



## Commentary

# Revere the Exclusion Nature of the Human Body

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### Abstract

Overusing artificial interventions such as intravenous infusion of antimicrobial agents or chemotherapy drugs can lead to adverse reactions (ADRs). The underlying biochemical mechanisms of these ADRs are widely studied but rarely from the evolutionary perspective. Extending the concept of evolution that man must adapt to nature to survive, we propose that medicine should adapt to the nature of the human body. It enables us to point out a mechanism that unnatural drugs entering the body in an unnatural way will trigger excessive free radicals to attack the body, which may be the common source of adverse reactions to infusion and chemotherapy. On the contrary, due to the long-term adaptation of the human body, intestinal digestion of herbal medicines is relatively less likely to stimulate excessive free radicals, and tea drinking is significantly beneficial to clearing excessive free radicals. Our research supports a shift towards an evolutionary-aware medicinal approach that aligns with human physiology to minimize ADRs. Further investigation is required to verify and incorporate this mechanism into clinical practice, which could significantly enhance treatment safety and effectiveness.

**Keywords:** Human-drug adaptability; Free radicals; Unnatural drugs; Adverse reactions; Herbal medicines; Tea-drinking

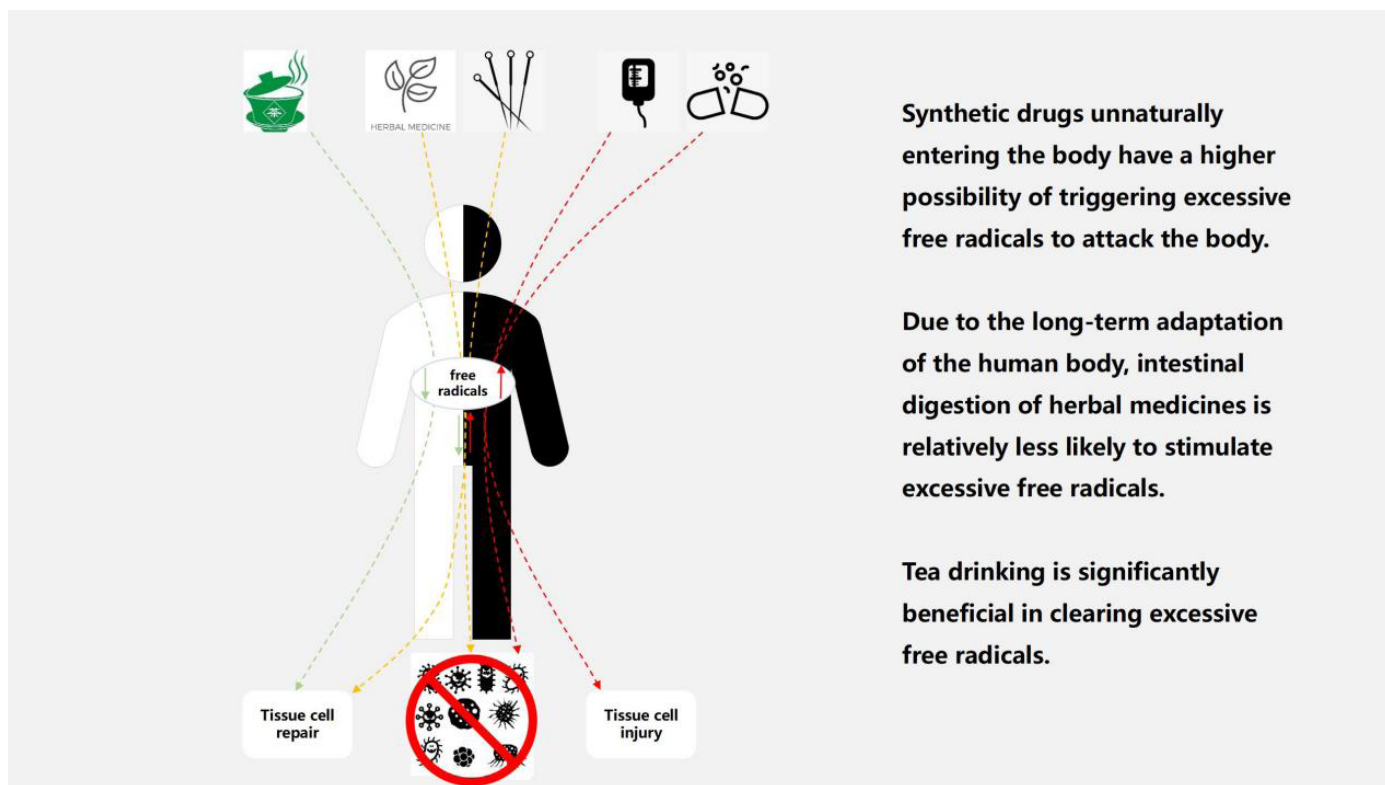
### Main Text

Compared to stars and planets, humans are in the position of “dust” in the universe, on which nature has a decisive influence. Darwin’s theory of evolution revealed the existing mechanisms that the human body forms during the long-time adaption to natural changes [1]. Other people and creatures that can’t adjust to these natural changes have been eliminated. Thus, the healthy survival of the human mind and body must follow nature, which is a real-life science-the only one, not any other.

This simple argument is inclusive and should be explored in depth. We should urgently pay attention to reverting the natural exclusion law of the human body, through which we can reduce the harm of some modern medical treatments to human beings. For example, the infusion of therapeutic drugs or saline directly into human blood is a routine treatment method in contemporary clinical practice. This method induces positive effects on some diseases. But a corresponding side effect is usually ignored: the harm of synthetic drugs and cells directly entering the blood (or the course of natural substances entering the human body in unnatural ways).

All substances entering the blood must be strictly screened and processed by the relevant organs of the human body. This is already a contract with nature for the long-term survival of human beings. Once violated, there may be uncertain damage to human health and even life. Once a substance that the relevant organs have not processed enters, the human body will start the rejection mechanism automatically. It will only stop once it reaches its goal. Two well-known effects of this rejection mechanism are the rejection of organ transplantation [2] and the adverse reaction associated with drugs and infusion [3-6]. This letter concerns the molecular mechanism of the Adverse Drug Reaction (ADR), especially the production of a chemical substance called a “free radical” used for fighting.

