



A possible cause and corresponding treatment for inflammatory, auto-immune or auto-aggressive diseases

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Summary This article develops the idea that many inflammatory, auto-immune or auto-aggressive diseases might result from conditioned responses acquired when occasional, possibly minor pathological conditions, normal organ fatigue, or similar sensations, are reinforced by an intense neural reward coinciding, often by pure bad luck, with these minor troubles. After such conditioning, and especially in times of frustration or distress, the brain will repeatedly try to obtain the reward again by recreating, with an intensity in proportion to the degree of frustration, the sensorial pattern of the initial minor trouble, producing auto-aggressive effects. This leads naturally to the idea of trying to extinguish diseases implying self-aggression by applying negative reinforcement. This behavioural strategy has been tested for some minor or medium-severity inflammatory/auto-immune troubles and, essentially, it works, although it implies practical difficulties that are reviewed in the text. Furthermore, the experience was very limited because of the difficulty of convincing people to try for good a scarcely tested technique requiring intense mental effort and completely different from the medical treatments people are used to. The article describes the physiological–behavioural model underlying our proposal, evaluates different possibilities of treatment, and provides useful practical advice. In particular, it appears that our proposal seems best suited for diseases in which the mental abilities of the person are intact and the inflammatory aggression is clearly identifiable by its symptoms, for example pain, itching, fatigue or paralysis. Possible candidate diseases could be, for example, superficial allergies or irritations, digestive inflammatory problems, rheumatoid or circulatory troubles, or motor neurological diseases like multiple sclerosis, Guillain-Barré syndrome and possibly ALS or Parkinson. The article is completed by some guidelines on the prevention of diseases implying auto-aggression, based on self-control, diet, exercise, mutual help, and avoidance of psychoactive or aggressive agents.

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Introduction

One of the major unresolved problems of today's medicine is the identification of the causes and

possible cures of diseases involving self-directed aggressive processes, inflammatory, auto-immune or of another nature. Such diseases include cancer, cardiovascular troubles, and typical auto-immune or inflammatory diseases like allergies, asthma, anaphylactic shocks, arthritis, type I diabetes, ulcerative colitis, Crohn's disease, Alzheimer's

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and Parkinson's diseases, multiple sclerosis, and many others. Taken together, these diseases account now, in most nations of the world, for around 60% of all human deaths from all causes, including infectious diseases, accidents, famines, wars, crime, natural catastrophes and all others [1]. There is massive evidence that all these diseases result from or are related to inflammations occurring without detectable cause [2–4]. Statistical associations have been detected between most of these diseases and well-known factors like excessively rich or refined diets, physical inactivity, and use of tobacco [1]. However, few experiments have provided reliable indications on whether these factors are causes or effects of the diseases, or both [5]. In addition, many such diseases are apparently triggered or aggravated by stress. Apart from that, little more is known about their aetiology.

This article develops the idea that many of the above diseases might be conditioned responses resulting from the previous coincidence in time between a medium- or high-intensity neural reward and some pathological condition or normal fatigue or lesion, possibly minor or commonplace. This initial coincidence would most often be a matter of bad luck. The mechanism hypothesized to cause the diseases is operant conditioning [6,7]. This idea has already been proposed by the author [8], but focused on artificial rewards caused by exposure to nicotine. In this first article, the only proposal of practical action was a generalized nicotine ban. Now, we will propose more realistic lines of action, despite some practical difficulties restricting their application to specific categories of patients. The rest of the article includes the simplified model of operant conditioning underlying our proposal, the proposed treatment with detailed practical advice, and guidelines for the prevention of the target diseases.

A simplified model of operant conditioning: reward, punishment, bio-activities, bio-cost, bio-patrimony

The model proposed here fully agrees with what is currently known about operant conditioning and related neural phenomena [6,7] and with everything that the author has observed by personal experimentation or observation of other people. On this basis, it seems reasonable to admit that the brains of superior animals, including humans, are programmed so as to maximise the benefits of the behaviour of the individual in terms of survival and expansion of the

species. For this purpose, the brain uses two abstract scales. The first is intended to provide a quantifiable estimation of the possible benefits of actions or circumstances in terms of survival of the species, and is materialized into the neurological perception of reward, most commonly known as pleasure. The second, inversely, quantifies possible harmful effects, and is known as suffering. The brain assigns a value to each potentially beneficial or harmful action or perception according to its own criteria, which combine innate and learned rules. Because of the complexity of life environments, most often the reliability of the measure of benefit will be rather low. Even in intelligent creatures like humans, the part of the brain in charge of these estimations, which we will call here the "behavioural brain", uses surprisingly simplistic rules, probably because of its non-plasticity, which is likely inevitable: if learning were controlled by plastic circuits, these would also control their own learning, causing a feedback loop blocking the entire plastic brain. Unfortunately, non-plastic circuits cannot be very intelligent: the genome does not have enough capacity to store intelligent ready-to-use programs, and strategies valid for a certain generation may not be valid even for the next one. In consequence, we must accept that, occasionally, the rewards assigned by our brains to certain strategies, including self-aggression, may not reflect the real benefits of these strategies.

When the behavioural brain detects a new circumstance that it associates, rightly or wrongly, with a benefit for the species, it triggers the rewarding process, which is perceived as a sensation of pleasure, and internally consists in reviewing all the activities that took place before or during the occurrence of the supposedly beneficial circumstance, in the hope that some of them were the cause of the supposed benefit. The brain registers all these activities as "valuable" and, from them on, will compel the individual to repeat these actions every time he or she wants or needs to obtain a similar reward again. These activities may not necessarily be of neuromuscular nature, but may involve other organs and/or be entirely internal or occur unconsciously. Therefore, to avoid any implicit restriction of the word "activity" to visible phenomena of mainly neuromuscular nature, we will introduce the concept of "bio-activity", which includes, together with muscular work, any other physiological activity controlled by the brain, voluntary or not, such as immune attacks, inflammation, control of blood pressure, digestion, etc.

There is solid experimental evidence suggesting that many auto-aggressive diseases are triggered by random coincidences between transitory biolog-

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