

# Potential avenue to protect male germ cells against heat stress

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A team of researchers from the National University of Singapore's (NUS) Yong Loo Lin School of Medicine has demonstrated for the first time that hydrogen sulphide (H<sub>2</sub>S), when applied exogenously, could protect testicular germ cells, which are male reproductive cells, against heat-induced injury, which is one of the major causes of male infertility. The findings may provide a new approach to treating male infertility.

H<sub>2</sub>S, a colorless gas with the characteristic foul odour of [rotten eggs](#), has been shown to produce anti-oxidant effects in various systems including the brain, heart, kidney and bone. Cells in the body produce small amounts of H<sub>2</sub>S, while H<sub>2</sub>S releasing compounds could also be used to boost the level of H<sub>2</sub>S in the body.

In a study led by Associate Professor Bian Jinsong from the Department of Pharmacology and Professor P C Wong from the Department of Obstetrics & Gynaecology, the research team from NUS Medicine discovered that low production of H<sub>2</sub>S may impair the normal functions of [germ cells](#). The scientists also successfully demonstrated that applying a low concentration of H<sub>2</sub>S through an H<sub>2</sub>S-releasing compound may rescue sperm functions of germ cells that are under heat stress. The findings were published in scientific journal *Nitric Oxide* in May 2015.

## Heat stress: A major cause of male infertility

Infertility is a widespread problem. Male infertility affects about 7% of

men worldwide and is increasing faster than female. Heat stress, which could be caused by saunas, excessive exercise and heat exposure working environment, is one of the major causes of [male infertility](#). To date, treatment options for male infertility are limited.

Assoc Prof Bian explained, "In this study, we revealed both physiological and pharmacological roles of H<sub>2</sub>S in testicular germ cells. Our results provided evidence for the potential therapeutic value of H<sub>2</sub>S on male infertility. Understanding the mechanisms by which exogenous H<sub>2</sub>S protects germ cells could lead to the development of new drugs that can release H<sub>2</sub>S slowly in the body to treat the disease."

Prof Wong said, "While the study is still preliminary, the findings are exciting as they help to indicate the direction that future research in male infertility should be heading. The next step will be to conduct more studies to determine how a decrease in H<sub>2</sub>S production lowers sperm function and whether H<sub>2</sub>S can reverse this."

"As the current study is conducted on mammalian tissues, future work will also need to focus on human tissues to determine whether the same mechanisms apply," Prof Wong added.

Provided by National University of Singapore

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