AIOREUS (Project Code: ΕΚΠΑΡ01-0034469)

The Assisted Reproduction Unit EUGONIA, internationally recognized for its scientific excellence, continues to expand the boundaries in the field of assisted reproduction. Guided by its longstanding commitment to research, EUGONIA constantly seeks innovative solutions to provide pioneering care to couples facing fertility issues and to advance and co-shape international scientific knowledge.

EUGONIA is now introducing artificial intelligence (AI) and three-dimensional (3D) ultrasound imaging to optimize follicular development monitoring during the in vitro fertilization (IVF) process. The groundbreaking research project titled "Augmenting IVF Success Rates through AI-Optimized 3D Ultrasound – AIOREUS" is being implemented by EUGONIA LTD in collaboration with Ubitech, a software and information systems development company.

The Project

AIOREUS is an innovative research program that will introduce a pioneering methodology for optimizing the efficiency of 3D ultrasound measurement systems, utilizing advanced machine learning and artificial intelligence (AI) techniques in the IVF process. The approach will be based on three-dimensional follicle imaging and will be supported by sophisticated AI tools. The project will leverage the valuable expertise and experience gained through the previous research program 3DFollicle AI. Furthermore, an ultimate goal is to establish new, more objective volumetric criteria expected to replace traditional dimensional ones, optimizing measurements of follicle

number and size during controlled ovarian stimulation, and particularly the selection of the optimal day for triggering final oocyte maturation.

Objectives

1. Improvement of monitoring accuracy and prediction of the triggering day.

2. Establishment of new, objective triggering criteria and their evaluation based on clinical and embryological outcomes.

3. Optimization of AI algorithms for more accurate determination of follicle dimensions, number, and volume.

4. Integration of AI algorithms into existing ultrasound systems for the development of an innovative product.

5. Dissemination of project results and presentation of the product to IVF clinics in Greece and the EU.

6. Improvement of pregnancy rates through support of clinical decision-making.

7. Design and development of an innovative AI product to support clinical decisions in IVF.

Outcomes

Upon completion of the AIOREUS project, the following outcomes are expected:

At the scientific level, new objective dimensional criteria will be developed for determining the optimal triggering day, which will be validated through a prospective randomized clinical trial. Concurrently, AI algorithms will be optimized for more accurate calculation of follicle dimensions, number, and volume.

At the clinical level, improvement in pregnancy rates and enhancement of clinical decision-making are expected, particularly for physicians with limited experience in ovarian stimulation.

At the technological and commercial level, an innovative product will be created—an AI-based recommendation engine—that will be seamlessly integrated into existing ultrasound units. The product will be provided for pilot use to IVF clinics in Greece, with the aim of commercial maturation and distribution to clinics across the EU.