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JONATHAN TREASURE

The
Thinking
Patient's
Guide to

CANNABIS
& CANCER

Vol 1: Cannabis in Context

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*The Thinking Patient's Guide to
Cannabis & Cancer
Vol.1: Cannabis In Context*

By

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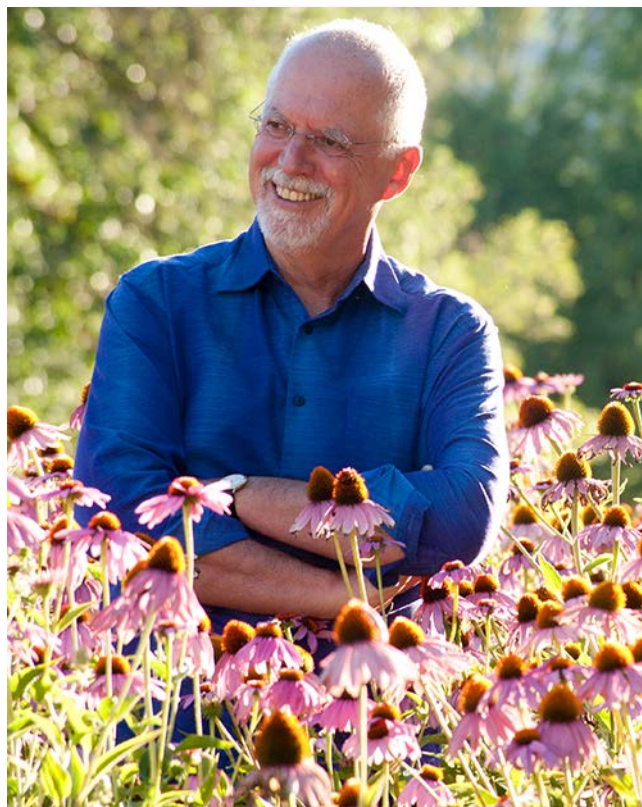
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CHAPTER 2

HERBAL MEDICINE & CANCER CARE

In Chapter 1, we looked at problems of misinformation about herbs and cancer in general, and about cannabis and cancer in particular, including critically reviewing testimonials as claims of evidence for efficacy of alternative cancer treatments. We also touched on how bad science, bias and pseudoscience negatively impact popular views about herbs and herbal medicine. In this chapter we will flesh out some of these issues by looking more closely at how applying the ill-fitting “drug model” of herbs impacts the data on herbs and how we view that data. We will also look at some key definitions and concepts of herbal medicine and how herbs really do influence cancer biology.

WHAT IS AN “HERBAL MEDICINE”?

In the United States, there is no official category of traditional herbal medicines; herbs and herbal products are currently regulated as “dietary supplements.” Medicinal claims are not allowed for dietary supplements,

which means herbal medicines cannot be promoted as having medical benefits. Thanks to this curious classification, common herbs with well-known health benefits can have a sort of “multiple personality disorder.” In the produce aisle, ginger root is a food, but in the supplement section it is a “dietary supplement.” Yet, we do not take ginger because our diet is so deficient in ginger that it has to be supplemented. If recommended by a licensed healthcare provider based on evidence-supported indication, it officially becomes “medicine”—but at no time is it an “herbal medicine.” Herbal medicines (the tools of herbal medicine) are not the same as herbal Medicine (the traditional therapeutic modality or practice of using herbal medicines). These days, mainstream medical resources describing scientific studies on herbs purport to be about “herbal medicine,” but this is akin to saying that a surgical instrument catalog is the same as an operating manual for surgeons.

Despite being the forebear of modern biomedicine, herbal medicine was politically suppressed in the U.S. in the early 20th century. It is not well known that there were tens of thousands of botanically trained physicians in practice in the northeastern states at the turn of the century. An alliance of the AMA, FDA, and the emerging pharmaceutical corporations backed a Rockefeller-funded Flexner Report (1910) on medical education which forced the closure of previously thriving botanical medical schools.¹ By the 1930s, botanically trained MDs had completely disappeared. In the U.S. today, herbal medicine is excluded even from the “official” definitions of complementary and alternative medicine approaches listed by the National Center for Complementary and Integrative Health (NCCIH).² Ayurveda, Chinese medicine and naturopathy are listed, but not herbal medicine. It follows that there are no licensed practitioners of Western herbal medicine in the U.S. (as opposed to the U.K., for example, where herbalists can legally diagnose and treat disease with herbal medicines)—simply because there is no officially recognized “herbal medicine” to license!

