

Andrei Dukhin

From: Dispersion Technology Inc. [andrei@dispersion.ccsend.com] on behalf of Dispersion Technology Inc. [adukhin@dispersion.com]
Sent: Wednesday, July 14, 2010 10:55 AM
To: adukhin@dispersion.com
Subject: Newsletter #23 from Dispersion Technology Inc.

Complete list of our newsletters on www.dispersion.com

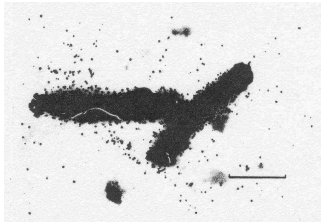
You're receiving this email because of your relationship with Dispersion Technology Inc.. Please [confirm](#) your continued interest in receiving email from us.

You may [unsubscribe](#) if you no longer wish to receive our emails.

Dispersion Technology Inc. Newsletter #23

Peculiarities of live cells' interaction with micro- and nanoparticles

Published in 1992



Full text of this paper published by "*Advances in Colloid and Interface Science*" is available for 30 days :

<http://authors.elsevier.com/offprints/CIS1091/99f96bb113ddef03e2538bf17b6>

Abstract:

Experimental evidence collected more than 20 years ago in different laboratories suggests that the interactions between live biological cells and micro- and nanoparticles depend on their metabolic state. These experiments were conducted by reputable groups, led by prominent leaders such as H. Pohl of the USA, who the inventor of dielectrophoresis, and B. Derjaguin of the Soviet Union who was leading author of DLVO theory. The experiments had been mostly conducted with microparticles in the early 1980s. In the early 1990s, Ukrainian researchers show that the interaction of live cells with gold nanoparticles consisted of an initial reversible step that also depended on cell metabolism. They found indirect evidence that the ion pumps of the cells were responsible for the reversible step. Ion pumps generate a transmembrane potential, a measurable and widely-used characteristic of the cell's energetic state. The transmembrane potential, in turn, strongly affects the ζ -potential, as was experimentally discovered 40 years ago by several independent groups using cell electrophoresis. This relationship should be taken into account when DLVO theory is considered as the basis for describing the interaction between live cells and micro- and nanoparticles. Unfortunately, detailed theoretical analysis indicates that such modification would not be sufficient for explaining the observed peculiarities mentioned above. That is why distinguished theoreticians such as Pohl, Frohlich, Derjaguin and others have suggested three theoretical models, presumably to explain these experiments. These theoretical models should be considered to be complementary to the well-established concepts developed on this subject in the molecular biology of cells and cell adhesion. This paper is no revision of the existing models. It is an overview of the old and forgotten experimental data and discussion of the suggested theoretical models.

The unusual interaction mechanisms are only specific for live biological cells and can serve a dual role: either as a first barrier to protect the cell from potentially damaging, dispersed particulates, or as a means of accumulating useful substances.

Both functions are critical for the modern problem of nanotoxicology.

✉ **SafeUnsubscribe®**

This email was sent to adukhin@dispersion.com by adukhin@dispersion.com.

[Update Profile/Email Address](#) | Instant removal with [SafeUnsubscribe™](#) | [Privacy Policy](#).

Email Marketing by



Dispersion Technology Inc. | 364 Adams Street | Bedford Hills | NY | 10507