

Title	Molecular Biological Differences between Sperm and Egg, and the Amazing Design of Fertilization
Topic/Field	Life sciences / Molecular biology
Target audience	Professionals / General / Family / Youths /
<p>The molecular biological differences between sperm and egg reveal the intricacy of their roles in reproduction, while the process of fertilization shows an extraordinary level of design and precision.</p> <p>Sperm are among the smallest cells in the human body. They have a streamlined shape, including a head (which houses the nucleus), a midpiece (rich in mitochondria for energy), and a tail (flagellum composed of very complicated proteins) for propulsion. They are highly mobile, relying on the flagellum, an intricate design found in only sperm cells for swimming toward the egg. Sperm contribute half the genetic material (23 chromosomes) to the zygote, including the sex-determining chromosome (X or Y). The mitochondria in the midpiece provide the energy required for the intense journey through the female reproductive tract.</p> <p>The egg is much larger than the sperm and is one of the largest cells in the human body. It contains a rich cytoplasm to support initial embryonic development. Unlike sperm, the egg is non-motile and relies on the cilia of the fallopian tube to be guided toward the site of fertilization. The cytoplasm of the egg contains nutrients and organelles to support early stages of development post-fertilization. The egg also provides 23 chromosomes, along with cellular machinery (mitochondria and RNA) essential for embryo formation.</p> <p>Recent molecular biological studies have shown that there is a longevity protein that helps eggs (oocytes) survive for about 40 years, while sperm can survive for up to 5 days.</p> <p>Fertilization begins when sperm identify and bind to the zona pellucida (the egg's protective outer layer) through specific molecular signals. This ensures that only sperm of the same species can fertilize the egg, demonstrating a highly selective and protective mechanism. Upon reaching the egg, the sperm undergo an acrosome reaction, releasing enzymes that digest a small part of the zona pellucida to allow entry. Once a single sperm penetrates the egg, the egg's membrane changes to block additional sperm (polyspermy), a critical step in ensuring the correct genetic makeup of the zygote. The nuclei of the sperm and egg fuse, combining their genetic material into a single diploid set of chromosomes. Fertilization activates the egg, initiating metabolic and cellular processes that lead to the formation of a zygote, the first stage of a new life. The zygote immediately begins mitotic divisions as it travels toward the uterus for implantation.</p> <p>The molecular differences between sperm and egg complement their roles in reproduction, while the process of fertilization highlights a level of precision and coordination that is as awesome as it is essential for life. The amazing design of these processes continues to fascinate many scientists and philosophers, inspiring discussions about the complexity and beauty of life itself.</p> <p>Human reproduction illustrates the specified complexity of life, which is evidence of intelligent design. In addition, such large differences in the reproductive cells of men and women are a fundamental obstacle to transgenderism.</p> <p>Furthermore, these differences and the sheer complexity of sexual reproduction speak against evolutionary ideas about the origin of sex, which remains an evolutionary enigma.</p> <p>Humans are not the product of evolution, but a special creation of God who made men and women different, but “in his image”.</p>	

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### Curriculum Vitae

**KACR** (Korea **A**ssociation of **C**reation **R**esearch) sent Dr Ko I to Mongolia 2002. Since then, he has been working **as a missionary professor** of bioscience and biotechnology at the Huree University in Ulaanbaatar, giving many lectures in other colleges, middle-high schools, and churches as well as his university.

He gave presentations at the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> AACC conferences held in Seoul (Korea), Okinawa (Japan), and Taipei (Taiwan).

August in 2006 Dr Ko organized the first seminar of creation science in Ulaanbaatar for Mongolian scholars and Christian workers, including pastors, in cooperation with KACR board members.

His team has translated and published a DVD and books on creation science for school and university students in Korean and Mongolian languages.

He facilitated establishment of the **C**reation **R**esearch and **E**ducation **A**ssociation of **M**ongolia (**CREAM**) on November, 2015

#### Educational Background and Brief Profiles

- Bachelor & Master at Seoul National University (major in Food Science & Biotechnology, 1987, 1989), Seoul, South Korea

- Ph.D. at **KAIST** (Korea Advanced Institute of Science & Technology) (major in Molecular Biology, 1997), Daejeon, South Korea

- Exchange Professor, School of Life Science, Handong Global University, Pohang, S.Korea (2009. 3.1- 2009. 10.31)

- Visiting Professor, Food R& D Centre, the Ministry of Agriculture and Agri-Food Canada (AAFC), St-Hyacinthe / Department of Microbiology& Immunology, McGill University, Montreal, Canada (2009.12.1 – 2011. 2.28)

- Executive Director, Bright Future Global Academy (educational organization), Ulaanbaatar, Mongolia. (2020. 09.01 – present)