The World is our Oyster: Natural Products used in Medicine Today

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The World is our Oyster: Natural Products used in Medicine Today  
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**Introduction:**
This project explores the important role played by natural products in the medicinal field used throughout history and leading into the current times, opening doors to possible remedies and therapeutics for various health ailments. These medicinal plants contain active components that can be chemically proven to have a particular affect on the body. Historical uses of medicinal plants before science was able to prove efficacy are evident in many cultures via documentation, origins including ancient China, India, Greece, and many more. Along with the analyzation of various natural products in medicine, I mimicked the binding activity of a specific active compound in aloe to a common protein associated with anti-inflammatory properties.

**Traditional Medicine:**
- **Green Tea ➔ Traditional Chinese Medicine.** *Camellia sinensis* plant. Proposed as helping with inflammation. Studies show possibility of preventing chronic diseases.
- **Cranberries ➔** Used by Native North Americans to treat UTI’s. Further evidence needed in present day.
- **Witch Hazel ➔** Valued by Native Americans and English settlers. Injected for bowel pain, drank as tea for tonic, leaves used on skin for inflammation. Common in skin cosmetics.

**Aloe vera**
*“The Plant of Immortality”*
~ Egypt, Greece, India, China, Japan, and Mexico ~
- Used for both medicinal and cosmetic purposes.
- Contains a variety of active components.
- Noted anti-inflammatory action, laxative effects, antiviral and antitumor activity, moisturizing and antiaging effects, and antiseptic effects.

**Anti-Inflammatory Effects of Aloe**

NF-κB is a protein that controls the expression of an immune response. NF-κB essential modulator is a protein that inhibits NF-κB, causing an anti-inflammatory response in the body.

Emodin is an active component in aloe that is known for its anti-inflammatory and antibacterial effects.

CBD is an active component in cannabis that also has proven anti-inflammatory effects in the body.

Figure A. mimics how CBD would bind to the NF-κB protein in the body to present an anti-inflammatory effect. Figure B. depicts the chemical structure of CBD and the various binding interactions that take place, some of which stronger than others. Figure C. shows the binding activity of Emodin to NF-κB, potentially exhibiting an anti-inflammatory effect.

**FDA Approved Drugs:**
- **Aspirin ➔** Active component salicyline. Found in the bark of the willow tree. Over 3500 years ago, used as a painkiller and antipyretic.
- **Penicillin ➔** Accidentally discovered in 1928 when mold *Penicillium notatum* inhibited the action of a disease-causing microbe. Additional research proved therapeutic use.
- **Paclitaxel ➔** Chemotherapeutic deriving from natural components of the pacific yew tree. Began testing in 1950’s for potential to block cancer cell growth.

Since CBD and Emodin have similar anti-inflammatory properties, the connection was able to be made between the binding of NF-κB to CBD having a comparable response to the same protein with Aloe’s Emodin.

**Importance of this Topic:**
The world will never stop demanding advancement in the pharmaceutical field. As we have discovered in recent times, there is no telling when an outbreak infection will arise. A large portion of our therapeutics are derived from a natural setting. A survey was created to gain a better understanding of the knowledge basis surrounding natural products used for medicinal purposes. It was concluded in this survey that most of the participants were unaware of the strong ties that the pharmaceutical field has with the natural world. Overall, we must work to understand the natural world that surrounds us to continue with the development modern medicine with traditional roots.

**The world is our oyster, and it is our duty to explore and uncover the potential therapeutics amongst the nature’s beauty.**

**Works Cited:**
- **Cannabis and Cannabinoid Research.** Published online July 1, 2020:can.2020.0025. doi:10.1089/can.2020.0025