



VITRUVIANMD

A multi-award-winning fertility platform

hello@vitruvianmd.com

Who are we?

VitruvianMD is a Medtech company specialising in laboratory diagnostics for assisted reproduction.

Our Purpose

To leverage artificial intelligence to improve fertility outcomes and revolutionise Assisted Reproductive Technology (“ART”).



Partners and achievements

Our cutting edge technology has attracted interest from various organisations, many of which are in pilots with us.

Pathology Groups



Universities



IVF Clinics



Awards and Programs



VC Investors



Problem: No way to select sperm based on DNA fragmentation

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Sperm selection for IVF/ICSI is subjective

Chemical tests can analyse quality of sperm but render them unusable for assisted reproduction. So sperm is chosen at random reducing the chance of successful embryo development.

50%

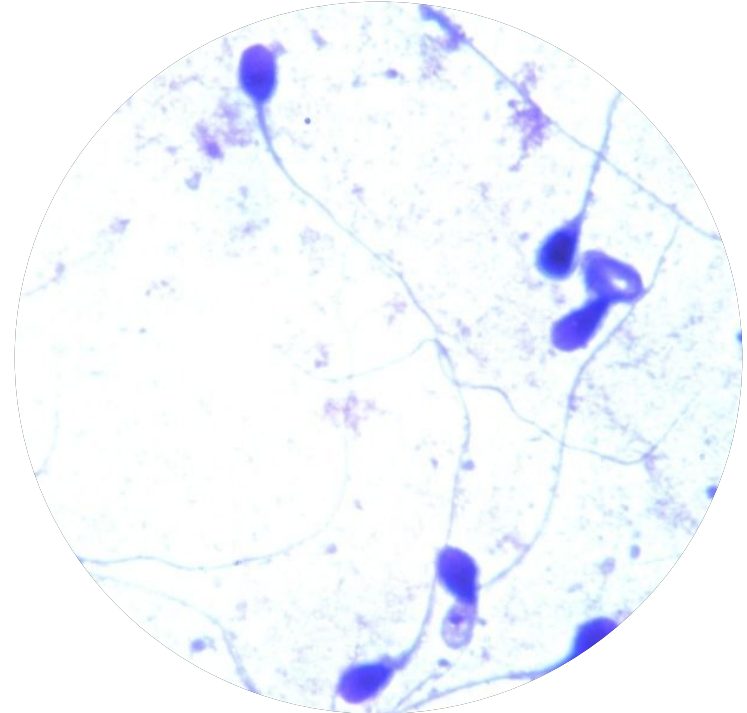
Couples with male factor infertility

Damage Sperm

Tests use chemicals, which means they cannot be used for ICSI

Subjective

Sperm is selected manually for ICSI/IVF without knowing which is the best quality to use.



What does the Science say?

Research shows that high DNA fragmentation in sperm leads to poor embryo development. Until now, there was no way to select sperm based on this quality metric.

Sperm DNA damage compromises embryo development, but not oocyte fertilisation in pigs

[Yentel Mateo-Otero](#), [Marc Llanerera](#), [Sandra Recuero](#), [Ariadna Delgado-Bermúdez](#), [Isabel Barranco](#), [Jordi Ribas-Maynou](#)  & [Marc Yeste](#) 

Effect of sperm DNA fragmentation on embryo development: clinical and biological aspects

[Cristian Alvarez Sedó](#) ¹, [Melina Bilinski](#) ¹, [Daniela Lorenzi](#) ¹, [Heydy Uriondo](#) ¹, [Felicita Noblía](#) ¹, [Valeria Longobucco](#) ¹, [Estefanía Ventimiglia Lagar](#) ¹, [Florencia Nodar](#) ¹

Sperm DNA integrity does play a crucial role for embryo development after ICSI, notably when good-quality oocytes from young donors are used

