PNRR Project “Development of the Italian Preimplantation Genetic Test (PGT) Network”

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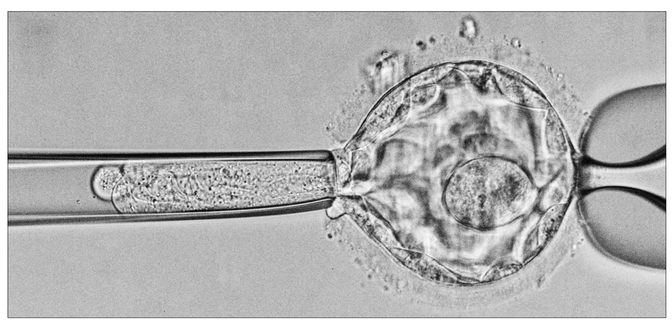
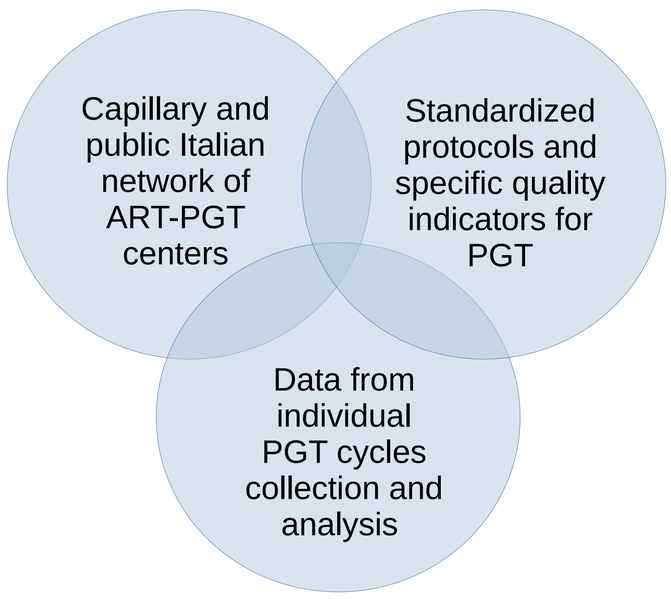
INTRODUCTION

Preimplantation Genetic Test (PGT) is the earliest form of prenatal diagnosis that enables the analysis of embryo DNA before its transfer into the uterus. It is used in combination with a cycle of Assisted Reproductive Technology (ART) and is performed at the embryonic stage of blastocyst (5th-6th day of in vitro development). The technique allows the couple to choose which is the preferable embryo to be transferred into the uterus, avoiding invasive prenatal diagnosis and termination of pregnancies. PGT is able to help many couples who are facing rare genetic diseases to have a healthy pregnancy, by minimizing the chance of miscarriage and allowing to give birth to a healthy baby.

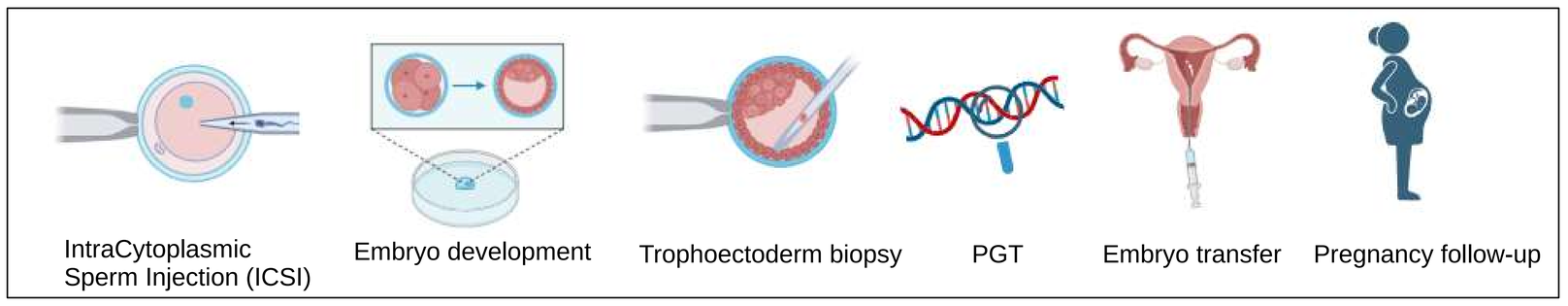
In Italy, the potential of this technology is not sufficiently known and disseminated among the population, due to the lack of information and the rarity of public centers that perform medically assisted procreation combined with PGT: only 9 public ART Centers out of 71 offer PGT, limiting access to these techniques primarily in the Center-North of the country.



Embryo biopsy at blastocyst stage.
National Geographic image collection/Alamy stock photo.



PNRR Project main objectives.



PGT workflow. First gametes are collected from the couple, then IVF is performed, usually by IntraCytoplasmic Sperm Injection (ICSI). The embryos that develop are biopsied after 5-6 days to be analyzed with PGT. The diagnosis allows to choose the embryo to be transferred.

