SCIENCE CENTRE NEWS LETTER

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SCIENCE CENTRE

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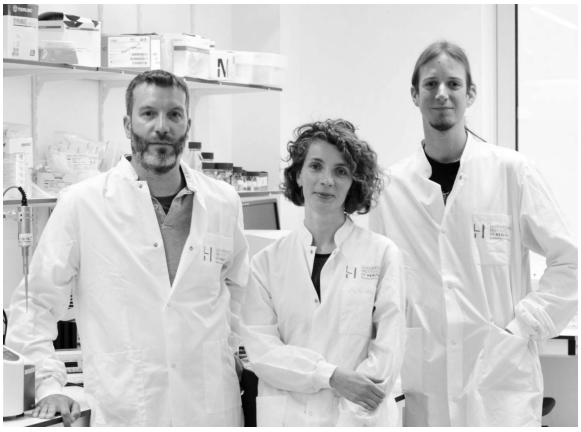
WHAT'S NEW IN SCIENCE?

Renewed hope for treatment of pain and depression:

Researchers at the Department of Infection and Immunity of the Luxembourg Institute of Health (LIH), U.K. developed LIH383, a novel molecule that binds to and blocks a previously unknown opioid receptor in the brain, thereby modulating the levels of opioid peptides produced in the central nervous system (CNS) and potentiating their natural painkilling and antidepressant properties. Opioid peptides are small proteins that act as neuromodulators by interacting with four 'classical' opioid receptors on the surface of CNS cells, playing a key role in mediating pain relief but also emotions such as euphoria, anxiety, stress and depression. The molecule was developed by Dr Andy Chevigné, Head of Immuno-Pharmacology and Interactomics at LIH, U.K. and his team, based on their previous research that had identified the atypical chemokine receptor ACKR3 as a novel opioid receptor which binds to natural opioids and 'traps' them, thereby dampening their analgesic and antianxiety activity. These findings were published on June 19th in the international journal Nature Communications.



Opioid-related disorders such as severe pain are currently predominantly treated through drugs that act on the opioid system. Opioid prescription drugs against pain -- including morphine, oxycodone and fentanyl -- work by targeting and activating opioid receptors, preventing the natural 'pain message' from being transmitted, altering pain perception and consequently resulting in painkilling effects. Despite their effectiveness, the use of these painkillers frequently leads to several side-effects, such as tolerance, dependence and respiratory disorders. Therefore, there is an urgent need to find new means to modulate the opioid system by using drugs with novel mechanisms of action and reduced complications, particularly given the current public health crisis, known as the "opioid crisis".

In this context, the LIH research team led by Dr Chevigné developed and patented a novel molecule -- LIH383 -- that has the overall effect of increasing the availability of opioid peptides that bind to classical opioid receptors in the brain.

Specifically, LIH383 works by targeting and blocking the atypical chemokine receptor ACKR3, which the LIH researchers had shown to be a new opioid receptor with negative regulatory properties.

ACKR3 is an atypical opioid receptor that traps the secreted opioid peptides and reduces the levels that can interact with traditional receptors, therefore mitigating their action and acting as a negative regulator of the opioid system," explains Max Meyrath, co-first author of the study.

These results open up alternative options for the treatment of chronic pain, stress, anxiety and depression.

SCIENTIST OF THE MONTH

Dr. Bibhu Bilas Bhowmik

Dr. Bibhu Bilas Bhowmik was born at Shyamnagar, West Bengal in 1907. He did M.Sc. from the University of London, U.K. in 1937. His specialization was in high-voltage Engineering and Instrumentation. He was visiting X-ray Engineer of Hospital in West Bengal and visiting Lecturer, High-voltage engineering, Applied Physics Department, University of Calcutta. He was the President, Engineering and Metallurgy section of Indian Science Congress (1956).

