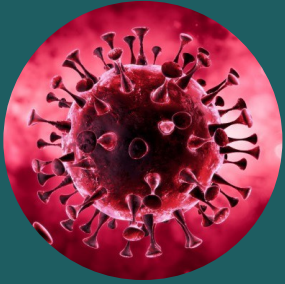


UPSC PATHSHALA

Essence

A Current Affairs
Monthly Publication



- Role of nitric oxide in fighting coronavirus
- Reforms in the National Pension System (NPS)
- Single crystal blades technology for helicopters
- Saudi Green Initiative and the Middle East Green Initiative
- UK's Indo-Pacific Tilt

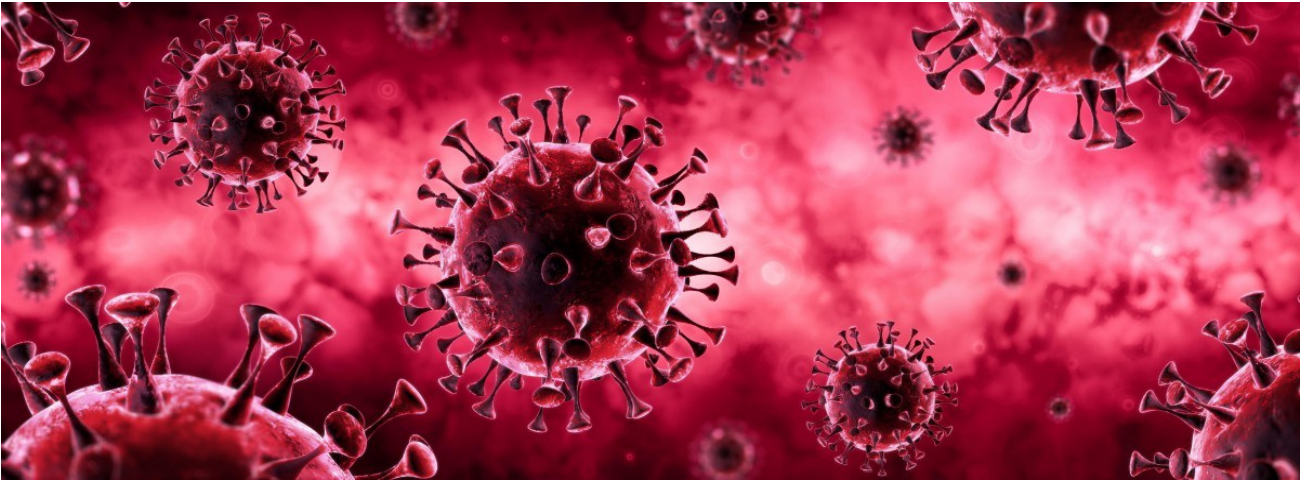
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1

Role of nitric oxide in fighting coronavirus

THEME:
Science & Technology



CONTEXT-

Recently, a multinational collaboration has announced the results of phase 2 clinical trials indicating that a nitric oxide nasal spray can be an effective viral treatment.

PRELIMS ANALYSIS:

About Nitric Oxide

The nitric oxide is known to have a broad antimicrobial effect against bacteria, fungi, helminths, protozoa and viruses.

MAINS ANALYSIS:

Background

- There is still no specific drug for controlling COVID-19 and scientists worldwide are working on effective antiviral drugs against SARS-CoV2, some are looking even beyond drugs.
- In this scenario scientists are considering use of nitric oxide nasal spray that can be an effective viral treatment.

What is Nitric Oxide nasal spray?

- The spray developed by a Vancouver-based biotech firm releases a small, topical amount of nitric oxide that is well known to kill viruses including SARS-CoV-2.
- As it is non-specific and thus kills any virus.
- The patients treated with the spray saw an average reduction of around 95% in viral load in the first 24 hours, and more than 99% within 72 hours.
- The self-administered nasal spray releases a small topical amount of nitric oxide and aims to kill the virus in the upper airways, preventing it from incubating and making its way to the lungs.
- To assess the potential of NO as a treatment for SARS-CoV-2 infection, researchers evaluated its vitro antiviral effect on SARS-CoV-2 replication.

WHO clearance for nitric oxide nasal spray

- The World Health Organization has yet to give an emergency use authorisation (EUA).
- Israel and Bahrain have given EUA to the spray, as a medical device.
- The developers have also applied for EUA in the UK.
- A phase 3 trial is being planned, although it would be for regulators to decide if it was needed
- How do scientists in India view this?
- Many Indian companies too are working on similar ideas.
- According to CSIR it is an interesting idea and the phase 2 clinical trial results look promising.

