

**RECRUITING AND TRAINING PHYSICIANS-SCIENTISTS TO EMPOWER TRANSLATIONAL RESEARCH**  
**A MULTILEVEL TRANSDISCIPLINARY APPROACH FOCUSED ON METHODOLOGY, ETHICS AND INTEGRITY IN**



**BIOMEDICAL RESEARCH - 2018-2023**

## **RESEARCH TRAINING PROGRAM I. General Information**

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### **Title of the research project:**

An Italian "body farm" experience: transdisciplinary methods to study the decomposition of 45 human heads buried in three different types of soil

### **Name and address of the department:**

1. Department of Medicine and Surgery, University of Insubria, Varese, Italy
2. Department of Biotechnology and Life Science, University of Insubria, Varese, Italy
3. DISTAV Department, University of Genoa, ITALY; IAS-CNR Genoa, ITALY

### **Student's supervisor:**

Mario Picozzi

## **II. Description of the project**

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### **Background**

*Estimating the post-mortem interval (PMI) of human skeletal remains is a crucial issue in forensic sciences, especially for intermediate and later stages of decomposition, as existing methods lack accuracy and applicability. The complexity of PMI estimation arise from various variables related to physical, biological and chemical changes.*

### **What is the aim of the project?**

*The project aims to develop new methodologies for estimating the PMI of the intermediate stages of decomposition of buried human remains through a transdisciplinary approach, considering different types of soil deposition.*

### **What techniques and methods are used?**

*An open-air lab has been established to understand the pattern of human decomposition, inspired by the experience of the American "body farms". In this study, 45 heads from human bodies donated to science were buried, in a 200 m<sup>2</sup> area within the cemetery of Varese. For the burial, we used agricultural, sandy and clayey soil to test the different interactions based on the soil matrix. We expect to exhume the remains after 4, 8, 12, 16, 20 months to acquire data on the progress of the experiment in several steps.*

*A transdisciplinary investigation model based on anthropological, entomological, radiological (micro-CT), microscopic (OM and ESEM), proteome and microbiome analyses will be employed to investigate the trend of cadaveric decomposition over 20 months. **When did the department start working on this project?** May 2023.*

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Type of research project:

Basic science  Clinical research without lab work

Clinical research with lab work

### III. Student's involvement

- 
- |  |   |
|--|---|
| The student will mainly observe  | <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |
| The student will observe the experiments but will be involved in data analysis | <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO |
| The student will take active part in experiments ("lab work")                  | <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO |
| The student will take active part in clinical examination (clinical research)  | <input type="checkbox"/> YES <input type="checkbox"/> NO            |
| The student will be allowed to work with patients                              | <input type="checkbox"/> YES <input type="checkbox"/> NO            |

*What are the tasks expected to be accomplished by the student?*

The student will acquire taphonomic, entomological, microbiological and proteomic knowledge. S/he will learn OM and ESEM sample preparation techniques. The student will also help in investigating the ultrastructure of bone tissue, both of the organic and inorganic matrix, and will collaborate in collecting and recording data obtained during the study.

*What is expected from/what will be the general outcome of the student?*

To prepare a poster / presentation / scientific report / abstract

The student's name will be mentioned in a future publication

Opportunity to present together with the supervisor the results on a conference

No specific outcome is expected

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#### IV. Requirements

*What skills are required from the student?*

Ability to work in team, collaboration and communication skills, knowledge of Scientific English

*Is there any special knowledge or a certain level of studies needed?*

Subjects passed:

\_\_\_\_\_

Previous experience with:

\_\_\_\_\_

Certificate of:

\_\_\_\_\_

None

*Are there any legal limitations in the student's involvement in the project?*  YES  NO If yes, what are the limitations?

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#### V. Schedule

*Duration of the project:*

1 month  2 months  3 months  4 months

*There are approximately 2 hours of work per day.*

*Available months:*

January     February     March     April     May     June  
 July     August     September  October     November  December

*How many students can you accept to the project at the same time?* 3

*Special remarks:*

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(e.g., students should bring a stethoscope and a white coat, any vaccinations required, etc.)

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**NOTE: a scientific report is required at the end of the program**