Moving between "Chronic Diseases" and "Secret Cures"

Bionetworking in the Context of Autoimmunity in Brazil*

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Abstract In this article, I explore from an anthropological Global South perspective the following question: how does the engagement of patients and physicians for unauthorized immunostimulant therapies for autoimmunity in Brazil impact the globally established biomedicine based on the use of palliative immunosuppressive drugs? My aim is to understand changing perceptions related to immunity, autoimmunity, immunological therapies, biotechnological innovation and regulation as constitutive of contemporary biomedical culture and of life sciences in Brazil. By addressing some forms of collaboration and deviance between patients with autoimmunity and physicians, I describe how they adopt and promote immunostimulant drugs as scientific innovations that meet difficulties to become legalized and that tend to be disqualified by established biomedical authorities. For it, I present a case study of regulatory experience and make a comparative digression involving respectively two immunostimulant therapies: the "anti-brucellic vaccine" (VAB—*vacina anti-brucélica*), and; the "autohemotherapy" (AHT—*autohemoterapia*). Like other immunostimulant therapies, both VAB and AHT are strongly associable with regenerative medicine and may be accessed through the informal sector. My argument is that established biomedicine has become increasingly circumnavigated in contemporary Brazil, while regenerative medicine is simultaneously emerging as a transnational paradigm shift through assemblages of life and respective moralities.

Keywords autoimmunity – biotechnological innovation – regenerative medicine – life assemblages – Brazil

Introduction: The problem

Over the last few decades in Brazil, thousands of people with autoimmune diseases and some physicians have begun adopting unconventional immunostimulant therapies. This implies that a high number of them, if not almost all, have simultaneously stopped or significantly reduced their use of conventional immunosuppressive pharmaceuticals such as Methotrexate/MTX, Interferon, glucocorticoids, and cytostatics. The reason being that immunostimulant and immunosuppressive drugs for autoimmunity are, as many of their stakeholders argue, incommensurable: they are based on contrary principles and should exclude each other to show efficiency. Although both these therapeutic models have been developed by biomedical actors, their status within biomedicine are far from equal and a struggle for legitimacy between them has taken place while both patients and health professionals come across new knowledge and practices, not always knowing whom to trust. In this article, I present and seek to understand, under this scenario, changing perceptions related to immunity, autoimmunity, immunological therapies, biotechnological innovation and regulation as constitutive of contemporary biomedical culture and, more specifically, of life sciences in Brazil. By addressing some forms of collaboration and deviance between patients with autoimmunity and physicians, which also take place through the informal sector and modern communication means, I describe how they adopt and promote immunostimulant drugs as scientific innovations associable with regenerative medicine that face difficulties in obtaining legal status and tend to be disqualified by established biomedical authorities.

Immunosuppressive drugs, also called "immunosuppressants" (Marson & Pasero 2012), are regularly prescribed by biomedical authori-

* All translations from Portuguese and German into English were made by the author.

ties worldwide. These drugs artificially impair the immune system of people with autoimmunity to prevent or reduce the "immune reactions" that characterize their diseases' symptoms. As part of the so-called Global South, Brazil does not figure as one of the centres for biomedical knowledge production unlike *e. g.* the UK, Germany and the USA. Consequently, established biomedicine in Brazil normally reproduces the global therapeutic model for autoimmunity. Nevertheless, despite official recommendation, several patients and experienced physicians in Brazil are dissatisfied with the side effects and long-term inefficiency of immunosuppressants and have decided to use and promote what they see as scientific innovative treatments. Numerous reports available on the internet express their fears and desires. Among these unconventional treatments, one can find those based on the opposite principle of immunostimulation such as synthetic phosphoethanolamine, vitamin-D therapy, stem cell therapies, cashew-membrane, urintherapy, collagen therapy, bee's poison (apitherapy), and frog's vaccine (*kambô*), etc. (see also Lorimer 2017).

"Immunostimulant-users"—as I call both patients and physicians who refuse conventional treatments and use immunostimulants to treat autoimmunity—have often dodged official therapeutic administration and adopted and promoted immunostimulants in collaboration with other actors. As people who exercise citizenship as entwined with biotechnology (Rose & Novas 2005), they have been working together in confidence and changed their therapeutic orientation and practices. Notwithstanding, many immunostimulants for autoimmunity usually meet legal difficulties to become authorized pharmaceuticals, are unapproved or in some cases even expressly prohibited and, thus, considered illegal in Brazil. In so doing, immunostimulant-users become, just like the immunostimulants themselves, marginalized before Brazilian private and public health care systems, regulatory agencies, and the established medical communities (*e. g.* the regional, and federal Medical Councils). However, their collaborative work continues to proliferate, and more people who are likewise disappointed with conventional therapies and have expectations concerning scientific innovations have joined them.

In different ways, the multiple frictions which have emerged in the context of the legal disputes and informal spread involving immunostimulants as biopolitical artefacts appear not only to re-evoke the evaluation criteria adopted by established governmental, and scientific agencies (formally seen as universal and therefore neutral), but also to expose the use of immunosuppressants for autoimmunity as the current dominant paradigm (*e. g.* Ximeng 2014, CRC/IMPATH, Thommen *et al.* 2018). While immunosuppressants tend to easily pass through legal channels as biotechnological innovations and, thus, are good examples of accepted drugs, immunostimulants tend to meet resistance and appear risky when they are proposed to become authorized pharmaceuticals for autoimmunity. In this sense, the regulatory experiences of immunostimulants for autoimmunity in Brazil shed light on further regulatory actors (like *e. g.* the patients demands and local pharmaceutical laboratories), and respective knowledge claims, who are also interested in affecting how people's bodies should be understood and administered.

In what follows, I explore two main questions from an anthropological perspective: how do these dissident patients and physicians (*i. e.* immunostimulant-users) experience and evaluate conventional immunosuppressive and contested immunostimulating drugs? To what extent and how do their attitudes in Brazil affect the authorized biomedicine for autoimmunity as global order?

To propose answers for these questions, I present and reflect on a case study of regulatory experience and make a comparative digression involving respectively two immunostimulant therapies: the "anti-brucellic vaccine" (VAB—*vacina anti-brucélica*), and; the "autohemotherapy" (AHT—*autohemoterapia*). Like other immunostimulant therapies, both VAB and AHT are strongly associable with regenerative medicine and may be accessed through the informal sector.

Theoretical background

At least since the immune system was institutionalized as the object of immunology as a specific life science, it has convincingly expressed all the characteristics of a total social fact (Moulin 1996). Accordingly, it has been expressing the cultural settings under which its uses and inter-

pretations emerge (Napier 2012). Immunity as a "system," for instance, appears as a post-war biomedical conceptualization (Anderson & MacKay 2014). Likewise, as constituted and constitutive of sociocultural settings, immunity has been seen as something to be regulated through sanctioned practices, *e. g.* by medical technologies (Brodwin 2000).

As Lakoff (2008) points out, pharmaceuticals operate at the intersections between biomedicine, commerce and government. To become authorized pharmaceuticals, proposed biotechnologies have to be absorbed into an established medico-legal system that is engaged in the technical administration of life. Thus, as biopolitical artefacts biotechnological innovations pose new political and ethical questions about how life should be understood and treated (*ibid.*: 742). Like the established immunosuppressants, the immunostimulants are also drugs that directly affect a person's life. Nevertheless, they do so in clear contrast to how most authorized pharmaceuticals are supposed to act when used to influence a multiplicity of immune reactions. Hence, the uses of immunostimulants to treat autoimmunity in Brazil do not reproduce the established global biomedicine for this medical area as expected (Haraway 1991: 204–5). As I will show, mainly when considered as two among several other immunostimulating therapies for autoimmunity in Brazil, and mainly looked internationally, VAB and AHT appear as colliding threats for immunosuppressants.

That is the case even when immunostimulant-users and promoters seek to avoid critics of conventional therapy like, *e. g.*, the attempts of the scientists who developed the synthetic phosphoethanolamine not to criticize chemotherapy for cancer during a public hearing at the Brazilian Federal Senate (Senado Federal 2015). Or, when physicians who work with immunostimulant treatments state that they do not want to substitute conventional therapies and, thus, that immunostimulant therapies are not an alternative for them. Following this, to neutralize the potential disqualification and stigmatization processes, which are organized and triggered by actors engaged in global immunosuppressants, some stakeholders for immunostimulants in Brazil refuse the term "alternative medicine." VAB users, for instance, emphasize that VAB was developed according to scientific standards, and is often conducted under supervision of recognized medical professionals with expertise. They characterize and support the adoption of VAB and other immunostimulants into the Brazilian publicly funded Unified Health Care System (SUS—Sistema Único de Saúde) as "complementary medicine" (for a disambiguation see NCCIH 2016).

Nevertheless, practically all immunostimulants require from their users the avoidance or a significant controlled diminishing of immunosuppressants to function properly (Gardner 2017: 70). Besides that, while immunostimulant-users verbalize the previously unquestioned premises of established biomedicine for autoimmunity, exposing them and their potential therapeutic uses as objects of thought—thus, forcing a re-opening of immunosuppressants as objects of scientific controversies (Latour 1987, Vilar 2018)—, the immunostimulants spread as much in discursive coherence as medico-legal practices. Together with immunosuppressants, the very idea of autoimmunity as a disease itself, which needed several decades to be accepted in biomedicine, is put in question by immunostimulant-users who tend to denaturalize it as fatality.

The motivations, means and techniques which immunostimulant-users articulate among themselves, and in association with multiple institutions and professionals, *e. g.* to provide the legal apparatus for the defence of a physician, to organize and sign petitions for the approval of a specific immunostimulating therapy, to enable circulation of immunostimulants informally, and/or to share therapeutic narratives that may be taken as acceptable medical evidence, among other activities, can be seen as expressions of one or more flexible assemblages that "[…] share questions related to the definition of what is 'a life worth living'" (Sleeboom-Faulkner 2014: 2). According to Sleeboom-Faulkner (*ibid.*), "[…] In life assemblages, members share mindsets that assume moral change towards life as inevitable and experience the transgression of ethical boundaries as a normal result of developments in science and technology."

