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Professor Chunghee Cho's research team discovers RNA that regulates birth-gender ratio (National Research Foundation of Korea)

- Research in mouse models suggest that long non-coding RNA that does not make a protein is involved in the balance of birth-gender ratio.
 - Long non-coding RNA does not have information to make a protein like messenger RNA, but the RNA itself has been highlighted as playing an important role in the process of differentiation and development. Long non-coding RNAs are also produced in testis, but their function are not well known.
- GIST (Gwangju Institute of Science and Technology, President Kiseon Kim) School of Life Sciences Professor Chunghee Cho's research team led by graduate student Seong Hyeon Hong demonstrated that a unique non-coding RNA produced only in the testis helps the sperm with the Y chromosome to function and is involved in the balance of the birth-gender ratio.
 - The research team named this non-coding RNA Teshl (testis-specific HSF2-interacting long non-coding RNA).



- In mammals, including humans, gender is determined by whether a person inherits sperm with an X chromosome or a sperm with a Y chromosome from the father. Therefore, the quantity and quality of sperm with each chromosome has an important role in maintaining the balance of the gender ratio at birth.
 - There are testis-specific genes (about 1,000) that are thought to be involved in sperm production and function, and studies have been conducted on genes that are translated into proteins mainly through messenger RNA.
- The research team discovered 26 testis-specific non-coding RNAs, paying attention to the fact that long non-coding RNAs were abundant in the testis. Among them, an animal model in which the tesil gene was removed from mice was prepared, paying particular attention to tesil, which is also present in humans and has a high expression level.
 - It was confirmed that the sperm head morphology of the male mice lacking tesil was abnormal, and the proportion of males among offspring born from these mice decreased. Specifically, it was found that Tesil binds to specific transcription factors and helps the expression of genes present on the Y chromosome. It promotes sperm with Y chromosome and is involved in the gender ratio balance.
- The research team explained that it is possible that the birth-gender imbalance could be caused by genetic factors.
 - On the other hand, long non-coding RNAs have various structures and functions, have a large effect on tissues or cells, and show tissue-specific expression, so they can be a good material for development as diagnostic markers and therapeutics.
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