

SpermXpression[®]

Advanced male infertility diagnosis

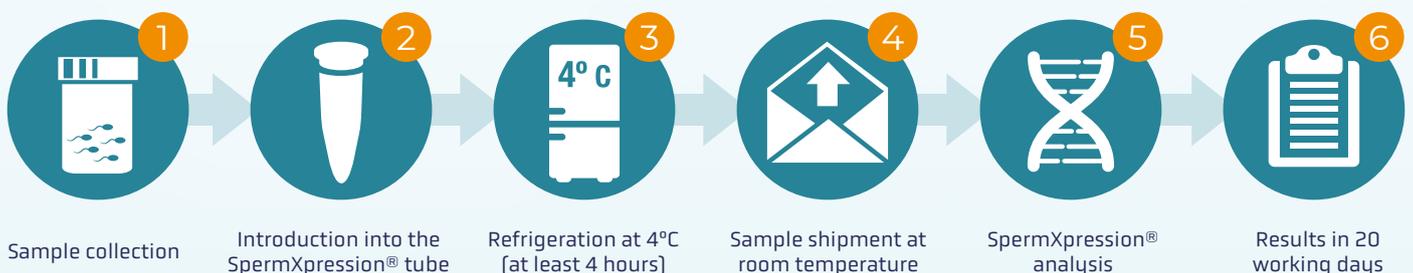


SpermXpression[®] allows identifying sperm alterations that are not detected in the conventional spermogram



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

Human spermatozoa express two types of protamines called protamine 1 (PRM1) and protamine 2 (PRM2), and both are essential for sperm function. The relative ratio of PRM1 to PRM2 is regulated at approximately a 1:1 ratio at the mRNA and protein level. Alterations in this proportion 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 the analysis of protamines gene expression in spermatozoa could be used as a biomarker for the diagnosis of male infertility in the clinical setting¹⁻³.

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 sperm analysis allows to identify alterations in sperm competence that are not detected with conventional spermiogram. This analysis improves the diagnosis of the infertile couple and the selection of therapeutic and treatment strategies more suitable for the couple. The results of this test may assist in the decision to perform in-vitro fertilization (IVF) or Intracytoplasmic Sperm Injection (ICSI) as a fertilization strategy, in the consideration of the recovery of sperm from the testicle by a Testicular Sperm Aspiration (TESA) or a Testicular Sperm Extraction (TESE), or in the assessment of the need to opt for the use of donor's 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

For the determination of the mRNA ratio of protamines PRM1/PRM2, the analysis of the expression of protamine 1 and 2 genes using quantitative PCR in a sperm sample is performed. In this way, whether or not the proportion of these two proteins is within normal values is estimated, thus establishing a possible influence of this parameter on male fertility.

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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.

