

Molecular Biologist

Dr. Francesco Fiorentino, PhD, is a molecular biologist, graduated from Messina University in Italy, and obtained his PhD at the above University.

Francesco has worked in the field of molecular genetics for 30+ years and has been involved in both laboratory and clinical management for 25+ years.

Dr. Fiorentino is actively involved in the field of reproductive genetics since over two decades, specifically in the diagnosis of genetic disorders and chromosomal abnormalities in embryos (Preimplantation Genetic Testing - PGT) and research on human oocytes and preimplantation embryos. He has a strong translational emphasis and is actively involved in the development of new techniques for improving the success rates of in vitro fertilization (IVF) treatment.

He has been involved in a number of exciting breakthroughs in the field of reproductive genetics, including (among the other):

- The innovation of using Minisequencing technique for mutation detection on single cells, a procedure that is now widely used by most of the PGD centers (Fiorentino et al. 2013);
- The use of STR-based haplotyping of the Human Leukocyte Antigen (HLA) region for Preimplantation HLA matching purpose, an important tool for couples at risk of transmitting a genetic disease to select unaffected embryos of a HLA tissue type compatible with those of an existing affected child (Fiorentino et al. 2004, 2005);
- The evolution of PGT for chromosomal translocations (PGT-SR) through PCR-based detection of chromosomal imbalances on embryos (Fiorentino et al., 2010);
- Clinical trials on array-comparative genomic hybridization (array-CGH), a comprehensive chromosome screening method aimed at revealing which of the embryos produced during an in vitro fertilisation (IVF) treatment cycle has the greatest potential for producing a child (Fiorentino et al., 2011). This approach has been widely practiced worldwide.
- the pre-clinical validation and following clinical application of Next Generation Sequencing (NGS) technology in Preimplantation Genetic Testing for Aneuploidy (PGT-A) and PGT for structural chromosomal aberrations (PGT-SR), for reliably screening the entire chromosome complement in embryos (Fiorentino et al., 2014a; 2014b; Bono et al., 2015).
- The role of chromosomal mosaicism in the clinical outcome of IVF treatments (Greco et al., 2015, and subsequent related papers).

Dr. Fiorentino is also a recognized expert in prenatal genetics, contributing in the development of several techniques that have become standard in this field, including:

- The introduction of array-CGH into routine prenatal diagnosis practice as first line test (Fiorentino et al., 2011; 2013);
- The implementation of cell-free fetal DNA (cfDNA)-based non invasive prenatal testing (NIPT) and the importance of determining the limit of detection of NIPT methods (Fiorentino et al., 2016);
- The introduction genome-wide cfDNA screening into routine NIPT practice (Fiorentino et al., 2017)

Francesco's work has frequently been noted for its innovation and has led to the publication of over 60 scientific papers and book chapters in reproductive and prenatal genetics. He is regularly invited as chair or speaker at national and international conferences.

Dr. Fiorentino is member of several scientific societies, such as the European Society of Human Reproduction and Embryology (ESHRE). He is currently Past Coordinator at the ESHRE SIG Reproductive genetics. In addition, Dr. Fiorentino has served as member on a number of international committees including the ESHRE PGT Consortium Steering Committee as well as the Steering Committee for External Quality Assessment through UK NEQAS. He was also involved in the publication of the ESHRE PGT consortium best practice guidelines for amplification-based PGD (Harton et al., 2011), PGT for cystic fibrosis (Girardet et al., 2015), ESHRE Working Group on Chromosomal Mosaicism good practice recommendations on managing chromosomal mosaicism (2022) and in the organization of EQA through UK NEQAS (Deans et al., 2013).

Finally, Dr. Fiorentino is reviewer for several international Journal, such as (among the others) Human Reproduction, Molecular Human Reproduction, Prenatal Diagnosis, Journal of Assisted Reproduction and Genetics, Fertility and Sterility, Reproductive Bio-Medicine Online.