

The positive impacts of cacao on stem cells and tissue regrowth are evident, with it being able to boost the formation of new cells and foster angiogenesis. Going forward, it is significant to contemplate how the antioxidants in cacao can aid guard cellular well-being from oxidative harm while potentially providing mental benefits as well.



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# Dark chocolate: An overview of its biological activity, processing, and .

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Dark chocolate: An overview of its biological activity, processing, and fortification approaches

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**ABSTRACT**

Dark chocolate gets popularity for several decades due to its enormous health benefits. It contains several health-promoting factors (bioactive components - polyphenols, flavonoids, procyanidins, theobromines, etc. and vitamins and minerals) that positively modulate the immune system of human beings. It confers safeguards against cardiovascular diseases, certain types of cancers, and other brain-related disorders like Alzheimer's disease, Parkinson's disease, etc. Dark chocolate is considered a functional food due to its anti-diabetic, anti-inflammatory, and anti-microbial properties. It also has a well-established role in weight management and the alteration of a lipid profile to a healthy direction. But during the processing of dark chocolate, several nutrients are lost (polyphenol, flavonoids, flavan-3-ols, ascorbic acid, and thiamine). So, fortification would be an effective method of enhancing the overall nutrient content and also making the dark chocolate self-sufficient. Thus, the focus of this review study is to gather all the experimental studies done on dark chocolate fortification. Several ingredients were used for the fortification, such as fruits (mulberry, chokeberries, and elderberries), spices (cinnamon), phytonutrients, peanut oil, probiotics (mainly Lactobacillus, Bacillus species), prebiotics (inulin, xanthan gum, and malto-dextrin), flavonoids, flavan-3-ols, etc. These fortifications were done to raise the total antioxidant content as well as essential fatty acid content simultaneously reducing total calorie content. Sometimes, the fortification was done to improve physical properties like viscosity, rheological properties and also improve overall consumer acceptance by modifying its bitter taste.

**1. Introduction**

Chocolate is a popular, lip-smacking sweet stuff among all age groups. Its consumption rate continues to grow around the world year after year. According to the consumption statistics, Switzerland was the leading country in chocolate consumption. According to a survey done in 2017, Swiss people have long affairs with the consumption of chocolate. Austria was ranked 2nd after Switzerland in per-capita consumption of chocolate. Germany, Ireland, Great Britain, Sweden, Estonia, Norway, and Poland are popular examples of per-capita chocolate consumption in the world (Hapsari and Yuniansih, 2020).

The consumer importance of chocolate is very high due to its delicacy and health benefits. The use of chocolate was 1st started in Meso America. Old Aztecs used chocolate as a valuable drug for the prevention of different ailments. Chocolate is also effective to increase overall longevity, sexual appetite, and fertility. These health benefits are due to

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2665-9271/© 2022 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Abstract Dark chocolate (70% Cacao) is a major source of flavonoid antioxidants, which appear to support cognitive, endocrine, and cardiovascular health benefits. However, the in vivo effects of cacao on human genome function are unknown.

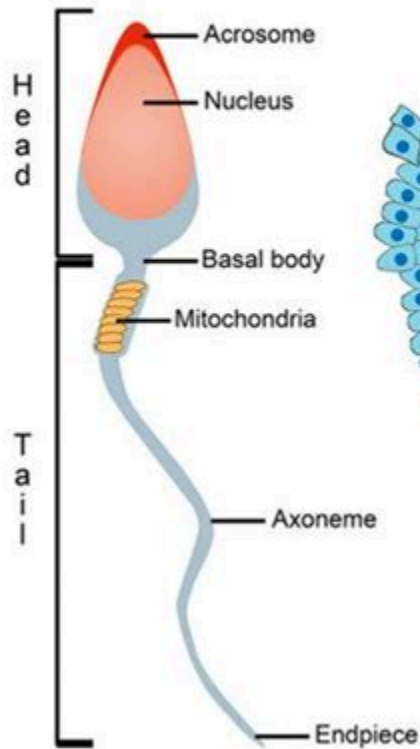
## Dark Chocolate (Cacao) and Stem Cell Regeneration



