

Laura A. Foster
Indiana University, Bloomington

The Making and Unmaking of Patent Ownership: Technicalities, Materialities, and Subjectivities

*Feminist sociolegal studies have recently taken up the technicalities of doctrines, documents, and regulations to better understand the law. In an affiliated move, feminist science studies turned to the materialities of theories, practices, and nonhuman organisms to make critical sense of science. These methodological turns focus not on gender, per se, but on precise mechanisms of law and science that structure, reinforce, and reconfigure power and inequality. Drawing on these methodological approaches, this article attends to the technicalities and materialities of patent ownership and benefit sharing in South Africa in regards to San peoples' struggles over the patenting of the *Hoodia gordonii* plant. An examination of patent documents, benefit-sharing agreements, legislative appendixes, and the biology of plants generates an understanding of how patent ownership, rather than being natural or value-neutral, is a historical and sociocultural process shaping, refashioning, and being inscribed across multiple scales of nation-state jurisdictions, divergent ways of knowing, and biochemical orderings of plants. [indigenous knowledge, Southern Africa, patent law, benefit sharing, feminist studies]*

Scientists with the South African Center for Scientific and Industrial Research (CSIR) obtained a provisional patent in 1997 related to the *Hoodia gordonii* plant, which they found to be responsible for suppressing appetite.¹ The patenting of *Hoodia* properties, officially granted in 1999, incited a network of actors as the plant was poised to become the next blockbuster weight-loss drug. CSIR scientists collaborated with the UK biotechnology firm Phytopharm and the global pharmaceutical company Pfizer, and eventually with Unilever, to develop *Hoodia*-based products for the growing "obesity epidemic" in the United States.² Angered over the patenting of *Hoodia*, indigenous San peoples mobilized against CSIR and its commercial partners, accusing them of stealing their knowledge without prior informed consent (Barnett 2001; Wynberg 2004). San claimed historical discovery of the plant they referred to as *!Khoba* as a source of water and energy when food supplies were low. Their knowledge of the plant's properties and uses in conditions of scarcity was now being appropriated to treat obesity. San's collective organizing led to the signing of a benefit-sharing agreement in 2003, whereby CSIR agreed to give San peoples 6 percent of their royalty income from future *Hoodia* sales and 8 percent of milestone payments.³

My own ethnographic research into *Hoodia* arose when San–CSIR benefit sharing seemingly faltered. Unilever dropped the project in late 2008, casting doubt over the promise of *Hoodia*-based products and monies to San. Legal uncertainty also ensued with the adoption of the Bio-Prospecting, Access and Benefit-Sharing Regulations⁴ in 2008 (hereafter, BABS Regulations). Despite this uncertainty, ≠Khomani San I spoke with considered benefit sharing to be a success because it brought recognition to San peoples. Benefit sharing simultaneously recognized two divergent ways of understanding *Hoodia*—one emanating from San and the other from CSIR researchers. The mechanisms underlying this

Accepted December 2014

recognition, however, remain unexamined. Several accounts have produced valuable histories of San struggles over the patenting of *Hoodia* and subsequent benefit-sharing negotiations (Comaroff and Comaroff 2009; Vermeylen 2008; Wynberg, Schroeder, and Chennells 2009). Delving into the technicalities and materialities relevant to these struggles, however, provides additional insights into how patent ownership and benefit sharing become sites for the fashioning (and unfashioning) of human and nonhuman subjects, albeit in limited and unequal ways.

In particular, I examine the technicalities of two *Hoodia* patent documents, the San–CSIR benefit-sharing agreement, and a South African legislative appendix governing benefit sharing to understand how patent ownership is constituted. To guide my analysis, I draw upon a recent turn in feminist sociolegal studies toward the technical and everyday details of law to understand how hierarchies of power and knowledge are produced and contested (Riles 2005; Valverde 2009). For instance, I find that the *Hoodia* invention and its scope of patent ownership differ in South Africa versus the United States. Through this analysis, patent ownership emerges not as a Lockean natural property right, but as a contingent and historical process.

Furthermore, I analyze how patents involve the making of both human and nonhuman subjects. While feminist sociolegal studies turn to technicalities, feminist science studies takes up the materialities of human and nonhuman matter. Attention is placed not only on the discursive representations of humans and nonhumans, but also on how the unpredictability of their biologies and materialities provoke their discursive constraints (Alaimo 2011; Barad 2007; Bennett 2010; Coole and Frost 2010). Considering the biochemistry of the plant, I show how *Hoodia* patent ownership and benefit sharing become sites for the interrelated engendering of both San and *Hoodia*. The liveliness of the plant inscribes San agency and conditions of law, and vice versa. In the end, I argue that patent ownership and benefit sharing are contingent scalar processes; as such, they are best understood through attention to scale, specificity, and the making of human and nonhuman subjects that are co-constituted by and against the law.

Feminist Trajectories of Technicalities and Materialities

Feminist sociolegal scholars have recently turned to the technicalities of law to understand how they structure conditions of knowledge and power (Riles 2005, 2011; Valverde 2009). This opens up areas of the law formerly left outside the bounds of feminist inquiry. Karen Knop, Ralf Michaels, and Annelise Riles (2012), for example, examine the technicalities of conflicts of law doctrine to shed light on tensions between feminism and the cultural defense. Mariana Valverde (2009) shows how the technicalities of procedural jurisdiction can make one think differently about plural temporalities and scales of governance. Technicalities of law, according to Riles, include ideologies, actors, problem-solving paradigms, and forms of technical legal doctrine (Riles 2005, 976). They involve everyday legal “knowledge-making” such as documents and files, which act with autonomous force, mobilizing networks of persons, ideas, and values (Riles 2011; Vismann 2008). Daniel Huizenga (2014), for instance, examines how a public repository of documents related to a ≠Khomani San land claim produces dominant notions of “community” that portray ≠Khomani San as fixed and singular, obscuring the input and participation of women in the land claim.

I understand the shift to technicalities as also affiliated with feminism’s ontological turn to materiality. Scholars such as Karen Barad (2007), Donna Haraway (2003), and Stacy Alaimo and Susan Hekman (2008) call for a feminist materialism that attends to the unpredictable liveliness of biology and matter. Though feminist scholars produce valuable accounts of the

sociocultural inscriptions of power upon bodies and nature, they fail to examine how biology and matter actively imprint the social. This shortcoming is understandable. Historically, appeals to biology and materiality have been used to subordinate marginalized groups. With such histories in mind, feminist materialists focus on how, as Samantha Frost writes: “Material objects act both independently of and in response to discursive provocations and constraints” (2011, 70). This shift is by no means uncontested. Sara Ahmed (2008) and Nikki Sullivan (2012), for instance, argue that the material and biological have always been central to feminist thought.

