Human genome decay and the origin of life

I question the claim that "Natural selection also plays a strong role in fertilization, ensuring that only the fittest one out of millions of sperm cells gets to fertilize the single egg that is produced in each reproductive cycle."[1] Not so: it is almost completely a matter of luck, based on the physical position of the 'successful' sperm in the ejaculate. Most of the movement of the sperm is by bulk flow or by ciliary propulsion in the fallopian tube. It is only in the last few millimetres that a sperm is 'on its own'. In addition, the mechanisms for rapid prevention of polyspermy do not depend on the relative fitness of an individual sperm. The sperms that are 'locked out' may be even more fit (whatever that means) than the lucky one that fertilized the ovum. Similarly, I know of no evidence that the female 'selects' which of her primary oocytes to retain during her embryogenesis. Since these assertions regarding gamete fitness figure into your models, they may affect their validity.

References

1. Williams, A., Human genome decay and the origin of life, *J. Creation* **28**(1):91–97, 2014.

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» Alexander Williams replies

I thank Richard Meiss for the feedback. I agree that chance is a big factor in conception. However, the passages you quoted came in the discussion and are not assumptions in the models so they do not affect the outcome. I mentioned natural selection only as a possible explanation for the very high copy fidelity.

Does the ovary play an active part in selecting the highest quality eggs when their numbers are dramatically reduced during ovary development? The recent discovery of a 'transcriptomic fingerprint' of egg quality suggests that it may do so.[1]

"Sperm experience intense and varied selection." Ejaculation sends sperm into the vagina only. The cervix remains closed until ovulation. Sperm that survive hours or days of waiting in the acid environment of the vagina must then swim through the uterus and up the fallopian tube. The distance (not including waiting time) can be more than 5,000 body lengths—in human equivalent, think 200 laps of a 50m swimming pool. Sperm must be prepared over several hours by mechanisms supplied by the female.[2]

"[E]vidence from biochemical, molecular and genetic studies [indicate] that the female reproductive tract can read and interpret a spermatozoon's 'molecular passport' or genetic signature" and select not only for fertilizing ability but also genetic suitability for that particular female.[3] If the female can select which sperm she wants on the basis of its 'molecular passport' then it seems reasonable to infer that she can also select developing eggs on the basis of their 'transcriptomic fingerprint'.

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References

1. Chapman, R.W., Reading, B.J. and Sulliva, C.V., Ovary transcriptome profiling via artificial intelligence reveals a transcriptomic fingerprint predicting egg quality in striped bass, *Morone saxatilis*, *PLoS ONE* **9**(5):e96818, 12 May 2014 | doi: 10.1073/pnas.0631609100.

2. See: youtube.com/watch?v=BFrVmDgh4v4).

3. Holt, W.V. and Fazeli, A., Do sperm possess a molecular passport? Mechanistic insights into sperm selection in the female reproductive tract, *Molecular Human Reproduction* **21**(6):491–501, 2015 | doi: 10.1093/molehr/gav012.