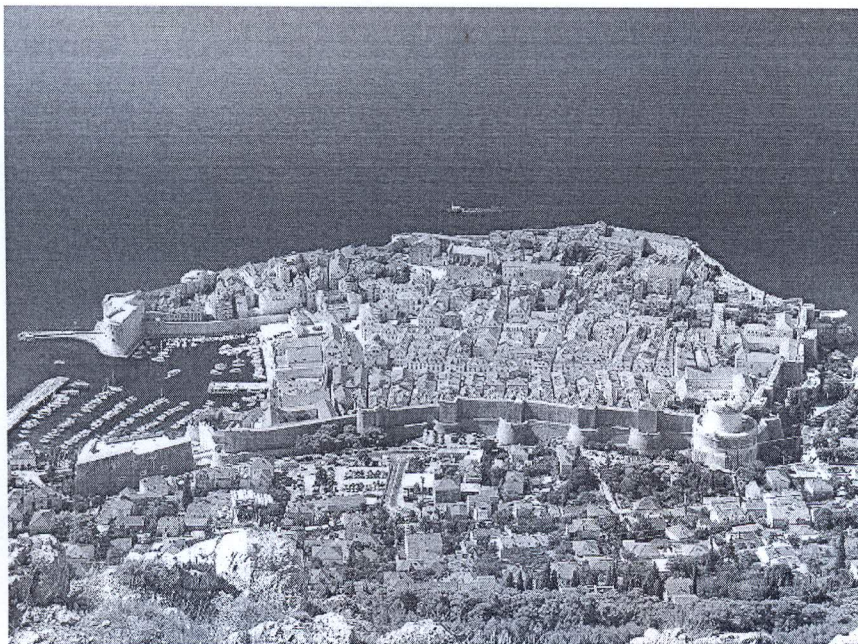




# Epigenetics and Periconception Environment



## Proceedings of the EPICONCEPT Workshop 2015 Periconception Environment

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### Editors

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EPICONCEPT Workshop 2015

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**Ram spermatozoa motile and metabolic activity – potentially predictable pattern of ejaculate fatty acid composition**

Spermatozoa contain considerably high proportion of polyunsaturated fatty acids (PUFA) thus being prone to peroxidation (PO). According to the “membrane pacemaker theory”, regarding spermatozoa, we hypothesized that fatty acid (FA) composition in the ejaculates could dictate spermatozoa metabolic profile whilst retaining vitality and resilience to PO. Samples were collected from four high performing rams (Pramenka) by artificial vagina. Standardized cell concentrations ( $\sim 300 \times 10^6$  in TRIS-PBS) were evaluated on CASA for compliance with velocity (VSL- $\mu$ /s) and linearity index (STR) cut-off nominal values (VSL  $\geq 60$ , STR  $\geq 0.8$ ). Total of 91 ejaculates have been categorized in three groups: A (not complying with either nominal), B (complying with one nominal), and C (complying with both nominal), each containing 18, 36 and 37 samples, respectively. FA values have been acquired on gas chromatography with flame ionization detector (GC-FID), expressed as percentile units (mean  $\pm$  SEM %). PUFA and docosahexaenoic acid (C22:6n3) had detectable peaks in 100% of the cases, while monounsaturated FA (MUFA) in 90%. Individual bias effect was excluded following comparison of ranks between subjects. PUFA and C22:6n3 pointed significantly highest values in A and lowest in C ( $P=0.0001$ ), being highly correlated ( $r=0.95$ ,  $P=0.0001$ ). MUFA resulted with highest concentration in C and lowest in A ( $P=0.0004$ ). These results indicate that ejaculate motility patterns could have predictable FA composition, possibly deducing the inter-species limits of the theory to in-species level. Higher presence of MUFA in ejaculates characterized by high velocity and linearity could be explained due to possible existence of cellular altering mechanisms that promote this lipid construction, more resilient to PO. The opposite presumption would apply for PUFA. For justification of our findings further experimentations and tests are needed to exclude possible biases and small sample heterogeneity.