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EDITED AND REVIEWED BY
Maria Beatrice Morelli,
University of Camerino, Italy

*CORRESPONDENCE
Kashif Shamim,
✉ Kashiffriends10@gmail.com

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Editorial: Bridging traditional and modern medicine: the role of botanicals in healthcare

Kashif Shamim^{1*}, Pankaj Kumar², Hee-Sung Chae¹ and
Islam Husain¹

¹National Center for Natural Products Research, School of Pharmacy, University of Mississippi, Oxford, MS, United States, ²Department of Botany and Microbiology, H.N.B. Garhwal University (A Central University), Srinagar Garhwal, India

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Editorial on the Research Topic

Bridging traditional and modern medicine: the role of botanicals in healthcare

People have relied on medicinal plants for centuries, long before pharmacology became an established scientific field. Most of what we know about these remedies didn't come from laboratory experiments; rather, it developed through generations of observation and hands-on experience. Even now, a surprising number of old plant-based treatments linger in our medicine cabinets and cultures. Lately, scientists are taking a closer, more systematic look at these practices, trying to bridge the gap between tradition and modern evidence. But honestly, bringing botanicals into mainstream medicine is still tough. There are both practical hurdles and tricky research challenges that slow things down.

One major Research Topic here is consistency. Plants aren't like factory-made pills. Their chemistry shifts with the soil, weather, and how people grow and process them. On top of that, we often see a plant do something helpful in the body before we really understand why it works. Many promising plants of this universe haven't been properly tested for their potential to cure diseases, so it's hard to turn traditional observations into medicines people can trust.

The articles collected in "Bridging Traditional and Modern Medicine: The Role of Botanicals in Healthcare" reflect this shift. Instead of standing alone, they show how research on botanicals now crosses many disciplines. A common thread across many of these works is the progression from traditional use to scientific validation, starting with plant selection informed by ethnobotanical knowledge, followed by chemical characterization, biological evaluation, and, in some cases, early clinical exploration. Thinking of this process as a continuous cycle helps to frame how traditional insights can feed into modern discovery pipelines (Figure 1).

A bunch of studies in this collection dig into how botanicals impact the brain and mental health. Li et al. found that berberine shows antidepressant effects in preclinical models—seems like it helps by influencing neuroinflammation and regulating neurotransmitters. Then Manganyi et al. took a closer look at South African medicinal plants that people have used for cognitive and neurological Research Topic for generations. They point out the real potential these plants have as sources of neuroactive compounds. Put together, these studies

Botanical innovation Cycle: Integrating Traditional Knowledge with Modern Biomedical research

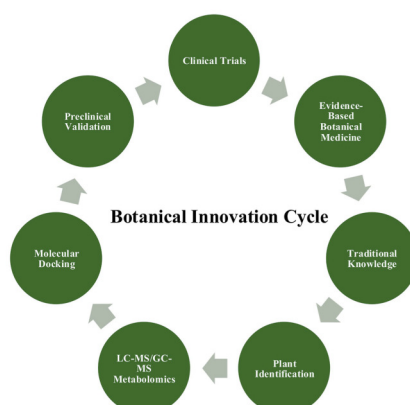


FIGURE 1

The botanical innovation cycle integrates traditional knowledge with modern biomedical research.

show there's a growing push to figure out how plant-based modulators can influence brain function, especially when it comes to tough neurological disorders.

Dealing with skin wounds and chronic inflammation is always tricky, so some researchers are turning back to traditional remedies to look for new answers. [Costa and Serra](#) mapped out which plants folks in Calabria, Italy have been using to treat wounds and skin problems. On the other hand, [Filatov et al.](#) showed that *Paeonia lactiflora* root extract can temper LPS-induced inflammation and boost collagen production in skin and gum cell models. So, there's real evidence backing up what healers have known for ages—botanicals can play a big part in healing tissues and fighting inflammation.

Botanical research is carving out a space in immunology and cancer, too. [Jha et al.](#) reviewed ways to combine Ayurvedic medicine with modern cancer treatments and found that plant compounds hit multiple molecular targets at once. [Feng et al.](#) went a step further and used bioinformatics to study how traditional Chinese medicine tweaks the tumor's immune environment. Meanwhile, [Qawasmeh et al.](#) zeroed in on the Nrf2 pathway in vitiligo, connecting herbal treatments to managing oxidative stress. All these studies underline one thing—it's complicated. Botanical therapies don't just hit one target; they work on several fronts in immune-related diseases.

When it comes to fighting infections—whether new or old—botanicals seem to have a lot to offer. [Milugo et al.](#) found that natural compounds from ethnomedicinal plants bind to the SARS-CoV-2 spike protein, which could mean antiviral action. [Abdel-Gaber et al.](#) showed that *Krameria lappacea* extract reduces inflammation in mice with coccidiosis, pointing to a role in controlling parasite-related inflammation. These examples really demonstrate that plant-derived compounds are being tested across all sorts of infectious disease models, and the potential is huge.

Moving forward, real progress hinges on bringing different fields together. Techniques like systems biology, high-throughput screening, and computational modeling open up new ways to tackle the complexity of plant mixtures and their

effects on the body. But science isn't the only piece of the puzzle—regulations need to catch up too. For botanicals to reach their potential in healthcare, the rules around them have to get smarter, making sure these products are safe and backed by solid research.

In summary, this Research Topic highlights a field in transition, where traditional knowledge is increasingly being examined through the lens of modern science. The contributions presented here underscore both the therapeutic potential of botanicals and the challenges that must be addressed to realize this potential. Continued progress will require not only technological advances but also careful study design, critical evaluation, and sustained interdisciplinary collaboration to advance botanicals toward evidence-based applications in healthcare.

Schematic representation of the iterative workflow in botanical research, beginning with traditional knowledge and plant identification, followed by phytochemical profiling using metabolomic approaches (LC-MS/GC-MS), molecular docking, and preclinical validation. These stages support the progression toward clinical trials and the development of evidence-based botanical medicine. The cycle highlights the continuous integration of ethnobotanical insights with modern analytical and translational methodologies to advance botanical therapeutics.

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