

# SpermXpression®

## Advanced male infertility diagnosis

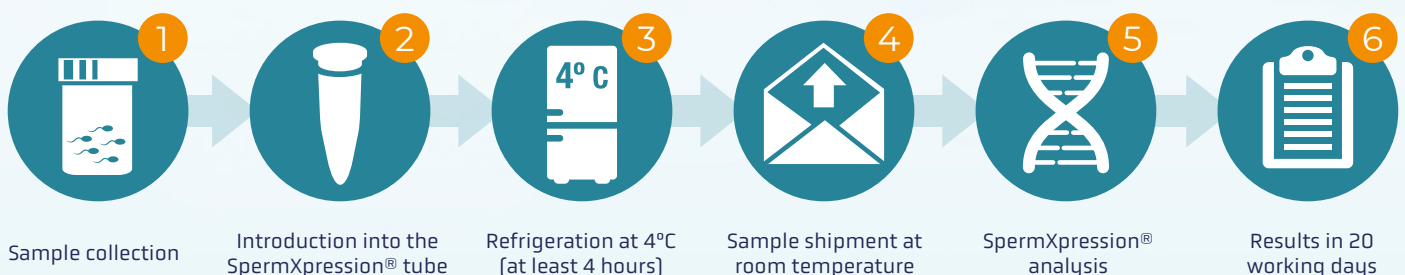


SpermXpression® allows identifying sperm alterations that are not detected in the conventional spermiogram



Male infertility is one of the main causes of infertility in couples, responsible for up to 50% of cases. A man may be completely healthy but produce poor-quality sperm. Sperm analysis is the most important test for assessing male fertility. Conventional semen analyses include the determination of the concentration, motility and morphology of sperm in a sample. These parameters are important but there are many other factors that could influence sperm competence and that are not routinely evaluated.

### The process





## Protamines

Human sperm carry the paternal genetic material, which must be properly packaged to preserve its integrity on the journey to the egg. Sperm DNA is uniquely protected in nature by proteins that uniquely compact it. These essential proteins are called protamines and are unique to sperm, not present in any other cell type, and are responsible both for packaging and protecting the paternal genome and for controlling its expression in the early stages of embryonic development.

Human sperm express two types of protamines called protamine 1 (PRM1) and protamine 2 (PRM2), both of which are essential for sperm function. The relative ratio of PRM1 and PRM2 is regulated at approximately a 1:1 ratio. Alterations in this ratio are rare in fertile men but common in infertile men and have been linked to poor sperm quality, increased DNA damage and decreased fertility. Several studies have proposed that analysis of protamine gene expression in human sperm could be used as a biomarker for the diagnosis of male infertility in the clinical setting<sup>1-3</sup>.

## SpermXpression® test description

SpermXpression® is a molecular tool that helps to determine whether a sperm sample has a normal or altered PRM1/PRM2 gene expression profile. This diagnostic method can detect some cases of male infertility and could help to improve the results of assisted reproduction treatments. Patients with an abnormal PRM1/PRM2 ratio generally have decreased sperm quality, lower fertilization capacity, and lower pregnancy rates when undergoing in vitro fertilization.

## Benefits & value-added

Advanced semen analysis allows the identification of alterations in sperm competence that are not detected with conventional semen analysis. This analysis improves the diagnosis of the infertile couple and the selection of the most appropriate therapeutic and treatment strategies for the couple, increasing their chances of pregnancy. The results of this test can help in the decision to perform In Vitro Fertilisation (IVF) or sperm microinjection (ICSI) as a fertilisation strategy, in the consideration of testicular sperm retrieval by testicular sperm aspiration (TESA) or testicular sperm extraction (TESE), or in the assessment of the need to opt for the use of donated sperm.

## Indications

Any patient undergoing assisted reproduction treatment can benefit from the detailed study of sperm competence by means of SpermXpression®. This test is recommended for patients who have experienced failed in vitro fertilization cycles, with low fertilization rates or reduced blastocyst development rates.

## Process details

In order to determine the ratio of PRM1/PRM2 protamine expression, the expression of human protamine 1 and 2 genes is analysed in a seminal sample using high-throughput quantitative PCR. In this way we can estimate whether or not the ratio of these two proteins is within normal values, thus establishing a possible influence of this parameter on male fertility.

1. J. Sarasa, M. Enciso, L. García, A. Leza, K. Steger, J. Aizpurua. Asian J Androl. 2020; 22(6): 623–628.
2. N. Rogenhofer, T. Dansranjavin, M. Schorsch, A. Spiess, H. Wang, et al. Hum Reprod 2013; 28: 969–78.
3. K. Steger, M.C.O. Cavalcanti, HC Schuppe. Int J Androl 2011; 36: 513–27.

