The role of the electronically excited state of bicarbonate water systems in the vital activity

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Bicarbonates play an important regulatory role in the vital activity of living organisms, as well as in ecological processes. Mechanism of their action may be related to biophotonic processes developing in their solutions. Bicarbonates catalyze free radical reactions involving reactive oxygen species that in most cases are accompanied with low-level photon emission (LLPE). Due to these reactions, bicarbonate water systems (BWS) serve as sources of ultra-weak radiation, i.e. they are active physical media. Using sensitive photon counters, we demonstrated that the properties of LLPE from such media depend on the illumination of BWS with visible and infrared light, mechanical treatment of aqueous solutions, on variations of external natural electromagnetic fields. The addition of H_2O_2 in submillimolar concentration to BWS leads to a gradual increase in LLPE from them that can last for many months. Electronically excited state of the BWS implies that these active systems are spatially and dynamically structured. This is indicated by the appearance of an absorption peak in them at 270 nm after their additional activation by H_2O_2 or by their mechanical agitation. This peak is characteristic for recently discovered dynamically organized Exclusion Zone water. EZ-water coexists with bulk water in all water systems and stable charge separation exists between these two water phases. In the BWS, bicarbonates catalyze conversion of this potential energy into the free energy of electronic excitations. This provides for the excited state of the BWS and their sensitivity to the action of external physical factors. Since almost all biological fluids and natural waters are BWS, their special energy properties can play crucial role in the ability of living systems to absorb scattered energy from the environment and convert it into high-density free energy, ultimately providing vital processes.