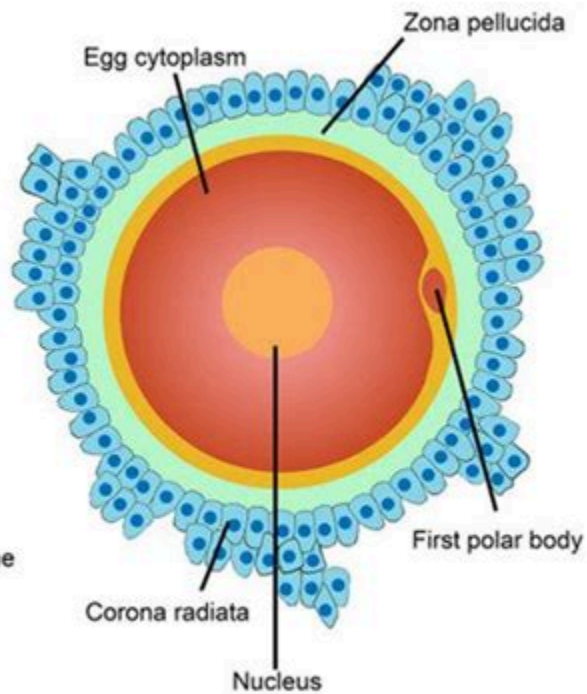
The bottom line. As noted in this research, not all chocolate is the same. Dark chocolate and cocoa have high flavanol levels, while milk chocolate and white chocolate have much lower levels. In addition, many types of chocolate are high in sugar, fats, and calories. So, even if dark chocolate turns out to be good for the brain, it's unlikely .

## Eggs from men, sperm from women: How stem cell science may change . - MSN

### SPERM

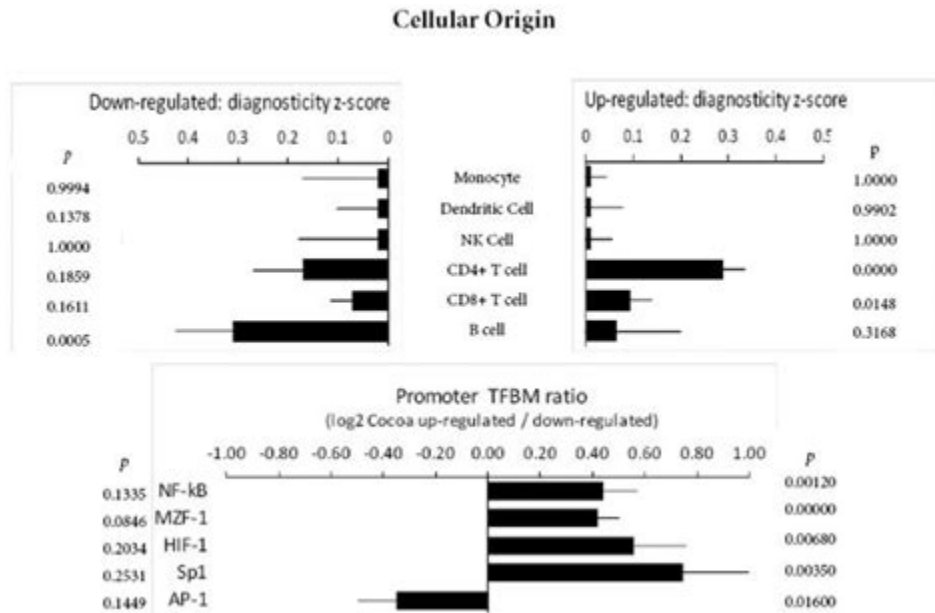


### OVUM



Cocoa procyanidins have also been shown to affect signaling pathways of polymorphonuclear cells, white blood cells involved in inflammation and injury . Kenny et al. demonstrated that flavanol fractions can enhance secretion of the cytokines  $TNF-\alpha$ , IL-1, IL-6, and IL-10 from stimulated human peripheral blood mononuclear cells ( 126 ).

## Dark chocolate (70% cacao) effects human gene expression: Cacao regulates cellular immune response, neural signaling, and sensory perception



In fact, there was a study done at the University of California San Francisco, researchers found that participants who received a chocolate drink made with cacao twice a day for 30 days, had twice as many stem cells in their circulation as the control group. So when you think stem cells, you're thinking about regenerating the body.

