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SCHOOL OF LIFE SCIENCES

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CHENNAI – 600048. TAMIL NADU. INDIA**

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Research and Opportunities in SLS

S. Hemalatha

School of Life Sciences

B.S.Abdur Rahman Crescent Institute of Science and Technology

Chennai – 600048, Tamil Nadu, India

❖ Pronounced Features of School of Life Sciences

- Established in the year 2013.
- Well qualified and dedicated members of faculty with Ph.D. and Post-Doctoral experience from abroad.
- Highly motivated and meritorious students.
- State of art Lab facilities.
- 12 laboratories facilitated in the 7 storey SLS Block.
- Semester patterned and choice based learning with flexible credit system.
- 360° feedback including all the stakeholders.
- Management strategy involves Class Advisor & Faculty Advisor.
- Wired and Wi-Fi internet connection all throughout the block.
- Collaboration with premier institutes and industries globally.
- Exclusive Department Library & Seminar Hall.
- International conferences are organized every year in association with universities abroad and sponsored by DST-SERB and ICMR, TNSCST.
- Several Workshops, Seminars, Guest Lectures, Industrial Visits have been organized.
- Motto of the School : ***Creating employers and not employees***
- Journal club conferences held by Undergraduates and research scholars.
- Research grants secured from DST, ICMR, DBT, BIRAC, and TNSCST.
- Faculty members serving as Editor and reviewers in Elsevier and other scientific publishers.

❖ Workshops / Conference Organized

1. Short Term Training Program on Algal Culturing Techniques and Biotechnology (STTP-ACTB) held on December 17-20, 2019 organized by School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India
2. International Conference on Biotechnology and Nanotechnology (ICBN 2019) held on September 30-31, 2019 organized by School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India

❖ International Internships :

Mr. Sriram B (B.Tech. Biotechnology) 4th Year student got selected to pursue final year project at Kangwon National University, Republic of Korea under Prof. M. Wang



❖ Awards and Honours:

Mr. Kishore J from **M.Sc. Microbiology (2018-2020)** and **Ms. Sathya R., Ph.D Scholar** received **Best Presentation award** in the DBT sponsored National Conference on Marine Natural Products and Pharmaceuticals 2019 held on September 15-16, 2019 at Sathyabama Institute of Science and Technology, Chennai, Tamil Nadu, India



Mr. Nassir Hussain A.E from **M.Sc. Biochemistry (2018-2020)** and **Mr. Sriram, B** from **B.Tech Biotechnology (2016-2020)** received **Best Presentation award** in the International Conference on Sustainable Development in Energy and Environment (ICSDEE'19), held on July 18-20, 2019 at Kamaraj College of Engineering and Technology, Virudhunagar



Ms. Sathya R., Ph.D Scholar received **best paper award** in the National Conference on Climate changes driven on Indian Biodiversity: Innovative solutions for Sustainable Development held September 25-27, 2019 at Pondicherry University, Puducherry, India

Ms. Pujitha S from **M.Sc. Microbiology (2018-2020)** appointed as **Coordinator for CRES_Sports 2K19** for her outstanding efforts in sports



Mr. Girish N and **Mr. Bharathan** from B.Tech Biotechnology (2017-2021) won II prize in Recharge 2019-Shutter up and Aura 19 respectively.

Mr. Abdul Haseeb from B.Tech Biotechnology (2017-2021) won I Prize in Quiz : Islamic Studies

❖ Publication details (2019)

Research / Review article: 40

Total Impact Factor: 38.726

Highest IF (2019): 4.525

❖ OPINION**Fluorosis – An Insidious Public Health Issue****V. Amalan Stanley**

International Institute of Biotechnology and Toxicology (IIBAT)
Padappai 601 301, Kancheepuram District, Tamil Nadu, India

Worldwide there are millions of people affected by the insidiously serious health problem called fluorosis and it is caused mostly due to the high concentration of fluoride in drinking water of natural and related sources (food, beverages and industrial pollution are other secondary sources), being ingested unwittingly, and getting accumulated in the mineralized tissues of the body, and the condition is called hydrofluorosis. There are endemic areas of fluorosis where the natural source of drinking water, eventually the local plants, is contaminated with fluoride in the soil in excess ¹.

