

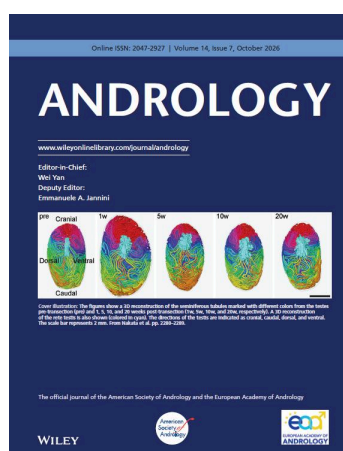


Literature alert

September 2026

The recent 14th European Congress of Andrology (ECA) held in beautiful Modena (16–18 Sept 2026) provided a fantastic review of the latest findings in our field of biomedicine. Hopefully, you have already digested the load of data and are ready for more “andro-information”, including the latest issue of our journal *Andrology*. Keywords for this edition: semen quality trends, fertility preservation in young cancer survivors and Klinefelter adolescents, free testosterone, sperm DNA fragmentation, prostate cancer guidelines, retroperitoneal lymph node dissection, management of older transgenders, piRNA defects in infertile men, impact of lifestyle and endocrine disrupters on the testis function, blood-testis-barrier, epididymis organoids, a new atlas of gene regulation in normal and impaired human spermatogenesis, transcriptomics from paraffin-embedded tissue, and more.

The latest issue of *Andrology*



The October issue (v. 14, i. 7) is worth browsing back-to-back, as always. Some of the articles were previously highlighted in our alerts, including the latest **EAA Clinical Practice Guidelines on Testicular Biopsies**, now available as the final publication

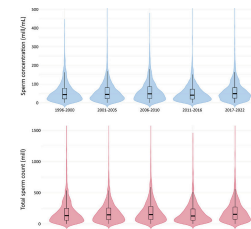
(doi.org/10.1111/andr.70300). The **Editors' picks** are:

- **Clinical:** Lei L *et al.* *Impact of Sperm Retrieval Yield and Freezing on ICSI Outcomes in Non-Obstructive Azoospermia: A Retrospective Study of 1394 Micro-TESE Cycles.* doi.org/10.1111/andr.70180
- **Basic:** Yuan S. *et al.* *Peroxisome Proliferator-Activated Receptor-γ Involved in Spermatogenesis by Affecting Oxidative Stress and Ferroptosis* <https://doi.org/10.1111/andr.7022>

The contents of the October 2026 issue: onlinelibrary.wiley.com/toc/20472927/2026/14/7?campaign=woletoc

Clinical andrology and epidemiology

The prospective Danish surveillance program of reproductive function in young men from the general population, showed low but stable semen quality over the latest three decades, concomitantly with a plateau in testicular cancer incidence. A modest improvement in semen quality was observed in recent years, likely reflecting favourable changes in environmental exposures or lifestyle factors.



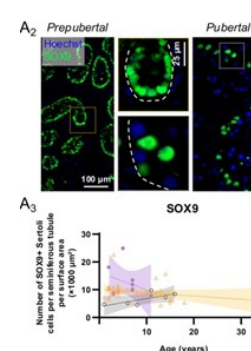
Priskorn L, Baslund-Storch C, *et al.* et Andersson AM, Jensen TK, Juul A, Jørgensen N. Marginal changes in semen quality over three decades (1996–2022) among 8320 men in the Danish Young Men Study (DYMS): Cohort profile and trends. **Andrology**. 2026 Sep 12. doi.org/10.1111/andr.70383

Free hormone hypothesis (FHH) posits that free testosterone (T), not bound to SHBG, activates intracellular signalling. This small study examined men with greatly elevated SHBG levels and primary hypogonadism, who had marked divergence in total and free T concentrations. In these men, low free T was associated with elevated gonadotropins, even when total T was within the reference range, consistent with the primacy of free T over total T in the hypothalamic-pituitary-testicular feedback loop.



