Is Vaccination Still Appropriate?

Quo vadis vaccination? An attempt to take a new look at the current "vaccination madness".

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A Little History

What happened roughly 150 years ago? In 1876, *Robert Koch*, a German physician, microbiologist, cultivated Bacillus anthracis, the anthrax pathogen, a few years later, in 1882, the tuberculosis pathogen, Mycobacterium tuberculosis, and a year later the cholera pathogen, Vibrio cholerae. *Louis Pasteur*, a French chemist, physicist, biochemist, 20 years older, had already studied microorganisms, explained yeast fermentation and developed vaccines against poultry cholera, anthrax, swine erysipelas and rabies. At the end of the 19th century, *Emil von Behring*, a German physician, immunologist, serologist, brought the diphtheria antiserum onto the market, in the development of which *Paul Ehrlich*, another German chemist, physician and serologist, was also involved. They were all famous, award-winning scientists, researching the causes of infectious diseases with the aim of helping sick people.

The scientific conquest of the world of microbes was fascinating, exciting, constantly brought new findings - and brought good profits for the emerging pharmaceutical industry. As early as 1895, Emil von Behring earned over 700,000 Reichsmark in net profit from the production of the diphtheria healing serum at the Hoechst Farbwerke. The wars in the first half of the 20th century, with their wounded, offered optimal conditions for field trials. And the plight of the population suffering from the consequences of the war offered the best conditions for spreading diseases of all kinds and their research. This was indeed a blessing for research, a gain for the pharmaceutical industry, and for people? At first everything looked quite good.

Technical progress expanded the knowledge. In 1926, the first viruses - bacteriophages - were described by *Felix d'Hérelle*, a French Canadian, and in 1939 a virus structure was shown for the first time under an electron microscope, the *tobacco mosaic virus*. From then on, the pharmaceutical industry tried to provide a medicinal response to every new discovery, and vaccination against every conceivable pathogen proved to be a particularly economical field. So research was carried out particularly diligently in this area.

The Success of Advertising

With the revival of national economies after World War II, it was not at first so easy to bring the pharmaceutical industry's new products to people and animals. For thousands of years, people had lived closely together with microbes. Dirt, excrement and waste defined the image of cities for centuries - and shaped the immune systems of those who survived these challenges of life.

After World War II, advertising therefore became the new profitable buzzword worldwide. Advertising for progress, for new medicines, for disinfectants and for almost everything spread all over the world with the help of modern media. Medical advertising in particular deliberately worked with fears, with threatening scenarios, fear of death, of infections, of crippling, of premature loss of youthful appearance. Fear has always been an effective means of influencing people.

The older ones among us will certainly still remember the television commercials in the 1960s, the advertising campaigns against bacteria that suddenly became the cause of almost all diseases and problems. There were disinfectants for every purpose, from laundry to toilets, from shampoo to shoe spray. And if someone did get sick, there were various antibiotics that worked well back then. Penicillin was even used for a simple sore throat, and at times even as chewing gum. The golden age of the pharmaceutical industry had begun.

Advances in research expanded knowledge in almost all areas of medicine. People knew about the risks of long-term effects of scarlet fever, but the culprits here were streptococci, and penicillin was effective against them for a long time. With the antibiotic era, dreaded diseases such as tuberculosis, syphilis and gonorrhea lost their terror, at first. The pharmaceutical industry was constantly finding new and more powerful antibiotic substances. The development of resistance in certain germs did not seem to be of decisive importance, as the growing antibiotics market was constantly offering new, effective alternatives.

Today we know that this euphoric behavior was wrong. We are all paying today for the carelessness in medicine over the last 70 years and for the industry's pursuit of profit. With this in mind, shouldn't we look at the latest developments in medicine a little more critically? Can everything really be geared towards the profit of the pharmaceutical industry?

Viruses

Viruses initially played a minor role in medicine after World War II. The term was usually associated with exotic diseases or the usual virus-related childhood illnesses. These were the diseases that children "went through"; complications were rare, and if they did occur, they were usually secondary bacterial infections, for which effective antibiotics were available. Serious complications were extremely rare, at least not in the immediate course of the disease.

Viruses were often even questioned as existential, described as cell products or assigned to exosomes. Discussions that have not yet been fully concluded, despite all the electron microscopic images and the knowledge gained from cell cultures.

