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ICR effect: from ion dynamics to living systems behaviour

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ABSTRACT

There is a wide experimental evidence for a specific biological interaction with ELF magnetic fields that is functionally dependent on ion cyclotron resonance (ICR) frequencies as derived from ionic charge-to-mass ratios.

We propose that the ions dynamics described trough the ICR mechanism, well studied in the Zhadin experiment in a simple ionic system, could play a significant rôle in the complex process that governs the ion crossing of the cell membrane.

Going from ions systems to living organisms we observe that the ion cyclotron frequency is not a sharp resonance but an effect can be detected in a narrow frequency range around the ICR. Such behaviour suggests that the complexity of the neighbourhood of each single ion, affects the response to the external stimulus.

Living systems are thus characterized by the following features:

- ❖ Functional dependence from ICR which implies the absence of collision among ions
- ❖ A thermal paradox which demands the existence of collective dynamics
- ❖ A frequency recovery mechanism which implies that ICR is not a sharp resonance but it widens because of a still unclear coupling mechanisms among ions
- ❖ A memory effect typically stored in long-length scales interactions

The main objective of a future research should be to elaborate a convincing model system able to cope with experimental data which points ICR, as the key to understand the mechanism of interaction between living and e.m. fields.