*Friday, 26 August 2022 09:40 (20 minutes)*

**Funding Agency**

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Contribution ID: 69

Type: **Poster**

## **Experimental Determination of Excitation Function Curves through the Measurement of Thick Target Yields in Liquid Targets**

**Funding Agency**

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Contribution ID: 70

Type: **Contributed Oral**

## **Electroplating and Recycling Chromium Targets for $^{52}\text{Mn}$ Production**

*Wednesday, 24 August 2022 11:30 (20 minutes)*

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**Presenter:** CHERNYSHEVA, Margarita (University of Wisconsin-Madison)

Contribution ID: 72

Type: **Contributed Oral**

## **Determination of Distribution Coefficients of Mercury and Gold on Selected Extraction Chromatographic Resins**

*Thursday, 25 August 2022 09:40 (20 minutes)*

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**Presenter:** CHEN, Shaohuang (TRIUMF)

Contribution ID: 73

Type: **Poster**

## **A New Cyclotron to Unlock Theranostic Radiopharmaceutical Availability**

**Funding Agency**

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Contribution ID: 74

Type: **Contributed Oral**

## Software for Yield and Target Power Optimization

*Wednesday, 24 August 2022 09:20 (20 minutes)*

### Funding Agency

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**Presenter:** Dr SIIKANEN, Jonathan (Department of Medical Radiation Physics and Nuclear Medicine, Karolinska University Hospital, Stockholm, Sweden)

Contribution ID: 75

Type: **Contributed Oral**

## **New Metallic Germanium Target Fabrication and Dissolution Techniques for the Cyclotron Production of Positron-Emitting $^{71}\text{As}$ and $^{72}\text{As}$**

*Tuesday, 23 August 2022 11:30 (20 minutes)*

### **Funding Agency**

the U.S. Department of Energy Isotope Program, managed by the Office of Science for Isotope R&D and Production

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**Presenter:** LO, Yi-Hsuan

Contribution ID: 76

Type: **Contributed Oral**

## **76/77Br: Production, Isolation, Labeling, and Shipping –Advances and Dosimetric Investigations**

*Tuesday, 23 August 2022 11:50 (20 minutes)*

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**Presenter:** MIXDORF, Jason



Contribution ID: 77

Type: **Contributed Oral**

## **Exploring the Chelation of the Exotic Meitner-Auger Emitter Mercury-197 with Sulfur-Containing Macrocycles**

*Thursday, 25 August 2022 10:30 (20 minutes)*

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**Presenter:** Dr TOSATO, Marianna (Department of Chemical Sciences, University of Padova, Padova, Italy)

Contribution ID: 78

Type: **Poster**

## **Toward Automating the Separation of Adjacent Lanthanides: $^{165}\text{Er}$ from $\text{NaHo}$**

### **Funding Agency**

DOE

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**Presenter:** JOHNSON, Taylor (University of Wisconsin)

Contribution ID: 79

Type: **Contributed Oral**

## Production of $^{165}\text{Er}$ by Deuteron

*Thursday, 25 August 2022 09:00 (20 minutes)*

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Contribution ID: 80

Type: **Contributed Oral**

## **Purification of Cyclotron-Produced Cobalt-55/58m from Copper and Iron**

*Thursday, 25 August 2022 11:10 (20 minutes)*

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NIH

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**Presenter:** LIN, Wilson (UW-Madison)

Contribution ID: 81

Type: **Contributed Oral**

## **Purifying Radioantimony for Targeted Radionuclide Therapy: Developments in Separating Antimony from Bulk Tin Target**

*Thursday, 25 August 2022 11:30 (20 minutes)*

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**Presenter:** Ms GRUNDMANE, Aivija (TRIUMF/SFU)

Contribution ID: 82

Type: **Contributed Oral**

## **Development of Novel Radiolabeling Strategies and Sulfur-Rich Ligands for Incorporation into Mercury-197m/g Radiopharmaceuticals**

*Thursday, 25 August 2022 10:50 (20 minutes)*

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**Presenter:** RANDHAWA, Parmissa (TRIUMF, SFU)

Contribution ID: 83

Type: **Contributed Oral**

## **Zinc Electrodeposition at Constant Current for Cyclotron Production of Gallium Radioisotopes**

*Wednesday, 24 August 2022 11:50 (20 minutes)*

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Contribution ID: 84

Type: **Contributed Oral**

## **A Therapeutic Goldilocks Radioisotope $^{67}\text{Cu}$ Produced at a Biomedical Cyclotron**

*Wednesday, 24 August 2022 10:30 (20 minutes)*

**Funding Agency**

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**Presenter:** SØNDERGAARD, Ursula (University Hospital of North Norway)



Contribution ID: 85

Type: **Contributed Oral**

## **Production of Radioisotopes Using Secondary Neutrons at the Brookhaven Linac Isotope Producer**

*Thursday, 25 August 2022 14:20 (20 minutes)*

### **Funding Agency**

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No email

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**Presenter:** SKULSKI, Michael (Brookhaven National Laboratory)

Contribution ID: 86

Type: **Contributed Oral**

## **Enhanced Exit Flange and High Current Collimator for GE PETtrace**

*Tuesday, 23 August 2022 08:40 (20 minutes)*

### **Funding Agency**

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**Presenter:** STOKELY, Matthew (BTI Targety LLC)

Contribution ID: 87

Type: **Poster**

## **A Technology Transfer Example for the Case of a Solid Target Station**

**Funding Agency**

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**Presenter:** DEHNEL, Morgan (D-Pace, Inc.)

Contribution ID: **88**

Type: **Poster**

## **Production of Cyclotron-Based [68Ga]Gallium Chloride Precursor for the Synthesis of Related Radiopharmaceuticals**

**Funding Agency**

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**Presenter:** LEPORIS, Marek (BIONT)

Contribution ID: 89

Type: **Contributed Oral**

## **Improvement of the Molar Activity of Lead-203 via Targetry and Chromatographic Approaches**

*Wednesday, 24 August 2022 10:50 (20 minutes)*

**Funding Agency**

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**Track Classification:** Modeling

Contribution ID: 90

Type: **Contributed Oral**

## **Automated and Hard-Wired Safety Systems for Radionuclide Production: the Jülich Cyclotron Interlock System**

*Tuesday, 23 August 2022 08:20 (20 minutes)*

**Funding Agency**

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Contribution ID: 91

Type: **Contributed Oral**

## **Feedback on Energy Degradation Developed at Cyncé Facility for Isotope Production**

*Thursday, 25 August 2022 13:40 (20 minutes)*

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Contribution ID: 92

Type: **Poster**

## **Plasma Chamber Erosion in a CW H<sup>-</sup> Ion Source Powered by a Planar External RF Antenna**

**Funding Agency**

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