



Natural sperm separation.
Simple.
Effective.

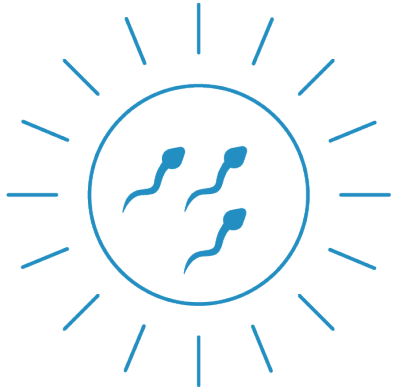


ZyMöt
devices
help you
select the
champions

Easy to adopt, simple to use, ZyMöt Sperm Separation Devices are innovative lab tools that efficiently isolate the healthiest, rapidly progressive sperm, to help achieve the best possible outcomes. ZyMöt devices are the first of their kind and FDA-approved.

ZyMöt Sperm Separation Devices deliver the healthiest, best-performing sperm for ICSI, IUI and IVF procedures.

We improve outcomes that matter to patients.



ZyMöt devices use a natural approach to separate sperm. When compared to traditional procedures, we help you achieve nearly undetectable levels of DNA fragmentation, significant improvements in motility and progression, and increased fertilization and euploidy rates.

It's that simple.



Learn more at zymotfertility.com



ZyMöt Fertility | a DxNow, Inc. business unit
401 Professional Drive, Suite 130
Gaithersburg, MD USA 20879-3429



LESS TIME. LESS ERROR. MORE PERFORMANCE.



DGC

VS



ZyMöt™

00:25

TECH TIME

00:05

TECH TIME

00:30

SPIN TIME

00:00

SPIN TIME

2.02%

DFI

0.39%

DFI



ZyMöt requires fewer steps, is more efficient and scalable, and reduces tech time by 80% when compared to Density Gradient Centrifugation.

Learn more at zymotfertility.com.

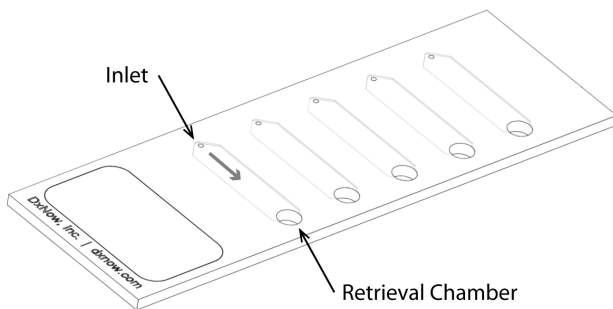
NATURE'S PRINCIPLES. PROVEN SUCCESS.

Understanding ZyMöt™ Sperm Separation Devices

Better Sperm Selection by Mimicking Nature

DxNow has developed novel devices for use in ART procedures conducted by fertility clinics and OB/GYN practices. ZyMöt ICSI and ZyMöt Multi Sperm Separation Devices prepare motile sperm from semen for use in ICSI, IUI and IVF procedures. These FDA-approved devices are the first of their kind in the U.S. market.

ZyMöt ICSI



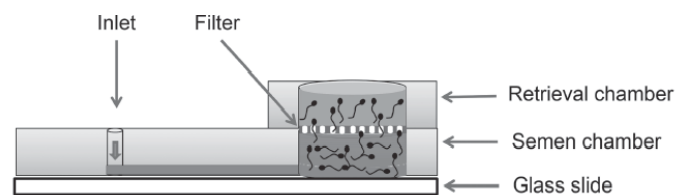
The ZyMöt ICSI has 5 channels, each accommodating 2 μ L of input. A sample is applied through an inlet port and sperm migrate through the 4mm wide channel filled with standard HTF-BSA media. The channel dimensions create an environment for optimal tail movement associated with straight-line, progressive motility, enabling separation of the most motile and functional sperm. Channel lengths of 1-3, 4-6, 7-9, 10-12, 13-15 and 16-20mm were compared, evaluating incubation times of 5, 15, 30 and 60 minutes. A 30-minute incubation using a 20mm channel was shown to produce optimal results.¹ Sperm with optimal, progressive motility are also shown to have a low DNA fragmentation index (DFI). After migration through the channel, the optimal sperm reach an outlet port for collection and subsequent use in ICSI procedures. No centrifugation is required.

