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NATURAL ISOLATED COMPOUND USED FOR TREATMENT OF COLORECTAL CANCER.

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Abstract:

We describe here the main natural ingredients used for cancer treatment and prevention, the historical features of their application and pharmacognosy. Two major applications of these compounds are described: such as cancer treatment and chemotherapy. Both natural and synthetic compounds, either derived from plants or animals or produced by antibiotics, and synthetic compounds, derived from natural extracts, are used. Other current critical aspects of cancer chemistry are also being discussed, focusing on genes and genes, as well as the latest cancer-changing concept: aneuploidy as the premium movens of cancer.

Keyword - Colorectal Cancer, Alkaloid, Chitin, Polysaccharide.

Introduction:

Evidence of cancer has been found in ancient fossils and in medical literature from antiquity, from the time of Pharaoh in ancient Egypt to the ancient world. Although it is difficult to interpret the diagnosis of doctors who live hundreds of years ago, we can assume that many of their explanations are related to cancer cases. Ancient medical literature reports that surgery was performed but doctors also recommended the use of certain natural products, especially plant products, which represent an interesting comparison point with current knowledge. Natural products play an important role in cancer treatment today with the large number of anticancer agents used clinically natural or found in natural products from a variety of sources such as plants, animals and micro-organisms (also from the sea) (Fig. 1). Major cancer drug detection programs and screening programs such as those promoted by the National Cancer Institute (NCI) have played an important role in the development of natural cancer-causing chemicals. Over the past few years, the availability of natural product drugs has increased with new technologies, such as combination and advanced testing, as well as their compatible methods. Vincristine, irinotecan, etoposide and paclitaxel are ancient examples of genes associated with plants; actinomycin D, mitomycin C, bleomycin, doxorubicin and l-asparaginase are drugs derived from bacterial sources, and citarabine is the first drug from a marine source. To date, new generations of taxis, anthracyclines, Vinca alkaloids, camptothecins, and the novel category of epothilones have been developed. Some of them are used for clinical use, others are used for clinical trials. Other agents from marine resources (both plants and animals) (e.g. trabectedin-ET-743, bryostatin-1, neovastat) also participated in clinical trials. All of these drugs are characterized by a variety of mechanisms, including microtubules, inhibition of topoisomerases I or II, DNA alkylation, and impaired signal transplantation. This review describes the key natural compounds used in cancer treatment and prevention. These factors have been synthesized and updated with a focus on the latest information on cellular communication factors and their cellular targets, from DNA to microtubules. Other current critical aspects of cancer cancer chemistry are also highlighted, as well as these more recent cancer mutations: where not genetic cancer mutations but genetics and / or aneuploidy are the onset of cancer.

A natural product that acts as a drug against the CRC in a clinical setting:

Alkaloid:

Alkaloids are a class of basic chemicals, naturally occurring to contain at least one nitrogen atom. The group also included other neutral-related factors [2] and weak structures. [3] Other synthetic compounds of the same structure can also be called alkaloids.

Classifications:

The nicotine molecule contains both pyridine (left) and pyrrolidine rings. Compared to other natural chemical compounds, alkaloids are characterized by excellent structural diversity. There is no parallelism. Initially, when genetic knowledge was in short supply, plant extracts were relied upon. This category is now considered obsolete.Recent categories have been based on the similarity of carbon sequestration (e.g., however, they need to be relaxed in boundary cases; can be assigned to both classes. Alkaloids are usually classified into the following major groups:

1. “True alkaloids” contain nitrogen in the heterocycle and are derived
amino acids. Their human examples are atropine, nicotine, and
morphine. This group also includes alkaloids other than the nitrogen heterocycle that contain terpene (e.g., Evonine). or peptide fragments (e.g. ergotamine). The piperidine alkaloids coniine and coniceine may be regarded as true alkaloids (rather than pseudoalkaloids: see below) although they do not originate from amino acids.
2. "Protoalkaloids", which contain nitrogen (but not the nitrogen heterocycle) and also originate from amino acids.Examples include mescaline, adrenaline and ephedrine.
3. Polyamine alkaloids - derived from putrescine, spermidine, and spermine.
4. The alkaloids of Peptide and cyclopeptide.

