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1.Reactive Oxygen Species and Sperm Function

Background

Many environmental, physiological, and genetic factors have been shown to impair sperm function through oxidative damage. Oxidative stress (OS) arises as a consequence of excessive reactive oxygen species (ROS) production and/or impaired antioxidant defence mechanisms. The decline in male reproductive health has generated considerable public and scientific concerns about the possible role of environmental contaminants. A better understanding of how OS affect sperm function will be beneficial as it might help in the design of new and effective treatment strategies to combat the problem of increasing male subfertility.

2.Reactive Oxygen Species, Oxidative Stress and male infertility

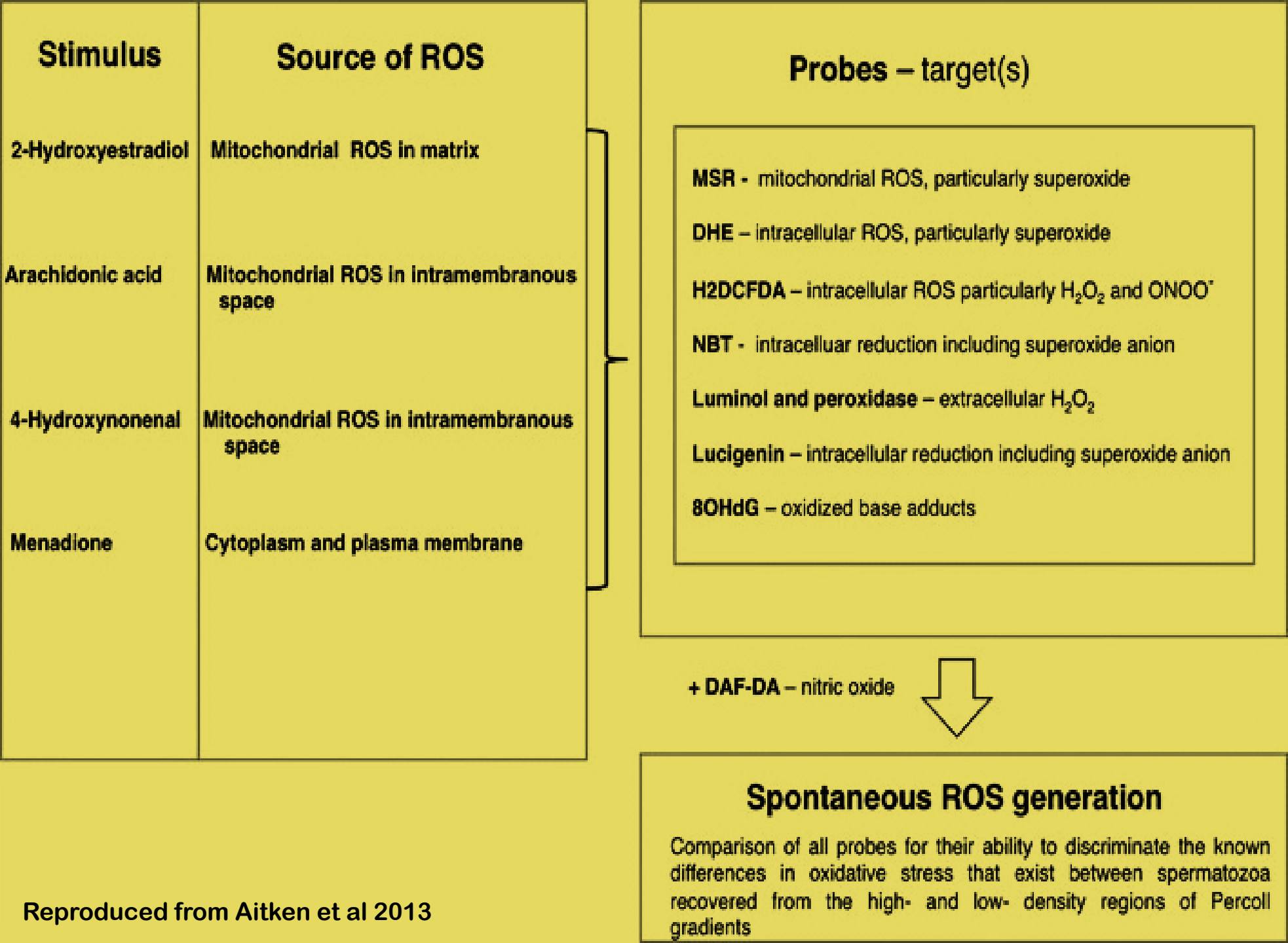
Background

Despite the vulnerability of sperm to oxidative stress, it is also clear that normal sperm function depends on low levels of ROS generation in order to promote the transduction signal pathways associated with capacitation. Modulators of ROS generation by spermatozoa may therefore have clinical utility in regulating the fertilizing capacity of these cells and preventing the development of anti-sperm immunity. The mechanisms by which oxidative stress limits the functional competence of mammalian spermatozoa involve the peroxidation of lipids, electron leakage from the sperm mitochondria, the induction of oxidative DNA damage, and the formation of protein adducts

3. Measurement of ROS generation by human spermatozoa

A variety of techniques have been developed for this purpose including chemiluminescence (luminol and lucigenin), flow cytometry (MitoSOX Red, dihydroethidium, 4,5-diaminofluorescein diacetate and 2′,7′-dichlorodihydrofluorescein diacetate) and spectrophotometry (nitroblue tetrazolium).

ROS generation is triggered with a variety of reagents including 2-hydroxyestradiol, menadione, 4-hydroxynonenal and arachidonic acid.



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4. Diabetes mellitus: impact on male sexual function and infertility