Simplifying and Standardizing Workflow

With simple and straightforward methods, ZyMöt ICSI and ZyMöt Multi Sperm Separation Devices provide considerable time savings and standardization over conventional methods. ZyMöt Devices avoid DGC and preserve normal sperm morphology, significantly reducing DNA fragmentation and reactive oxygen species (ROS) production. Contact us for more information about how to evaluate ZyMöt Devices in your clinic. We offer comprehensive support with experts who are ready to help you incorporate our tools into your procedures and extend your success. Learn more at zymotfertility.com.

Our revolutionary tools simulate the natural barriers of the cervical and uterine pathway that sperm must overcome to fertilize an egg. We enable separation of optimally functional sperm without the use of damaging chemicals or density gradient centrifugation (DGC). There are two single-use ZyMöt device models available:

ZyMöt Multi



The ZyMöt Multi is available in two processing volumes, 850 μ L and 3mL. A sperm sample is applied through the device's inlet port, connected to a lower sample chamber. This chamber is separated from an upper collection chamber by an 8 μ m microporous filter. Filter size was determined after comparison between 3 μ m, 5 μ m and 8 μ m pore sizes. Incubation times of 15, 30 and 45 minutes were evaluated, with sperm saturation achieved at 30 minutes. These parameters yielded optimal sperm collection efficiency and motility, with the 8 μ m pore demonstrating the highest degree of normal morphology.² During sample incubation, the most motile and functional sperm swim upward through the filter, leaving less motile sperm behind. Separated sperm are then collected from the upper chamber for subsequent use in ICSI, IVF or IUI procedures. No centrifugation is required.

References

1. Tasoglu, S., Safaee, H., Zhang, X., Kingsley, J. L., Catalano, P. N., Gurkan, U. A., Nureddin, A., Kayaalp, E., Anchan, R. M., Maas, R. L., Tüzel, E. and Demirci, U. (2013), Exhaustion of Racing Sperm in Nature - Mimicking Microfluidic Channels During Sorting. *Small*, 9: 3374-3384. doi:[10.1002/sml.201300020](https://doi.org/10.1002/sml.201300020)
2. Asghar, W., Velasco, V., Kingsley, J. L., Shoukat, M. S., Shafiee, H., Anchan, R. M., Mutter, G. L., Tüzel, E. and Demirci, U. (2014), Selection of Functional Human Sperm with Higher DNA Integrity and Fewer Reactive Oxygen Species. *Adv. Healthcare Mater.*, 3: 1671-1679. doi:[10.1002/adhm.201400058](https://doi.org/10.1002/adhm.201400058)

ZYMÖT™ DATA SPOTLIGHT: DNA & ROS

Understanding the latest science in the ZyMöt revolution

The Need for Healthy Sperm

Using healthy sperm for IVF, IUI and ICSI is more important than ever. In new research¹ from scientists at Imperial College London, recurrent pregnancy loss was directly connected to the presence of elevated sperm DNA fragmentation and reactive oxygen species, along with a lower percentage of normal morphology. This follows a growing body of evidence that links improved sperm health to better pregnancy outcomes.² ZyMöt Devices enable the separation of sperm with nearly undetectable levels of DNA fragmentation and oxidative stress. Improved sperm health means better clinical outcomes.