About Emergency Use Authorisation (EUA)

1. It is a mechanism in emergency situations that the regulatory authorities around the world have developed to grant interim approvals if there is sufficient evidence to suggest a medical product is safe and effective.
2. It allows the medicine or the vaccine to be used on the public
3. But the final approval is granted only after completion of the trials and analysis of full data.

Granting of Emergency Use Authorisation (EUA)

1. In the US, the Food and Drug Administration (FDA) grants an EUA only after it has been determined that the “known and potential benefits outweigh the known and potential risks of the vaccine” which implies that an EUA application can be considered only after sufficient efficacy data from phase 3 trials had been generated.
2. The EUA cannot be granted solely on the basis of data from phase 1 or phase 2 trials, although these too need to show the product is safe.
3. The FDA, for COVID vaccines, has specified that it would consider an application for EUA only if phase 3 data showed it was at least 50% effective in preventing the disease.

Emergency Use Authorisation (EUA) in India

1. Central Drugs Standard Control Organisation (CDSCO) is the regulatory authority in India.
2. India’s drug regulations do not have provisions for an EUA, and the process for receiving one is not clearly defined or consistent.
3. The CDSCO has been granting emergency or restricted emergency approvals to Covid-19 drugs such as remdesivir, favipiravir and itolizumab.

2

Reforms in the National Pension System (NPS)

THEME:
Society, Elderly



CONTEXT-

The National Pension System (NPS) will no longer compel investors to convert 40% of their accumulated retirement corpus into an annuity.

PRELIMS ANALYSIS:

What is meant by annuity?

- It is a contract between the policyholder and the insurance company, wherein the policyholder needs to make either lump-sum payment or pay in installments to receive regular income as an annuity after retirement. The annuities can be paid either immediately after payment of the lump-sum amount or after completion of the specific tenure.

MAINS ANALYSIS:

What is the National Pension System?

- National Pension System (NPS) is a voluntary, defined contribution retirement savings scheme designed to enable the subscribers to make optimum decisions regarding their future through systematic savings during their working life.
- NPS will inculcate the habit of saving for retirement amongst the citizens.
- It is run by the Pension Fund Regulatory And Development Authority (**PFRDA**).
- It is an attempt towards finding a sustainable solution to the problem of providing adequate retirement income to every citizen of India, said PFRDA.
- The National Pension System Trust (NPST) established by PFRDA is the registered owner of all assets under NPS.
- NPS account can be opened only in individual capacity and cannot be opened or operated jointly or for and on behalf of HUF.

Eligibility under National Pension System

- Any individual citizen of India (both resident and Non-resident) in the age group of 18-65 years (as on the date of submission of NPS application) can join NPS.
- The OCI (Overseas Citizens of India) and PIO (Person of Indian Origin) card holders and HUFs are not eligible for opening of NPS account.

Changes planned by PFRDA

- The law regulating the NPS allows members to withdraw just 60% of their accumulated savings at the time of retirement. With the remaining 40%, it is mandatory to buy an annuity product that provides a fixed monthly income to retirees till their demise.
- The members who accumulate up to ₹ 2 lakh in their NPS account at the time of retirement are exempted from the mandatory annuitisation, and they can withdraw the full amount.
- The limit on funds under the National Pension system (NPS) at the time of retirement will be revised to **Rs 5 lakh**.
- According to PFRDA, the regulator increased the maximum entry and exit age for the NPS scheme, allowing subscribers who join after **60 years of age to continue their NPS accounts till they are 75**.

What prompted this overhaul of the National Pension System?

- The falling interest rates and poor returns offered by annuity products had triggered complaints from some members and experts about the compulsory annuitisation clause.
- Since annuities are taxable, deducting the tax and factoring in the inflation means annuities are yielding negative returns.
- PFRDA believes that it will allow members to get better returns, and these savings can be paid out to members over 15 years through systematic withdrawal plans offered by mutual funds, etc.

Where does the National Pension System (NPS) invest your money?

- Under the NPS, individual savings are pooled into a pension fund which is invested by PFRDA-regulated professional fund managers into diversified portfolios comprising government bonds, bills, corporate debentures and shares etc. These contributions would grow and accumulate over the years, depending on the returns earned on the investment made.

3

Single crystal blades technology for helicopters

THEME:
Science & Technology



CONTEXT-

The Defence Research and Development Organisation (DRDO) has developed single crystal blades technology for helicopters and has supplied 60 of these blades to Hindustan Aeronautics Limited (HAL) as part of their indigenous helicopter development programme for engine application. With this, India has joined the league of nations, **including USA, UK, France and Russia**, that have the capability to manufacture single crystal (SX) components which are used for helicopter engines.