## Cocoa for pleasure — and health? — Harvard Gazette



The aim is to persuade these stem cells to become eggs or sperm. These techniques could use stem cells taken from early embryos. But scientists have also worked out how to revert adult cells to a .



## The Potent Powers of Cacao: Stem Cell Regeneration



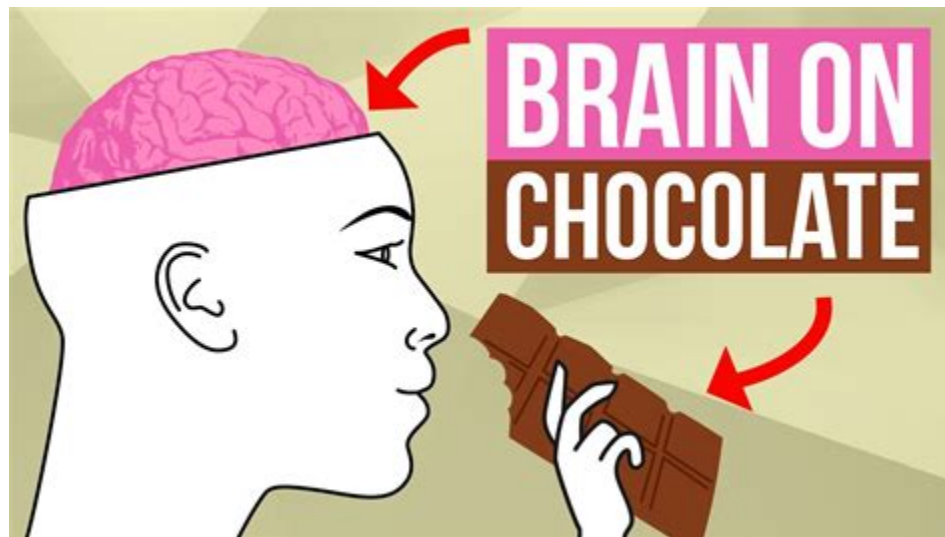
The use of cacao for health benefits dates back at least 3000 years. Our understanding of cacao has evolved with modern science. It is now felt based on extensive research the main health benefits of cacao stem from epicatechin, a flavanol found in cacao. The process of manufacturing dark chocolate ...

### **Dark chocolate consumption reduces stress and inflammation**



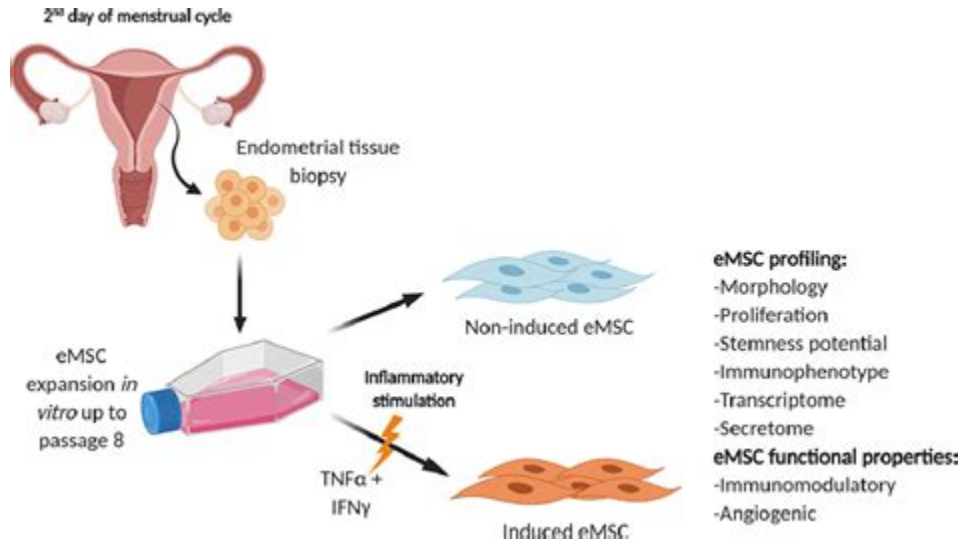
For the first study, the researchers enrolled five healthy subjects aged 22-40. Each participant ate 48 grams of dark chocolate (70 percent cacao and 30 percent organic cane sugar), which is the .

