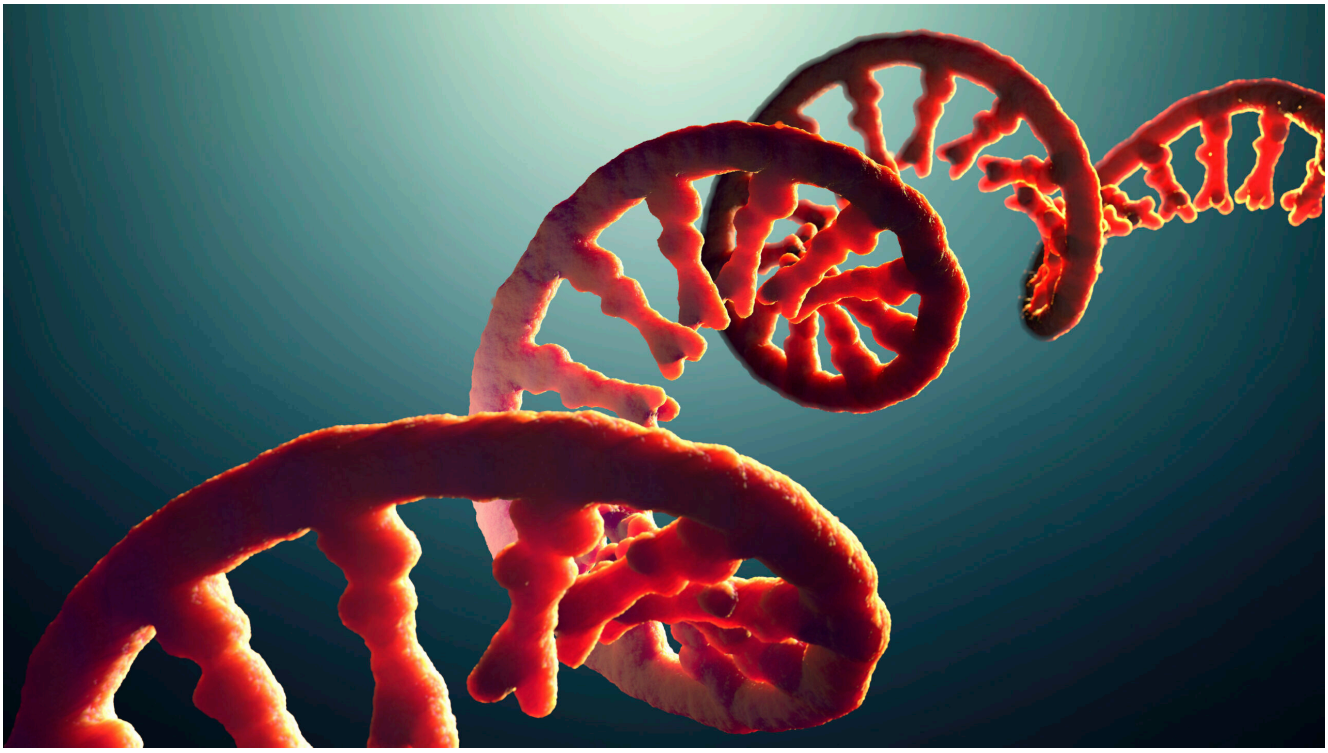
Do you take after your dad's RNA?



Until recently, however, most evidence linking small sperm RNAs to environmental challenges and subsequent effects in offspring has been correlational. Attempts to pin down causality—by injecting RNAs directly into embryos—have often used far higher RNA concentrations than typically found in sperm. In fact, there was no proof that the RNA fragments even make it inside the egg.

But though puzzles remain, recent studies show that not only are paternal RNA fragments transferred to a fertilized egg, but also that they are capable of inducing changes in the offspring at the doses found in sperm.

Epigenetic effects

Researchers first noticed the intergenerational effects of paternal lifestyle back in the 1960s, but it was decades before they started experimental investigations using animal

models. Today, those studying the phenomenon are sure the effects exist but aren’t certain how they are transmitted. The end result, they believe, is adjustments to the activity of genes—a phenomenon known as epigenetics.

Such adjustments occur during normal development as tissues and organs adopt their different identities, which require certain genes to be active or to be turned off. Epigenetic changes also occur throughout our lives, due to factors including exposures to certain chemicals, and activities such as smoking—and, maybe, exercise, stress, fatty diets, and more. Such changes can occur in myriad body cells, including those that give rise to sperm.

As evidence mounted that sperm somehow transmit environmental information to a male’s children, researchers started probing the epigenetic mechanisms that might be responsible. Several possibilities exist: methyl groups that turn down gene activity when they accumulate on genes, and acetyl groups that attach to the protein spools called histones, around which the DNA wraps. These tend to ramp up activity of nearby genes.

https://arstechnica.com/science/2026/05/do-you-take-after-your-dads-rna/