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Editorial

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Mini Review section – Conjunctivitis is inflammation of the outermost layer of the white part of the eye and the inner surface of the eyelid. It makes the eye appear pink or reddish. Pain, burning, scratchiness, or itchiness may occur. The affected eye may have increased tears or be "stuck shut" in the morning. Swelling of the white part of the eye may also occur. Itching is more common in cases due to allergies. Conjunctivitis can affect one or both eyes.

Current Trends section – Recent studies have shown that plasma can efficiently inactivate microbial pathogens such as bacteria, fungi and viruses in addition to degrading toxins. Moreover, this technology is effective at inactivating pathogens on the surface of medical and dental devices, as well as agricultural products. The current practical applications of plasma technology range from sterilizing therapeutic medical devices to improving crop yields as well as the area of food preservation.

In Profile Scientist – Gagandeep Kang born on 3 November 1962 is an Indian microbiologist and virologist who is the Professor in the Department of Gastrointestinal Sciences at the Christian Medical College, Vellore, India[and was an executive director of the Translational Health Science and Technology Institute, Faridabad, an autonomous institute of the Department of Biotechnology, Ministry of Science and Technology, Government of India.Her major research focus is on viral infections in children, and the testing of rotaviral vaccines. She also works on other enteric infections and their consequences when children are infected in early life, sanitation and water safety.

Bug of the Month – Adenoviruses (members of the family Adenoviridae) are medium-sized (90–100 nm), nonenveloped (without an outer lipid bilayer) viruses with an icosahedral nucleocapsid containing a double-stranded DNA genome. Their name derives from their initial isolation from human adenoids in 1953.They have a broad range of vertebrate hosts; in humans, more than 50 distinct adenoviral serotypes have been found to cause a wide range of illnesses, from mild respiratory infections in young children (known as the common cold) to life-threatening multi-organ disease in people with a weakened immune system.

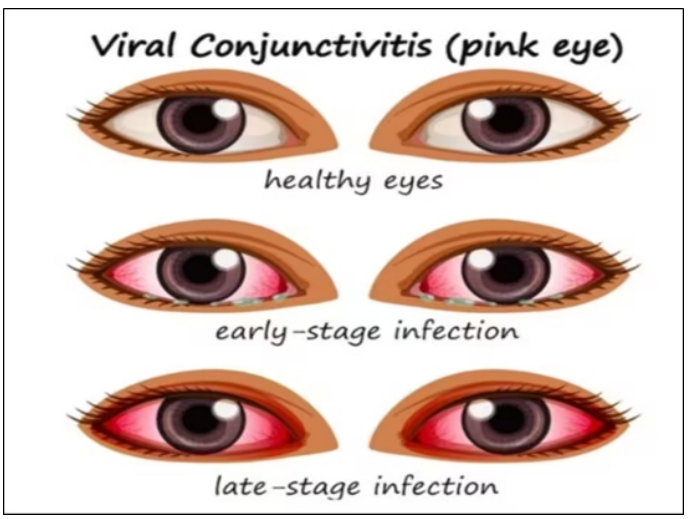
Did You Know? – Vitamin D, also known as the sunshine vitamin, has long been known to be a hormone that regulates calcium-phosphorous homeostasis and safeguards the integrity of the skeletal system. The epidermis is the natural source of vitamin D synthesis by the action of ultraviolet light (UV) B of the sun or other UVB source. On the other hand, evidence is accumulating that vitamin D might represent a key modulator of immune and inflammation mechanisms**.** Recently, a role for vitamin D in the pathogenesis of different skin diseases, including psoriasis, has been reported.

Best Practices – Maintaining the safety of food is crucial not only to the success of a food manufacturing business but also to the health of consumers. It entails a concerted effort and commitment to following food safety processes by all those involved in food production to keep food safe, prevent costly product recalls, and stay aligned with industry standards. Collaboration within the organization and preparation at every step of production from receiving the raw materials to the delivery of the finished product can help in the effective implementation of food safety processes in the organization.

Tickle yourself enjoying the jokes in our **Relax Mood section**.
Our JHS team is thankful to all our readers for their ever-increasing appreciation that has served as a reward & motivation for us. Looking forward for your continuous support.