OBJECTIVES

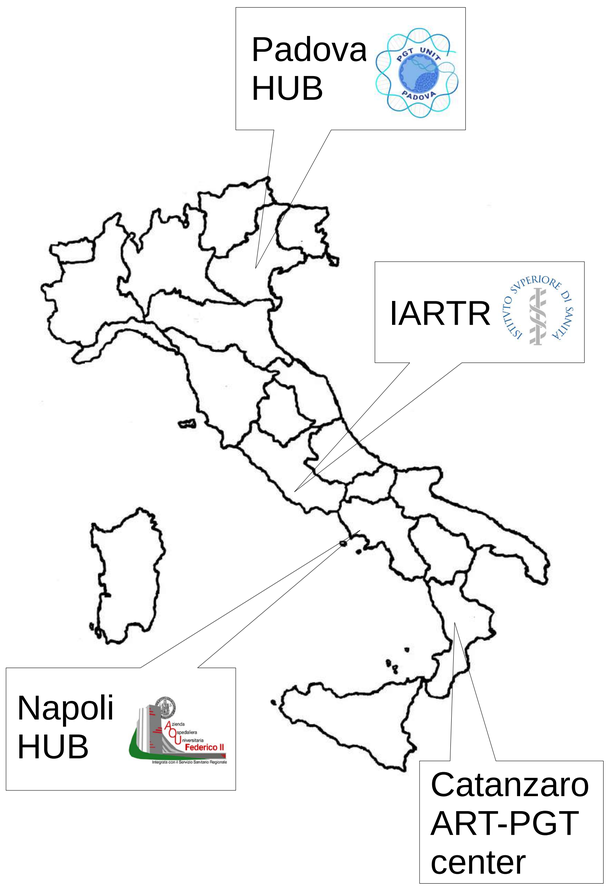
The PNRR Project aims to improve the access and effectiveness of PGT in Italy, enabling a fairer distribution and a more accurate assessment of prenatal diagnosis techniques. In particular, the aims of the project are: to develop a capillary and public Italian network of ART Centers that perform PGT by centralizing molecular laboratories; to implement standardized protocols for PGT in order to enable qualitative evaluations of procedures; to collect and analyze data based on individual PGT cycles, making the information transparent and accessible to the public, enabling couples to make more informed decisions regarding family planning.

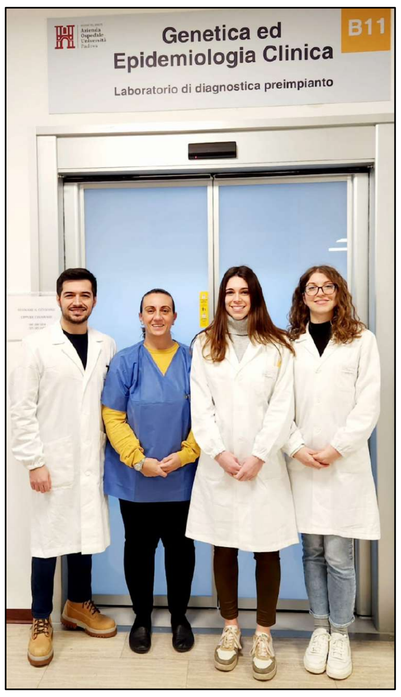
RESULTS

The Project has started in May 2023 and involves the contribution of 4 Operational Units, each with specific activities:

- Azienda Ospedaliera Universitaria Federico II di Napoli, which will cover the estimated need for PGT in Central and Southern Italy.
- Azienda Ospedale Università di Padova, which will cover the estimated need for PGT in Central and Northern Italy.
- Italian ART Registry (IARTR), which is the permanent observatory of PGT in Italy and will collect and analyze data from ART Centers in order to carry out epidemiologic evaluations on efficacy and safety of the procedures and qualitative assessments for each single ART Center.
- Azienda Ospedaliera Università R. Dulbecco di Catanzaro, which will be the first PGT Public Center in region Calabria.

The Project has so far allowed the completion of the PGT Unit at the Hospital of Padova, the training of the embryology and laboratory staff of the Operational Units, and the organization of embryo biopsy courses for embryologists from ART Centers who wish to implement PGT. Furthermore, data collection from 25 Italian ART Centers performing PGT started in January 2024. Finally, two training events on PGT (a course consisting of 4 webinars and the National Congress) have been organized with the aim of providing continuous training on preimplantation genetic diagnosis and allowing specialists to be always updated and help patients in the best possible way.





Padova PGT Unit.

CONCLUSIONS

Thanks to this Project, families with rare genetic diseases will have easier access to genetic counseling and diagnostic techniques in PGT, improving the chances to have a healthy baby. In fact, the aim of the project is to have at least one PGT Center per region to facilitate travel and support for families and to improve access to this technique.

In addition, the Project promotes educational events on PGT and aims to disseminate information on its applications through the website www.embryo-gen.it, which can be accessed at any time by professionals and patients.

The PNRR Project

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