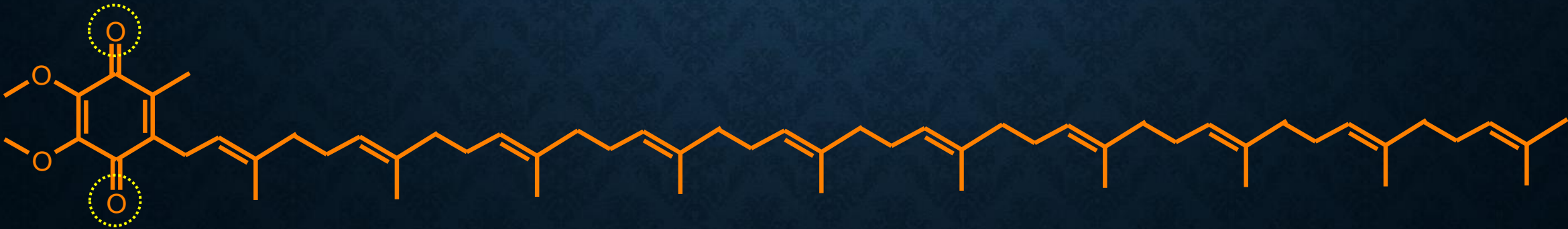


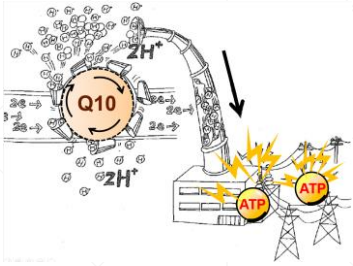
2020

Q10 & MALE FERTILITY

★ Q IS GOOD ★



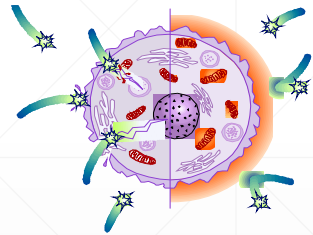
Coenzyme Q10 in Sperm Cells



high energy expenditure for sperm motility



membrane & sperm integrity needs to be protected against *oxidative stress*



Q10 is very highly concentrated in sperm cells and seminal fluid

Oxidative stress in sperm cells can overconsume Q10 to the detriment of its bioenergetic role (*Mancini 2011*)

Infertile have a Q10 deficit compared to healthy controls

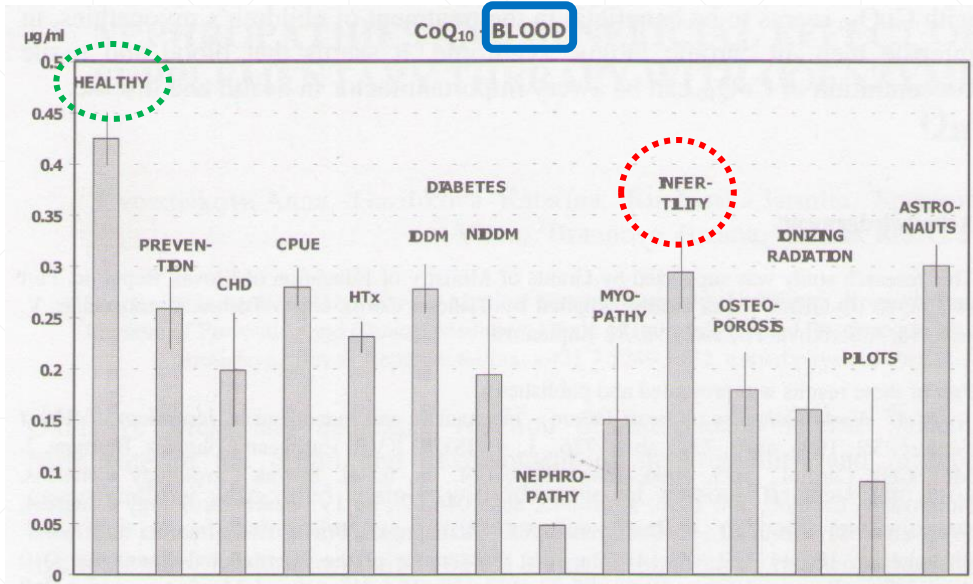


Fig.1.: Abbreviations: Healthy – healthy volunteers, Prevention – stressed people, CHD – chronic heart disease, CPUE – cardiomyopathy of unknown etiology, HTx- patients after heart transplantation, IDDM – insulin dependent diabetes mellitus, NIDDM – non insulin dependent diabetes mellitus, Astronauts – 2 Slovak pilots before start to Cosmos

Gvozdková 2000

Multicenter Slovak Study (3000 human samples)



Table 3. Coenzyme Q10 levels in seminal plasma

Groups	<i>n</i>	CoQ10 ng ml ⁻¹
Controls	5	71.80 ± 3.62
IDA	12	29.66 ± 1.13**
VARA	12	37.41 ± 1.70**
Azoospermic Patients	5	63.80 ± 2.85

*Controls and azoospermic patients vs. IDA or VARA, $P < 0.01$.
**Controls and azoospermic patients vs. IDA or VARA, $P < 0.001$

Table 2. Coenzyme Q10 levels in sperm cells

Groups	<i>n</i>	CoQ10 (ng/10 ⁶ sperm cell)
Controls	5	4.63 ± 0.26
IDA	12	2.65 ± 0.14
VARA	12	3.08 ± 0.14 [§]

*Controls vs. IDA or VARA, $P < 0.05$.

