



About 2–4 percent of births include the use of assisted reproductive techniques (ART) especially in developed countries. Semen samples must be processed prior to insemination.

Distinctively, these sperm preparation methods seek to recreate the natural process via *in vitro* wherein feasible sperms are separated from other components of the ejaculate as they actively migrate through the cervical mucus.

There are various sperm preparation and selection techniques used to process sperm for use with the assisted reproductive technique. This includes the **swim-up method and density gradient centrifugation**.

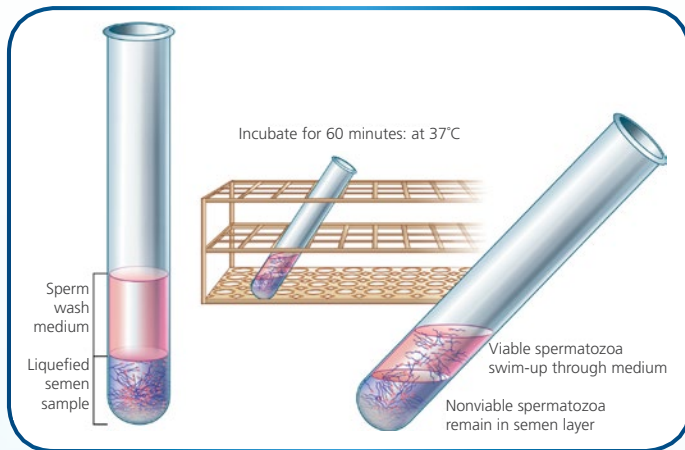


Figure 1. The swim-up technique (Beydola et al., 2013)

One of the most commonly used techniques for sperm preparation is the pellet swim-up or PSU method. This can be performed using a cell pellet or a liquefied semen sample. First, the semen aliquot is diluted in a 1:2 ratio with the sperm preparation medium and centrifuged for 10 minutes at 1,500 rpm. Then, the supernatant is dispensed and 1 mL of fresh culture medium is layered above the pellet. The tube was incubated again for 1 h (37°C, 6% CO₂) and the supernatant is aspirated and transferred into an empty tube.

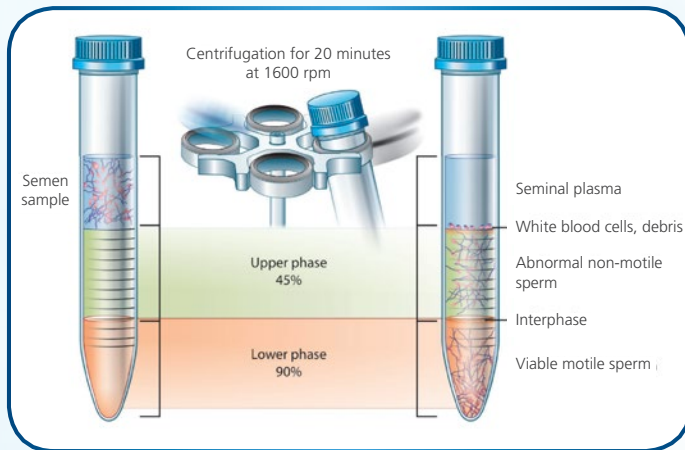


Figure 2. Density gradient centrifugation (Beydola et al., 2013)

In density gradient centrifugation or DGC, the lower and upper gradients are thoroughly layered while the seminal ejaculate is layered on the top. The sample is centrifuged for 20 minutes at 1,600 rpm. The uppermost part of the gradient is the clear seminal plasma, followed by a clear separation of white blood cells, debris, and other cells. The immature, abnormal sperm are seen along the gradient based on their motility and density. Highly motile normal sperm move actively to the bottom of the gradient and collected as a pellet.

Using a steadfast centrifuge dedicated to sperm enrichment is vital for successful *in vitro* fertilization. **Esco Versati™ Centrifuges** are designed to prepare samples in the best conditions for a satisfactory result.

CHOOSING ESCO'S CENTRIFUGE FOR YOUR IVF LABORATORY IS THE BEST CALL.



References:

- [1] Beydola, T., Sharma, R., and Agarwal, A. (2013). Sperm Preparation and Selection Techniques. http://www.ccf.org/reproductiveresearchcenter/info/2010/Beydola-T_Sharma-RK-2013.pdf
- [2] Volpes, A., Sammartano, F., Rizzari, S., Gullo, S., Marino, A., and Allegra, A. (2016). The pellet swim-up is the best technique for sperm preparation during in vitro fertilization procedures. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4889479/>