India is among the 23 nations around the globe, where health problems occur due to the consumption of fluoride contaminated water at higher concentrations. An estimated 62 million people in India in 17 out of the 32 states are affected with dental, skeletal and/or non-skeletal fluorosis ². Tamil Nadu is one of the 19 states with high fluoride contamination in drinking water, and about 121 blocks in 19 districts have high fluoride concentration in groundwater including Dindigul, Salem, Madurai, Dharmapuri with new regions such as Viluppuram, Kancheepuram, Rameshwaram, Kanyakumari, Chennai being included in the list recently.

Chronic fluoride exposure through the ingestion of drinking water with a high fluoride level will result in its accumulation, predominantly in hard tissues such as teeth and bones, and cause diverse adverse changes, appearing in the form of dental mottling (dental fluorosis) and bone deformities (skeletal fluorosis; *genu valgum*) in both humans and animals ³. Besides, there are also reports, in humans as well as in domestic and laboratory animals, of non-skeletal fluorosis or toxic effects of chronic exposure to fluoride in soft tissues or organs including gastrointestinal discomforts, neurological disorders,

impaired endocrine and reproductive functions, teratogenic effects, renal effects, genotoxic effects, apoptotic and excito-toxic effects ⁴.

It is well known that skeletal fluorosis is more dangerous than dental fluorosis, and highly significant as it diminishes the mobility of fluorotic humans and animals at a very early age by producing varying changes in the bones such as periosteal exostosis, osteosclerosis, osteoporosis, and osteophytosis ^{5,6}. These changes appear clinically in the form of vague aches and pains in the body and joints, causing associated rigidity, lameness, stunted growth, and palpable bony lesions in the body ^{7,8}. The excess accumulation of fluoride in muscles also restricts movements and the condition leads to crippling and lameness in humans and domestic animals. Neurological complications such as paraplegia and quadriplegia, and the syndromes of genu-valgum or genu-varum can result from severe skeletal fluorosis in human beings.

There found to be a significant inverse association between the drinking water fluoride levels and IQ in children aged 6–14 years and 7–13 years ⁹. Interestingly, a research finding indicates that it could be the exposure of their mothers during pregnancy that could be the major cause of the F-induced neurotoxicity rather than the levels of fluoride that the children were exposed to at ages 6–14 years ¹⁰. Worldwide, fluoride has been known for its therapeutic effect of preventing dental caries, (but being challenged its authenticity of late, scientifically) and therefore has been in use for many decades as an important ingredient of toothpastes. Even it was known as pesticide in olden days. The paradoxical effect of fluoride, which serves as a caries preventer at lower concentrations conversely causes cancer at higher concentrations of chronic exposure to it, a kind of hormetic effect.

In spite of various health complications having been revealed through extensive research efforts for the past four decades, such as haematological, biochemical as well as metabolic, neurological ¹¹ and pathological changes including carcinogenic potential of it, in human beings and animals, many countries are still not considering it as a health problem.

In Tamil Nadu, in 2007, a three pronged strategy to control fluorosis at the community level, focussing on the hazardous effect of fluoride prevalent in Dharmapuri and Salem districts, jointly by the officials of Hogenakkal Water Supply and Sanitation

Project and Japan Bank of International Cooperation (JBIC) allocating about hundred crores towards implementation of a) health component, b) school education component and c) community component to tackle the problem of fluorosis ¹².

Prevention is the bedrock of fluorosis management as suggested by many eminent scientists in India, who have been in the field for more than three decades. Experts emphasise the need for Governments to invest in diagnostic facility for fluorosis in all hospitals. The diagnostic procedure involve testing blood, urine and drinking water for fluoride, along with haemoglobin testing and a forearm x-ray. Children require additional tests in the form of thyroid hormone/thyroid stimulating hormone assay and urinary iodine levels. It involves identifying the source of fluoride entry, cutting out the source and promoting intake of vegetables, fruits and dairy products rich in essential nutrients (calcium, iron, vitamins and other antioxidants) ¹³. In the Fluorosis Management Programme, the major thrust is on (i) awareness generation, (ii) opting technology for fluoride removal/strategy for providing safe water on a sustainable basis, and (iii) emphasis on importance of consuming calcium, vitamin C, E and antioxidant-rich diet for minimizing the adverse effects of fluoride ¹⁴. With this in mind, a project to map the incidence of endemic fluorosis in Tamil Nadu and also create awareness among the victims, presenting them with preventing measures, an ICSSR project is being initiated by the International Institute of Biotechnology & Toxicology, Padappai, TN, recently. If any of the readers are aware of such incidence in TN, it is suggested to inform the author of this article.

