

# NRRP Project "Development of the Italian Preimplantation Genetic Test (PGT) Network"

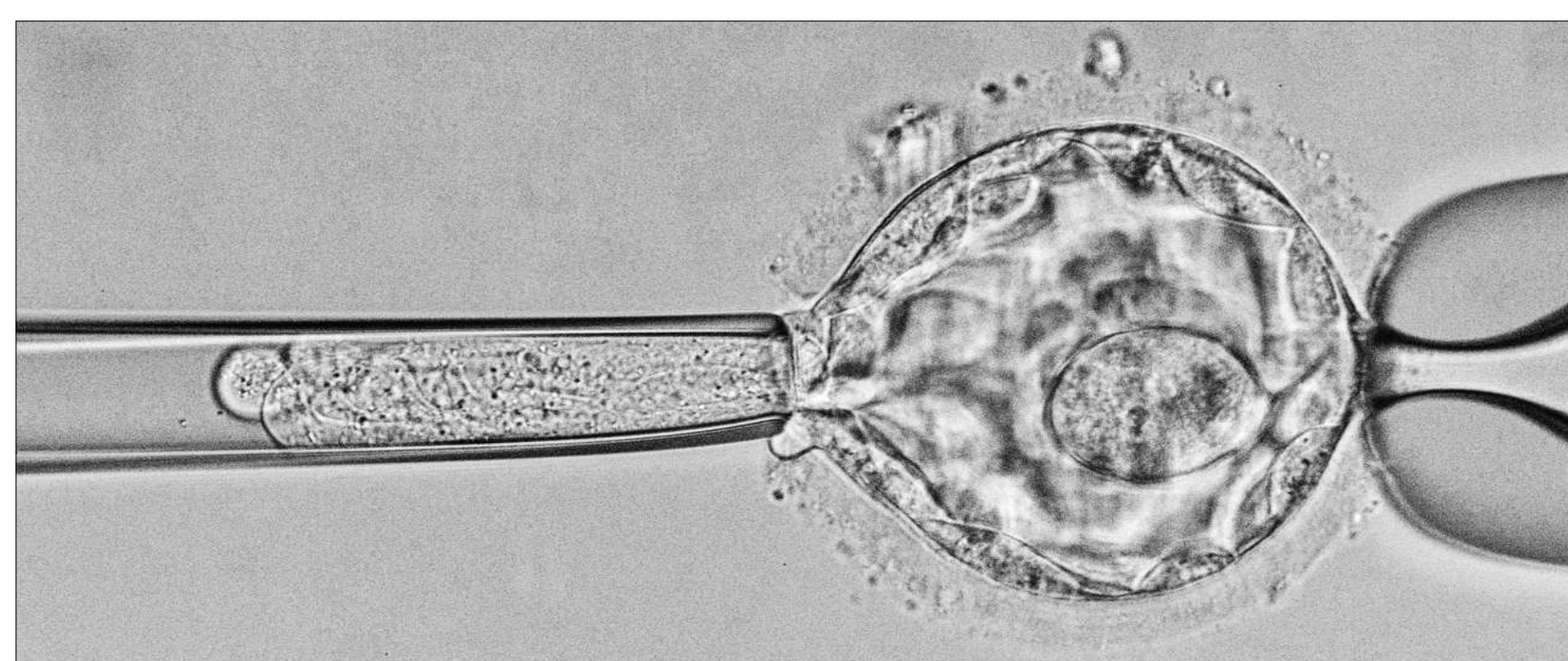
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## INTRODUCTION

Preimplantation Genetic Test (PGT) is the earliest form of prenatal diagnosis that allows 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 pregnancy termination, thus increasing the reproductive chances of many couples carrying genetic alterations.

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 out of 71 public ART Centers offer PGT, limiting access to these techniques mainly in the Center-North of the country.



