

## **CRP E31007**

### ***Instructive Surfaces and Scaffolds for Tissue Engineering Using Radiation Technology (conducted jointly with F23030)***

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#### **Summary:**

Tissue engineering is poised to revolutionize medicine by shifting the focus of treatment from addressing the symptoms, roots and causes of diseases to repair and regeneration. Regenerative medicine involving cell therapy is an emerging field that seeks to combine the knowledge and expertise of diverse disciplines towards the aim of restoring impaired tissue/organ functions in the body. This paradigm shift will have huge impact in both high and middle/low income countries. Radiation technologies plays a role in facilitating and speeding up the development of tissue engineering by addressing some of its challenges and opportunities, such as preparation/optimization of instructive scaffolds and their sterilization. This CRP will provide a forum for knowledge and technology transfer among participating institutions and facilitate the formation of a network between diverse disciplines, as well as promote the early involvement of middle/low income Member States (MS), thus enhancing their level of competence. It aims to support MS in developing and testing instructive scaffolds and surfaces using radiation technology to create tissue grafts and help decrease the need for human donors. This is a collaborative CRP between Division of Physical and Chemical Sciences (NAPC) and Division of Human Health (NAHU). NAPC will implement the part related to the development and testing of the instructive surfaces and scaffolds, while NAHU will implement the biomedical application part related to the intended end-uses.

#### **Research Objectives:**

- The goal of the CRP is to engineer instructive scaffolds and surfaces using radiation technology to create tissues from autologous and allogeneic human somatic cells to provide tissue grafts and decrease the need for human donors.
- Specifically, participating institutions will investigate and optimize the preparation on instructive surfaces and scaffolds and their sterilization by radiation, to study the cell-scaffold-matrix interactions, as well as the effectiveness of combining biological and non-biological materials on regeneration/repair

#### **Expected Research Outputs:**

- Technical guidelines, methods and protocols for synthesizing instructive surfaces and scaffolds by radiation methods and their sterilization.
- Data on the cell-cell-matrix-scaffold interaction, as well as on the effectiveness of combined biological and non-biological materials on regeneration-repair are expected.
- A multidisciplinary network of researchers and end-users is expected to be established.

**Participating institutions:**

<i>Country</i>	<i>City</i>	<i>Institution</i>
ARGENTINA	BUENOS AIRES	Comision Nacional de Energia Atomica (CNEA)
BRAZIL	SÃO PAULO	Instituto de Pesquisas Energeticas e Nucleares (IPEN-CNEN/SP)
CUBA	LA HABANA	Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear; Agencia de Energía Nuclear y Tecnologías de Avanzada (AENTA)
MEXICO	OCOYOACAC	Instituto Nacional de Investigaciones Nucleares (ININ)
SLOVAKIA	BRATISLAVA	Comenius University
UNITED KINGDOM	CLWYD	Oswestry Tissue Bank & Veterinary Tissue Bank
URUGUAY	MONTEVIDEO	Instituto Nacional de Donacion y Trasplante (INDT)