REPROLAM
Red de Optimización de Protección Radiológica Ocupacional en LatinoAmerica y Caribe

NEWSLETTER

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The **REPROLAM** website is now available

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Regional Directory on External Dosimetry Services: GENERAL DATA AND AVAILABLE SERVICES

SURVEY TO CREATE REGIONAL DIRECTORY ON EXTERNAL DOSIMETRY

Among the first activities that we will be carrying out is the creation of a regional directory with the capacities of laboratories and / or external dosimetry services. This directory will function as the basis for the organization and participation in the activities planned in the **REPROLAM** external dosimetry working group. For this reason, we invite you to complete the following forms through the Google Forms application.

The survey has been designed in three modules as follows:

Module 1: (deadline to participate November 30): https://docs.google.com/forms/d/e/1FAIpQLSewtRzvxZwWeydRhO9 qOJEoWbgEMVaPdJpm8lV6x491SiLJA/viewform?usp=sf_link

Module 2: (deadline to participate December 17): https://docs.google.com/forms/d/e/1FAIpQLSc8MYR0CfwBUi4sjYe32gKWCTLOZZRMmYDuEK2RcV9avNTU-A/viewform?usp=sf_link

Module 3: (deadline to participate January 30, 2021): https://docs.google.com/forms/d/e/1FAIpQLSdVlNAUodzmbPWtirNCyZH9dhPlkhx1nqP3kO2kdPjaYJ0aQQ/viewform?usp=sf_link

Women in Nuclear (WiN) in Latin America

by Nélida del Mastro, President of WIN Brazil and Juana Gervasoni, President of WIN Argentina.

WiN Global is an organization that brings together women who work in the nuclear field, be it in nuclear plants for the generation of electrical energy, production of radioisotopes, or in the application of nuclear and isotopic techniques that contribute to preserve water and soil resources already control insect pests, guarantee food safety and greater food security, as well as improve livestock production and health.

Currently, a regional chapter Women in Nuclear (**WiN ARCAL**) is being created, where **ARCAL** is an acronym that means Regional Cooperation Agreement for the promotion of science and technology in Latin America and the Caribbean.

Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Mexico, Peru, Uruguay and Venezuela joined forces with the objective of promoting the full and equitable participation of women in nuclear science and technology, based on the promotion of their empowerment at all levels, especially highlighting training in gender and leadership.

For more information or to join the **global WiN**, visit www.win-global.org/join and request registration in the chapter corresponding to your country.

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Article: Biological dosimetry assays for estimate absorbed dose

The objective of biological dosimetry is to estimate the absorbed dose by people who are presumed or proven to be overexposed to ionizing radiation, whether from natural sources or produced by man, from biological samples.

CYTOGENETIC TESTS OF BIOLOGICAL DOSIMETRY

	Conventional Cytogenetics (DCA)	Cytokinesis Blocking Micronuclei (CBMN)	Fluorescence in situ hybridization (FISH)	Premature Chromosome Condensation (PCC)
Chromosome aberration count in the applications of biological dosimetry	Dicentrics and rings	Micronuclei and nucleoplasmic bridges	Translocations and diccentrics	Rings, excess chromosome fragments, dicentric and translocations
Scenarios overexposure	Recent. Sharp and prolonged	Recent. Acute and prolonged	Recent and Past. Acute and prolonged	Recent and acute
Dose range	(0,1 – 5) Gy	(0,25 – 4) Gy	(0,3 – 5) Gy	(0,1 – 20) Gy
Persistence of effect (up to 3-4 weeks)	Yes	Yes	Yes	Yes
Persistence of effect (12 months or more)	N/A	N/A	N/A	N/A
Assessment overexposure inhomogeneous	Yes	N/A	N/A	Yes
Dose evaluation with triage criteria	Yes	Yes	N/A	Yes
Application	Dosimetry: Gold Standard	Dosimetry with triage criteria	Retrospective dosimetry and integral dosage	Dosimetry high doses
Standardization	ISO 19238: 2014 Radiological protection Performance criteria for service laboratories performing biological dosimetry by cytogenetics	ISO 17099: 2014 Radiological protection Performance criteria for laboratories using the cytokinesis block micronucleus (CBMN) assay in peripheral blood lymphocytes for biological dosimetry	ISO 20046: 2019 Radiological protection Performance criteria for laboratories using Fluorescence In Situ Hybridization (FISH) translocation assay for assessment of exposure to ionizing radiation	

