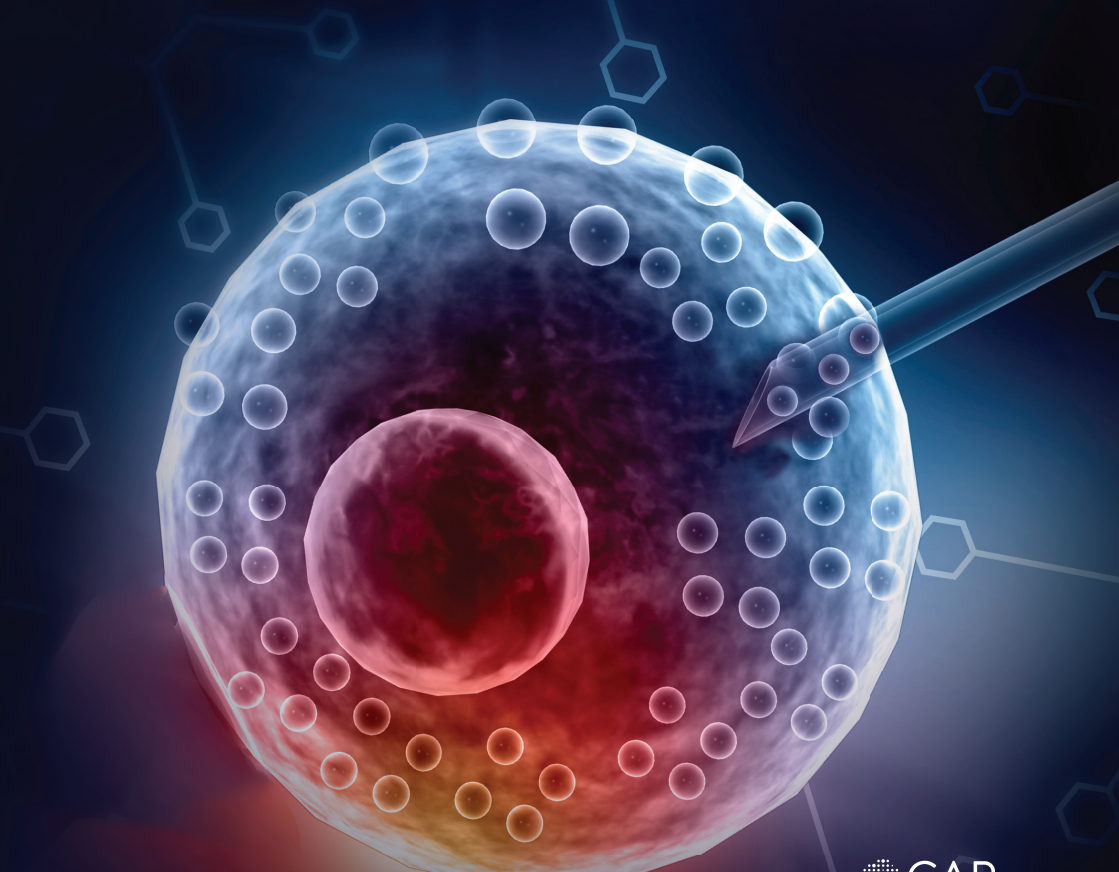
MEDGENOME | Claria
Reproductive Genetics

Preimplantation Genetic Testing- Aneuploidies (PGT-A)

Preimplantation Genetic Testing- Monogenic Disorders(PGT-M)

Preimplantation Genetic Testing- Structural Rearrangements (PGT-SR)



Maximise the success of your IVF procedures.
And help transform your patients' life.