## Your brain on chocolate - Harvard Health



The neurobiological actions of flavanols are believed to occur in two major ways: (i) via direct interactions with cellular cascades yielding expression of neuroprotective and neuromodulatory proteins that promote neurogenesis, neuronal function and brain connectivity, and (ii) via blood-flow improvement and angiogenesis in the brain and .

## Exploring distinct properties of endometrial stem cells through .



0:00 / 6:47 Can Food Reactivate Your Stem Cells? | Dr. William Li Mark Hyman, MD 1. 02M subscribers 946K views 4 years ago The Doctor's Farmacy with Mark Hyman M. D. Among the major superpowers of.

## 4 Benefits of Cacao | Dr. Sam Berne - Holistic Eye Care



Unlike embryonic stem cells, which can only be derived from embryonic tissue, induced pluripotent stem cells can be derived from adult cells that are abundant in skin, urine, and blood. Induced pluripotent stem cells are engineered in labs by resetting adult cells to a stem cell-like state. This gives regenerative medicine researchers an easily .

## Health Benefits of Cacao - Dr William Li



One such treasure that has captured the attention of experts is raw cacao, the purest form of chocolate. While it has long been celebrated for its rich flavor, raw cacao is now making waves for a different reason - its potential to promote stem cells, the body's natural healers. Stem Cells: The Architects of



# The Health Effects of Chocolate and Cocoa: A Systematic Review



Review

## The Health Effects of Chocolate and Cocoa: A Systematic Review

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**Abstract:** Chocolate has a history of human consumption tracing back to 400 AD and is rich in polyphenols such as catechins, anthocyanidins, and pro anthocyanidins. As chocolate and cocoa product consumption, along with interest in them as functional foods, increases worldwide, there is a need to systematically and critically appraise the available clinical evidence on their health effects. A systematic search was conducted on electronic databases such as MEDLINE, EMBASE, and Cochrane Central Register of Controlled Trials (CENTRAL) using a search strategy and keywords. Among the many health effects assessed on several outcomes (including skin, cardiovascular, anthropometric, cognitive, and quality of life), we found that compared to controls, chocolate or cocoa product consumption significantly improved lipid profiles (triglycerides), while the effects of chocolate on all other outcome parameters were not significantly different. In conclusion, low-to-moderate-quality evidence with short duration of research (majority 4–6 weeks) showed no significant difference between the effects of chocolate and control groups on parameters related to skin, blood pressure, lipid profile, cognitive function, anthropometry, blood glucose, and quality of life regardless of form, dose, and duration among healthy individuals. It was generally well accepted by study subjects, with gastrointestinal disturbances and unpalatability being the most reported concerns.

**Keywords:** chocolate; cocoa; health benefits



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### 1. Introduction

Chocolate has a long history of being consumed for its fine flavours as a luxury food since ancient times. The origins of chocolate can be traced back to 400 AD [1]. Chocolate is produced from cacao beans through a multistep process involving fermentation, drying, roasting, nib grinding and refining, conching, and tempering to ensure its stability and flavour [2,3]. The transformation process steps are first, fermentation of cacao beans to develop the chocolate flavour, followed by removal of water content by drying, then roasting, cleaning, and shelling of beans into nibs. Nibs are then ground and refined into cacao liquor, before being finally combined with various ingredients to produce different types of chocolate, such as dark chocolate, milk chocolate, and white chocolate [4]. The Latin name for the cacao tree, *Theobroma cacao* L., means 'Food of Gods' [5]. Chocolate contains mostly fat (in the form of cacao butter) and is rich in polyphenols, such as catechins, anthocyanidins, and pro anthocyanidins [6]. The polyphenol content of chocolate varies with different raw ingredient sources and manufacturing processes [3,7].