5. Pseudoalkaloids - alkaloid-like chemicals that do not come from amino acids. This group includes alkaloids such as terpene and steroids, as well as purine alkaloids such as caffeine, theobromine, theacrine and theophylline. Some authors classify it as pseudoalkaloids chemical compounds such as ephedrine and cathinone. Those are derived from the amino acid phenylalanine, but derive a nitrogen atom not from an amino acid but by conversion. Some alkaloids do not have carbon

the skeletal aspect of their group. Therefore, galanthamine and homoaporphines do not contain traces of isoquinoline, but, more commonly, are caused by isoquinoline alkaloids.

Features:

Many alkaloids contain oxygen in their cellular structures; those compounds usually contain colorless crystals in the existing conditions. Oxygen-free alkaloids, such as nicotine or coniine, are usually liquid, colorless, and oily. A head of a sheep born from a sheep that ate the leaves of the corn lily plant. Cyclopia is caused by the cyclopamine present in the plant. colored alkaloids, such as berberine (yellow) and sanguinarine (orange).

Many alkaloids are weak foundations, but some, such as theobromine and theophylline, are amphoteric. Many alkaloids are soluble in water but are easily soluble in natural solvents, such as diethyl ether, chloroform or 1,2-dichloroethane. Caffeine, cocaine, [163] codeine and nicotine are soluble in water (with ≥1g / L solubility), and

others, including morphine and yohimbine are very small amounts of water (0.1-1 g / L). Alkaloids and acids form salts of various strengths. These salts are usually soluble in water and ethanol and are insoluble in most solvents. Variations include scopolamine hydrobromide, soluble in organic solvents, and waterolube quinine sulfate. Many alkaloids have a bitter or toxic taste when ingested. Alkaloid production in plants appears to have shifted to a nutrient response by

predators; however, some animals have shifted their ability to release toxins from alkaloids. Some alkaloids can produce developmental defects in predatory animals but cannot detoxify alkaloids. One example is the alkaloid cyclopamine, which is produced from maize leaves. In the 1950's, up to 25% of lambs born from lambs that had been fed corn on the cob had serious facial features. These ranged from paralyzed jaws to cyclopia. After decades of research, in the 1980's, the company responsible for this disability was identified as alkaloid 11 deoxyjervine, later called cyclopamine.

Applications:

In medicine The use of alkaloid-containing plants has a long history, so, when the first alkaloids were isolated in the 19th century, they quickly found the use of alternative therapies. are designed to enhance or reverse the main effect of a drug and to minimize unwanted side effects. [208] For example, naloxone, an opioid receptor antagonist, is based on thebaine present in opium.

2. Polysaccharide:

Polysaccharides polycarhydrate, the most abundant carbohydrate found in food. They are many polymeric carbohydrates composed of monosaccharide units composed of glycosidic bonds. This carbohydrate can react with water (hydrolysis) using amylase enzymes such as catalyst, which produces sugar (monosaccharides, or oligosaccharides). They vary in structure from row to large branches. Examples include starch polysaccharides, starch, glycogen and galactogen and structural polysaccharides such as cellulose and chitin.

Function:

Nutrient polysaccharides are common sources of energy. Many organic matter can easily digest starch into sugar; however, many organisms cannot use cellulose or other polysaccharides such as chitin and arabinoxylans. These types of carbohydrates may be synthesized by certain bacteria and protists. Ruminants and termites, for example, use microorganisms to process cellulose. Although these polysaccharides are very complex, they provide essential nutrients for humans. Called dietary fiber, these carbohydrates increase digestion among other benefits. The main action of dietary fiber is to alter the contents of the intestinal tract, and to change the way other nutrients and chemicals are absorbed. Soluble fiber binds to bile acids in the small intestine, making them less likely to enter the body; this in turn lowers blood cholesterol levels. Soluble fiber also reduces sugar absorption, reduces postprandial sugar response, makes normal blood lipid levels and, once mature in the colon, produces low-chain acids such as organic products (discussion below). Although uncontrolled fiber is associated with a reduced risk of diabetes, the mechanism by which this occurs is unknown. It has not yet been officially recognized as an important macronutrient (since 2005), dietary fiber is considered an important dietary supplement, with regulatory authorities in many developed countries recommending increased dietary fiber intake. Storage of polysaccharides Starch. units bound by alpha connection. It is made with a mixture of amylose (15-20%) and amylopectin (80-85%). Amylose contains the corresponding series of several hundred glucose molecules, and Amylopectin is a branched particle made up of several thousand units of sugar (the whole series of 24-30 units of glucose is one unit of Amylopectin). Starch does not dissolve in water. They can be digested by breaking down alpha connections (glycosidic bonds). Both humans and animals have amylases, so they can digest starch. Potatoes, rice, wheat, and corn are the main sources of starch in the human diet. The composition of starch is the way plants store sugar.