These turns to technicalities and materialities are from a desire to understand the interior spaces of law or science. The lively matter of biological things such as molecules and plants finds affiliative kinship in the materialities of legal documents, contracts, and statutes. Studying the life and body of the law requires attention to its technical and material forms. Delving into the details of patent applications, contractual agreements, and legislative texts sets in motion ways of developing knowledge within and against the law. With technicalities and materialities in mind, feminist sociolegal studies can begin to investigate how the law inscribes bodies and nature, which in turn independently engrave the law.

In deploying feminism as a methodological framework for analyzing patent ownership, I therefore understand feminism within its analytical movements from gender to power. Banu Subramaniam notes a shift, for example, in feminist science studies “from pipeline to power” (2009, 963). The gains of liberal feminism have come up short. Subramaniam (2009) suggests that feminist science studies (and I would also argue feminist legal studies) increasingly focus less on getting women into the pipelines of scientific (and legal) professions and more on challenging the epistemological and ontological assumptions of the pipelines themselves. Feminist attachments to gender, indeed to the category itself, have thus become increasingly unstable.⁵ In examining quantum physics, for example, Karen Barad (2011) articulates a feminist science analysis that is not centered on women or gender, per se, but rather on engagements with feminist notions of power and the political that work toward making a better world.

In engaging with feminism, however, I am mindful of its tensions with indigeneity. Scholars such as Andrea Smith (2007), Joyce Green (2007), and M. Annette Jaimes (1998) argue that feminism, with its attachment to gender, has historically both failed to address colonialism and imperialism and obscured the complexity of indigenous women’s lives in relation to—not separate from—indigenous men and sovereignty. An untying of feminism from gender toward notions of power and politics, however, provides more critical methodological guideposts to address indigenous women’s concerns and mobilizing over patent ownership. Native scholar Winona LaDuke (2005) argues against the patenting of seeds and Native peoples’ knowledge regarding rice in Minnesota. Indigenous women themselves established patent rights as a top priority of concern in their 1995 Beijing Declaration of Indigenous Women.⁶ Women are also organizing, for example, through Vandana Shiva’s “Diverse Women for Diversity,” a grassroots program in support of biodiversity.⁷ Feminist methodological inquiry regarding the technicalities of patent law is meant to respond and contribute to indigenous women’s organizing against patent ownership, while also being cognizant of historical tensions between feminism and indigeneity.

Inventing *Hoodia*, Owning *Hoodia*

The contingency and localness of patent ownership comes into view by analyzing the technicalities of patent documents. In this section, I examine modes of sameness, difference, and ambiguity across translations of *Hoodia* as a patented invention from South Africa to the United States and from ≠Khomani San to CSIR. In doing so, patent ownership unfolds as

unique to a given culture and society (i.e., indigenous), dynamically reflecting the changing priorities and interests of nation-states and peoples. South Africa awarded the first *Hoodia* patent in 1999 to a group of six scientists from CSIR who invented *Hoodia*-related processes and chemical compounds responsible for suppressing appetite.⁸ In 2002 the scientists filed for a patent in the United States on the same invention.⁹ Inventors often file in multiple nation-states to ensure global patent protection and satisfy potential investors. The *Hoodia*-related invention, in being translated from one nation-state to the other, had to become intelligible to US patent law. In these modes of translation, similarities and differences arise at different scales—between nation-state jurisdictions, divergent CSIR and San ways of knowing, and biochemical orderings of the plant.

One site where similarities across these scales become apparent is the requirement of novelty. Patent ownership is assigned to “novel” inventions under both the US Patent Act (USPA) and the South African Patent Act (SAPA). What is considered novel depends on an applicant showing that the claimed invention was not previously disclosed or anticipated by a single “prior art” (USPA, Section 102(a)) or “state of art” (SAPA, Section 25(5)) reference. To determine novelty, a claimed invention is compared to a prior art reference. Under both US and South African law, if the prior art reference fully discloses all the elements found in the claimed invention, then the invention is considered anticipated (i.e., not novel).¹⁰

According to South African law, a state of art reference is that “which has been made available to the public (whether in the Republic or elsewhere) by written or oral description, by use or in any other way” (SAPA, Section 25(6)). In contrast, as amended under the Leahy–Smith America Invents Act,¹¹ effective March 16, 2013, prior art under US law is that which has been previously patented, described in a printed publication, or in the public use, on sale, or otherwise available to the public before the filing date of the claimed invention (USPA, Section 102(a)). This differs from the prior version of the law, which qualified prior art through geographic distinctions. It specified prior art as a reference to a claimed invention that was known or used by others *in the United States*, or patented or described in a printed publication *in the United States or a foreign country* before the date of invention (emphasis added) (USPA, Section 102(a)).

This prior version of the law would serve as a control in the case of a San challenge to the 2002 US patent, which would hold them to a more difficult standard for challenging novelty. They would have to show, for instance, that a patent application or printed publication, prior to the date of invention, fully discloses all the elements indicated in the applicant’s claimed invention. Evidence of oral communication showing how San previously knew or used *Hoodia* would not be considered prior art because of their geographic location outside of the United States. The revised law has since eliminated this geographic distinction. Indigenous peoples may find a more likely challenge to US patents, however, not through novelty, but by arguing that the claimed invention was obvious to an ordinary person skilled in the art.¹²

Novelty takes on different meanings between nation-states not only through these differing statutory languages, but also through interpretation or noninterpretation by relevant patent offices. South African intellectual property expert Andrew Rens explained to me that the scope of patent ownership and novelty differ in part because South Africa is a nonexamining country (personal communication, March 21, 2014). As Ren notes, “No review of novelty or other requirements for patentability takes place prior to registration. A lack of novelty can be the basis for a court challenge to the validity of a patent that has already been registered, but then only if those who wish to challenge the patent have the means to launch a court challenge.” In contrast, the United States Patent and Trademark Office (USPTO) requires an examination for novelty prior to approval.

Novelty also becomes a site to consider similarities and differences between CSIR and San ways of knowing *Hoodia*. Prior art references pull these two forms of knowledge apart, but one can challenge this dichotomous legal thinking by reading them as closer together. Hierarchies of knowledge production characterize indigenous peoples' knowledge as "traditional" and rooted in the past. A close look at the 2002 US patent document, however, reveals how CSIR-patented *Hoodia* knowledge is also rooted in ancestral histories—a past of antiobesity research made manifest through a list of prior art sources. Nineteen US patents for treating obesity are listed from 1978 to 2000, ranging from new milkweed plant varieties to a chewing gum. Among the foreign patents referenced is the 1999 South African patent. Forty-six academic publications, in such fields as chemistry, botany, and medicine, also enumerate past antiobesity studies that range from steroidal glycosides to the constituents of *Asclepiadaceae* plants. Patent officials at the USPTO examined past histories of obesity research to determine if knowledge of *Hoodia* as an appetite suppressant was previously known or anticipated. They looked to these histories, while simultaneously constructing them. In doing so, CSIR knowledge became connected to a particular past of obesity research. At the same time, it was disconnected from its relationships to San peoples and knowledge. Indigenous peoples' knowledge became unmarked within the technicalities of patent law, their contributions to CSIR *Hoodia* knowledge made invisible. Patent ownership depended on this delimiting between what is considered the novel and traditional ways of knowing *Hoodia*.