Conjunctivitis on rise

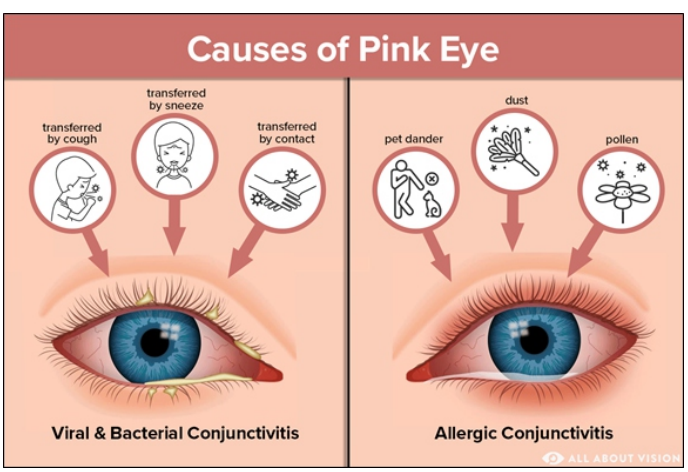
With persistent rain, cases of conjunctivitis, or 'pink eye', are on the rise in several parts of the country. Conjunctivitis is inflammation of the outermost layer of the white part of the eye and the inner surface of the eyelid. It makes the eye appear pink or reddish. Pain, burning, scratchiness, or itchiness may occur. The affected eye may have increased tears or be "stuck shut" in the morning. Swelling of the white part of the eye may also occur. Itching is more common in cases due to allergies. Conjunctivitis can affect one or both eyes.



The most common infectious causes are viral followed by bacterial. The viral infection may occur along with other symptoms of a common cold. Both viral and bacterial cases are easily spread between people. Allergies to pollen or animal hair are also a common cause. Diagnosis is often based on signs and symptoms.

How do you get Conjunctivitis

There are three main types of conjunctivitis: viral, bacterial, and allergic. However, conjunctivitis can also be caused by irritants, such as a foreign body in the eye, chemicals, or pollutants.



Viral Conjunctivitis

The following viruses can cause viral conjunctivitis, with adenoviruses being one of the most common causes:

- Adenoviruses
- Rubella virus
- Rubeola (measles) virus
- Herpesviruses, including
  - o Herpes simplex virus
  - o Varicella-zoster virus, which also causes chickenpox and shingles
  - o Epstein-Barr virus, which also causes infectious mononucleosis (mono)
- Picornaviruses.

Viral conjunctivitis is highly contagious. Most viruses that cause conjunctivitis spread through hand-to-eye contact by hands or objects that are contaminated with the infectious virus. Having contact with infectious tears, eye discharge, fecal matter, or respiratory discharges can contaminate hands. Viral conjunctivitis can also spread by large respiratory tract droplets. As viral conjunctivitis can be highly contagious, infected individuals should be counseled to prevent transmission e.g., washing hands frequently, using separate towels, and avoiding close contact with others during the period of contagion.

Most cases of acute, infectious conjunctivitis in adults are viral and self-limited; these cases do not require antimicrobial treatment. Antiviral medication may be used to treat more serious forms of conjunctivitis, such as conjunctivitis caused by herpes simplex virus or varicella-zoster virus.

Depending on the cause of viral conjunctivitis, some patients may have additional symptoms or conditions, such as the following:

- Common cold, flu, or other respiratory infection.
- Pharyngoconjunctivial fever – a syndrome that can produce conjunctivitis as well as a fever and sore throat, and is most commonly caused by infection with adenovirus serotypes 3, 4, and 7.
- Epidemic keratoconjunctivitis – a more severe type of conjunctivitis, commonly caused by infection with adenovirus serotypes 8, 19, and 37.
- Acute hemorrhagic conjunctivitis – a type of conjunctivitis that is often associated with large epidemics worldwide, especially in the tropical and subtropical regions. The viruses most commonly associated with it include enterovirus 70, coxsackievirus A24, and adenoviruses.
- Herpetic keratoconjunctivitis – a type of conjunctivitis associated with herpes simplex virus and blister-like lesions on the skin; it may affect only one eye.
- Rubella and rubeola (measles) – conjunctivitis can occur with these viral rash illnesses which are usually accompanied by rash, fever, and cough.

Bacterial conjunctivitis

Streptococcus pneumoniae, one common cause of bacterial conjunctivitis.

Many species of bacteria can cause bacterial conjunctivitis including:

- *Haemophilus influenzae*

- *Streptococcus pneumoniae*
- *Moraxella catarrhalis*
- *Chlamydia trachomatis*
- *Staphylococcus aureus*
- *Moraxella lacunata*
- *Neisseria gonorrhea*
- *Neisseria meningitides*

Bacterial conjunctivitis can spread from person to person in many ways. These include from hand-to-eye contact, via eye contact with contaminated objects, vertically from mother to baby. Bacteria can also spread by large respiratory tract droplets. Alternatively, changes in the usual bacteria that live on the conjunctiva can also cause conjunctivitis.

Signs and symptoms of bacterial conjunctivitis overlap with other causes of conjunctivitis, including viral and allergic conjunctivitis, which can make diagnosis difficult. Typical signs and symptoms include:

- Red eye
- Purulent discharge that causes eyelids to be matted together
- Chemosis
- Decreased vision
- Eyelid swelling and pain

Contact lens wearers with bacterial conjunctivitis are at higher risk of bacterial keratitis. They should be asked to remove their contact lenses, treated with topical antibiotics, and promptly evaluated by an ophthalmologist.