The polyphenols of chocolate, which originates from cacao beans, are thought to partially contribute to the cardiometabolic health benefits of chocolate in modulating blood pressure and lipid profiles [8]. Several meta-analyses have suggested the benefits of chocolate consumption in reducing the risk of cardiometabolic events including coronary

ABOUT CONTACT Cocoa, the delightful ingredient that gives chocolate its irresistible flavor, has long been cherished for its indulgent taste. But did you know that cocoa might also hold the key to enhancing your body's regenerative potential? A recent clinical study has shed light on the remarkable connection between cocoa and stem

## Guest Post: 7 Pleasantly Surprising Health Benefits of Dark Chocolate

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India Ki Pharmacy

**Controls Blood Pressure**  
Flavanol produces nitric oxide that dilates blood vessels and promotes blood flow, controlling blood pressure.

**Promotes Heart Health**  
Flavanols, polyphenols and theobromine in dark chocolates lowers LDL cholesterol and increases good cholesterol.

**Boosts Brain Function**  
The richness of cocoa promotes blood flow to the brain and exhibits positive impact on mood, memory and cognition.

**5 INCREDIBLE HEALTH BENEFITS OF DARK CHOCOLATE**

**Potent Anti-inflammatory Effects**  
Anti-inflammatory properties of dark chocolate reduce inflammation and other chronic diseases.

**Healthy Vision**  
Flavanols in dark chocolate promote nutrient flow to the retina and boosts vision.

As a sweet, chocolate is a confection containing saturated fat and processed sugar, two ingredients that are not healthy. But dark chocolate with high amounts of cocoa solids provides antioxidants, which mobilize stem cells, aid in blood sugar control, and reduce inflammation—all contributing to a reduced risk of diabetes.

# Chocolate and the brain: neurobiological impact of cocoa . - PubMed

Neuroscience and Biobehavioral Reviews 37 (2013) 2445–2453

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Neuroscience & Biobehavioral Reviews

Review

**Chocolate and the brain: Neurobiological impact of cocoa flavanols on cognition and behavior**

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Neurocognition  
Neuromodulation  
Neuroprotection

**ABSTRACT**

Cocoa products and chocolate have recently been recognized as a rich source of flavonoids, mainly flavanols, potent antioxidant and anti-inflammatory agents with established benefits for cardiovascular health but largely unproven effects on neurocognition and behavior. In this review, we focus on neuro-modulatory and neuroprotective actions of cocoa flavanols in humans. The absorbed flavonoids penetrate and accumulate in the brain regions involved in learning and memory, especially the hippocampus. The neurobiological actions of flavanols are believed to occur in two major ways: (i) via direct interactions with cellular cascades yielding expression of neuroprotective and neuromodulatory proteins that promote neurogenesis, neuronal function and brain connectivity, and (ii) via blood-flow improvement and angiogenesis in the brain and sensory systems. Protective effects of long-term flavanol consumption on neurocognition and behavior, including age- and disease-related cognitive decline, were shown in animal models of normal aging, dementia, and stroke. A few human observational and intervention studies appear to corroborate these findings. Evidence on more immediate action of cocoa flavanols remains limited and inconclusive, but warrants further research. As an outline for future research on cocoa flavanol impact on human cognition, mood, and behavior, we underscore combination of functional neuroimaging with cognitive and behavioral measures of performance.

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**1. Introduction**

Cocoa products and especially, chocolate has taken a special place in our daily life and culture. This food of the gods as tells its Latin name *Theobroma cacao* given by the noted Swedish nosologist Carl Linnaeus in 1753, has been ennobled in many countries around the globe as a curative drug, a culinary delight, and even a currency for commodity trading, retaining its appeal over the centuries. No

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<http://dx.doi.org/10.1016/j.neubiorev.2013.06.013>

Theobroma cacao—The Food of the Gods, provides the raw material for the multibillion dollar chocolate industry and is also the main source of income for about 6 million smallholders around the world. Additionally, cocoa beans have a number of other nonfood uses in the pharmaceutical and cosmetic industries. Specifically, the potential health benefits of cocoa have received increasing .