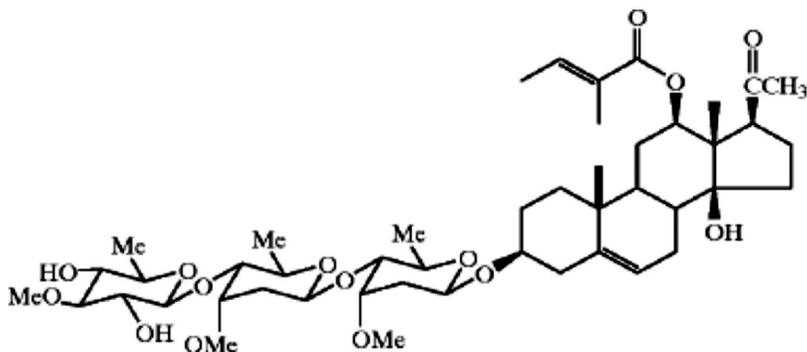
Prior art references reinforce and produce demarcations of "Western" versus indigenous *Hoodia* knowledge, yet CSIR and San knowledge both emerge as connected to ancestral pasts and continually in flux. Arrie Tities (≠Khomani San) knows *Hoodia* from his ancestors, who used it to "stay for many days in the veld" (interview with author, March 3, 2009). Furthermore, Tommy Busakhwe, also ≠Khomani San, says his plant knowledge came from "my mother [who] was the one who had the knowledge about medicinal plants" (interview with author, March 3, 2009). As ≠Khomani San, Andries Steenkamp also notes how he learned from "my grandmother," who "told me many things about *Hoodia*" (interview with author, March 4, 2009). San *Hoodia* knowledge also changes over time, becoming fused with CSIR *Hoodia* knowledge. Tities, for example, says he learned additional information about *Hoodia* from the "the technology people" (interview with author, March 3, 2009). San peoples thus take up contemporary meanings of *Hoodia* implicit within its commercialization as an appetite suppressant.

To be sure, these ancestral histories of CSIR-patented *Hoodia* versus San expertise are not equally rendered. Indigenous peoples' knowledge is marked as traditional by characterizing it within a fixed past. Patent ownership situates CSIR *Hoodia* knowledge within an ancestral past of only obesity research, but renders such histories as dynamic and changing with every new *Hoodia*-related invention. Yet, San *Hoodia* knowledge is similarly dynamic. Some San, such as Tities and Busakhwe, articulate the many uses of *Hoodia*—for example, to treat gassiness in babies because "sometimes the babies have wind"; for hunting to "lessen your hunger"; to satisfy "greedy children" who want food; and for "water" and "energy" when in the veld (interviews with author, March 3, 2009). Similarly, multiple uses are also articulated within the nine *Hoodia*-related patents filed in the United States since 2002. Some of these include "anti-diabetic use"; reducing "gastric acid secretion" in animals; and new forms of *Hoodia*, including a "chewable appetite suppressant composition" and a form with "improved flavor."¹³ *Hoodia* patents and San expertise, therefore, share like attributes, participating in what Madhavi Sunder notes is the "invention of traditional knowledge" (2007, 97). Both sets of *Hoodia* knowledge production are similarly inventive, dynamic, and evolving, sparking new understanding and uses of *Hoodia* that align with local interests.

Both, in the words of Marilyn Strathern, “perpetuate the very concept of nature” (2001, 9). This knowledge of nature begets more knowledge of nature and its uses.

Where similarities begin to pull apart, though, is with the description of invention. Temporary patent monopolies, in both countries, are granted so long as the invention is made publically available. The description of the invention within the body of a patent document serves as a disclosure to those desiring to invent something entirely new or make a patentable improvement on the specified invention. The 2002 US *Hoodia* patent and 1999 South African *Hoodia* patent contain identical descriptions of the same invention. Yet, these indistinguishable descriptions become a site where contrasts between CSIR and San ways of knowing *Hoodia* are constructed.

Under US law, to obtain patent rights, an inventor must “isolate and purify” a product from nature, and that product must be “markedly different” from its natural state.¹⁴ Patent rights only extend to the isolated and purified element of the plant, not to the plant itself. South African law implies a similar doctrine as set forth in its exclusion of discoveries from patentability.¹⁵ Through this doctrine, *Hoodia* is articulated, through the language and practice of science, as isolated and purified down to its chemical compounds. In the lab, the materiality of these chemical compounds would appear visible to scientists. But in the domain of patent law, the materiality of this composition becomes one of the following structural formula:



Patent law requires a reduction in scale as the plant becomes fractured into its chemical, molecular parts. In reading the description, I learned that *Hoodia* plant material is “homogenized in the presence of a suitable solvent, for example, a methanol/methylene chloride solvent, by means of a device such as a Waring blender.” The extraction solution becomes separated from the plant material through “filtration or centrifugation.” The solvent is removed by means of a “rotary evaporator,” and then the resultant extract is “further purified by way of a methanol/hexane extraction.” Another process for preparing an extract is also described, which involves “pressing collected plant material to separate sap from solid plant material” and then drying the extract to remove the moisture to form a “free-flowing powder.”¹⁶ This latter process reminds me of interventions made by one ≠Khomani San woman, Sanna Witbooi, who explained to me how, after bringing *Hoodia* home, you “must clean it up and then you put it in the sun so you must dry it out and then you make powder with it” (interview with author, March 4, 2009).

The document also describes in detail a “novel compound” of a “steroidal trisaccharide” and its derivatives that has appetite suppressant properties; descriptions of several chemical compounds and their structural formulae are described, along with “modifications to the molecule” to enhance its properties for suppressing appetite.¹⁷ Furthermore, processes for

synthetically producing the compound and reaction schemes for preparing steroids from the compound are given.¹⁸ Patent ownership depends on these technological modifications of *Hoodia* down to its chemical and molecular properties. What is deemed inventive and novel about this *Hoodia* invention is how CSIR scientists intervened in the plant to isolate its productive chemical properties for suppressing appetite. In other words, inventiveness is located in what Nicholas Rose suggests are new processes of “molecularization” within contemporary bioeconomies (2006, 5–6). Modern scientific knowledge production focuses less on observing the visible parts of the plant and more on life at the molecular level. Technological advancements and molecular “style[s] of thought” become epistemological boundary markers, valuing CSIR ways of knowing over that of San (12). Thom van Dooren notes that this boundary making means that indigenous peoples remain classified as closer to nature, relegated to “work *in* it, never *on* it” (van Dooren 2008, 7).

