

Phenomeno

Project name:	Physical breast anthropomorphic models and technology for their production
Funded by	European Commission
Call	H2020-MSCA-RISE-2020
Project number & acronym	№ 101008020 PHENOMENO
Coordinator	Assoc. Prof. Eng. Kristina Bliznakova, PhD
Duration	2021-2025

Project description

Breast cancer is the most common form of cancer among women under the age of seventy. Early diagnosis is recognized as a critical factor that improves the chance of survival. This study examines the need for anthropomorphic physical three-dimensional breast models when a real tissue background is required to investigate lesion detection, the effectiveness of image processing algorithms, reconstruction algorithms, the entire imaging system, and to replace the real breast in virtual clinical trials. The physical production of such models is not yet widely accepted, due to the costs and challenges of existing 3D technologies, the limited number of suitable printed materials and the limited availability of anthropomorphic computer models.

Objectives

The main goal of this project is to form an international and intersectoral network of organizations working on a joint research program in the field of anthropomorphic models used to generate X-ray images of the mammary gland and 3D printing technologies. Participants will exchange knowledge and gain skills that will allow them to advance to key advances in the development of new computer and physical anthropomorphic models of the mammary gland through a new methodology for segmenting medical images of patients and applying new 3D printing technology and will strengthen joint research between research groups from Bulgaria, Greece and Italy from the academic and private sectors.

As a result of the proposed cooperation, the project will provide: ● new materials for 3D printing, designed to optimize X-ray images and methodology for their production; ● methodology and

prototype of a new technology for 3D printing, dedicated to working with new materials; ● demonstrator of methodology and software for creating computer and physical models of the breast, based on patient MRI data; ● a database with models of the mammary gland, open to the scientific community; ● software application for modeling the compression of the mammary gland, open to the scientific community (not freely available); ● a new physical anthropomorphic model of the mammary gland.

Work Packages (WP)

WP 1. Management and coordination

WP 2. Computer methods for creating anthropomorphic phantoms of the mammary gland and its structures

WP 3. 3D printing Technologies

WP 4. Validation and effective use of computer and physical models for X-ray examinations

WP 5. Dissemination, exploitation and training.

Project Consortium

1. Medical University “Prof. Dr. Paraskev Stoyanov” – Varna
2. University of Naples – Federico II, Italy
3. MORPHE, Greece
4. MICROSYSTEMS Ltd, Bulgaria
5. BioEmission Technology Solutions, Greece

Additional information can be found on the official website of the project:

www.phenomeno.eu

Acknowledgement:

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 101008020.