Free radicals are substances that humans are born with [7]. There is a special rule in the world of atoms: as long as more than two atoms are combined, their peripheral electrons must be paired. Otherwise, they must find another electron to make themselves a stable substance. Scientists call such atoms or molecules with unpaired electrons free radicals. Free radicals in the human body can kill viruses and germs by capturing their electrons, which is beneficial to people on the one hand (Figure 1). Still, on the other hand, too many free radicals will loot the electrons of normal cells to make them die, causing harm to the human body [8].



**Figure 1:** Schematic diagram of the effects of tea drinking and various treatments on free radicals in the human body.

We argue that when a medicine is infused through veins or even injected intramuscularly, the human body can produce a corresponding number of free radicals to fight against foreign substances. But unfortunately, it induces so many free radicals that exceed the human body’s threshold of keeping healthy. Furthermore, excess free radicals consume people’s energy and physical and mental strength, producing many corpse cells that hinder blood circulation. This hypothesis points out a new way to understand the mechanism of adverse reactions of infusion. A retrospective study shows hyperglycaemia is associated with high, continuous infusion rates of total parenteral dextrose nutrition [9]. Furthermore, animal experiments have shown that acute hyperglycaemia induced by intravenous infusion of excessive glucose can cause oxidative stress and make a low systemic inflammatory response in rat liver tissues [10]. Therefore, the mechanism may be that the enhancement of glucose oxidation leads to increased free radicals, causing membrane lipid peroxidation and leading to membrane dysfunction and tissue damage.

Doctors have observed some cases of young patients receiving intravenous infusion in clinical treatment due to light respiratory tract infection, acute gastritis, and other minor problems resulting in a mysterious death. On the other hand, since worrying about cardiovascular and cerebrovascular problems when the seasons change and the weather turns cold, some older people go to the hospital

for preventative intravenous infusion, resulting in death or severe illness after the infusion. These clinical observations are also supported by scientific research. One research reported many cases of sudden death during intravenous infusion in children and young people [11]. For older people, sudden cardiac death is the most severe clinical syndrome of heart disease, killing 544,000 people in China every year [12]. A regional forensic pathology study has found that infusion is one of the most significant causes of sudden coronary death [13].