As a rule, the term "virus" only refers to the protective capsid made of proteins that envelops the viral genome information in the extracellular environment. This infectious particle is known as a virion and is generally considered dead. Virions are entities that invade cellular organisms and take control of them in order to produce more virions. The virion is the extracellular step in the life cycle of a virus. It is the dormant and inactive form of viral genetic information. The actual virus, however, is more than its dead shell in the environment. It is part of a living organism as soon as it is in a host cell. Most viruses need a specific receptor to bind to a cell, but some can also fuse directly with the membrane of a cell. The binding process to the receptor is energy-independent, whereas penetration of the cell wall is energy-intensive. And the cell provides the energy for this. This is actually very strange. What if this mechanism was intended in evolutionary terms?
Regardless of the consideration of the life status, viruses are part of the constantly evolving biosphere and therefore a relevant factor in the most diverse evolutionary processes. The earlier discussion that only retroviruses are able to nest in the genome has long been considered outdated. Today we know that non-reverse transcriptase viruses, RNA and DNA viruses can also be integrated into our genome and can take over long-term functions in our system.
Viruses contain the information for their reproduction, but not the cellular requirements necessary for this. Viruses do not have their own metabolism and are dependent on the metabolism of an intact host cell to reproduce. Viruses only have one type of nucleic acid, RNA or DNA. In many textbooks, viruses are referred to as parasites. According to recent findings, this does not generally apply. Viruses can certainly be considered symbionts. And like all life forms, viruses also have a purpose in the course of evolution. They can be described as the USB sticks of evolution, that is, as information transmitters that constantly supply us with new genes.

Vaccinations

Starting from some initial purely empirical medical successes, vaccination became increasingly important after the Second World War. With the research into antibodies, which were first described in 1948 by the Swedish immunologist *Astrid Fagraeus*, a correlate for the "vaccination success" was finally found, and this correlate became more and more important, even more important than the frequency of new occurrences of a disease in people who had already been vaccinated against it. The smallpox vaccination, which had been in use since the end of the 18th century, became compulsory for many years. Every winter, influenza was blown up into a life-threatening epidemic, especially by the pharmaceutical industry, which, together with doctors, made good money from the annual flu vaccination. Routine vaccination programs for children were developed, and new vaccines were added year after year. And there were enough vaccination scandals. Please remember *Hexavac*, *Ticovac*, *Rotarix* and *Rotatec*, *Pandemrix*, all vaccinations with sometimes serious side effects that nevertheless remained on the market for a long time and caused more harm than good.

Now, one might argue that all this is being done for the good of people, for our health, that problems sometimes only appear later, and that the positive effects have mostly outweighed the negative ones. At least since the Corona pandemic, it should be clear to everyone that this is not the case. Even stubborn vaccination advocates are gradually realizing the lobbying influence that vaccination policy is under. Monovalent vaccinations have become polyvalent mixed vaccinations with sometimes bizarre consequences. The introduction of a "compulsory measles vaccination" in Germany in March 2020

effectively became a compulsory vaccination against measles, mumps and rubella, quite simply because the industry no longer offers a monovalent measles vaccine. Whether all of this could have negative long-term effects is completely ignored. Politicians dutifully follow the influence of the powerful pharmaceutical lobby.

Today, children in Germany receive 34 vaccinations by the end of their second year of life and 50 vaccinations by the time they are 18 years old. We vaccinate against rotaviruses, tetanus, diphtheria, pertussis, Haemophilus influenzae B, polio, hepatitis B, pneumococci, meningococci, measles, mumps, rubella, varicella, HPV, herpes zoster, influenza and COVID-19. In the USA, there are significantly more injections.

Based on the number of vaccinations, people should be much healthier today than they were 70 years ago, life expectancy should have increased steadily, and infectious diseases should basically no longer play a role on this planet. But is this really the case? Are people healthier today than in the 1960s or 1970s?

No, they are not! In fact, people are sicker on average today, and even life expectancy has decreased in many developed countries in recent years, and not just since COVID. In contrast, diseases that were previously largely unknown have increased dramatically. Autism, dementia and other neurological diseases, autoimmune diseases with their sometimes complex metabolic effects, and malignant diseases are just a few examples. Few people really think about why this is the case. Smoking, obesity due to poor diet, lack of exercise, environmental pollutants, even climatic changes are all cited as causes, and yes, all of these may play a role, but almost nothing has really changed as a result of this realization.

Could it be that increased vaccinations play a causal role here, possibly in conjunction with other factors like environmental toxins like glyphosate? Should we perhaps assume that vaccinations are failing in the long term? Could it be that there are other, previously unconsidered factors that influence the initial success of vaccinations in the long term, factors that bring with them negative vaccine-related effects on people's health?

A trip into genetics

Like all other life forms, we humans are the product of our genes, and not just the protein-coding ones, which only make up about 1.5% of the entire genome, but also a multitude of other genetic factors that ultimately determine our phenotype. And because we are the product of our genes and genetic factors, we should also be aware that we owe this to evolution, a process of shaping life on this planet that has lasted for millions of years. We sit at the end of a branch of the tree of life. Our genes are the product of trillions of influences, mixing and transformations during the course of evolution up to the present day. Whether we like it or not, we are somehow related to all other life forms on this planet, right down to the last archaic single-celled organism. The entire micro and macro world of life is a single, closely knit network.