Types of bacterial conjunctivitis include:

Acute bacterial conjunctivitis

- Is the most common form of bacterial conjunctivitis
- In children is often caused by *Haemophilus influenzae*, *Streptococcus pneumoniae*, or *Moraxella catarrhalis*
- Is typically self-limited within 1–2 weeks, but topical antibiotic therapy may reduce the duration of disease

Hyperacute bacterial conjunctivitis

- Is a very rare and severe type of conjunctivitis with rapid onset and progression, as well as severe symptoms, including massive exudate, severe chemosis, eyelid swelling, marked hyperemia, pain, and decreased vision
- Caused by *Neisseria gonorrhoeae* or *Neisseria meningitidis*
- Requires both parenteral and topical antibiotic therapy
- Can progress to corneal infiltrates, melting and perforation and vision loss if not treated promptly by an ophthalmologist

Chronic bacterial conjunctivitis

- Defined as symptoms lasting for at least 4 weeks
- Common causes include by *Staphylococcus aureus* or *Moraxella lacunata*
- Often occurs with blepharitis (inflammation of the eyelid), which can cause flaky debris and warmth along the lid
- People with this condition should see an ophthalmologist

Chlamydial conjunctivitis

- In neonates
  - Infection usually is acquired during delivery of infants born to mothers with Chlamydia trachomatis
  - It is called chlamydial ophthalmia neonatorum in the first 4 weeks of life
  - Usually symptoms develop 5 to 14 days after birth; symptoms can develop earlier if the amniotic sac is ruptured during delivery Concurrent chlamydial infection elsewhere in their bodies (e.g., lungs, nasopharynx) is common
  - Approximately 50% of infants who develop pneumonia have a history of chlamydial conjunctivitis
  - Presenting symptoms include watery, mucopurulent, or bloody discharge, marked swelling with red, thickened, and friable conjunctivae, and a pseudomembrane may form
- Trachoma
  - The leading global cause of preventable blindness
  - A chronic follicular conjunctivitis caused by *Chlamydia trachomatis* subtypes A through C
  - Causes scarring of the inner eyelid which can cause the eyelashes to turn in and scratch the cornea (trichiasis), leading to permanent damage
  - Transmitted from person to person through contact with discharge from the eyes or nose of an infected person, through shared items, or by flies spreading ocular secretions
  - Repeat infections occur in children younger than 10 years of age
  - Common in developing countries where access to water and sanitation may be poor.

Gonococcal conjunctivitis

- In neonates
  - Infection usually is acquired during delivery of infants born to mothers with *Neisseria gonorrhoeae*
  - It is called gonococcal ophthalmia neonatorum in the first 4 weeks of life
  - It usually presents in the first 2 days of life and can be associated with bacteremia and meningitis
  - Prompt treatment is recommended as there is concern for corneal perforation, scarring, and blindness.

Allergic Conjunctivitis

Allergic conjunctivitis is common in people who have other signs of allergic disease, such as hay fever, asthma, and eczema. It is caused by the body's reaction to certain substances it is allergic to, such as

- Pollen from trees, plants, grasses, and weeds
- Dust mites
- Animal dander
- Molds
- Contact lenses and lens solution
- Cosmetics.

Disinfection and sterilization using plasma technology

Recent studies have shown that plasma can efficiently inactivate microbial pathogens such as bacteria, fungi and viruses in addition to degrading toxins. Moreover, this technology is effective at inactivating pathogens on the surface of medical and dental devices, as well as agricultural products. The current practical applications of plasma technology range from sterilizing therapeutic medical devices to improving crop yields as well as the area of food preservation.

Irving Langmuir first coined the term 'plasma' in 1927 to describe an ionized gas. Early applications of plasma technology mainly focused in the field of engineering, such as nuclear fusion and plasma etching.

However, over the past 20 years, there has been a plethora of patents and scientific papers describing the microbicidal properties of plasma. Recently accumulated knowledge has led to improvements in the efficiency of the disinfection and sterilization using plasma technology and a growing awareness of its potential utility.

Fundamentals of Plasma and Method for its Generation

There are three commonly encountered states of matter: solid, liquid, and gas. When a solid is heated, it transforms into a liquid and then from a liquid into a gas. If enough energy is applied to gas, it becomes an ionized gas known as plasma, which represents the fourth fundamental state of matter.

The plasma contains reactive chemical species such as electrons, ions, neutral molecules, and atoms, as well as charged species. In addition, the emission of radiation occurs in the ultraviolet (UV) as well as visible and near-infrared regions during plasma generation.

A state of plasma could be typically classified according to temperature as shown in Table 1.