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

## OBJECTIVES

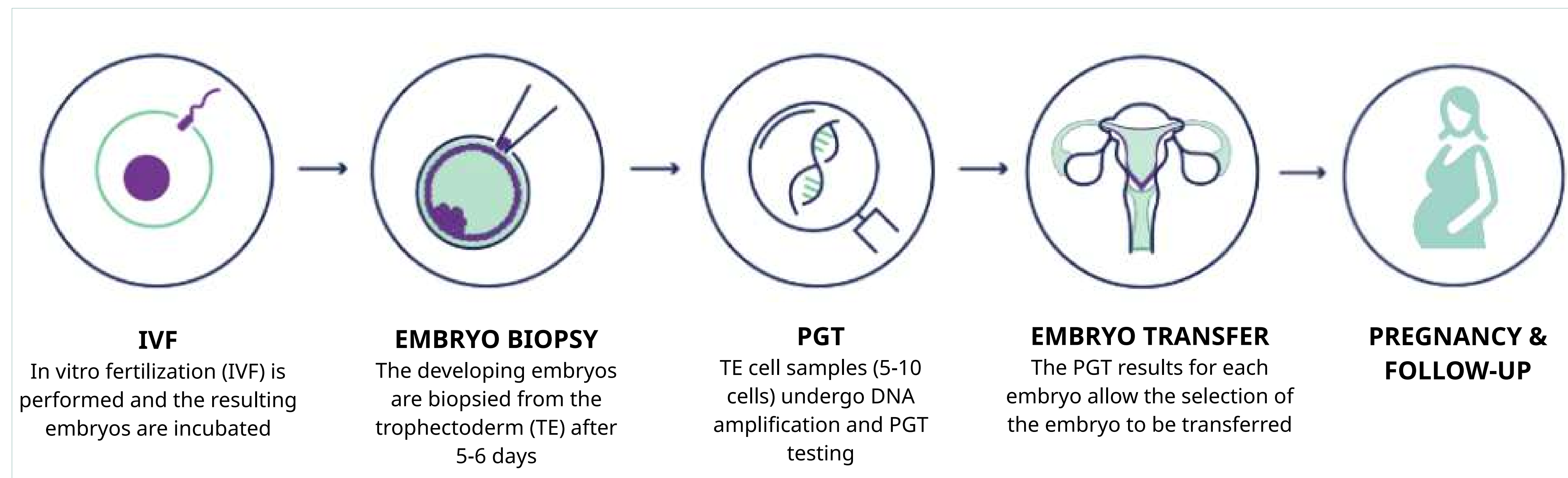
The NRRP project aims to improve the access and effectiveness of PGT in Italy, enabling a fairer distribution and a more accurate assessment of prenatal diagnosis techniques. In particular, the project aims to develop a capillary and public Italian network of ART centers that perform PGT by centralizing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