The two patents also differ in terms of the drafting of claims. The precise wording of what an invention is determines the parameters of patent ownership and control. Each patent document specifies precisely what the scope of the *Hoodia* invention is, laying claim to its particular chemical compositions and processes for preparing extracts from the plant. As the invention was translated from South Africa to the United States, the scope of patent ownership became narrower, with a reduction in claims from 132 to 58. Some reasons for this may be that patent attorneys were forced to draft their claims in a more concise manner to satisfy patent examination in the United States as opposed to South Africa. Claims in the South African patent were able to give more detail on the scientific processes of extraction, outlining a “solvent extraction” step involving “methylene chloride” or “ethyl acetate” and then “chromatic separation.”¹⁹ In contrast, the US patent described the same process, but in more plain language, as an extract from which “all the non-active impurities have been removed” and in which the plant has been reduced to a “free-flowing powder.”²⁰ References in the US patent to specific technological processes were fewer in number, as well as less descriptive. The US patent also entirely leaves out some of the extraction processes claimed in the South African patent. For example, the claims in the South African patent specify a process of preparing an extract from *Hoodia* by “pressing collected plant material to separate sap from solid plant material.”²¹ This process was not mentioned in the US patent claims. Steps for preparing a specific steroid, compound, and some carbohydrates were also left out. Further research is needed to understand why such exclusions appear. Regardless, these points of difference within the translation of *Hoodia* invention speak to how the scope of patent ownership is historically and socioculturally contingent across nation-state scales.

Despite these differences, the descriptions and claims articulated by both the US and South African patent share a similar focus on chemical compositions and processes to extract *Hoodia*’s chemical parts. Attention to *Hoodia* at the molecular scale serves to privilege some forms of knowledge over others, namely that of CSIR over San peoples. Lines between what is constructed as modern versus traditional knowledge are thus drawn along biochemical scales of the molecular versus the molar (Rose 2006, 11). By molar I mean the larger mass of the plant itself, which in this case becomes associated with “traditional” San knowledge. What is considered more valued as inventive under the law is how knowledge of the molecular parts of *Hoodia* interact with the body to suppress appetite. The workings of *Hoodia* on the body become a patentable invention when culturally modified, isolated, and purified down to the molecular parts. Recognition of *Hoodia* at the molecular level therefore contributes to the devaluing of San agency.

Sharing *Hoodia*, Containing *Hoodia*

Patent ownership is also constituted in relation to other legal orders. In particular, contractual benefit sharing can be used to reorder the discursive and material effects of patent ownership. It can challenge the way patents discursively privilege CSIR's molecular styles of thought by recognizing San knowledge. Depending on how agreements are negotiated, indigenous peoples could also contest the material practices of patenting by demanding co-ownership of patents or oversight of how patents are licensed and to whom. San-CSIR benefit sharing was unique because it occurred after *Hoodia* research and patenting had begun. It thus differed from practices of bioprospecting such as those illuminated by Cori Hayden (2003), who notes that agreements for benefit sharing between the University of Arizona and Mexico's National Autonomous University were developed at the beginning of the research process.

Before diving into the technicalities of San-CSIR benefit sharing, San struggles over patent ownership and benefit sharing must be understood within histories and claims over land. According to Steven Robins (2001), the changing postapartheid landscape in the mid-1990s gave rise to revitalization movements by ≠Khomani San to reclaim their heritage, language, and land. For example, they signed a historic agreement with the South African government for land restitution in 1999. San had been forcibly removed from lands within and adjacent to the Kalahari Gemsbok National Park as a result of apartheid-era legislation. The land claim, as Robins notes, required a strategic essentialism on the part of San to assert themselves through "narratives of cultural continuity and belonging" to obtain rights (840). Once the land agreement was signed, however, these narratives of continuity and homogeneity began to give way as pragmatic questions arose over who was (and was not) ≠Khomani San and, therefore, who could gain access to land and state resources (840). Tensions intensified between factions of "traditional" versus "Westernized" ≠Khomani San. Robins explains these tensions, arguing that ≠Khomani San navigated pressures from nongovernment organizations and the state to adhere to a "double-vision" as both "'First Peoples' and modern citizens-in-the-making" (833).

Previous San mobilization around land meant ≠Khomani San were prepared to challenge CSIR patent ownership. The committee negotiating on behalf of San included members of the South African San Council and their lawyer, Roger Chennells. The signing of the document in March 2003 at the Molopo Lodge in the Kalahari Desert produced a spectacle of postapartheid, transformation politics. Complex scripts of indigeneity were performed as South African officials sat alongside Petrus Vaalbooi, then-chairperson of the South Africa San Council, proudly dressed in traditional clothing. Another prominent member of the council, Andries Steenkamp, remembers the signing as "amazing" (interview with author, March 3, 2009). Many people, including reporters from BBC News, came to witness the signing. Steenkamp recalls an excitement about "millions and millions and billions" coming to the "Bushmen" and that "life is going up, not down" (interview with author, March 3, 2009). Sanna Witbooi (≠Khomani San) noted a similar excitement over the signing of the contract and "about the money" (interview with author, March 4, 2009). Through benefit sharing, the life of San peoples became linked to the commercial life of *Hoodia* and its unpredictability in suppressing human appetite. It also reconfigured *Hoodia* patent ownership's discursive privileging of scientific, molecular understandings of *Hoodia* by valuing San knowledge of the plant.

In their analysis of *Hoodia* benefit sharing, Comaroff and Comaroff (2009) note how San peoples are both empowered and disempowered through benefit sharing. San are brought into the fold and included as political agents, but only through their willingness to assert San indigeneity as fixed and stable. Similar to land claims, San peoples strategically deployed and navigated constructions of San as both traditional peoples and modern

citizens during their negotiations. The agreement recognized San as “custodians of an ancient body of tradition and cultural values” associated with “human uses of the *Hoodia* plant” (Benefit-Sharing Agreement 2003, Section (a)). Their ancient knowledge resulted from their “interrelatedness with nature in all its forms, over the ages” (ibid.). The agreement also acknowledged “the importance of the traditional knowledge of the San people,” which existed for a “millennia” and “predated scientific knowledge developed by Western civilization over the past century” (ibid., Section (b)). The language of the text portrays San as traditional peoples. Yet, their political actions in negotiating against CSIR simultaneously offered alternative depictions of San as modern political actors.

