Nanotechnology and nanomedicine are dynamically developing branches of science blurring the boundaries of knowledge with each other. The prefix nano- is assigned to materials with a grain size in at least one dimension less than 100 nm. Increased surface area, a greater share of atoms coordinatively unsaturated (edges atoms) and the electronic properties make the properties of such materials differ significantly from their macroscopic counterparts of the same elemental composition, wherein the properties are mainly responsible for the bulk properties. The limitation faced by use of TiO_2 is a range of activities lying in the ultraviolet. Extension to visible light activity is called photosentization. The use of the photochemical properties of organic compounds in visible light (above 400 nm) allows their use in medicine as photosterilizing compounds (eg. methylene blue in the dental periodontal disease). Tetrapyrol compounds and its metallated derivatives find their application in photodynamic therapy, or the use of visible radiation for excitation of the photosensitive compound which penetrated tumor cells. Excited form of the compound may return to the ground state by transferring the excitation energy to the environment. This energy acceptor is can be molecular oxygen. Titanium dioxide is part of the inorganic photoactive material which undergoes electron transfer reactions, ie. redox reactions due to excitation. Thanks to the use of visible light for excitation of TiO_2 becomes an attractive material for use in medicine and as a sterilizing and cleaning. At present study gives us the ability to synthesize this material as a particle-size of a few dozens of nanometers, which make them similar in size to the key biomolecules protein, DNA and allows potentially interact with cell membranes enable their penetration into cells. Appropriate surface modification of TiO_2 nanoparticle keeps the grains dispersed, and suspended in a water solution of a color look like solution. All this makes for investigation of TiO_2 nanoparticles modified with biologically important molecules is possible to use techniques known homogeneous systems. In clinical use will be much spectroscopic techniques, e.g.,. technique involving the detection of fluorescent light emitted by the excited internal fluorophore. In the case of proteins, is tryptophan. This emission is dependent on the structural changes, so that structural changes reflected in the spectroscopic properties. The thermodynamic studies will test the heat released during interactions to model the structures of membranes that can be obtained in a laboratory. This will power information interaction of nanoparticles with cell membranes. The project is planned to study interactions of nanoparticles with living cells.