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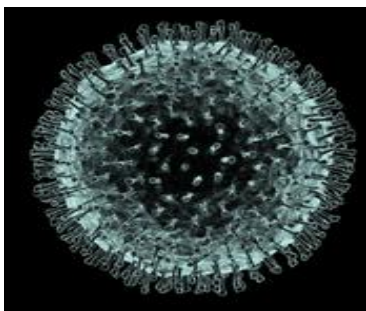
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❖ **Mini Review****Biology of Corona Virus****Divya R**

Biotechnology, School of Life Sciences, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India

Coronaviruses are a group of viruses that causes that cause disease in mammals and birds. In human this virus causes respiratory infections. Including the common cold which are typically mild.



| | |
|------------|-----------------------|
| Realm | Riboviria |
| Phylum | <i>Incertae sedis</i> |
| Order | Nidovirales |
| Family | Coronaviridae |
| Sub family | orthocoronavirinae |

Human coronaviruses

Coronaviruses are believed to cause a significant percentage of all common colds in human adults and children. Coronaviruses cause colds with major symptoms, e.g. fever, throat swollen **adenoids**

There are **seven strains of human coronaviruses**:

1. Human Coronavirus 229E (HCoV-229E)
2. Human Coronavirus OC43 (HCoV-OC43)
3. Severe Acute Respiratory Syndrome Related Coronavirus (SARS-CoV)
4. Human Coronavirus NL63 (HCoV-NL63, New Haven coronavirus)
5. Human Coronavirus HKU1
6. Middle East Respiratory Syndrome Related Coronavirus (MERS-CoV), previously known as *novel coronavirus 2012* and *HCoV-EMC*.
7. Novel Coronavirus NCoV-2019 also known as Wuhan coronavirus. ('Novel' in this case means newly discovered, or newly originated, and is a placeholder name.)

History of human coronavirus

Severe acute respiratory syndrome (SARS-CoV)

-**SARS** the first human infections can be traced back to the Chinese province of Guangdong in 2002..

-**Symptoms** flu-like signs and symptoms — fever, chills, muscle aches, headache and occasionally diarrhea.

-**Source** The source of the virus has never been clear

-**Cases recorded** more than **8,000 infections** of an influenza-like disease in **26 countries** with close to **800 deaths**.

Middle East respiratory syndrome (MERS-CoV)

-**MERS** was first identified in **Saudi Arabia in 2012**

-**Symptoms**- fever, cough, shortness of breath and occasionally gastrointestinal problems such as diarrhoea.

-**Source**- The virus has never been officially confirmed, though evidence points to **dromedary camels** as a potential reservoir of infection.

-**Cases recorded**- 2,500 cases of infection in **27 countries** since initial outbreaks, resulting in nearly **860 deaths**.

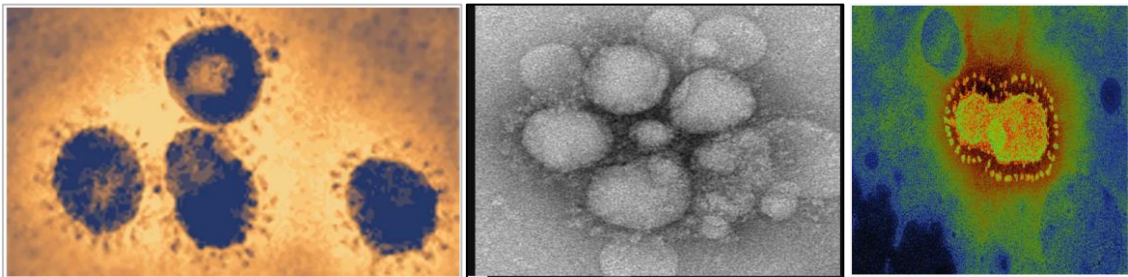
Wuhan coronavirus (2019-nCoV)

-**Wuhan coronavirus** was first identified in the Chinese city of Wuhan in 2019.

