



Memorandum of Understanding for Collaborative Research

This Memorandum Of Understanding for Collaborative Research (hereinafter referred to as “MOU”) is made and entered into on February 21, 2023 (hereinafter referred to as “Effective Date”) by and between:

Niigata University (hereinafter referred to as “NU”), a University organized and existing under the laws of Japan, having its office at 8050, Ikarashi 2 no-cho, Nishi-ku, Niigata-shi, Niigata 950-2181, Japan;

AND:

Cochin University of Science and Technology (hereinafter referred to as “CUSAT”), a University organized and existing under the laws of the Republic of India, having its office at University Road, South Kalamassery, Kalamassery, Kochi – 682022, Kerala, India;

Hereinafter referred to as the Parties collectively, or Party individually.

WHEREAS, the Parties desire to perform collaborative research and are willing to receive/send research materials and exchange Confidential Information.

WHEREAS, the performance of collaborative research is consistent with each Party’s research objectives.

NOW THEREFORE, in consideration of the mutual promises and covenants contained herein, the Parties agree as follows:

Article 1: DEFINITIONS

As used in this MOU, the following terms when capitalized have the following meanings:

- 1.1 “Confidential Information” means any information designated at the time of disclosure as “Confidential” “Proprietary” or some similar designation in tangible or intangible form and made available by or on behalf of one Party to the other Party in connection with or pursuant to this MOU. Orally communicated information will be Confidential Information if it is confirmed in writing as being Confidential Information within thirty (30) days after the initial disclosure. Confidential Information does not include any information that (i) was publicly known or becomes publicly known (other than via action or inaction of the Party receiving the Confidential Information), (ii) is already in the possession of the Party receiving the Confidential Information prior to its receipt, (iii) is obtained by the Party receiving the Confidential Information without a breach of someone’s confidentiality

- obligations, or (iv) is independently developed by the Party receiving the Confidential Information. Notwithstanding the foregoing, the terms and conditions of this MOU shall be regarded and treated as Confidential Information.
- 1.2 “Intellectual Property Rights” mean any and all world-wide intellectual property rights, including, but not limited to, patent rights, utility model rights, design rights, circuit layout rights, plant breeder’s rights, copyrights and know-how, and any and all rights as well as interests in and to these proprietary rights and applications therefor.
 - 1.3 “Invention(s)” means any invention, idea, design, circuit layout creation, cultivation of plant varieties, works of authorship, software, information or data, know-how and any other proprietary information which may be protected by Intellectual Property Rights.
 - 1.4 “Joint Application Agreement” means an agreement which may be entered into by the Parties who jointly owns the Intellectual Property rights for the purpose of filing an application for protection of the Intellectual Property rights covering the Research Results.
 - 1.5 “Know-how” means technical information arising out of or relating to the Research, which the Parties mutually agree in writing they are able to keep confidential between them.
 - 1.6 “Principal Researcher” means the person identified in the Attachment, one selected by NU and one selected by CUSAT to be the lead researcher for Party. Each Party may appoint a different person to be its Principal Researcher upon prior written notice to the other Party.
 - 1.7 “Research” means research activities identified in the Attachment, titled “Investigations of the effect of the world’s highest level of natural radioactivity on reproductive activity and exposure assessment in India”
 - 1.8 “Researcher” means each person who performs the Research belonging to the Parties.
 - 1.9 “Research Collaborator” means any person other than the Researcher, who is appointed to participate in the Research and is listed in the Attachment.
 - 1.10 “Research Materials” means any materials that are necessary to perform the Research.
 - 1.11 “Research Result(s)” means any technical result obtained jointly from conducting the Research jointly under this MOU, including, but not limited to, any Invention, idea, design, circuit layout creation, cultivation of plant varieties, copyrightable work, know-how, trademark, utility solution, trade name, business secret and any other intellectual property objects. For avoidance of doubt, the Research Result shall not include any technical result obtained by one Party independently without any

contribution of the other Party or use of Confidential Information (hereinafter defined) provided by the other Party.

