

# REVOLUTIONIZING SPERM PREPARATION

**ZyMöt™ Sperm Separation Devices:** Better for your patients. Better for your practice.

## A better way to prepare sperm

Quality, accuracy and efficiency are central to the success of a fertility practice. Traditional, centrifugation-based sperm preparation methods are not only time-consuming and laborious, but cause additional sperm DNA fragmentation<sup>1</sup> and cellular stress,<sup>2</sup> lowering the odds of success.<sup>3,4</sup> ZyMöt Sperm Separation Devices are a better way to prepare sperm for use in IUI and ICSI procedures. It's that simple.

## Simple to adopt. Easy to use.

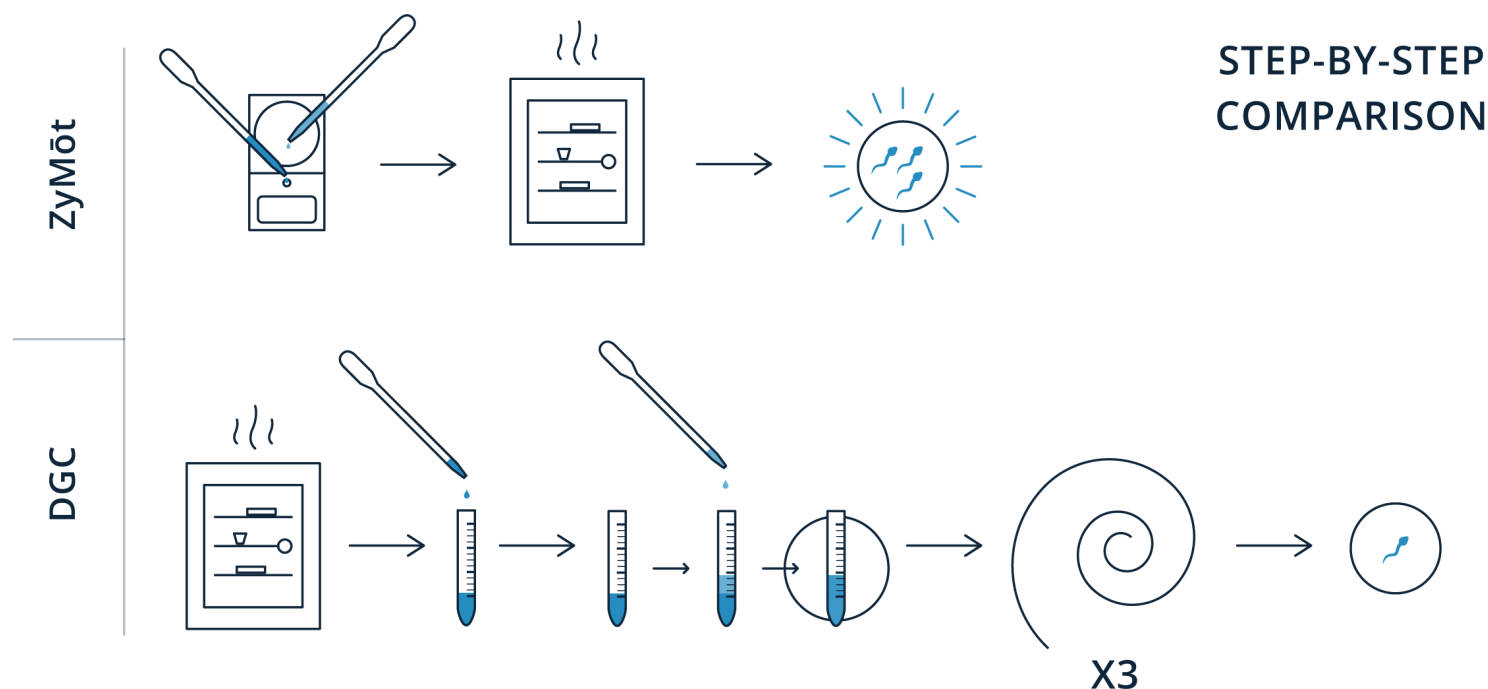
FDA-cleared, CE-certified and available worldwide, ZyMöt devices efficiently isolate the healthiest, rapidly progressive sperm, to help achieve outcomes that matter.<sup>5</sup> Minimal training is required, with simple, standardized procedures that help users quickly achieve optimal performance.