In the context of cooperation between members of life assemblages in Brazil, the internet appears as a privileged platform for the exchange of unauthorized knowledge and practices. Rose &

Novas (2005) and Woolgar (2002) argue that, as a new technology for the circulation of information, the internet can radically transform society and serve as means to engage biological citizens. One of the challenges that Woolgar (*ibid.*) identifies consists in knowing how people organize themselves. In the context of my research, on the internet, dynamic and interactional matrices—as each homepage may be seen—to promote immunostimulant therapies can be organized and kept *outside* the established medico-legal paths of scientific innovation through cooperation between members of life assemblages. Likewise, it is also possible for them to produce their own media content, and inventories, and to disseminate it through the internet. The internet, therefore, became an ideal platform through which people who do not know each other personally but who share common therapeutic dramas come together, and cooperate with each other, as it is often the case in life assemblages for immunostimulant therapies in Brazil.

Methodological strategies

In this article, I use research material mainly produced and collected by myself through participant observation conducted between 2009 and 2017, in intercalated periods, in several cities in Brazil including: Vitória da Conquista and Porto Seguro (in Bahia); Brasília (Distrito Federal); João Pessoa (Paraíba); Natal (Rio Grande do Norte); Guarapari and Vitória (Espírito Santo); and Belo Horizonte (Minas Gerais). Although my physical permanence in these locations amounts to approximately 7 months, I complementarily carried out a considerable amount of research on immunostimulants and their users by systematically following them on the internet; this I combine with autoethnography.

As I describe in more details elsewhere (Vilar 2018), I myself was diagnosed with psoriasis arthritis at the beginning of 2009. I followed the conventional treatment based on immunosuppression for 6 months, before experimenting with the anti-brucellic vaccine (VAB, *vacina anti-brucélica*) over three years, having obtained amazing satisfactory results. Both experiences enabled me privileged access to two different worlds within biomedicine and to learn from their respective actors—mainly physicians, patients, and their relatives, webmasters, and immunological drugs themselves—and, through it, to know about their interactions with Brazilian regulatory institutions. In my present attempt to apprehend changing perceptions in contemporary biomedical culture, I here mainly posit myself as an immunostimulants-user and stakeholder.

As explained above, along with my presentation of some ethnographic findings, I analytically conceive patients with autoimmunity and their families, physicians, and other actors, who use and support the use and liberalization of immunostimulants for autoimmunity in Brazil as compounding life assemblages (Sleeboom-Faulkner 2014: 2). *I. e.* provisional sets of entwined networks and/or communities of people who see the processes of developing, promoting, and adopting scientific innovation as eventually requiring the transgression of established institutional, and moral boundaries (see also DelVecchio Good 2003). In consonance with it, I heuristically apprehend the collaborative work between these life assemblages for immunostimulants as comprising "bionetworking activities." Sleeboom-Faulkner defines bionetworking activities as those non-scientific collaborative works that are conducted by and among a plurality of actors (stakeholders, market agents, patient groups, universities, clinical offices, media etc.) which "underpin the scientific ones" (2014: 160).

All in all, when I follow unauthorized immunostimulants through participant observation, digital methods and archive research, they guide me through unofficial paths of scientific innovation in the Global South that connect new communication technologies, informal economies, local moralities, health care demands, and emerging regimes of truth.

Article's structure

This article is divided into four sections. First, I describe how global biomedical authorities see and officially re-present autoimmunity as "chronic," including how, according to them, it should be treated. In the second section, I describe two contrasting therapies based on immunostimulation, which according to immunostimulant-users have been successfully employed in Brazil for the

treatment of autoimmunity, though most informally and experimentally. I concentrate on one of them and use the second as a comparative digression. In so doing, I take them as examples of discontinuity in relation to the hegemonic therapeutic model for autoimmunity described in section one and focus on key moments of their regulatory experiences. In the third section, I thematize how unauthorized and/or tabooed knowledge and therapeutic practices circumnavigate among immunostimulant-users outside official pharmaceutical circuits. For it, I focus on the cooperation among members of life assemblages for immunostimulants by using four categories (patients, physicians, mediators, and immunostimulants), and identify implications of their bionetworking exchanges. Finally, I briefly resume aspects of mutual affections between the conventional immunosuppressive and the contested immunostimulation therapeutic models on the context of local-global tension.

My hypothesis is that when one focuses on the negotiation dynamics of medico-legal regimes in Brazil under the impact of immunostimulating therapies for autoimmunity as a contested innovative biotechnology, in which patients, physicians, socioeconomic and governmental actors are involved, it becomes possible to highlight significant aspects of how law, science and society shape their boundaries and co-constitute the legal and the illegal (Jasanoff 1990, 2004; Faulkner *et al.* 2012). Moreover, I suggest that recent changes of perceptions and attitudes related to autoimmunity in Brazil, when considered internationally, can be seen as local expressions *and* part of the emergence of the regenerative medicine as a transnational shifting paradigm (Kuhn 2012, Webster 2013).

"Chronic diseases" as biomedical definition

Considered by the World Health Organization as one of the greatest causes of disability in the world, reaching from 5 % to 10 % of the world population across all ages, and increasing mainly in urban centres, autoimmunity comprises over four hundred conditions, as diverse as psoriasis, lupus, Sjörgen syndrome or arthritis (WHO 2017, Policy Department of European Parliament 2017, Langer 2015, Cooper *et al.* 2009). According to A. D. A. M. Medical Encyclopedia, "an autoimmune disorder occurs when the body's immune system attacks and destroys healthy body tissue by mistake" (MedlinePlus 2015). In other words, "when you have an autoimmune disorder, your immune system does not distinguish between healthy tissue and antigens. As a result, the body sets off a reaction that destroys normal tissue" (*ibid.*).

The exact cause of autoimmune reactions remains officially unknown. However, independent of the cause, one knows that the immune reactions are inflammatory processes that can potentially occur in each part of the human body (Melchers 2006: 18). Although the autoimmune diseases may unexpectedly come and go, alternating states of control and of exacerbation, and are therefore unpredictable, they are defined by world biomedical authorities as "chronic;" *i. e.* as diseases that remain for a lifetime. Officially, there is no known guaranteed prevention for most autoimmune disorders, and there is no scientifically recognized treatment which helps to cure autoimmunity. There is only treatment to relieve its symptoms. Given that, physicians normally advise patients with autoimmunity that they "have to learn to live with it" (Andrews 2011, Anderson & MacKay 2014: 92–115).

By transforming people with autoimmune symptoms into chronic patients through diagnostics, physicians relocate them from common lifetime to a distinct spatiotemporality that is characterized by imminent risk of *self-damaging* and, therefore, must be biomedically monitored and modulated (Greenhalgh 2001). For decades, biomedicine has largely employed immunosuppressive palliative drugs to control inflammations and to relieve the symptoms of autoimmune reactions. The treatment of rheumatoid arthritis, a classical autoimmunity, can illustrate the modus operandi. In their medical guide, which can still be found in German medical offices, Lackinger and Weiss explain that:

> The treatment is carried out during acute inflammatory crisis [also called exacerbations and/or immunological overreactivity] through anti-inflammatories and pain-relieving medications (analgesics, nonsteroidal or steroidal anti-inflammatory drugs, *e. g.* corticosteroids). As a long-term treatment of autoimmune rheumatic disease, one

> starts nowadays already at an early stage with a base therapy to prevent so much as possible long-term consequences such as joint damage. [...] (Lackinger & Weiss 1992: 85)

Published two decades ago, these basic therapeutic proceedings are the same today. The British Society for Immunology (2012), for instance, states that the treatment for rheumatoid arthritis "is largely symptomatic and provides pain relief, reduces inflammation and slows down further damage to the joints. For those patients with more severe damage, surgery is often performed." Furthermore, even the newest pharmaceuticals offered in rheumatologic offices (like the so-called "biologics" such as Adalimumab/Humira, Etanercept/Enbrel, Rituximab/Rituxan, etc.) are marketed as "scientific innovation," although they operate through the logic of reaching symptomatic relief through immunosuppression.

The statement published on the consulting homepage of PAPAA—"[...] a joint venture between the Psoriatic Arthropathy Alliance (PAA) [...], and the Psoriasis Support Trust (PST) [...] to establish the principal resource of information and help for people with psoriasis and psoriatic arthritis in the UK" (PAPAA 2015)— reproduces the logical similarity:

> The "Biologics" are relatively new entrants into the field of psoriasis management and are made from biological (human or animal based) proteins rather than artificial chemicals, much in the way that insulin was made from animal sources in the past.
>
> Biologics are different from other medications for psoriasis and psoriatic arthritis as they are designed to block both diseases in the immune system rather than waiting to treat the symptoms of the disease.
>
> It is thought that overactive cells in the immune system set off a series of events in the body, eventually causing psoriasis to develop on the skin and arthritis symptoms to develop in the joints. Biologics work by blocking the action of specific immune cells that cause these cells to misbehave by either reducing the number of these cells in the skin and blood or by blocking the activation of the immune cells or the release of chemicals from them. [...] (*ibid.*).

In Brazil, biologics were enthusiastically received as promising innovations. Despite their very high costs, they were immediately adopted and spread quickly. At least until the 2016 coup d'état, the Brazilian Federal Government provided the inclusion of mainly three kinds of biologics to be made available to poorer patients for free through the SUS (BRATS 2012). However, as "blockers" of "specific immune cells," they differ from older immunosuppressants primarily through their composition as containing animal or vegetal elements. In the end, biologics are still in charge of preventively punishing immune cells that may bring themselves and other cells to *misbehave*. Thus, in principle, they are different and *newer* biotechnologies scientifically conceived *for the same* immunopolitical purpose and function; the hegemonic biomedical understanding of autoimmunity and of what should be done to tackle it remain unaltered.

Likewise, even the aim of using nanomedicine to treat autoimmunity in a near future seems to be previously limited by the long-term biomedical search of the best instruments to treat it by suppressing specific metabolic activities of one's body. As Gharagozloo *et al.* (2015: 1003) wrote in an article in which they focus on "nanomedicine-based delivery strategies of biological immunomodulatory agents for the treatment of autoimmune disorders," these agents are taken as potential "novel nanomedicine approaches for inducing immunosuppression and immunological tolerance in autoimmune diseases in order to modulate aberrant and pathologic immune responses" (*ibid.*). The modulatory action of the nanomedicine-based agents, which the authors mean, are clearly of immunosuppressive order. Like the biologics, they present a potential technological refinement of the same: a new generation of immunosuppressants (*ibid.*).