As a result of this suppression, both mainstream biomedicine and the lay public default to a “drug model” of herbs that views herbs as impure, unpredictable natural substances which are generally either ineffective or potentially dangerous due to their toxicity, adulteration, or possible adverse interactions with prescription medications. Furthermore, although the disciplines of pharmacognosy and medical botany were dropped

¹These were the Eclectic and Physiomedical Schools of Botanical Medicine

²A department of The National Institutes of Health (NIH).

from pharmacy school curricula many years ago, reference databases of dietary supplements are today compiled and maintained by pharmacists whose default perspective is a “drug model” of herbs. Seeing herbs as either poison or panacea is unhelpful, but so is vilifying either modern mainstream or traditional herbal medicine. A more useful way to illustrate the differences between the two would be by comparing the approaches of a gardener and a mechanic.

THE MECHANIC AND THE GARDENER

Mainstream medicine tends to see the body as a machine—albeit a complex one. A machine is understood in terms of basic principles of engineering design, where the assembly of component parts follow predictable rules of organization and behavior; a malfunction can usually be fixed by logical fault-finding (diagnosis) and mending or replacing the defective part—a mechanical approach. For herbal medicine, the body is more like a garden—an ecosystem unto itself, a complex network of inter-relating and interdependent systems in which the whole is more than the sum of its parts. Malfunction can arise from stressors or perturbances which, if uncorrected, lead to imbalances that, over time, manifest as patterns of disease. Fixing problems therefore involves adjustments to the terrain or ground... much like the job of a gardener. Put another way, when things go wrong, mainstream medicine tends to focus on the problem in terms of the pathology and the disease, whereas herbal medicine tends to look at the person who has the disease.

In terms of cancer, this is classically described as the polarity between tumor and host, the latter being the terrain or ground in which the tumor develops. Extending our horticultural theme, cancer could be likened to an invasive weed. Weeds thrive in disturbed and neglected ground, so amending the soil (checking its pH, mineral content and feeding it with appropriate micronutrients) can prevent invasive weeds from taking root. Similarly, creating an internal "anti-cancer" garden or terrain within the body is one of the more important ways in which herbs can be used to prevent cancer and inhibit its progression. And, as is the case with chemotherapy and other heroic cancer treatments, killing weeds with poisons and herbicides that cause collateral damage to the surroundings is not necessarily the best way to clear them from a garden—although at times it may be the only way. In any event,

there will always be gardeners who have a mechanical approach, and mechanics who can be as artistic as gardeners. In practice, especially with cancer where the situation is rarely simple, the smart patient will seek out gardeners who understand mechanics and mechanics who are gardeners. Meanwhile, we have to look at how herbal medicines themselves actually work.

“HERBS DON'T WORK”?

A recurrent claim about herbal medicine made by mainstream critics is that “herbs don't work.” This claim is based on the medical “drug model” applied to herbs as described above. Is this statement true? To find out the answer, let’s examine the ways in which we view the plants that we have been using since the beginning of human evolution.

Indigenous peoples often classify the plant world as our ancestors did, in terms of food, medicine or poison. This triad was a practical and pragmatic way for our forebears to make distinctions about the use value of different plants. Ethnobotanically, demarcations between these categories might vary, but there is some heuristic value in this basic classification when transported to modernity. Plant food nourishes and supports human life, not just in terms of calories and essential micronutrients, but literally with vital energy. Plant medicine helps with what ails us, and although it overlaps somewhat with the food category, it also includes many plants that we would not voluntarily choose to eat as a salad. These plants could be called “true” medicines; they support and enhance the body’s vital processes, including the capacity to self-heal. Finally, plant poison refers to a smaller group of plants whose ingestion can have more or less unpleasant consequences. Depending on exposure (dose), poisonous plants are actively harmful to vital processes—although in experienced hands, this category may overlap with stronger plant medicines. In general however, despite some cross-over between categories (medicinal foods and strong plant medicines), the trinity of food, medicine and poison is a canonical way of classifying the plant world with which humans have co-evolved. If we now re-parse our modern ideas of what constitutes food, medicine and poison in this light, we arrive at a sobering picture of how topsy-turvy things are today.

