For some pressing problems in medicine, such as the obesity epidemic or the rapid increase in chronic inflammatory and mental illnesses, new, more effective solutions are sought. Could the rather young discipline of evolutionary medicine be of help?
What is evolutionary medicine? Evolutionary medicine or Darwinian medicine is the interaction of evolution theory, biology and medicine. This interaction opens up new questions and ways of thinking that can lead to new ways of preventing and treating diseases. The principles of Darwin's theory of evolution state that random mutations occur in organisms which are selected in the respective environment, so that the organisms best adapted to this environment have a survival advantage. In addition to the struggle for existence, cooperation plays an important role. The methods of evolutionary medicine derive from many different disciplines. These include, for example, archeology, anatomical comparison, ethnographic studies, microbiology, genetics, ecology, nutritional medicine, oncology, physiology and evolutionary psychology.

Fife examples from current research illustrate which new approaches emerge through evolutionary thinking in medicine.

1. Antibiotic resistance: Antibiotics exert a selective pressure on bacterial pathogens. This leads to antibiotic resistance and thus to increased mortality – a growing problem in medicine. In the evolutionary sense, there are two ways to reduce the formation of resistance: First, by reducing the selection pressure, i.e. reducing the amount of antibiotics. The second way would be to reduce the possibility of resistance formation, for example by administration of a particularly high dose of antibiotics or combination therapies [1]. Recently, the second approach led to a novel screening of the interaction of antibiotics and natural products. One result was that vanillin significantly increases the effect of the otherwise very weakly acting antibiotic spectinomycin on multidrug-resistant *E. coli* bacteria. This offers new therapeutic options [2].

2. Neurodermatitis: Neurodermatitis is a chronic inflammatory skin disease that is often treated symptomatically with cortisone ointments. Looking at the skin in its structure not only anatomically but systemically, the skin flora comes into focus. In atopic dermatitis patients, first experiments could show that the application of sprays containing the composition of a healthy skin flora was able to reduce the affected area of the skin, the itching and the need for cortisone [3].

3. New pharmaceuticals and self-recovery by nutrition: Modern dietary recommendations focus on macro- and micronutrients. The evolutionary view reveals an important gap in almost all food pyramids: The phytochemicals, especially in the form of herbs and spices, are missing. Even small amounts can have a pharmacological effect, for example against parasites. It is known from zoopharmacognosy that animals specifically select plants to treat diseases. So the Nigerian chimpanzees select the leaves of *Desmodium gangeticum* against worm infections [4]. This plant is also used in the Ayurvedic diet against worm diseases. The search for new pharmacological agents could be shortened by such observations.

4. Mental disorders: Secondary plant compounds also play an important role in the search for new pharmacologically active substances for mental illnesses. One example is the identification of new antidepressants with fewer side effects. Saffron offers new hope here. The ingredient crocine acts via four mechanisms, resulting in a significant antidepressant effect with fewer side effects than current antidepressants [5]. Other spices such as fennel, turmeric, nutmeg, fenugreek, cilantro, pepper and cinnamon have come to the fore in terms of their mood-enhancing effects, as well as Alzheimer's prevention or treatment, and as neural performance enhancers [6].

5. Sleep: Ethnographic studies of the Hadza in Tanzania, one of the last active hunter-gatherers, show that the different chronotypes of humans have a selective advantage for groups. Measurements in the Hadza group during the night have confirmed the guardian hypothesis, according to which some people are always awake or only in a light sleep phase. Only 0.002% of the time the entire group spends sleeping. To fall asleep very early or very late is thus no sleep disturbance or extreme deviation of the norm, but has evolutionary roots [7].

These current examples show that the evolutionary biological perspective on the development, prevention and treatment of diseases opens up new, unusual avenues. In retrospect, they are often astonishingly simple solutions to problems that seem unsolvable at first. Just like the dissolution of the puzzle about the egg of Columbus.

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