-**Source** Snakes have been suspected as a potential source for the outbreak, though other experts currently consider this as unlikely.

-**Symptoms** fever, shortness of breath, liver failure, pneumonia.

-**Cases recorded** Number of infected are still on the rise, with a number of deaths having been reported.

**SARS****MERS****NCoV**

Novel coronavirus (2019-nCoV)

Mechanism of wuhan coronavirus

1. Direct viral damage

Direct viral damage is probably the most common way the infection caused disease. This is likely the case with the Wuhan coronavirus. The Wuhan coronavirus attaches to a particular receptor found in lung tissue. This is like a lock and key mechanism allowing the virus to enter the cell, and is the same receptor the SARS coronavirus used. Viruses “hijack” the host cell’s mechanisms to make more copies of itself. Damage results from either viruses taking over the cell completely and causing it to die, or immune cells recognising the viral infection and mounting a defence, triggering cell death. If large numbers of cells die, then the affected organ can’t function effectively. The Wuhan coronavirus can also damage other organs, including the kidneys.

2. Pneumonia

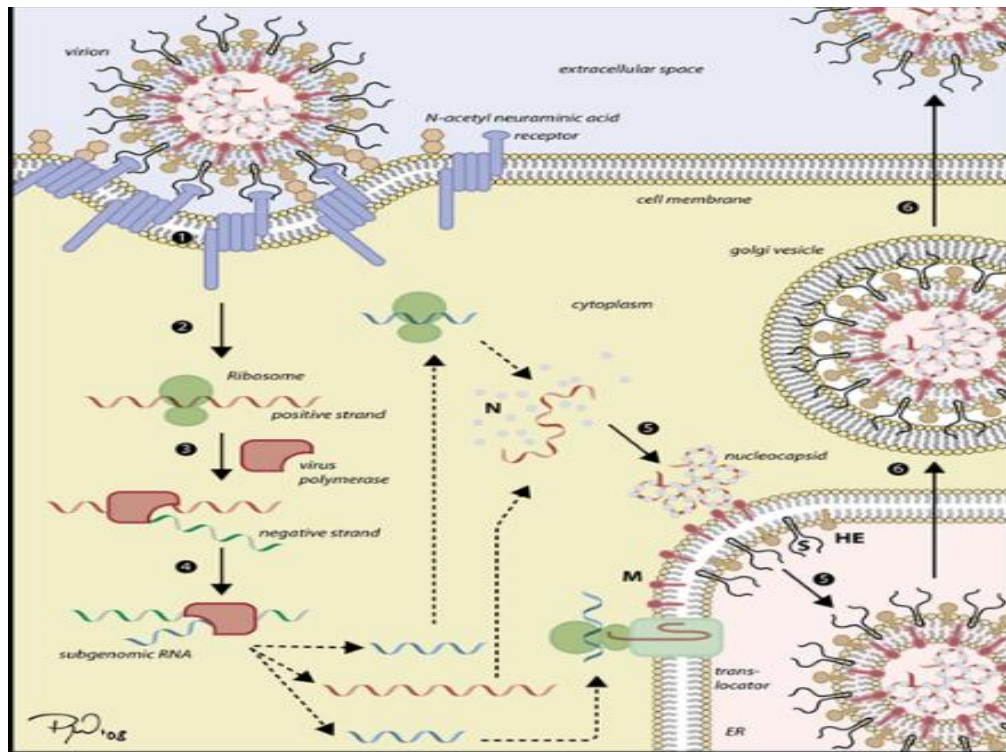
In hospitalised patients, around 10% of those with influenza and pneumonia die, compared to around 2% of those who don’t have pneumonia. The Wuhan coronavirus appears to cause pneumonia in two ways: when the virus takes hold in the lungs, and through secondary bacterial infections, however, the first way appears to be more common.

