RAMAIAH UNIVERSITY OF APPLIED SCIENCES | Faculty of Pharmacy

PANPHARMACON

3rd Anniversary Edition

A QUARTERLY E-NEWSLETTER

DEPARTMENT OF PHARMACOLOGY
PANPHARMACON

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Department of Pharmacology
Faculty of Pharmacy
Ramaiah University of Applied Sciences
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(1922-1997)
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21-05-2017

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devotion to enlightenment

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The Faculty of Pharmacy (FPH), formerly M. S. Ramaiah College of Pharmacy, was established in 1992. The Faculty of Pharmacy ranked 65 th in the AIR–NIRF 2023, is a leading pharmacy institute with 31 years of legacy. It imparts outcome-based pharmaceutical education to meet our country's growing demands for well-trained healthcare professionals. The faculty offers 4-years undergraduate programme - Bachelor of Pharmacy (B. Pharm), 2-years Postgraduate programme – Master of Pharmacy (M. Pharm) in Pharmacognosy, Pharmaceutical Chemistry, Pharmaceutics, Pharmacology, Pharmacy Practice, 6-years Doctor of Pharmacy (Pharm D) and Doctoral research programme (Ph.D.)

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Aspires to create skilled and competent pharmacy professionals by imparting quality education in pharmaceutical sciences to meet the global health challenges for the betterment of mankind

Mission

- To impart quality education to develop pharmacy professionals to lead the progress in global healthcare
- To evolve into center of excellence in pharmaceutical research
- To create entrepreneurs and problem solvers in multi-disciplinary arena
- To inculcate professional ethics and passion for lifelong learning

PANPHARMACON

3rd

ANNIVERSARY

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EDITOR'S NOTE

Dear Readers,

With immense pride and pleasure, I present to you the 3rd Anniversary edition of Panpharmacon!

In this issue, our team brings you an assortment of articles that span a diverse range of domains, uncovering the most recent breakthroughs and advancements that shape the future of medicine and therapeutics. Our team has meticulously curated a collection of articles that explore novel therapeutic approaches, and a diverse range of topics, from personalized medicine to precision drug targeting, from the recent trends in drug delivery to the potential of artificial intelligence in drug discovery. As we embark on this journey together, we invite you to stay informed and engaged with the ever-evolving landscape of pharmacology.

In response to the demands of readers, we are presenting a new section namely ThesauRx comprising information pertaining to new investigational drugs. If there's anything that you'd like to share for the Panpharmacon, or just have any questions, please reach out to us directly at the email below. Your voice matters a lot and let it be heard by us. Thank you for being a part of our scientific community.

Happy reading!!!

Dr. Anbu Jayaraman
Editor

Acknowledgement

Team Panpharmacon is very thankful to RUAS management for providing a wonderful platform to explore and utilise our knowledge and skills. We wish to thank our Hon'ble Vice Chancellor and Pro Vice Chancellors for their patronage and advise us on the importance of enhancing the visibility of the workplace that stimulated us to come out with Panpharmacon, an E – Newsletter. We also thank all our colleagues, well-wishers, student concilium and friends for supporting us in making this newsletter.

CONTENTS

The Umbilical Cord-Derived Mesenchymal Stem Cell Reactivates Folliculogenesis

At the age of 40, menstruation does not occur due to Primary Ovarian Insufficiency (POI), a condition characterized by depleted or dysfunctional ovarian follicles. The cessation of hormonal secretory activity and ovulation has been established as a consequence of POI.

Hormone Replacement Therapy (HRT) has shown significant efficacy in restoring the fertility of patients with POI, no other therapeutic intervention has demonstrated such success. Despite its apparent side effects, failure to suppress the FSH rise or improve impaired ovulation, HRT continues to be clinically used. In ancient Indian culture, umbilical cord blood holds a profound significance as the symbol of 'Jiva,' the very beginning of life. Numerous case studies have proven that consuming umbilical cord blood can enhance fertility. This historic tradition is still practiced in many regions of India to this day.