Glycogen:

Glycogen acts as a second long-term energy storage in animal and fungal cells, which have the main energy stores captured by adipose tissue. Glycogen is mainly produced by the liver and muscles, but can also be produced by glycogenesis within the brain and stomach. Glycogen is similar to starch, a polymer glucose in plants, and is sometimes called animal starch, which has the same structure as amylopectin but has more branches and compounds than starch. Glycogen is a polymer α (1 → 4) glycosidic bonded, with α-connected branches (1 → 6). Glycogen is found in the form of granules in the cytosol / cytoplasm in many cell types, and plays an important role glucose cycle. Glycogen forms energy storage that can be used immediately to meet the unexpected demand for glucose, but less common and more readily available as energy storage than triglycerides (lipids). In the hepatocyte of the liver, glycogen can absorb up to 8 percent (100-120 grams in adult) of new weight immediately after a meal. Only glycogen stored in the liver can be made available to other organs. In muscle, glycogen is found in less than one to two percent muscle filter. The amount of glycogen stored in the body - especially within the muscles, liver, and red blood cells varies with exercise, basal metabolic rate, and eating habits such as periodic fasting. A small amount of glycogen is found in the kidneys, as well as small amounts in certain glial cells in the brain and in white blood cells. The uterus also retains glycogen during pregnancy, feeding the fetus.Glycogen is made up of a series of branches of glucose residues. It is stored in the liver and muscles.

• It is an energy reserve for animals.
• It is the main source of carbohydrate stored in the animal's body.
• It does not dissolve in water. Turns reddish brown when mixed with iodine.
• It also produces glucose in hydrolysis

Galactogen:

Galactogen is a galactose polysaccharide that acts as a storage energy for pulmonate snails and other Caenogastropods. This polysaccharide is only for production and is only found in the albumen gland from the reproductive system of the female snail and the perivitelline egg yolk. Galactogen acts as an energy storage device for the development of embryos and nodules, which are later replaced by glycogen in children and adults.

Insulin:

Galactogen is a galactose polysaccharide that acts as a storage energy for pulmonate snails and other Caenogastropods. This polysaccharide is only for production and is only found in the albumen gland from the reproductive system of the female snail and the perivitelline egg yolk. Galactogen acts as an energy storage device for the development of embryos and nodules, which are later replaced by glycogen in children and adults.

Cellulose:

The nutrients in plants are made mainly from cellulose. Wood
especially cellulose and lignin, while paper and cotton are almost pure cellulose. Cellulose is a polymer made up of repeated glucose units that are glued together with betalinkages. Most people and animals do not have the enzyme that breaks down beta interactions, so they do not digest cellulose. Certain animals, such as termites, can digest cellulose, since they have enzyme-containing bacteria in their gut. Cellulose is waterless. It does not change color when mixed with iodine. In hydrolysis, it produces glucose. The most abundant carbohydrate in nature.

Chitin:

Chitin is one of the most naturally occurring polymers. It forms part of the structure of many animals, such as exoskeletons. Over time the environment diminishes. Its breakdown may be caused by enzymes, which are secreted by microorganisms such as bacteria and fungi and are produced by other plants. Some of these tiny insects have simple sugar receptors from chitin decay. When chitin is detected, they then produce enzymes that break it down by removing glycosidic bonds to convert it into light sugars and ammonia. Chemically, chitin is closely related to chitosan (based on water-soluble chitin). It is also closely related to cellulose because it is a long offline option for glucose products.