DB laboratories accredited under ISO 17025 Current revision: "General requirements for the competence of testing and calibration laboratories"

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Calibration curves

For calibration purposes, laboratories perform in vitro dose-response curves for the most relevant radiation qualities, obtaining dose-response relationships:

- linear quadratic $y_D = c + \alpha D + \beta D^2$ for low LET radiation
- linear $y_D = c + \alpha D$ for high LET radiation

where:
y_D: frequency of dicentrics for dose D;
c: spontaneous frequency;
α: linear coefficient;
β: quadratic coefficient.

Dose calculation

The estimated dose is expressed as a mean dose with a 95% confidence interval. The mean dose (D) is determined from the frequency of dicentrics measured (observed), using an appropriate calibration curve.

Being D:

$$D = \frac{-\alpha \pm \sqrt{\alpha^2 - 4\beta(c - y)}}{2\beta}$$

The spontaneous frequency of dicentrics (c), determined in large groups of healthy individuals, is 1.0 in 1000 cells evaluated with a confidence interval [0.0; 2.0] in 1000 cells analyzed.

Uncertainty associated with the dosimetric estimation: the absorbed dose (expressed in Gy) is reports with a 95% confidence interval.

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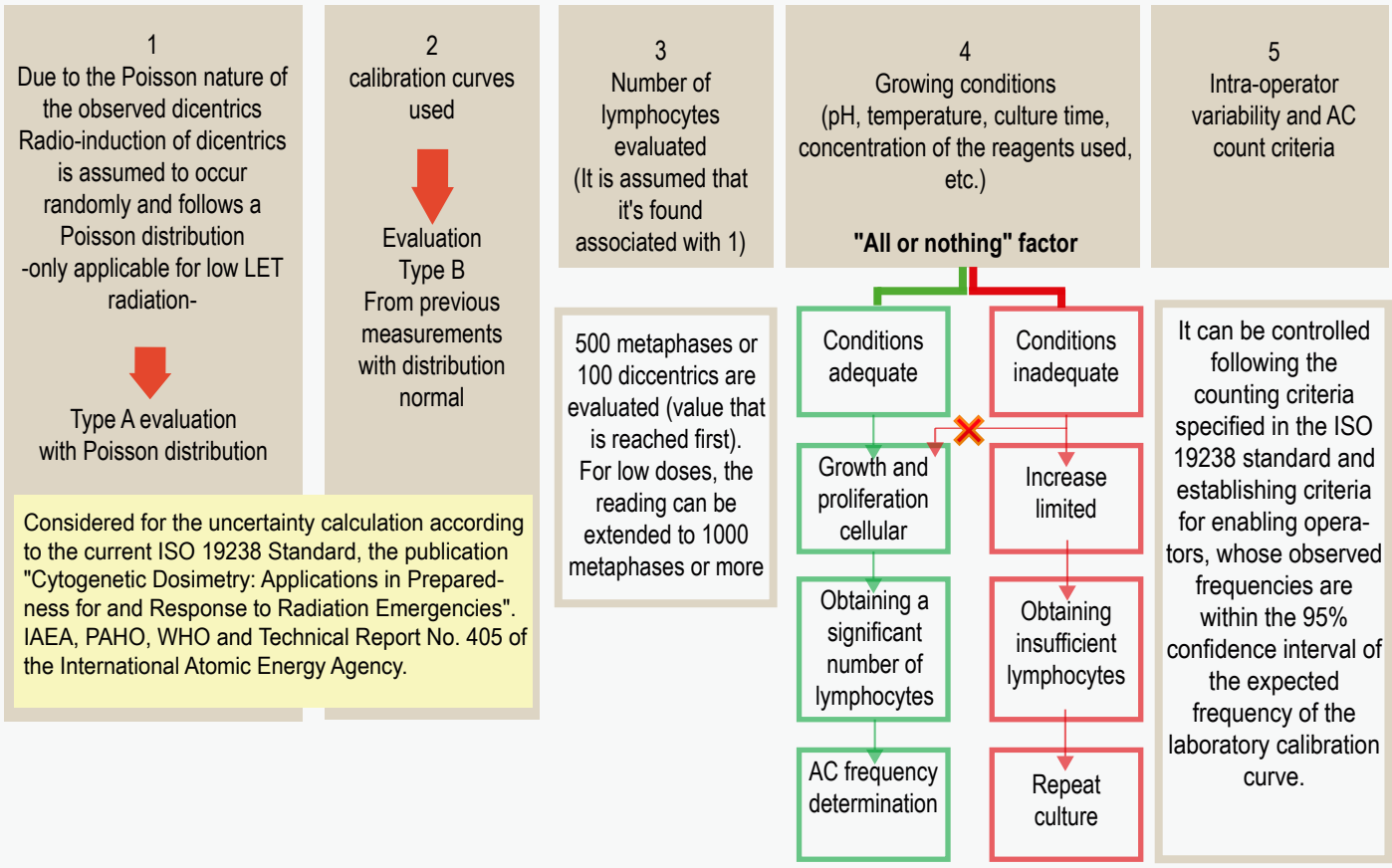
POSSIBLE SOURCES OF UNCERTAINTY AND FACTORS THAT WOULD CONTRIBUTE TO THE OBTAINING ERROR RESULTS IN DB TESTS *