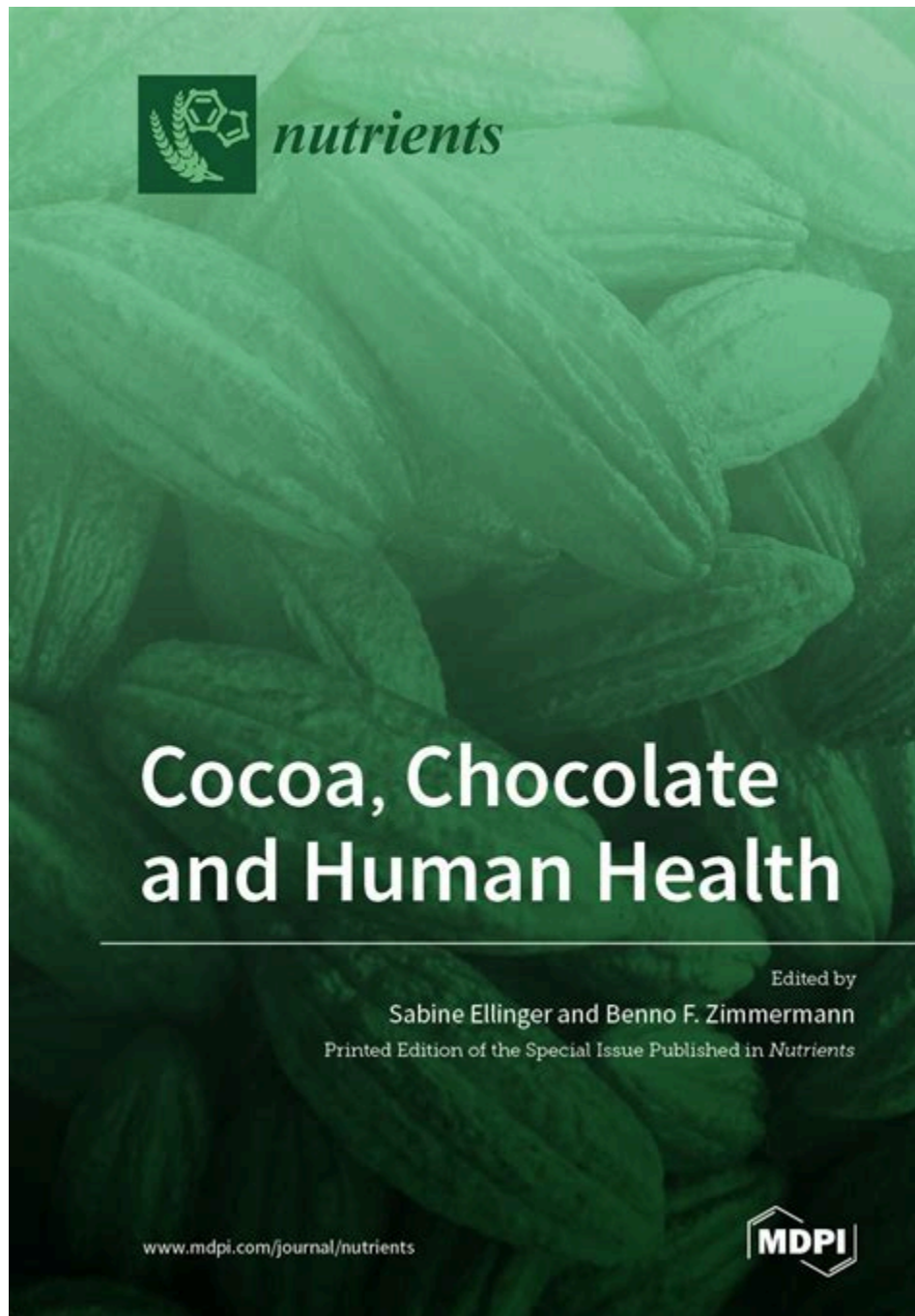
## How dark chocolate could boost brain health, immunity - Medical News Today



Date: April 24, 2018. Source: Loma Linda University Adventist Health Sciences Center. Summary: Findings from two new studies show dark chocolate consumption reduces stress and inflammation, while .