In a series of groundbreaking studies, it was demonstrated that Bone marrow Mesenchymal Stem Cells (BMSCs) possess the remarkable ability to aid in the restoration of injured tissues, enabling them to regain their natural form and function. These cells, originating from the mesodermal layer, exhibits a remarkable capacity to differentiate into various mesenchymal tissues, such as bone, cartilage, tendon, muscle, fat, and marrow stroma, during embryonic development.

Even beyond embryonic development, these Mesenchymal stem cells retain their potency as progenitor cells and persist in the post-natal organisms, referred to as BMSCs. Remarkably, even after extensive *in vitro* sub-cultivation, these stem cells retain their inherent growth capabilities.

Recent studies revealed a promising discovery in the field of medicine offering a glimmer of hope for restoring ovarian function and hormone production in individuals experiencing chemotherapy-induced ovarian failure. In a mouse model of chemotherapy-induced ovarian failure, the administration of bone marrow Mesenchymal stem cells intravenously has shown potential in revitalizing ovarian hormone production and folliculogenesis.

In pursuit of further insights, the investigators undertook two parallel experiments, one focusing on treatment and the other on breeding. The study comprised three distinct groups, each consisting of six mice:

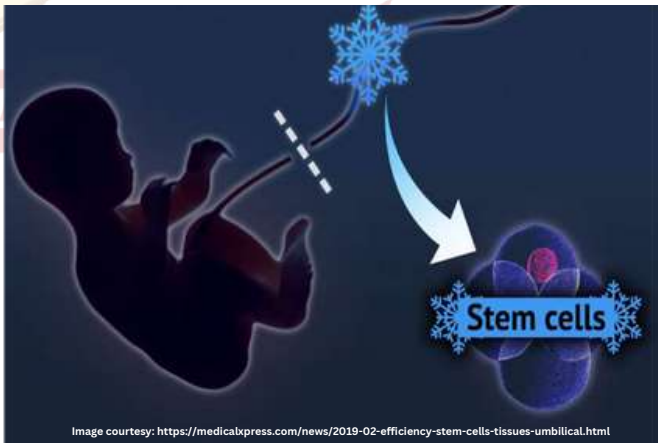

Image courtesy: https://medicalxpress.com/news/2019-02-efficiency-stem-cells-tissues-umbilical.html

- Group 1 - Normal Control: These mice were not subjected to chemotherapy and were administered saline as a placebo

- Group 2 - Positive Control: These mice underwent chemotherapy and were given saline

- Group 3 - Test: Following chemotherapy, these mice received a stem cell-based treatment using Umbilical Cord-derived Mesenchymal Stem Cells (UCMSCs)

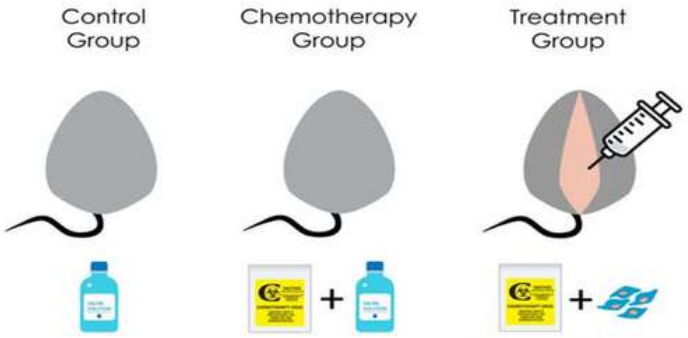

Figure Illustrates different experiment groups:
Normal Control - Saline
Positive Control - Chemotherapy + Saline
Treatment group - Chemotherapy + Stem cells

In the realm of research, this study stood as an empty canvas in comparison to the treatment trial. Once again, the researchers divided the same three groups of mice at random, but this time, they introduced male mice that were carefully matched in terms of weight and age to facilitate mating.