Clear distinctions between the three are no longer possible in a real sense, almost everything could be described as poison nowadays. Certainly the

synthetic prescription drugs of modern "medicine" can with some justification all be described as poisons. This applies not just to the obvious ones like cytotoxic chemotherapy, but all pharmaceutical medicines are poisons in that they are, as the Physiomedicalist herbalists put it "inimical to life", being man-made molecules that deliberately disrupt or interfere with vital processes.³ It is no coincidence that Erlich⁴ called the ideal drug a "magic bullet." Prescription drugs are well known to be one of the leading causes of death in the U.S. today. Meanwhile, the majority of what passes for "food" in our supermarkets would be unrecognizable as real food to our grandparents let alone our ancestors. Processed foods, packaged with added preservatives, colorants and contaminated by residual agrichemicals, seasoned with refined sugars, bad fats and more, are quite literally poison. At the same time, the older category of poison once limited to a few toxic plants and the venom of some animals has expanded to a frighteningly encyclopedic list of harmful industrial, agricultural, and pharmaceutical toxins that pervade our soil, air, water, and inevitably the food chain, to the extent that hundreds of compounds with toxic properties have been detected in our bodies. It's not unreasonable to say we are, in many ways poisoning our planet, our ecosystems and ourselves.

The majority of herbs (or "true medicines"⁵) are really more like foods. Take a plate of pasta, for example. If we ask, "How does pasta work?", the question seems silly. The reason is that pasta does not "work," obviously the body works on pasta. Our physiology "works" to digest, absorb, assimilate and—critically—determine the ultimate fate of dietary ingredients like carbohydrates according to the needs and state of the body's systems. This last point is important. The fate of a pile of pasta consumed by a dedicated distance runner preparing for a marathon competition by carb-loading will be very different from the same meal consumed by a sedentary, obese couch potato for whom excess carbs will likely exacerbate insulin resistance, inflammation and consequent chronic disease.

In 1921, Walter Cannon, the Harvard physiologist who developed the theory of homeostasis, entitled his major work on the subject, *The Wisdom of the Body*. The work of the body on food and food-like substances such as herbs is an illustration of this innate wisdom. This is an intrinsic aspect of living

³ Of course, this neither implies that modern drugs lack benefit, nor condones the cliché that "*natural equals safe*".

⁴ Paul Erlich, Nobel Prize Winning Immunologist first proposed the magic bullet ideal of drug action in 1908

⁵ "True Medicines" was the term given by Physiomedicalist herb doctors to their gentle plant remedies to distinguish them from poison drugs like mercuric chloride used by their "regular" physician contemporaries in the 19th century

systems. Naturopathic physicians use the Latin phrase *Vis Medicatrix Naturae* (“the healing power of nature”) to describe this inherent self-organizing and healing property

The view that it is the body which “acts” flies in the face of the pharmaceutical drug/medical model, in which the body is an object upon which drugs act.⁶ Even though they can play a role in saving lives, drugs are poisons, fundamentally inimical to life processes. As poisons, drugs actively perturb, modify or disrupt biological function. Treating a perturbation (disease) with an agent that perturbs (drug) is a revealing way of looking at the underlying rationale of pharmaceutical drugs. Medicinal herbs, on the other hand, do not perturb (or “act”), but rather enhance or support vital activity. The abilities of any herb to differentially provide support to a specific body system/organ/tissue comprised the “virtues” of that herbal remedy in traditional use. This corresponds closely to the idea of furnishing a capacity or influence upon which the body may act.⁷ Of course, just as there is some overlap between foods and medicines (such as the pot herbs and culinary spices) there is also an overlap between medicinal herbs and “poisonous” or toxic herbs. These latter usually are used as medicine only by those with appropriate skills and knowledge, whether wise woman, shaman, or modern health professional.

The body’s wisdom is due in part to a deep level of general compatibility between natural compounds and our own physiology. In turn, this is due to the fact that the molecular machinery in plants that produces medicinal compounds is similar to that found in each of our own cells. An ancient congruence and co-dependence between plants, their secondary compounds, and our own cellular and metabolic processes is the result of countless millennia of intimate co-evolution. (This is particularly interesting in the case of cannabis, as we shall see in Chapter 5.)