Article 2: CONDUCT OF RESEARCH

- 2.1 The Parties shall undertake the Research in accordance with the Attachment.
- 2.2 The Parties shall use reasonable efforts to carry out the Research. All activities concerning and related to the Research shall be carried out in compliance with any applicable laws, regulations and guidelines governing the conduct of similar research activities in the jurisdiction in which the Research is conducted.
- 2.3 This MOU shall not prevent the Party from conducting any part of the Research independently from the other Party, without using any Confidential Information provided by the other Party.
- 2.4 The Parties shall satisfy its respective role and responsibility as described in the Attachment.

Article 3: RESEARCH TITLE

- 3.1 The Research title is identified in the Attachment.
- 3.2 The description of the Research is described in the Attachment, which may only be modified by mutual written agreement between duly authorized representatives of the Parties.

Article 4: RESEARCH COLLABORATOR

- 4.1 The Party who appoints the Research Collaborator to cooperate in the Research shall ensure that such Research Collaborator complies with this MOU.
- 4.2 The Party may, if any person other than the Research Collaborator listed in the Attachment is deemed necessary to perform the Research, appoint such person to participate in the Research as its Research Collaborator, with the consent of the other Party.
- 4.3 The Party shall cause every member of the Research Collaborator to comply with all of the terms and conditions of this MOU.
- 4.4 The provisions of this MOU shall apply mutatis mutandis to the handling of any invention arising from the collaboration of the Research Collaborator.

Article 5: RESEARCH PERIOD

- 5.1 The period of the Research shall be identified in the Attachment, commencing on February 21, 2023 and terminating on March 31, 2024 (hereinafter referred to as the

“Research Period”).

Article 6: RESEARCH RECORDS

- 6.1 Throughout the Research Period, the Parties shall keep and maintain records related to the Research in good scientific manner so as to reflect work done and the Result achieved under the Research.
- 6.2 The Parties shall cooperate to promptly draft the Final Report that describes the Result learned during the period in which the Research was performed.

Article 7: DESIGNATION OF KNOW-HOW

- 7.1 The Parties shall, upon consultation, promptly designate certain Research Results in the Report as Know-How.
- 7.2 When designating the Research Results as Know-How, the term of confidentiality for such Know-How shall be explicitly specified.
- 7.3 The term of the confidentiality as provided in the preceding Paragraph shall be determined upon consultation between the Parties; provided that, as a general rule, such term shall be five (5) years from the day following the date of the completion of the Research; provided, however, that, if necessary after the designation, such term may be extended or shortened upon consultation between the Parties.

Article 8: RESEARCH EXPENSES

- 8.1 The Party shall bear its own expenses to play its roles in the Research under this MOU.
- 8.2 In the event that NU works with CUSAT in India where the samples are collected, NU will bear all expense including needed for performing the Research.

Article 9: MATERIALS AVAILABLE FOR RESEARCH

- 9.1 CUSAT retains ownership of the Research Materials collected in India and made them available for the Research.
- 9.2 For the purposes of performing the Research, the Research Materials listed in the Attachment are provided with an optional transmittal fee solely to reimburse CUSAT for its preparation and distribution costs.
- 9.3 Research Materials may be added in the list of the Attachment according to the needs of the Research, provided that the addition is discussed and agreed upon between the Parties.
- 9.4 The Parties shall execute a separate written agreement for transferring the Research

Materials provided under this MOU.

- 9.5 The Research Materials shall be provided in compliance with the applicable laws in accordance with Article 17.
- 9.6 CUSAT agrees that the Research Materials will be transferred through NU to the Research Collaborators to conduct the Research. NU shall impose on the Research Collaborators obligations which are substantially the same as those which NU owes to CUSAT under the MOU.
- 9.7 The Research Materials shall not be transferred to other parties other than the Research Collaborator without prior written consent of CUSAT.