Group 3 exhibited a noteworthy P-value of 0.05 when the total number of follicles was compared between the groups two weeks after the stem cell implantation. Furthermore, the results indicated that the UCMSCs group had a slightly higher number of pups than the control group.

- The regulation of folliculogenesis predominantly hinges on the endocrine system. Disruptions in the follicular development and storage processes can lead to the onset of the ovarian condition known as POI (Premature Ovarian Insufficiency). It is highly probable that UCMSCs operate via the paracrine pathway to exert their functions

- The age of the subjects, the level of exposure, and the ovarian reserve at the time of exposure all play critical roles in determining a patient's capacity to reverse the damage caused by chemotherapy

Umbilical cord blood holds a profound significance as the symbol of 'Jiva,' the very beginning of life

The study revealed that the repair of ovaries damaged by chemotherapy is feasible with the assistance of UCMSCs. Upon the administration of UCMSCs, two essential functions of the ovary were successfully restored. Firstly, its exocrine function, crucial for ensuring successful pregnancies and the delivery of healthy offspring, was reinstated. Secondly, the endocrine function of the ovary, responsible for

producing estrogen and regulating weight in estrogen-dependent organs like the ovaries, was also effectively revived.

Considering the growing population of females facing fertility challenges due to various factors such as age, genetics, or chemotherapy treatments, the significance of UCMSCs as a viable source of stem cells for restoring reproductive capacity cannot be overlooked. These findings pave the way for potential therapeutic applications and offers hope to those seeking ways to regain their fertility despite undergoing damaging treatments.

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Nanonized Paclitaxel Gel Ameliorates Experimental Glioblastoma and Rebuild Immune Systems to Fight Recurrence of Cancers

Glioblastoma multiforme is the most aggressive of the gliomas, a collection of tumours arising from glia or their precursors within the central nervous system. The most frequent location for Glioblastoma Multiforme (GBM) is the cerebral hemispheres, with 95% of these tumours arising in the supratentorial region, while only a few percent of tumours occur in the cerebellum, brainstem, and spinal cord. Glioblastoma cells divide and multiply quickly, leading to rapid tumour growth. This aggressive growth often results in increased pressure within the brain, causing neurological symptoms and complications.

Despite being a rare tumour with a global incidence of less than 10 per 100,000 people, GBM poses a critical public health issue due to its dismal prognosis. Patients with GBM have a survival rate of only 14-15 months after diagnosis, making it highly concerning. Surgical removal of the entire tumour is difficult with glioblastoma tumours because they penetrate the nearby brain tissue.

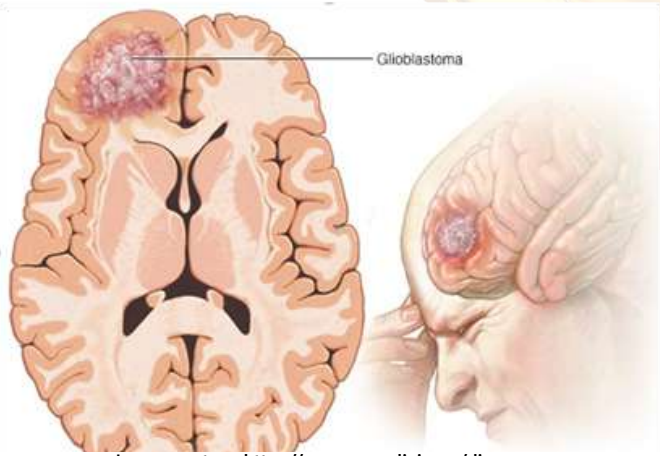


Image courtesy: https://www.mayoclinic.org/diseases-conditions/glioblastoma/cdc-20350148

Despite the removal of the majority of the tumour, tiny cancer cells may still be present in the tissue around the tumour, increasing the risk of recurrence. The blood-brain barrier makes delivering effective pharmacological therapies to the tumour location problematic. Glioblastoma tumours are highly heterogeneous. Resistance to radiation and chemotherapy is common in glioblastoma cells, decreasing the efficiency of these treatments.