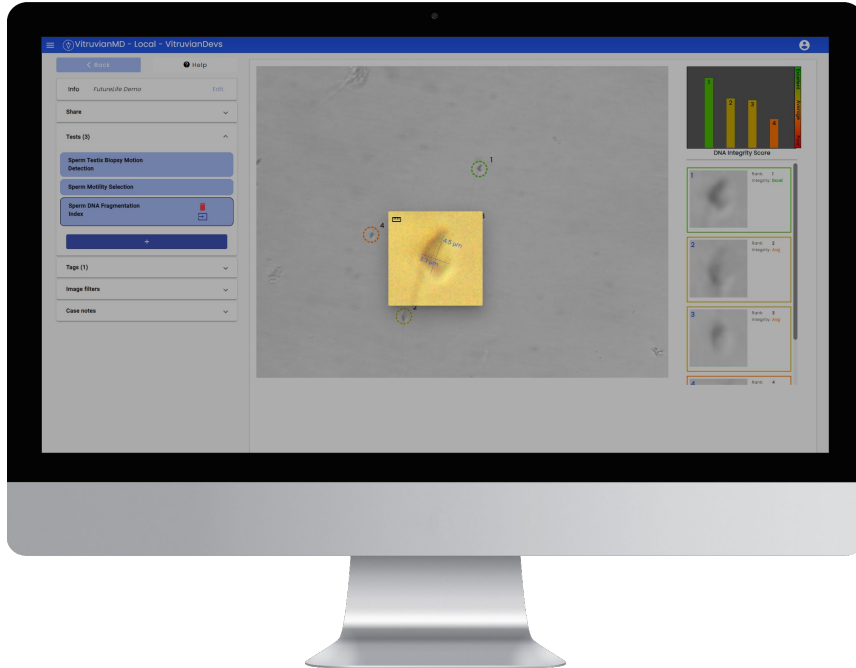
[Jordi Ribas-Maynou](#) , [Sergi Novo](#), [Marc Torres](#), [Albert Salas-Huetos](#), [Sergi Rovira](#), [Marta Antich](#) & [Marc Yeste](#)

Solution: AI-powered Sperm Screening and Selection

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World-first. AI-powered sperm selection

VMD predicts the quality of sperm in a non-destructive way and preserves sperm for use in assisted reproduction.



Chemical-free DNA Fragmentation testing



Select the best sperm for IVF



10x reduction in cost and time



>70% accuracy

Key Value Proposition

Make data-guided decisions to select high-quality sperm based on well established principles.

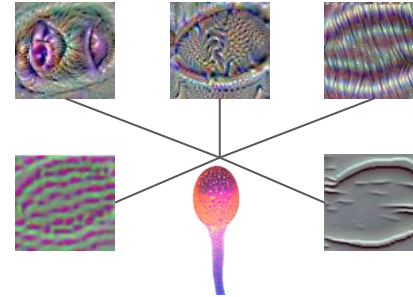
Real-Time Kinematic Analysis



Quantifiable motility metrics
ensures data-backed choices



DNA Fragmentation Prediction



High-accuracy prediction
assists selecting the best sperm

Reduce subjectivity using data-driven methodology aligned with literature

By integrating these two insights, you're selecting sperm not just by appearance, but by indicators that research strongly correlates with improved embryo development. We're not asking you to re-validate these principles; they're already widely accepted in the field. Our platform simply makes it easier and more consistent to apply them

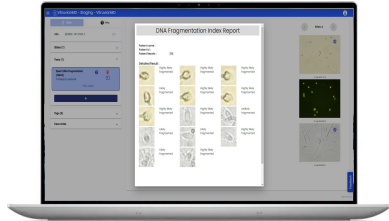
Easy Setup and Integration

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What you need to get started

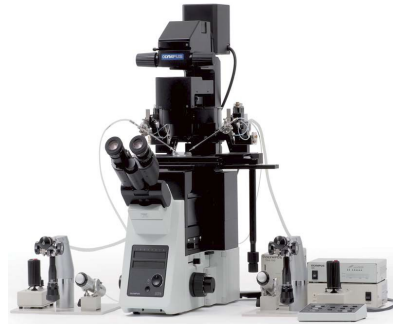
One of the best aspects of this technology is how straightforward it is to implement.