3.Polyphenol:

The term polyphenol is not well defined, but it is generally agreed that it is natural products "with a polyphenol structure (e.g., many hydroxyl groups in perfumed rings" include four main classes: "phenolic acid, flavonoids stilbenes, and lignans"

Flavonoids include flavones, flavonols, flavanols, flavanones, isoflavones, proanthocyanidins, and anthocyanins. The most common flavanoids in the diet are catechin (tea, fruit), hesperetin (citrus fruits), cyanidin (red fruits and berries), daidzein (soy), proanthocyanidins (apple, grapes. , cocoa) and quercetin (onions, tea, apples).

Phenolic acid contains caffeic acid

Lignans polyphenols derived from phenylalanine are found in flax seeds and other grains.

Structure and biosynthesis:

Structural features:

Polyphenols are usually large molecules (macromolecules). Their molecular weight limit is about 800 Daltons, allowing them to spread rapidly throughout the cell membrane so that they can access sites of intracellular activity or remain as pigs once the cell cells are still in the cells. Therefore, many polyphenols are large
in-situ biosynthesized from small polyphenols to non-hydrolyzable tannins
and remains unavailable in plant matrix. Most polyphenols contain phenolic compounds of phenolic moitions of pyrocatechol, resorcinol, pyrogallol, and phloroglucinol linked to esters (non-hydrolyzable tannins) or stable CC bonds (tannins containing non-hydrolyzable condensed). Proanthocyanidins are mainly units of catechin and epicatechin. Polyphenols tend to have more active groups than hydroxyl groups. Ether ester interactions are common, as are carboxylic acids.

Chemical properties:

Polyphenols are reactive species toward oxidation, hence their description as
antioxidants in vitro.

Uses:

Some polyphenols are traditionally used as dyes. For example, in India
on the continent, pomegranate peel, which is high in tannins and other polyphenols, or
juice, employed in the dyeing of unused fabrics. Polyphenols, especially tannins, are traditionally used to tan the skin and even today and as precursors of raw chemistry specifically to produce plastics or fractions by applying polymerization with or without the use of formaldehyde or adhesive particleboards. Targets usually use plant residues from grapes, olives (called pomaces) or pecan shells left over after processing. Pyrogallol and pyrocatechin are among the oldest photo developers.

Mechanism underlying the action of potential natural product based drugs against CRC:

1 proliferation based regulation
2 migration and invasion based regulation
3 apoptosis based regulation
4 autophagy based regulation
5 angiogenesis based regulation

1. Proliferation based regulation

a) Nuclear proliferation:

The proliferation of nuclear weapons is the proliferation of nuclear weapons, inputs, and nuclear technology used in weapons in countries known as the "Nuclear Weapon States" by the Treaty on the Non-Proliferation of Nuclear Weapons, also known as the Non-Proliferation Treaty or NPT. The increase has been opposed by many nations with and without nuclear weapons, as governments fear that more nuclear powers will increase the risk of nuclear war (up to the so-called countervalue targeting of civilians with nuclear weapons), de-stabilize international or regional relations, or violate them. world empire.

Dual use technology:

Double-use technology refers to the possible military use of public-sector power. Many of the technologies and materials associated with the development of the Dual use technology system for nuclear power have double power, because several phases of the nuclear fuel cycle allow for the separation of nuclear material. When this happens the nuclear power system can be the path that leads to the atomic bomb or the public annex to a secret bomb system. The crisis in Iran's nuclear activities is an example of this.

b) Cell proliferation:

Cell proliferation is the process by which a cell grows and divides to produce two daughter cells. Cell proliferation leads to a clear growth of cell numbers and is therefore the fastest way to grow tissue. Cell proliferation requires that cell growth and cell division take place simultaneously, as cell proliferation remains constant in humans. Cell division is possible without cell growth, producing more slow-moving cells (such as in zygote purification, while cell growth can occur without cell division to produce one larger cell (such as growth) senses). Therefore, cell proliferation is not the same as cell growth or cell growth Separation, except that these words are sometimes used interchangeably.