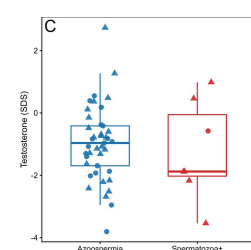
Gagliano-Jucá T, Puri I, Ramirez-Rivera G, Shekhar S, Valderrábano RJ, Goldman AL, Memish-Beleva Y, Weiss M, Shang YV, Pencina KM, Jasuja R, Bhasin S. Hormonal profiles of men with highly elevated SHBG and primary testicular dysfunction support free hormone hypothesis. **J Endocr Soc**. 2026 Aug 12; 10(Sept):bvag185. [10.1210/jendso/bvag185](https://doi.org/10.1210/jendso/bvag185)

This study analysed testis tissue samples from boys and male adolescents treated with chemotherapy and assessed the density and maturity status of testicular somatic cells. Numerous alterations in immunohistochemical markers of somatic cell density and maturation (incl. SOX9, COUP-TFII, CYP11A1, INSL3) were identified.



Rousseau V, Rives N, Basille-Dugay M, Neusius C, Fraissinet F, Chemin E, Dufour M, Dupuis H, Rondanino C, Feraille A, Dumont L. Impact of chemotherapy received prior to testicular tissue cryopreservation on somatic cells from prepubertal to postpubertal males. **Hum Reprod**. 2026 Aug 23:deag135. doi.org/10.1093/humrep/deag135

The conundrum of fertility preservation in adolescents with Klinefelter Syndrome (KS) was addressed in this study. Neither biochemical nor clinical parameters could reliably predict the presence of spermatozoa in the ejaculate, which in this series were found in 14.6% adolescents with KS. This highlights the need for age-appropriate fertility counselling that balances emotional readiness with realistic expectations.



Larsen CN, Fritzboøger AFØ, Winge SB, Jørgensen N, Juul A, Aksglaede L. Prevalence of Spermatozoa in the Ejaculate of Adolescents with Klinefelter Syndrome: Implications for Fertility Counseling. **Andrology**. 2026 Aug 31. doi.org/10.1111/andr.70325

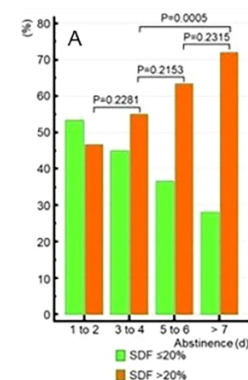
More and more transgender people enter older age. In the latest edition of the JCEM's "Approach to the Patient" series, illustrative cases are presented with advice how to deal with them in the context of gender-affirming hormone therapy concurrent with age-associated diseases, e.g. prostate cancer in a woman, menopause in a man or the risk of cardiovascular disease.



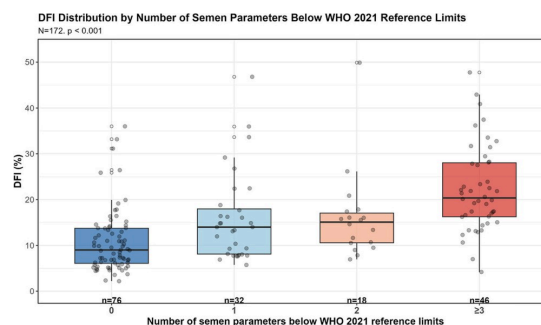
Rothman MS, van Heesewijk JO, Ariel D, Iwamoto SJ. Approach to the patient: cases of hormonal management in older transgender and gender diverse adults. **J Clin Endocrinol Metab**. 2026 Sep 16;111(10):e2281-e2289. doi.org/10.1210/clinem/dgag231

In this retrospective study from the EAA centre in Doha (Qatar), a threshold of abstinence for the diagnostic use of tests for sperm DNA fragmentation (SDF, HaloSperm) and oxidative stress (MiOXSYS) was investigated in 2782 patients. Results showed significant trends of higher SDF and oxidative stress with longer periods of abstinence. The authors recommend a maximum of 4 days of abstinence when tests for SDF and oxidative stress are performed.