So, returning to the proposition that “herbs don't work,” we can now say we agree with the statement—indeed, herbs do not “work.” Rather, the body works on herbs.

⁶ Interestingly, modern pharmacology describes the processes by which the body acts on drugs as a separate sub-discipline called pharmacokinetics. How drugs act on the body is called pharmacodynamics.

⁷ See my article “Herbalism 3.0” (Treasure, J. 2014) for more explanation of the similarity between the idea of herbs possessing “capacities” and the ancient idea of traditional herbalism that herbs possessed “virtues.”

HERBS FOR CANCER

By now, it should be clear that the drug model of herbal medicine is a poor choice for understanding herbs, and hence sheds little light on how herbs can influence cancer. Because this is a common and popular misconception, it follows that this model can and often does easily derail patients from optimal incorporation of botanicals into their cancer treatment program. This will become clearer as we gain perspective from an overview of the three potential areas of herbal involvement in cancer therapeutics: antineoplastic, co-management, and preventive strategies.

Antineoplastic Herbs

“Antineoplastic” effectively means “directly killing cancer cells” to debulk or shrink tumors. Herbs in this group fall into two categories. First, there is a rather small number of what herbalists call “low-dose” or toxic anticancer herbs that are not generally used in everyday herbalism. Several of these are sources of modern chemotherapy drugs, such as Taxotere® (from pacific yew or *Taxus brevifolia*), Navelbine® (from the Madagascar periwinkle or *Catharanthus roseus*), and etoposide or (from mayapple or *Podophyllum peltatum*) among others. Anticancer compounds from plants like these are isolated, synthesized and often slightly “tweaked” in the laboratory by pharmaceutical corporations to produce chemotherapy drugs with greater clinical efficacy than their naturally occurring analogs. Generally, these “low-dose” or toxic anticancer herbs can only be accessed by professional herbalists in the form of whole plant extracts. Such extracts are typically far less toxic than their purified drug analogs, and often contain many closely related compounds. For example, over 100 taxanes have been isolated and identified from *Taxus* (yew) species. Their use requires considerable familiarity with herbal prescribing in cancer settings.

Documented *in vitro* activities of the second, larger group of antineoplastic herbs were insufficient to suggest them as candidates for pharmaceutical cancer drug development, but these are more readily used by herbalists as antineoplastics. In some cases, purified active compounds or isolates are extracted from these plants. Examples include artemisinin from sweet Annie (*Artemisia annua*) and honokiol from the bark of *Magnolia* spp., both of which are commercially available as dietary supplements in the U.S. Since relatively high oral doses of these herbs are required to obtain

anticancer effects, these concentrated isolates make attaining effective anticancer serum levels more feasible than if only teas or tinctures were used for administration. In some cases, injectable preparations of isolates are used, but this is the exception rather than the rule. High doses of isolates constitute a significant departure from the traditional ways in which herbs are used, but is typically the way that cannabis concentrates are used when the goal of cannabis use is antineoplastic.

In Anglo-American herbal medicine, very few herbal materials are manufactured in the form of injectable products (which have to be physician-prescribed). However, some antineoplastic herbs are available as injectables. Best known is the subcutaneous injectable Iscador, an extract of fermented European mistletoe (*Viscum album*). Originally proposed by Rudolf Steiner as a cancer cure, there are a number of different preparations of Iscador on the market, and these are only prescribed by anthroposophical doctors (physicians who follow Steiner's philosophy). Outside this niche, Iscador remains a controversial herbal remedy whose value is often overstated by its advocates.⁸

Herbs for Cancer Co-management

Co-management herbs are used supportively before, during and after conventional interventions such as surgery, chemo and radiation. During radiation, a variety of herbs can protect from the adverse effects of ionizing radiation, and may also sensitize malignant cells to its effects; this radiosensitizer/radioprotectant combination enhances the treatment outcomes. In addition to the side effects of mainstream treatment, disease progression is often associated with unpleasant symptoms that affect quality of life and ability to function. Here again, herbs can often be used to great positive effect, whether for supporting compromised systems or organs, or directly alleviating symptoms. As most readers will already know, cannabis is a valuable herb in this context, with demonstrated abilities to help with pain and cachexia, as well as chemo-related symptoms such as nausea, vomiting and appetite loss. Generally, herbs used for cancer co-management are the province of experienced herbal or naturopathic practitioners working in integrative cancer care situations.