Stem cells experience cell proliferation to produce increasing "growth" daughter cells later divide to form tissue during normal growth and tissue growth, during tissue regeneration after injury, or in cancer. The total number of cells in humans is determined by the rate of cell proliferation minus the number of cell deaths. Cell size depends on cell growth and cell division, with an unequal increase in the rate of cell growth leading to mass cell production and an unequal increase in cell division that leads to mass production. small cells. Cell proliferation usually involves the moderate growth of cells and the levels of cell division that maintain a stable cell size in increasing cell numbers.

c) Cell growth:

Cell growth means an increase in the total weight of a cell, including the cytoplasmic, nuclear and organelle volumes. Cell growth occurs when the overall level of cellular biosynthesis (biomolecule production or anabolism) is greater than the total rate of cellular decline (destruction of biomolecule by proteasome, lysosome or autophagy, or catabolism). by cell division or cell cycle, which is a different process possible and cell growth during the process of cell proliferation, when a cell, known as a "mother cell", grows and divides to produce two "daughter cells". cell growth and cell division can also occur independently of each other. During early embryonic development (the division of the zygote to form a morula and blastoderm), cell division occurs more frequently without cell growth.

2. migration and invasion based regulation:

Human migration Migration involves the movement of people from one place to another for the purpose of settling, permanently or temporarily, in a new place (local region). Movement usually occurs over long distances and from one country to another, but internal migration (in one country) is also possible; indeed, this is an outstanding form of global migration. Migration is often associated with better human structure at individual and home levels, as well as better access to migration networks. Age is also very important for job migration and unemployment. People can move as individuals, in groups of families or in large groups. There are four main types of migration: invasion, conquest, colonization and emigration. Immigrants are traditionally defined as people who change the country they live in for common reasons and purposes. These objectives may include a search for better job opportunities or health needs. This term is the one most often interpreted as anyone who permanently changes his place can be considered an immigrant.

3. Apoptosis Based Regulation:

Apoptosis is a form of programmed cell death thatoccurs in multicellular organisms.Biochemical events lead to characteristic cell changes (morphology) and death.These changes include blebbing, cell shrinkage, nuclear fragmentation, chromatin condensation, chromosomal

DNA fragmentation, and global mRNA decay. The average adult human loses between 50 and 70 billion cells each day due to apoptosis. For an average human child between the ages of 8 and 14, approximately 20–30 billion cells die per day.Activation mechanisms.The initiation of apoptosis is tightly regulated by activation mechanisms, because once apoptosis has begun, it inevitably leads to the death of the cell. The two best-understood activation mechanisms are the intrinsic pathway (also called the mitochondrial pathway) and the extrinsic pathway.The intrinsic pathway is activated by intracellular signals generated when cells are stressed and depends on the release of proteins from the intermembrane space of mitochondria. The extrinsic pathway is activated by extracellular ligands binding to cell-surface death receptors, which leads to the formation of the deathinducing signaling complex (DISC).

4 Autophagy:

Autophagy (or autophagocytosis) (from the Greek autóphagos, meaning "devouring" and κύτος kýtos, meaning "vain") is a natural, controlled process of a cell that removes unwanted or inactive substances. Allows for systematic damage and cell renewal.

Conclusions:

Cancer treatment has made great strides since the early years of modern anti-tumor research. A selected number of human trauma (e.g. lymphoblastic leukemia in childhood, lymphomas and testicular cancer) can be treated with modern treatments and long-term survival has been found in many others [139]. The identification and development of natural chemicals and discoveries has had a profound effect on these advances and many of these compounds are now being used in clinical practice.Nature is still today a rich source of effective mechanisms that fight cancer cells. Natural chemicals contain old cytotoxic categories targeting different and specific macromolecules identified by cancer cells and to a lesser extent by normal growing cells (e.g. DNA, enzymes, microtubules) or new chemicals targeting macromolecules eg another appropriate field for the use of natural chemicals is cancer chemoprevention because these compounds can inhibit certain processes involved in cancerogenesis.Even a popular press often publishes articles on chemoprevention cancer and its potential benefits and regularly reports on newly available natural exotic chemicals. However, although there is a strong molecular basis for this strategy, the preoperative data and clinics in this field are still limited and no controlled clinical research has been published showing the benefits in are suitable for clinical practice. It is important to emphasize that only intensive pre-surgery and clinical studies and an accurate understanding of the new chemical chemistry can ensure the selection of an effective and safe anticancer and chemopreventive drugs, including natural compounds.

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