## Work on your timeline

ZyMöt devices enable processing whenever a sample is ready, eliminating delays caused by an equipment bottleneck. With **only 5 minutes of total hands-on tech time per sample**, every ZyMöt-processed specimen represents a significant time savings over traditional, centrifugation-based methods. Using ZyMöt devices frees staff for other critical tasks and improves lab productivity.

## Fewer steps. More confidence.

A shorter chain of custody – fewer movements per sample – means that ZyMöt devices help minimize mismatching risk, reducing the potential for costly error. **Processing sperm with ZyMöt devices gives providers more confidence and gives patients more peace of mind.**



Comparison of major sperm separation steps when using ZyMöt Sperm Separation Devices (top) versus using traditional, centrifugation-based methods (bottom). ZyMöt requires fewer movements per sample, improving efficiency and productivity while reducing risk of costly errors.

## Natural. Simple. Effective.

Try ZyMöt Sperm Separation Devices and realize immediate savings of time and resources, while providing premium quality sperm separation for your patients. **Learn more at [zymotfertility.com](https://zymotfertility.com).**

## References

1. Zini, A., Finelli, A., et al. Urology (2000). doi: 10.1016/S0090-4295(00)00770-6
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# NATURE'S PRINCIPLES. PROVEN SUCCESS.

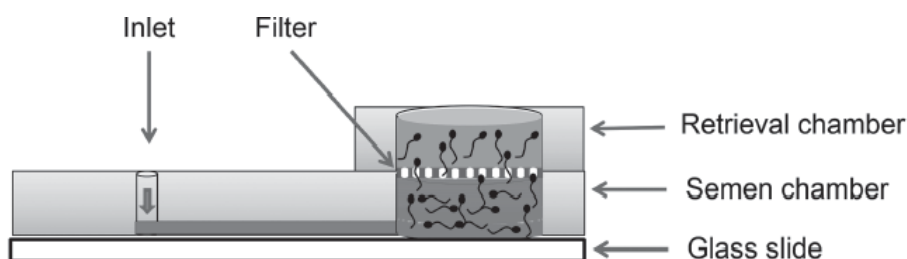
## Understanding ZyMöt™ Sperm Separation Devices

### 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 Multi Sperm Separation Devices prepare motile sperm from semen for use in IUI and ICSI procedures. These FDA-cleared, CE-certified devices are the first of their kind and available worldwide.

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).

#### ZyMöt Multi



The ZyMöt Multi is available in two processing volumes, 850µL and 3mL. A 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 8µm microporous filter. Filter size was determined after comparison between 3µm, 5µm and 8µm pore sizes. Incubation times of 15, 30 and 45 minutes were evaluated, with sperm saturation achieved at 30 minutes.<sup>1</sup> These parameters yielded optimal sperm collection efficiency and motility, with the 8µm pore demonstrating the highest degree of normal morphology.<sup>2</sup>

During sample incubation, the most motile and genomically competent sperm migrate upward through the filter, leaving less motile sperm behind. Separated sperm are then collected from the upper chamber for subsequent use in IUI or ICSI procedures. **No centrifugation is required.**

### Simplifying and Standardizing Workflow

Easy to adopt and simple to use, ZyMöt Multi Sperm Separation Devices provide considerable time savings and standardization over traditional methods. ZyMöt devices avoid damaging 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 practice and extend your success. **Learn more at [zymotfertility.com](http://zymotfertility.com).**

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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)
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# ZYMÖT™ DATA SPOTLIGHT: DNA & ROS

Understanding the latest science in the ZyMöt revolution

## The Need for Healthy Sperm

Using healthy sperm for IUI and ICSI procedures is more important than ever. In new research<sup>1</sup> 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.<sup>2</sup> By avoiding sperm-damaging centrifugation, ZyMöt devices enable the separation of sperm with the lowest-possible levels of DNA fragmentation and oxidative stress. Improved sperm health means better clinical outcomes.