Article 10: OBLIGATION OF CONFIDENTIALITY

- 10.1 Any Confidential Information that one Party discloses or makes known to the other Party related to the Research may be disclosed only if the other Party strictly keeps the Information in confidence and does not disclose the Information to any third party other than the Party's employees and the Research Collaborators who need to know such Confidential Information. NU shall cause the Research Collaborators to enter into a non-disclosure agreement of the Confidential Information.
- 10.2 The Parties shall not use any Confidential Information received from another Party for any purpose other than conducting the Research jointly nor disclose such Confidential Information to any third party, without prior written approval of the providing Party.
- 10.3 If the Party deems it necessary to disclose any Confidential Information to its employees, officers, directors or agents other than the Principal Researcher, then that Party may disclose the Confidential Information to them; provided that such Party executes a written agreement or provides internal rules binding them during and after employment to obligations of confidentiality no less restrictive than those contained in this MOU unless otherwise agreed in writing between the Parties, neither the Parties may use or disclose the Confidential Information for purposes other than performing the Research. If the Party is served with notice of judicial or governmental action that could result in disclosure of the Confidential Information, it will promptly notify the other Party such that both Parties may take appropriate legal action to prevent or limit the extent of any such disclosure.
- 10.4 The obligations of this Article 10 are effective during the Research Period and for five (5) years after its expiration or termination. However, upon consultation of the Parties, the Parties may extend or shorten this period.
- 10.5 None of the Parties shall disclose the Research Results to any third party other than JSPS without the prior written consent of the other Party, which consent shall not be unreasonably withheld.

Article 11: INTELLECTUAL PROPERTY RIGHTS

- 11.1 The Research Results shall be jointly owned by the Parties who jointly obtained such Research Results, unless otherwise agreed upon between those joint owners in writing.
- 11.2 The Intellectual Property Rights originating from the Research Results shall be jointly owned by the Parties and the Research Collaborators who jointly obtained such Research Results in proportion to the respective contributions made by those joint owners in the creation thereof, unless otherwise agreed upon between those joint owners in writing. Any application for such Intellectual Property Rights, unless otherwise agreed upon by all joint owners of such Intellectual Property Rights in writing, shall be jointly filed, prosecuted and maintained by those joint owners by sharing any costs and expenses of filing, prosecuting, maintaining, defending, and enforcing such Intellectual Property Rights in the same proportion, and revenues from such Intellectual Property Rights shall also be shared between those joint owners in the same proportion.
- 11.3 However, the right to obtain patents based on the execution of the Party and/or the Research Results made solely by the Party and not developed from direct usage of the Research Materials shall be owned solely by the Party with the prior written approval of the other Party.
- 11.4 Notwithstanding the provisions of Sections 11.2, in the event that any joint owner of such Research Result does not intend to bear the costs and expenses relating to filing, prosecuting, maintaining, defending, and enforcing the Intellectual Property Rights originating from any Research Result, such joint owner shall waive its share of ownership in such Intellectual Property Rights.
- 11.5 None of the joint owners of any Intellectual Property Rights hereto shall commercially exploit the Research Results or assign or grant a license to a third party for the Intellectual Property Rights thereof owned jointly by the Parties without the prior written consent of all the other joint owners.
- 11.6 The joint owners of any Research Result shall enter into the Joint Application Agreement prior to filing of any applications for the Intellectual Property Rights covering the Research Results and determine further details about handling of such applications and the Intellectual Property Rights, unless otherwise agreed upon by those joint owners in writing.
- 11.7 Any Party may use the Research Results without any payment to the other Parties in its own educational and research activities.
- 11.8 The Parties acknowledge that the Intellectual Property Rights originating from the Research Results are subject to governmental control under the Japanese law entitled "Industrial Technology Enhancement Act" (also known as Japanese Bayh-Dole system) and under the Indian law entitled "Patent act of 1970, with amendments in 1999, 2002, 2005 and Biological Diversity Act, 2002". The Parties shall comply with those laws and regulations of their respective countries.

- 11.9 This MOU is not intended to affect any Party's rights to intellectual property in existence before the Parties collaborated under this MOU ("Background intellectual property"). All rights, title and interest in and to any inventions or technologies, respectively of the Parties, existing on or before the effective date of this MOU shall be the exclusive property of the respective party.