## Cocoa and Chocolate in Human Health and Disease - PMC



Among the many health effects assessed on several outcomes (including skin, cardiovascular, anthropometric, cognitive, and quality of life), we found that compared to controls, chocolate or cocoa product consumption significantly improved lipid profiles (triglycerides), while the effects of chocolate on all other outcome parameters were not sign.

## How Cocoa Boosts Stem Cells - A Fascinating Clinical Study



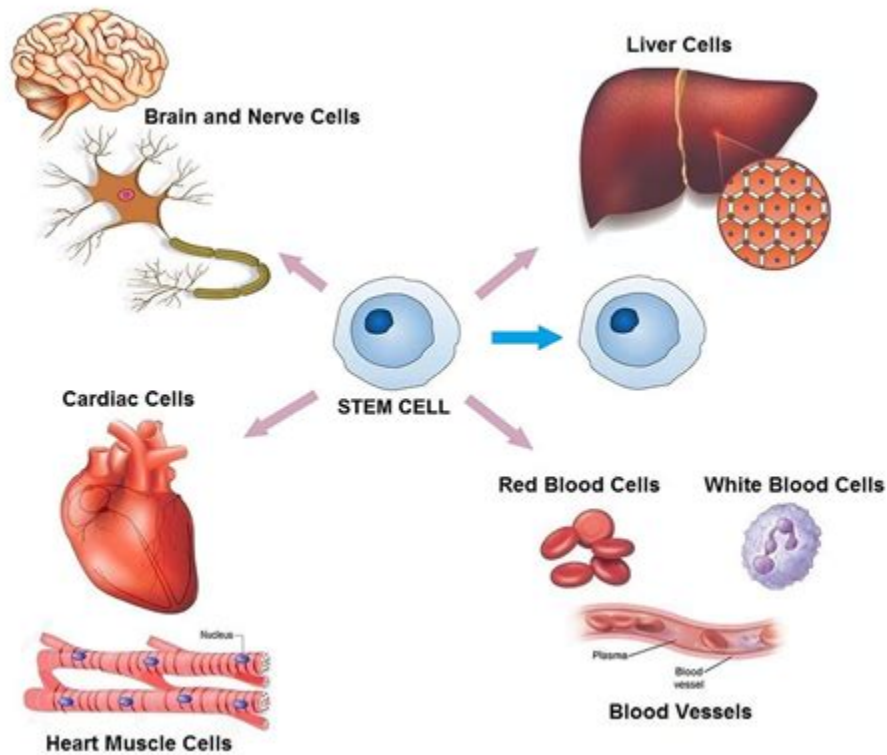
The endometrium is a dynamic tissue that undergoes cyclic changes in response to ovarian hormones during the menstrual cycle. These changes are crucial for pregnancy establishment and maintenance. Endometrial stem cells play a pivotal role in endometrial regeneration and repair by differentiating into various cell types within the endometrium.

### Cacao and Stem Cells - Téó Cacao



Cacao and Stem Cells by Jesse Breffle February 18, 2023 Stem cell research has been going on for a long time. There is a lot of controversy around it all but the importance of stem cells is not a debate. They are the master cells, the building blocks of our bodies.

## Regular Consumption of CACAO Doubles The Stem Cells Circulating In Your .



It is a Stem Cell-Recruiting Food. With the help of over 750,000 stem cells, your body regenerates itself each and every day. Dark chocolate can mobilize your stem cells to carry out their job to the fullest. At the University of California, San Francisco, researchers found that participants who received a chocolate drink made with cocoa twice .

### Can Food Reactivate Your Stem Cells? | Dr. William Li



Cocoa flavanols, Manson said, are believed to promote production of nitric oxide in the blood vessels,



which dilates and relaxes arteries, lowering blood pressure and keeping blood flowing to meet the body's needs. The flavanols may also have anti-inflammatory properties that improve glucose metabolism and lower insulin resistance.

## Cardiovascular Benefits of Dark Chocolate? - PubMed

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**Potent Antiinflammatory Effects**  
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**Healthy Vision**  
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August 19, 2023 • 9:30AM The Nectar of Regeneration: Unlocking the Potent Powers of Cacao on Stem Cells and Tissue Rejuvenation Cacao's Influence on Stem Cells and Tissue Regeneration Cacao, the sumptuous star behind our beloved chocolate, has always been celebrated for its delectable flavor.