Henkel R, Arafa M, Majzoub A, El Bardisi H, Das M. Association of sperm DNA fragmentation with abstinence duration, seminal oxidative stress and age: a call to consider abstinence in andrological diagnostics. *Front. Urol.* 2026, 6:1926391. doi.org/10.3389/fruro.2026.1926391



This study investigated associations between sperm DNA fragmentation index (DFI), clinical characteristics, and lifestyle factors in comparison with conventional semen parameters in a large series of men from infertile couples and controls. DFI largely paralleled conventional semen parameters and should not be interpreted as a stand-alone marker, although it may provide complementary information in male infertility evaluation.



Adams LHM, Priskorn L, Arce JC, Aasted H, Carlsen E, Al-Najaar RB, Juul A, Jørgensen N. Associations Between Sperm DNA Fragmentation and Lifestyle Factors. *Andrology.* 2026 Aug 27. <https://doi.org/10.1111/andr.70354>

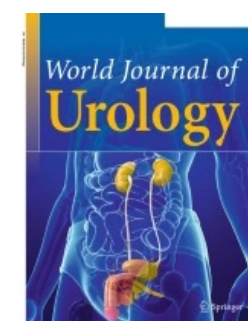
The latest updates of clinical guidelines on prostate cancer management prepared by several societies have been published. Especially the part I is of relevance for andrologists.

Cornford P, *et al.* (Part I) and Tilki *et al.* (Part II). EAU-EANM-ESTRO-ESUR-ISUP-SIOG Guidelines on Prostate Cancer—2026 Update. Part I: Screening, Diagnosis, and Local Treatment with Curative Intent, and Part II: Treatment of Relapsing and Metastatic Prostate Cancer. *Eur Urol*, 2026; 90, 254-269, and 270-290.



This large multicenter study compared open versus robotic post-chemotherapy retroperitoneal lymph node dissection (PC-RPLND) in patients with testicular cancer. Providing that the patients are correctly diagnosed and selected, and the surgeons have sufficient experience, robotic PC-RPLND - compared to the open approach - offers low morbidity and improved perioperative outcomes while maintaining the similar oncological outcomes.

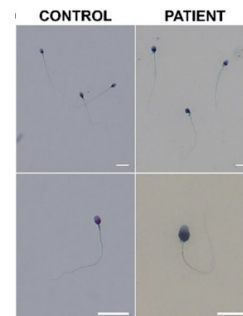
Chavarriaga J, Ghoreifi A, *et al.* et, Ward JF, Jewett M, Djaladat H, Hamilton RJ. Robotic versus open post-chemotherapy retroperitoneal lymph node dissection: a propensity score matched study across 11 academic medical centers. *World J Urol.* 2026 Aug 28;44(1):612. <https://doi.org/10.1007/s00345-026-06621-9>



Androgenetics

In a patient with teratozoospermia, including macrocephalia, the genetic analysis revealed a high proportion of spermatozoa with 23 chromosomes (2c DNA content), consistent with sister chromatid non-disjunction during meiosis II. WES identified a homozygous missense variation in *CCNA1*, essential for meiotic progression and chromatin remodeling in male germ cells. Genetic screening panels for teratozoospermia ought to include *CCNA1*.

Perrin A, Morel F, *et al et*, Ray PF, Coutton C, Martinez G. A *CCNA1* Missense Variant Associated With Chromatid Non-Disjunction in Abnormal-Headed Sperm and Male Infertility. **Andrology**. 2026 Sep 16. doi.org/10.1111/andr.70387



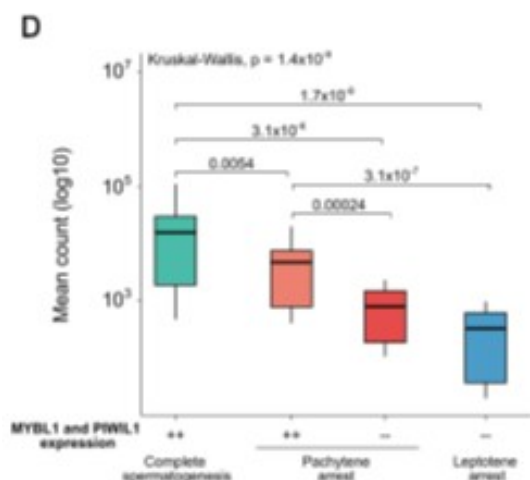
This study identified eight variants in PET (PIWI-EXD1-TDRD12) complex encoding genes *TDRD12* and *EXD1* in three infertile patients. Notably, *TDRD12* mRNA was absent in three NOA patients, spermatogenesis was arrested at zygotene stage, and piRNA biogenesis was disrupted.