CAP ACCREDITED
COLLEGE of AMERICAN PATHOLOGISTS

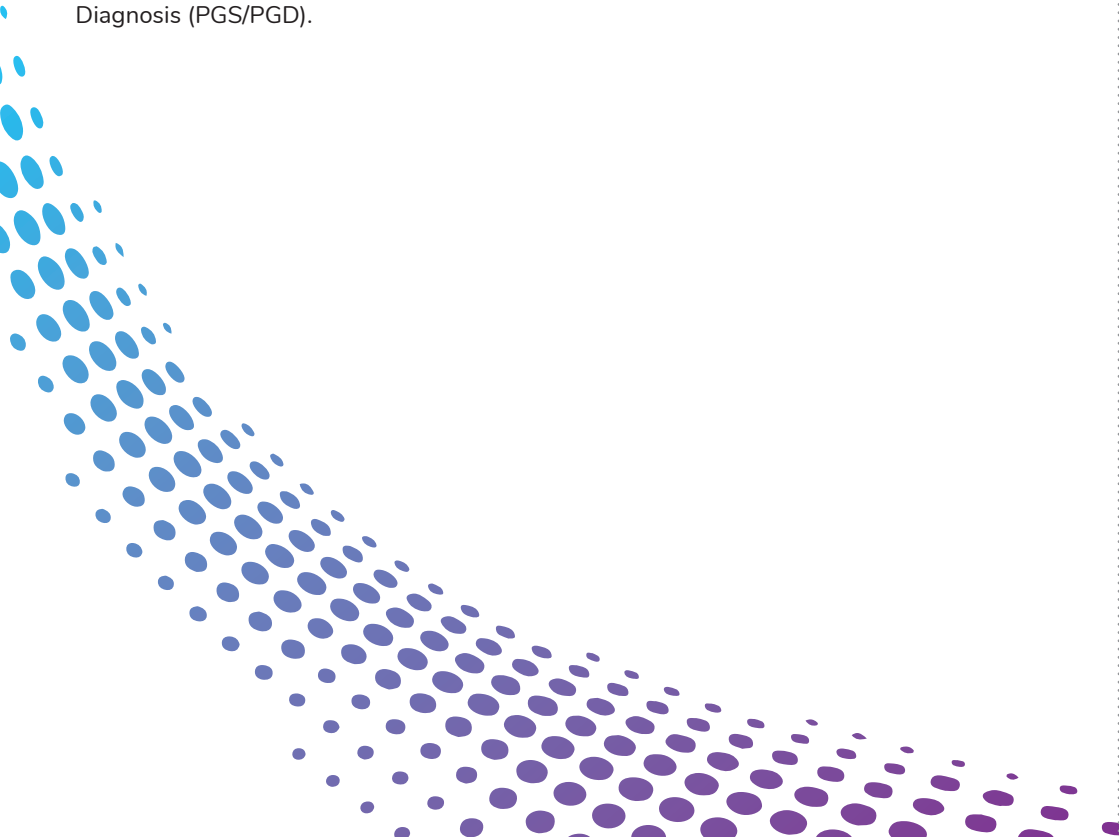
Claria
From MedGenome

MedGenome is driven to empower clinicians to deliver the best outcomes to their patients. Our passion to deliver actionable insights to clinicians has resulted in the development of “Claria” - a suite of NGS (Next-Generation Sequencing) technology-based solutions for reproductive testing.

Claria offers the most accurate Non-Invasive Prenatal Screening Test (NIPT), the Genetic Carrier Screening Test and the Preimplantation Genetic Screening/ Diagnosis (PGS/PGD).

We understand your time is valuable, and that’s why Claria has a team of in-house genetic counsellors to help you interpret and explain reports.

Additionally, Claria offers an absolutely free, on-demand pre and post-test genetic counselling to all your patients.



Why is screening an embryo before implantation critical?

1. One-in-two human preimplantation embryos from IVF (in vitro fertilized) are chromosomally abnormal[#]
2. Even up to 40% of morphologically normal embryos harbour aneuploidies[*]
3. 2-3 times increased rate with PGT-A as opposed to no PGT-A pregnancies[$]
4. Reduces number of IVF cycles the patient has to undergo
5. Improves the overall success rate of the IVF Center

What is Preimplantation Genetic Testing-Aneuploidies (PGT-A)?

Preimplantation Genetic Testing- Aneuploidies (PGT-A) is a test that examines the chromosomal material of an IVF embryo before implanation. It involves removing one or more cells from an IVF embryo to test for chromosome number and check for any numerical chromosomal abnormalities (Aneuploidy). This screening method facilitates the selective implantation of embryos that have the normal number of chromosomes (Euploid Embryos).

Why PGT-A?

1. Leads to greater implantation rates and improved IVF outcomes
2. Reduces the number of IVF cycles required to achieve a successful pregnancy
3. Increases success rate for single embryo transfer
4. Reduces the likelihood of miscarriage due to Aneuploidies
5. Increases reproductive success rates in women above 35 years

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[#]McCoy RC. Mosaicism in Preimplantation Human Embryos: When chromosomal abnormalities are the norm. Trends Genet. 33(7): 448–463 (2017).