3. Sepsis

Sepsis is a serious condition that can be caused by many infections. When we get an infection, we need to mount an immune response to fight off the pathogen. But an **excessive immune response can cause damage and organ failure**. This is what happens in the case of sepsis. Although it can be difficult to determine whether organ

damage from the Wuhan coronavirus is a result of direct viral infection or indirect “collateral damage” from the immune system, initial reports suggested around 11% of people severely ill with the Wuhan coronavirus experienced sepsis with multi-organ failure.

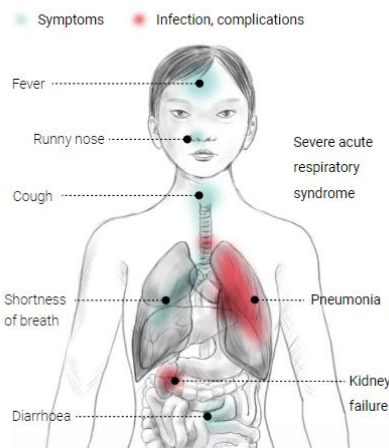
Mechanism of coronavirus



Symptoms:

Symptoms and complications

Some infected people do not show any symptoms, while for others the symptoms can be severe, even fatal.



For confirmed 2019-nCoV infections, reported illnesses have ranged from people with little to no symptoms to people being severely ill and dying. Symptoms can include:

- Fever
- Cough
- Shortness of breath

CDC believes at this time that symptoms of 2019-nCoV may appear in as few as 2 days or as long as 14 after exposure. This is based on what has been seen previously as the incubation period of MERS viruses.

Causes:



The wuhan coronavirus is believed to have spread either from snakes or wild bats.

Treatment:

1. A patient showed a good response to a medicine used in treating **HIV and AIDS**. The drug called **Nelfinavir** is a protease inhibitor drug which decreases toxins in already infected cells. The drug also helps to reduce the production of virus from cells.

2. With a cocktail of anti-virals used to treat flu & **HIV**, Thailand's health ministry said on Sunday. The 71-year-old patient tested negative for the virus 48 hours after Thai doctors administered the combination as per the report.

Till now there's no cure for the severe conditions of the wuhan coronavirus and there's no anti-viral drug to fight against the virus. Many scientist and doctors are working on it for finding a better solution for it.

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6. IMAGE 3; <https://images.app.goo.gl/a2VPJQYF6e593SKq7>
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9. IMAGE 6; <https://images.app.goo.gl/eTotaGfYhe4QZomw6>

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❖ **MINI REVIEW**

Last Five Years of Nobel Laureates in Medicine: An Overview

Arshad Wahab

Biotechnology, School of Life Sciences, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India

The Nobel Prize in Physiology or Medicine 2019



William G. Kaelin Jr
(UNITED STATES)



Sir Peter J. Ratcliffe
(UNITED KINGDOM)



Gregg L. Semenza
(UNITED STATES)

"How cells sense and adapt to oxygen availability"

They established the basis for our understanding of how oxygen levels affect cellular metabolism and physiological function. Their discoveries have also paved the way for promising new strategies to fight anemia, cancer and many other diseases

The Nobel Prize in Physiology or Medicine 2018



James P. Allison



Tasuku Honjo

(UNITED STATES)

(JAPAN)

"Cancer therapy by inhibition of negative immune regulation"

Different strategies for inhibiting the brakes on the immune system can be used in the treatment of cancer. The seminal discoveries by the two Laureates constitute a landmark in our fight against cancer

The Nobel Prize in Physiology or Medicine 2017



**Jeffrey C. Hall
(UNITED STATES)**



**Michael Rosbash
(UNITED STATES)**



**Michael W. Young
(UNITED STATES)**

"Molecular mechanisms controlling the circadian rhythm"

How plants, animals and humans adapt their biological rhythm so that it is synchronized with the Earth's revolutions. Nobel laureates isolated a gene that controls the normal daily biological rhythm. Biological clock helps to regulate sleep patterns, feeding behaviour, hormone release, blood pressure, and body temperature

