
ДОСЛІДЖЕННЯ, ГІПОТЕЗИ, ДИСКУСІЇ

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NANOBACTERIA: DISSEMINATION, PROPERTIES, HYPOTHESIS

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Проаналізовано матеріали наукової літератури щодо існування «нанобактерій», виявлених у біоценозах, які контамінують органи ссавців. Залишається загадкою можливість наповнення цих дрібних часток «субстратом» клітин. Доведено, що розмір «нанобактерій» часто менший від деяких вірусів різних таксономічних груп. Висловлено припущення про «міграцію» на Землю «нанобактерій» з інших планет, їх поширення в ґрунті, воді, органах людини. Розглянуто матеріали про можливу контамінацію подібними частками шапинкових грибів, стічної води.

Ключові слова: «нанобактерії», морфологія, біомінералізація, компліментарність, віруси, мікроорганізми.

Interest in the opening of «nanobacteria» is extremely important. Because these particles, as number of authors announces, are self-restoring structures that resemble viruses of individual taxonomic groups in size [1–18].

For the first time «rocky» bacteria (nanobacteria) are considered to be found in 1990 by geologist Robert Folk on the rocks of soil carbonates, volcanic tuffs [10]. After this sensational message several works, in which researchers gave an interpretation of studying results of nanobacteria (nanobs) «immured» in stone shell, were published. Herewith main researches of authors were directed to morphological and partly to structural features of original particles, which were found on different objects. Also at that time the results about stone particles in culture medium, people kidneys were reported [11]. Unfortunately most authors of these works about the «nanobacteria» detection did not discuss the important issues of the mechanism of their formation for various reasons. Main work of researchers was directed on studying of nanobs morphological parameters in identifying them in human organism under conditions of

renal stone disease and polycystic. These and other researches were conducted by transmission and scanning electron microscopy methods. The last one gave opportunity to observe volumetric image of preparation without detecting thin structure of examined particles, that prompted authors to unilateral interpretation of experiments – showing nanobs morphological features: filamentous, oblong as caterpillars, annular formation. Thus on the basis of these particles researchers observed aggregated amorphous and crystalline structures of different sizes [1, 9].

Researchers have paid special attention to distribution of calcined nanoparticles in water. For this purpose, a specialized groups of scientists in Russia (Ivanovo, Vladimir) were created. By studying nanoparticles in aqueous media researchers in exciting colors concluded: «Opening of the new biological forms existence – nanobacteria is not less revolutionary than the work of Louis Pasteur and Robert Koch about classical bacteria» [5, 8, 18].

Recently, scientists from different countries: Finland – the company «Nanobac», U.S. – University of California, NASA and Raisa University, George Washington hospital,

specialists of research universities in Australia, Germany and other scientific schools of Biomedical Problems concluded 'involvement nanobacteria in the process of biomineralization in the human body'. The authors of these studies believe that nanobs are involved in pathological processes with atherosclerosis, gout, kidney stones, cholecystitis, diabetes, cancer, and other diseases [6–8]. These and other researchers believe that Nanobacteria contaminate human body exactly through the water, causing the pathology of different difficulty levels [6, 8]. Neoplasms in samples of water were often spherical shape and differ from classical bacterial cells [8]. The authors observed the formation of similar samples with blood analysis, atherosclerotic formations, fragments of the thyroid gland when nodular goiter parodontosis [8].

As noted, nanoforms found in water have the capacity for growing and reproducing in the serum-free medium, as the researchers write, «They were similar to those observed in our previous studies of biological samples» [17, 18]. These and other researchers believe that they have proven that the interaction between proteins and minerals of nanobacteria with the formation of particles of biological nature that are active in the embryonic center, prompting crystallization of nanostructures when biomineralization with the formation of mineral concretions sated with calcium and phosphate [6, 8, 10]. However, in our opinion, this information requires a number of modern researches and explanations of the interaction of components under conditions of biomineralization, molecular fractionation of possible structures, properties of possible RNA and DNA viruses, «bacteria» and phages, specific explanation electronographies, separation bacteria by growth and development on artificial environments. All these and other methodological approaches require multidimensional modeling experiments based on the development and application of appropriate thoughtful programs for their execution.

It should be noted that the rapid burst of works presented research results on «Nanobacteria» at the end of the twentieth century,

has recently started to fade. On pages of available literature results of study about contamination meteorites with «nanobacteria», participation of «dwarf stone bacillus» in the process of myocardialetc disappeared. However, there are reports about organization of specialized laboratories in the USA (NASA), Russia, Finland and other countries materials of re-discussion about the existence of material «stone» bacteria are submitted [8].