Recognition of San knowledge challenged *Hoodia* patent ownership rights that privileged CSIR *Hoodia* knowledge at the molecular level. Through benefit sharing, both San and CSIR ways of knowing became recognized. Two protected spheres of value were simultaneously constructed—one a scientifically based commodity and the other traditional knowledge. Value was also implicitly placed on scales of *Hoodia* associated with such epistemologies. CSIR knowledge of *Hoodia* at the molecular level was regarded alongside San ways of knowing *Hoodia* at the molar level as plant and extract. Acknowledging the relationship between two enduring incommensurable knowledges, the agreement explicitly asserted the role of San “knowledge [in] leading to new scientific findings, which formed the basis of the patents” (ibid., Section 3.1).

Recognition of San ways of knowing also came in the form of financial and educational benefits. CSIR agreed to give monies to a trust set up for San in South Africa and “elsewhere who are members of the San organization WIMSA (Working Group for Indigenous Minorities in Southern Africa)” (Benefit-Sharing Agreement, Section 1). These benefits amounted to 8 percent of milestone payments and 6 percent of royalty income received by CSIR from Phytopharm as a result of the “successful exploitation of products in the form of licensing income, and/or sales of products anywhere in the world” (ibid., Section 1.5.2). Products were specified as “any commercially viable product(s) derived from the patents” (ibid., Section 1.10). The agreement also provided for the making of a detailed “Bioprospecting Collaboration” between CSIR and San to conduct bioprospecting in the future (ibid., Section 3.5). Furthermore, it specified that CSIR would “make the existing CSIR study bursaries and scholarships available to the San Council,” allowing members of San communities to benefit from educational opportunities (ibid., Section 3.7). Financial and educational benefits were to act as recognition of San knowledge and redress for taking it without prior informed consent. San political efforts in obtaining benefit sharing became ways of asserting San agency, while challenging the discursive manner in which patent ownership had devalued their knowledge. Yet, San political action remains embedded within relations of power that limit its counter-hegemonic effects. San negotiated the terms of the agreement and percent of royalty income, but whether these are fair remains questionable. Royalty payments were also limited only to what CSIR received from Phytopharm, not Pfizer or Unilever.

Such limitations were further expressed within the technicalities of the agreement. Terms of the contract further specified that San agreed to the following: (1) not to claim any co-ownership of *Hoodia* patents or products; (2) not to assist or work with any third party to develop industries that might compete with the patents and products; (3) not to approach the patent licensees for additional financial benefits; and (4) not to contest the validity of the patents themselves (Benefit-Sharing Agreement 2003, Sections 4, 6.1.4–6.1.6). Additionally, it specified that San agree to help CSIR defend its patents in the case of any third-party claims of infringement and to reevaluate the contract if challenges are successful (ibid., Section 9.2). The provisions here appear to be less about the sharing

of benefits and more about protecting CSIR's ownership rights and potential profits from further challenge by San. Patent ownership of *Hoodia* at the molecular level became secured. Although the agreement recognizes San and CSIR ways of knowing, in reordering the discursive power of patent ownership, it failed to reorder material conditions of power by keeping CSIR patent ownership intact. Yet, the provisions did imply San agency to engage in such actions. CSIR recognized San as forceful actors with the potential to partner with others to promote competing *Hoodia* innovations and to launch legal challenges against the validity of CSIR patents. San were thus forced into an extremely difficult location that Jane Anderson describes as "paradoxically exclusionary and inclusive" (Anderson 2009, 114).

Elizabeth Povinelli (2002) notes how this places indigenous peoples in an impossible position. They are forced to mediate between being cast as traditional, while also being responsible as modern liberal subjects for their own self-determination. Benefit sharing allowed CSIR to confront shameful colonial and apartheid histories against indigenous San and move on. CSIR scientists were triumphant patent owners protecting the biodiversity of South Africa from potential threats of bioprospecting from the entities in the global north, while seemingly empowering San knowledge and indigeneity. Recognition of rights, however, Povinelli argues, casts indigenous peoples in a difficult position as they are forced to come into being as traditional, romantic subjects with little attention paid to their past traumas and actual lives (50–54). While CSIR progressed, indigenous San peoples, Povinelli would likely caution, were left to struggle with uncertain promises of benefit sharing, their own sense of indigenous identity, and their emergence as modern, neoliberal subjects responsible for their own self-empowerment through market means, a negotiation made difficult by their conditioning as traditional.

Regulating *Hoodia*, Managing *Hoodia*

Private benefit sharing (and patent ownership) is now being reordered through governmental management. As indigenous medicinal knowledge takes on increasing economic and socio-cultural value, it becomes worthy of state recognition, protection, and standardization. Prior to the 2010 Nagoya Protocol on Access and Benefit-Sharing,²² South Africa adopted its own Bio-prospecting, Access and Benefit-Sharing Regulations in 2008 (later amended in May 2015) under the South African Minister of Environmental Affairs and Tourism. According to the new 2015 BABS Regulations,²³ parties wanting to conduct bioprospecting research must apply for a permit. The application requires parties to obtain prior informed consent from and enter into benefit-sharing agreements with indigenous communities that provide access to "indigenous genetic and biological resources" (BABS Amendments Regulations 2015, Section 9.1(b)). The regulations, therefore, engender a temporal shift, inducing parties to discuss patent ownership before patents are sought. Government management of benefit sharing requires researchers and indigenous peoples to communicate before access to biological and genetic resources is granted. It *theoretically* gives indigenous peoples the chance to negotiate for conditional attachments on patent ownership, which could include co-ownership with indigenous peoples, stipulations over the intended use of resources, and/or constraints on the licensing of patents. In its standardization of benefit sharing, the BABS Regulations bring about new relationships of governing between indigenous peoples and the state. It also affects, Anderson (2009) notes, how indigenous knowledge is produced and made knowable as a legal subject deserving of protection. This relationship, however, continues to be shaped through pressures for indigenous peoples to navigate identities as both traditional peoples and modern self-governing citizens.

According to the regulations, agreements must be in accordance with a model legal form set out in Annexure 12 of the 2015 BABS Regulations. Parties can elect to use their

own agreement documents and attach further provisions, but they must follow “the general format” in Annexure 12 prescribing agreements (BABS Amendments Regulations 2015, Annexure 12). Under the previous 2008 regulations, its Annexure 8 specified a single format to be used for a “provider of access” (read non-indigenous community) or “indigenous community” (BABS Regulations 2008, Annexure 8). Under the new 2015 amendments, Annexure 12 provides two separate formats: one for “access provider(s) of indigenous biological resources”—who can be either a “natural person or “Indigenous Community”—and the other for “traditional knowledge holders”—who likewise can be a “natural person or Indigenous Community” (BABS Regulations 2015, Annexure 12, Section 2). With these distinctions, the law seems to take into account the unique conditions in which indigenous communities provide access to resources and their struggles over representation and prior informed consent. Debra Harry and Le’ a Malia Kanehe, however, argue that reference to “indigenous communities,” rather than “Indigenous peoples,” ignores their “status as rights holders” and instead demotes them “to the status of stakeholders” (2005, 1). Classification as stakeholders, they argue, places indigenous peoples in the same category as corporations and nongovernmental organizations (1). Indigenous communities are in fact defined as a subset of “stakeholders” in South Africa’s Biodiversity Act of 2004 (hereafter, Biodiversity Act),²⁴ to which the BABS Regulations are associated (Biodiversity Act, Section 1). The 2004 Biodiversity Act also serves to nationalize traditional knowledge as the state is given “trusteeship of biological diversity,” obscuring indigenous peoples’ relationships to biodiversity (*ibid.*, Section 3).