**Controls vs. IDA or VARA, $P < 0.01$.

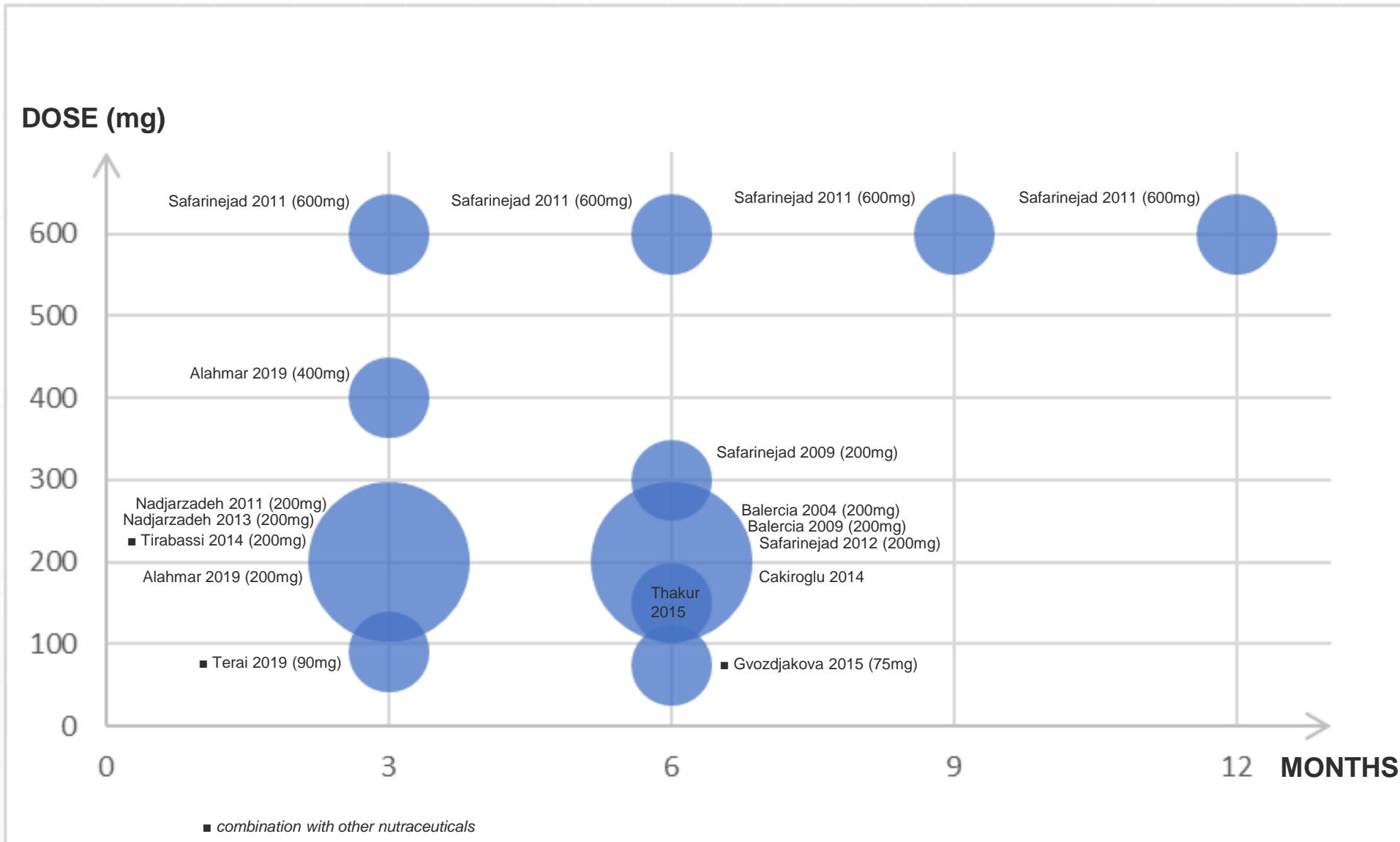
° Controls vs. IDA or VARA, $P < 0.02$.

^{oo} Controls vs. IDA or VARA, $P < 0.001$.

