

Nidacon News

The newsletter from your ART supplier • Fall • 2025

Egg cells may hold the key to repairing damaged sperm DNA

A recent review published in Reproductive BioMedicine Online explores a fascinating and vital aspect of human reproduction: the ability of oocytes to repair fragmented sperm DNA. This process is emerging as a critical factor in determining embryo viability and successful fertilization outcomes.

Unlike most cells, mature sperm lack the internal machinery to repair their own DNA. Their tightly packed chromatin and streamlined structure make them efficient carriers of genetic material – but vulnerable to damage. When sperm DNA is fragmented, the burden of repair falls entirely on the oocyte during fertilization.

The study highlights that oocytes are equipped with robust DNA repair systems, including nucleotide excision repair and other pathways, which are most active before fertilization. These mechanisms allow the egg to correct damage in the sperm genome, ensuring proper embryonic development. However, the efficiency of this repair process is closely tied to maternal age. Younger oocytes are significantly better at repairing DNA damage, while aging eggs show reduced repair capacity, which may contribute to lower fertility rates and higher risks of miscarriage or developmental issues.

This research underscores the importance of oocyte quality in assisted reproduction and natural conception alike.

Importantly, the oocyte's repair role continues until the embryo activates its own genome – a milestone known as embryonic genome activation. Until then, the egg's ability to maintain genetic integrity is essential for healthy development.

This research underscores the importance of oocyte quality in assisted reproduction and natural conception alike. It suggests that strategies aimed at preserving or enhancing egg health – especially in older patients – could improve outcomes for couples facing male-factor infertility. It also reframes the conversation around sperm DNA fragmentation, showing that

its impact depends not only on the extent of damage but also on the egg's ability to repair it.

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its impact depends not only on the extent of damage but also on the egg's ability to repair it.

In the broader context of fertility science, this review adds a compelling layer to our understanding of how both gametes contribute to reproductive success – and why maternal age remains a pivotal factor in the equation.

Martin, Angel. "Oocyte-Mediated Repair of Sperm DNA Fragmentation: A Critical Determinant of Embryo Viability." Reproductive BioMedicine Online, vol. 61, 2025



NidOil – improved quality assurance

NidOil is a paraffin oil overlay designed with gametes and embryos in mind.

Some procedures for IVF and ICSI use oil overlays to protect small volumes of culture medium from evaporation and the effects of sudden changes in temperature, gas saturation, and pH. NidOil is tested for sterility and toxin levels to ensure a high-quality oil overlay. Our latest update includes the addition of a Day 6 Mouse Embryo Assay to further strengthen our quality control.

Mouse Embryo Assay (MEA)

Mouse embryos are extremely sensitive to toxic agents and suboptimal conditions, making them an effective biological indicator for detecting contaminants in IVF products. The assay evaluates the actual biological effect of a product on embryo development. This is more relevant than purely chemical or physical testing because it directly mirrors the conditions under which human embryos are cultured during IVF.

Despite species differences, the findings from MEAs are generally predictive of how products will perform with human embryos. If a product supports mouse embryo development to the blastocyst stage, it is highly likely to be safe and effective for human embryo culture. Many regulatory and professional



guidelines in assisted reproduction endorse MEAs as a critical component of quality assurance for IVF products.

Compliance with these standards ensures that laboratories meet high safety and performance benchmarks. In the MEA, mouse embryos are exposed to oil and cultured in vitro for 5-6 days. At least 80% of the embryos must reach the expanded blastocyst stage and pass a strict daily visual examination of morphological quality.

The MEA tests are performed at an external and independent laboratory with long experience that provides quality control (QC) services specifically designed to detect toxicity in all types of materials, culture media, products or equipment used routinely in IVF laboratories.

Day 6 (extended MEA)

Additional information regarding MEA results on day 6 is provided on the Quality Assurance certificates for Nidoil. Day 6 (extended MEA) results offer an extra layer of safety assessment, enhancing our ability to detect potential toxicity and ensuring the highest product standards.

Why should one use NidOil?

- Easy to use and handle in the laboratory
- Long shelf-life of two years
- Same shelf- life after opening
- Storage and transportation in room temperature
- Packaging in amber bottles for light protection to prevent any light-induced changes (there have been several reports of paraffin oils becoming embryo-toxic after exposure to light on the laboratory bench).

Ainsworth AJ, Fredrickson JR, Morbeck DE. Improved detection of mineral oil toxicity using an extended mouse embryo assay. J Assist Reprod Genet. 2017 Mar;34(3):391-397.