Article 12: PUBLICATION

- 12.1 The Parties agree that any Research Results which have value for scientific, industrial or other social use, may in principle be made available to the public by any Party, subject to (i) the compliance with the provisions of Sections 10.2 and 11.1 and (ii) securing the Parties' right to obtain Intellectual Property Rights for such Research Results.
- 12.2 Neither the Parties may publicly announce or publish the Results unless it first notifies the other Party in writing of the contents, timing, and nature of such announcement and provides such announcement or publication to the other Party thirty (30) days prior to announcement or publication for their review and protection of its Confidential Information. The publishing Party agrees to redact any Confidential Information of the other Party's found to be in such announcement or publication upon request within that thirty (30) review period.
- 12.3 In the event that a Principal Researcher intends to publish and/or present, in the form of papers or presentations at academic conferences or otherwise (the "Publications"), about the Research Results, all Researchers and Research collaborators who have contributed the Research Result shall be included in such Publications as co-authors.

Article 13: NOTICES

- 13.1 Any notice or other communication required or permitted to be delivered under this MOU (hereinafter referred to as the "Notice") shall be delivered to the Principal Researcher or any other person assigned by the relevant Party, who will be set forth in below (hereinafter referred to as "Administrative Contact").
- 13.2 The Notice shall be in writing, including, by e-mail, to the Principal Researcher or the Administrative Contact. If the Notice is sent by e-mail, the recipient shall send a return e-mail to confirm receipt thereof, and such Notice shall become effective upon receipt of such return e-mail.

To NU:
Associate Professor Hideaki Yamashiro
E-MAIL:hyamashiro@agr.niigata-u.ac.jp

Research Promotion Division
ADDRESS: 8050, Ikarashi 2-no-cho, Nishi-ku, Niigata-shi,
Niigata 950-2181, Japan

PHONE:+81-25-262-5642
E-MAIL:kenkyushikin@adm.niigata-u.ac.jp

To CUSAT:
Professor (Dr). A.A. Mohamed Hatha
E-MAIL: mohamedhatha@cusat.ac.in, mohamedhatha@gmail.com

Department of Marine Biology, Microbiology and Biochemistry
ADDRESS: School of Marine Sciences, Lakeside Campus, Fine Arts Avenue,
Cochin – 682016, Kerala, India
PHONE: 91-484-2368120
E-MAIL: marinebiology@cusat.ac.in

Article 14: DISPUTE RESOLUTION

14.1 Any issues that are not addressed or stipulated in this MOU and any dispute arising out of or in connection with this MOU, the Parties shall be agreed and resolved through amicable negotiation and discussion in good faith between the Parties.

Article 15: LIABILITY

15.1 None of the Parties shall be liable to the other Party for any damages, including incidental, indirect, special or consequential damage of any kind whatsoever, suffered by the other Party due to any event arising from the Research.

Article 16: DURATION OF MOU

16.1 The term of this MOU shall be effective as of February 21, 2023 and shall terminate on March 31st, 2024.

16.2 The other Parties may, if they unanimously agree to do so, which agreement shall not be unreasonably withheld, treat any Party as having withdrawn from the Research upon thirty (30) days prior written notice to that Party upon a material breach by that Party of any of its obligations under this MOU; provided, however, that such withdrawal shall become effective only if the breaching Party shall fail to: (i) remedy or cure the breach within such thirty (30) day period, or initiate a remedy or cure within such period if it is not practicable to complete the cure in such period; or (ii) within such thirty (30) day period, provide written notice of the breaching Party's dispute of the alleged breach or failure to cure.

16.3 The provisions in Articles 4, 6, 7, 9, 10, 11, 12, 16, 17 and 19 shall remain in force after the expiration or termination of this MOU or the withdrawal of any Party.

Article 17: COMPLIANCE WITH LAWS AND REGULATIONS

17.1 The Party shall observe all applicable laws, regulations and guidelines of the

countries and institutions in which it conducts the Research.