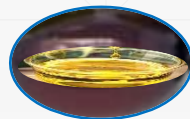
[§] IDA vs. VARA, $P < 0.05$.

Balercia 2002

Q10 and fertility: published scientific papers



Mostly oil-dispersed Q10 in softgel

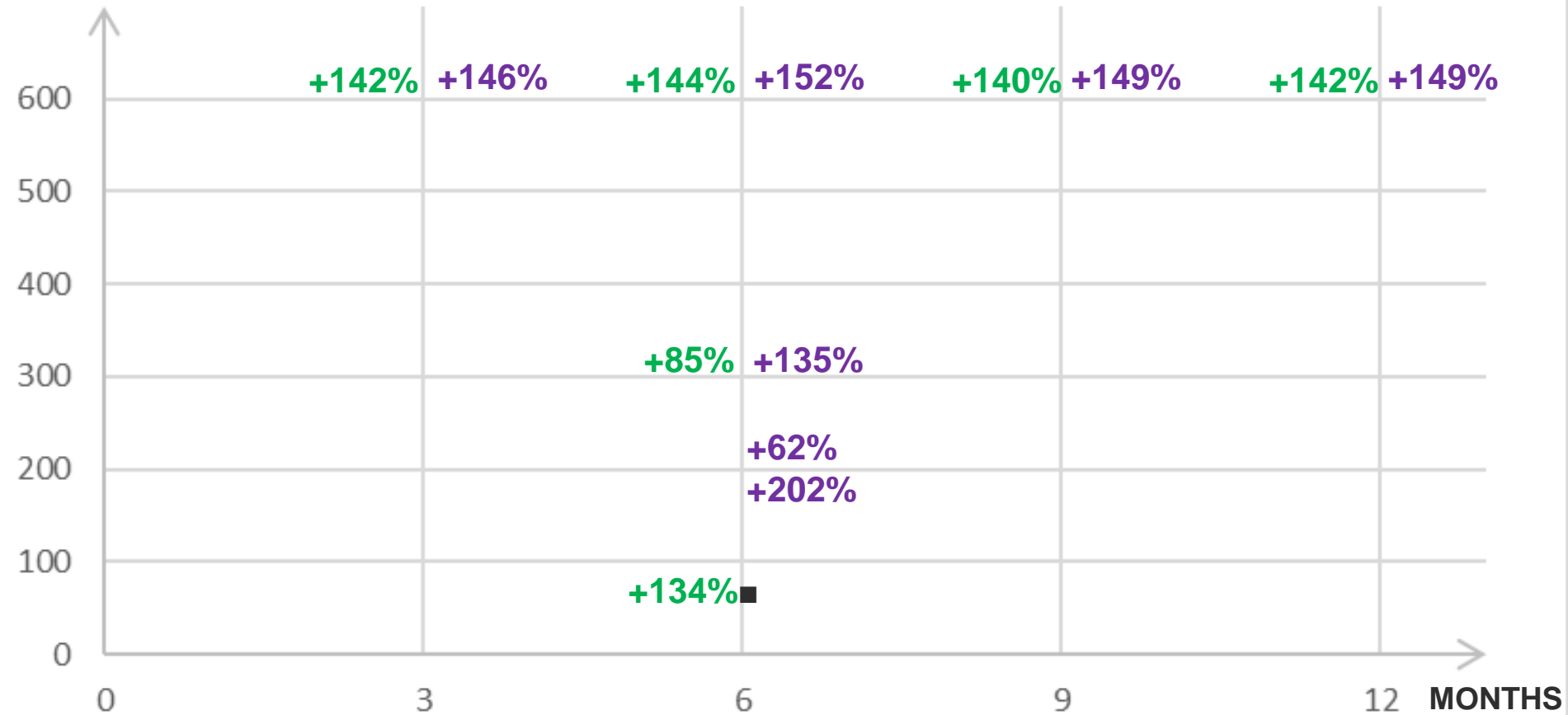


Oral Q10 increases blood and seminal plasma Q10

Plasma CoQ10 ($\mu\text{g/ml}$) / Seminal CoQ10 (ng/ml)

(summary of statistical significant improvements from different studies)

DOSE (mg)