PRELIMS ANALYSIS:

About DRDO

- DRDO was formed in **1958** from the amalgamation of the then already functioning Technical Development Establishment (TDEs) of the Indian Army and the Directorate of Technical Development & Production (DTDP) with the Defence Science Organisation (DSO).

- DRDO is the **R&D wing of Ministry of Defence**, Govt of India. Its vision is to empower India with cutting-edge defence technologies and a mission to achieve self-reliance in critical defence technologies and systems, while equipping our armed forces with state-of-the-art weapon systems and equipment in accordance with requirements laid down by the three Services.

MAINS ANALYSIS:

What is a Single Crystal Blade?

The Single Crystal blades are made of nickel based superalloys. As these alloys can withstand high temperatures they are critical for powerful and compact aero engines to operate in extreme conditions. The technology is to be used in helicopters.

Grain Boundary

- In “Grain Boundary” technology the metal forms grains while solidifying and it is used to make blades.
- A grain boundary (GB) is the interface between two grains, or crystallites, in a polycrystalline material. Grain boundaries are defects in the crystal structure, and tend to decrease the electrical and thermal conductivity of the material.
- These boundaries lead to creep in the blades.

What is a Creep?

Creep is the tendency of blade material to deform at low temperatures.

What is Single Crystal Blade Technology?

- In Single Crystal Blade Technology the problem of creep is overcome. In it the alloys are designed to be used in single crystal form which means that there will be no boundaries.
- The technology uses a vacuum investment casting process to realise the blades which includes ceramic moulding, wax patterning, heat treatment.

4

Saudi Green Initiative and the Middle East Green Initiative

THEME:
Environment



CONTEXT-

Certain areas in four districts of Mizoram have been declared as epicentres of the African swine fever (ASF) that has so far killed 1,119 pigs in a month

PRELIMS ANALYSIS:

What is Saudi Green Initiative?

- Under Saudi Green Initiative, 10 billion trees will be planted in the Kingdom.
- It aims to reduce carbon emissions by more than 4% of global contributions, through a renewable energy programme that will generate 50% of Saudi's energy from renewables by 2030.
- It aims at raising the percentage of its protected areas to more than 30% of its total land area, representing roughly 6 lakh sq km, exceeding the global target of 17%.

What is the Middle East Green Initiative?

- Under this initiative, Saudi will coordinate with neighbouring countries of the Gulf Cooperation Council states and Middle Eastern Countries to plant 40 billion trees in the Middle East.
- This tree plantation program is claimed to be largest reforestation program in the world, double the size of the Great Green Wall in the Sahel which is the second-largest such regional initiative.
- It represents 5% of the global target of planting one trillion trees and reducing 2.5% of global carbon levels.



MAINS ANALYSIS:

Vision 2030: Saudi Arabia

- Prince Mohammed bin Salman has overseen a series of social and economic reforms known as 'Saudi Vision 2030'.
- They are aimed at modernising the country, reducing its dependence on oil, expanding its economy, developing the public service sector and bringing it in line with international human rights norms
- Under this a comprehensive restructuring of the environmental sector was done and Environmental Special Forces were established in 2019.
- It is a comprehensive road map to improve the quality of life of the citizens of the country and was unveiled in 2016.
- NEOM and the Line (proposed smart cities under the Vision) has already redefined the idea of sustainable habitats.

Significance

- The initiatives will help in shaping the Kingdom's tendency to protect earth and nature.
- The initiative will clearly define an ambitious road map; that rallies the region and significantly contributes to achieving global targets in confronting climate change.

5

UK's Indo-Pacific Tilt

THEME:
Science and Technology



CONTEXT-

The British Government has said that the UK Carrier Strike Group's "globe-spanning maiden deployment will feature visits to India, Japan, Republic of Korea and Singapore". Earlier, the European Union had announced that it will reinforce its strategic focus, presence and actions in the Indo-Pacific with the aim of contributing to the stability, security, prosperity and sustainable development of the region, based on the promotion of democracy, rule of law, human rights and international law.

PRELIMS ANALYSIS:

About Carrier Strike Group

- A carrier strike group (CSG) is a type of carrier battle group of the **United States Navy**.
- It is an operational formation composed of personnel, an aircraft carrier, a cruiser, a destroyer squadron of at least two destroyers or frigates, and a carrier air wing of 65 to 70 aircraft.

- A carrier strike group also, on occasion, includes submarines, attached logistics ships and a supply ship.
- The carrier strike group is a flexible naval force that can operate in confined waters or in the open ocean, during day and night, in all weather conditions.
- Carrier strike groups are combat **organized by mission rather than by platform**.