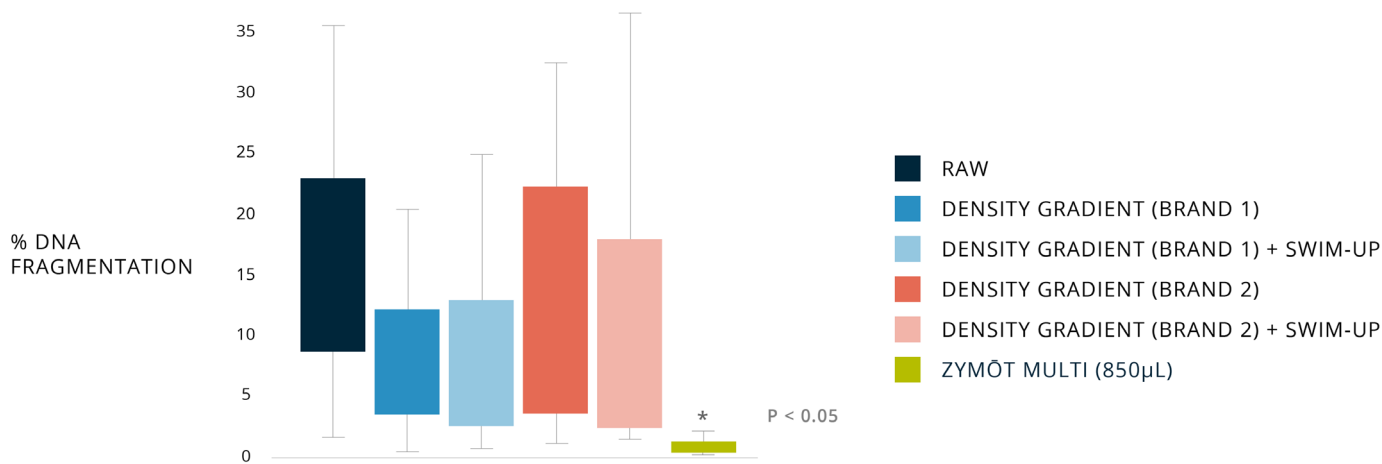
## Avoiding DNA Fragmentation and Oxidative Stress

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

directly compared to traditional sperm preparation techniques.<sup>4</sup> 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, and after processing with commercially available gradients (with and without swim-up) and ZyMöt Sperm Separation Devices.

## Improving Efficiency and Outcomes

ZyMöt devices are easy to adopt and simple to use, helping labs quickly achieve optimal performance. With only 5 minutes of total hands-on tech time per sample, every ZyMöt-processed specimen represents a significant time savings over traditional, centrifugation-based methods. In addition to increased efficiency, ZyMöt devices deliver improved sperm performance to achieve the best possible outcomes in IUI and ICSI procedures. **Learn more at [zymotfertility.com](http://zymotfertility.com).**

## 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.
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4. Broussard A et al. Sperm DNA fragmentation (SDF) was most effectively improved by a sperm separation device compared to different gradient and swim-up methods. Fertility and Sterility, Volume 111, Issue 4, e15.