Laptop



Windows with stable internet connection*

ICSI Microscope



Any ICSI microscope with a free camera port

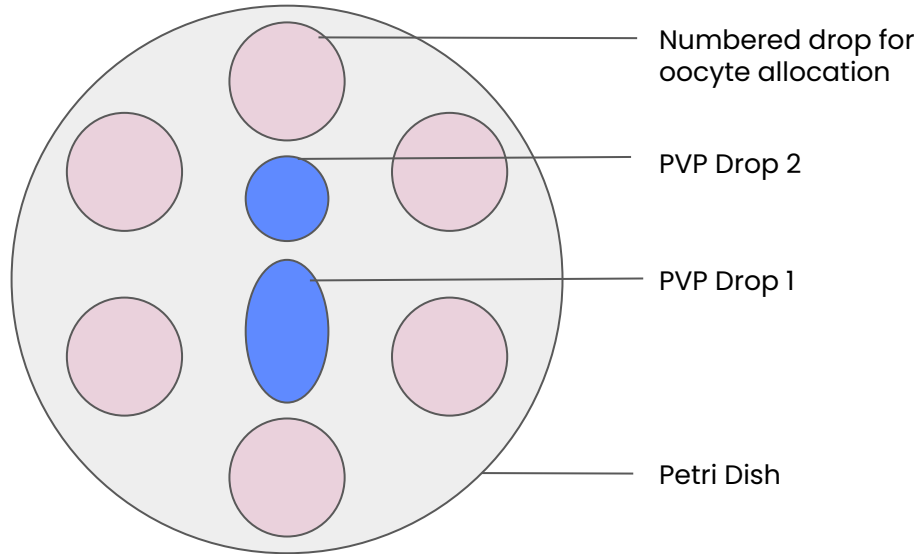
VisionMD Camera



Microscope camera from VitruvianMD

Seamlessly fit into existing process

A two-step selection process grades sperm by motility, morphology and DNA fragmentation.



1. Sperm is placed in PVP Drop 1 and graded using VMD Motility AI
 - a. The best sperm is picked up and transferred to PVP Drop 2
 - b. Sperm is immobilised in PVP Drop 2
2. VMD DNA Fragmentation AI is run on sperm and ranked by quality where the best sperm can be used for ICSI

Validation and Performance

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Validation Results: DNA Fragmentation AI

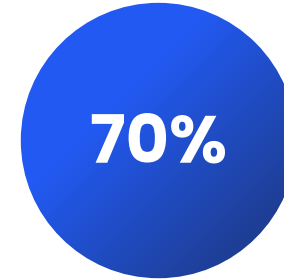
Run by the University of Pretoria, showed the the sensitivity of our TUNEL-based predictor is above 70%, dramatically improving upon the baseline of Zero.



65 Patients



**Evaluated against
CMA3, TUNEL, AO,
TB, AB, GoldCyto
and Diff Quik**



**Sensitivity of the
TUNEL-based AI**

Sperm was imaged across brightfield, phase contrast and fluorescent

Validation Study Supporting our AI Model

Validation of an Artificial Intelligence Tool for the Detection of Sperm DNA Fragmentation Using the TUNEL In Situ Hybridization Assay

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^bUniversity Pretoria, Faculty of Health Sciences, Department of Obstetrics and Gynaecology, Steve Biko Academic Hospital, Hatfield, Private Bag X20, Pretoria, 0028, Gauteng, South Africa

^cVitruvianMD Pte Ltd, 3 Fraser Street, Singapore, 189352, Singapore



This study validates a novel AI tool for the detection of sperm DNA fragmentation using the TUNEL assay as a reference standard. Our machine learning approach enables non-destructive assessment of sperm DNA integrity through the analysis of phase-contrast and bright-field microscopy images alone. With a sensitivity of 70%, the system demonstrates significant potential for improving sperm selection in assisted reproductive technologies by ensuring that only sperm with intact DNA are utilised.