Zhang B, Ma A, *et al. et* Zhao X, Sun F. Pathogenic Variants in PET Complex Encoding Genes *TDRD12* and *EXD1* Impair piRNA Biogenesis and Cause Male Infertility. **Hum Mutat**. 2026 Aug 21;2026:7629729. doi.org/10.1155/humu/7629729



Translational and basic andrology

Defects in the PIWI-interacting RNA (piRNA) pathway can cause nonobstructive azoospermia. This study combined small RNA sequencing with immunohistochemistry for MYBL1 and PIWIL1 in testis biopsies from patients with spermatogenic arrest. The data showed that PIWIL1 expression and pachytene piRNAs were lost in half of the cases of spermatogenic arrest, indicating that the piRNA processing is a key pathway in human spermatogenesis.



Saritas G, Winge SB, Sørensen LH, Riera M, Schierup MH, Mørup N, Almstrup K. Arrest of human spermatogenesis at the pachytene stage is frequently accompanied by disruption of the piRNA pathway. **Cell Death Discov**. (3 Sept. 2026). doi.org/10.1038/s41420-026-03327-0

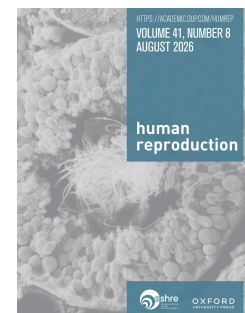
This preliminary proof-of-concept study profiled cell-free (cf) RNA in human seminal plasma from >300 Chinese individuals with various sperm abnormalities, azoospermia, and 100 controls. The study showed a strong association of seminal cfRNA with semen parameters and ART outcome, suggesting that piRNA abnormalities are a hallmark of spermatogenic impairment.

Zhou Q, Jiang Y, *et al. et* Liu R, Wang WJ, Zhang H. Comprehensive profiling of cell-free RNA in seminal plasma reveals functional links to spermatogenic impairment. **Clin Transl Med**. 2026 Sep;16(9):e70788. doi.org/10.1002/ctm2.70788

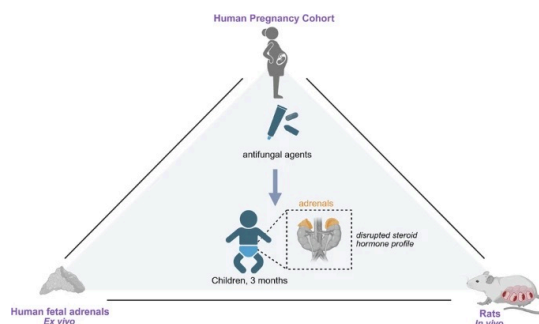


The authors investigated in the mouse model the reproductive phenotype of the *M1ap* ablation, and possible effects of lifestyle factors. They found that the loss of M1AP and a “Western-style” diet (21% fat, 34.1% sugar, 19% protein) separately led to subfertility in male mice, and in combination subfertility was worsened. The study highlighted that genetic and lifestyle factors can interact to exacerbate testis function and male fertility.