In all these therapeutic biomedical approaches, the tasks and ordinary practices of physicians basically consist of: first, recognizing and identifying the symptoms which a patient presents among hundreds of classified autoimmune diseases; second, treating these particular symptoms with the appropriate immunosuppressants to bring them under control, and; third, monitoring, managing and trying to reduce as far as possible the multiple side effects of the employed immunosuppressants, which tend to occur frequently and continuously in the course of conventional treatment as a kind

of chain reaction. "Cure" remains outside the language and therapeutic horizon of possibilities of most established physicians.

It is commonly accepted among most physicians and medical scientists—to the point that it is normally not even an object of discussion—that strengthening the immune system, in contrast to conventional therapies based on immunosuppression, could only lead to an aggravation of the symptoms, given that the inflammations are seen as "overreactivity." Therefore, immunostimulating treatments are for established biomedicine out of the question. Despite its variations, this standardized knowledge on autoimmunity is found everywhere where biomedicine plays a predominant regulatory role, and it is considered as having universal validity.

Nevertheless, for at least the last 70 years, medical scientists have also been trying to develop other ways to treat autoimmunity and to *rehabilitate* one's immunity (Veronesi 2008 [1976], Mullen 1977, Melchers 2006: 18). Among these efforts are attempts to treat patients with immunostimulation. However, rheumatologists, dermatologists and other physicians, who are systematically trained to employ and promote immunosuppressants, rarely say something about these other possible medical futures to their uninitiated patients, while they repeatedly emphasize the inevitable risks of autoimmunity when these are not treated with immunosuppressants (Cohn 2000: 207–8).

Also, in Brazil, medical scientists have been developing another understanding about how immunological disorders occur and how they should be treated. Countering the established biomedical notions of chronicity and causality related to autoimmunity, patients, stakeholders and unauthorized substances have been helping these medical scientists to co-materialize a political economy of hope (Novas 2006) founded on the expectation of cure by immunostimulation as therapeutic possibility. Through their bionetworks, which expand rhizomatically, immunostimulants-users and stakeholders generate a concurrent biomedical future regarding autoimmunity.

To illustrate this, I shall now consider aspects of the regulatory experiences, medical trajectory and informal circulation of an immunostimulating therapy for autoimmunity in Brazil called the "anti-brucellic vaccine" (VAB, *vacina antibrucélica*). To better understand the VAB case, I will also briefly report on another immunostimulating therapy known as the "autohemotherapy" (AHT, *autohemoterapia*) as to provide a comparative digression.

"Secret cures" as biomedical deviance

On 21 October 2005, the Brazilian federal government's Official Gazette (*Diário da União*) published the resolution nº 2.629 of the National Health Surveillance Agency (ANVISA, *Agência Nacional de Vigilância Sanitária*). The head of the Collegiate Board of Directors of ANVISA called for "the seizure, nationwide, of the product 'vacina antibrucélica,' manufactured by the professional Dr Genésio Pachecho da Veiga" (ANVISA 2005a: 76). Its enunciated reason was that "the product does not have registration/notification and the professional is not in possession of an Operating Business Permit to manufacture it, not having therefore corresponded to the ANVISA's regulatory requirements" (*ibid.*) While, at the first sight, the ANVISA's prohibition of VAB appears to be a standard judicial-administrative procedure, it proves to be a more complex issue when one observes what happens next.

The ban of VAB immediately sparked strong reactions. The office of ANVISA began to receive complaints from every corner of Brazil, most of them from patients with autoimmunity and users of VAB. The production and commercialization of VAB was stopped. Supporters of VAB reacted on the internet: an account was created on a social network called *Orkut* (later, another one was created on Facebook and is presently active). At least one discussion forum was created (*e. g.* on the homepage *InForum*), and a VAB group was founded on *Yahoo!*. On personal blogs and forums related to autoimmunity, patients and ex-patients posted about their personal experiences with VAB. Many of them claimed that their autoimmunity—diagnosed as "chronic" by physicians—were cured or significantly ameliorated thanks to the VAB therapy. Although the ANVISA interdicted VAB to protect the "population's health" from the potential danger of an unregistered drug, VAB users saw this act as an interruption of a successful and necessary therapy.

One month after the prohibition, Dr Veiga, the most publicly known VAB's manufacturer, an immunologist and one of the few Brazilian specialists on the treatment of brucellosis in humans, published an article on the homepage of the Brazilian Association of Biomolecular and Nutrigenomic Medicine (ABMB, *Associação Brasileira de Medicina Biomolecular e Nutrigenômica*). Another physician, Dr Felippe, a physiologist who works with regenerative medicine and coordinates the ABMB, co-authored the work (Felippe & Veiga 2005). In their article, they detailed the clinical trial they conducted in 1988 on the effects of VAB on people with rheumatoid arthritis in São Paulo. 377 people who presented the symptoms of rheumatoid arthritis according to the American Association of Rheumatology, participated in the study. As they reported:

> In the course of [VAB] immunotherapy, 80 % of the patients presented a great improvement or complete regression of joint pain, inflammatory signals, functional impotence and general symptoms. It was noted the disappearance of subcutaneous nodules in half of the treated patients [...]. The congestive deformities, *i. e.* those reversible also disappeared in 40 % of cases.
>
> The patients' self-assessment of clinical improvement, without the interference of the physician, showed a good performance of immunotherapy: 79.5 % indicated excellent and good results, 16 % regular, and 4.5 % bad or very bad [...].
>
> Note that after the immunological approach, it was possible to suspend corticosteroids and anti-inflammatory in 40 % of patients. 54.5 % was possible to reduce such medicaments and by 4.5 % of the patients, the need for such drugs remained unchanged. [...] (Felippe & Veiga 2005: n. p.)

VAB aims to strengthen the defence-system of its users through stimulation using a specific vaccine which contains dead "Brucella"—a type of bacteria found in many animals, and which causes brucellosis. Here I would like to make a historical digression concerning the development of VAB and its transformation into a biotechnological innovation to treat autoimmunity. How did VAB come to be what it was in 2015?

From BRUVAC to VAB

VAB was first presented by Dr Veiga's homonymous uncle and renowned researcher of Institute Oswaldo Cruz, Dr Genésio Pacheco, in two articles, which were co-authored by Dario Simoni da Silva and by José Gonçalves da Silva, originally for the treatment of brucellosis in humans (Pacheco *et al.* 1969, Pacheco 1970). It was registered and commercialized with the name "BRUVAC" as one among many different types of vaccines against brucellosis that use either living Brucella or dead ones, or a mix of both (*e. g.* Mello 1978). For at least the next 20 years, both uncle and nephew co-authored a minimum of 12 scientific works on brucellosis in humans, mainly between 1943 and 1947, *e. g.* in *Revista Brasileira de Medicina*, *Brasil-Médico* and *Medicina, Cirurgia, Farmácia*. As one of the very few—maybe the only—physician specialized in treating humans with brucellosis in Brazil at that time, Dr Veiga systematically used the BRUVAC attending people of the whole country at his own medical office in Rio de Janeiro.

For most of that time, he was frequently confronted with other physicians who did not believe that brucellosis was a serious disease of epidemiologic level in Brazil. As Dr Veiga often explained to me, and Dr Mello later confirmed (personal communication in June 2017), this controversy happened mainly because the symptomatology of brucellosis taught at the medical schools in Brazil, in the last century, was based on its most common European variant which is caused by the Brucella *melitensis*, present in goats. The problem was that, in Brazil, brucellosis was and still is mostly provoked by the types *abortus*, of ox, and *suis*, of swine, which present quite different symptoms. In addition, brucellosis is a highly contagious disease, it spreads very quickly and is very difficult to diagnose, which contribute to making brucellosis often invisible as a public health problem. It was only in 2001 that the Brazilian Federal Government implanted the "National Program of Control and Eradication of Brucellosis and Animal Tuberculosis" (PNCEBT, *Programa Nacional de Controle e Erradicação da Brucelose e Tuberculose Animal*) (MAPA 2006: 15).

In 1985, a few years after his retirement, while revising the literature on brucellosis Dr Veiga

came across the text of Meiselas *et al.* (1961) where the authors described an experiment involving patients with arthritis and vaccination with Brucella. After the authors have injected different types of "*gram-negative bacteria*" in the patients, they noted that only through the inoculation of "*Brucella antigen,*" occurred a very particular immunological modification: At the same time as the production of a certain type of antibodies (19-S) was stimulated by the arthritis patients, their symptoms became weaker or disappeared. The results are resumed as the following:

> 1. Forty-one patients with various rheumatic diseases and 27 control patients were inoculated with Brucella vaccine. As a group the patients exhibited a significantly greater rise in antibrucella agglutinins compared with the controls. Some overlap in both groups was present. 2. Alterations were noted in other antibody systems-anti-red cell (Coombs), anti-thyroglobulin, and possibly in the influenza antibody and rheumatoid factor-after this primary stimulation in some of the patients with rheumatic diseases, but no titers for these antibodies were noted in the control patients. 3. The effect of brucella antigen in these patients may be related to the damage that this organism can produce on mesenchymal tissue. (Meiselas *et al.* 1961: 1880)

Earlier, as Dr Veiga was treating his patients with BRUVAC, he perceived that those who also suffered from some rheumatic disease had their symptoms relieved. Hence, Meiselas' experiment showed to him that the relieving of rheumatic symptoms by his own patients was not just a coincidence: The increasing of certain antibodies stimulated by the inoculation of Brucella antigen explained the reason. Encouraged by this possibility, he started an adaption of the BRUVAC, conducted the clinical trial and began employing it to treat autoimmunity.

Dr Veiga presented VAB once at a Brazilian Rheumatology Conference in 1996. The present rheumatologists could not accept using a vaccine due to its immunostimulant effects to treat autoimmunity: this was as inconceivable at that time as it is today. Nevertheless, VAB was, in fact, not a "vaccine" anymore if one defines vaccine also through its use and not only through its composition. *I. e.* as "biological products containing one or more antigenic substances which, when inoculated, are capable of inducing active specific immunity and protecting against the disease caused by the infectious agent which gave rise to the antigen" (ANVISA 2005b: 59). Despite that, Dr Veiga kept calling it the "anti-brucellic vaccine," as it was already known among his patients. This persistence apparently reinforced the tendency of other physicians to refuse VAB as a potential innovative treatment for autoimmunity. As Dr Mello explained to me, VAB is rather a "lysate of Brucella" (*lisado de Brucelas*).

