

Saraswati Dental College, Faizabad Road, Lucknow
Science Update Notice Board

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<http://www.medicalnewstoday.com/articles/299433.php>

Scientists uncover bacterial mechanism that links gum disease to heart disease

Catharine Paddock PhD, 14 September 2015

A new study clarifies the microbiology underlying the well-established link between gum disease and heart disease by identifying the effect of a bacterium common to both conditions. Researchers found that a **bacterium involved in gum disease alters the expression of genes that boost inflammation and atherosclerosis in the arteries that supply blood to the heart**. The study, from Orebro University in Sweden, is published in the journal 'Infection and Immunity'.

It surrounds the activity of a bacterium called *Porphyromonas gingivalis*, a well-known culprit in the development of periodontitis - a serious gum infection that damages the soft tissue that surrounds the teeth and attacks the bone that supports them. The team found that *P. gingivalis* **alters the expression of genes that code for proteins that boost inflammation and atherosclerosis in the coronary arteries** - the vessels that supply blood to the heart.

Atherosclerosis, or hardening of the arteries, is caused by artery walls becoming clogged up with fats, cholesterol and other substances. The build-up forms plaques that can burst and trigger a blood clot. **Previous studies have already shown that *P. gingivalis* is present in coronary artery plaques of heart attack patients, and animal studies have also shown that it triggers and hastens atherosclerosis in the aorta - the main artery from the heart to the rest of the body - and coronary arteries.**

The new study, led by Torbjörn Bengtsson, a Professor in the Department of Clinical Medicine, reveals the **underlying molecular mechanisms** behind such findings. *P. gingivalis* enzymes boost inflammation in aortic smooth muscle cells. Prof. Bengtsson and colleagues began by culturing human aortic smooth muscle cells and infecting them with *P. gingivalis*. Human aortic smooth muscle cells offer an ideal model for studying cardiovascular function and diseases like atherosclerosis at the cell level. When the heart pumps, it stretches the aorta, and the smooth muscle cells in the wall of this main artery contract it again. Changes in the wall of the aorta - such as those caused by atherosclerosis and high blood pressure - strongly influence this process.

When they injected *P. gingivalis* into the smooth muscle cells, the researchers found it secretes enzymes called **gingipains** that alter the ratio between two angiotensin-converting enzyme (ACE) inhibitors - proteins involved in inflammation - in a direction that boosts inflammation, which is thought to play an important role in atherosclerosis. Specifically, the team found that the gingipains boosted the expression of the pro-inflammatory protein angiotensin-converting enzyme 2 (Angpt2) and dampened the expression of the anti-inflammatory protein angiotensin-converting enzyme 1 (Angpt1).

The cell-signaling protein tumor necrosis factor (TNF) - which is produced in the human body - is also a cardiovascular risk factor that promotes atherosclerosis via Angpt1 and Angpt2. However, Prof. Bengtsson points out that their study shows the gingipains from *P. gingivalis* influence the two proteins independently from TNF.

First author Boxi Zhang, a PhD student in Prof. Bengtsson's lab, concludes: "Our **research clarifies the mechanism behind the association of periodontitis and cardiovascular disease. Our aim is to find biomarkers that can help us diagnose and treat both diseases.**"

In severe cases of periodontitis, dentists may prescribe antibiotics to fight the infection. However, Medical News Today recently learned of a study that suggests wild **blueberry extract may prevent the dental plaque** that leads to gum disease. The researchers say the dual antibacterial and anti-inflammatory action of lowbush blueberry polyphenols make them strong candidates for such a treatment.

Next week: Gum disease treatment using blueberry extract in development

Quote of the Day

*Do not dwell in the past,
do not dream of the future,
concentrate the mind on the present moment.*

..... Buddha



<http://www.medicalnewstoday.com/articles/298988.php>

Gum disease treatment using blueberry extract in development

3 September 2015

Gum disease is a common condition that, in severe cases, calls for antibiotics. Now, researchers are developing a treatment based on wild blueberry extract that could prevent the formation of dental plaque that leads to gum disease. Blueberry extract shows antibacterial and anti-inflammatory action. A report on the work, by a team from Université Laval in Canada, can be found in the *Journal of Agricultural and Food Chemistry*.

Many people have some degree of gum inflammation, or gingivitis, that results from the build-up of dental plaque containing bacteria. However, if the inflammation persists, it eventually leads to gum or periodontal disease. If the bacterial plaque is not removed - for example, by regular brushing and gum care - it leads to a much harder deposit called tartar that only a dental health professional can remove to stop the periodontal disease process. According to the Centers for Disease Control and Prevention (CDC), nearly half of American adults aged 30 and over have some form of periodontal disease. In severe cases of periodontal disease, the dentist may also prescribe antibiotics to fight the infection.