[*]Harton GL, Munne S, Surrey M, et al. Diminished effect of maternal age on implantation after preimplantation genetic diagnosis with array comparative genomic hybridization. Fertil Steril. 2013;100(6):1695–1703.

[$]Lee HL, McCulloh DH, Hodes-Wertz B, Adler A, McCaffrey C, Grifo JA. In vitro fertilization with preimplantation genetic screening improves implantation and live birth in women age 40 through 43. J Assist Reprod Genet. 2015 Mar;32(3):435-44.

[$]Sato T, Sugiura-Ogasawara M, Ozawa F, Yamamoto T, Kato T, Kurahashi H, Kuroda T, Aoyama N, Kato K, Kobayashi R, Fukuda A, Utsunomiya T, Kuwahara A, Saito H, Takeshita T, Irahara M. Preimplantation genetic testing for aneuploidy: a comparison of live birth rates in patients with recurrent pregnancy loss due to embryonic aneuploidy or recurrent implantation failure. Hum Reprod. 2019 Dec 1;34(12):2340-2348.

Who should be offered PGT-A?

- Couples undergoing IVF
- Patients at any age that have repeated implantation failure or recurrent pregnancy loss while undergoing IVF
- Women over 35 years old undergoing IVF
- Positive history of chromosomal abnormalities in the family
- Diagnosed carriers of chromosomal aberrations such as translocations
- Male Factor Infertility
- Couples opting for PGT-M

When should a biopsy be done?

A biopsy can be done on Day 3 (Blastomere) or Day 5 (Trophectoderm).

A biopsy can be done on Day 3 (Blastomere) However, on Day 5, a frozen embryo transfer is possible, which is why Day 5 biopsy is recommended.

Why is Day 5 biopsy preferred over Day 3 for PGT-A?*

- At this stage, there are sufficiant number of cells from which DNA can be isolated thus ensuring success of the test
- Mosaicism of aneuploidies can be detected at this stage
- Vitrification (rapid-freezing) of embryos after biopsy also allows ample time for testing and allows the clinician to determine the optimum conditions for implantation

* Wang AY, Sullivan EA, Li Z, FarquharC. Day 5 versus day 3 embryo biopsy for preimplantation genetic testing for monogenic/single gene defects. Cochrane Gynaecology and Fertility Group. 2018

Day 3 (Blastomere)	Day 5 (Blastocyst Biopsy)
Single cell = Less DNA	More cells (8-10 cells) = More DNA
Poorer representation of embryo (1 cell only)	Better representation of embryo (few cells)
Higher Test Failure Rate, as only one/ two cell(s) is available for analysis	Lower Test Failure Rate, as more number of cells are available for analysis
Cannot detect Mosaicism	Can detect Mosaicism

Why Claria PGT-A is better?

Sequencing based PGT-A lead to higher resolution and detects segmental deletions and duplications