In fact, viruses in particular, but also bacteria and probably eukaryotes, have played a key role in shaping our genome by incorporating themselves into our genome millions of years ago and are still incorporating them today. At least 9% of our genome are endogenous retroviruses, viruses that are now so firmly linked to our genome that they have taken over vital functions in our system. The mitochondria, our cellular energy factories, are the descendants of rickettsia-like bacteria, have their own genetic material that is still passed on from generation to generation via the maternal route. Our cell functions are absolutely dependent on these endosymbionts.

We are not the end point of an evolutionary history that makes us the crowning glory of any kind of creation. The genome has always been subject to constant change, from the outside and from the inside. We must not believe that evolution has stopped working on us. We continue to be subject to its rules and changes, whether we like it or not.
Every day we come into contact with billions of microbes and viruses. Every day, our organism comes into contact with these other life forms, mostly unnoticed, and is constantly being changed and shaped by them in an evolutionary sense. These confrontations can sometimes make us ill, but ultimately they are always adaptation processes to the inexorably changing environment. These adaptation processes influence our genome permanently and continuously. And the genome does not stand still internally either.

Transposable elements, also called "jumping genes," are discrete pieces of DNA that can move from place to place within and sometimes between genomes. The way they interact with their genomic environment is the subject of current research. It is now known that almost half of our genome is derived from such

transposable elements, and this is probably an underestimate, since many of these elements have changed beyond recognition over time. These elements come from other life forms, mostly viruses or bacteria. These transposable elements include LTR retrotransposons, non-LTR retrotransposons, including their subelements LINE-1, Alu and SVA elements, among others. It is worth looking into their functions. They have proliferated within the genome over the last 80 million years of primate evolution and now make up about a third of the human genome.
Their influences are phenomenal: they generate insertion mutations, genomic instability, changes in gene expression and contribute to genetic innovation. In doing so, they also influence epigenetic mechanisms, lead to changes in our phenotype and, together with the constantly new genes that are introduced from outside (for example, by viruses), enable us to adapt to the changing environment. This makes us more able to survive as a species. As the sequences of human and other primate genomes are analyzed in ever greater detail, we are beginning to understand the extent and complexity of the past and present contribution of these elements to genomic change in the human lineage.

Microbiome

Every higher life form has its own microbiome. This applies to the plant world as well as the animal world. Put a bouquet of flowers in a vase of water and after a week look at a drop of this water under the microscope! This drop is suddenly teeming with life. This life is based on the microbiome of the flowers in the vase.
The situation of our life is therefore much more complicated than the common idea of our existence. Our genetically structured system is not capable of surviving on its own. How, you may ask yourself. We come into the world as living beings, we breathe, scream, move. In fact, that is enough for the first breath. From this moment on, however, our organism, just like all other life forms, needs the interaction with a multitude of microbes, i.e. bacteria, fungi, parasites and viruses. This microbiome is absolutely vital for us. Without the microbiome, a newborn would die very soon.

The microbiome colonizes our skin, mucous membranes, respiratory tract, intestines, and even the individual tissues of the body within a short period of time. There are around 39 trillion bacteria and fungi compared to our 30 to 32 trillion body cells in adults, and if we include viruses, the microbiome increases by a factor of 10. Metagenomic studies have now shown that almost all pathogenic bacterial subgroups and many pathogenic virus species are already contained in our holo-microbiome, but without causing any damage to a "healthy" organism.

The interaction between the microbiome, virome, and our body is so comprehensive that there is practically no metabolic process in which microbes or viruses are not involved: the gut-brain axis, gut-lung axis, and gut-skin axis all indicate these intensive connections. Isn't it amazing that the bacterial colonization of our digestive tract is able to influence our ability to think? And if the intestinal microbiome is sick, our central nervous system can also become sick as a result. The genome of certain intestinal bacteria has even been found in arteriosclerotic plaques, and cancer cells also have their own microbiome.
The bacteria in the intestinal microbiome help with the digestion process of food, provide us with essential amino acids that we cannot produce ourselves, provide us with vitamins and ensure that the environment in the intestine is optimized for the digestive processes. Any disruption to this system makes us sick, changes the permeability of the intestinal wall barrier, affects the function of our immune system and even provokes malignant diseases.

But it is not just the influence of the intestinal microbiome on metabolic processes and the immune system that is of fundamental importance. The skin microbiome, in conjunction with the products of our sweat glands and sebaceous glands, protects us from damage caused by external factors and from the pathogenic effects of some microbes. If necessary, antimicrobial peptides or defensins can be mobilized on the epithelial surfaces. These peptides, usually less than 50 amino acids long, are found in all animals and also in plants. They are generally positively charged and have a hydrophobic or amphipathic (hydrophilic and at the same time lipophilic) domain in their folded structures. They have a broad spectrum of antibiotic activities that are able to kill or inactivate bacteria, fungi, some parasites and even certain enveloped viruses, which is difficult to achieve even with the most modern antiviral drugs.