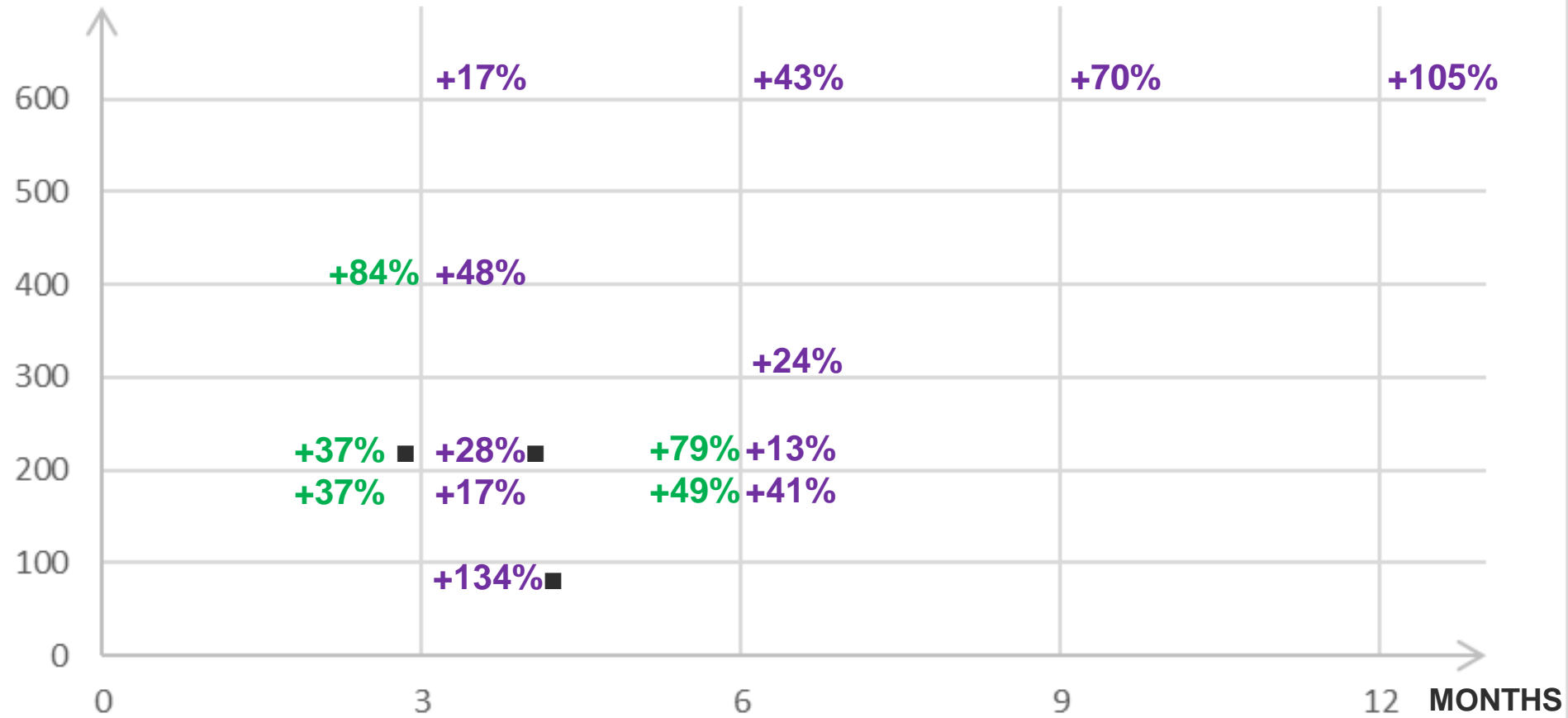
■ combination with other nutraceuticals

Q10 improves semen quality

Forward (progressive) motility / Total motility