The model agreement set forth in Annexure 12 also requires applicants to identify and describe the indigenous community provider of knowledge. It is unclear how extensive a description should be, especially given that only two blank lines are provided on the form. The act of describing an indigenous community, however, is significant. It is embedded within histories and mechanisms of colonization, involving what Linda Tuhiwai Smith refers to as the power of naming and claiming (2004, 80). Cheryl Harris also attributes the power to define social groups to the perpetuation of “whiteness as property” (1993, 1709). Examining land claims by the Mashpee, a Massachusetts Indian tribe, Harris cautions that “definition is so often a central part of domination” that one must be critical of “who is defining, how is the definition constructed, and why is the definition being promulgated” (1763). Controlling the classification and naming of subjects secures whiteness. These questions become similarly important for understanding how Annexure 12 incites representations of indigenous peoples by themselves or others in accordance with the BABS Regulations.

Applicants are also required to attach a resolution from the indigenous community. This requirement was specified in Annexure 8 under the 2008 Regulations, but the new regulations spell this out explicitly in the text by stating that the resolution must confirm that the indigenous community has “authorize[d] a representative” to “give prior consent” and to “enter into benefit sharing and material transfer agreements on behalf of the indigenous community” (BABS Amendments Regulations 2015, Section 9.1(b)(xii)). The regulations thus position indigenous peoples as modern, self-governing citizens with political agency to negotiate with researchers and demand prior informed consent. It also reconfigures practices of bioprospecting, requiring scientists to communicate with indigenous peoples and to obtain consent prior to conducting research. The 2015 regulations differ, though, by no longer requiring a resolution specifying that the indigenous community has “full knowledge of the bioprospecting project” (BABS Regulations 2008, Annexure 8, Section 4.4). The

risk with this change is that scientists might only communicate with a select few within indigenous communities. Although the 2015 BABS Regulations contain an entirely new Annexure 13, which designates specific language for such a community resolution, the emphasis is placed on knowledge by indigenous community representatives rather than the indigenous community as a collective.

What is also troubling is how some of these requirements are embedded within colonial and colonial settler histories and their civilizing project. Specific styles of governing are being imposed upon indigenous peoples, which may run counter to their own ways of organizing. The 2008 BABS Regulations defined indigenous communities as “living or having rights or interests” within a “distinct geographical area” of South Africa and with a “leadership structure” (BABS Regulations 2008, Section 1). In contrast, the 2015 BABS Regulations do not define indigenous communities, but the law remains based on the assumption that they have a governing structure to approve resolutions and appoint representatives. This raises the concern that government oversight of benefit sharing can become a new mechanism for managing indigenous peoples through imposing particular forms of governing. Given that indigenous peoples’ organizing is dynamic and strategic, it becomes important to ask how San express a willingness to adopt such styles of governing while simultaneously resisting them.

Turning to plant materialities, the standardization of benefit sharing through Annexure 12 also inscribes biological organisms and vice versa. The agreement must list the “scientific and common names of the indigenous genetic and biological resource. . . . The part or state of the resource to be collected/utilized. The quantity required. The locality data where the material will be sourced from” (BABS Regulations 2012, Annexure 12, Section 4). A benefit-sharing agreement no longer needs to list the “current uses,” “intended use,” and “traditional use” of resources like it did under the previous 2008 regulations, but an emphasis remains on two forms of knowledge (BABS Regulations 2008, Annexure 8, Sections 6–8). Similar to the private San–CSIR agreement, value is placed on both indigenous peoples’ and scientists’ ways of knowing and using *Hoodia*. I would suggest, however, that the biological resource itself becomes an unmarked third party to the agreement. Benefit-sharing agreements imply good faith between the researchers and indigenous communities that enter into them. They create hope and promise that the biological resource will act according to its intended use and yield benefits. Biological organisms, however, have a vitality of their own that provokes their positioning as commodities. They may or may not interact with the human body in ways that enable commercialization. Contractual benefit-sharing arrangements can therefore break down due to lack of performance, not just by the human actors involved, but also by the nonhuman.

Clinical studies in 2008, supported by Unilever at the Covance Clinical Research Unit in Madison, Wisconsin, concluded that a purified *Hoodia* extract containing 79.3 percent steroid glycosides had no efficacy on reducing energy intake or body weight (Blom et al. 2011). Rather, it negatively affected the blood pressure, bilirubin, and electrocardiogram measures of study participants. When *Hoodia* extracts did not work according to plan, Unilever terminated the project in late 2008, leaving San with little hope for future royalty payments. Government regulation of benefit sharing, therefore, remains subject to the unpredictability of biological resources to fulfill their intended uses. The discursive power of benefit sharing, albeit limited, to recognize indigenous peoples’ knowledge, however, remains significant. The liveliness of biological organisms such as *Hoodia* may render its commercialization unstable, but recognition of San–*Hoodia* relations and histories can strengthen San political agency in ways beyond financial reward.

Conclusion

Feminist methodological attention to the technicalities and materialities of patent ownership and benefit sharing reveals how patent law, rather than being natural or value-neutral, is a historical and sociocultural process. In her examination of race and genetic ancestry testing, Alondra Nelson urges scholars to attend to issues of “scale, site, and subjectification,” not the “zero-sum definitional boundaries” related to genomics (2008, 775). Drawing from Nelson, I have shown how patent ownership is constituted through the porous, simultaneous interactions of micro-, meso-, and macro-scales. Attention to the macro-scales of patented *Hoodia* reveals how patent ownership differs when translated from South Africa to the United States. Attending to its meso-scales demonstrates the ways in which patented CSIR *Hoodia* knowledge is simultaneously similar to and distinct from San ways of knowing the plant. Furthermore, examination at the micro-level indicates how patent ownership inscribes and is inscribed by the unpredictable liveliness of *Hoodia* in its interactions with the human body. Understandings of patent ownership as a historical, sociocultural process are developed through attending to these temporal and spatial scales of the nation-state, divergent ways of knowing, and plant biologies.