# ZYMÖT™ DATA SPOTLIGHT: MOTILITY & MORPHOLOGY

Understanding the latest science in the ZyMöt revolution

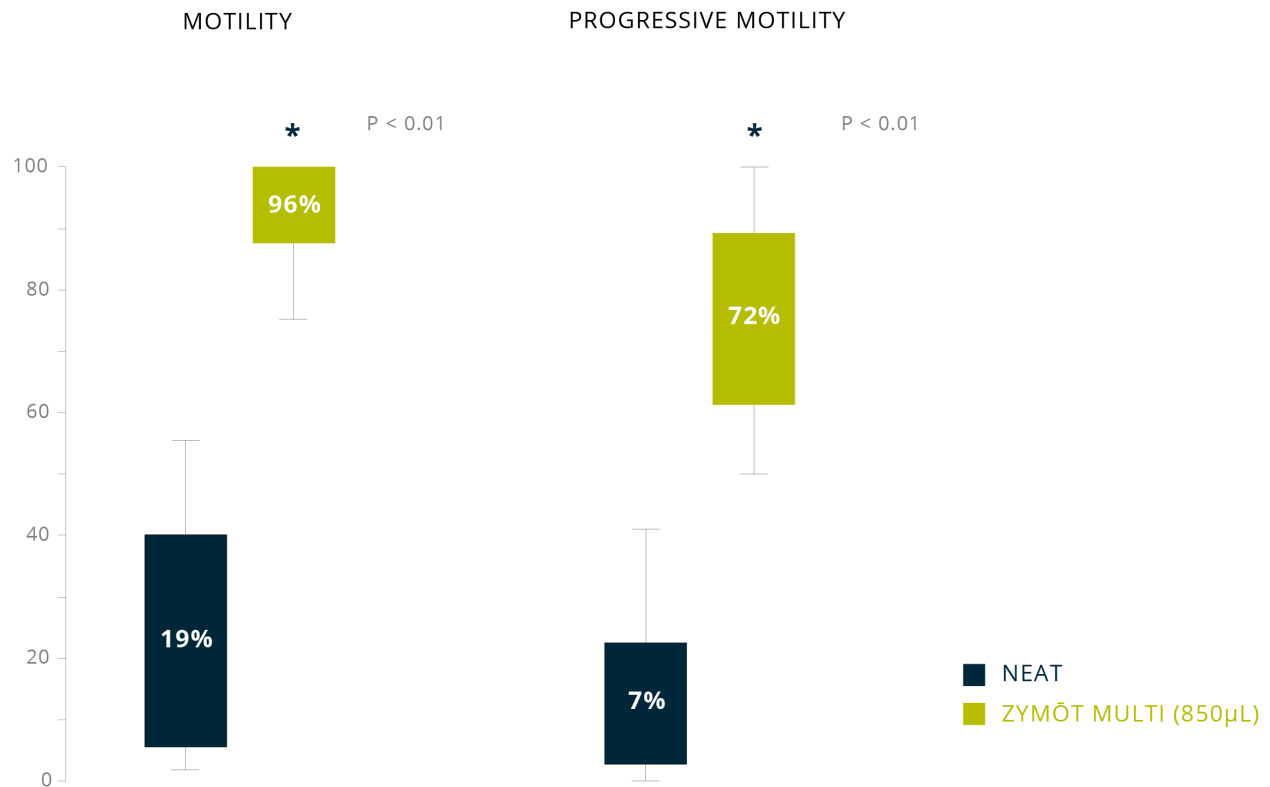
## Delivering Superior Motility and Morphology

ZyMöt™ Sperm Separation Devices were 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 enables the separation of sperm with the lowest possible levels of DNA fragmentation and oxidative stress, while increasing fertilization and euploidy rates. Processing with ZyMöt has also been shown to increase the proportion of sperm with normal morphology. Improved sperm health means better clinical outcomes.

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

**Results:** Median motility increased significantly ( $P < 0.01$ ) after processing with ZyMöt devices (below, left). Similarly, progressive motility showed a significant increase ( $P < 0.01$ ) after processing (below, right). ZyMöt processing also 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.



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 are simple to use, helping labs quickly achieve optimal performance. With only 5 minutes of total hands-on tech time per sample, every ZyMöt-processed specimen represents a significant time savings over traditional, centrifugation-based methods. In addition to increased efficiency, ZyMöt devices deliver improved sperm performance to achieve the best possible outcomes in IUI and ICSI procedures. [Learn more at zymotfertility.com](https://zymotfertility.com).

# 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 the lowest possible levels of DNA fragmentation and oxidative stress. Improved sperm health means better clinical outcomes.

