

Human magnetism in the COVID-19 vaccination era: Rereading of a long-standing scientific fact that has resurfaced

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Can the human body produce a magnetic field to attract metal objects? Until recently, folks were skeptical of this fact and considered such a characteristic specific to those who perform dramatic movements in the circus. During vaccination of the COVID-19 pandemic, distributed homemade movies—depicting metal attraction on the body—raised a question in the public mind if ingredients of vaccines play a role in observing this phenomenon. On June 3rd, 2021, the United States Centers for Disease Control and Prevention (CDC) announced that receiving a COVID-19 vaccine will not make the recipients magnetic. Yet, the abundance of reports increases the probability of authenticity of the observations. Although the observations seem unprecedented, the scientific community is not entirely foreign to them. In 1975, David Cohen, in an article, explained the proven source of magnetic field originating from the human body—possible due to the same observations at the time (1).

As Cohen described, and now is an accepted observation, two primary sources of magnetic fields in the human body are the heart and the brain. The reason for that is coming from a general old rule of physics that electric current creates a magnetic field. Since the heart has a more synchronous depolarization, it can produce a stronger magnetic field—with a magnitude around 1 to 14 nT (1, 2). As participants in the above-mentioned experiments refer to the vaccination site (usually the left arm), it should be noted that the human body's magnetic field sites are dominantly around the heart, chest, and left arm, and such a co-localization with the vaccination site is just a coincidence. However, there is still a huge gap between the magnetic field at the body's surface and the magnetic field, which is required to attract a relatively small metal object like a spoon. Thus, there should be other explanations for these spooky observations.

One possible scenario, which can relate the status in the pandemic era to human magnetism, is the substantial change in the heart's electrical conduction due to infections. The scenario can be supported by frequently related myocardial pathology. Cardiopathy might be associated with an acute and systematic inflammatory condition, prolonged hypoxia of patients, and/or direct infection of the myocardium due to the virus (3-5).

The other complementary scenario may be related to the increased amount of paramagnetic substances, such as ferritin, in infected patients (6). For the specific ferritin case, macrophages can provide a plausible explanation. Macrophages are responsible for heme-iron homeostasis (7-8). Ferritin elevation can be related to the up-regulation of immune cells due to infection and/or vaccination. However, it is of particular note that a paramagnetic substance, like ferritin, does not have spontaneous magnetization and

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needs an external magnetic field to align electron spins and show a magnetic property. More calculations and experimental studies are required to determine the possibility of these hypotheses.

Regarding the presence of biomagnetic materials in higher organisms such as animals and plants, the most substantial discussion and challenges are on the presence of an evolutionarily conserved multimeric magneto-sensing protein complex called magnetoreception-related cryptochromes (9). This complex is a flavoprotein receptor that reveals the traits of both cryptochromes and iron-based systems and exhibits spontaneous alignment in magnetic fields (10).

Conclusively, more detailed investigations are needed to confirm whether the recent observed human magnetism is related to COVID-19 infec-

tion and/or vaccination or is just a coincidence. We herein propose to assess the correlation of the electrocardiogram (ECG) and echocardiogram (echo) records when strong human magnetism is observed in clinical trial studies. Investigations on biomagnetic proteins and their application have been proposed for modern physiotherapy and brain-to-brain communication. The relevance of these proteins in drug development is of great value for future pharmaceutical discussions.

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Conflict of Interest

None declared.

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