About UK Carrier Strike Group (CSG)

- The “28-week deployment” will span 26,000 nautical miles, and the Carrier Strike Group will “conduct engagements with Singapore, the Republic of Korea, Japan and India as part of the UK’s tilt towards the Indo-Pacific region”.
- It will undertake over 70 engagements in over 40 nations.

MAINS ANALYSIS:

Significance of UK CSG Deployment in Indo- Pacific:

- The deployment will bolster already **deep defence partnerships** in the region, where the UK is committed to a more enduring regional defence and security presence.
- Engagement in Singapore, the Republic of Korea, Japan and India “will provide the opportunity for strengthening our security relationships, tightening political ties and supporting our UK exports and International Trade agenda”.
- It will be a global deployment, from the North Atlantic to the Indo-Pacific and it will help achieve the UK’s goal for deeper engagement in the Indo-Pacific region in support of shared prosperity and regional stability.

Prelims Question

Q.1 Which of the following is correct regarding Central Drugs Standard Control Organisation?

1. The CDSCO is the Central Drug Authority for discharging functions assigned to the Central Government under the Drugs and Cosmetics Act.
2. It comes under Dept. of Pharmaceuticals, Ministry of Chemical & fertilisers.
 - a. 1 only
 - b. 2 only
 - c. 1 & 2
 - d. None of the above

Ans. a

Q.2 Which of the following are correct in relation to a virus-

1. From a biological perspective, viruses cannot be classified either as living organisms or non-living.
2. Viruses are inert outside a host cell, and are called virions.
 - a. 1 only
 - b. 2 only
 - c. Both 1 & 2
 - d. None of the above.

Ans. c

Q.3 Which of the following is correct regarding the National Pension Scheme?

1. Any individual citizen of India (both resident and Non-resident) in the age group of 18-60 years (as on the date of submission of NPS application) can join NPS.
2. NPS accounts can be opened only in individual capacity and cannot be opened or operated jointly or for and on behalf of HUF.
 - a. Only 1
 - b. Only 2
 - c. Both 1 & 2
 - d. None of the above

Ans.b

Q.4 Which of the following is correct regarding PFRDA?

1. The interim PFRDA was established in 2003.
2. This was to oversee the National Pension System (NPS), and regulate India's pensions sector.
 - a. Only 1
 - b. Only 2
 - c. Both 1 & 2
 - d. None of the above.

Ans. c

Q.5 Select the correct statements-

1. DRDO is the R&D wing of the Ministry of Home Affairs, Govt of India.
2. Defence Research and Development Organisation (DRDO) developed 'Sindhu Netra' satellite successfully deployed in space recently.
 - a. Only 1
 - b. Only 2
 - c. Both 1 & 2
 - d. None of the above

Ans. b

Q.6 Which of the following is correct regarding Single Crystal Blade Technology recently seen in news?

1. Creep is the tendency of blade material to deform at low temperatures.
2. In Single Crystal Blade Technology the problem of creep is overcome. In it the alloys are designed to be used in single crystal form which means that there will be no boundaries.
 - a. Only 1
 - b. Only 2
 - c. Both 1 & 2
 - d. None of the above

Ans. c

Q.7 Which of the following is not a bordering country of Saudi Arabia?

- a. Yemen
- b. Iraq
- c. U.A.E
- d. Israel

Ans.d

Q.8 Choose the correct options-

- 1. Saudi Green Initiative:** Under this initiative, Saudi will coordinate with neighbouring countries of the Gulf Cooperation Council states and Middle Eastern Countries to plant 40 billion trees in the Middle East.
 - 2. Middle East Green Initiative:** Under Saudi Green Initiative, 10 billion trees will be planted in the Kingdom.
- a. Only 1
 - b. Only 2
 - c. Both 1 & 2
 - d. None of the above

Ans. d

Q.9 Which of the following are correct statements regarding the North Sea?

1. Norwegian Sea lies to the south of the North sea.
 2. Irish Sea lies to the left of the North Sea
- a. Only 1
 - b. Only 2
 - c. Both 1 & 2
 - d. None of the above.

Ans. b

Q.10 Which of the following is a military exercise between the UK & India?

- a. Varuna
- b. Sampriti
- c. Ajeya Warrior
- d. Yudh Abhyas

Ans. c



Mains Practice Question



- 1. In the light of the present pandemic, discuss how culture and civic sense of a region can lead to better outcomes.**
- 2. Social Security for elderly in India is a necessity. Comment.**
- 3. Discuss the significance of modern technologies in fighting 21st century warfare.**
- 4. With the recent announcements of social & economic reforms by Saudi Arabia's Crown Prince, Comment on the need and necessity of these reforms across the Middle East.**
- 5. In the recent race of asserting power in the seas, Do you think we are moving towards colonisation of seas. Comment.**



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