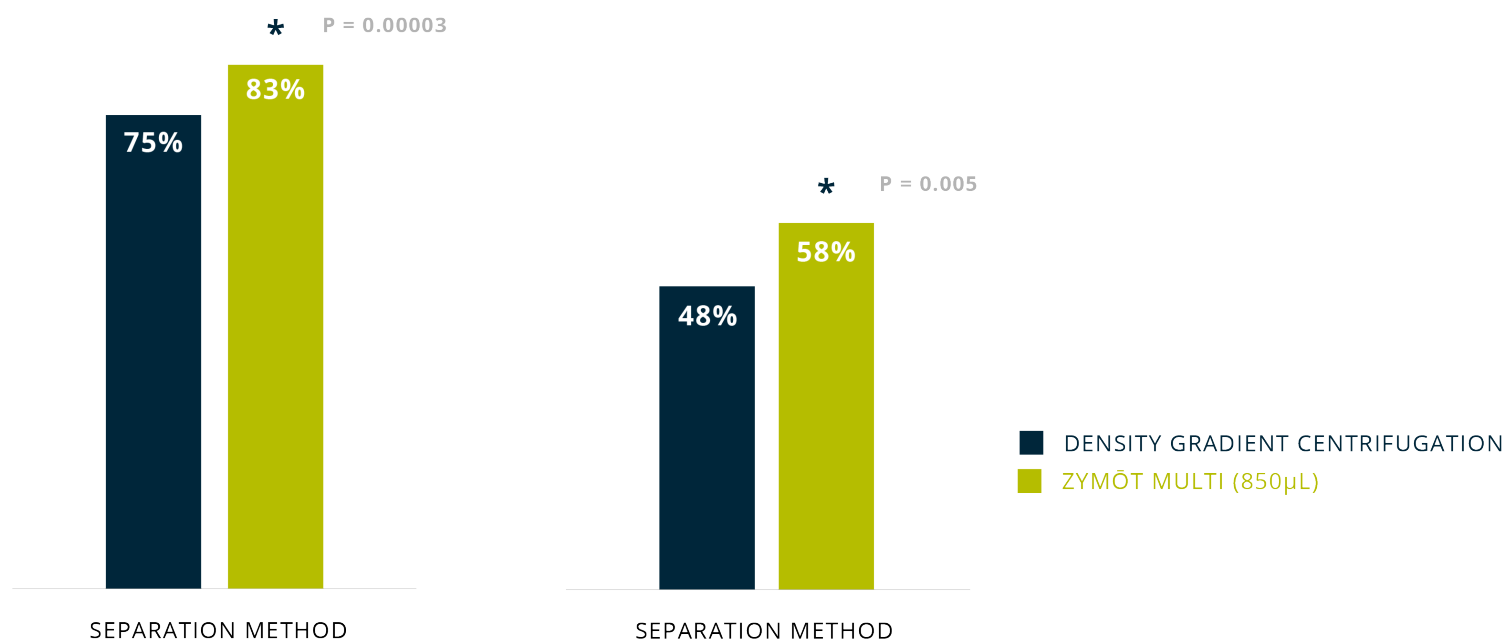
**Results:** In a study of over 3600 oocytes at The Fertility & IVF Center of Miami, the center observed a significant increase in fertilization rates, from 75% using their traditional sperm preparation methods to 83%

when using ZyMöt devices, an 11% increase ( $P=0.05$ ) over the baseline rate (below, left). 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% ( $P<0.05$ ) over baseline (below, right).

**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.

### FERTILIZATION RATE

### EUPLOIDY RATE



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 are simple to use, helping labs quickly achieve optimal performance. With only 5 minutes of total hands-on tech time per sample, every ZyMöt-processed specimen represents a significant time savings over traditional, centrifugation-based methods. In addition to increased efficiency, ZyMöt devices deliver improved sperm performance to achieve the best possible outcomes in IUI and ICSI procedures.

Learn more at [zymotfertility.com](http://zymotfertility.com).

