

Introduction

Currently, only female birth control pills are available as one of the most reliable nonpermanent contraceptive methods. The existing male contraceptive methods include **condoms that have a failure rate of 14%** with typical use (Marfatia, Pandya, & Mehta, 2015) and **vasectomy**, which is a **permanent procedure**. Therefore, scientists are aiming to discover a “male contraceptive pill”. In this poster, we will be exploring the ongoing developments of two potential male contraceptives — **DMAU** (dimethandrolone undecanoate) and **EP055**. These studies allow us to leap towards gender equality as it may no longer be women’s full responsibility to take pills that may trigger side effects. Also, it provides an efficient and reversible contraceptive option for men.

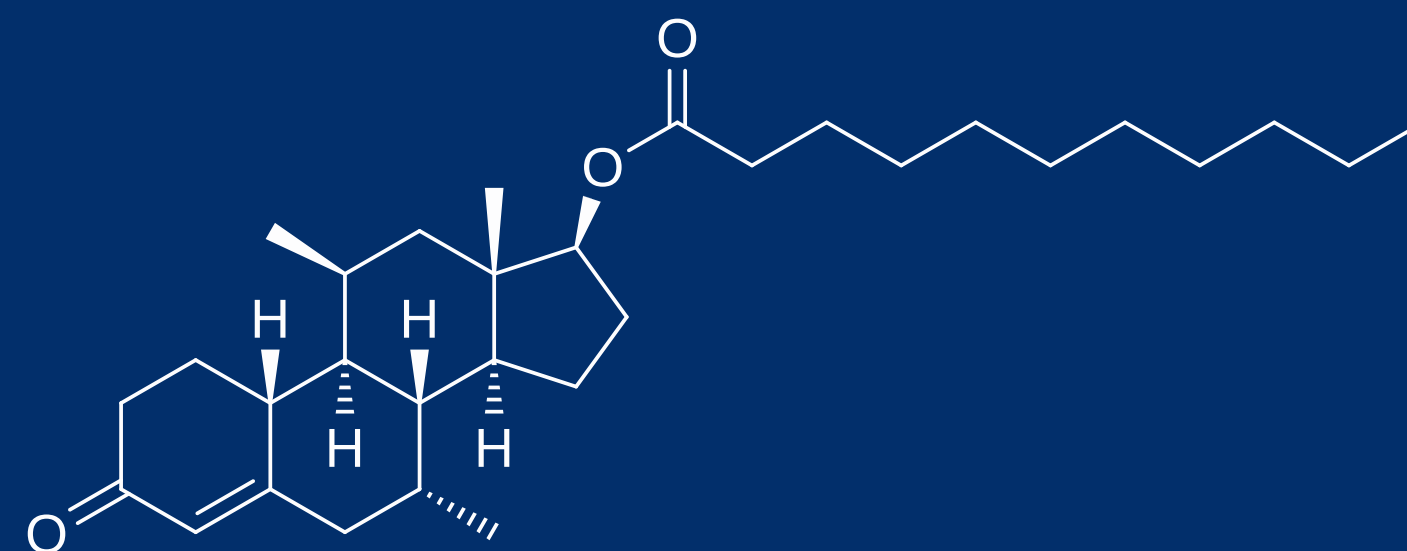
Principle

Female contraception pills are highly accessible and effective which is why they are widely used. However, male contraceptive pills are not yet available on the market. An ideal “male pill” has to **suppress the follicle-stimulating hormone (FSH) and luteinizing hormone (LH) in blood**. (Wang & Swerdloff, 2010) FSH and LH are gonadotropins— hormones that stimulate testes and ovaries to produce sperm and ova respectively. (“Gonadotropins”, 2021) After the decrease of gonadotropins, the **T (testosterone) level will decrease**, impairing spermatogenesis. Thus, **sperm production can be inhibited**. (Wang & Swerdloff, 2010) Additionally, the oral contraceptive should be **reversible** and bring **no side effects** including no effect to libido, sexual activity and others. (Matthew & Bantwal, 2012)

Current development

DMAU (dimethandrolone undecanoate)