Fast facts about gum disease

- Gum disease and tooth decay are the two biggest threats to dental health
- Smoking, diabetes and poor oral hygiene increase risk of developing gum disease
- Red, swollen, tender or bleeding gums and persistent bad breath or bad taste are some of the signs of gum disease.
- Poor gum health has also been linked to a number of other diseases. For example, improving gum health may reduce heart risk, and that poor oral hygiene or gum disease is linked to higher risk of developing Alzheimer's disease.

The team behind the new study has been investigating a range of natural antibacterial compounds to fight gum disease. More recently they began to look at blueberry polyphenols, which are known to protect plants against some diseases. They wondered if the compounds - which they found in extracts from the wild lowbush blueberry, *Vaccinium angustifolium* Ait. - might have an effect on *Fusobacterium nucleatum*, a bacterium that plays a key role in gum disease.

Lab tests showed that the **compounds successfully stopped the bacterium growing and forming biofilms**. Tests on macrophages - immune system cells that play a key role in inflammation - also showed that the **polyphenol-rich extract blocked a molecular pathway that is involved in inflammation**.

Biofilms are precursors to plaques. They consist of a matrix of substances the bacteria produce and in which they embed themselves. The researchers conclude: "This dual antibacterial and anti-inflammatory action of lowbush blueberry polyphenols suggests that they may be promising candidates for novel therapeutic agents." The team is now developing an oral device that slowly releases the extract after deep cleaning to help treat gum disease.

https://en.wikipedia.org/wiki/Flag_of_India

National Flag of India – Tiraṅgā

The National Flag of India is a horizontal rectangular tricolour of deep saffron, white and India green; with the Ashoka Chakra, a 24-spoke wheel, in navy blue at its centre. It was adopted in its present form during a meeting of the Constituent Assembly held on 22 July 1947, when it became the official flag of the Dominion of India. The flag was subsequently retained as that of the Republic of India. In India, the term "tricolour" (Hindi: तिरंगा, Tiraṅgā) almost always refers to the Indian national flag. The flag is based on the Swaraj flag, a flag of the Indian National Congress designed by Pingali Venkayya.

The flag, by law, is to be made of khadi, a special type of hand-spun cloth, or silk made popular by Mahatma Gandhi. The manufacturing process and specifications for the flag are laid out by the Bureau of Indian Standards. The right to manufacture the flag is held by the Khadi Development and Village Industries Commission, who allocate it to the regional groups. As of 2009, the Karnataka Khadi Gramodyoga Samyukta Sangha has been the sole manufacturer of the flag.

Usage of the flag is governed by the Flag Code of India and other laws relating to the national emblems. The original code prohibited use of the flag by private citizens except on national days such as the Independence Day and the Republic Day. In 2002, on hearing an appeal from a private citizen, Naveen Jindal, the Supreme Court of India directed the Government of India to amend the code to allow flag usage by private citizens. Subsequently, the Union Cabinet of India amended the code to allow limited usage. The code was amended once more in 2005 to allow some additional use including adaptations on certain forms of clothing. The flag code also governs the protocol of flying the flag and its use in conjunction with other national and non-national flags.

Sizes of the National Flag		
Flag size ^[1]	Length and width (mm)	Size of Ashoka Chakra (mm)
1	6300 × 4200	1295
2	3600 × 2400	740
3	2700 × 1800	555
4	1800 × 1200	370
5	1350 × 900	280
6	900 × 600	185
7	450 × 300	90
8	225 × 150	40
9	150 × 100	25

According to the Flag code of India, the Indian flag has a ratio of two by three (where the length of the flag is 1.5 times that of the width). All three stripes of the flag (saffron, white and green) are to be equal in width and length. The size of the Ashoka Chakra is not specified in the Flag code, but it has twenty-four spokes that are evenly spaced. In section 4.3.1 of "IS1: Manufacturing standards for the Indian Flag", there is a chart that details the

size of the Ashoka Chakra on the nine specific sizes of the national flag. In both the Flag code and IS1, they call for the Ashoka Chakra to be printed or painted on both sides of the flag in navy blue.

A few days before India became independent on 15 August 1947, the specially constituted Constituent Assembly decided that the flag of India must be acceptable to all parties and communities. So, a modified version of the Swaraj flag was chosen; the tricolour remained the same saffron, white and green. However, the charkha was replaced by the Ashoka Chakra representing the eternal wheel of law. The philosopher Sarvepalli Radhakrishnan, who later became India's first Vice President and second President, clarified the adopted flag and described its significance as follows:

“ Bhagwa or the saffron colour denotes renunciation or disinterestedness. Our leaders must be indifferent to material gains and dedicate themselves to their work. The white in the centre is light, the path of truth to guide our conduct. The green shows our relation to (the) soil, our relation to the plant life here, on which all other life depends. The "Ashoka Chakra" in the centre of the white is the wheel of the law of dharma. Truth or satya, dharma or virtue ought to be the controlling principle of those who work under this flag. Again, the wheel denotes motion. There is death in stagnation. There is life in movement. India should no more resist change, it must move and go forward. The wheel represents the dynamism of a peaceful change.