I have also examined how the making and unmaking of patent ownership involves subjectification, or the fashioning of subjects. Becoming patent owners means that CSIR scientists are recognized as producers of patented *Hoodia* knowledge, rather than as mere suppliers of raw material. The making of CSIR scientists as patent owners, however, necessitates delimiting forms of Western, scientific *Hoodia* knowledge from indigenous peoples’ ways of knowing. As a counter-hegemonic response, San–CSIR benefit sharing sutures these forms of knowledge together in simultaneous recognition, while both empowering and disempowering San agency and knowledge. The technical details of the San–CSIR agreement and South African benefit-sharing regulations, however, reveal tensions within law as a limited site for subject formation. Standardization of benefit sharing through governmental management may offer ways to further contest patent ownership before bioprospecting has begun, but its provisions also remain complicit within the project of civilizing indigenous peoples. Additionally, the *Hoodia* plant also becomes a figure that is discursively and materially structured through patent ownership and benefit sharing, while its unpredictable liveliness autonomously provokes it.

A focus on technicalities and materialities, therefore, presents a different approach to understanding politics and knowledge making. It engages with the practices of law (and science) through multiple scales, expanding inquiry of law toward the technicalities and materialities of legal documents and their governed human and nonhuman agents. Materialities have always been central to the law; however, the specificities of legal documents and the liveliness of plants have often been left unaddressed by sociolegal studies. Engaging with these practices can account for how hierarchies of knowledge and expertise come to be and how they are reconfigured and undone by the agents they seek to govern, including those that are nonhuman. Technicalities and materialities thus offer another way of understanding San political struggles regarding patent ownership and benefit sharing by examining the work that legal documents and plants are doing (and undoing) in co-constituting relationships between peoples, plants, and politics.

Notes

1. Pharmaceutical Composition Having Appetite Suppressant Activity, Republic of South Africa Patent 97/3170, filed April 15, 1998, issued December 29, 1999, filed by Fanie Retief Van Heerden, Robert Vleggaar, Roelof Marthinus Horak, Robert Alec Learmonth, Vinesh Maharaj, and Rory Desmond Whittal.

2. “Collaboration with Pfizer to Develop and Commercialize Obesity Drug (P57),” news release, August 24, 1998, on file with the author. “Phytopharm and Unilever Enter into a License and Joint Development Agreement for *Hoodia gordonii* Extract,” news release, December 15, 2004, on file with the author.
3. Benefit-Sharing Agreement between the CSIR and South African San Council, signed on March 24, 2003, by Dr. Sibusiso Sibisi and Mr. Petrus Vaalbooi, on file with the author.
4. 2008 *Regulations on Bio-Prospecting, Access and Benefit-Sharing Regulations*, Government Gazette No. 30739.
5. An untethering of feminism from gender, however, has its consequences. It risks ceding the institutional spaces feminism has gained within the academy. It also makes political organizing not impossible, but more challenging (Subramaniam 2009).
6. “Beijing Declaration of Indigenous Women,” items 39-40, NGO Forum, United Nations Fourth World Conference on Women, Huairou, Beijing, China 1995. http://www.ipcb.org/resolutions/htmls/dec_beijing.html
7. Women for Diversity, <http://www.navdanya.org/diverse-women-for-diversity>.
8. See Note 1.
9. Pharmaceutical Composition Having Appetite Suppressant Activity, US Patent 6,376,657, filed October 13, 1999, issued April 13, 2002, filed by Fanie Retief Van Heerden, Robert Vleggaar, Roelof Marthinus Horak, Robert Alec Learmonth, Vinesh Maharaj, and Rory Desmond Whittall.
10. See *Gentiruco AG v. Firestone (South Africa) (Pty) Ltd*, 1971 BP 58 (A) at 138F-139A; see *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628 [Fed. Cir. 1987].
11. *Leahy-Smith America Invents Act*, Pub. L. No. 112-29, 124 Stat 284 (2011): 284-381.
12. U.S. Patent Act, 35 U.S.C. Section 103 specifies that an invention is not patentable if it would have been obvious to a person with ordinary skill in the pertinent art. It cannot be just any prior art though. Prior art for the purposes of Section 103 is determined by what is prior art according to the previously discussed Section 102 novelty provisions. Challenging a patent based on non-obviousness differs from novelty, the latter of which determines anticipation by comparing the claimed invention and a single source of prior art. In contrast, challenging a patent based on nonobviousness involves a comparison of two or more prior art references. See *Graham v. John Deere Co.*, 383 U.S. 1 [1966]).
13. (1) Hoodia Plant Extract with Improved Flavor, US Patent 7,923,435, filed April 21, 2008, issued April 12, 2011, filed by Amir Maximiliaan Batenburg, Mohamed Said Chaara, Egge Aart Eddy Rosing, Frederik Michiel Meeuse, and Salomon Leendert Abrahamse. (2) Gastric Acid Secretion, US Patent 6,488,967, filed October 18, 2000, issued December 3, 2002, filed by John Hakkinen, Roelof Marthinus Horak, and Vinesh Maharaj. (3) Extracts, Compounds, and Pharmaceutical Compositions Having Anti-diabetic Activity and their Use, US Patent 7,033,616, filed June 27, 2001, issued April 25, 2006, filed by Ian Duncan Rubin, Jasjit Singh Bindra, and Michael Anthony Cawthorne. (4) Appetite Suppressant Composition, US Patent 8,455,024, filed October 16, 2008, issued June 4, 2013, filed by Audrey Sommerfeld and Steve Witherly.
14. *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013).
15. South Africa Patent Act 57 of 1978, Government Gazette No. 6012.

16. See Note 9, all quotes from p. 10.
17. Ibid, p. 11.
18. Ibid, p. 16.
19. See Note 1, p. 118.
20. See Note 9, p. 4.
21. See Note 1, p. 120.
22. United Nations Environment Programme, *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity*, U.N. Doc. UNEP/CBD/COP/DEC/X/1, 2010.
23. 2015 *Amendments to the Regulations on Bio-Propecting, Access and Benefit-Sharing*, Government Gazette No. 38809.
24. *Biodiversity Act of 2004*, Government Gazette No. 25436.

