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Cancer Science & Paediatrics - Anthocyanin acts as scavenger for heavy metal ions, attack cancer cell and interacts with uric acid and urea to expel it through urine system

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Anthocyanin is found mainly in red beet juice, cherry, red rose. It is red color pigment with high solubility in water. It is exchangeable similar to cation exchanger in demineralization processes of water (hetero reaction) while with the anthocyanin juice is homogenous reaction. Addition of heavy metal salt like metal nitrate (water soluble) results in sudden precipitation of metal anthocyanin and the colour of the solution disappear slowly. The pH of the solution becomes more acidic and leads to the formation of nitric acid in which the pH reaches nearly four. No precipitations shown with sodium and potassium ions while with magnesium and calcium ions need high concentration of them. Anthocyanin can be used to purify water from poisonous metals ions. Anthocyanin colour in acidic solution is shine red which gets changed to reddish green colour in basic solution and deep red colour in neutral solutions. So it is suitable indicator in acid-base reaction. It is more suitable than classically used phenolphthalein indicator which is water in soluble. Irrigation of red rose plant with acidic solution like hydrochloric acid result in changing the colour of the rose from deep red to shine red, also that happen when red raised plant left in acidic atmosphere. This is a good test for detection of acidic rain in industrial area. A case study was carried out on the urine of a man of (40) years old. Two urine samples were taken from the urine system of the person, one after drinking concentrated red beet juice (mechanically extracted) and the second one without drinking juice. The results showed that: anthocyanin formed hydrogen bonding with uric acid and urea enhancing detoxification of both of them from blood; anthocyanin lowers the acidity of urine which is good for lessening human tension; anthocyanin reduces viscosity of urine even less than that of pure water which enhance the flow of urine through urine system; Reduces conductivity of urine i.e. captures proton of uric acid; Changes color of urine from yellow to pink as shown in figure below. Proton in its juice from red beet nearly 6.4 while in red rose juice more acidic .i.e. pP < 6.4 .The radius of exchangeable proton= (1.5/106) * 10-9 nanometer (nm) thus it is called Trans membrane proton.

Introduction: A cancer diagnosis is upsetting at any age, but especially so when the patient is a child. It's natural to have many questions, such as, who should treat my child? Will my child get well? What does all of this mean for our family? Not all questions have answers, but the information and resources on this page provide a starting point for understanding the basics of childhood cancer.

- ◊ Types of Cancer in Children
- ◊ Treating Childhood Cancer
- ◊ Where Children with Cancer Are Treated
- ◊ Coping with Cancer
- ◊ Survivorship
- ◊ Cancer Causes Research

Types of Cancer in Children: In the United States in 2019, an estimated 11,060 new cases of cancer will be diagnosed among children from birth to 14 years, and about 1,190 children are expected to die from the disease. Although cancer death rates for this age group have declined by 65 percent from 1970 to 2016, cancer remains the leading cause of death from disease among children. The most common types of cancer diagnosed in children ages 0 to 14 years are leukemias, brain and other central nervous system (CNS) tumors, and lymphomas.

Treating Childhood Cancer: Children's cancers are not always treated like adult cancers. Pediatric oncology is a medical specialty focused on the care of

children with cancer. It's important to know that this expertise exists and that there are effective treatments for many childhood cancers.

Types of Treatment: There are many types of cancer treatment. The types of treatment that a child with cancer receives will depend on the type of cancer and how advanced it is. Common treatments include: surgery, chemotherapy, radiation therapy, immunotherapy, and stem cell transplant. Learn about these and other therapies in our Types of Treatment section.

Clinical Trials: Before any new treatment can be made widely available to patients, it must be studied in clinical trials (research studies) and found to be safe and effective in treating disease. Clinical trials for children and adolescents with cancer are generally designed to compare potentially better therapy with therapy that is currently accepted as standard. Most of the progress made in identifying curative therapies for childhood cancers has been achieved through clinical trials.

Treatment Effects: Children face unique issues during their treatment for cancer, after the completion of treatment, and as survivors of cancer. For example, they may receive more intense treatments, cancer and its treatments have different effects on growing bodies than adult bodies, and they may respond differently to drugs that control symptoms in adults. For more information, see the PDQ® Pediatric Supportive Care summary. Late effects of treatment are discussed later on this page in the Survivorship section.

Cancer Causes:

The causes of most childhood cancers are not known. About 5 percent of all cancers in children are caused by an inherited mutation (a genetic mutation that can be passed from parents to their children).

Most cancers in children, like those in adults, are thought to develop as a result of mutations in genes that lead to uncontrolled cell growth and eventually cancer. In adults, these gene mutations reflect the cumulative effects of aging and long-term exposure to cancer-causing substances. However, identifying potential environmental causes of childhood cancer has been difficult, partly because cancer in children is rare and partly because it is difficult to determine what children might have been exposed to early in their development. More information about possible causes of cancer in children is available in the fact sheet, Cancer in Children and Adolescents.

Research:

NCI supports a broad range of research to better understand the causes, biology, and patterns of childhood cancers and to identify the best ways to successfully treat children with cancer. In the context of clinical trials, researchers are treating and learning from young cancer patients. Researchers are also following childhood cancer survivors to learn about health and other issues they may face as a result of their cancer treatment. To learn more, see Childhood Cancers Research.