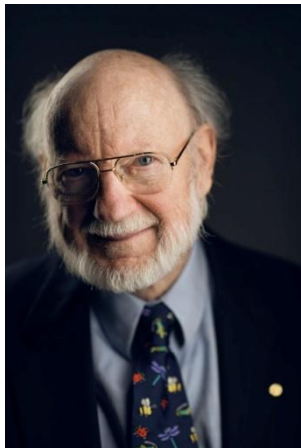
The Nobel Prize in Physiology or Medicine 2016



Yoshinori Ohsumi

(JAPAN)**"Mechanisms for autophagy"**

His discoveries opened the path to understanding the fundamental importance of autophagy in many physiological processes, such as in the adaptation to starvation or response to infection. Mutations in autophagy genes can cause disease, and the autophagic process is involved in several conditions including cancer and neurological disease

The Nobel Prize in Physiology or Medicine 2015

William C. Campbell
(IRELAND)



Satoshi Ōmura
(JAPAN)



Tu Youyou
(CHINA)

One half jointly to William C. Campbell and Satoshi Ōmura "for their discoveries concerning a novel therapy against infections caused by roundworm parasites" and the other half to Tu Youyou "for her discoveries concerning a novel therapy against Malaria"

The discoveries of Avermectin and Artemisinin drug have revolutionized therapy for patients suffering from devastating parasitic diseases. Laurates have transformed the treatment of parasitic diseases. The global impact of their discoveries and the resulting benefit to mankind are immeasurable

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❖ RESEARCH HIGHLIGHTS

Biodegradable Surgical Staple Composed of Magnesium Alloy

Tesy Ranjana, A

Department of Biochemistry and Molecular Biology, School of Life Sciences, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India

Research Highlights:

This article discusses on producing a novel biodegradable magnesium alloy staple and gives the analyses conducted to evaluate its safety and feasibility. Currently Titanium alloy staples which are non-biodegradable are being used for the surgery of intestinal anastomosis. This procedure has been reported to cause allergic reactions and interfere with imaging because of its high x-ray absorption coefficient. As an alternative magnesium alloy staples that are biodegradable have been produced as they have a better biocompatibility and fewer artefacts in computed tomography. Then an immersion test using artificial intestinal juice was carried out to test the biodegradable behaviour and the durability of the staple. However there were some issues with their durability, biodegradation behaviour and the generation of hydrogen gas during the process of biodegradation. To overcome this the shape of the staple was designed to be more rounded form without acute bending points to avoid fracturing or degrading at those bends. The evolution of hydrogen gas was evaluated and the magnesium alloys were engineered as to slow down the degradation rate by addition of rare earth elements along with the application of grain structure refinement in the fabrication processing. This gained the required results. The proposed magnesium alloys staples, employed the magnesium alloy (Mg2 wt%,Nd 1 wt% Y, FAsorbMgTM) fabricated buy Fuji light metal co., Japan., as the base material. It has all the properties to be used as staple because of addition of Nd and Y. The alloy was shaped into a wire rod 2.0 mm in diameter at 723 k with an extrusion ratio of 28:1 and was annealed at 673 k 30 minutes in the atmosphere. The wire rod was repeatedly processed to reduce its diameter to 0.25mm. Then it was designed and shaped.

The diameter, width, height, weight, and surface area of the staple were 0.25 mm, 3 mm, 2.5 mm, 0.6 mg, and 0.06378 cm², respectively. For the immersion test, artificial intestinal juice was prepared in the ratio 0.006 g weight of the staple per 1 mL in a humidified atmosphere with 5% CO₂ at 37 °C. The degraded Mg alloy staples was observed after one, four, eight, and 12 weeks of immersion. Moreover, the concentrations of the composition of the alloy (Mg, Y, Nd) in the intestine juice were calculated by coupled plasma mass spectroscopy (ICP–MS; NexION 300D, Perkin Elmer, Waltham, Massachusetts, USA). These magnesium alloy staples were tested on animals (Pigs with general anaesthesia) and it caused no technical failure during anastomotic procedures. All surgery sites of small intestine healed well and the staples maintained the shape without causing fracture. No complications like anastomotic leakage, hematoma or adhesion were reported when the pigs were humanely killed.