Classification	Temperature	Electron Density	Discharge Type	Examples
High-temperature plasma (Equilibrium plasma)	Te ≈ Tion ≈ Tgas = 06–108	ne ≥ 1020	Laser fusion Tokamak	Fusion plasma for energy
Thermal plasma (Quasi-quilibrium plasma)	Te ≈ Tion ≈ Tn ≈ Tgas ≤ 2 × 104	ne ≥ 1020	Arc plasma, Plasma torch, Radio-frequency (RF) Plasma, Microwave plasma etc.	Radiation, welding and cutting, Waste treatment, Material processing, etc.
Non-thermal plasma (Non-equilibrium plasma)	Te ≥ Tion ≥ Tn ≈ Tgas = 300–1000	ne ≈ 1010	Glow discharge, Corona discharge, atmospheric pressure plasma jet (APPJ), dielectric barrier discharge (DBD), micro-hollow cathode discharge (MHCD), Plasma needle, Low-pressure plasma etc.	Ozonizer, Plasma medicine, Volatile organic compound (VOC) treatment, Plasma agriculture, Surface modifications (coating, etching, activation, cleaning, nitration, etc.), Illumination (plasma screen, fluorescent lamps, etc.)

Te = electron temperature, Tion = ion temperature, Tgas = gas temperature, ne = electron density.

In a high-temperature plasma, which is a strong or fully ionized plasma, the temperature of the electrons Te and ions Tion are the same, so they are in thermal equilibrium with each other by collision due to thermal motion. The gas temperature Tgas of high-temperature plasma and thermal plasma is too extreme for treating living organisms. Alternatively, in non-thermal plasma, comprising partially ionized plasmas, the temperature of the electrons Te is much higher than that of the ions Tion and neutrons Tn. The energy transfer of the kinematics of a collision between electrons (light particles) and ions or neutrals (heavy particles) tends to be very slow by elastic collision, but

electron-electron collisions readily achieve thermodynamic equilibrium. Therefore, the ionized gas temperature keeps the normally ambient temperature in non-thermal plasma. As a result, the gas temperature of non-thermal plasma remains low, making it suitable for biological applications.

Electrical discharge methods commonly utilized for non-thermal plasma generation in biological applications are generally categorized into one of the following: glow discharge, corona discharge, atmospheric pressure plasma jet (APPJ), dielectric barrier discharge (DBD), micro-hollow cathode discharge (MHCD), DC discharge, pulse discharge, or high/low-frequency discharge. The type of discharge depends on the frequency of the power source, such as direct current (DC) and alternating current (AC) discharge, as well as ambient gas pressure, such as low-pressure and atmospheric pressure plasma, and the precise shape and configuration of the electrodes [9]. In addition, the waveform may also affect the type of discharge. Different types of plasma can be used in various biological fields, including disinfection/sterilization.

Non-thermal plasma is easy to obtain under low-pressure conditions because the collisions between electrons, ions, and neutral molecules occur infrequently. Low-pressure plasma can be generated by a low breakdown voltage in a vacuum chamber evacuated with a vacuum pump. Low-pressure plasma systems are important for the manufacture of semiconductor components. Furthermore, research into low-pressure plasma systems has also focused on the decontamination and sterilization of medical devices. Although low pressure plasma can generate high concentrations of active species with a uniform glow plasma, it involves high maintenance costs because of the requirement for a vacuum system. Atmospheric pressure plasma requires a high voltage and relatively high temperature due to frequent collisions between electrons and ions accompanying the high particle density. However, it is possible to generate plasma under non-thermal conditions by using a pulse discharge and APPJ, DBD, and floating electrode barrier discharge (FE-DBD) or MHCD. These non-thermal conditions allow applications involving exposure of the plasma with tissues such as skin.

Similarly, non-thermal plasma can be used to disinfect agricultural products and medical devices with relatively little impact on their structural integrity. Alternatively, the plasma could be transferred to a target site where the object for treatment is located using a plasma afterglow shown in Figure 1.

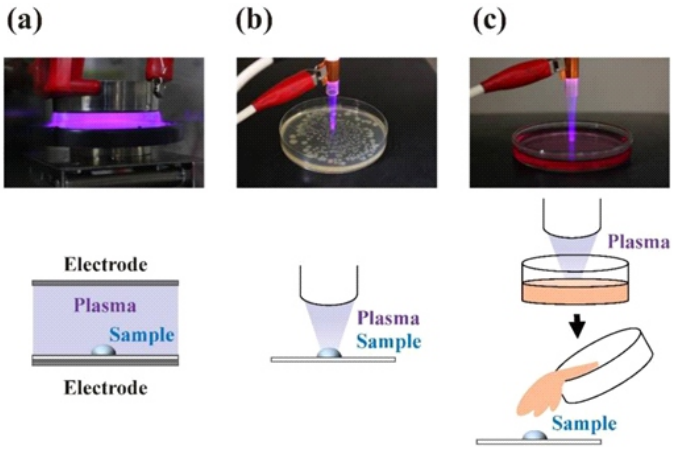


Figure 1

Indirect treatment using solutions treated with plasma, known as “plasma-activated water (PAW)” [33], “plasma-activated medium (PAM)”, “plasma-stimulated medium (PSM)”, “plasma-treated water (PTW)”, “plasma-treated phosphate-buffered saline (pPBS)”, or “non-thermal plasma-conditioned media (NTP media)”, is also possible. The constituents in these solutions react with samples and act as disinfectants or anti-cancer agents.