- 17.2 In the event that the Parties need to transfer the Materials to the other Party to conduct the Research, the transfer of the Materials shall be separately discussed and agreed upon between the providing Party and the receiving Party. In the transfer of the Research Materials, the Parties, the providing Party and the receiving Party, shall be responsible for making the necessary arrangements on their own, including the export and import procedures in their respective countries related to the transfer of the Materials. In providing the Research Materials, the providing Party shall conform to the laws, policies, rules and regulations concerning the Materials in the Party's country (collectively the "Rules"). The providing Party shall be solely responsible for any deviation from the Rules in any aspect including collection and transfer of the Research Materials. The receiving Party shall bear no responsibility for any deviation from or contravention of the Rules. The providing Party shall indemnify and hold harmless the receiving Party and its officers, employees, students from any claims arising in connection with any deviation from or contravention of the Rules. Unless otherwise agreed by the Parties in writing, neither Party shall charge the other Party for any transfer of the Research Materials for the purpose of conducting the Research jointly under this MOU.

Article 18: FOREIGN EXCHANGE AND FOREIGN TRADE ACT

- 18.1 If the Parties export or provide goods or technology provided by the other Party in accordance with this MOU, they shall take necessary procedures, such as acquisition of an export permit, in accordance with Foreign Exchange and Foreign Trade Act and other relevant laws and regulations.
- 18.2 The Parties shall not use any goods or technology provided, supplied or loaned by the other Party in accordance with this MOU for the purpose of designing, manufacturing, using, storing and the like of weapons of mass destruction and the like, and shall not export or provide, either directly or indirectly, such goods or technology when it becomes aware that they will be used for such purpose.

Article 19: MISCELLANEOUS

- 19.1 None of the Parties shall be responsible in damages to the other Party for any failure or delay in performance of any of its obligations hereunder due to any war, earthquake, riot, fire, flood, explosion or other disaster or similar event or any governmental act or regulation or action or embargo, any act of God and any other event beyond such Party's control (the "Force Majeure Event") provided however that such Party shall take all steps reasonably possible to mitigate damages caused by such failure or delay. In the event that a Party (the "Affected Party") shall claim that a Force Majeure Event has occurred thereby resulting in the failure or delay in its performance hereunder, the Affected Party shall give to the other Parties a notice in writing within ten (10) days from the date of occurrence of such Force Majeure Event and shall provide sufficient written evidence thereof, including the nature and effect of the Force Majeure Event on its obligations. Notwithstanding the foregoing, if such

failure or delay shall continue for more than six (6) months, the non-affected Party shall have the right at any time thereafter during the continuance of such failure or delay, to terminate this MOU.

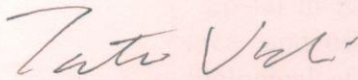
- 19.2 If a court of competent jurisdiction holds that (i) any portion of this MOU is void, voidable, illegal, or otherwise unenforceable; or (ii) this MOU would be void, voidable, illegal, or otherwise unenforceable unless a portion of this MOU were severed from this MOU, then such portion shall be automatically deemed to be severed and removed from this MOU and shall not affect the continued effectiveness of this MOU, unless to do so would irrevocably change the underlying purpose of this MOU.
- 19.3 This MOU constitutes the entire agreement between the Parties and supersedes all prior oral and written agreements and discussions in connection with the subject matter of this MOU and it is expressly declared that no variations of this MOU shall be effective unless agreed by the Parties in writing.
- 19.4 This MOU shall be governed by and construed in accordance with the laws of the home province or state of the Party which is the defendant in any litigation. The Parties further acknowledge that the courts of the home province or state of the Party which is the defendant in the litigation shall have exclusive jurisdiction to entertain any complaint, demand, claim or cause of action whatsoever arising out of this MOU and hereby irrevocably submit to the exclusive jurisdiction of said courts.

Article 20: SEPARATE WRITINGS AND ATTACHMENTS

- 20.1 The Attachment constitutes a part of this MOU and is incorporated into this MOU by reference. Should any inconsistency exist or arise between a provision of this MOU and a provision of any exhibit, schedule, or other incorporated writing, the provision of this MOU will prevail.