# HIGHER GENOMIC COMPETENCE IMPROVES OUTCOMES

## Understanding the latest sperm science in the ZyMöt™ revolution

### Not all sperm are created equal

Using the best sperm helps increase the odds of a successful fertility treatment cycle. **But not all sperm are created equal:** up to 11% of men with a normal semen analysis have a measurable problem with sperm chromatin (DNA) fragmentation, and thus reduced motility.<sup>1</sup>

**ZyMöt Sperm Separation Devices are a better way to process sperm**, without harmful centrifugation.<sup>2,3</sup> ZyMöt devices enable the separation of sperm with nearly undetectable levels of DNA fragmentation and oxidative stress.<sup>4</sup> Improved sperm health means better clinical outcomes.<sup>5,6</sup>

In research<sup>1</sup> from scientists at Weill-Cornell Medical College, ZyMöt devices were directly compared to density gradient centrifugation (DGC), evaluating parameters of sperm health and clinical outcomes.

### Results

In a collection of 23 patients, semen samples were split and processed by either DGC or the ZyMöt Multi 850µL device, with analyses before and after processing. Highly statistically significant results were observed in the ZyMöt-processed samples, when compared to DGC: **Sperm motility and normal morphology increased. DNA fragmentation decreased.**

Similar processing was applied to another 25 couples undergoing intracytoplasmic sperm injection (ICSI). Again, statistically significant results were observed when ZyMöt processing was compared to DGC: improved sample motility, progression and normal morphology. There was a dramatic decrease in DNA fragmentation.

In studying clinical outcomes within a cohort of 16 patients with a history of recurrent implantation failure, ZyMöt device use followed by fresh embryo transfer in 9 patients resulted in a **50% clinical pregnancy rate**. This group of patients had experienced a 0% implantation rate in their previous cycles, which used density gradient centrifugation.

The remaining 7 patients in the cohort underwent PGT-A prior to a frozen embryo transfer. These patients saw a statistically significant increase in the number of euploid embryos following the use of a ZyMöt Multi (850µL) Sperm Separation Device. Additionally, they experienced an **80% ongoing pregnancy rate**.



The ZyMöt Multi (850µL) device delivers a processed sperm sample with significantly reduced DNA fragmentation, increased motility and normal morphology, leading to improved euploid rates and more healthy pregnancies.

### Conclusion

Processing with ZyMöt **enhanced sperm sample motility, progression and morphology**, along with providing a “remarkable reduction” of DNA fragmentation. ZyMöt devices yielded sperm with “**higher genomic competence**” demonstrated by their improved euploid rate and ability to establish healthy pregnancies. ZyMöt devices are suitable for use with IUI and ICSI procedures. **Learn more at [zymotfertility.com](https://zymotfertility.com).**

### References

1. Parrella, A., Keating, D., Cheung, S. et al. J Assist Reprod Genet 36, 2057–2066 (2019). doi: 10.1007/s10815-019-01543-5
2. Zini, A., Finelli, A., et al. Urology (2000). doi: 10.1016/S0090-4295(00)00770-6
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# IMPROVING IUI OUTCOMES

Understanding the latest sperm science in the ZyMöt™ revolution

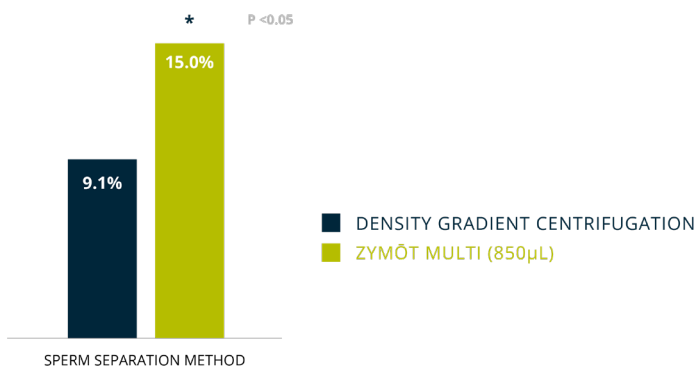
Intrauterine insemination (IUI) is routinely used as the first line of treatment for infertility patients. The procedure is less invasive, requires little or no medication, and amounts to a fraction of the cost of an IVF cycle. Pregnancy rates following IUI treatment have historically been low, and it is common for patients to complete multiple IUIs prior to moving on to an IVF cycle.<sup>1</sup>