HPV effects on sperm and semen health

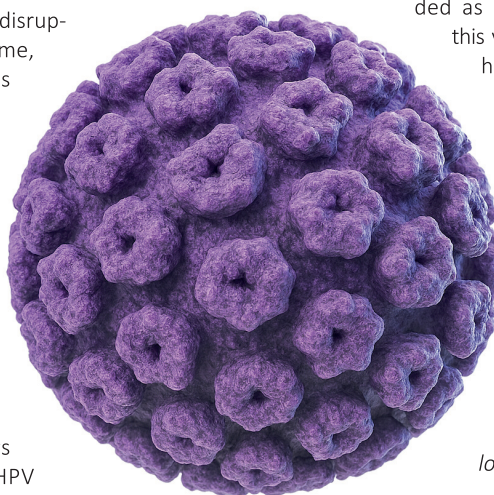
Researchers from Argentina have found strains of HPV which put people at high risk of cancer are associated with a greater percentage of dead sperm.

In semen samples from those with high-risk strains, scientists noticed a lower count of white blood cells and an elevation of reactive oxygen species, which can damage sperm and alter DNA. Samples from those with low-risk HPV did not show the same correlations. The findings align with previous findings linking HPV to lower sperm count and reduced motility and viability, indicating an insidious impact on male fertility.

HPV is known to cause cancer in the penis, anus, mouth, and throat of male patients. Its DNA can be detected at these sites with the right diagnostic tools. WHO recommends routine vaccination for all children, but only one-third of countries include boys. In 2019, just 4% of boys worldwide had completed the vaccine series, compared to 15% of girls.

New research from Argentina found that nearly 20% of unvaccinated men tested positive for HPV, with several carrying high-risk strains. Compared to HPV-negative men, those with high-risk HPV showed increased sperm death and DNA damage – changes missed by standard semen analysis. Researchers suggest oxidative stress and immune disruption may be to blame, raising concerns about HPV's impact on fertility and offspring health.

Cervical cancer cases have dropped – by almost 90 percent in the UK – thanks to the HPV vaccine, but throat and penile cancers associated with HPV are on the rise.



In 2021, two public health scientists from Uppsala University in Sweden argued that vaccinating everyone against HPV, regardless of their sex, "is the only way" to eradicate this all too common infection and its long-term health consequences.

If HPV continues to be primarily regarded as a "woman's problem", this virus may forever wreak havoc on both male and female fertility.

Rojas-Barón, María del Rosario, et al. "Toxoplasma gondii Interacts with Human Sperm and Induces Morphological Damage: Implications for Male Fertility." Frontiers in Cellular and Infection Microbiology, vol. 14, 2024.

How long can I use the product after opening?

All Nidacon products can be used up until the shelf-life date printed on the bottle – even after opening – provided they are stored correctly.



For example, if you have a bottle of PureSperm100 with a shelf-life marked as 17 Jan 2025, you may open the bottle, store it in the refrigerator, and continue using it until the 17th of January 2025. It is essential to follow aseptic procedures when handling the bottle to maintain product integrity.

How are the products so stable?

All ingredients in Nidacon products are carefully selected for their temperature tolerance and long-term stability in aqueous solutions. Extensive shelf-life testing – both before and after opening – has been conducted to ensure that the theoretical stability of the salt formulations is reflected in the actual performance of the final product.

Important exception: SpermVitalStain (SVS) is an exception to this standard since it is a diagnostic product. Please refer to specific instructions for SVS regarding its use after opening.

Ancient amber reveals oldest known sperm – A 100-million-year-old reproductive marvel

In a groundbreaking discovery, scientists have identified the oldest known sperm ever found – preserved inside a female ostracod encased in Burmese amber dating back approximately 100 million years.