## **Unleashing the Potential: How Cacao Nurtures Stem Cells for a Healthier .**



Regular Consumption of CACAO Doubles The Stem Cells Circulating In Your Blood Vessels

### **Cacao biotechnology: current status and future prospects - PMC**



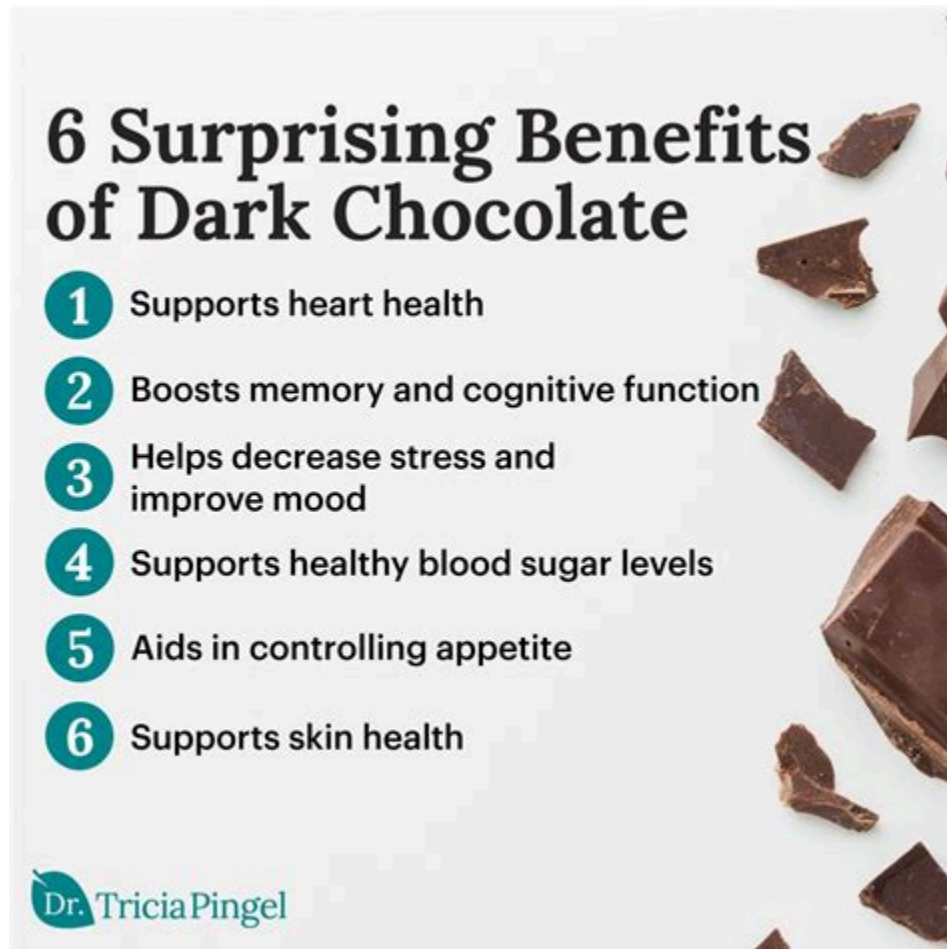
And according to Dr. Li, dark chocolate or cacao is one of the best foods for improving the stem cell response inside your body. Dark chocolate, containing 70 to 80 percent cacao or higher or its more processed cousin cocoa, is rich in polyphenols, antioxidants that help protect from disease-causing free radicals.

## Cacao Stem Cells: Boost Your Healing with Chocolate Power



It confers safeguards against cardiovascular diseases, certain types of cancers, and other brain-related disorders like Alzheimer's disease, Parkinson's disease, etc. Dark chocolate is considered a functional food due to its anti-diabetic, anti-inflammatory, and anti-microbial properties.

## 7 Pleasantly Surprising Health Benefits of Dark Chocolate



Cacao has also been shown to improve stem cell function. At the University of California, San Francisco, researchers explored whether a chocolate drink made with cocoa containing high levels of flavanols could influence stem cells and blood vessel health.

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