There are certain rules against the misuse of the National Flag. Some of the most important of these are as follows

1. Flag should not be lowered before anything.
2. It is to be borne on the right shoulder of the standard bearer and carried in front of the procession.
3. No other flag should be placed above the national flag or to its right.
4. When the flag is horizontal, the saffron end should be at the top.

The Indian Flag Code is a set of laws that govern the usage of the Flag of India. The Bureau of Indian Standards is the authority which governs and enforces the manufacture and correct usage of the flag according to the certain standards issued in three sets of documents. The standards were created in 1968 and thereafter updated in 2008.

The National Flag reminds us of the sacrifices made by our freedom-fighters to earn us freedom. We should up-hold its glory and honour by all means within our power.

Quote of the Day

Happiness is not something readymade.

It comes from your own actions.

... Dalai Lama

Republic Day of India

Republic Day honors the date on which the **Constitution of India** came into force on 26 January 1950 replacing the Government of India Act (1935) as the governing document of India. The Constitution was adopted by the Indian Constituent Assembly on 26 November 1949, and came into effect on 26 January 1950 with a democratic government system, completing the country's transition towards becoming an independent republic. **26 January was chosen as the Republic day because it was on this day in 1930 when the Declaration of Indian Independence (Purna Swaraj) was proclaimed by the Indian National Congress as opposed to the Dominion status offered by the British Regime.**

The Constitution gave the citizens of India the power to choose their own government and paved the way for democracy. Dr. Rajendra Prasad took oath as the first President of India at the Durbar Hall in Government House and this was followed by the Presidential drive along a five-mile route to the Irwin Stadium, where a salute of 21 guns and the unfurling of the Indian National Flag by Dr. Rajendra Prasad heralded the historic birth of the Indian Republic on that day. Thereafter 26th of January was decreed a national holiday and was recognised as the Republic Day of India.



President Rajendra Prasad (in the horse-drawn carriage) readies to take Part in the first Republic Day parade on Rajpath, New Delhi, in 1950

India achieved independence from British rule on 15 August 1947 through the Indian Independence Act 1947 (10 & 11 Geo 6 c 30), an Act of the Parliament of the United Kingdom. The country did not yet have a permanent constitution and its laws were based on the modified colonial Government of India Act 1935. On 28 August 1947, the Drafting Committee was appointed to draft a permanent constitution, with Dr B R Ambedkar as Chairman. While India's Independence Day celebrates its freedom from British Rule, the Republic Day celebrates of coming into force of its constitution. A draft constitution was prepared by the committee and submitted to the Assembly on 4 November 1947. The Assembly met, in sessions open to public, for 166 days, spread over a period of 2 years, 11 months and 18 days before adopting the Constitution. After many deliberations and some modifications, the 308 members of the Assembly

signed two hand-written copies of the document (one each in Hindi and English) on 24 January 1950. Two days later, it came into effect throughout the nation.

The main **Republic Day celebration** is held in the national capital, New Delhi, at the Rajpath before the President of India. On this day, ceremonious parades take place at the Rajpath, which are performed as a tribute to India - its unity in diversity and rich cultural heritage. One of the main functions of the Republic Day Parade is to pay tribute to the martyrs who have sacrificed their lives for the country and to confer bravery awards on military persons, citizenry and children for showing courage in the face of adversity.

The **Beating Retreat ceremony** is held after officially denoting the end of Republic Day festivities. It is conducted on the evening of 29 January, the third day after the Republic Day every year. It is performed by the bands of the three wings of the military, the Indian Army, Indian Navy and Indian Air Force. The venue is Raisina Hill and an adjacent square, Vijay Chowk, flanked by the North and South block of the Rashtrapati Bhavan (President's Palace) towards the end of Rajpath. The Chief Guest of the function is the President of India who arrives escorted by the 'President's Bodyguards' (PBG), a cavalry unit. When the President arrives, the PBG commander asks the unit to give the National Salute, which is followed by the playing of the Indian National Anthem, Jana Gana Mana, by the Massed Bands, and at the same time by the unfurling of the National Flag of India on the flagpole. 'Beating the Retreat' has emerged as an event of national pride when the Colours and Standards are paraded. The ceremony traces its origin to the early 1950s when Major Roberts of the Indian Army indigenously developed the unique ceremony of display by the massed bands. 'Beating Retreat' marks a centuries old military tradition, when the troops ceased fighting, sheathed their arms and withdrew from the battlefield and returned to the camps at sunset at the sounding of the Retreat. Colours and Standards are cased and flags lowered. The ceremony creates longing for the times gone by.

Quote of the Day

The time is always right to do what is right.

..... Martin Luther King, Jr.