Houston BJ, Nguyen J, Rotte N, Tüttelmann F, Friedrich C, Merriner DJ, O'Connor AE, O'Bryan MK, Dunleavy JEM. A Western-style diet exacerbates male infertility in *M1ap* knockout mice. ***Hum Reprod***. 2026 Aug 31:deag130. doi.org/10.1093/humrep/deag130



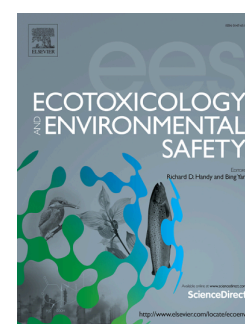
This translational study integrated data on maternal antifungal use during pregnancy from a human mother-child cohort with evidence from in vivo gestationally exposed rats and an ex vivo human fetal adrenal model to demonstrate that prenatal exposure to topical antifungal agents persistently alters circulating steroid hormone levels in infants. The safety of topical azole use during pregnancy may warrant re-evaluation.



Mola G, Draskau MK, Jørgensen A, Chalmel F, Melau C, Evrard B, Mandrup K, Hegaard H, Hueg TK, Frederiksen H, Flück CE, Andersson AM, Juul A, Almstrup K, Fischer MB, Svingen T, Hagen CP. Prenatal antifungal exposure disrupts fetal steroidogenesis and is associated with persistent effects in children. ***Commun Med*** 2026 Jul 31;6(1):473. <https://doi.org/10.1038/s43856-026-01815-z>

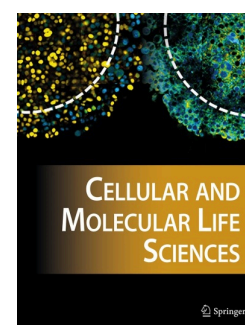
Thyroid hormone (TH) signaling is critical for normal testis development and is vulnerable to several environmental endocrine disrupters. This experimental study identified a shared transcriptomic signature across different thyroperoxidase (TPO)-inhibitors in rat testicles during development. TH-mediated molecular profile aligned with morphological phenotype.

Strand IW, Draskau MK, Axelstad M, Evrard B, Elmelund E, Pedersen M, Crispulli S, Chalmel F, Svingen T. Comparative transcriptomics reveals a core molecular signature of hypothyroid testis development across three TPO inhibitors. ***Ecotoxicol Environ Saf***. 2026 Sep 16;324:120797. [10.1016/j.ecoenv.2026.120797](https://doi.org/10.1016/j.ecoenv.2026.120797)



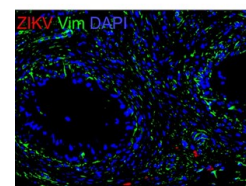
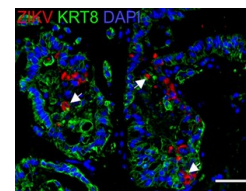
A-kinase anchor protein 12 (AKAP12) plays a critical role in various biological barriers, so this study looked for its role in blood-testis barrier (BTB). The study showed that Sertoli cell-specific Akap12-deficient male mice had markedly reduced fertility following Bisphenol F (BPAF) exposure. Mechanistically, AKAP12 protects against BPAF-induced male fertility impairment by sequestering Src kinase, preserving tight junction integrity, and maintaining the BTB.

Bao, M., Guo, S., Xue, D. *et al.* et Chen L. AKAP12 maintains blood-testis barrier integrity and resists BPAF-induced male fertility impairment by inhibiting Src-mediated ZO-1 degradation. ***Cell Mol Life Sci***. (15 Sept 2026). doi.org/10.1007/s00018-026-06424-6



Remember the Zika virus (ZIKV) epidemics? Of relevance for andrologists, ZIKV was detected also in semen. In this study, ZIKV replication kinetics, cellular tropism, and the impact on tissue viability and innate immune responses were examined using novel *ex vivo* organotypic cultures of human efferent ducts and corpus epididymis. The study identified these organs as reservoirs for viral persistence in semen.

da Silva J, Satie AP, Houzet L, Lista Brotos MJ, Mathieu R, Goepp A, Aubry F, Dejucq-Rainsford N. Novel *ex vivo* models reveal segment-specific infection of the human efferent ducts and epididymis: implications for Zika virus persistence and shedding in semen. *Hum Reprod*. 2026 Sep 18:deag141. doi.org/10.1093/humrep/deag141



The endocannabinoid system is involved in regulating male reproduction. This study investigated the impact of prenatal cannabidiol (CBD) exposure on reproductive parameters in the mouse model. CBD promoted the differentiation of spermatogonia and changes in histone marks in the prepubertal testis, modified the adult testicular transcriptome, especially kallikrein genes, and impaired sperm production.