In cases where samples are in contact with plasma bulk in the discharging area, plasma components such as UV radiation and reactive chemical species directly interact with the samples. Thus, short-life reactive chemical species, such as reactive oxygen species (ROS) and reactive nitrogen species (RNS), efficiently interact with the sample components. By contrast, in cases where the sample is in contact with plasma bulk away from the discharging area, the contribution of UV radiation is significantly lower.

In addition, there is a greatly reduced concentration of reactive chemical species in the post discharging area due to their short half-life at ambient temperature. In the case of plasma-treated solutions, freezing can extend the storage time and minimize the loss of reactive chemical species.

Gagandeep Kang

Gagandeep Kang born on 3 November 1962 is an Indian microbiologist and virologist who is the Professor in the Department of Gastrointestinal Sciences at the Christian Medical College, Vellore, India[and was an executive director of the Translational Health Science and Technology Institute, Faridabad, an autonomous institute of the Department of Biotechnology, Ministry of Science and Technology, Government of India.Her major research focus is on viral infections in children, and the testing of rotaviral vaccines. She also works on other enteric infections and their consequences when children are infected in early life, sanitation and water safety. She was awarded the prestigious Infosys Prize in Life Sciences in 2016 for her contributions to understanding the natural history of rotavirus and other infectious diseases.In 2019, she became the first Indian woman to be elected as a Fellow of the Royal Society.She was on the Life Sciences jury for the Infosys Prize in 2020.

Kang is co-author of book **Till We Win: India's Fight Against The COVID-19 Pandemic**, with Chandrakant Lahariya, a leading Indian medical doctor and Public policy and health system expert and Randeep Guleria, the director of AIIMS, New Delhi. The book has been published by India's leading publisher Penguin Random House India and has become an instant bestseller.

Gagandeep Kang was born in Shimla on 3 November 1962. Her mother taught English and history and her father was a mechanical engineer in the Indian Railways. Kang grew up moving around north and east India, changing schools 10 times. She practiced science frequently at home during her childhood, building a lab with her father at home when she was 12 and experimenting in biology, physics and chemistry.

Kang completed her Bachelor of Medicine, Bachelor of Surgery (MBBS) in 1987 and her Doctor of Medicine (MD) in Microbiology in 1991 from Christian Medical College, Vellore and obtained her PhD in 1998. She obtained her membership of the Royal College of Pathologists and carried out postdoctoral research with Mary K. Estes at the Baylor College of Medicine, Houston before returning to the Christian Medical College.

Kang is a medical scientist who has worked on diarrhoea diseases and public health in India since the early 1990s. She is a key contributor to rotavirus epidemiology and vaccinology in India. Focusing on vaccines, enteric infections and nutrition in young children in disadvantaged communities, she has combined field epidemiology with intensive laboratory investigations to inform both the science of infectious diseases and policy in India. Her comprehensive research on rotavirus has demonstrated the high burden of rotavirus disease across India, the genetic diversity of viruses, the lower protection from infection and vaccines and the exploration of several approaches to improve the performance of oral vaccines. Her work has led to her being described as India's "vaccine godmother".

She has published over 300 scientific papers and is or was on editorial boards for several journals, including PLoS Neglected Tropical Diseases, Current Opinion in Infectious Diseases and Tropical Medicine and International Health. She is on many review committees for national and international research funding agencies, and has served on several advisory committees mainly related to vaccines, including India's National Technical Advisory Group on Immunisation, the WHO's Global Advisory Committee on Vaccine Safety and the Immunisation and Vaccine Implementation Research Advisory Committee. She chairs the WHO SEAR's Regional Immunisation Technical Advisory Group (2015–present). She has received honorary appointments as an associate faculty member at the Johns Hopkins University Bloomberg School of Public Health in Baltimore, Maryland and adjunct professor at Tufts University School of Medicine in Boston, Massachusetts.

Kang played a significant role in the efforts that culminated in the development of Rotavac, a vaccine from Bharat Biotech that targets diarrhea. She was one of three principal investigators in the Phase III clinical trials of the vaccine.Her initial interest was in identifying the correlates of protection against the rotavirus. She and others began by recreating a study conducted in Mexico to identify children protected from rotaviral infection, research the immune responses and isolate the correlate of protection. The recreated study itself did not succeed, but it did develop high quality laboratory methods for the detection of rotaviruses. Kang and one of her students subsequently established vaccine assays for rotavirus infections, used in testing Rotavac.

Kang is the second Indian woman scientist to be elected a Fellow of the Royal Society (FRS) in 359 years of history of this scientific academy. She was the ninth woman to be awarded the Infosys Prize. She is the first Indian and the first woman to edit Manson's Textbook of Tropical Medicine. Other awards and honours include:

1998-1999 – Dr. P.N. Berry Fellowship
2005 – The Lourdu Yedanapalli Award for Excellence in Research
2006 – Woman Bioscientist of the Yearś
2016 – Infosys Prize in Life Sciences
2019 – Elected a Fellow of the Royal Society (FRS)

Jokes

Husband:
Call ambulance, fast!
I am having heart attack...