## A Better Way to Process Sperm for IUI

ZyMöt Sperm Separation Devices offer an alternative preparation method that allows for **simple, natural, and effective isolation of motile sperm with the greatest chromatin integrity**. Previous studies have demonstrated a reduction in IUI pregnancy rates in couples with elevated levels of DNA fragmentation.<sup>2</sup> **ZyMöt devices have been shown to reduce sperm DNA fragmentation and cellular stress.**<sup>3</sup>

**Results:** In a retrospective study of 265 IUI patients with unexplained infertility, patients whose semen samples were processed using ZyMöt Sperm Separation Devices were 3.5 times more likely to achieve an ongoing pregnancy than the age-matched control group, where sperm was processed with the traditional, centrifugation-based method.<sup>4</sup> In this study, the ZyMöt IUI treatment group also experienced a reduced miscarriage rate when compared to patients whose semen samples were processed by density gradient (0% vs. 5% respectively).<sup>4</sup>

### ONGOING PREGNANCY RATE



The effect of IUI sperm preparation method on pregnancy outcomes: ZyMöt improved treatment prognosis.

**Conclusion: Processing sperm with ZyMöt devices can improve a patients' IUI treatment prognosis** at the onset of their infertility journey, offering the greatest chance of success with the lowest risk treatment option.



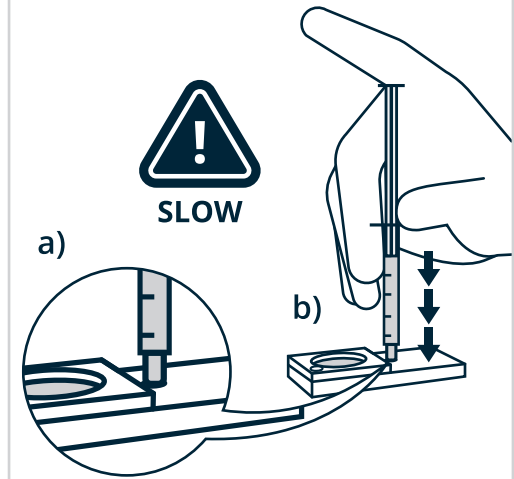
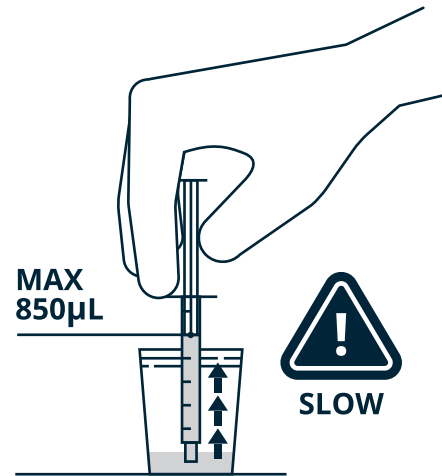
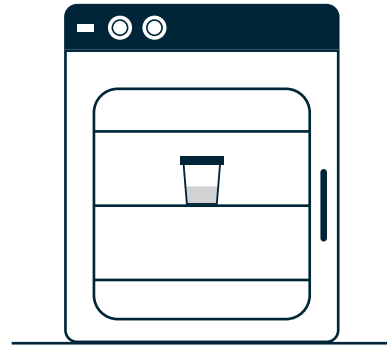
The ZyMöt Multi (850µL) device accepts 850µL of raw semen input, and yields a final sample volume of 500µL — directly suitable for IUI procedures. No centrifugation is required.

## Simple to Adopt. Easy to Use.

FDA-cleared, CE-certified and available worldwide, ZyMöt Sperm Separation Devices efficiently isolate the healthiest, rapidly progressive sperm, to help achieve outcomes that matter.<sup>5</sup> Minimal training is required, with simple, standardized procedures that help users quickly achieve optimal performance. **ZyMöt Sperm Separation Devices are a better way to prepare sperm. It's that simple.** Learn more at [zymotfertility.com](http://zymotfertility.com).