Background

- DM basically impinges on the male reproductive system and fertility through its effects on
  - Erectile dysfunction (ED)
  - Impaired semen parameters.
- The mechanisms via which DM can impact on infertility is
  - Hyperinsulinemia
  - Changes in reproductive hormonal levels
  - Oxidative stress
  - Adipokines
  - Adipocyte derived hormones such as resistin and leptin

5. Potentials of Phytotherapeutic Treatment of Erectile Dysfunction (ED)

Background

It is often difficult to establish the exact etiology of ED, as it is frequently a secondary symptom of an underlying condition, the nature of which can be physical, psychological, or biochemical. Physical conditions include diseases such as diabetes, renal failure, malaria, & cancer, as well as cardiovascular factors (hypertension, atherosclerosis and heart disease, all of which can also be associated with life style factors (age, smoking, and drug / alcohol intake).

Significant

Phytotherapeutic drugs generally have a broad spectrum of action in the body, and are often capable of influencing virtually all metabolic processes with minimal side effects. Studies investigating the potential of phytotherapeutic treatments for ED are extremely limited.

Herbal therapies appear to have potential benefits, but the health risks of various phytotherapeutic compounds still need to be elucidated.

6. Leukocytospermia and Oxidative Stress

Background

The invasion of microorganisms and infective bacteria in the genito-urinary tract leads to the rapid increase in white blood cells that can present in the ejaculate.

Inflammatory response, aimed at killing the microorganisms via the production and release of pathological ROS levels leading to Oxidative Stress.

Leukocytospermia (leukocyte concentration >106/ml semen) is present in ±20% of male factor infertility.

Significance

Leukocytospermia represents an additional risk factor that should be treated, especially when in vitro therapy is to be scheduled, in order to improve gamete quality.

