MEMORANDUM OF UNDERSTANDING (MoU)

CANCER INSTITUTE (WIA), A Public Charitable Insitution, Registered under the Societies Registration Act 1860 and having its Administrative Office at Canal Bank Road, Gandhi Nagar, Adyar, Chennai-600020, and recognised by the government of India, in the Ministry of Health & Family Welfare, New Delhi, as a Regional Cancer Centre for Cancer Research and Treatment.

In pursuit of excellence in cancer treatment and care, the Cancer Institute has developed a Bone Bank Centre in their premises at 38, Sardar Patel Road, Chennai PIN:600036, and approached the Indira Gandhi Centre for Atomic Research, Kalpakkam, for irradiation of bone of various sizes for use in the surgical treatment of cancer patients.

INDIRA GANDHI CENTRE FOR ATOMIC RESEARCH, KALPAKKAM, having such irradiation facility at their Centre in Kalpakkam has agreed for irradiation of bones received from the Institute's Bone Bank.

This MoU entered into on 18th November 2021 between **CANCER INSTITUTE (WIA)**, represented by Dr.E.Hemanth Raj, Executive Vice Chairman, hereinafter referred to as the "INSTITUTE" (which expression, unless repugnant to the context and meaning thereof shall deem to include its successors-in-interest and permitted assigns) on the ONE PART

AND

INDIRA GANDHI CENTRE FOR ATOMIC RESEARCH, having its facilities in KALPAKKAM, and represented by Shri S.Athmalingam, Associate Director, Radiological and Environmental Safety Group (RESG), Safety, Quality Resource Management Group (SQRMG), Indhira Gandhi Centre for Atomic Research, hereinafter referred to as "IGCAR, KALPAKKAM" (which expression, unless repugnant to the context or meaning thereof, shall deem to include its successors-in-interest and permitted assigns) of the OTHER PART.

The INSTITUTE have a Bone Bank for providing Bone replacement treatment to their patients as and when found necessary. The Bone needs radiation before use for such replacements.

IGCAR, KALPAKKAM, having been the pioneers in the technical and engineering expertise on radiation of Bone, has in principle agreed to help the Institute for radiation of bones of various sizes and strengths.

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पुषा: आव्यविनम्/S. ATHMALINGAM पुषा: निवेशक/Associate Director The probable source of bones would be:

- 1. Orthopaedic Hospitals Bones from amputated part of Limb (due to trauma), bone from femoral head and bone slices following replacement surgeries.
- 2. Brain-Dead Following organ harvesting, bones would be harvested from them;

The bones will need terminal sterlisation by gamma rays (25 kilo Grey)

Bone processed by two different types would need to be irradiated with above mentioned dose as a part of terminal sterlisation:

- 1. Lyophilised (Free-Dried bones);
- 2. Deep- Frozen bones;
- 1) Lyophilised or Freeze-Dried Bone: This processed bone will be in packets of 20 grams to 100 grams each. It would be stored at room temperature. Terminal sterlisation of the product would require 25 kilo Grey of gamma radiation. The bone would be structurally weak. The bone will be in pieces. The processing would entail chemical treatment (70% ethanol, 0.5% Sodium Hypochlorite), pasteurization and freezedrying. The estimated water content of the product would be less than 7%. The bone will be vacuum-sealed and triple packed (polythene), along with an indicator for radiation sterlization.
- 2. Deep-Frozen: Terminal sterlisation of the product would require 25 kilo Grey of gamma radiation. To maintain cooler temperatures during radiation, 1 kg of bones would be packed approximately with 1 kg of dry ice. The bone would be structurally strong. The bone would be in its entire length or divided into 2 halves in length. The bone will be triple layer packed (with appropriate packing material) and stored at minus 80° celcicus. The maximum length of the bone would be 50 cms.

It is decided, for the present, that the radiation of bones sent from the INSTITUTE will be done by IGCAR without charges. The bones would be delivered to IGCAR, KALPAKKAM, in a sealed form by the INSTITUTE. The transportation of bones for radiation and bringing back to the INSTITUTE will be done by the INSTITUTE at its own cost. The following will be the box sizes in which packed bones will be kept to be irradiated:

1. Maximum Length 64.5 cms

2. Maximum Width: 40.5 cms

3. Maximum Height: 42 cms

Size of the pack may vary, but within the above limits. Multiple boxes also will be packed in a single box not exceeding the above dimensions.

IGCAR, KALPAKKAM would also provide a certificate/report on irradiation conditions including dose rate, time of exposure, distance, calibration of the facility. IGCAR would also ensure that the required dose has been delivered using radiation monitors/LTDs and chemical dosimetry techniques.

पुषा. आरपशिंगम/S. ATHMALINGAN पात्र निवेशक/Associate Director IGCAR hereby agrees to make available the gamma irradiator/calibration facility for irradiation of bones for the INSTITUTE as a service. The dose details for irradiation would be provided by the INSTITUTE and IGCAR's role is limited to irradiation of the bones following all prescribed safety norms of AERB. IGCAR is not liable for any of the consequences arsing from irradiation and IGCAR takes no third party liability for its service. Transportation of the bones from the INSTITUTE and back following all prescribed safety norms is the responsibility of the INSTITUTE. All the permissions required for this purpose including medical/ethical/administrative/statutory/regulatory clearances would be the responsibility of the INSTITUTE. The same (relevant ones) shall also be shared with IGCAR, KALPAKKAM.

BOTH Parties shall adhere to the ethical norms required for such radiation as per the laws laid in India.

AGREEMENT signed this 18th day of November 2021

For CANCER INSTITUTE (WIA)

DR.E.HEMANTH RAJ

EXECUTIVE VICE CHAIRMAN

EXECUTIVE SIDE CHAIRMAN ANCER ISSTITUTE (WIA)

WITNESS:

Signature:......

1. P.KRISHNAMOORTHY

Cancer Institute (WIA)

Canal Bank Road,

Gandhi Nagar,

Adyar,

Chennai-600020

Signature:

2 Dr. K Chandrakumar,

Cancer Institute (WIA)

38, Sardar Patel Road,

Chennai-600036

For INDIRA GANDHI CENTRE FOR ATOMIC RESEARCH

S.ATHMALINGAM

S. Appth

ASSOCIATE DIRECTOR,

(RESG) (SQRMG) IGCAR

WITNESS

Signature: M. Mercublan

1 M. MENAKA

HEAD, RAMS

RESD, IGCAR

Signature: V Culongui

2 V. SUBRAMANIAN

Head, ATBS

RESD, IGCAR