

Panagopoulos DJ, Balmori A, Chrousos GP, (2020): On the biophysical mechanism of sensing upcoming earthquakes by animals. *Sci Total Environ.* 717:136989. [Epub ahead of print]

This study explains for the first time the behavioral changes of animals a few weeks prior to large Earthquakes (EQs), a phenomenon recorded since the ancient times. It is shown that animals can sense via the “Ion Forced-Oscillation mechanism” the Ultra Low Frequency (ULF) (0-3 Hz) electromagnetic pulses emitted by the seismic focal area. These weak polarized pulses called Seismic Electric Signals (SES) are able to irregularly gate electro-sensitive ion channels on the animal cell membranes disrupting the ionic concentrations in the animal cells which can be sensed as stress. Thus, the sensing of upcoming intense EQs is due to the electrical sensitivity of animals. This is an additional confirmation for the “Ion Forced-Oscillation mechanism”, the only plausible mechanism for the action of electromagnetic fields (EMFs) on cells, showing that the biological activity of polarized EMFs is proportional to their intensity, inversely proportional to their frequency, and doubles for pulsed EMFs (Panagopoulos et al 2000; 2002; 2015). The mechanism refers to all cation channels on animal cell membranes the majority of which are electro-sensitive or “voltage-gated”. The so called “VGCC mechanism” is simply the application of the above mechanism on the calcium channels. The same mechanism applies to sodium, potassium and all other cation electro-sensitive channels playing major roles in cell function and balance.

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