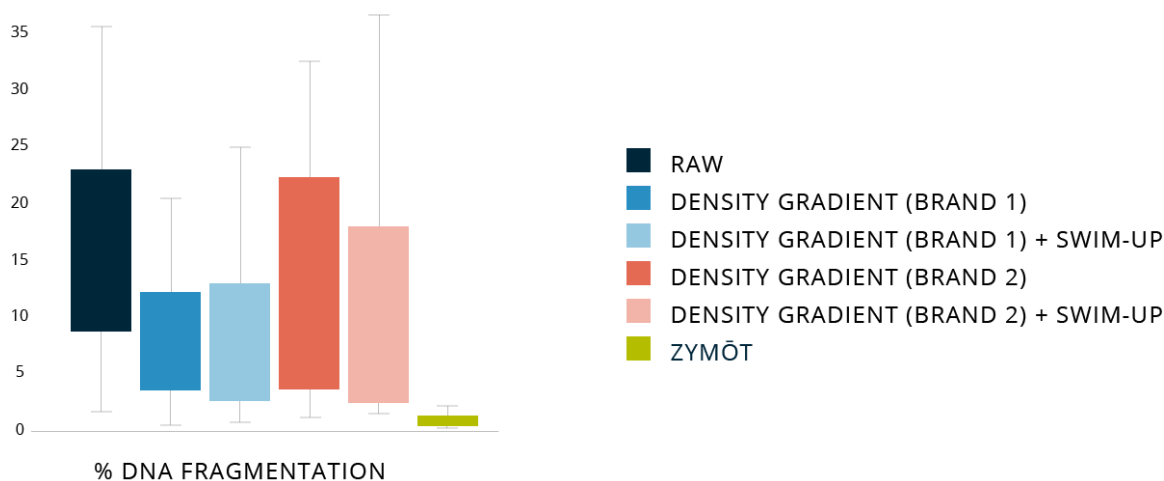
Avoiding DNA Fragmentation and Oxidative Stress

ZyMöt ICSI Sperm Separation Devices have been shown to separate sperm with near-zero DNA fragmentation, compared to density gradient centrifugation.³ In a new, independent study from Midwest Fertility Specialists, ZyMöt (850µL) Sperm Separation Devices were

directly compared to traditional sperm preparation techniques.⁴ This clinical research determined which approach resulted in improved DNA fragmentation index (DFI) and other sperm health biomarkers such as oxidative stress adducts (OSA) and high DNA stainability (HDS).

Results: Using ZyMöt effectively reduced DFI ($p < 0.05$) compared to standard protocols: two commercially available gradients, and gradients followed by swim-up. The device also significantly reduced ($p < 0.05$) OSA levels, a measurement of oxidative stress, and HDS, a measurement of immature cells and high histone retention. "Overall, the quality of the sperm obtained post-processing was improved by the use of the separation device," wrote the study author.

Conclusion: Using ZyMöt Devices shows statistically significant improvements in three DNA- and stress-focused indicators of sperm health and function, when compared to traditional, centrifugation-based methods.



Comparison of DNA fragmentation levels for raw semen, after processing with commercially available gradients (with and without swim-up) and ZyMöt Sperm Separation Devices.

Improving Efficiency and Outcomes

ZyMöt Devices require fewer steps to complete, are simpler to use and can reduce hands-on tech time by as much as 80%, when compared to density gradient centrifugation. In addition to increased efficiency, ZyMöt Devices deliver improved sperm performance to achieve the best possible outcomes in ICSI, IUI and IVF procedures.

References

1. A.P. Dimakopoulou et al. Elevated semen oxidative stress in male partners as novel marker of recurrent pregnancy loss. ENDO 2019, New Orleans, March 24, 2019.
2. C.N. Jayasena et al. Reduced testicular steroidogenesis and increased semen oxidative stress in male partners as novel markers of recurrent miscarriage. Clinical Chemistry. Volume 65, January 2019, p. 161.
3. M.M. Quinn et al. Microfluidic sorting selects sperm for clinical use with reduced DNA damage compared to density gradient centrifugation with swim-up in split semen samples. Hum Reprod. July 10, 2018. doi: 10.1093/humrep/dey239.
4. A. Broussard et al. Sperm DNA fragmentation (SDF) was most effectively improved by a sperm separation device compared to different gradient and swim-up methods. PCRS 2019, Indian Wells, April 5, 2019.

ZYMÖT™ DATA SPOTLIGHT: MOTILITY & MORPHOLOGY

Understanding the latest science in the ZyMöt revolution

Delivering Superior Motility and Morphology

ZyMöt™ Sperm Separation Devices have been designed and developed to aid reproductive medicine professionals in the selection of the healthiest and best performing sperm for use in assisted reproductive technology (ART) procedures. ZyMöt Devices enable the separation of sperm with nearly undetectable levels of DNA fragmentation and oxidative stress, while increasing fertilization and euploidy rates. Improved sperm health means better clinical outcomes.

In an internal study of sperm health, ZyMöt Multi Sperm Separation Devices (850uL) were evaluated in a heterogeneous population of more than two dozen samples.