CAP accredited and AAB proficiency testing passed

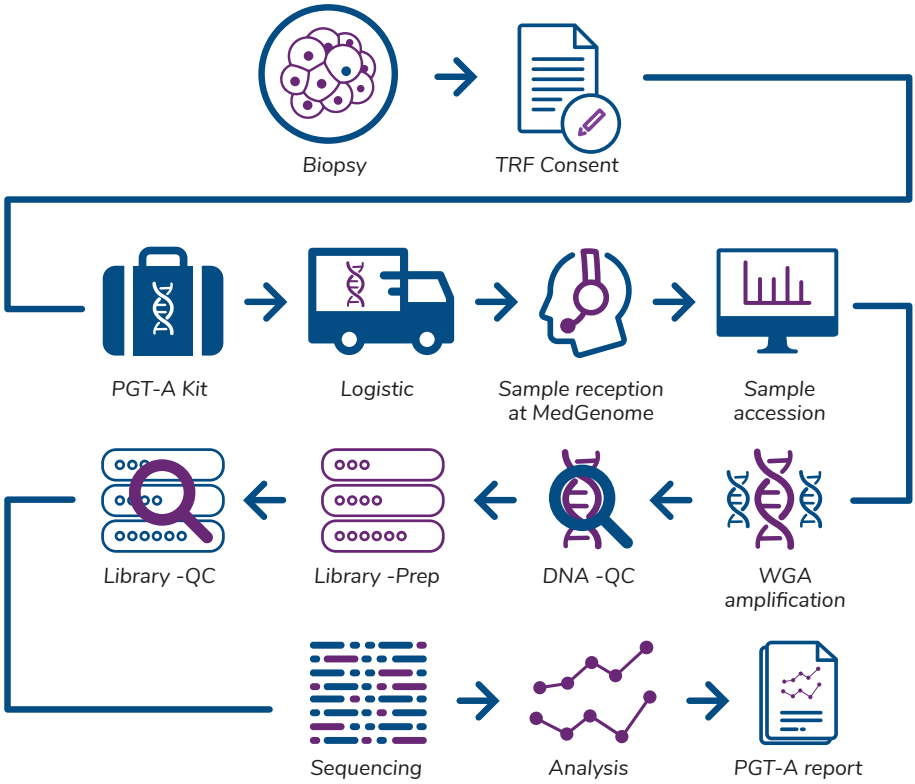
We provide end-to-end support: From helping to decide which test to perform the result data interpretation to phenotype correlation and genetic counselling

Robust sequencing technology that provides sensitive and replicable results.

What can Claria PGT-A detect?

- Down Syndrome
- Edwards Syndrome
- Patau Syndrome
- Turner Syndrome
- Klinefelter Syndrome
- Other trisomies and monosomies which could increase the risk of implantation failure and miscarriage
- Segmental Gain and Losses in chromosomes which can lead to abnormalities in the embryo

Claria PGT worklow



Advantages of PGT-A by NGS vs. other screening approaches

Fluorescent In Situ Hybridisation (FISH)	*Array Comparative Genomic Hybridisation (aCGH)*	*Single Nucleotide Polymorphism (SNP) Microarray*	NGS
A largely manual process, highly skill/ operator dependant	Requires control DNA for each sample to provide a comparison. A prolonged hybridisation step	SNP array analysis of DNA, extracted from a cell population, cannot indicate the mosaicism within the sample.	NGS detects partial chromosomal gains and losses more accurately NGS detects Aneuploidy and segmental imbalances at the same time.
Screening all 24 chromosomes at once is not possible. Mosaicism detection is not possible	Levels of mosaicism not detected.	Low level of mosaicism not detected	NGS provides more accurate detection of mosaicism of the Trophectoderm cells from blastocyst biopsy.
Highly expensive	Relatively expensive.	Relatively expensive.	NGS offers reduced costs and enhanced precision. It allows parallel analysis for multiple embryos for a single patient.

Technology

Claria PGT-A is carried out using advanced Next-Generation Sequencing (NGS) technology

What are the advantages of NGS based techniques?

- Rapid and convenient
- Screening of all 23 pairs of chromosomes for abnormalities in one test
- Able to detect greater than 20Mb gains and losses in chromosomes
- Higher resolution
- High sensitivity in detecting Aneuploidy (100 % sensitivity)
- High specificity and accuracy (99.98% specificity)
- Lower chances of test failure with NGS

Externally validated results

MedGenome's PGT-A test has shown 100% accuracy in Aneuploidy detection, when external validation was done using proficiency testing (PT) samples by the American Association of Bioanalysts.

MedGenome's PGT-M has shown 100% accuracy in mutation detection when externally validation was done using proficiency testing (PT) samples by QualiGene Ltd.

Case study

36 years old woman realizes dream of motherhood through PGS (Now PGT-A) technology

Patient information

Mrs Swamy (36), (name changed) a house wife and her husband have been wanting a baby since they got married in 2006. Unfortunately, each time she got pregnant, it wouldn't last more than 6-7 weeks. They tried to conceive through Intra Uterine Insemination (IUI) process 7 times and once through In Vitro Fertilisation (IVF) in UK and India respectively.

Previous genetic testing

On investigation it was found that the miscarriages occurred due to aneuploidies in the foetus. While there was no family history of chromosomal abnormalities, advanced maternal age was considered as one of the contributing factors.

Doctor Recommendation

She was recommended Intra Cytoplasmic Sperm Injection (ICSI) along with Pre-implantation Genetic Testing- Aneuploidy (PGT-A) for the Embryos that developed.