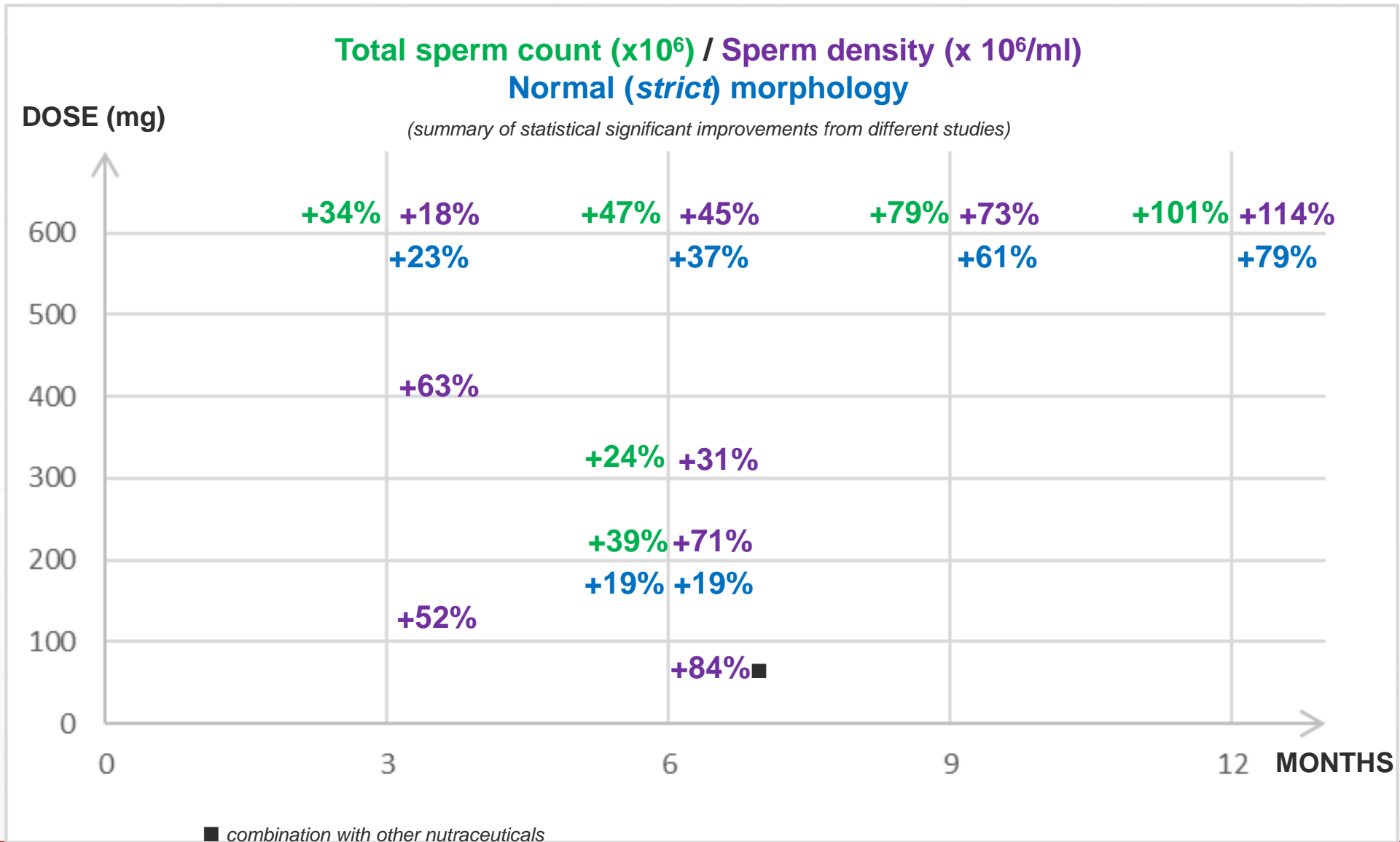
(summary of statistical significant improvements from different studies)

DOSE (mg)