VAB as regenerative medicine

From physicians who use VAB to treat patients with autoimmunity I heard two basic explanations, which they sometimes combine. Some of them emphasize the effect of the vaccine as a means of purification. That is, the vaccine helps the body to *detoxify* itself from elements that disturb its immune system (Boucinhas 2012). Others—like Dr Veiga and Dr Felippe—prefer to speak of the *rehabilitation* process that is provoked by the regular infusion of dead Brucella due to their special immunological properties. A third explanation that I found elsewhere as related to immunostimulants in general is that these *distract* the immune system of damaging itself. All such supporting doctors argue that the cause of the immunological disturbance lies precisely in the weak state of the immune system, which can sometimes be made visible by monitoring the quantity of blood white cells (Veronesi 2007 [1976]). The "immunological tolerance"—what prevents an organism from "attacking itself"—can be broken when one's immunity is within a deep state of debilitation and, therefore, no longer able to produce enough antibodies. The overreactivity of immunological cells becomes rather part of a chain reaction within a broader deterioration process.

According to Dr Veiga, when the number of antibodies (particularly, of macrophages) grows through stimulation by using VAB, the body begins to recover its skill to distinguish between its own and strange cells again, and therefore the immune system stops attacking its own body. The pain is then gone because the inflammation is gone. In this sense, through applications of this vaccine that begin with small doses, which are

gradually increased over a long period of time, one's immunity *relearns* to act in a healthy way, protecting itself again. Similar to "allergy shots" (Kirchheimer 2016, American College of Allergy, Asthma and Immunology 2016), the whole VAB treatment usually takes two or three years and, until recently, it was divided into two phases: first, it was injected subcutaneously and, then, carried out further through intramuscular applications.

Following Dr Veiga and Dr Felippe (2005), many VAB users compare VAB with conventional therapies. They are clearly aware that immunosuppressants only control symptoms by impairing the immune system, slowing down the patients' metabolism and corporeal functions, to *retard* further developments of autoimmunity. They affirm that these treatments, on which modern biomedicine is based, mostly worsen the patients' state of health, rather than improve it. Furthermore, some VAB users argue that the ANVISA did not allow the registration of VAB because no rheumatologist had participated in the clinical trial.

In any case, the characterization of established biomedical therapy for autoimmunity presented by Dr Veiga and Dr Felippe, and by other VAB users, is not controversial. Indeed, the authorized treatments offered and administered by rheumatologists share the same discourse: conventional therapies aim to slow down the inevitable progress of the autoimmunity by controlling the symptoms through immunosuppression. But when established physicians state that immunostimulating treatments for autoimmunity are dangerous and should be excluded, the therapeutic use of VAB consequently becomes highly controversial. Here, the ANVISA prohibition of VAB echoes this among other established biomedical premises as being universally valid.

Catching wind of a potentially legitimate controversy, some journalists—mainly from "alternative vehicles"—interviewed and wrote articles about Dr Veiga and *his* vaccine, as VAB became known. According to most of these journalists, the ANVISA's prohibition of VAB is an injustice against autoimmunity sufferers made to favour the interests of pharmaceutical industry (*e. g.* Rabelo 2007a, 2007b, personal communication in April 2017). In contrast, most physicians and mainstream media ignored the reactions of VAB-enthusiasts. They let the law speak for itself, thus dismissing possibilities of discussion and halting the emergence of VAB to a broader level.

Autohemotherapy

The silence strategy of immunosuppressants defenders in the context of the VAB case can be partially understood when one looks at the autohemotherapy (AHT). AHT is another medical therapy for autoimmunity that is also based on immunostimulation. Rather than using a vaccine, AHT uses the patient's own blood to strengthen his own immunity. Like VAB, AHT falls under the regenerative medicine category that covers "[…] the set of sciences and technologies involved in the collective project meant to coax the body to repair itself and potentially to extend the lifespan" (Hogle 2007: 859).

When a low-budget video promoting AHT, which had been informally sold on DVD on the streets of Brazil and which was later released on the internet (Martinez & Sarmento 2004), was called to the attention of medical and governmental authorities, they opposed it and the ANVISA prohibited the practice (CFM 2007, ANVISA 2017, Silva da Costa 2017). The DVD shows an interview with Dr Moura, who has been working with AHT for several decades in both public and medical service. In his interview, he reports several cases of cure or amelioration of different diseases through the employment of AHT. Dr Moura learnt it from his father, who was also a physician, and who had adopted the AHT earlier as a means to help patients recover faster post-surgery. Dr Moura was then heavily criticized in public mainly by pharma-lobbyists and accused of "ideological falsity" at a national level. He was also threatened with the loss of his medical licence and being sent to jail. However, despite the intimidations against Dr Moura, the mainstream media's portrayal of the AHT as polemical and risky has only helped to popularize it, and the AHT has been systematically adopted outside medico-legal circuits.

In 2007, on the state and municipal stage of the "XIII National Conference for Health" (*XIII Conferência Nacional da Saúde*) in Espírito Santo, where Dr Veiga lived, both VAB and AHT were presented by a religious delegate as two thera-

pies that should be included into the SUS due to their low cost, high effectiveness and absence of side-effects. The delegate's proposal was unanimously accepted in the first ballot, in which the organizers—*i. e.* the agents of the "Municipal Health Office" (*Secretaria Municipal da Saúde*)—did not participate. However, when the organizers did vote in the final round of the conference, the proposal was rejected (Coimbra 2007, also Geovanini 2009).

Since ANVISA's prohibitions, VAB and AHT therapies were relegated to invisibility, where the therapies have been carried out by both medical professionals and patients illegally, and in precarious and risky conditions. In the following years, Dr Veiga has been fined by ANVISA twice (2006: 32, 2007: 63) and received more intimidations.

From VAB to CAE

However, the tide began to turn for VAB in the last years. In 2012, after more mobilization for VAB, and to protect Dr Veiga before the law, Cheila Pimenta, one of his ex-patients, initiated a petition at AVAAZ—a civic organization that supports activism on a global level—for the regularization of VAB that achieved 15,656 signatures. Her brother, who is a lawyer, informally assisted Dr Veiga in judicial matters. Dr Veiga was sued again by ANVISA and a new trial was scheduled for November 2015 but postponed until 2017. Later, the court case has been closed. During this time, VAB was temporarily available to the public again, though with a new composition and form.

Negotiations between Dr Veiga and private laboratories, which are mainly involved with the veterinary industry, took place mediated by Cláudia Ludolf, his daughter and animal breeder. The two first attempts failed after the interested laboratories, which were at the beginning very impressed with the results of using VAB to treat animal diseases (*e. g.* "*canine distemper*"), realized that VAB contained dead Brucella as its main raw material—*i. e.* a substance that should be eradicated from the country per the PNCEBT, and for whose maintenance and use they needed to obtain a special permit. Finally, a new deal with another private laboratory, localized close to Belo Horizonte, in Minas Gerais, and directed by the medical scientist and nuclear physicist Dr Rosa, was moved forward.

As Ludolf told me, she and her father were convinced that ANVISA would never approve of any pharmaceutical containing Brucella to treat people due to the PNCEBT. Moreover, notwithstanding the fulfilment of all further ANVISA's requirements for the approval of VAB, it would take between 10 and 13 years to achieve regularization in Brazil. Two main strategies were then adopted to create a gateway for VAB in the formal market: to reformulate its compound and form; to register it and patent it first in the USA. The first measure would overcome the barrier rose by the PNCEBT. The second would paradoxically accelerate the process of authorization in Brazil given that the Brazilian regulatory sanitary authorities tend to regularize pharmaceutical products coming from USA much faster than to approving its own national medical innovations.

Dr Rosa and Dr Veiga developed *another* drug out of VAB while excluding the Brucella endo protein from it. After he isolated the components of the VAB's formula, he was able to identify those amino acids that are specifically responsible for the stimulation and strengthening of the immune system, preserving the organizational principle that assemblage the amino acids in a particular manner that boosts the production of antibodies. In collaboration with Dr Rosa, Dr Veiga replaced VAB as an injectable solution by drops of what they renamed as the "Complex of Essential Amino Acids" (CAE, *Complexo de Aminoácidos Essenciais*) to be administered under the tongue. Until now, however, many users refer to it as "the vaccine" (*a vacina*).

Ludolf defines CAE as an "evolution" of VAB (from now on VAB/CAE). In its clinical trial, as coordinated by Dr Rosa and conducted at a clinic in São Paulo, VAB/CAE was recently used by more than 3.000 patients in one year. With help of VAB/CAE users and stakeholders, his daughter, and other actors engaged with the judicial rehabilitation of the VAB/CAE, and with informal assistance of some ANVISA's officers, Dr Rosa and Dr Veiga recently reached the liberalization of VAB/CAE officially as "manipulated product." Crucial for this achievement, however, seems to be the forging of a new promissory identity for VAB/CAE (Gardner 2017: 71).

On 13 October 2016, both father and daughter inaugurated the "Instituto Dr Genésio Pacheco da Veiga," as financially supported by their broader family, at which other physicians are now officially working with CAE as substitute of VAB that is now produced by Dr Rosa and his laboratory team in Minas Gerais. Furthermore, two further associated clinic offices, which are going to be opened by Brazilian physicians living abroad and who positively experienced and promote VAB/CAE, will soon act as branches of the Institute Genésio Pacheco da Veiga offering, prescribing and administering VAB/CAE, respectively, in London and in Lisbon. Dr Veiga, who had taken VAB for decades, could still witness the acceptance of VAB/CAE before he died, a few months after having completed 102 years old, at the beginning of 2018.

Yet, the regulatory experiences of VAB/CAE and AHT provoke a series of questions. How do these *not-disciplined patients* and *not-recommended physicians* seek to overcome isolation, tabooisation and invisibility? While seeking to improve their health and professional status, how do they exchange unauthorized knowledge, personal experiences and innovative biotechnologies when there is a lack of institutional support? In what follows, I will explore key aspects of collaboration and exchanges of VAB/CAE users to highlight how they impact upon and re-organize biomedical knowledge.