Compared to Alternative Solutions

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Traditional Methods vs. Our Integrated Solution

Our approach seamlessly integrates advanced motility analysis with predictive DNA fragmentation assessment, offering a comprehensive, objective solution that elevates traditional sperm selection methods.

Approach	Key Features	Limitations
PICSI	Uses hyaluronic acid binding to select mature sperm	Focuses on one biomarker; may miss other functional aspects
IMSI	High-magnification morphology analysis	Subjective and time-consuming; limited to morphology
MACS	Removes apoptotic sperm via magnetic sorting	Only targets apoptotic cells; does not assess motility or other DNA damage (some sperm may still have DNA Fragmentation but not be apoptotic)
VitruvianMD	Integrated analysis assessing both motility and predicting DNA fragmentation	Enhances selection without precluding the use of traditional methods

Our technology not only offers a more comprehensive assessment, but can also complement these traditional approaches for an even more robust evaluation.

Interested? Lets run a pilot

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Way forward: Pilot

Try the technology for 30 days. Run in parallel with your current process.



1 month pilot

Week 0 - 1 Setup, training and quality control across pilot locations

Week 4 - 5 User experience feedback and outcomes of the trial



Start small

Select 1 location to deploy the VitaMD Selection system and begin testing our services in a clinical setting



Pricing

USD1000 once-off for the camera and relevant ICSI attachments

Reduced rate per patient case for first 50 patients as part of the pilot



Pilot outcomes



Usability

To confirm that utilising the VitaMD Selection tool provides data analytics that can standardise the selection process



Service

To confirm that the VitruvianMD team can service the needs of your business adequately



Feedback

We love feedback, so please tell us what else you wish the system could do or how we can make it to better suit your needs

Annexure: Use in Screening

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Screening: DNA Fragmentation by AI

Our AI predicts the level of DNA Fragmentation in sperm, quickly, accurately and cost effectively making DNA Fragmentation screening viable as a routine test in semen analysis.



Chemical-free DNA Fragmentation testing



Less than 10 minutes



Minimal preparation. Standard Lab equipment



Cost effective for lab and patients

How to use the DNA Fragmentation AI

Our screening is designed to be done with minimal effort in a process that should take less than 15 minutes.

What you need

- 2 x Eppendorf Tubes (or alternative centrifuge tubes)
- 2 x Pipettes
- Centrifuge
- 2ml PBS medium
- Phase Contrast Microscope
- 40x Phase Objective

Sample Prep

- Flow sample into Eppendorf tube containing 1ml of PBS at 37°C
- Centrifuge the sample at x300g for 10 minutes
- Remove supernatant and resuspend the pellet in 1500µL of PBS at 37°C
- Place 10–20 µL of the resuspended sample onto a clean microscope slide
- Cover with a coverslip, gently pressing to spread the sample evenly

AI Analysis

- Place the prepared slide on the microscope stage.
- Set the phase contrast ring (PH1/PH2/PH3) based on the objective in use.
- Align the phase annulus to match the objective.
- Focus the image and adjust for optimal contrast.
- Capture fields of view using the VisionMD camera.
- Count 100 sperm cells.
- Run the AI analysis.

Screening: Advanced Motility Analysis

Easy to use, accurate analysis tool that speeds up current process and allows for digital reporting.



Phase Contrast Microscope*



Leja slides or equivalent*



Pay-per-patient



Highly accurate and fast

*Phase contrast microscope and Leja slides are required for best results. These are sold separately.



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PROJECTS & OPERATIONS**

LET'S CONNECT

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