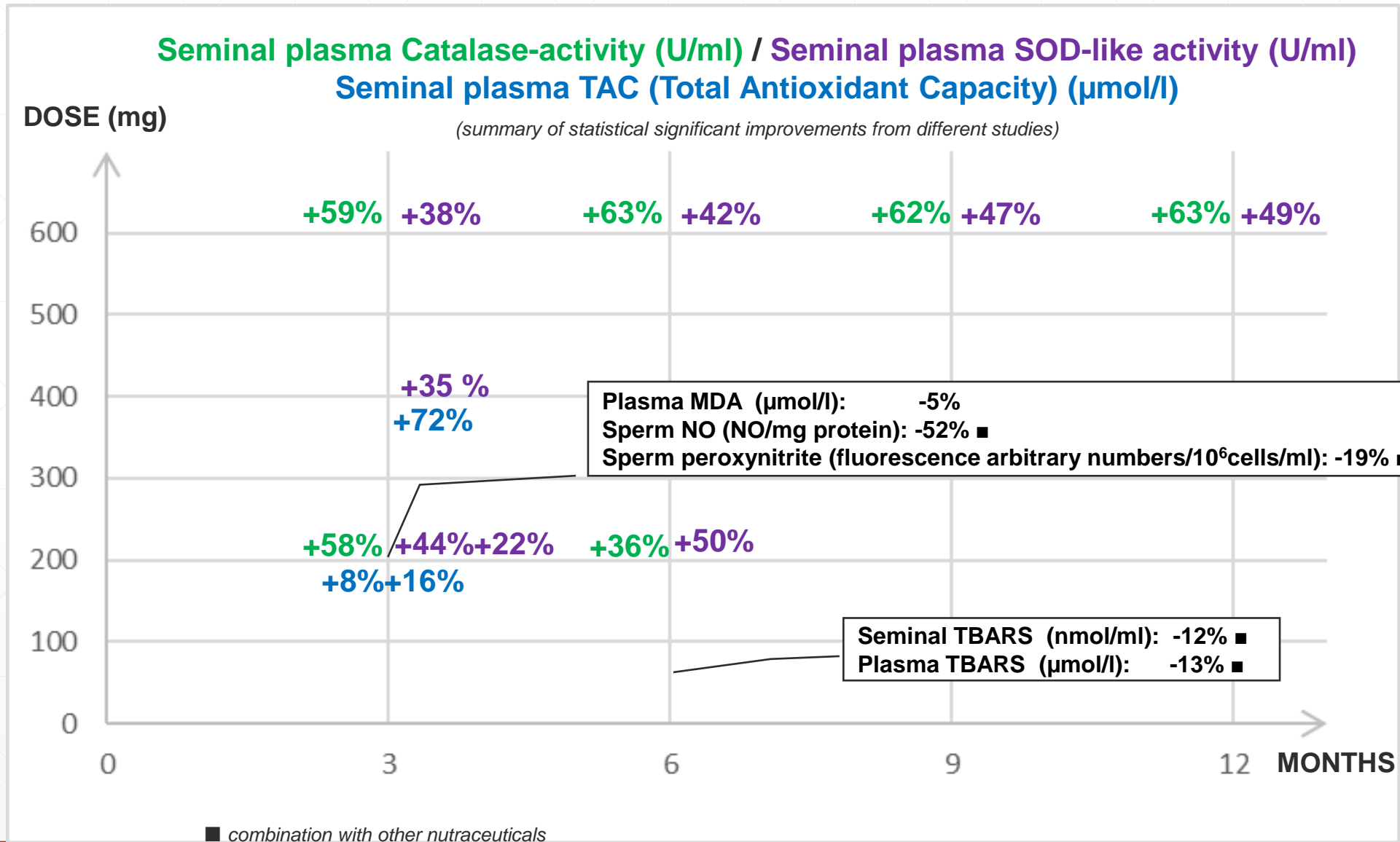


■ combination with other nutraceuticals

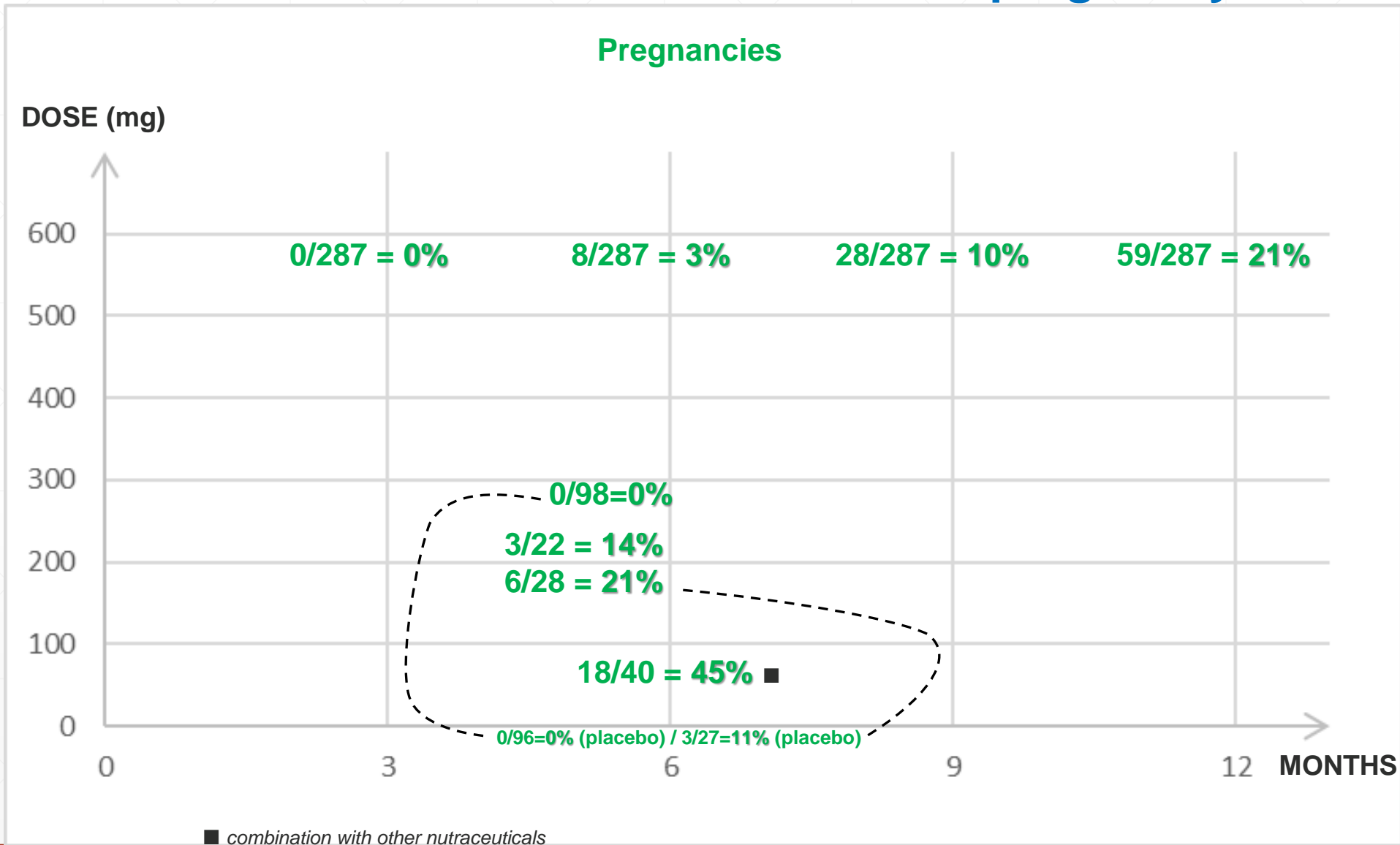
Q10 improves semen quality



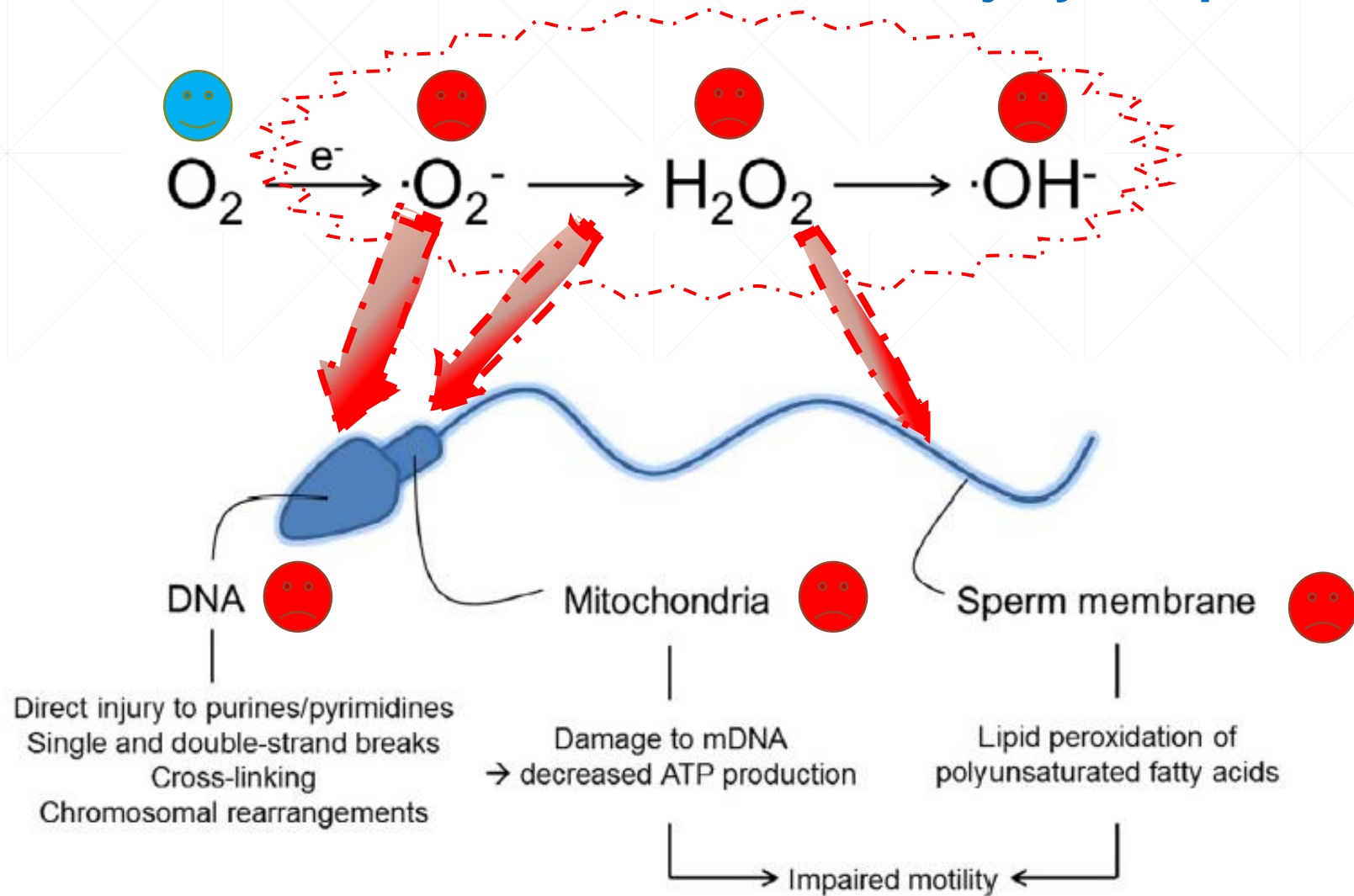
Q10 improves seminal oxidative defence



Oral Q10 has beneficial effect on pregnancy rate



Oxidative stress and injury in spermatozoa

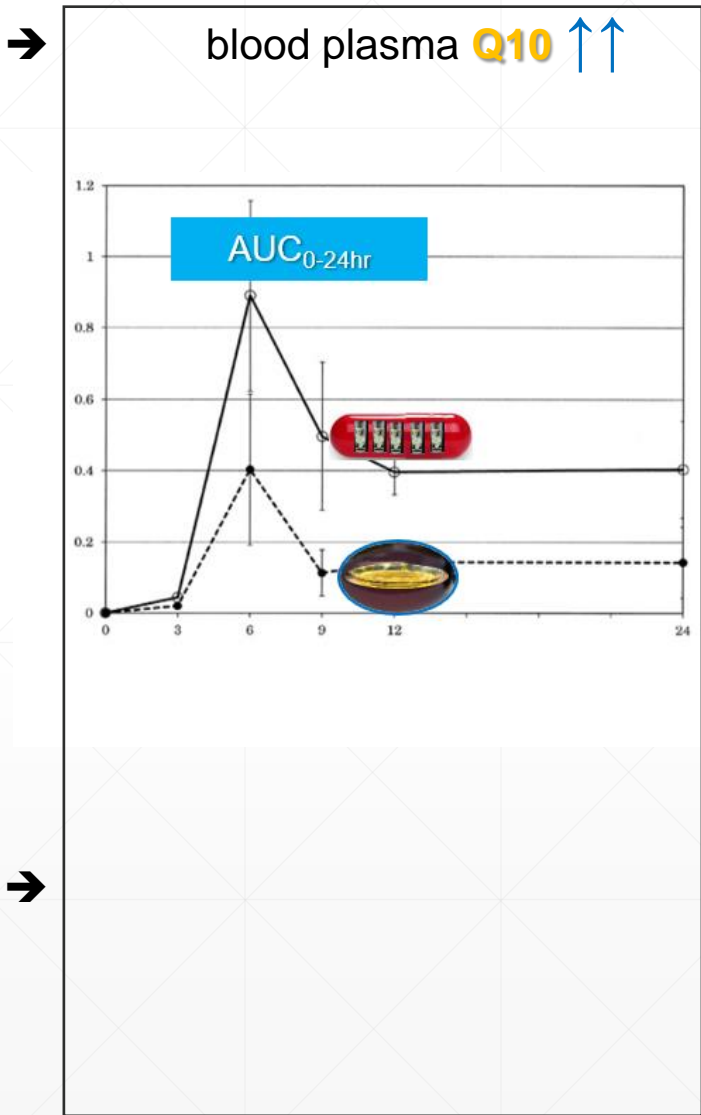


Oxidative stress and injury to DNA, mitochondria, and plasma membrane of spermatozoa.