IN WITNESS WHEREOF, this MOU may be executed in counterpart by the Parties duly authorized representatives as of the date of each Party's execution below. The Parties agree photocopy, facsimile, electronic or other copies shall have the same effect for all as in ink-signed original.

Niigata University



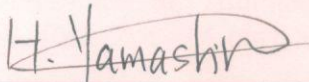
Name: USHIKI Tatsuo

Title: President

Date: FEB. 21. 2023

Witness

Niigata University



Name: YAMASHIRO Hideaki

Title: Associate Professor

Faculty of Agriculture

Cochin University of Science and
Technology



Name: MEERA V.

Title: Registrar

Date:

Dr. MEERA V.
Registrar
Cochin University of
Science and Technology
Kochi - 682 022, Kerala



Cochin University of Science and
Technology



Name: A.A. MOHAMED HATHA

Title: Director

School of Marine Sciences

Attachment

1. Research Title ¹	Investigations of the effect of the world's highest level of natural radioactivity on reproductive activity and exposure assessment in India			
2. Description of the Research	<p>[Full Description] Since the Fukushima Daiichi Nuclear Power Plant accident, we have established an archive system of wild and domestic animals from surrounding ex-evacuation zone. This system provides critical information for understanding the environmental pollution, dose evaluation, biological effect etc. Coastal in Kerala contains the world's highest level of natural radioactivity area, and offering an opportunity to characterize radiation-associated with biological effects including the reproductive activity for wild and domestic animals. The objectives of this collaboration study is to investigate the effect of chronic radiation exposure associated with natural radioactivity in Kerala of wild and domestic animals. This is a comparative study between Fukushima and Kerala for future human being.</p> <p>[NU's Role] Animal reproduction (Hideaki Yamashiro), Environmental Radiology (Jun Goto), and Geological study (Satish-Kumar Madhusoodhan)</p> <p>[CUSAT's Role] Local coordination for sampling and research collaboration</p> <p>[The Research Collaborators' Role] [Hirosaki University] Radiation Biological study (Tomisato Miura)</p> <p>[Japan Atomic Energy Agency] Environmental Radiological study (KazumaKoarai)</p> <p>[Hokkaido University of Science] Molecular Biological study (Akifumi Nakata)</p> <p>[Tohoku University] Environmental Dental study (Hisashi Shinoda and Yoshinaka Shimizu)</p>			
3. Research Period	From February 21, 2023 To: March 31, 2024			
4. Principal Researcher (" * " indicates Principal Researcher)	Affiliation	Name	Department	Title
	NU	*Associate Prof.Hideaki Yamashiro	Faculty of Agriculture	Ph.D

	CUSAT	* Prof. A.A. Mohamed Hatha	Department of Marine Biology, Microbiology and Biochemistry, School of Marine Sciences	Ph.D.
5. Research Collaborator	Affiliation	Name	Department	Title
	NU	Prof. Satish-Kumar Madhusoodhan	Faculty of Science	Ph.D
		Assistant Prof. Jun Goto	Institute for Research Promotion Center for Coordination of Research Facilities	Ph.D
	CUSAT	Dr. Swapna P. Antony	Department of Marine Biology, Microbiology and Biochemistry	Ph.D
	Hirosaki University	Prof. Tomisato Miura	Institute of Radiation Emergency Medicine,	Ph.D
	Japan Atomic Energy Agency	Researcher Kazuma Koarai	Collaborative Laboratories for Advanced Decommissioning Science	Ph.D
	Hokkaido University of Science	Associate Prof. Akifumi Nakata	Faculty of Pharmacy	Ph.D
Tohoku University	Prof. Hisashi Shinoda	Faculty of Dentistry	Ph.D	
	Assistant Prof. Yoshinaka Shimizu		Ph.D	
6. Research Materials	Sample		Animal Species	
	Tissue (Muscle, Liver, Spleen, Kidney, Thyroid, Testis, Ovary)		Mouse, Rat, Bovine, Goat, Sheep	
	Blood		Mouse, Rat, Bovine, Goat, Sheep	
	Mandibular and maxillary bones		Mouse, Rat, Bovine, Goat, Sheep	