Genetic testing at MedGenome

In the next IVF cycle 11 embryos were screened using PGT-A at MedGenome Labs. The report provided by the company recommended the best embryos for transfer.

Implications of the test

After a 12 year long struggle the couples dream of becoming parents became a reality as they were blessed with a baby.

Summary

PGT-A is an advanced genetic testing technique, which screens IVF embryos for numerical chromosomal defects (known as Aneuploidies) prior to implantation. This allowed the clinician to choose normal (known as Euploid) embryos for transfer. By using PGS the chances of having a successful IVF pregnancy increases from 40% to 70%.

Preimplantation Genetic Testing-Monogenic (PGT-M)

What is PGT-M

PGT-M is a diagnostic procedure to test the material collected from an embryo for the presence of mutations carried by one or both parents. This is carried out when one or both genetic parents has a known genetic abnormality. In PGT-M every test is prepared on a case-by-case basis.

Possible candidates for PGT-M

- Carriers of X-linked genetic disorders
- Carriers of single gene disorders
- Couples who have a child/ children affected by a single gene disorder
- Couples who have a family history of a single gene disorder

What are the benefits of PGT-M?

PGT-M can test for most single gene disorders

PGT-M allows the clinician to select embryos that do not carry the single gene disorder being tested for the implantation

By using PGT-M, the single gene disorder can be prevented from being passed on from one generation to the next

Pre - PGT - Work up

- Detailed information of disorder, the genetic testing reports need to be evaluated
- A pedigree analysis with all affected(multiply sign) unaffected members is reviewed
- Each case is evaluated and the appropriate method is planned
- Parental (multiply sign) arielle index case or unaffected sibling sample will be pre-tested before accepting embryo biopsy samples.

How to order the Embryo Biopsy Kit

Contact Customer Support
MedGenome Labs Pvt. Ltd., Bangalore
Ph 91-80-67154990/91
(At least 2 days in advance)

▼

Clearly indicate number of kits required

▼

Kits will be transported to the provided address at room temperature

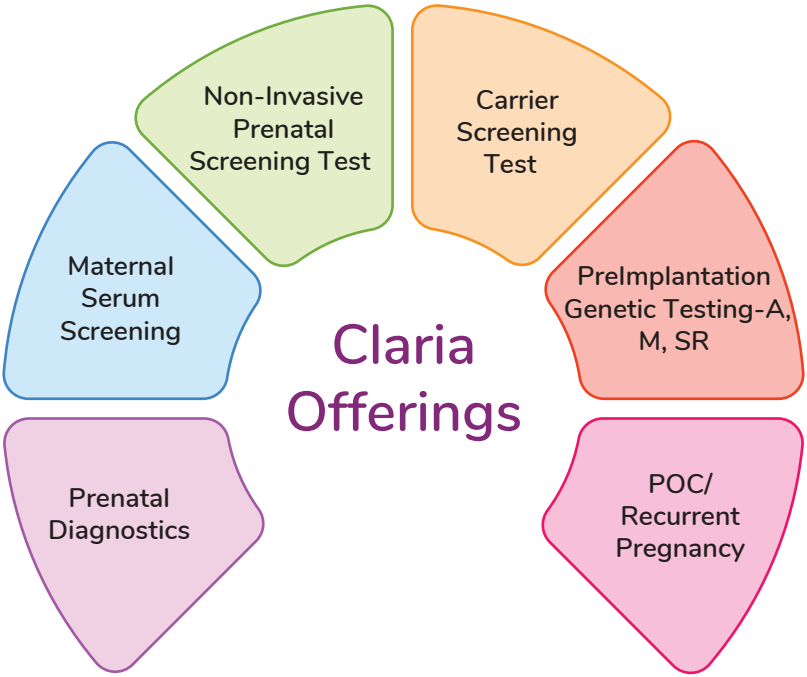
▼

Ensure the contents of the kit are intact before proceeding with the biopsy. Refer to the instructions on the kit.

For further queries or clarification, contact customer care

MEDGENOME | Claria Reproductive Genetics

Precision in Reproductive Genetic solutions



- QF-PCR
- FISH
- Karyotyping
- MLPA
- Chromosomal Microarray
- Exome Sequencing
- Sanger Sequencing

Talk to the Experts

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