References Cited

- Ahmed, Sara. 2008. "Open Forum Imaginary Prohibitions: Some Preliminary Remarks on the Founding Gestures of the 'New Materialism.'" *European Journal of Women's Studies* 15 (1): 23–39.
- Alaimo, Stacy. 2011. "New Materialisms, Old Humanisms, or, Following the Submersible." *NORA - Nordic Journal of Feminist and Gender Research* 19 (4): 280–84.
- Alaimo, Stacy, and Susan J. Hekman. 2008. *Material Feminisms*. Bloomington: Indiana University Press.
- Anderson, Jane E. 2009. *Law, Knowledge, Culture: The Production of Indigenous Knowledge in Intellectual Property Law*. Cheltenham, UK: Edward Elgar.
- Barad, Karen. 2007. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham, NC: Duke University Press.
- Barad, Karen. 2011. "Erasers and Erasures: Pinch's Unfortunate 'Uncertainty Principle.'" *Social Studies of Science*: 41 (3):1–12. doi:10.1177/0306312711406317.
- Barnett, Antony. 2001. "In Africa the Hoodia Cactus Keeps Men Alive. Now its Secret is 'Stolen' to Make Us Thin." *The Observer*, June 17. <http://www.theguardian.com/world/2001/jun/17/internationaleducationnews.businessofresearch>.
- Bennett, Jane. 2010. *Vibrant Matter: A Political Ecology of Things*. Durham, NC: Duke University Press.
- Blom, Wendy A. M., Salomon L. Abrahamse, Roberta Bradford, Guus S. M. J. E. Duchateau, Winfried Theis, Antonia Orsi, Caroline L. Ward, and David J. Mela. 2011. "Effects of 15-d Repeated Consumption of *Hoodia gordonii* Purified Extract on Safety, ad libitum Energy Intake, and Body Weight in Healthy Overweight Women: A Randomized Controlled Trial." *American Journal of Clinical Nutrition* 94:1171–81.
- Comaroff, John L., and Jean Comaroff. 2009. *Ethnicity, Inc.* Chicago: University of Chicago Press.
- Coole, Diana H., and Samantha Frost. 2010. *New Materialisms: Ontology, Agency, and Politics*. Durham, NC: Duke University Press.
- Frost, Samantha. 2011. "The Implications of the New Materialisms for Feminist Epistemology." In *Feminist Epistemology and Philosophy of Science: Power in Knowledge*, edited by Heidi E. Grasswick, 69–83. New York: Springer.

- Green, Joyce. 2007. *Making Space for Indigenous Feminism*. Black Point, NS: Fernwood Pub.
- Haraway, Donna Jeanne. 2003. *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. Chicago: Prickly Paradigm Press.
- Harris, Cheryl. 1993. "Whiteness as Property." *Harvard Law Review* 106 (8): 1709–91.
- Harry, Debra, and Le'a Malia Kanehe. 2005. "The BS in Access and Benefit Sharing (ABS): Critical Questions for Indigenous Peoples." In *The Catch: Perspectives in Benefit Sharing*, edited by Beth Burrows, 81–20. Edmonds, WA: The Edmonds Institute.
- Hayden, Cori. 2003. *When Nature Goes Public: The Making and Unmaking of Bioprospecting in Mexico*. Princeton, NJ: Princeton University Press.
- Jaimes, M. Annette. 1998. "Savage Hegemony: From 'Endangered Species' to Feminist Indiginism." In *Talking Visions: Multicultural Feminism in Transnational Age*, edited by Ella Shohat, 413–39. New York: New Museum of Contemporary Art.
- Knop, Karen, Ralf Michaels, and Annelise Riles. 2012. "From Multiculturalism to Technique: Feminism, Culture, and the Conflict of Laws Style." *Stanford Law Review* 64 (3): 589–56.
- LaDuke, Winona. 2005. *Recovering the Sacred: The Power of Naming and Claiming*. Cambridge, MA: South End Press.
- Huizenga, Daniel. 2014. "Documenting 'Community' in the #khomani San Land Claim in South Africa." *PoLAR: Political and Legal Anthropology Review* 37 (1): 145–61.
- Nelson, Alondra. 2008. "Bio Science: Genetic Genealogy Testing and the Pursuit of African Ancestry." *Social Studies of Science* 38 (5): 759–83.
- Povinelli, Elizabeth A. 2002. *The Cunning of Recognition: Indigenous Alterities and the Making of Australian Multiculturalism*. Durham, NC: Duke University Press.
- Riles, Annelise. 2005. "A New Agenda for the Cultural Study of Law: Taking on the Technicalities." *Buffalo Law Review* 53 (3): 979–1033.
- Riles, Annelise. 2011. *Collateral Knowledge: Legal Reasoning in the Global Financial Markets*. Chicago: University of Chicago Press.
- Robins, Steven. 2001. "NGOs, 'Bushmen' and Double Vision: The #khomani San Land Claim and the Cultural Politics of 'Community' in the Kalahari." *Journal of Southern African Studies* 27 (4): 833–53.
- Rose, Nikolas. 2006. *The Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century*. Princeton, NJ: Princeton University Press.
- Smith, Andrea. 2007. "Native American Feminism, Sovereignty and Social Change." In *Making Space for Indigenous Feminism*, edited by Joyce Green, 93–107. Black Point, NS: Fernwood Pub.
- Smith, Linda Tuhiwai. 2004. *Decolonizing Methodologies: Research and Indigenous Peoples*. New York, NY: Zed Books.
- Strathern, Marilyn. 2001. "The Patent and the Malanggan." *Theory, Culture and Society* 18 (4): 1–26.
- Subramaniam, Banu. 2009. "Moored Metamorphoses: A Retrospective Essay on Feminist Science Studies." *Signs: Journal of Women in Culture and Society* 34 (4): 951–80.
- Sullivan, Nikki. 2012. "The Somatechnics of Perception and Matter of the Non/human: A Critical Response to New Materialism." *European Journal of Women's Studies* 19 (3): 299–313.

- Sunder, Madhavi. 2007. "The Invention of Traditional Knowledge." *Law and Contemporary Problems* 70 (2): 97–124.
- Valverde, Mariana. 2009. "Jurisdiction and Scale: Legal 'Technicalities' as Resources for Theory." *Social and Legal Studies* 18 (2):139–57.
- van Dooren, Thom. 2008. "Inventing Seed: The Nature(s) of Intellectual Property in Plants." *Environment and Planning D: Society and Space* 26 (4): 676–97.
- Vermeylen, Saskia. 2008. "From Life Force to Slimming Aid: Exploring Views on the Commodification of Traditional Medicinal Knowledge." *Applied Geography* 28:224–35.
- Vismann, Cornelia. 2008. *Files: Law and Media Technology*. Stanford, CA: Stanford University Press.
- Wynberg, Rachel. 2004. "Rhetoric, Realism and Benefit Sharing: Use of Traditional Knowledge of Hoodia Species in the Development of Appetite Suppressant." *Journal of World Intellectual Property* 7 (6): 851–76.
- Wynberg, Rachel, Doris Schroeder, and Roger Chennells. 2009. *Indigenous Peoples, Consent and Benefit Sharing: Lessons from the San-Hoodia Case*. New York: Springer.

Court Cases Cited

- Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013).
- Gentiruco AG v. Firestone (South Africa) (Pty) Ltd*, 1971 BP 58 (A).
- Graham v. John Deere Co.*, 383 U.S. 1 [1966].
- Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628 [Fed. Cir. 1987].