This large group of herbs includes diverse remedies from the

⁸ The apparent anticancer properties of Iscador are likely more related to immunomodulation rather than direct antineoplastic qualities.

traditional *materia medica* repurposed into the context of mainstream cancer treatment. Most of the herbs that are recruited to these support settings are rarely well known, and even the more familiar ones are used in ways entirely different from their popular indications (uses). A good example might be the use of ginkgo as a radiosensitizer or chemosensitizer to increase sensitivity of germ line tumors to platinum drugs; both uses are a far cry from ginkgo's famous reputation as "the herb for memory."

An important concern in this area of co-management is the need to understand herb-drug interactions. Adverse interactions between herbs and drugs are often cited by oncologists as a reason for avoiding herbs entirely during cancer treatments; in fact, beneficial or positive herb-drug interactions are the defining feature of this integrative therapeutic territory.

Chemopreventive Herbs & The Terrain

There is a large and accessible group of botanicals that includes several common culinary spices and other food ingredients generally classed as "dietary chemopreventives." This term literally means a food-derived ingredient that is associated with prevention of or reduced risk of developing cancer (in distinction to pharmaceutical chemopreventives such as tamoxifen for prophylaxis of breast cancer in susceptible patients). As dietary plant compounds, these have very low toxicity, are widely available, and are relatively easy to use. They have a broad range of benefits, and copious amounts of credible science underpins their therapeutic use. Examples include epigallocatechin gallate (EGCG) from green tea, resveratrol from grape skins and curcumin from turmeric.

Large-scale population studies have suggested an inverse correlation between culinary spice consumption and cancer incidence. In particular, dietary use of turmeric and other curry spices such as ginger, chili pepper and mustard seed are associated with lower incidence of bowel cancer in populations that regularly consume them. These spices are also excellent botanical tools for creating an anticancer terrain in people with an active cancer challenge. Once again, here is a difference between low doses over time (prevention of cancer), and high acute doses (for active disease). High doses of curcumin, turmeric's active ingredient, can actually inhibit cancer in multiple ways (see next section, "Molecular Multitasking"), demonstrating that with this class of plant materials, the link between prevention and treatment is in the dose. The fact that low dose and high dose exposures to an

herb to induce different responses was also touched on in relation to the antineoplastic group of herbs above, and is again important with cannabis and cancer—although cannabis is not exactly a dietary ingredient (for most people). Perhaps the most distinctive feature of the dietary chemopreventives is their "molecular multitasking" abilities; quite unlike the "magic bullet" that locks onto a single target, they interact with hundreds of different targets, producing as many effects.

Molecular Multitasking

In the 15 years or so since the decoding of the human genome in Y2K, there has been a seismic shift in our understanding of the mechanisms of cancer, which has driven a revolution in cancer therapeutics. Less well known is the fact that this approach has been paralleled by related developments in our understanding of how natural compounds from plants affect these same underlying mechanisms of cancer biology. Not only has this transformed the respective areas of oncology and natural product biochemistry, but the interaction of these disciplines has enabled an unprecedented inquiry into the potential for herbal strategies in the treatment of cancer.

Cancer was traditionally classified in "geographic" terms—i.e., by the name and location of the tissue of origin (breast, lung, prostate, etc.), as well by as the microscopic appearance of the malignant cells (in situ, invasive, more or less differentiated, etc.). A well-established methodology developed using histopathological, surgical and clinical data to define and stage a given patient's cancer as the precondition for determining the most appropriate therapeutic approach for that individual, ultimately (or ideally) based upon clinical data from large scale clinical trials.

Today, cancer classification can be significantly refined by its "under the hood" functional features; that is, the specific molecular and genetic perturbations and myriad "-omic" (genomic, proteomic, metabolomic) sub-features of each tumor. In this new paradigm, each cancer is unique, including those that traditional histopathological assessments class as identical. Paradoxically, cancers with different tissues of origin may share genomic characteristics that link them (and hence their treatment) in previously unknown ways.