Creation of standardized protocols and specific quality indicators for PGT

Collection and analysis of data from individual PGT cycles

Establishing a capillary network of public Italian ART-PGT centers

## PGT WORKFLOW



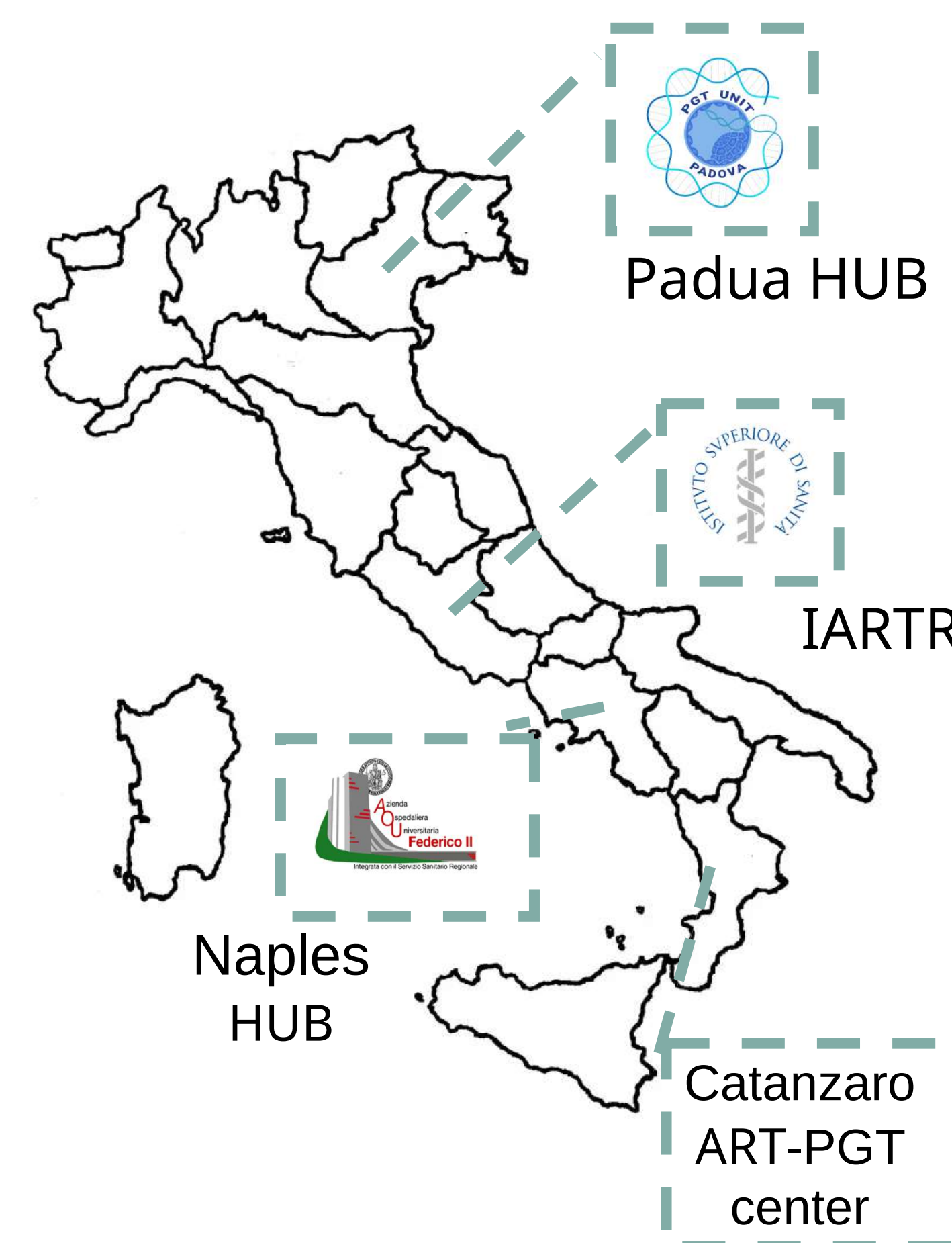
PGT workflow: gametes are collected from the couple, then IVF is performed usually by IntraCytoplasmic Sperm Injection (ICSI). The embryo is subjected to a trophoctoderm (TE) biopsy on day 5 or 6 to be analyzed by PGT. PGT results for each embryo will guide the selection process of the embryo to be transferred, in order to achieve the higher chance of a successful pregnancy.

## RESULTS

The project has started in May 2023 and involves the contribution of 4 operational units, each with specific activities:

- **Federico II University Hospital of Naples** will cover the estimated need for PGT in Central and Southern Italy;
- **University Hospital of Padua** 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, 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;
- **R. Dulbecco University Hospital of Catanzaro** 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 free embryo biopsy courses for embryologists from ART centers all over Italy wishing to implement PGT. Furthermore, data collection from 28 Italian ART centers performing PGT started in January 2024. In addition, a course consisting of 4 free webinars on PGT has been organized and 2/4 courses have already been completed. On the 21st of June 2024, the National Congress of the Italian PGT Network will be held, allowing specialists to be updated with the latest knowledge in the field ensuring appropriate and standardized care for patients.



## CONCLUSIONS

Thanks to this project, families with rare genetic diseases will have easier access to genetic counselling and diagnostic techniques in PGT, improving their chances of having a healthy baby. In fact, the project's aims to guarantee at least one PGT center per region, facilitating travel and improving access to this reproductive option. In addition, the project promotes educational events on PGT and aims to disseminate information on its applications through the website [www.embryo-gen.it](http://www.embryo-gen.it), which can be accessed at any time by professionals and patients.

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All authors declare no conflicts of interest.

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