Q10 antioxidant protection in seminal plasma & sperm cells

Oral Q10





seminal plasma Q10 ↑↑

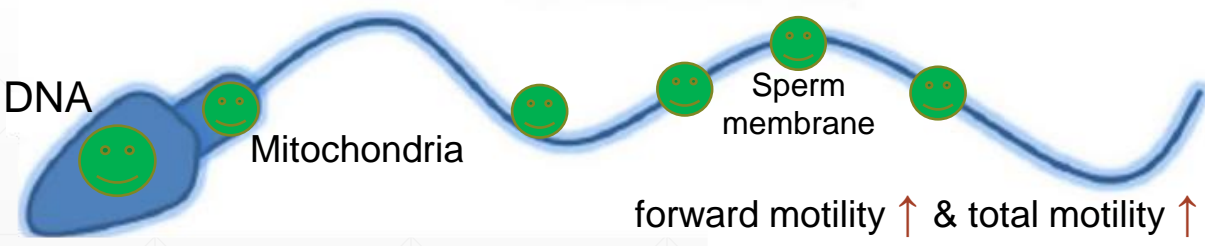
Catalase ↑↑

$$O_2 \xrightarrow{e^-} \cdot O_2^- \xrightarrow{\text{Superoxide dismutase}} H_2O_2 \xrightarrow{\text{Glutathione peroxidase}} \cdot OH \xrightarrow{\text{Catalase}} H_2O$$

↑↑ Superoxide dismutase Glutathione peroxidase


Enzymatic antioxidants that react with and buffer free radicals

seminal sperm cell Q10 ↑↑



DNA Mitochondria Sperm membrane

total Antioxidant Capacity ↑
 plasma MDA ↓
 plasma & seminal TBARS ↓

forward motility ↑ & total motility ↑
 sperm count & sperm density ↑
 normal morphology ↑
 pregnancies ↑ 

(Wagner 2019) (Alleva 1997) (Balercia 2004) (Balercia 2009) (Safarinejad 2009) (Nadjarzadeh 2011) (Safarinejad 2011) (Safarinejad 2012) (Nadjarzadeh 2013) (Cakiroglu 2014) (Tirabassi 2014) (Gvozdjakova 2015) (Thakur 2015) (Alahmar 2019) (Terai 2019)