Keywords- Magnesium alloys, surgical staples, biodegradable.

Further reading- Biodegradable Surgical Staple Composed of Magnesium Alloy. *Sci Rep* 9,14671. <https://www.nature.com/articles/s41598-019-51123-x>

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❖ RESEARCH HIGHLIGHTS**PHENOLIC ACIDS - NATURAL VERSATILE MOLECULES****Aarthy Venkatesan and Haripriya Kumaravel**

Department of Biochemistry and Molecular Biology, School of Life Sciences, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India

Research Highlights:

Plant Phenolic acids or Phenolcarboxylic acids are a diverse class of polyphenol (phytochemical). This weak acid which has aromatic ring, carboxylic acid, hydroxyl group is found in fruits (skin) and vegetables (leaves). Its two sub groups include Hydroxybenzoic acid and Hydroxycinnamic acid. They are referred as secondary metabolites and are produced from Shikimate pathway of primary metabolites (carbohydrates, aminoacids, lipids) or by breakdown of lignins (cell wall polymer) or by some microbes. However the biotechnological production can enhance the mass production. In humans, the absorbed dietary phenolic acids are metabolised by colonic microflora. It is followed by methylation, glucuronidation and sulfation occurring at reducing hydroxyl group which results in structural change and decrease in antioxidant activity. The bioavailability of dietary phenolic acids determines its intensity of protective role in degenerative diseases. The concentration of hydroxycinnamic acids is high and undergoes rapid absorption and conjugation than hydroxybenzoic acids. Most of the phenolic acids are present as esters and glycosides and so their extraction method depends on the chemical nature and properties of the desired phenolic compound sample. The sample is initially subjected to washing, grinding, homogenisation and filtration. It is followed by extraction in which the chosen solvent influences the biological activity of the final extract. The extracted analytes are said to be isolated and quantified by acid-base fractionation and chromatographic techniques etc. For quantification of specific phenolic(s) HPLC is highly chosen. The structure and chemical nature of separated desired phenolic compound is studied through UV-Visible, NMR, FT-IR etc. In plants, it helps in

protecting against UV radiation, virus, insects and provides growth, smell, colour. They act as signalling molecules during initial stage of arbuscular mycorrhizal and legumerhizobia symbioses. It acts as alternative source of carbon if needed for diazotrophs. It enhances the production of indole acetic acid and suppress *nod* gene *Rhizobium trifolii* expression. In humans, it acts as anti-cancer agent, anti-allergic agent, anti-inflammatory agent, anti-diabetic agent, anti-microbial agent. In addition, its wide applications include skin care products, animal husbandry, neuro protective, food preservative. Phenolic acids when consumed regularly, prevents cell damage from free-radical oxidation reactions. They are in high demand as they are easily metabolised by natural microbes thereby achieving environmental saving attempts.

Keywords: Phenolic acid, polyphenol, phytochemical, antioxidant.

Further Reading: Phenolic acids: Natural versatile molecules with promising therapeutic applications, *Biotechnol. Rep.*, (2019) e00370. <http://doi.org/10.1016/j.btre.2019.e00370>

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❖ RESEARCH HIGHLIGHTS**Efficient Degradation Of Cellulose by recombinant plasmid Bgls-NRC1 constructed using endo b-1,3-1,4glucanase (bgls) gene from Bacillus subtilis BTN74 strain****Priyanka Thakur**

Department of Biochemistry and Molecular Biology, School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India

Research Highlights:

