

## A Novel Non-Hormonal Composition as Contraceptive for Ovulation (Tel Hashomer)

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### A Novel Non-Hormonal Composition as Contraceptive for Ovulation

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### Abstract

Prostaglandins (PGs) are a group of hormone-like lipid compounds, are organic anions, derived enzymatically from fatty acids and have important physiological functions

PGs are local mediators of a variety of biological and pathological processes, where their biological effects include triggering inflammation, fever and pain; induction of labor; modulation of renal hemodynamics and of water and solute reabsorption; and cause constriction or dilation in vascular smooth muscle cells. Further, PGs have long been known to participate in female reproductive functions, including ovulation, fertilization, luteolysis, implantation and parturition. As such, PGs are known as one of the major intra-ovarian mediators of the ovulatory cascade.

Prostaglandin transporter (PGT) mediates PGs transport cross biological membranes. PGT is a 644 amino acids membrane protein, function as a PGs transporter with high affinity for PGE<sub>2</sub>, PGF<sub>2</sub> and PGD<sub>2</sub>.

Endometrial prostaglandin F<sub>2</sub> (PGF<sub>2</sub>) is the luteolytic hormone. Cellular transport of PGF<sub>2</sub> in the uterine endometrium is critical for regulation of the estrous cycle. PGT regulates the PGF<sub>2</sub> efflux and influx in endometrial cells that influence luteolytic mechanisms in ruminants.

### The Need

- 1) Non hormonal contraceptive agent instead of hormonal contraceptive agents.
- 2) Non hormonal contraceptive agent for woman that cannot receive hormonal contraceptive agents
- 3) Non hormonal contraceptive agent for woman who began their menstrual cycle.
- 4) Non hormonal contraceptive agent for IVF instead of hormonal ovulation inhibition

## The Technology

**Our research** and studies focus on the effect of PG and Ovulation. **Our results** indicate that inhibition of PGT by 4,4 -Diisothiocyanatostilbene-2,2 -disulfonic acid disodium salt hydrate (DIDS) or bromocresol green (BCG) blocks ovulation. Moreover, our **preliminary results** suggest that ovulation inhibition by DIDS did not affect ovulation in the next estrous cycle.

**Our results** provide new insight into mechanisms that regulate the action of PGE<sub>2</sub> within the pre-ovulatory follicles, and emphasize the major role of PGT in PGE<sub>2</sub> signaling and ovulation.

**Based on our preliminary results, PGT inhibitors** can be developed as non hormonal contraceptive agent.

## Applications

Non hormonal contraceptive agent.

## Advantages

There are many contraceptive options available for women today. Most of them are hormonal contraceptive, with the drawback associated with hormonal treatments. Moreover, none block ovulation as the primary method of pregnancy prevention. Selective inhibition of ovulation is an important target for the development of new contraceptives. Ovulation inhibition without alteration of ovarian steroid hormone synthesis would be particularly valuable. This approach would minimize or eliminate the side effects experienced by many women who use current hormonal contraceptives but still provide protection against undesired pregnancy. Moreover, some women are prohibited from taking hormonal contraceptives due to increased risk in developing serious medical illnesses such as heart attack, migraines and blood clots. Thus, providing non-hormonal effective and safe contraceptives for women is important for public health

## The Market

Based on the product types, the global contraceptives market is segmented into two major segments, namely, contraceptive drugs and contraceptive devices. The global major players that are Actavis, Inc., Bayers AG, Church & Dwight, Co., Inc., CooperSurgical, Inc., Mayer Laboratories, Inc., **Merck & Co.**, Inc., Reckitt Benckiser plc, Pfizer, Inc., **Teva Pharmaceutical Industries Ltd.** and The Female Health Company.

The global market for contraceptive pills is estimated to reach \$1.03 billion by the end of 2019.

Most of the contraceptive devices are used in order to avoid side effects and demanding hormonal contraceptive. The contraceptive devices market revenue alone was more than USD 9 billion in 2013.

In 2014 there were 62 million U.S. women in their childbearing years (15-44).

Some 62% of all women of reproductive age are currently using a contraceptive method.

In the US , 27.5% of all contraceptive users are using hormonal Pills (combined estrogen and progesterone).

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