

Plant to Pharmaceutical

UNIT 7 RECAP

Many of the medicines you would find in your medicine cabinet right now would not be there if it weren't for the relationship between plants and people. To create plant-derived pharmaceuticals, plants must be identified and harvested. Then their compounds are identified, isolated, and manufactured to treat specific diseases. How have we identified these plants with healing properties? Often it is through Indigenous Traditional Ecological Knowledge (TEK), which is information from indigenous groups who have used

local plants as medicines and treatments for centuries. Many plants we use in pharmaceuticals today come from areas considered biodiversity hotspots, meaning they are found in places that have many different species living in the same area such as a rainforest. Because of the high biodiversity, these areas could potentially contain many other plants with medicinal properties that are undiscovered by modern medicine. Plant compounds that treat disease are considered bioactive and once a bioactive

plant is recognized, there must be a biochemical assay to determine the molecular compounds and properties in the plant. From there, the mechanism of action of the plant compounds to combat disease are recognized and the compound will move forward on the drug development pathway. It is important to determine who the patients are for the new drug and how the drug will be administered to patients before it can go to market to improve human health.

INSPIRATION 1

Community gardens are a great solution to food deserts and food insecurity. They're also an important tool to educate people about the importance of eating healthy, fresh foods. The variety of plants that serve as medicine for ailments are backed by many generations of traditional use by indigenous peoples. Coming together to grow and learn about medicinal plants is one way to honor indigenous groups who introduced them and continue their traditions.

PROBLEM

Can a community medicinal garden be used to educate people about the healing power of plants and the role that traditional ecological knowledge plays in their widespread use to improve human health?

SOLUTION DESIGN DRIVING QUESTIONS

How do you create a community garden?

What medicinal plants would grow in the garden area?

What is the background on the use of and discovery of these plants in modern medicine?

How will gardeners and visitors learn about the history of the plants in the garden?

RESOURCES

[Community Gardens: An Effective Approach to Food Equity | Institute for Health Policy Leadership](#)

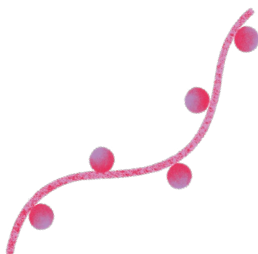
[How to Start a Community Garden: Getting People Involved | UGA Cooperative Extension](#)

[A Guide to Common Medicinal Herbs—Health Encyclopedia—University of Rochester Medical Center](#)

[Growing Medicinal Plants in the Home Garden | Homegrown](#)

[A magical space: UW's Medicinal Herb Garden | In Our Nature](#)

[Medicinal knowledge vanishes as Indigenous languages die | Science | AAAS](#)



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INSPIRATION 2

One of the greatest conservation challenges is deforestation. In 2022, 10.25 million acres were lost, an increase of 10% from the previous year (WRI & UMD). As forests are lost, so are the species living there. Plants introduced to us by indigenous tribes include quinine, lapacho, and ayahuasca. As plants from these areas may hold the key to treating or curing disease, what's the responsibility of drug companies that depend on them?

PROBLEM

What role could drug development and pharmaceutical companies have in the effort to conserve biodiversity hotspots and support indigenous people who live there?

SOLUTION DESIGN DRIVING QUESTIONS

Which areas on Earth are at most risk of deforestation?

What are the reasons that deforestation is happening so rapidly?

How are new plants that can be used as medicines discovered?

What role do drug development companies play in the discovery of new medicinal plants?

Are there mitigation strategies in place for drug companies to protect biodiversity hotspots?

How can people be educated on the importance of plants and their medicinal origins that lead to the drugs and treatments we have today?

How can companies that rely on rainforest plants for new pharmaceutical discoveries be encouraged to help to conserve the areas they are found in?

RESOURCES

[Deforestation and Forest Loss | Our World in Data](#)

[Amazon Deforestation—How Much of the Rainforest is Left? | Sentient](#)

[Biodiversity conservation and drug discovery: Can they be combined? The Suriname and Madagascar experiences | PubMed Central | National Library of Medicine](#)

[Seeding Hope | ProPublica](#)

['Protect biodiversity to secure traditional medicine sources' | News | Eco-Business](#)

[Monetizing nature: The under-explored power of the Amazon's natural capital | News | Mongabay](#)