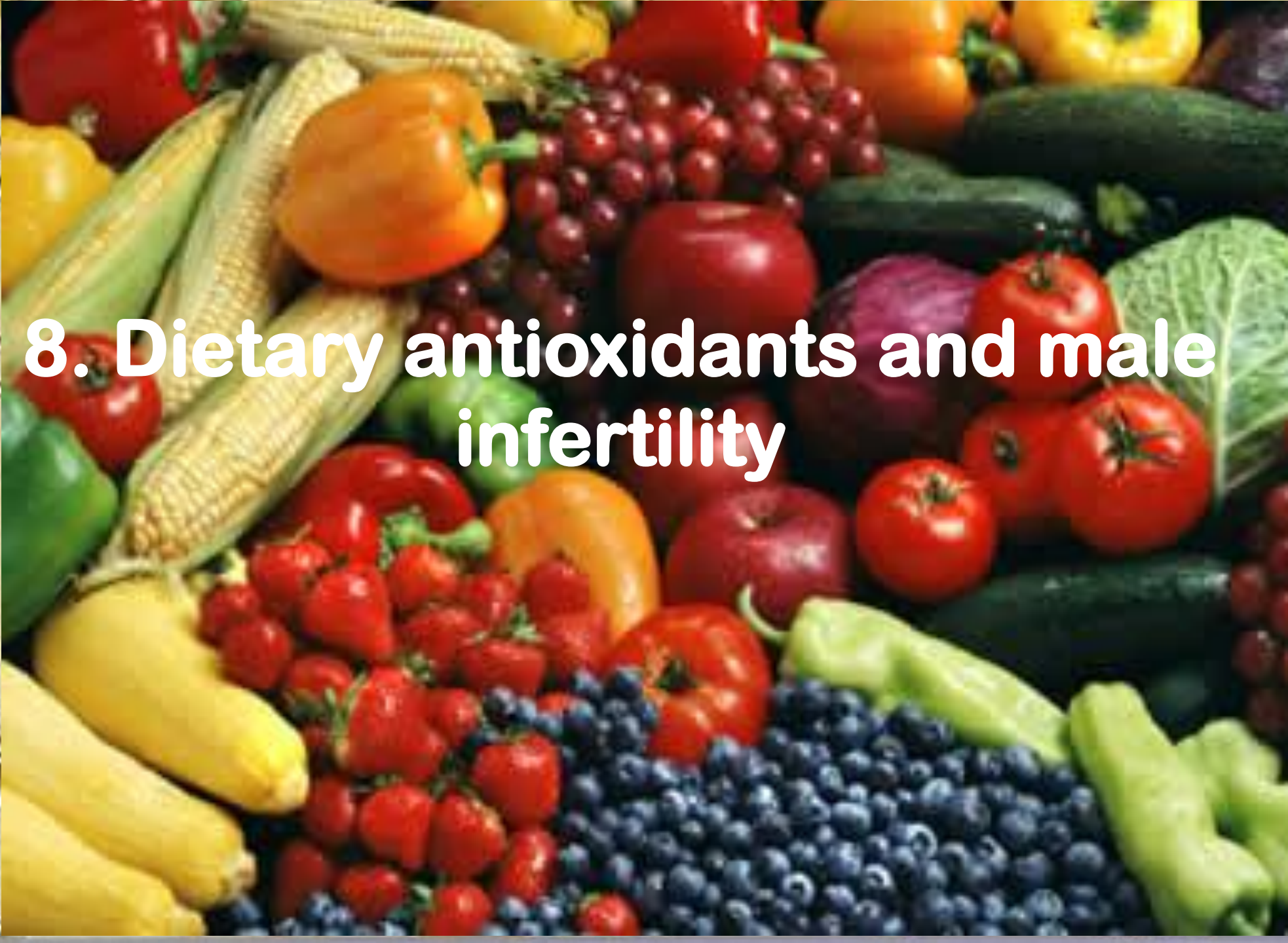
The relationship between leukocytospermia, OS as well as possible treatment regimes are explored.

7. Effects of Methamphetamine (MA) on male reproductive function

Background

Nicotine and Methamphetamine (MA) addiction are serious worldwide public health problems with many consequences and complications. Significant morbidity including cardiovascular, infectious, pulmonary, dental diseases and other system complications are associated with abuse of these substances.

Using a wistar rat model, we are investigating the effects of chronic usage of MA on sexual beheviour and on male reproductive function.
This study maight shed more light on the exact level of male spermatogenesis that is influenced by the exposure to Methamphetamine .



8. Dietary antioxidants and male infertility

Background

Antioxidants are able to protect biological systems against the potentially harmful effects of processes or reactions that can cause excessive oxidation.

Different antioxidant protection systems play important and interdependent roles in reducing OS in male reproductive function.

Antioxidants mostly derived from the human diet maintain a healthy sperm production and can offer an alternative when managing male infertility because they are cost effective and have little or no side effects on male reproductive function.

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