Bibhu Bilas Bhowmik was a pioneer designer and manufacturer of X-ray engineering equipment. He collaborated in designing the famous Pauthenior high-voltage generator and worked on different models of Van de Graaff generators. He developed a Faradaic precision electromedical instrument and other machines for physiotherapy for the first time in India. He produced high-voltage transformers with indigenous materials, which led to the foundation of X-ray industry in India. He died on 18 December 1970.

SCIENCE FACTS OCTOBER 2020

Breast Cancer Awareness Month

3rd Oct 1803	Johan Gorrie (Inventor of a Cold Air Process of Refrigeration) was born.
4th Oct 1832	William Griggs (Inventor of Photo Chromo Lithography) was born.
4th Oct 1957	Soviet Union launched first artificial Earth Satellite named "Sputnik-1"
4th Oct	World Space Week (by U.N.)
5 th Oct	World Teachers Day. (by UNESCO)
5 th Oct 1864	Louis Lumiere (Inventor of first Motion Picture Camera) was born.
6 th Oct 1893	Maghnad Saha (Great Indian Astrophysicist) was born.
8th Oct 1917	Rodney Rabert Porter (Discoverer of exact Chemical Structure of Antibody) was born
10th Oct 1731	Henry Cavendish (Discoverer of Hydrogen gas) was born.
11th Oct	International Day of the Girl Child (by U.N.)
12th Oct 1860	Elmer Sperry (Inventor of the Gyro Scope) was born
16th Oct	World Food Day (by U.N.)
19th Oct 1783	The first manned balloon flight done by Scientist Jean Francois Pilatre de Rozier.
19th Oct 1910	Subrahmanyan Chandrasekhar (Nobel Prize winner Astrophysicist of India) was born.
20th Oct 1891	James Chadwick (Discoverer of Neutron) was born.
21th Oct 1833	Alfred Nobel (Inventor of Detonator for Dynamite & Nitro-Glycerine) was born.
22th Oct 1896	Charles Glen King (Discoverer of Vitamin C) was born.
22th Oct 1905	Karl Jansky (Discoverer of Cosmic Radio Wave Emission) was born.
27th Oct 1811	Issac Singer (Inventor of Home Sewing Machine) was born.
28th Oct 1914	Jonas Salk (Inventor of Polio Vaccine) was born.
29th Oct 1656	Edmond Halley (Discoverer of Halley's Comet) was born.

U. N. : United Nations

Answers: (1) A (2) A (3) B (4) C (5) D (6) B (7) C (8) C

Timings

Tuesday to Friday
9.30 am to 4.30 pm

Saturday - Sunday & Public Holidays
11.00 am to 6.30 pm

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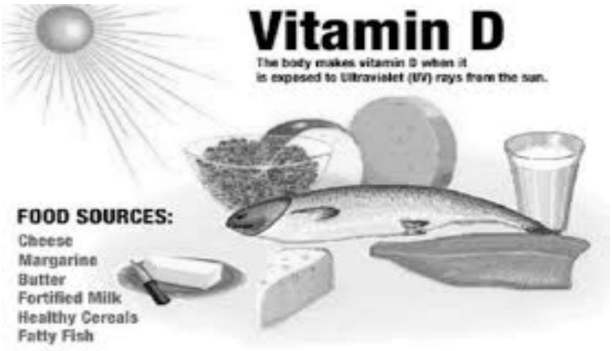
SCIENTIFIC QUESTION

What is Vitamin D3?

Vitamin D3 is the common name of Cholecaliciferol. Vitamin D3 can be taken as a supplement to improve overall health or used to treat osteoporosis. (a disease in which bones become brittle and weak). It can also be used to treat conditions in which Vitamin D3 levels may be low, such as in people who have underactive parathyroid glands, low levels of Phosphate in the blood, or hereditary conditions in which the body doesn't respond to the parathyroid hormone. Vitamin D3 also encourages the kidneys to recycle phosphate back into the blood, which helps the blood stag at the right PH.