According to Y. Martel and D. Young [14], researchers from Taiwan, Falk discovery remained a mystery up to 1996, when D. Mac Kay announced that the Martian meteorite is a carrier of original bacteria. Furthermore, researchers partially studied biochemical characteristics of these particles, which had in their structure magnetite, individual particles of ferrous sulphate and polycyclicaromatic compounds as well. It should be emphasized that Y. Martel and D. Young managed to make interesting conclusions about the existence of «nanobacteria» and their formation based on the analysis of scientific papers by various authors, and the results of their experiments. The authors analyzed the main results and made conclusions about nanobs – «Extremely small to be alive?» Particles, found by Falk in 5–100 times smaller than classical bacteria. However, these particles contain nucleic acids and proteins. As the authors point out on the basis of DNA sequencing, researchers called unique bacteria *Nanobacterium sanguineum*, which have a subset of pathogens *Brucella* and *Bartonella*. But it turned out that the culture in medium contaminated with «normal» bacteria that were not identified before the experiment was used in the work. However, research boom about nanobs, which remain controversial according to some facts up to our days, made it possible for company Nanobac Pharmaceuticals (Florida, USA) «to absorb» the Finnish company and start making pharmaceutical preparations against the spread of «nanobacteria» infections that cause diseases in the population [14]. The researchers made assumption about the prion nature of «nanobacteria».

As it was pointed out by Y. Martel and D. Young, nanoparticles got in the model ex-

periments based on calcium carbonate can bind and form aggregates and form crystals. The authors prove that nanoparticles form components with molecules-ions, lipids, proteins with a diversified structure. Formation of nanoparticles is done best of all when the corresponding functions of ionic compounds successfully interact with calcium, quickly move through hematopoietic system of organism. Further Y. Martel and D. Young announce that they had the opportunity to prove some positions of formation antibody to «nanobacteria». According to the researchers, the company Nanobac actually implemented the diagnostics to fetuin-A and albumin as diagnostic measures.

Thus, the first experiments (of Nanobac production) with using antibodies directed to identify «nanobacteria» in human tissue culture, in fact detected ordinary blood proteins (translation by N.N. Shafranovska) [13, 14]. Summarizing these studies it is possible to note that formation of mineralogical particles in the system of a living organisms is proved. It has been investigated that these particles (nanobs) cause diseases, but they are not living systems.

In our point of view, such studies raised a number of new challenges in the study of natural substrates and distinctive living organisms» [12]. Moreover, the study of prions, bacteria, viruses and nucleic acids and proteins each time caused the important phenomenon of complementarity in living systems, which allows them to find new functions at the molecular level. For example, aggregation of viruses, bacteria and their structures capable of forming new architectural complexes- amorphous and crystalline [2, 16], and specific sequence of nucleotides in one of the variants of «Grandpa of Virology» (TMV) induces their interaction with tumor cells Hela, piglets testes in culture and cause their lysis [2,4], which is clearly observed with a scanning electron microscope.

Studying some pathogens of pileate fungi, we have developed express method for the preparation of native products for transmissive electron microscopy [3, 15], which gave a unique opportunity to detect pathogens

of different nature (viruses, bacteria, microscopic fungi fragments) on a sticky surface covered with fruiting bodies of fungi. In this case aggregation of pathogens, their morphological characteristics and structure are well observed in mushrooms. In addition it turned out that these fruiting bodies of some species of fungi were carriers of small (20 nm) particles that were contrasted by heavy metal salts [3], they occasionally form aggregates and were met in sight with viruses, bacteria and phages.

Interestingly, in suburban settling tanks of water such particles often aggregate and form a unique architectural structure. To take into consideration these and other studies it is possible to make assumptions about the «strip» and «dressing», assembly of biopolymers in biocenoses under in vitro conditions and even formation capsular structures on their basis.

It should be emphasized that the submitted information about «Nanobacteria» makes it possible to conduct further experiments of «stone» structures and similar systems, depending on the structure of biopolymers and their information systems.

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НОВИНИ

9–13 вересня 2013 р. в Інституті агроєкології і природокористування НААН відбулися курси підвищення кваліфікації наукових кадрів мережі Національної академії аграрних наук України та науково-педагогічних працівників вищих аграрних навчальних закладів.

Слухачами курсів були працівники із 8 науково-дослідних установ та інститутів агропромислового виробництва НААН, а також представники трьох вищих навчальних закладів (Житомирський національний агроєкологічний університет, Харківська державна зооветеринарна академія, Харківський національний аграрний університет ім. В.В. Докучаєва).

Програмою лекційних та практичних занять було охоплено коло питань з таких спеціальностей:

- агроєкологічний моніторинг;
- економіка природокористування та охорони навколишнього середовища;
- збереження біорізноманіття та біобезпека.

До проведення лекційних та практичних занять було залучено як провідних, так і молодих вчених інституту.