## References

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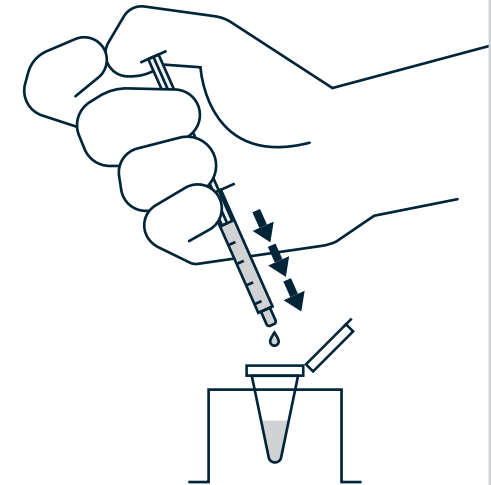
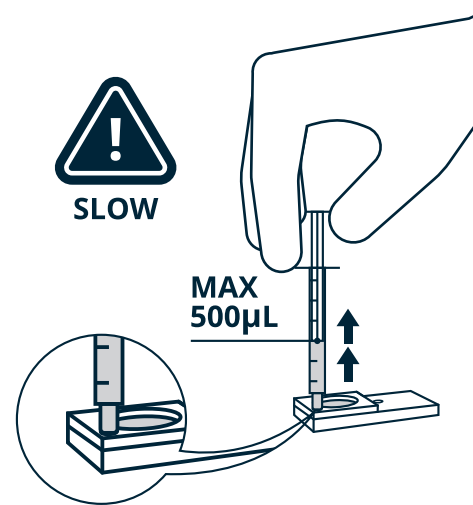
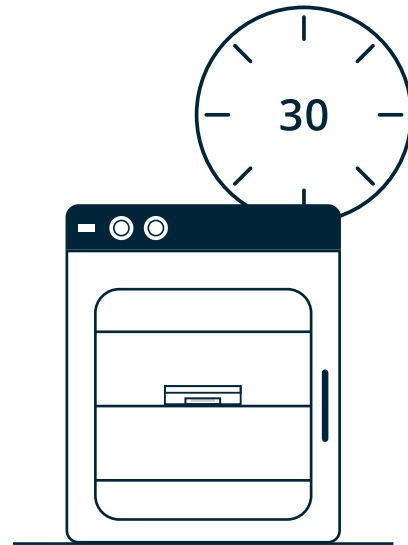
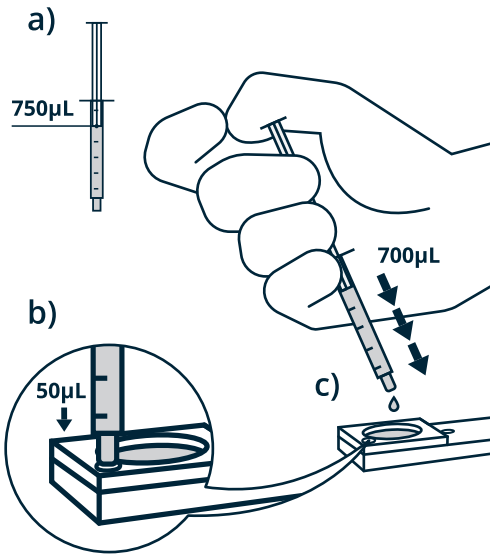


## INSTRUCTIONS FOR USE

**1.** Allow sample to liquefy.

**2.** Draw 850µL of the sample.

**3.** a) Achieve seal.  
b) Slowly inject sample.



**4.** a) Draw 750µL of media.  
b) Prime outlet channel.  
c) Cover membrane.

**5.** Incubate at 37°C for 30 minutes.

**6.** Slowly aspirate a maximum of 500µL.

**7.** Transfer the collected material for later use.