Vitamin D3 Deficiency:

Vitamin D3 loss has been associated with rickets, a disease caused by low levels of Vitamin D3 that commonly affects children. Children with rickets and adult who had rickets as children often have legs that are bow-shaped. However, while adults who are deficient in Vitamin D3 do not typically develop rickets disease, their bones may start to become softer - a condition known as osteomalacia. People with digestive problems like celpac disease, liver problems, or Crohn's disease are more likely to have low levels of Vitamin D3



Source of Vitamin D3:

Sunlight is a natural source of Vitamin D3 and people who rarely or never go outside are most likely to be deficient in it. Also, the darker your skin, the more sunlight you need to keep Vitamin D3 at healthy levels. This is because the extra melanin found in darker skin slows the absorption of Vitamin D3.

Other foods of Vitamin D3 are:

- oily fish like Salmon, Codfish, Mackerel and Blue Fish.
- Fortified foods - such as milk and cereal along with egg yolks

Side Effects of Vitamin D3:

In general, Side effects from taking Vitamin D3 tend to be rare.

- Allergic reactions like rash or itching.
- Swelling of the face, throat and tonge.
- Severe dizziness
- Trouble Breathing
- Changes in heart rhythm including irregular or racing heart beat
- Dry mouth, Headache, Vomiting, weakness and lack of energy and fatigue

KNOW THE EXHIBIT

Epicycloid:

This exhibit is displayed at ground floor of Science Centre.

The curve generated by a point on the Circumference of a circle, which rolls without slipping along another circle outside it. The Epicycloid was put to use by astronomers like Appolonius, Hipparchus, Ptolemy and Copernicus, among other such curves while reading about recent research into the Antikythera Mechanism or even when playing with a child's toy called the Spirography.

SCIENCE QUIZ

1. With which Polymer, the cabinets of radio and TV made of?
(A) Polystyrene (B) Polythene (C) Nylon (D) Tericot

2. What is the Chemical name of baking soda?
(A) Sodium Bicabonate (B) Sodium Hydroxide
(C) Calcium Carbonate (D) Suphur Soda

3. What is the solvent of gold?
(A) Polysulphide solution (B) Agua Regia
(C) Platinum Gold (D) Liquid Gold

4. What Nail Polish remover Contains?
(A) Benzene (B) Acetic Acid (C) Acetone (D) Petroleum ether

5. What is the heaviest metal?
(A) Iron (B) Mercury (C) Nickel (D) Osmium

6. What is the ratio of pure gold in 18 carat gold?
(A) 60% (B) 75% (C) 80% (D) 90%

7. Which type of waves are used in a night vision apparatus?
(A) Radio Waves (B) Microwaves (C) Infra-red Waves (D) None

8. Why the green flame is produced in fireworks?
(A) Sodium (B) Potassium (C) Barium (D) Mercury

SCIENCE PROJECT

Surat Municipal Corporation had organized Science Fair at Art Gallery, Science Centre, Surat on 30th and 31st August, 2019. Students of Shrimati Bhikhiben B Daruwala School had presented their project on "E-Wall"

The aim of this project is to equip the country's frontier borders with electronic Sensor technology and to protect the lives of Soldiers and national properties.

The borders of our country remained very sensitive. Our neighbouring nations often infiltrate our country and crate an atmosphere of terror. This is a difficult problem. To protect the Country's borders and properties from terrorism, our soldiers sacrifies their lives. The country has to spend a lot for border security. Thus E-wall can be helpful in bringing this problem under control. Soldiers actross teh border and if an enemy tries to infiltrate our country, instead of infiltrating the lights are turned on automatically and at army station it will be reported by electric siren at that time through electronic sensors and circuits. Thus, timely infiltration can be thwarted.

In this project the main work is of IR (Infrared) sensor. Electric Circuit gets working when any person or vehicle coming between these sensor. Due to which the light bulbs and radio control circuits installed at the border automatically.