Wife: (took his mobile)
Quick!! Tell me the password

Husband:
It's ok! I am feeling
Better now.

Santa-Oye!what R U doing?

Banta-Recording this babys voice.

Santa-Why?

Banta- When he grows up,

I shall ask him what he meant by this..

Wife : had ur lunch.?

Husband : had ur lunch.?

Wife : i m asking you

Husband : i m asking you

Wife : u copying me.?

Husband : u copying me?

Wife : lets go shopping

Husband :Yes i had my lunch

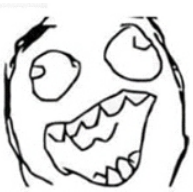
After English Exam

How Was The Paper ?

It Was Easy But Question 5 Confused Me

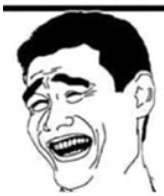
What Was the question?

Question 5 Wanted The
Past Tense Of "Think",
I Thought & Thought & Thought
And End Up With Writing "Thinked"



Dad!
I'm going out!

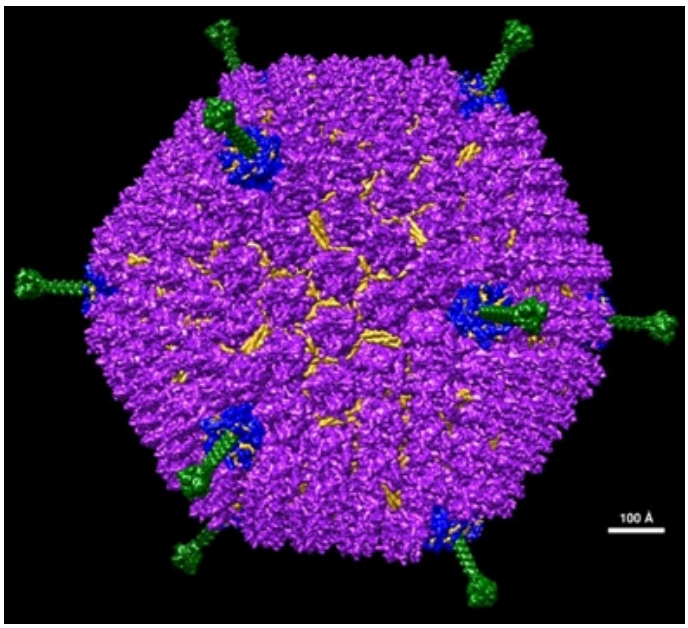
Are you telling me or are
you asking me permission?



I'm asking you for
money!

Boy:
"What's your age...?"
Girl:
"We don't reveal our age
to boys...!"
Boy:
"What's your
email address...?"
Girl:
"pooja_1988@gmail.com"

Adenovirus



Adenoviruses (members of the family Adenoviridae) are medium-sized (90–100 nm), nonenveloped (without an outer lipid bilayer) viruses with an icosahedral nucleocapsid containing a double-stranded DNA genome. Their name derives from their initial isolation from human adenoids in 1953.

They have a broad range of vertebrate hosts; in humans, more than 50 distinct adenoviral serotypes have been found to cause a wide range of illnesses, from mild respiratory infections in young children (known as the common cold) to life-threatening multi-organ disease in people with a weakened immune system.

In humans, currently there are 88 human adenoviruses (HAdVs) in seven species (Human adenovirus A to G). Different types/serotypes are associated with different conditions:

- respiratory disease (mainly species HAdV-B and C)
- conjunctivitis (HAdV-B and D)
- gastroenteritis (HAdV-F types 40, 41, HAdV-G type 52)
- obesity or adipogenesis (HAdV-A type 31, HAdV-C type 5, HAdV-D types 9, 36, 37)

All these types are called Human mastadenovirus A–G by the ICTV, because all are members of the genus *Mastadenovirus*.

Adenoviruses are medium-sized (90–100 nm). The virions are composed of one linear piece of double-stranded DNA inside an icosahedral capsid. 240 hexon proteins make up the bulk of the capsid, while twelve penton bases cap the icosahedron's corners. The penton bases are associated with protruding fibers that aid in attachment to the host cell via the receptor on its surface.

In 2010, the structure of the human adenovirus was solved at the atomic level, making it the largest high-resolution model ever. The virus is composed of around 1 million amino acid residues and weighs around 150 MDa.

Adenoviruses can cause mild to severe illness, though serious illness is less common. People with weakened immune systems, or existing respiratory or cardiac disease, are at higher risk of developing severe illness from an adenovirus infection.