When healthy, the system cleverly uses the natural functions of certain types of bacteria and thus ensures a state of balance that enables the life and survival of all those involved. Not only do our own skin cells communicate with the microbiome, but the microbes also communicate with each other. Sophisticated techniques such as quorum sensing regulate the population density in our skin microbiome using highly

specific signaling molecules and thus ensure, among other things, an optimal, protective pH range in the individual skin and mucous membrane regions.

The importance of the skin microbiome becomes even more comprehensive when we consider that it also influences communication within our species. Even though we have lost many olfactory abilities over the course of evolution, our sense of smell still plays a major role in choosing a partner. Being able to "smell" or "not smell" someone is very important for whether or not the brain can transmit a "sympathy signal". Choosing the right partner can be a decisive factor for positive evolutionary selection.

Microbiome research is still young and has only gradually gained momentum in the last 20 years. But the importance of the interaction between the individual microbes, viruses and our body cells is becoming increasingly obvious. It is almost succinct to mention that viruses in our intestines, as bacteriophages, are essential regulatory mechanisms of the bacterial and fungal side of the intestinal microbiome.

Back to vaccination

The invention of the wheel was perhaps the most decisive advance for us humans, a development that ultimately led to the car and the airplane. But people had to realize that this advance had consequences, risks and dangers, including for life. Environmental pollution, smog, exhaust fumes made people sick. But people eventually learned and sought improvements, exhaust filters for cars, improved fuels with fewer pollutants, and even electric drives. This advance brought ecological and economic benefits.

The idea of vaccination is over 200 years old, always associated with the idea that we could prevent the spread of an infectious disease. The discovery of bacteria and viruses fit in perfectly with the idea of vaccination, and the suppression of microbes became the primary goal, supported by an almost all-powerful pharmaceutical industry that derived infinite profits from it. We now know a lot more about microbes. We know that our organism is a holobiont that needs not only its own body cells to survive, but also the trillions of microbes and viruses that belong to it.
In view of these findings, is it not high time to completely rethink the concept of vaccination, just as we had to rethink the consequences of our mobility? It is becoming increasingly clear that certain infections in childhood have a vital, if not evolutionary, function.

"Experiencing" measles, mumps, and rubella has a significant protective effect against cardiovascular diseases in adulthood. Measles infection protects against certain types of cancer. There is also evidence that after several "childhood vaccinations", diabetes, ulcerative colitis, and Crohn's disease occur more frequently later on, so that conversely, natural infections may have a protective effect here.

The presence of certain viruses in the body, e.g. the cytomegalovirus, improves the immune defense against other infections. For example, the herpes virus that is latently present in the body has a protective effect against Listeria monocytogenes and Yersinia pestis infections, thus protecting against plague. Fusobacteria in the oropharyngeal microbiome protect against certain squamous cell carcinomas in this area and are now even used therapeutically.

It is highly likely that all of these effects are due to the connections and mechanisms of action of the holomicrobiome, and the knowledge on this is based on research over the last 30 years. Some vaccinations are probably already life-saving, for example the rabies vaccination as pre-exposure prophylaxis when traveling to countries where rabies is rampant, although here too the pharmaceutical industry's profit is likely to take precedence over human health. However, most vaccinations today are not primarily life-saving, at least not in countries with a sufficiently high standard of living. In most cases, the diseases against which vaccinations are given in these countries today had long since declined, if not disappeared, before a vaccine was introduced. Today, vaccinations against respiratory infections and classic childhood diseases in particular should be reassessed, as should vaccinations against diseases that are usually harmless, such as RSV infections.
The introduction of a vaccine into the body always has an impact on our holomicrobiome. And if this affects the microbiome or virome, our genetic system is also affected. Antibodies that are forcibly produced in the body, against whatever germ, without any connection to an infection, must logically disrupt the balance within the functional systems, from metabolic processes to effects on genetic processes such as chromatin folding and thus the readability of individual genes.

The use of a large number of drugs should also be reassessed in light of these connections.

I think it is high time to reassess the entire vaccination ideology and also a large part of pharmaceutical therapy in this regard. We urgently need studies that explore the inherently logical connections, beyond the boundaries of the individual specialist areas. This research must be independent, uninfluenced by the lobbying of the pharmaceutical industry, paid for with taxpayers' money.

This is the only way to break up the entrenched pharmaceutical system, especially the vaccination system. Without such research, we run the risk of harming ourselves in the long term through carelessness. Humanity has already made too many mistakes out of greed and carelessness. It is time to reflect.

In my opinion, all the new findings speak against "blind" vaccination, especially of children.

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