Journal of Cancer Research and Cellular Therapeutics
Enrique Konstat-Korzenny . J Cancer Research and Cellular Therapeutics
http://dx.doi.org/ 10.31579/1.10039

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Artemisinin: How an antimalarial drug will alter the future of cancer Treatment

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Received date: May 29 , 2018; **Accepted date : July 25, 2018**; **Published date: August 01, 2018.**

Citation this Article: Enrique Konstat-Korzenny. Artemisinin: How an antimalarial drug will alter the future of cancer Treatment. J. Cancer Research and Cellular Therapeutics .**Doi: http://dx.doi.org/ 10.31579/1.10039.**

Introduction

Ever since humans have lived on this planet, cancer has been a part of life. The first description of this disease is believed to be in the Edwin Smith papyrus, in about the year 3000 BC by the Egyptians. However, it was not until Hyppocrates used coined the term cancer, as he observed projections rising from tumors, which he thought resembled a crab [1].

As the intricate relationship between cancer and humans developed over time, the medical field has been on a constant search to find the cure to this pathology. Several options have been discovered, including surgery, radiotherapy, drugs that elimínate rapidly dividing cells, and even molecular therapies oriented at disrupting intricate signaling pathways. However, the current paradigm of most present therapies involves several adverse effects that hinder the continuation of the drug regimes or pose life threatening conditions to the patient, such as tumor lysis syndrome, fever, neutropenia and susceptibility to opportunistic infections, just to name a few [2].

In an effort to find a novel cure for Malaria, Dr. Youyou Tu worked with several herbolary compounds used in traditional Chinese medicine. She found that artemisinin, a compound derived from the Artemisia annua plant had excellent antipaludic capacities and is nowadays one of the main drug therapies against this infection [3]. After synthetic derivatives were developed, researchers began to investigate artemisinin as a drug to treat cancer and since the the 80s decade up until this date, there have been promising results regarding both the in vitro and in vivo antineoplastic activity of these compounds. [4-7].

Through different proposed modes of action, apoptosis induction, endoperoxide bridge interaction with intracellular iron, cytotoxic radical formation, mitochondrial activation, intracellular signaling pathway inhibition, membrane-adhesion protein disruption, artemisinin and its derivatives have shown to be a potential drug to treat different types of neoplasms [8].

However, the most important feature of the reported studies on this drug is the capacity to selectively kill cancer cells, while leaving healthy cells unharmed, thus reducing adverse effects considerably. [8].

There is hope that more research will be carried out on this drug, as it has shown promising anticancer activity, while the minimal adverse effects of the drug regime would represent a change in the current paradigm of chemotherapy.

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