Circumnavigations of knowledge, materials and practices

In the context of marginality, those physicians and patients who use immunostimulants found on the internet an ideal platform for continuous exchange of unauthorized medical knowledge, materials and practices. Within the forums that they created for the discussion of different immunostimulating therapies, one finds reports of personal experiences with immunostimulants and questions of people looking for further information. Likewise, personal blogs act as vehicles for information, and have a high number of visitors. Mainly, ex-patients with positive therapeutic experiences with immunostimulants act as mediators between interested patients and physicians. The latter produce, co-distribute and administer immunostimulating pharmaceuticals from their laboratories. In addition, several amateur tutorial videos have been posted on "*YouTube*," which present and give support to a myriad of physicians and immunostimulants— *e. g.* by entering the names "fosfoetanolamina sintética," "vacina anti-brucélica," "autohemoterapia," "vitamina D." Through these informal means, contact details of immunostimulants providers are informed, words of encouragement are exchanged, and critiques of established institutions are shared.

For instance, Patrícia Britto posted in 18/06/2015 on her Facebook profile about her experience with VAB/CAE:

> [Dear] Friends, I couldn't stand the excitement. I need to share it with you. I have been using the vaccine for one year and eight months. I visited again the rheumatologist just to make routine exams and had a big surprise when opening the results … Neither Lupus nor rheumatoid arthritis appear in my diagnosis … […] I'm perplexed [and] I don't know what to say, I can only thank God for having placed Doctor Genesio Pacheco [da Veiga] in my life … and the support of all my family […] mainly my husband […] It was his faith that found the vaccine […] and saved me … […] trust in the vaccine. It works.

Five days after posting this message, Patrícia uploaded the results of her examinations from one month earlier. She wrote from Brás Cubas, in São Paulo, but most VAB/CAE and other immunostimulant-users are spread all over the country, and even outside it, without knowing each other personally. She also provided the phone number of Dr Veiga, just as many other VAB/CAE users did.

In the case of VAB/CAE, due to the eventual geographical distance between the physician and the user, the treatment can be conducted by phone, after which the VAB/CAE producer and/or distributor will mail VAB/CAE-ampoules through regular postal service as travelling biotechnologies. At that time as it should be injected, the user had to learn how to apply it or be helped by a local medical professional with the applications, given that it is not easy for uninitiated people who do not have the appropriate medical skills.

In addition, during its clandestine period, as with other immunostimulating therapies, VAB/CAE could also be directly administered in specific medical clinics by engaged professionals,

as I learned during my fieldwork in two cities in north-eastern Brazil. The application of VAB/CAE was, then, carried out in secret in fear and hope. Hence, a fundamental condition to this collaborative work between patients and medical professionals is to assure mutual security. Medical professionals run the risk of losing their medical licences, paying fines, becoming isolated and stigmatized within medical community, or in the worst case, of being imprisoned. How can they develop mutual trust?

Protection can sometimes be achieved through prestige and respect among local sanitary authorities, who sometimes close their eyes to the illicit medical practices involving immunostimulants for autoimmunity.

Physicians as biomedical dissidents

The following ethnographic notes, taken out of my field diary, offer a picture of these collaboration networks at local clinics:

> 21/06/2014
> I learned about the AHT and of other immunostimulating treatments as current practices within (and as constitutive part of the) medical informal sector in the city of *A*. There is an old established pharmacist (a known and respected person also in neighbouring cities). He is not only engaged with AHT, but also involved with VAB. There are several people making use of VAB under his supervision within the ambulatory department of his pharmacy/drugstore, and outside it. He was afraid to talk about that with me and did it only in a reserved and careful way at the beginning.
>
> I came to him through my mother's physiotherapist, who knew him and who told me that many people used to get pharmaceuticals there, which otherwise they could not find elsewhere and could not access without a doctor's prescription. However, he only really began to talk with me about the applications of VAB and AHT after I mentioned a nurse friend of mine who worked at his ambulatory, whom he trusts [...].
>
> 19/07/2014
> [Beyond the pharmacist in A.] A physician in the city of *B*. (200 km from *A*.) who was a professor of a local university for many decades published, in 2012, a short article about and in favour of VAB in a local newspaper. Nowadays, he is retired but still works at his own private clinic, at which he makes use of AHT, and VAB. Because the former is also not recognized and, thus, an illegal therapy, he explained to me a tactic to dodge the law and sanitary vigilance: instead of speaking about "autohemotherapy" he refers to it as "ozone-therapy" (*ozônioterapia*), which is the same but "covered" with other proceedings, which do not change the results at all. Normally, the blood is just taken from the vessel's patients to be immediately re-injected into his muscles. With the ozone-therapy however, the blood goes through a filtering process with ozone before it is re-injected into the person's muscles. This clinician and retired professor explained to me that it changes nothing, but it makes the whole therapeutic proceedings seem like treatment "in experimental character" and, therefore, officially tolerable.
>
> He further explained to me that he has been applying VAB for a long time. When I asked about pressures on the practice, he answered that there were very few. They were limited to discussions within internal committee reunions with colleagues, but nothing in the public sphere or any threat of ANVISA [This contrasts with the experience of Dr Veiga and of the pharmacist in city *A*, who was sought by the sanitary police two or three times at his drugstore, despite his name in the city]. But, as he told me, given the fact that he is a renowned physician, one of the founders of that health department at the university, and someone who was always well financially supported, no one wanted to "buy a fight" with him due to VAB. Not least because they conduct VAB therapy in secret and without disturbing other authorities. In his words, [...] "no one wants to prejudice someone, who brings financial resources and prestige into the university." [...]

In general, information and access regarding unauthorized immunostimulants for autoimmunity is difficult for people to obtain at the local clinics where immunostimulation is practiced, unless a potential patient knows "a trustworthy person" who may mediate the contact between them as potential users and medical professionals who administer immunostimulants clinically. If a person does not expect professional help for properly using immunostimulants, and must learn by themselves, it is always possible to appeal to ex-patients or current users on the internet. One way or another, by now, most potential immunostimulant-users have already begun to change their perceptions concerning the

established networks of healthcare for autoimmunity.

The adoption of immunostimulants becomes subversive when patients begin to switch from immunosuppressive treatments to unauthorized immunostimulant ones, and medical scientists begin to adhere to it, though with great precaution. In this context, both are changing their scope of medico-legal risks in the context of the multiple normative struggles around unauthorized drugs. Instead of exposing themselves to those risks normally linked to the use of immunosuppressants, *e. g*. to their side-effects and the return of the disease in a more aggressive form, immunostimulants-users prefer to face different forms of risks; such as the risk of being denounced for using illicit pharmaceuticals, or of being cheated.

Users and potential users of immunostimulants

On a layman level, the dialogue below appears emblematic of how interested people may learn from each other, change and express their perceptions about their diseases or those of their relatives, and close persons. It is from a website for people with multiple sclerosis—an autoimmunity normally treated with a drug called "Interferon," an immunosuppressant—who consider themselves cured thanks to the "Vitamin-D therapy," an immunostimulating treatment. Contrasting with VAB/CAE and AHT, Vitamin-D therapy—a new immunostimulating therapy that consists in administering high doses of vitamin D3 to patients—met as imported biotechnology no problem to become authorized. However, it is object of controversies in Brazil between some rheumatologists, who argue against it, and some neurologists, who act in favour of its broad adoption. The queries on the website are not limited to multiple sclerosis but include other types of autoimmunity. My rationale for including it here is to show how people begin to oppose the current official medical discourse on autoimmunity as chronic.

[1st movement: searching for information] Theresa Ferreira sent the following question in 15/04/2012:

> Good afternoon,
> I would like to know how I could treat my mother, for she has chronic rheumatoid arthritis and feels much pain since she was 8 years old. Today she is 73, and she has a great difficulty to go to São Paulo to carry the treatment. [...] I would like to know how you could make a medical evaluation of her and treat her. [...]

[2nd movement: response] Ten minutes later, "vitamindforanothertherapy" (*vitaminadporumaoutraterapia*) answered:

> Theresa, this website is kept by enthusiast patients of the [vitamin D] treatment, and not by the physicians themselves. For the medical evaluation which you need, I suggest you call one of the physicians listed above; [However] I can anticipate [to you] that, yes, very probably they [the listed physicians] are going to be able to help your mother with the arthritis, for that is an autoimmune disease, just like multiple sclerosis.

[3rd movement: further comment] More than one year later, Andréa Cigerza added:

> Congratulations for whom gave an answer for Theresa regarding her mother's problem. I entered in this website because of the multiple sclerosis' problem of my neighbour [...] and, to my surprise, I was informed that this same treatment with the Vitamin [D] is also good for arthritis (which is my case, actually). [...] [I hope you] continue helping other people even without knowing them personally.

The participants of the dialogue above, as other immunostimulants-users, break the Cartesian boundaries raised by medical scientists to keep the myriad of autoimmune diseases independent and distinct from each other, classified only according to the specificity of their symptoms, and as different problems to be treated separately. Likewise, on a broader level, several immunostimulant-users who participated in similar exchanges are simultaneously producing, collecting and comparing therapeutic and institutional evaluations. With it, immunostimulants-users politically participate in the co-production and organization of medical evidence and contra-evidence (Akrich *et al*. 2013: 17–8); *e. g*., as a particular video produced by an ex-patient with multiple sclerosis posted on the internet shows (Cunha 2012).

These exchanges demonstrate two mutual implications. First, when switching from an established therapy to a tabooed one, people with autoimmunity and physicians seem to dodge the established medico-legal regime in Brazil. Second, by this same movement, they also change and partially assume the ways they understand and conceptualize their autoimmunity and possibilities of treatment, and their medical institutional environment and forms of engagement (Greenhalgh 2001, Law & Mol 2004).

Mediators

Some observations relayed to me by an activist informant and webmaster help to show how the scenarios described above are intertwined. Escobar (own pseudonym) administers a frequently visited webpage in Brazil which offers information about immunostimulating therapies (VAB/CAE, AHT and others), and serves as a space for people to report their therapeutic experiences. "Secret Cures" (*Curas Secretas*), as his blog is called, was created by him after he saw his:

> dying wife become completely cured within two years of treatment through a simple restrictive diet—eliminating all pro-inflammatory and industrial food –, suspending any drugs and doing physical exercises five times per week, associated with autohemotherapy; thus, a complete change in her life habits! [03/02/2014, personal communication]

Catarina, his wife, had been diagnosed with Lupus, rheumatoid arthritis and Sjögren's syndrome. Following her recovery, he realized that several physicians who had said to them that there was no possibility of cure, "either do not have that knowledge [of healing] or were too ambitious to share it." Regarding his motivation to create and manage his website, he confirms that:

> the blog is indeed a very good reference. I do not sell anything, I do not recommend anything, I do not allow propaganda. I only tell my story of struggle and success. It [the homepage] was created [by me] to welcome my debt to God for having totally healed my wife through this treatment.

