Answer 1

Biological robustness and fragility are the common features of biological systems, they coexist and interact to each other. Biological robustness is the directional evolution of biological system, it continuously strengthen the specific feature in long run to ensure the robustness become an integral part of survival. At the same time, biological fragility usually is the weakness and the competition disadvantage of the biological system, causes the death or even extinction. However, a fragility may turn out to be a robustness of the biological system under the natural selection.

What are the definitions of biological robustness and fragility, before figuring out the coexistent and interaction between them.

Biological robustness is the biological system feature that maintains some other performance characteristics under a certain parameter perturbation. In other words, it shows the ability of the biological system to complete the scheduled work well when the system fails. For example, when creature A and creature B encounter the same environmental variables (such as floods and droughts), creature A can better follow the original complicated rules of survival, while creature B perishes in this variable. Then we will feel that the biological robustness of creature A is better than that of creature B.

Robustness promotes the possibilities of directional evolution. In the series of iterations, natural selection may select the most suitable ones for the environment.

Biological fragility refers to the fragility of organisms to changes in external environmental variables, resulting in fragmentation or destruction of their own nature or state. Often a weakness and a competitive disadvantage in biological systems and can lead to death or even extinction.
Disease is a type of biological vulnerability in which organisms are affected by changes in environmental variables (such as cancer, diabetes, AIDS), thereby affecting the normal functioning of their own organisms. The coronavirus is the detection of the biological fragility of the entire human being. A virus that has not previously occurred on the human body suddenly broke out and spread and evolved rapidly in the entire human environment. Millions of humans died as a result, and billions of humans are infected by the virus. This made human beings, who thought they were omnipotent, feel his biological fragility.

Is biological robustness integral part of survival, and why?
Biological robustness is a must for biological survival. It allows organisms to adapt to new variables in a timely manner with their original attributes when encountering environmental changes, without causing individual death. Thereby striving for more possibilities of evolution and diversity for the whole species. And in a short enough time, strengthen the robustness and compensate for the fragility.

What are the consequences of fragility and how one could avoid it?
The fragility of organisms often leads to the failure of the original rules and states to continue normally, which may cause illness, death, or even extinction in severe cases. As mentioned above, the evolution of fragility through natural selection cannot be determined by a single individual. But as for a single organism, avoiding drastic environmental changes and staying in familiar and adapted environmental variables is the most instinctive way to avoid vulnerability, that is, to seek advantages and avoid disadvantages.

The above explains the coexistence of robustness and fragility, so what is their interaction?
I think the robustness and fragility of organisms are determined in specific environmental variables, not static. When the environment variable changes, robustness and fragility may switch, that is, robustness becomes fragility in the new environment variable. vice versa.

Geckos and other lizards, when encountering natural enemies, can actively abandon their tails to attract natural enemies, so as to achieve the purpose of escape. The lost tail can grow back after a period of time, and the gecko can return to normal living conditions, thereby maintaining the survival

of the individual, the continuation of DNA and the reproduction of the species. But in the initial period, this property of easy tail docking belonged to the gecko's fragility, because when it did not encounter natural enemies, this shortcoming would affect the gecko's crawling, foraging, and mating. But under natural selection, such geckos reproduced and strengthened this attribute. This means that the biological fragility can be transformed into robustness, but only under certain natural selection rules.