# SPERM SELECTION BY MICROFLUIDICS: COMPARATIVE ANALYSIS BETWEEN ZYMOT ® AND LEENSHOKE®

Amandia Ramos Batschauer, Triamare, Curitiba – PR, amandiaembrio@triamare.com.br;
Gabriella Mendes Neves, Triamare, Curitiba – PR, gabriellamneves@gmail.com
Eduarda Rocha Bauer, Triamare, Curitiba – PR, eduarda_rochab@hotmail.com;
Yasmin Cristine Michelino, Triamare, Curitiba – PR, michelinoyas@gmail.com
Lorenna Brito Del Vecchio,Triamare, Curitiba – PR,britodelvecchilo@gmail.com

## Objective

To compare the effectiveness of different microfluidic devices, Zymot® and Leenshoke®, in sperm sample selection, evaluating their separation and cell enrichment mechanisms, with emphasis on the sperm quality parameters obtained motility, concentration, and morphology of the sample.

## Conclusion

Semen processing using microfluidic devices significantly improved sperm parameters compared to the fresh sample. Both Zymot® and LeensHoke® substantially increased progressive motility and completely eliminated immotile spermatozoa, although LeensHoke® demonstrated greater efficiency in cellular recovery. Although microfluidic protocols do not specifically aim to improve sperm morphology, an increase in the proportion of morphologically normal spermatozoa was observed, with 20% for Zymot® and 30% for LeensHoke®, compared to 12% in the fresh sample. These findings indicate that the use of microfluidic technologies can optimize sperm quality, potentially enhancing outcomes in assisted reproduction procedures.

## Methods

A semen sample obtained after 2 days of sexual abstinence was used, with a total volume of 3,5 mL, presenting parameters within the reference range for motility, concentration, and sperm morphology according to the World Health Organization (WHO, 2021). The sample was homogenized and divided into three aliquots of 1 mL each: (i) fresh analysis, (ii) processing using the microfluidic device Zymot®, and (iii) processing using the microfluidic device Leenshoke®. Both microfluidic techniques were conducted according to the specific protocols of each manufacturer, using MHM culture medium previously heated to 37 °C. The devices were kept in the incubator at 37 °C for 30 minutes. After processing, progressive motility, concentration, and sperm morphology were again evaluated. The results obtained after processing in each microfluidic device were compared to the fresh state, considering the recovery rate of motility, concentration, and morphological quality.

## Results

| Parameter | Fresh Semen (i) | ZyMot® (ii) | LeensHoke® (iii) |
|---|---|---|---|
| Progressive Motility (A+B) | 39% | 90% | 96% |
| Immotile Sperm (D) | 31% | 0% | 0% |
| Concentration ($\times 10^6$/mL) | 100 | 5 | 8 |
| Normal Morphology (% of 100 cells) | 12% | 20% | 30% |