As I asked him about the collaboration, exchange and relationships in general not only between patients, but also between patients and physicians (DelVecchio Good & Good 2000), he explained that:

> For some ambitious physicians, or even for some modest physicians, who are limited and imprisoned in their own dogmas and paradigms, we are often seen as liars, charlatans or just "mad"—even if the medical professional in question has never read a unique line about us [our therapeutic experiences]; that is what is funny ... They believe [in it] only when they themselves, their sons or dear relatives become ill; then they come to us asking for information ... I have known two physicians who were terminal patients and [who] are completely cured! Arthritis and lupus. There are other stories ... of relatives, sons, etc. Completely cured. But when the one, who is sick, is the patient, then it is very easy to say that nothing can be done, and that the person has to learn to live with the pain!

Although I am citing Escobar and his activities to inform and promote immunostimulant therapies for the treatment of autoimmunity through his own homepage on the internet, it is important to keep in mind that each satisfied immunostimulant-user, or engaged medical professionals, is a potential mediator between immunostimulant drugs and patients seeking recovery.

The ethnographic observations on bionetworking activities that I reported here seem to support this argument. A person diagnosed with one or more autoimmune diseases, and who can potentially become a user of unauthorized immunostimulant, will probably not find information about related therapies at their town's clinics, even if these therapies are practiced there. Due to fear, these practices take place in secret. Access to them can be reached through the internet, or through personal relationships that involve trust, and that likewise do not rarely take place outside clinical and ambulatory environments. Therefore, informal and formal paths of biotechnological innovation may appear here as unfolding from and framing each other. By this movement, it is possible to observe that informal personal relations, based on trust, and impersonal exchanges of experiences on the internet, based on commonality, substitute medical offices as mediators between patients and the authorized immunological therapies, dodging the immediate adoption of immunosuppressants to which patients are normally directed when they go to conventional physicians.

One observes that, on the one hand, members of life assemblages for immunostimulants also contribute through their bionetworking activities to re-insert the perspective of cure through other therapeutic means into public debates on "chronic" diseases and, thus, to directly confront the established biomedical narrative on autoimmunity as inevitable destiny. On the other, the very perspective of cure, as part of another immunopolitical agenda, becomes possible through the existence and performance of immunostimulants themselves.

Immunostimulants

Along their multiple trajectories, immunostimulant drugs become travelling biotechnologies that provide terrain and language through which negotiations of immunological politics take place (Schnitzler 2013), such as the possibility of talking about a cure.

As mentioned in section 2, physicians who employ VAB/CAE, *e. g.*, argue that the cause of the immunological disturbance lies in the weak state of the patients' immunity, and not in its overreactivity, which should rather be seen as a consequence of a broader immunological deterioration process. When they argue that the immunity of patients can be rehabilitated through controlled contact with Brucella, because Brucella help their bodies to *regenerate* themselves, they directly challenge the established biomedical conception of immunity as being only a defence system which looks to protect the *self* from the *non-self* through distinction, avoidance and elimination (Anderson & Mackay 2014). VAB/CAE users, therefore, are learning from immunostimulants that the self-regeneration of a body's person is reached through its adequate interaction with one or more *others*. That corroborates what Napier has been arguing for decades (*e. g.* 1992: 139–75, 2003). Taking the use of stem cell therapy to treat "*Fanconi anaemia*," he explains that:

> A cure becomes possible because, rather than suppressing immune responses, we reshape them by encouraging and feeding novel viral information—information of a new type that one day may well lead to therapies for what were once incurable genetic disorders. (Napier 2012: 3)

In the case of VAB/CAE, the *other*, with its *novel information*, used to resiliently re-teach or recommit the immunological cells of patients with autoimmunity are dead Brucella. For instance, Mello argues (1979: 679) that the efficiency of the different vaccines used to prevent brucellosis, independent of their type, lie on their gradual application and desensitization procedures. Dr Rosa explained to me, for his turn, that VAB/CAE helps to "remind the immune system how it used to be at the time of its intrauterine life" (personal communication, May 2017).

The plurality of immunostimulants used to treat autoimmunity show that this *other*, to which Napier refers, can be made out of multiple sources ranging from poisonous and allergen substances (type-II collagen, apitoxin, *kambô*, mygalin etc.) or minerals (vitamin D3, magnesium chloride, etc.) to a person's own tissue (stem cells, blood, etc.). This multiplicity of agents engaged in the co-regulation of the patients' bodies confirms that immunity, "[…] appears to be exploring otherness as much as defending itself […]," as Anderson & MacKay (2014: 148) state in support of Napier's theory of immunity as a "search engine" of difference that helps one's body to adjust to its environment (2003, 2012).

While immunostimulants disseminate an*other* immunopolitical agenda (Davis *et al.* 2016), they also co-articulate their own adoption spaces (Gardner *et al.* 2017) by re-organizing established institutions. Bionetworking, as cooperation between diverse actors, including physicians, patients, mediators and unauthorized materials to promote contested scientific innovation, seems to imply transformation processes that take place by re-coding and co-opting already existing infrastructures (*e. g.* juridical, communicational, and scientific ones). So much so, that the making of biomedical worlds appears as being propitiated through exclusion as much as through commonality (Calkins & Rottenburg 2017).

In particular, immunostimulant-users for autoimmunity seem to address their health problems as interpersonal experiences of social suffering and hope (Kleinman 1995: 95–172). Instead of being considered as isolated or detached from society, unauthorized immunostimulants for autoimmunity around which life assemblages are formed rather arrange, through their multiple exchanges

with diverse sectors of Brazilian society, rhizomatic channels of circulation *outside* established healthcare networks, and simultaneously *inside* and *through* these same healthcare networks, being legally constrained by multiple pharmaceutical circuits in turn. Hence, the struggles for therapeutic legitimacy for immunostimulants extend themselves over and through informal markets without necessarily becoming *parallel* to established pharmaceutical circuits.

To resume, if one observes how unauthorized immunostimulants become systematically employed by unsatisfied patients and physicians, and how stakeholders build their own pharmaceuticals circuits, some ways through which established biomedical institutions are being increasingly circumnavigated become clear. At the same time, the set of medico-legal frictions which emerge from these reciprocal contestations seem to reveal the conventional uses of immunosuppressants to treat autoimmunity in contemporary Brazil, normally taken as self-evident, as a contested totality, in decline.

Conclusion: Biotechnological innovation in Brazil, global medical order and regenerative medicine

As I have demonstrated, each time when immunostimulant pharmaceuticals interact with people's bodies to treat autoimmunity, they subvert and challenge an established medico-legal order, its actors and structures. VAB/CAE and AHT, and other immunostimulants for autoimmunity in Brazil, like synthetic phosphoethanolamine against cancer (Vilar n. d.), affect and are affected by a whole set of interconnected global institutions built to support immunosuppressants, and which in turn is supported by them. Furthermore, those immunostimulant therapies developed in Brazil as biotechnological innovations seek to find their way towards the "Global North," challenging the established global economy of technological innovation (Medina *et al*. 2014, Rottenburg 2013). Through their bionetworking activities, members of life assemblages for unauthorized immunostimulant therapies, in Brazil, contribute to introject local discontinuities into the established global order for autoimmunity. In so doing, their cooperation work turn perceivable how questions concerning drug approval and regulatory science also points to the involvement of a plurality of local actors (physicians, patients and their relatives; governmental actors; market agents, stakeholders, etc.), their own worldviews, criteria and means of regulation, which are not taken into account by objective, transparent and universal scientific criteria usually associated with biomedicine (Harding 1998).

A crucial point here is that while established medical authorities fundamentally see a body at war against itself that must be forcefully pacificated when they look at autoimmunity—an idea strongly associable with the predominant "Western illusion of human nature" as described by Sahlins (2008), according to which humans are inherently evil—, they overlook the increasing tendency to understand one's own body as constantly engaged in interaction with and assimilation of others, of *non-selves* that co-constitute its immediate environment as much as the very *self*. This tendency becomes more visible when one considers the use of immunostimulants to treat autoimmunity in Brazil as part of changing perceptions in biomedical culture related to the global advent of regenerative medicine.

Concerning the possibility of regenerative medicine being itself a new paradigm, Webster observes that it

> […] is breaking new clinical boundaries in terms of its biological/material goals and processes but it is socially located in a regulatory and commercial context that means that changes will be incremental and move at different paces on various fronts […] and that early adoption is most likely to be within hospitals as part of the existing "*hidden innovation system*." At the same time, [… regenerative medicine] has posed some significant problems for the regulatory domain, and is […] a "novel experimental site of contemporary bio-politics." […] (Webster 2013: 220)

In Brazil, as I have experienced so far, the term "regenerative medicine" does not circulate, in general, among members of life assemblages for immunostimulants. Instead, cure is broadly used, circulated, exchanged, re-written, reinforced and newly uttered among immunostimulants-users who, in cooperation with each other, cross the borders officially administered by established bio-

medicine to, paradoxically, re-make biomedicine. Following this, it is possible to see "cure" as a concept that, along with immunostimulants and associated marginal biomedical knowledge, materials and practices in Brazil, delineates the boundaries of immunostimulants-assemblages as opposed to the idea of "chronic" (or *forever-ill*), which lays the biomedical ground on which "immunocompromised persons" are produced.

When apprehended as co-constituting *immunostimulant-assemblages*, the medico-legal constraints related to VAB/CAE and to AHT, and other immunostimulants to treat autoimmunity in Brazil, appear as interlinked and encompassing numerous complex changes and conflicts that have occurred in the last decades in different places, such as courts of law, scientific environments, and formal and informal economies (Chen *et al*. 2013). Thus, the regulatory experiences of and bionetworking activities for VAB/CAE, AHT and other immunostimulants, considered internationally, can provide crucial insights: first, into changing perceptions and practices towards immunity, autoimmunity and immunological therapies, which have taken place within biomedical culture and life sciences in Brazil; second, into the development of informal pharmaceutical economies; and, finally, into a relation between these both and the emergence of regenerative medicine as a transnational process.