Wu L, Manfredola F, Desdoits-Lethimonier C, Toupin M, Monterozo D, Cobellis G, Chalmel F, Dejucq-Rainsford N, Gely-Pernot A. Prenatal exposure to cannabidiol affects spermatogonial homeostasis and the production of spermatozoa in adulthood. *Cell Biol Toxicol* (3 Sept 2026). doi.org/10.1007/s10565-026-10235-7



New research resource

Collaboration between scientists in the UK and Germany (EAA Center in Münster) developed a comprehensive atlas of gene regulation in normal and impaired human spermatogenesis, which integrates single-nucleus multiomics with spatial transcriptomics to preserve the structural context of the seminiferous epithelium and interstitial compartment.

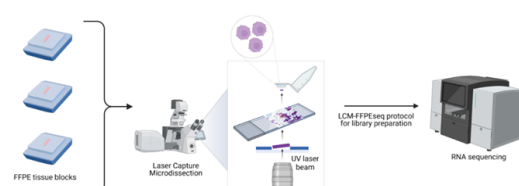
By integrating their findings with known genetic variants linked to male infertility, the ground-breaking study connected non-coding risk loci to specific candidate enhancers and target genes within cell-type-specific regulatory contexts.

Bhaskaran J, Ing-Simmons E, Balaguer Balsells I, Di Persio S, Chan MMY, Politz M, Cremers JF, Rotte N, Kliesch S, Friedrich C, Tuettermann F, Ernst C, Laurentino S, Neuhaus N, Vaquerizas JM. A single-nucleus multiomic and spatial atlas of gene regulation in human spermatogenesis. *bioRxiv* [PREPRINT] 2026.09.04.7494098. doi: <https://doi.org/10.64898/2026.09.04.749409>

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Andrology lab

This article introduced a combination of laser capture microdissection (LCM) with a modified Smart-seq3xpress protocol for spatial transcriptomics of formalin-fixed paraffin-embedded (FFPE) sections.



LCM-FFPEseq approach detects > 14,000 protein-coding genes per sample of 30 cells. The authors provided a proof-of-concept test analysing archived testicular tissue from transgender females receiving gender-affirming therapy.

Callens, E., Syryn, H., Deserranno, K. *et al* et Cools M., Van Nieuwerburgh F. A laser capture microdissection-based method for high-sensitivity transcriptomics from archived FFPE tissue slides with single-cell resolution using LCM-FFPEseq. *Sci Rep* (2026). <https://doi.org/10.1038/s41598-026-69088-z>

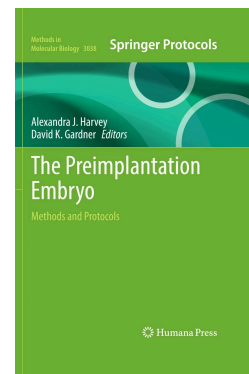
Book of the Month

Book: The Preimplantation Embryo - Methods and Protocols

Editors: Alexandra J. Harvey & David K. Gardner (Australia)

Methods in Molecular Biology series, Springer Nature, Humana Press
2026 link.springer.com/book/10.1007/978-1-0716-5292-3

The book contains detailed description of techniques used in studies of mammalian preimplantation embryo development, in vitro embryo culture and cryopreservation, methods for embryo assessment, gamete preparation and embryo implantation (25 protocols in total, available also as single chapters).



Of relevance for andrologists, the book contains protocols for **sperm preparation for ART**, **evaluation of sperm quality by flow cytometry (DNA fragmentation and acrosome reaction)**, **sperm proteomics and phosphoproteomics**, **IVF and ICSI**, **non-cryogenic storage of spermatozoa**, and more.

EAA Librarian

RajpertDeMeyts.EAA@gmail.com

European Academy of Andrology

Office: Szent István Krt. 7., 1055, Budapest, Hungary

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