Adenoviruses can cause a wide range of illnesses such as:

- common cold or flu-like symptoms
- fever
- sore throat
- acute bronchitis (inflammation of the airways of the lungs, sometimes called a "chest cold")
- pneumonia (infection of the lungs)
- pink eye (conjunctivitis)
- acute gastroenteritis (inflammation of the stomach or intestines causing diarrhea, vomiting, nausea and stomach pain)

Less common symptoms of adenovirus infection include

- bladder inflammation or infection
- neurologic disease (conditions that affect the brain and spinal cord)

Adenoviruses are usually spread from an infected person to others through

- close personal contact, such as touching or shaking hands
- the air by coughing and sneezing
- touching an object or surface with adenoviruses on it, then touching your mouth, nose, or eyes before washing your hands

Some adenoviruses can spread through an infected person's stool, for example, during diaper changing. Adenovirus can also spread through the water, such as swimming pools, but this is less common. Sometimes the virus can be shed (released from the body) for a long time after a person recovers from an adenovirus infection, especially among people who have weakened immune systems. This "virus shedding" usually occurs without any symptoms, even though the person can still spread adenovirus to other people.

Treatment

There are no approved antiviral medicines and no specific treatment for people with adenovirus infection. Most adenovirus infections are mild and may be managed with rest and over-the-counter pain medicines or fever reducers to help relieve symptoms. Always read the label and use medications as directed. **Adenovirus vaccine is for U.S. military only.** There is a vaccine for adenovirus types 4 and 7 that is used in military personnel who may be at higher risk for infection from these two adenovirus types. This vaccine contains live virus that can be shed in stool and potentially cause disease in other people if transmitted. The safety and effectiveness of this vaccine has not been studied in the general population or in people with weakened immune systems, and it is not approved for use outside of the military. There is currently no adenovirus vaccine available to the general public.

Psoriasis Symptoms Are More Severe in People With Low Vitamin D

Psoriasis is a chronic immune-mediated inflammatory skin disease, with a prevalence of about 2%–3% in the general population. The primary manifestation of psoriasis most commonly manifests on the skin, although inflammatory processes can occur also in other organs. Indeed, nowadays psoriasis is considered a systemic pathology, including also other conditions, from psoriatic arthritis to obesity and metabolic disease (MetS), which increased cardiovascular risk in psoriatic patients. Histologically, the dermatosis is characterized by hyperproliferation of keratinocytes, impaired epidermal barrier function at the sites of skin lesions, and skin infiltration by activated inflammatory cells. The aetiology of psoriasis is not fully understood. Several factors contribute to its development, such as auto-immunological, genetic, hormonal and psychosomatic issues.

Vitamin D, also known as the sunshine vitamin, has long been known to be a hormone that regulates calcium-phosphorous homeostasis and safeguards the integrity of the skeletal system. The epidermis is the natural source of vitamin D synthesis by the action of ultraviolet light (UV) B of the sun or other UVB source. On the other hand, evidence is accumulating that vitamin D might represent a key modulator of immune and inflammation mechanisms**.** Recently, a role for vitamin D in the pathogenesis of different skin diseases, including psoriasis, has been reported. However, the effectiveness of vitamin D supplementation as adjunctive treatment option in psoriatic patients still remains controversial. In the current review, we analyzed the possible bi-directional links between vitamin D and psoriatic disease.

Patients suffering from psoriasis present a broad range of clinical phenotypes. Psoriatic lesions are classified into plaque, guttate, pustular, and erythrodermic types according to clinical features, especially regarding lesions size and distribution. Disease onset may occur at any age, including childhood, with two peak age ranges, 16 to 22 and 57 to 60 years. Psoriasis lesions are characterized by hyper-proliferation with incomplete differentiation of epidermal keratinocytes and decreased keratinocyte apoptosis, associated with inflammatory cellular infiltrate in both dermis and epidermis. Psoriasis Area and Severity Index (PASI) score is currently the preferred method for the assessment of the disease severity and extent.

The role of vitamin D as main regulator of skin physiology is very complex. The epidermis is composed of four layers: basal layer (stratum basale), spinous layer (stratum spinosum), stratum granulosum and stratum corneum. The stem cells within the basal layer, which contact the basement membrane, continually divide during the lifetime of the organism, providing a source of cells which progressively migrate upwards through the epidermis, differentiating and stratifying to form the barrier layer of the skin. The process of epidermal differentiation is complex, sequential, and tightly controlled. The precursor of vitamin D, 7-dehydrocholesterol, is located in the membranes of keratonocytes of the basal and spinous layer of epidermis. By the action of UVB (wavelength between 290 and 315 nm), via a photochemical reaction, the B ring of 7-dehydrocholesterol is broken to form pre-vitamin D3 or cholecalciferol, which is subsequently converted first to 25-hydroxyvitamin D (25OHD) by the enzymes CYP27A1 and CYP2R1 and then to 1,25-hydroxyvitamin D (1,25(OH)D or calcitriol) the active form of vitamin D, by CYP27B1. Physiologically, the active form of vitamin D and its receptor regulate the differentiation and proliferation of keratinocytes, the balance of the cutaneous immune system and the process of apoptosis. The 1,25(OH)D has been shown to exert anti-proliferative effects on keratinocytes.