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References

Akrich M., Moreira T. & Rabeharisoa V. 2013. "Evidence-Based Activism: Patients' Organisations, Users' and Activists' Groups in Knowledge Society." Paris, France: Centre de Sociologie de l'Innovation (CSI). Working Papers Series n. 033.

American College of Allergy, Asthma and Immunology. 2016. "Allergy Shots (Subcutaneous Immunotherapy);" http://acaai.org/allergies/treatment/allergy-shots-immunotherapy.

Anderson W. & Mackay I. 2014. *Intolerant Bodies: A Short History of Autoimmunity*. Baltimore, MD: John Hopkins University Press.

Andrews A. 2011. "Autoimmunity: Deconstructing Fictions of Illness and the Terrible Future to Come". PhD Thesis, Department of Visual Cultures, Goldsmiths, University of London.

ANVISA (Agência Nacional de Vigilância Sanitária). 2005a. "Resolução n. 2.629". *Diário Oficial da União* 203(21/10); http://www.jusbrasil.com.br/diarios/836551/pg-76-secao-1-diario-oficial-da-uniao-dou-de-21–10–2005.

——— 2005b. "Anexo: Regulamento Técnico dos Procedimentos de Registro, de Alteração Pós-Registro e Revalidação de Registro dos Produtos Biológicos Terminados". *Diário Oficial da União* 209 (31/10): 58–62. Accessed from: https://www.jusbrasil.com.br/diarios/6009658/pg-59-suplemento-secao-1-diario-oficial-da-uniao-dou-de-31–10–2005 [02/12/17].

——— 2006. "Decisão". *Diário Oficial da União* 201 (19/10); http://www.jusbrasil.com.br/diarios/735744/pg-32-secao-1-diario-oficial-da-uniao-dou-de-19–10–2006.

——— 2007. "Decisão". *Diário Oficial da União* 125 (02/07); http://www.jusbrasil.com.br/diarios/627871/pg-63-secao-1-diario-oficial-da-uniao-dou-de-02–07–2007.

——— 2017. "Nota Técnica Nº 6/2017/SEI/GSTCO/DIARE/ANVISA. Processo nº 25351.907403/2017–89"; http://portal.anvisa.gov.br/documents/33840/330709/Nota+T%C3%A9cnica+n%C2%BA+01+de+2007/0dd4d549-bf19–4988–9946–133b5825d10c.

Boucinhas J. 2012 (04/01). "Uma Promessa de Alívio para os Artríticos". *Tribuna do Norte*; http://tribunadonorte.com.br/noticia/uma-promessa-de-alivio-para-os-artriticos/216503.

BRATS (Boletim Brasileira de Avaliação de Tecnologias em Saúde). 2012. "Medicamentos Biológicos para o Tratamento da Artrite Reumatóide". Ano VI(19); http://portal.anvisa.gov.br/documents/33884/412285/Boletim+Brasileiro+de+Avalia%C3%A7%C3%A3o+de+Tecnologias+em+Sa%C3%BAde+%28BRATS%29+n%C2%BA+19/3fb1f5be-421a-4fa5-be79–71fcfac2d3a0?version=1.1.

British Society for Immunology 2012. Autoimmune Diseases; https://www.immunology.org/page.aspx?pid=1272.

Brodwin P. (ed) 2000. *Biotechnology and Culture: Bodies, Anxieties, and Ethics*. Bloomington, IN: Indiana University Press.

Calkins S. & Rottenburg R. 2017. Evidence, Infrastructure and Worth. In Harvey P., Jensen C. B. & Morita A. (eds). *Infrastructures and Social Complexity: A Companion* (eds), 253–65. London: Routledge.

CFM (Conselho Federal de Medicina). 2007. "Processo-Consulta CFM N. 4.275/07 – Parecer CFM N. 12/07". Rapporteur: Munir Massud.

Chen H., Haddad C. & Gottweis H. 2013. Unruly Objects: Novel Innovation Paths, and their Regulatory Challenge. In Webster, Andrew (ed). *The Global Dynamics of Regenerative Medicine: A Social Science Critique*. London and New York: Palgrave Macmillan: 88–117.

Cohn S. 2000. Risk, Ambiguity and the Loss of Control: How People with a Chronic Illness Experience Complex Biomedical Causal Models. In Caplan P. (ed). *Risk Revisited*. London and Sterling: Pluto: 204–25.

Coimbra U. 2007 (23/07). "Auto-Hemoterapia: Manobra Impede Aprovação no SUS. *Século Diário*; http://www.seculodiario.com.br/arquivo/julho/23/noticiario/meio_ambiente/23_07_05sau.asp.

Cooper G. S. Bynum M. L. & Somers E. C. 2009. Recent Insights in the Epidemiology of Autoimmune Diseases: Improved Prevalence Estimates and Understanding of Clustering of Diseases. *Journal Autoimmun* 33, 3–4: 197–207; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2783422/pdf/nihms-151887.pdf

CRC/IMPATH (Collaborative Research Center 1160 Immune-mediated pathology as a consequence of impaired immune reactions—IMPATH). "Welcome"; http://www.sfb1160.uni-freiburg.de/.

Cunha D. 2012. Vitamina D Por uma Outra Terapia Vitamin D For an Alternative Therapy. YouTube; https://www.youtube.com/watch?v=yuVZuM1or9w.

Davis M., Flowers P. Lohm D., Waller E. & Stephenson N. 2016. Immunity, Biopolitics and Pandemics: Public and Individual Responses to the Threat to Life. *Body & Society* 22, 4: 130–54; http://journals.sagepub.com/doi/pdf/10.1177/1357034X14556155

DelVecchio Good M. 2003. The Medical Imaginary and the Biotechnical Embrace: Subjective Experiences of Clinical Scientists and Patients. Harvard, US: *Russel Sage Working Papers* n. 210; https://www.russellsage.org/sites/all/files/u4/Good_Medical%20Imaginary%20and%20the%20Biotechnical%20Embrace%20Subjective%20Experiences%20of%20Clinical%20Scientists%20%26%20Patients.pdf.

——— & Good B. 2000. Clinical Narratives and the Study of Contemporary Doctor-Patient Relationships. In Gary A., Fitzpatrick R. & Scrimshaw S. (eds). *The handbook of social studies in health and medicine*. London: Sage: 243–58.

Faulkner, A., Lange B. & Lawless C. 2012. Material Worlds: Intersections of Law, Science, Technology, and Society. *The Journal of Law and Society* 39, 1: 1–19.

Felippe Jr. J. & Pacheco da Veiga G. 2005 (November). Emprego da Vacina Anti-Brucélica contra a Artrite Reumatóide. *Associação Brasileira de Medicina Biomolecular e Nutrigenômica*; http://www.medicinabiomolecular.com.br/pop_artigo.html?pagina=do-0750.

Gardner J., Higham R., Faulkner A. & Webster A. 2017. Promissory Identities: Sociotechnical Representations & Innovation in Regenerative Medicine. *Social Sciences & Medicine* 174: 70–8; https://ac.els-cdn.com/S0277953616306980/1-s2.0-S0277953616306980-main.pdf?_tid=e44be123-6c99-44e0-b295-56b0ee7f16fe&acdnat=1524577067_6fb362e0df766c3c25a3ab39befb87bb.

Geovanini T. 2009. Em Defesa da Liberação da Autohemoterapia no Brasil; http://www.stf.jus.br/arquivo/cms/processoAudienciaPublicaSaude/anexo/EM_DEFESA_DA_LIBERACAO_DA_AUTOHEMOTERAPIA_NO_BRASIL.pdf.

Gharagozloo M. Majewski S & Foldvari M. 2015. Therapeutic Applications of Nanomedicine in Autoimmune Diseases: From Immunosuppression to Tolerance Induction. *Nanomedicine* 11, 4: 329–39; https://ac.els-cdn.com/S1549963415000088/1-s2.0-S1549963415000088-main.pdf?_tid=fdf72c68-4547-442b-aa5c-300d8411cd36&acdnat=1524577188_7e241e1338b65cdef2a764d60f33ed14.

Greenhalgh S. 2001. *Under the Medical Gaze: Facts and Fictions of Chronic Pain*. Berkeley: University of California Press.

Haraway D. 1991. *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge; https://monoskop.org/images/f/f3/Haraway_Donna_J_Simians_Cyborgs_and_Women_The_Reinvention_of_Nature.pdf.

Harding S. 1998. *Is Science Multi-Cultural? Postcolonialisms, Feminisms, and Epistemologies*. Bloomington: Indiana University Press.

Hogle L. 2007. Emerging Medical Technologies. In Hackett E., Amsterdamska O., Lynch M. E. & Wajcman J. (eds). *The Handbook of Science and Technology Studies*. Massachusetts: MIT: 841–74.

Jasanoff S. 1990. *The Fifth Branch: Science Advisers as Policymakers*. Cambridge and London: Harvard University Press.

——— (ed) 2004. *States of Knowledge: The Co-Production of Science and Social Order*. London: Routledge.

Kirchheimer S. 2016. Allergy Shots: Underused treatment?. *Women's Health – WebMD*; http://www.webmd.com/women/fea tures/allergy-shots-underused-treatment.

Kleinman A. 1995. *Writing at the Margin: Discourse between Anthropology and Medicine*. Berkeley, Los Angeles and London: University of California Press.

Kuhn T. 2012 [1962]. *The Structure of Scientific Revolutions*. Chicago and London: The University of Chicago Press.

Lackinger I. & Weiss H. 1992. *Rheuma, Arthrose, Gicht*. Stiftung Warentest: Stuttgart.

Lakoff A. 2008. The Right Patients for the Drug: Pharmaceutical Circuits and the Codification of Illness. In Hackett E., Amsterdamska O., Lynch M. E. & Wajcman J. (eds). *The Handbook of Science and Technology Studies*. Cambridge, MA: MIT: 741–59.

Langer H. 2015. Was ist Rheuma. *Rheuma-Online*; https://www.rheuma-online.de/krankheitsbilder/was-ist-rheuma/.

Latour B. 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.

Law J. & Mol A. 2004. Embodied Action, Enacted Bodies: The Example of Hypoglycaemia. *Body and Society* 10, 2–3: 43–62; http://journals.sagepub.com/doi/pdf/10.1177/1357034X 04042932.