Results: Median motility increased significantly ($p < 0.01$) after processing with ZyMöt Devices (Figure 1, left). Similarly, progressive motility showed a significant increase ($p < 0.01$) after processing with ZyMöt Devices (Figure 1, middle). Using ZyMöt Devices also significantly improved the proportion of sperm with normal morphology.

Conclusion: Using ZyMöt Devices shows statistically significant improvements in sperm motility and progression, enriching a sample for improved sperm performance.

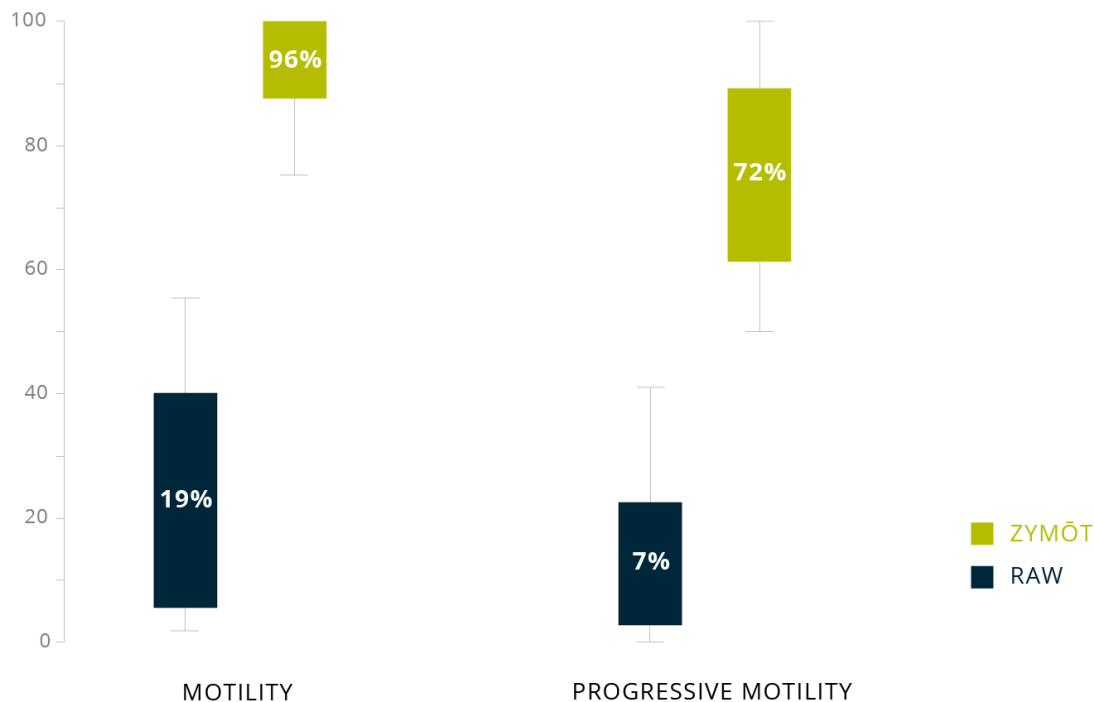


Figure 1. In an internal study of a heterogeneous population of more than two dozen samples, ZyMöt Devices were shown to significantly increase motility (left), and progressive motility (right).

Improving Efficiency and Outcomes

ZyMöt Devices require fewer steps to complete, are simpler to use and can reduce hands-on tech time by as much as 80%, when compared to density gradient centrifugation. In addition to increased efficiency, ZyMöt Devices deliver improved sperm performance to achieve the best possible outcomes in ICSI, IUI and IVF procedures.