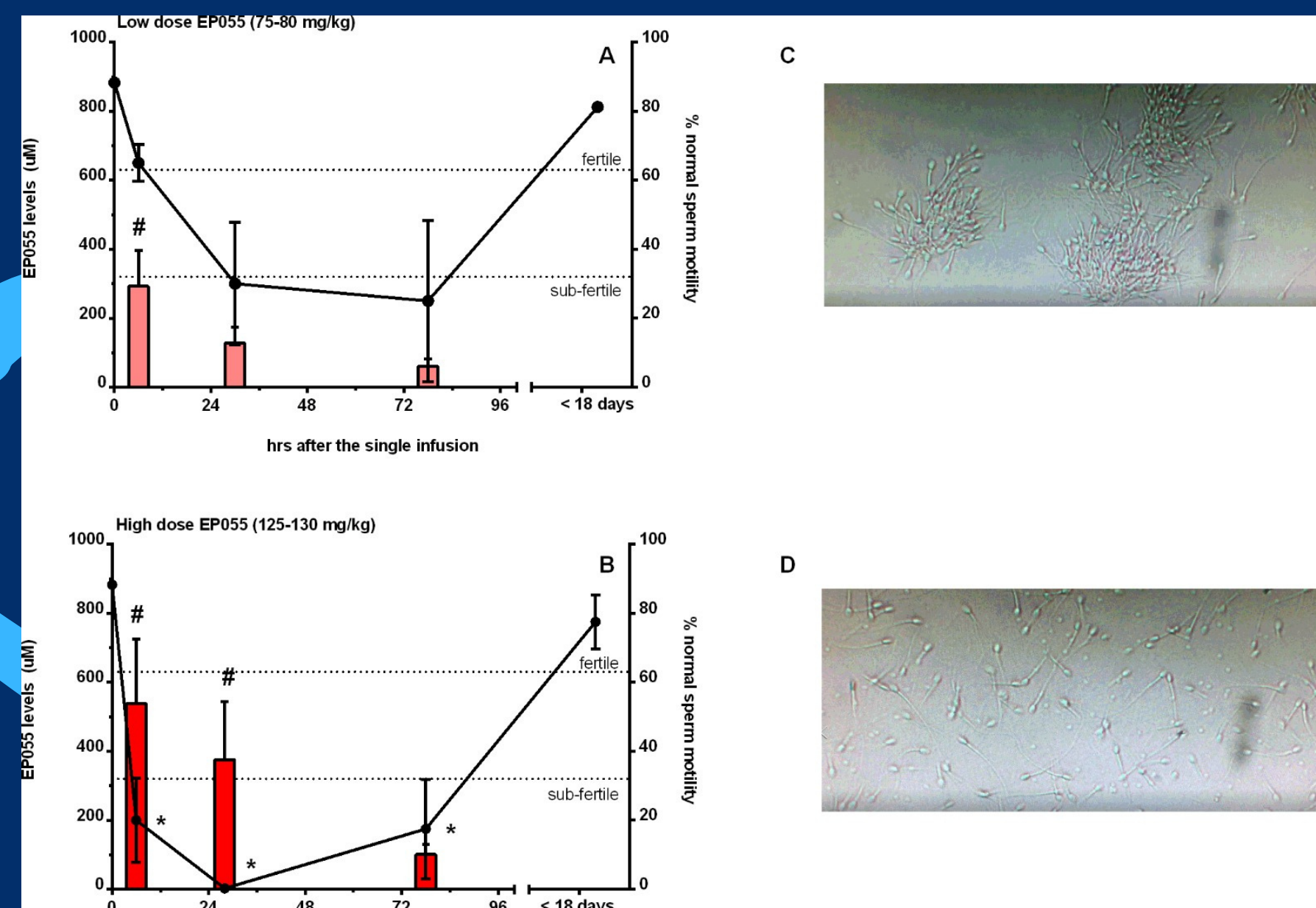
DMAU is changed into DMA (dimethandrolone) that **binds to androgen receptors**. It carries out androgenic activity, **suppressing gonadotropin secretion** and serum T. Hence, sperm production is inhibited. (“Dimethandrolone undecanoate”, 2020) A study on the effect of DMAU was conducted and 100 men (18 to 50 years) took DMAU established in castor oil or powder (0, 100, 200, or 400 mg) for 28 days. The result indicates **suppression of serum LH and FSH** of participants that had doses above 200mg and **serum T was suppressed** in all treatment groups. Yet, **no significant reduction in sperm concentration** was noted. (Thirumalai et al., 2018)



Source: Wikimedia Foundation. (2020, December 31). Dimethandrolone undecanoate.

EP055 (Non-hormonal)

EP055 is an organic compound that can bind onto sperm protein—EPPIN which is on the human sperm surface, **restricting sperm motility**. In the study, 4 male macaques had **a low dose** with recovery time **and a high dose** of EP055 to test its ability to **influence sperm mobility**. The data obtained indicate that the mobility of sperms had **dropped to 20%** after taking the high dose and **no motility was recorded after 30-hours** of administration. The macaques were able to reach **full recovery 18 days** after administration, showing that EP055 is a potential candidate as a reversible male contraceptive. (O’Rand et al., 2018)



Source: (O’Rand et al., 2018)

Challenges encountered

- The hormonal approach lowers the T level to stop producing sperms, but adverse effects like **decrease in libido, erectile dysfunction** may happen. Hence, the hormonal change should be precisely controlled. (Long et al., 2019)
- We still do not have the full picture of the effectiveness of DMAU because **spermatogenesis takes 72 days to finish** but the research treatment was **28 days**. (Thirumalai et al., 2018)
- The study of EP055 shows that the **ALT (alanine aminotransferase) level and glucose levels has increased** during the medication which indicates that the drug may **influence liver function**. (O’Rand et al., 2018)
- There is currently very few researches carried out regarding EP055’ s effectiveness on birth control as the **development of the drug is still in early stage**.

Current side effects of female contraceptive pills

Female birth control pills often cause side effects like **nausea, sore breasts, headaches** and more. (Combination birth control pills 2020) However, scientists are still working hard on the discovery and improvements of both female and male birth control pills. Thus, gender equality in contraception can hopefully be improved.

References

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