Knowledge of tumor-specific molecular and genetic characteristics has led to the development of novel "targeted drug" chemotherapies (such as

monoclonal antibodies) that are highly selective for a specific target. Assuming the presence of testable biomarkers of specific drivers of the disease, then theoretically, targeted drugs will enable treatments of far greater precision, and far higher efficacy and with less toxicity than traditional cytotoxic chemotherapy. Such treatments for subsets of patients with specific tumor profiles approximate the ideal of "personalized medicine," in contrast with the classical one-size-fits-all approach.

Systems biology approaches (based on computational modeling of complex biomedical systems) are now being used to interpret the massive amount of data that modern research is generating about the complex networks of pathways of cellular processes in cancer. One aim is to define patterns of gene overexpression and mutation that may be oncogenic "drivers" of the disease process. A new "network pharmacology" is emerging in biotech, with novel multi-targeted drugs that resemble botanical molecular multitaskers, far more than they do classical pharmaceutical drugs. These agents simultaneously modulate multiple targets in related pathways of a network or linked networks. Modern drugs (e.g. small molecule multikinase inhibitors) now focus on two or three targets simultaneously, but natural compounds such as curcumin, or EGCG inhibit dozens and often hundreds of targets in all stages of cancer from tumorigenesis to metastasis. More importantly, the emerging science on the capacities of natural compounds to multitask at the molecular level of cancer biology is based on exactly the same molecular biological foundations informing modern targeted cancer drug development. This means that today, herbal medicine is now able to provide more refined interventions that are congruent with and complementary to modern mainstream targeted approaches. Cannabis is a key example: many preclinical studies on the influence of cannabis and cannabinoids on cancer biology suggest the herb has extensive molecular multitasking capabilities. Before moving on, it is relevant to review how these recent trends in cancer research, drug development and insights into the molecular mechanisms of the plant compounds on cancer mentioned above are impacting some long-standing issues regarding the evidence base for herbal medicine.

HERBS AND EVIDENCE-BASED MEDICINE

Mainstream clinical practice in general, and oncology in particular, develops standard treatment guidelines for different conditions based on what is called

“evidence-based medicine” (EBM). EBM was first defined in the 1980s as a method of making decisions about patient care that integrated individual clinical experience with the best available external evidence from systematic clinical research. EBM was crucial in the application of science-based methodology to the art of clinical practice at the end of the 20th century. For EBM, the “gold standard” of evidence is the clinical study design known as randomized controlled clinical trial (RCT).⁹ Other forms of data such as pre-clinical science or case reports are considered to rank below RCTs in the “hierarchy” of external evidence used by EBM.

From its inception, EBM attracted controversy and criticism from widely differing political, philosophical and clinical viewpoints. However, the key point here is that for herbal medicine, RCT evidence is generally not available. It is well known that lack of patent protection for traditional herbal medicines is a major disincentive for companies to study potential benefits of natural compounds; this especially applies to herbs relevant to cancer treatment and even more so to cannabis and cancer. In fact, at the time of writing, among the thousands of papers on cannabis and cannabinoids there is only one small human (non-randomized) pilot study on the use of cannabis (isolated THC) in refractory glioma patients.¹⁰ Almost all studies on cannabis and cancer are preclinical (i.e. laboratory experiments using cell lines, animal models, etc.). It is also well known that novel and clinically important scientific discoveries can take many years to migrate from the laboratory to clinical practice. In the case of cannabis and cancer, this gap is more like a yawning chasm, which is unlikely to change in the near future.

In addition, the trusted RCT system was developed to help determine the “best” intervention by comparing very large groups of patients; clearly, this classical RCT approach is somewhat at odds with the challenges of multiple subsets of cancer patients distinguished by profiling different tumor biomarkers in individual patients. It is not yet clear how well RCT methods can be adapted to the demands of these more individualized approaches. Systems biology and bioinformatic technologies may be able to crunch the numbers, but it will be a while before we see real-time results in the clinic. As a result, there is tension and some controversy in mainstream oncology

⁹ The RCT is a clinical study design where the subjects are assigned by chance to different groups that compare different treatments, often including a placebo. RCT outcomes are evaluated by statistics and large (and very expensive) trials are often required. Another way of getting larger numbers is a combined “meta-analysis” of several similar trials.