New recombinant strain was constructed that effectively degrade cellulose which forms major part of plant cell walls and cereal cell walls of mixed linked 1,3-1,4-1 b glucans. Cellulose is degraded by enzymes belonging to glycosyl hydrolase families. Experimental results shows that b-1,3-1,4glucanase (EC 3.2.1.73) secreted by Bacillus subtilis BRN74 strain effectively degrade cellulose out of other two types of b- glucan endohydrolase. To improve the activity of cellulose degradation Endo b-1,3-1,4glucanase(bgls) gene was cloned using PCR technique. Optimization of PCR mixture and programs were identified and performed respectively. Specific primers were deduced. The highest bgls concentration produced followed by the addition of MgCl₂ in PCR program and the bands of bgls gene from the gel is purified using MEGA quick-spin™ total fragment DNA purification kit and sequenced. The nucleotide sequence of bgls gene was placed in public domain (Gene Bank accession number KM009051.1) containing 729 BP encoding 243 amino acids. The purified DNA is then ligated with pGEM@easy vector and the recombinant plasmid named Bgls-NRC-1(3794 bp) is produced. The recombinant plasmid transformed to host E.coli DH5a and transformants were screened. Cellulase activity of bgls clones were determined. The transformants produce much higher enzyme yield than the donor strains producing about 29% and 57% higher cellulase specific activity at 370 C and 550C respectively. The optimization of cellulolytic activity of new strain was described. CMS(carboxymethyl cellulose) was proved to be best medium for cellulase production, based on the order of cellulase activity production using different

medium supplement such as CMC 27.2 >cellulose21.9 >LB19.8U/mg protein. It also showed that when initial inoculum is doubled more cellulase activities resulted in all media

Keywords: *Bacillus subtilis*, Endo-b-1,3-1,4 glucanase, PCR, Cellulolytic activity , cellulose ,bglS gene

Further Reading: WafaaK.Hegazy et al. Improvement of cellulose degradation by cloning of endob-1,3-1,4glucanase(bglS) gene from *Bacillus subtilis* BTN7A strain. J. Genetic Eng. Biotechnol., 16 (2018) 281–285.

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JOURNALS /WORKSHOPS/ CONFERENCE/ INTERNSHIPS**D. MubarakAli***

School of Life Sciences, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India.

Special Issues:**Inorganic and Nano-Metal Chemistry (Taylor and Francis): IF: 0.98**Special Issue on Nanobiotechnology: **March 2020****Guest Editors:** Hemalatha, S., Raghuraman**Sustainability (MDPI): IF: 2.657**Special Issue on Microalgal Process and Sustainability: **March 2021****Guest Editors:** Praveenkumar, R., MubarakAli, D.**Nanotechnology (Frontiers):**Special Issue on Nanomaterials for sustainable use for health and environment: **March 2021****Guest Editors:** Saravanakumar, K., Wang, M., MubarakAli, D and Gasidi Panusuwon**Workshop:**

National Workshop on Medicinal Mushroom Technology to be held on January 30-31, 2020 at School of Life Sciences, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India

Intra-School cultural event, **INTRON 2020** to be held on January 23, 2020 organized by School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India

Conference:

International Conference on Basic and Translational Cancer Research: Novel Ideas and Approaches (ICBTCR 2020) to be held on **June 25-27, 2020** organized by School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India

International Conference on Bionanotechnology, Energy and Environment (ICBEE 2020) to be held on **Feb 18-19, 2020** organized by School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India

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❖ INSTRUCTIONS TO CONTRIBUTORS

SLS newsletter, a biannual publication by the School of life science intends to enlighten the readers with research articles, reviews, reports, research highlights, news and facts, concerned to the advancing field of biotechnology.

In order to acknowledge recent advancements and potential knowledge, bringing it to the notice of the science community through the newsletter, SLS welcomes original research, review and reports and details of the forthcoming events (conferences, seminars, symposia, trainings and workshops.)

❖ GUIDELINES FOR SUBMISSION:

- ✓ The article submitted must be an own write up on the selected article.
- ✓ References: The research paper referred must be assessed from renowned publishers (science, nature etc.,) and the references must be mentioned in the article.
- ✓ No Plagiarism will be entertained.
- ✓ The article should be typed in double space in word format limited to > 1000 words with font “Cambria” and font size 12 with 1.5 line spacing.
- ✓ Illustration and tables: Illustrations must be reduced to one – third of the page. Typed tables should be provided with tittles. Authors are specially requested to reduce the number of tables, illustrations and diagrams to a minimum (maximum 2).
- ✓ The SLS newsletter assumes no responsibility for statements and opinions advanced by the contributors to the journal.



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