ZYMÖT™ DATA SPOTLIGHT: IMPROVING OUTCOMES

Understanding the latest science in the ZyMöt revolution

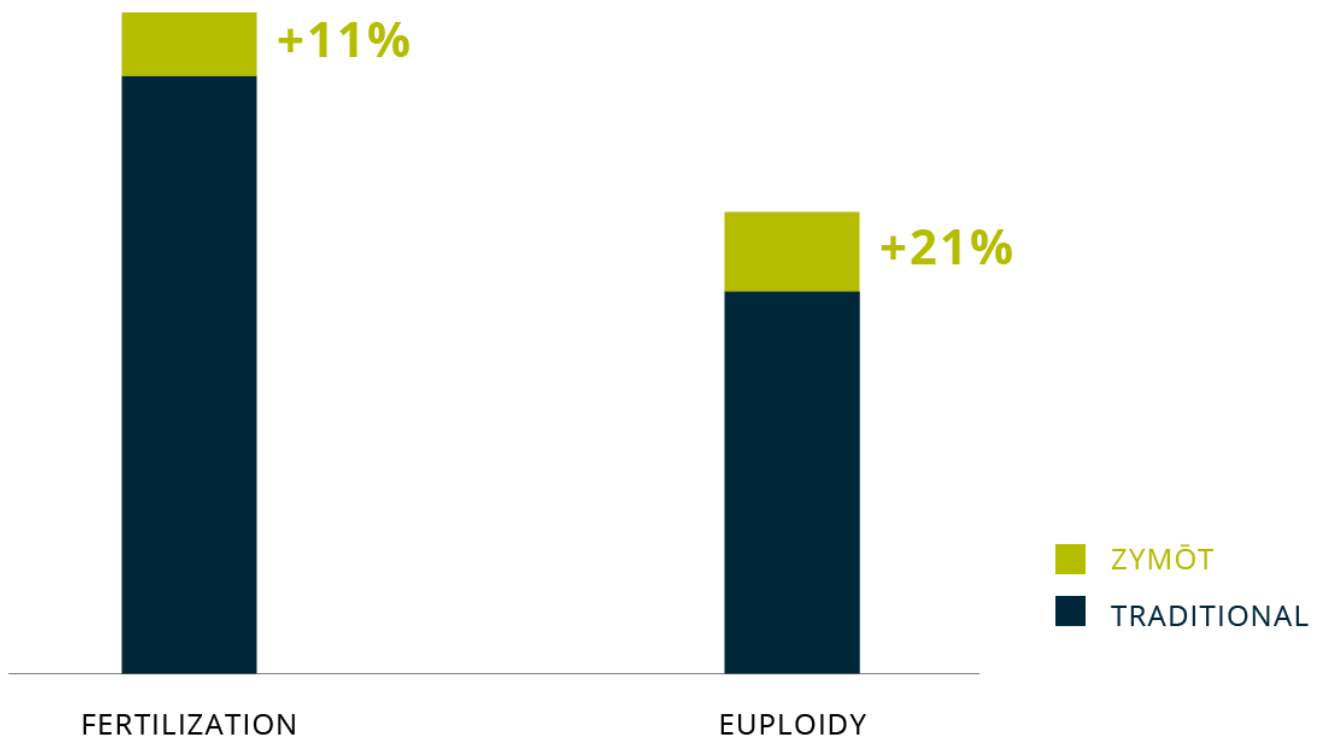
Increasing Fertilization and Euploidy Rates

ZyMöt™ Sperm Separation Devices have been designed and developed to aid reproductive medicine professionals in the selection of the healthiest and best performing sperm for use in assisted reproductive technology (ART) procedures. ZyMöt Devices enable the separation of sperm with nearly undetectable levels of DNA fragmentation and oxidative stress. Improved sperm health means better clinical outcomes.

Results: In a study of over 3600 oocytes at The Fertility & IVF Center of Miami, the center observed a significant increase in fertilization rates, from 75% using their traditional sperm preparation methods

to 83% when using ZyMöt Devices, an 11% increase over the baseline rate ($p < 0.05$). Following the biopsy of over 1300 embryos, traditional methods yielded a 48% euploidy rate, which improved significantly to 58% when using ZyMöt Devices, an increase of 21% over baseline ($p < 0.05$). As of April, 2019, the study is ongoing.

Conclusion: The ZyMöt Multi (850µL) Sperm Separation Device resulted in significantly improved fertilization and euploidy rates. ZyMöt Devices offer a competitive advantage to lab workflow and patient outcomes.



At The Fertility & IVF Center of Miami, using the ZyMöt Multi (850µL) Sperm Separation Device resulted in an 11% increase over the baseline fertilization rate (left) and a 21% increase over the baseline euploidy rate (right).

Improving Efficiency and Outcomes

ZyMöt Devices require fewer steps to complete, are simpler to use and can reduce hands-on tech time by as much as 80%, when compared to density gradient centrifugation. In addition to increased efficiency, ZyMöt Devices deliver improved sperm performance to achieve the best possible outcomes in ICSI, IUI and IVF procedures.