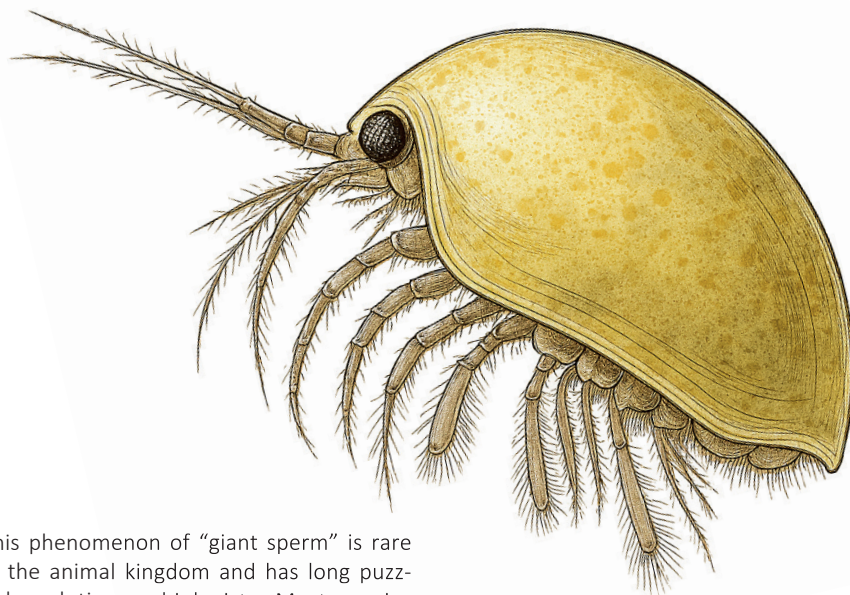
The specimen was found with mature sperm still stored in her reproductive tract, suggesting she had mated shortly before being trapped in tree resin that later fossilized into amber.

What they found was astonishing: not only was the sperm intact, but it was also unusually large – measuring around 200 micrometers. For comparison, ostracods (a small crustacean) are only a few tenths of a millimeter long, making their sperm disproportionately massive.

adaptations that existed even during the Cretaceous period. As one researcher noted, the find provides “unprecedented insights into an unexpectedly ancient and advanced instance of evolutionary specialization.”

For those in the reproductive sciences, this fossilized moment in time is more than a curiosity – it’s a reminder of how diverse and inventive nature can be when it comes to reproduction.

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This phenomenon of “giant sperm” is rare in the animal kingdom and has long puzzled evolutionary biologists. Most species produce small, numerous sperm cells, but ostracods appear to have evolved a different strategy – investing in fewer, but much larger sperm. Researchers believe this may represent an evolutionarily stable reproductive tactic, possibly linked to sperm competition or fertilization efficiency.

The discovery offers a rare glimpse into the reproductive biology of ancient organisms and highlights the complexity of evolutionary

Wang, He, et al. “A New Species of Ostracod with Exceptionally Preserved Giant Sperm from the Cretaceous.” *Proceedings of the Royal Society B: Biological Sciences*, vol. 287, no. 1935, 2020

Meet our new Product Manager – Frida Molin

I joined Nidacon in 2025 as human product manager, with my heart still in the lab.



My background as an embryologist and biomedical scientist has given me a deep understanding of both the people behind the fertility treatment and the science that makes it possible.

What drives me is developing solutions that truly make a difference – and sharing them with clinics and teams working to help more people build the families they dream of.

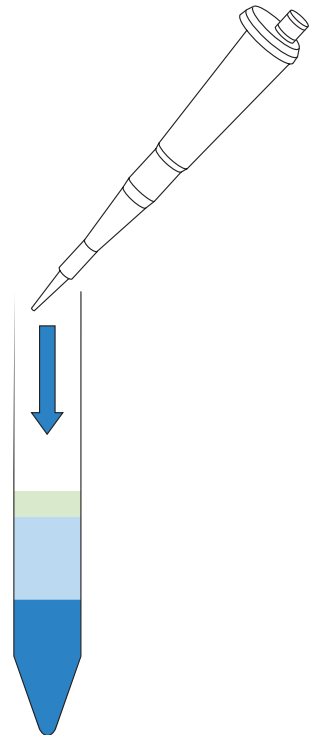
Precision matters: How gradient preparation determines your results

All solutions at room temperature.

- Prepare the gradient using 2 mL layers.
- Prepare the gradient no more than 30 minutes before use to prevent the layers from mixing.
- Avoid overloading – do not exceed the recommended 1.5 mL of sample.
- Follow the recommended centrifugation settings: 300 g for 20 minutes.
- Retrieve the pellet immediately after centrifugation stops.
- Wash the pellet using PureSperm Wash (a hSA containing medium): 500g for 10 minutes.

Using uneven layers, or overloading the gradient can lead to blockage, spermatozoa aggregation and rafting. These issues may reduce the yield and number of motile sperm after preparation.

By following our recommended techniques, you can ensure high quality preparation of motile sperm.



Coming up



Svenska Sällskapet för Reproduktionsmedicin
Swedish Society for Reproductive Medicine

■ **SSRM Swedish Society for Reproductive Medicine**
16-17 April 2026, Linköping, Sweden

Who to contact



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