* for the test of dicentrics and centric rings; They are applicable to the rest of the cytogenetic tests but with particular modifications to each one of them.

Decision Rule

A safety zone is chosen equal to the expanded uncertainty (k = 1.95). This 95% confidence interval is the interval that covers the true dose 95% of the time. It is constructed using the “two combined coverage factors” methodology (Poisson confidence interval for the frequency of aberrations and the regression factor R which is the 95% confidence limit of a $\chi 2$ distribution with 3 degrees of freedom for a quadratic linear calibration curve). This double coverage interval is conservative.

Article provided by the coordinators of the REPROLAM Biological Dosimetry working group

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IAEA_ International Conference on Radiation Safety

Improving Radiation Protection in Practice

Virtual Event: November 9 to 20, 2020

The Conference aims to take stock of the worldwide radiation safety situation. It will provide a forum for the exchange of information on Member States' experiences in applying the system of radiological protection, as provided for in the IAEA safety standards, to the protection of workers, patients, the public and the environment. Both natural and artificial radiation sources fall within the scope of the Conference.

A particular focus will be given to the lessons learned from applying GSR Part 3 and improvements that could be considered to further facilitate its application. Discussion on changes in approach considered necessary for effectively dealing with new and emerging challenges in radiation protection is expected and encouraged. .

For more information visit: https://www.iaea.org/events/international-conference-on-radiation-safety-2020

Webinar: Radiation Protection in Interventionism

Online event

November 12, 2020,14: 00HS

Topics:

• **"How to reduce occupational radiological risks and interventional patients"** by Eliseo Vañó, Department of Radiology, University of Madrid.

• **"Optimization of interventional procedures: success stories"**. By Gustavo Andrade, Hospital Restoration. Recife.

To register, go to:
https://forms.gle/XM3mkgfWJR9FYz8p9

Virtual Conference on Applied Radiation Metrology (vCARM)_By NPL

Online event

Monday, November 23, 2020, 06:00 HS-
Friday, November 27, 2020, 13:00 HS

Virtual CARM is the latest in a series of conferences run by NPL for the nuclear metrology community, bringing together expertise from areas including nuclear medicine, the nuclear industry, manufacturers, radioanalytical laboratories and academia. The meeting is a great opportunity to keep up-to-date on progress in nuclear metrology sphere and to network with colleagues across a wide range of sectors.