Numerous *in vitro* and *in vivo* studies have demonstrated dose-dependent effects of vitamin D on proliferation and differentiation of keratinocytes. Of interest, low concentration of vitamin D promotes keratinocyte proliferation *in vitro*, while at higher pharmacological doses a clear inhibitory effect became apparent. Moreover, 1,25(OH)D and analogs reduce S100A7 levels, generally up-regulated in psoriatic skin, in the reconstituted human epidermis stimulated by IL-22, in interleukin (IL)-17-stimulated keratinocytes and in skin of patients with psoriasis. Indeed, 1,25(OH)D regulates the cell proliferation in the stratum basale and increases the synthesis of keratins (K1 and K10), involucrin, transglutaminase, loricrin, and filaggrin, in the stratum spinosum. Furthermore, vitamin D helps to regulate the synthesis of glycosylceramides needful for the barrier integrity and permeability in the stratum corneum. These actions are due to the capacity of vitamin D to regulate intracellular calcium level, through induction of the calcium receptor, and the phospholipase C enzymes. A decrease or deficiency in 1,25(OH)D or a loss-of-function of its receptor has been shown to disrupt the differentiation of the epidermis, with reduced levels of involucrin and loricrin and loss of keratohyalin granules, resulting in hyperproliferation of the basal layer.

Best practices in food manufacturing

Maintaining the safety of food is crucial not only to the success of a food manufacturing business but also to the health of consumers. It entails a concerted effort and commitment to following food safety processes by all those involved in food production to keep food safe, prevent costly product recalls, and stay aligned with industry standards. Collaboration within the organization and preparation at every step of production from receiving the raw materials to the delivery of the finished product can help in the effective implementation of food safety processes in the organization.

It is absolutely crucial for food manufacturing companies to practice food hygiene and food safety to not only keep the business running, but to also stay compliant with Good Manufacturing Procedures (GMP) for food and to protect end customers and employees.

Facilities location and design

The design and location of a food processing facility need to be taken into account when ensuring food safety meets the correct standards. Areas that are known to be pest "hot spots" as well as prone to pollution need to be avoided to reduce the risk of contamination.

Machinery and production line design

The layout of the production line should allow easy maintenance and cleaning of machinery, surroundings and prevent contamination of the food products and ingredients during the production process. The design of machinery used for food processing also has to be taken into account to comply with food safety regulations. Poor design can result in build-up of food material in hidden places that are difficult to clean. There are standards for machinery design, such as the NSF equipment design standard, to ensure all food handling and processing is performed to a high standard of hygiene.

The 10 principles of sanitary design are:

- Cleanable to a microbiological level
- Made of compatible materials
- Accessible for inspection, maintenance, cleaning and sanitation
- No product or liquid collection
- Hollow areas hermetically sealed
- No niches
- Sanitary operational performance
- Hygienic design of maintenance enclosures
- Hygienic compatibility with other plant systems
- Validate cleaning and sanitizing protocols

Pest control

Pest control plays an important part in food safety. Troublesome insects such as cockroaches and flies can spread food-borne diseases by contaminating food at any stage of production. Rodents also spread diseases as well as causing damage to buildings, fixtures and machinery. Stored product insects can damage and contaminate food during transport and storage. Investing in pest control monitoring and detection can help prevent pests from entering a food processing establishment, assisting in the compliance of food safety.

Waste management

Provide appropriate containers and suitable waste storage areas. Establish adequate procedures for the storage and removal of waste. This prevents build-up of waste and pests and reduces risk of contamination of ingredients, equipment and products.

Cleaning

Establish cleaning and disinfection programmes to ensure the correct hygiene standards are met and reduce the risk of a foodborne illness outbreak. This includes properly cleaning and disinfecting food preparation areas as well as machinery and utensils used within the food processing cycle to eliminate the microorganisms that cause food poisoning. Adhering to the correct cleaning processes will also reduce the risk of pests such as rodents, flies and cockroaches in food preparation and processing areas by removing potential food sources and insect breeding sites.

Maintenance

Establishing proactive maintenance measures for premises and food processing machinery to ensure they run smoothly and properly, and ensures the production of safe foods. A number of food-borne illness outbreaks can be linked to the failure to ensure equipment is properly maintained under the correct sanitary conditions. Pests such as rats and mice can affect the way in which machines perform, gnawing at the power cables and contaminating the components that have direct contact with the products.

Personal hygiene

Installing the correct facilities for staff to ensure proper personal hygiene is met contributes towards meeting food safety requirements. Bacteria can easily be spread through biological and physical contamination. This can put foods at high risk of carrying food-borne diseases.

- Hand Washing — ensure effective hand washing techniques are followed at appropriate times.
- Minimise hand contact with food — try to minimise direct hand contact with raw food by using appropriate utensils and safe use of disposable gloves.
- Personal cleanliness — cover hair; do not sneeze or cough over food; cover cuts and sores; and do not wear jewellery.
- Wear protective clothing — wear suitable clean protective clothing and handle appropriately to prevent cross contamination.

Highlights of the coming issue

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