In these two examples, medical regulations, in most cases, are strictly carried out without apparent mistakes. But a simple disease such as cold has killed people, which is unacceptable to the families of the deceased and also makes medical treatment fall into medical and ethical embarrassment. This indisputable fact is not only related to a few cases. According to incomplete statistics, in a country with a population of more than one billion, 390000 people died of intravenous infusion in the whole year [14], bringing the country significant health problems and high social costs. Therefore, pointing out the critical mechanism and finding solutions is very urgent. Unfortunately, the joint post-mortem analysis of these cases often attributes the cause to adverse drug reactions, delayed allergic reactions, the indications and contraindications of intravenous infusion [15], and complications, such as acute pulmonary edema [16]. Moreover, there is a lack of examinations on the underlying biochemical mechanism and clinical methodology. As mentioned above, we argued that the attack from excess free radicals caused by synthetic drugs unnaturally entering the blood might be the key to this sudden death caused by infusion. We believe further exploring and testing this new idea will help us understand and deal with related problems.

In addition to the flooding of free radicals caused by intravenous infusion, the entry of cancer chemotherapy drugs into the blood will also cause the retaliatory flooding of free radicals [17]. Because chemotherapy drugs kill both cancer cells and normal cells, the human body will regulate the free radical numbers corresponding to the strength of chemotherapy drugs to fight them, turning the human body into a battlefield. As a result, some cancer patients had successful operations but died of chemotherapy. Indeed, reactive oxygen species have been reported to cause or contribute to some side effects common to many anticancer drugs, such as gastrointestinal toxicity and mutagenesis [18].

Medicine must revere nature. The human body uses free radicals as soldiers to fight against substances that enter the blood in unnatural ways, which belongs to the nature category. Therefore, doctors should pay great attention to substances not produced by the human body in the blood and use them cautiously. If doctors have to do this, consider free radicals' production, side effects, and the degree of danger.

Traditional Chinese medicine has a history of thousands of years since ancient periods and has always insisted that the ingredients of traditional Chinese medicine cannot enter the blood until digestion and absorption by the viscera [19]. Acupuncture needles are inserted into acupoints and can induce local free radical confrontation. However, the acupuncture time is short, and the acupuncture site is small. Thus, the free radicals produced are very few. On the other hand, some studies find acupuncture is effective in treating oxidation caused by reactive oxygen species during stress-induced depressive behaviour [20] or after ischemia-reperfusion injury [21], according to many pathways.

In addition, drinking tea can eliminate excess free radicals in the body [22]. Traditional Chinese medicine is good at using tea, especially organic green tea. "Shen Nong tasted a hundred herbs and was poisoned seventy-two times a day but was healed after he got the tea." In China, this is a much-told story from ancient times to today. However, this phenomenon can be scientifically interpreted after discovering free radicals in contemporary science. The tea polyphenols (especially catechin) in organic green tea have powerful antioxidant properties, effectively scavenging free radicals and reducing oxidative stress damage on the body [22]. Drinking organic green tea at the right time and in the right amount every day can brighten the heart and brain, which is the effect of tea that can wash the free radicals. We must know this.

In conclusion, this letter has discussed the pivotal role of free radicals in shaping the body's response to various medical procedures. We propose that the insertion of synthetic drugs via non-natural routes, such as intravenous infusion or chemotherapy, may instigate a proliferation of free radicals. This radical overproduction, surpassing the body's innate capacity to regulate, can precipitate harmful consequences, including adverse reactions, cellular damage, and, in extreme cases, mortality. On the other hand, Traditional Chinese Medicine, with its emphasis on natural administration and herbal remedies, seems to elicit a more subdued radical response. For example, acupuncture induces a localized and minimal free radical conflict, while consistent consumption of organic green tea proves efficacious in neutralizing surplus free radicals.

However, this letter is only the beginning. Further studies are warranted to validate our proposed mechanisms and explore potential mitigation strategies. Future studies should aim to understand the precise conditions under which free radical production becomes excessive, the specific impacts of different types of drugs and treatments, and the potential methods to control and mitigate such reactions. A more comprehensive understanding of these processes could lead to safer and more effective clinical practices and treatments.

## Data Availability

No underlying data was collected or produced in this study.

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