For more information visit:
https://www.eventbrite.co.uk/e/virtual-conference-on-applied-radiation-metrology-vcarm-registration-116885598973?utm_campaign=new_attendee&utm_medium=email&utm_source=eb_email&utm_term=event_name

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2020 LAS / ANS SYMPOSIUM

Preservation and management of nuclear technology knowledge in Latin America.

November 24-27, 2020, Rio de Janeiro, Brazil

Annually, LAS / ANS holds a symposium in a Latin American country with the aim of exchanging information and discussing the latest advances in the applications of nuclear energy in the region and the world, and showing the general public, including professionals of communication, the benefits of using nuclear energy.
The LAS / ANS 2020 symposium will have as its main theme “Preservation and management of knowledge of nuclear technology in Latin America”. Traditionally, the symposium brings together personalities from the nuclear field of the countries of the region, as well as from North America, Europe and Asia.

For more information visit: https://las-ans.org.br/event/2020-las-ans-symposium/

ICRP International Conference on Recovery After Nuclear Accidents

Radiological Protection Lessons from Fukushima and Beyond

Virtual event_December 1-4, 2020

The objective is to share experiences and lessons related to radiological protection aspects of recovery from the Fukushima Daiichi nuclear accident, the Chernobyl accident, and other events to improve international understanding of the current state of recovery in Japan, consider strategies that may accelerate recovery, and improve preparedness for recovery from possible future major nuclear accidents.

The International Conference on Recovery After Nuclear Accidents: Radiological Protection Lessons from Fukushima and Beyond is an on-line event organised by the International Commission on Radiological Protection (ICRP), hosted by Japan Atomic Energy Agency (JAEA), and in association with several Japanese, International, and other organisations.

For more information visit: https://www.icrprecovery.org/about-eng

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Second International Symposium on Radiological Protection in Medicine

Online event: Guayaquil, Ecuador, December 03 to 06, 2020

In order to give continuity to the exchange of experiences, review and propose new proposals as well as analyze the progress that is being achieved in the region with respect to the recommendations established in the First Symposium held in Arequipa, the Ecuadorian Association of Radioprotection organizes the **SECOND INTERNATIONAL SYMPOSIUM ON RADIOLOGICAL PROTECTION IN MEDICINE** in which it will take place in the city of Guayaquil, Ecuador from December 03 to 06, 2020, in ONLINE MODALITY.

At the Symposium, scientific papers will be presented and there will be round tables to deal with specific topics, but above all, progress in the application of the recommendations of the first symposium held in Arequipa will be evaluated and new strategies will be established to improve radiation protection conditions in our region.

The Symposium is sponsored by the Pan American Health Organization (**PAHO**), the International Atomic Energy Agency (**IAEA**), and is supported by the Radioprotection Federation of Latin America and the Caribbean (**FRALC**), the Latin American Network for Radiation Protection in Medicine (**Red-LAPRAM**), the Latin American Network for Education and Training in Nuclear Technology (**LANENT**) and the Latin American Association of Medical Physics (**ALFIM**).

Information and registrations: http://aerpecuador.org/index.php/eventos/ii-simposio-internacional-2020?

15th International Congress of the International Radiation Protection Association (IRPA15) _COEX, Seoul, Korea

January 18-22, 2021

The adoption of the theme "Uniting Radiation Protection Science and Culture - Expanding Public Empathy" for the IRPA15 Congress reflects the strong commitment of the IRPA15 Organizing Committee to provide invaluable opportunities to discuss and strengthen the correlation between culture. and Radiation Protection science, and share various scientific knowledge and experiences on radiation protection not only among experts but also among the public. The IRPA15 Congress will undoubtedly contribute to opening a new path towards the development of the future radiation protection system, which will be based on public empathy.

Deadline for submission of full papers: December 31, 2020
Standard registration deadline: December 31, 2020

More information in:https://www.irpa2020.org/