¹⁰ Guzmán, M. et al (2006) *A Pilot Clinical Study of Delta9-tetrahydrocannabinol in Patients with Recurrent Glioblastoma Multiforme*. British Journal of Cancer 95, 2. 197-203

between classical approaches and personalized medicine factions. For many patients, what it boils down to is a distressingly large time lag between the actual cancer care they receive today and the much heralded promise and potential of personalized treatments and targeted therapeutics.

At present, the process of transition from the traditional RCT-supported approaches to more selective strategies based on an individual tumor profile is uneven and beset by challenges in practice. These include: the difficulty of assimilating huge amounts of data; the limited availability and high costs of testing technologies; knowing which features are critical to the cancer (sometimes called "driver" as opposed to "passenger" characteristics); the challenges of profiling each individual (especially since "-omic" characteristics of a given malignancy can change significantly over time); and finally, the high cost of many novel targeted drugs. Unfortunately, we are a long way from knowing precisely which tumor characteristics might indicate particular suitability for using cannabis treatment. As a simple example, commercial laboratory testing of tumor samples for cannabinoid receptors is not yet available; until this changes, it will be difficult to accumulate an understanding of when and how cannabis can be most effectively used in a given cancer.

Although we are clearly quite a long way from fully understanding the whole picture, cannabis is emerging as a lead player in the cast of herbs for cancer, and is arguably already entitled to its own entry in the "hall of fame" of elite herbs for this disease. To conclude this overview of herbs for cancer we now look briefly at traditional herbal medicine, which lies almost entirely outside the purview of EBM, yet gives us some of the most valuable medicines on the planet. These have a lineage of traditional use that extends back for centuries and today are becoming increasingly integrated with modern molecular and "-omic" medicine.

ELITE HERBS AND CANCER: LESSONS FROM TRADITIONAL HERBAL MEDICINE

While post-genomic developments have expanded the available repertoire of herbs and increased the potential precision with which they can be employed in cancer protocols, there are two categories of herbal medicines with extraordinary capabilities that are (or should be) the cornerstone of any effective botanical strategy for cancer: the adaptogens and

immunomodulators. These medicines can unreservedly be described as elite herbs.

“Adaptogen” and “immunomodulator” are modern terms for many plant medicines which have been held in the highest esteem for centuries in Asian medicine especially, including the Chinese and Ayurvedic traditions, and that have only relatively recently been incorporated into the Western herbal materia medica. The best known examples of adaptogens are plants such as ginseng root (*Panax ginseng*) and ashwagandha (*Withania somniferum*). The majority of immunomodulators are medicinal mushrooms such as reishi (*Ganoderma* spp.) and turkey tail (*Trametes versicolor*) but include other immunopotentiating herbs such as echinacea (*Echinacea* spp.) and astragalus (*Astragalus membranaceus*).

Conventional cancer drug toxicities typically include bone marrow suppression, resulting in the lowering of blood cell counts, and the consequent unwanted degradation of immune responses. Immunomodulating and adaptogenic herbs not only enhance immune responses (and improve chemotherapy outcomes) but also can provide deeper nourishment and subtler protection for the bone marrow during chemotherapy. In contrast, modern stem cell rescue drugs (e.g., Neulasta®, Neupogen®, etc.) attempt to stimulate compromised bone marrow function in a manner more resembling flogging a dead horse”.

Reductionist science since the time of Descartes and Bacon expelled from Western culture concepts of energy, spirit and soul in order to free from religious constraint its advancing mechanistic understanding of the body in health and disease. In traditional Chinese medicine, energy, spirit and vital force are described as the foundational Three Treasures Qi, Shen, and Jing, respectively. Herbs such as ginseng that support one or more of the Three Treasures are considered "superior" or “kingly” group herbs, which broadly equates to our designation "elite." In Western terms, the hybrid mind-body discipline of psychoneuroimmunology comes closest to describing the sphere of influence of the adaptogens, because of their capacity to enhance our general adaptation response (response to stressors which is neuroendocrine-mediated). Ironically, in the original Chinese system, antineoplastic herbs were regarded as "inferior" due to their potency and related toxicity.¹¹ Another, more recent therapy of Chinese medicine relating to using immune herbs and adaptogens is called *fu zheng* (or more properly *fu zheng pei ben*). This

¹¹ This use of the term “inferior” dates from the ancient *Shen Nong Ben Cao* and is not to be confused with the TCM classification of emperor/minister/servant herbs in a formula.

translates roughly as “support the normal Qi and strengthen resistance” and is a specific application of these elite herbs to counteract the effects of mainstream treatments, especially chemotherapy. These *fu zheng* strategies acknowledge that such effects, whether caused by the disease itself or the side effects of its treatment, can devastate the spirit of the cancer patient.