Lorimer J. 2017. "Probiotic Environmentalities: Rewilding with Wolves and Worms." *Theory, Culture & Society* 34 (4): 27–48. https://doi.org/10.1177/0263276417695866.

MAPA (Ministério da Agricultura, Pecuária e Abastecimento). 2006. *Programa Nacional de Controle e Erradicação da Brucelose e Tuberculose Animal (PNCEBT): Manual Técnico*. Brasília; http://www.adapar.pr.gov.br/arquivos/File/GSA/PECEBT/MANUAL_PNCEBT.pdf.

Marson P. & Pasero G. 2012. A short History of Anti-Rheumatic Therapy: VIII. The Immunosuppressants. *Reuma-*

tismo 64, 1: 44–54; https://pdfs.semanticscholar.org/9d48/e8487f76eec5b 616de3f04fac9b5b5da7d3e.pdf.

Martin E. 1990. Toward an Anthropology of Immunology: The Body as Nation State. *Medical Anthropology Quarterly* 4, 4: 410–26; https://www.jstor.org/stable/pdf/649224.pdf?refreqid=excelsior:a7247693b447b2a4d433afea2c36e35d.

——— 1994. *Flexible Bodies: Tracking Immunity on American Culture from the Days of Polio to the Age of AIDS*. Boston: Beacon.

Martinez A. & Sarmento L. F. 2004. *Autohemoterapia: Contribuição para a Saúde. Conversa com Doutor Luiz Moura*. DVD; https://www.youtube.com/watch?v=N-dmpGfkKN0.

Medina E. da Costa Marques I. & Holmes C. (eds). 2014. *Beyond Imported Magic: Essays on Science, Technology, and Society in Latin America*. Cambridge, MA & London: The MIT Press.

MedlinePlus. 2015. Autoimmune disorders. *A. D. A. M. Medical Encyclopedia*. Bethesda (MD): National Library of Medicine (US). https://medlineplus.gov/ency/article/000816.htm.

Meiselas L. E., Zingale S. B., Lee S. L., Richman S. & Siegel M. 1961. Antibody Production in Rheumatic Diseases: The Effect of Brucella Antigen. *The Journal of Clinical Investigation*. 40: 1872–80; https://www.jci.org/articles/view/104411/pdf.

Melchers F. 2006. Immunological Research in Germany. In Deutsche Gesellschaft für Immunologie (ed). *Immunology in Germany 2006*, 18–28; https://www.dgfi.org/sites/default/files/images/01–06_Gremien/Immunology_in_Germany_2006.pdf

Mello M. T. de 1979. Vacunas Muertas y de Extractos Celulares contra la Brucelosis. *Ciência e Cultura* 31(6).

Moulin A. M. 1996. Un Object Scientifique a la Charnière des Sciences Biologiques et Sociales: Le Système Immunitaire. *História, Ciências, Saúde – Manguinhos* 3, 2: 300–18; http://www.scielo.br/pdf/hcsm/v3n2/v3n2a06.pdf.

Mullen P. W. 1977. Cancer Immunotherapy and Drug Disposition. *British Journal of Clinical Pharmacology* 4: 695–7; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1429171/pdf/brjclinpharm00301–0039.pdf.

Napier A. D. 1992. *Foreign Bodies: Performance, Art, and Symbolic Anthropology*. Berkeley: University of California Press.

——— 2003. *The Age of Immunology: Conceiving a Future in an Alienating World*. Chicago: University of Chicago Press.

——— 2012. Nonself Help: How Immunology Might Reframe the Enlightenment. *Cultural Anthropology* 27, 1: 122–37; https://anthrosource.onlinelibrary.wiley.com/doi/epdf/10. 1111/j.1548–1360.2012.01130.x.

NCCIH (National Center for Complementary and Alternative Health). 2016. Complementary, Alternative, or Integrative Health: What is a name? https://nccih.nih.gov/health/integrative-health.

Novas C. 2006. The Political Economy of Hope: Patients' Organizations, Science and Biovalue. *BioSocieties* 1: 289–305; https://link.springer.com/article/10.1017%2FS1745855206003024.

Pacheco G., da Silva D. S. & da Silva J. G. 1969. Nova Vacina Curativa contra a Brucelose. *Hospital* 76, 2: 747–53.

——— 1970. Sobre o Emprêgo da "Nova Vacina Curativa da Brucelose". *Hospital* 77, 4: 329–37.

——— & de Mello M. T. 1950. Brucelose Humana no Brasil: Contribuição para o Estudo Nacional da Casuística. *Memórias do Instituto Oswaldo Cruz* 48, Rio de Janeiro.

PAPAA (*The Psoriasis and Psoriatic Arthritis Alliance*). 2015. Immunosuppressants and Biologics; http://www.papaa.org/psoriasis-treatments/immunosuppressants-and-biologics.

Policy Department of European Parliament 2017. *Autoimmune Diseases—Modern Diseases*. Directorate General for Internal Policies. Policy Department A: Economic and Scientific Policy. Study for the European Parliament's Committee on Environment, Public Health, and Food Safety. Brussels: European Union; http://www.europarl.europa.eu/cmsdata/133060/ENVI%202017–09%20WS%20Autoimmune%20diseases%20%20PE%20614.174%20(Publication).pdf.

Rabelo J. 2007a (07/07). A Cura Indesejável. *Século Diário*; http://seculodiario.com.br/25330/15/a-cura-indesejavel.

——— 2007b (09/07). Aprovada pelos Pacientes, Vacina é Barrada por Interesses Econômicos. *Século Diário*; http://www.seculodiario.com.br/arquivo/2007/julho/09/noticiario/meio_ambiente/09_07_05sau.asp.

Rose N. & Novas C. 2005. Biological Citizenship. In Ong A. & Collier S. *Global assemblages: technology, politics, and ethics as anthropological problems*. Malden, MA: Blackwell: 439–63.

Rottenburg R. 2013 (05/04). On Authorizing Knowledge in Development Arenas. Keynote lecture at the Symposium "Is There a New Development?" at the Berkeley University; https://www.youtube.com/watch?v=b3CDO_o_Mfc.

Sahlins M. 2008. *The Western Illusion of Human Nature: With Reflections on the Long History of Hierarchy, Equality, and the Sublimation of Anarchy in the West, and Comparative Notes on Other Conceptions of the Human Condition*. Chicago: Prickly Paradigm Press.

Senado Federal (2015, 29 October). Ata da 19ª Reunião Conjunta das Comissões Permanentes, Realizada pela Comissão de Ciência, Tecnologia, Inovação, Comunicação e Informática (43ª Reunião) com a Comissão de Assuntos Sociais (32ª Reunião) da 1ª Sessão Legislativa Ordinária da 55ª Legislatura, Realizada em 29 de Outubro de 2015. Brasília; https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwip9N-jitPaAhUKqaQKHaqdC0QQFgguMAE&url=http%3A%2F%2Fwww19.senado.gov.br%2Fsdleggetter%2Fpublic%2FgetDocument%3Fdocverid%3D6fa32d0d-6342–4e91-aeac-867f324f48a0%3B1.1&usg=AOvVaw35QR7dcOCbMk96tNtpCgI9.

Silva da Costa T. L. 2017. Discursos sobre a Interdição à Auto-Hemoterapia: Genealogia de um Fato Médico-Científico. PhD thesis, Universidade Federal do Ceará; http://www.repositorio.ufc.br/bitstream/riufc/22660/1/2017_tese_tlscosta.pdf.

Sleeboom-Faulkner M. 2014. *Global Moralities and Life Science Practices in Asia: Assemblages of Life*. London and New York: Palgrave Macmillan.

Thommen D. S., Koelzer V. H., Herzig P., Roller A., Trefny M., Dimeloe S., Kiialainen A., Hanhart J., Schill C., Hess C., Prince S. S., Wiese M., Lardinois D., Ping-Chih Ho P.-C., Klein C., Karanikas V., Mertz K. D., Schumacher T. S., & Zippelius A. 2018. A transcriptionally and functionally distinct PD-1+ CD8+ T cell pool with predictive potential in non-small-cell lung cancer treated with PD-1 blockade. *Nature Medicine*, doi: 10.1038/s41591–018–0057-z. https://www.nature.com/articles/s41591–018–0057-z.

Veronesi R. 2008 [1976]. Imunoterapia: O Impacto do Século. *Medicina de Hoje* n. n.: 194–200; http://www.medicinabiomolecular.com.br/biblioteca/pdfs/Biomolecular/mb-0212.pdf.

Vilar M. 2018. "To Uninstall Oneself:" Ethnographizing Immunostimulants for Autoimmunity in Brazil. In Garnett E., Reynolds J, & Milton S. (eds) *Ethnographies and health: reflections on empirical and methodological entanglements*. London: Palgrave Macmillan: 213–32. Quelle: https://www.palgrave.com/la/book/9783319893952.

——— n. d. (Forthcoming/under review). Following "Fosfo:" The synthetic phosphoethanolamine and the transfiguration of immunopolitics in Brazil. *Medicine Anthropology Theory*. Obrist B., Mattes D. & Hadolt B. (eds), Special issue "Rethinking sociality and health: transfigurations of bodies, practices, and policies in an interconnected world."

Von Schnitzler A. 2013. Travelling Technologies: Infrastructure, Ethical Regimes and the Materiality of Politics in South Africa. *Cultural Anthropology* 28, 4: 670–69; https://culanth.org/articles/718-traveling-technologies-infrastructure-ethical.

Webster A. (ed). 2013. *The Global Dynamics of Regenerative Medicine: A Social Science Critique*. London and New York: Palgrave Macmillan.

WHO (World Health Organization) 2017. *Noncommunicable Diseases Progress Monitor 2017*. Geneva: World Health Organization; http://apps.who.int/iris/bitstream/handle/10665/258940/9789241513029-eng.pdf;jsessionid=59F2C937AD5D163EC424FD54335D9F7A?sequence=1.

Woolgar S. (ed) (2002). *Virtual Society? Technology, Cyberbole, Reality*. Oxford: Oxford University Press.

Ximeng C. 2014 (22/04). Bee Healthy. *Global Times*; http://www.globaltimes.cn/content/856106.shtml.

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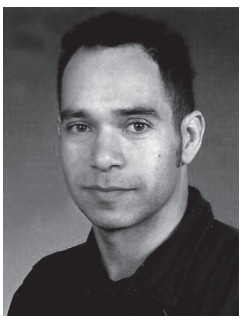

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