Mainstream medicine, at least in the guise of so-called “integrative” medicine, has conceded that a variety of “mind-body” interventions such as meditation, massage, yoga, tai chi, and so on produce some benefits in oncological settings, where they have been shown to increase quality of life and moderately improve treatment outcomes in some cases. It is notable, however, that herbal strategies for “mind-body-spirit” intervention are largely absent, and in fact are usually actively discouraged.¹²

Cannabis is unusual in terms of our three-way classification of cancer herbs (i.e. antineoplastics; comanagers; chemopreventives). Cannabis has both antineoplastic properties and molecular multitasking qualities typified by the dietary chemopreventives, alongside well-documented abilities to co-manage the side effects of mainstream interventions. Further, its additional psychoactive properties which clearly affect both mind and spirit arguably qualify cannabis as a member of our elite category of anticancer herbs. Although it is neither a classical adaptogen nor an immunomodulator, cannabis can definitely be considered a traditional herbal medicine, but its contemporary cancer care indications are a product of science-based knowledge rather than traditional use (see Chapter 4).

Earlier in this chapter, we saw from different angles (host vs. tumor, terrain vs. disease, person vs. pathology, etc.) that the benefits of herbal medicine are maximized when leveraging the intrinsic strengths of herbal medicines. Despite the fact that some plant compounds have led to the development of chemo drugs, seeing herbs as “natural” alternatives to cytotoxic drugs risks mistakenly overemphasizing the antineoplastic aspect; as described earlier in this chapter, this is not the major strength of herbal medicines. This cannot be overstated: newly diagnosed patients with a prior “alternative/natural” mindset or lifestyle often set out fixated on the idea that they should use only use “natural” cancer therapies. Based on Google “research” as described in Chapter 1, they find obscure anticancer herbs that are often little known, little used, little studied and hard to access, while often

¹² The exception perhaps being the few very limited and stringently controlled investigations on the potential for using psychedelic agents such as psilocybin in terminal cancer care.

overlooking the many readily available and well-studied botanicals that address terrain and host factors described above.

This mindset is very compatible with the conspiracy theory belief in cannabis as a miraculous but suppressed cancer cure. Excessive emphasis on “natural chemo” is potentially a double mistake: it risks missing out on benefitting from the real strengths of many herbs including cannabis, and can also risk incurring possibly critical delays in adopting mainstream interventions in the erroneous belief that antineoplastic herbs (including cannabis) are an effective replacement for mainstream drug treatments. Botanicals are almost never used as single agents by herb-literate professionals working with cancer, but are always combined in a highly focused protocol of different remedies formulated for the specific individual cancer patient, their disease, stage, treatment setting and so on.

The good news is that for practitioners of botanical medicine, lack of RCT evidence is the norm, and an accepted handicap that simply has to be worked around. Patients with cancer generally do not have the luxury of time on their hands, and herbalists who have worked for decades using traditional knowledge can now combine this repository of traditional know-how with cutting-edge natural product chemistry and molecular biology to inform their clinical therapeutics. Among practitioners who have specialized in working with herbs in oncological settings, a new approach, translated from “bench to bedside,” has been enabled by the developments described in this chapter: namely, that much of the scientific data on the influences of plant compounds upon cancer biology is framed in precisely the same terms that inform modern targeted cancer-drug development; and the discovery of the unique capacity of many cancer-inhibiting natural compounds, including cannabis, to multitask at the molecular level that mirrors the multifactorial nature of cancer itself. In this context, cannabis and the cannabinoids, like many time-served herbal remedies, are being retooled and retasked as novel agents in cutting-edge botanical strategies for cancer. The next chapter will introduce the basics of cannabis as a botanical and medicinal plant as a prelude to looking more closely at how it has been used in traditional herbal medicine.