The combination of protein drugs and small-molecule therapeutics has improved treatment outcomes by synergizing their biological and pharmaceutical activities; however, differences in molecular characteristics, such as size and water solubility, frequently pose challenges in the development of effective drug delivery systems. In this context, Paclitaxel (PTX), a small-molecule anticancer medication with low water solubility, is incorporated into a molecular hydrogelator to deliver CD47, a hydrophilic macromolecular antibody, locally. This not only combines the distinct material properties of the two therapeutic agents for long-acting local release but also synergizes their biological properties to stimulate tumor-associated macrophages with concurrent T cell-mediated immune response, thereby improving tumor treatment.

Researchers at Johns Hopkins University have

developed a gel for experimental brain cancer treatment that not only healed all mice but also trained their immune systems to fight the recurrence of cancers. When battling glioblastoma, the gel activates an immune response that a mouse's body struggles to activate on its own. When the researchers re-exposed the surviving mice to a fresh glioblastoma tumor, their immune systems defeated the malignancy without the use of any further medicine. The gel appears to not only protect against cancer but also assist in retraining the immune system to prevent recurrence through immunological memory.

The gel solution is composed of nano-sized filaments of paclitaxel, an authorized medicine for breast, lung, and other malignancies. These filaments serve as carriers for delivering an antibody known as αCD47. By evenly blanketing the tumor cavity, the gel releases medication continuously over several weeks, and its active ingredients remain near the injection site.

CD47, also known as Integrin Associated Protein (IAP), is an immunoglobulin-like transmembrane protein consisting of integrins, cholesterol, and G proteins. It is extensively expressed in normal cells such as red blood cells and platelets. However, it is frequently inappropriately overexpressed on tumor cells like glioma cells. Signal Regulatory Protein Alpha (SIRPα) produced on the surface of macrophages could operate as a ligand to bind to the amino terminus of CD47, inhibiting macrophage phagocytosis and reducing tumor antigen presentation to T cells. As a result, inhibiting the CD47-SIRPα. The gel solution is made up of nano-sized filaments of paclitaxel, which is one of the most efficacious and successful drugs in cancer chemotherapy and has been approved to treat a variety of cancer types. As a cell-cycle-dependent, antimitotic drug, PTX selectively kills proliferating cells and, thus, represents a logical choice for the local treatment of brain tumors. Recently, mounting evidence has supported that PTX can trigger the infiltration of TAMs (Tumor-Associated Macrophages) and induce enrichment of CD47 on cancer cells. As a direct connection of a chemotherapeutic agent onto a physiologically active β-sheet-forming peptide changes the drug into a supramolecular hydrogelator, the findings imply that PTX has the ability to stimulate the immune response in a synergistic manner with CD47 blocking immunotherapy. Under physiological settings, the quick solution-to-hydrogel phase transition of such self-assembling prodrug complexes enables their deposition and retention in the resection cavity soon after the surgical removal of GBM. Based on these findings, the researchers reasoned that such PTX-containing in situ-formed hydrogels could be used for localized administration of immunotherapeutic drugs, allowing for a sustained, directed release of the combination therapy into adjacent brain regions to kill remnant tumor cells.

The use of hydrogel demonstrated a significant reduction in tumor recurrence following postsurgical Glioblastoma multiforme excision and resulted in a remarkable 100% survival rate

The researchers implanted brain tumors in mice and then separated them into six groups of eight mice to evaluate the experimental brain cancer treatment.

1. Control Group: This group consisted of mice whose tumors were not removed, and they died with a median survival time of 22 days after tumor implantation
2. Test Groups: These groups of mice received different treatments or interventions to evaluate their effects on tumor growth and survival

a) Test Group 1: Mice in this group had their tumors surgically removed eight days after implantation and lived for a median of 28.5 days

b) Test Group 2: Mice in this group received a hydrogel containing only the antibody and survived for a median of 39 days

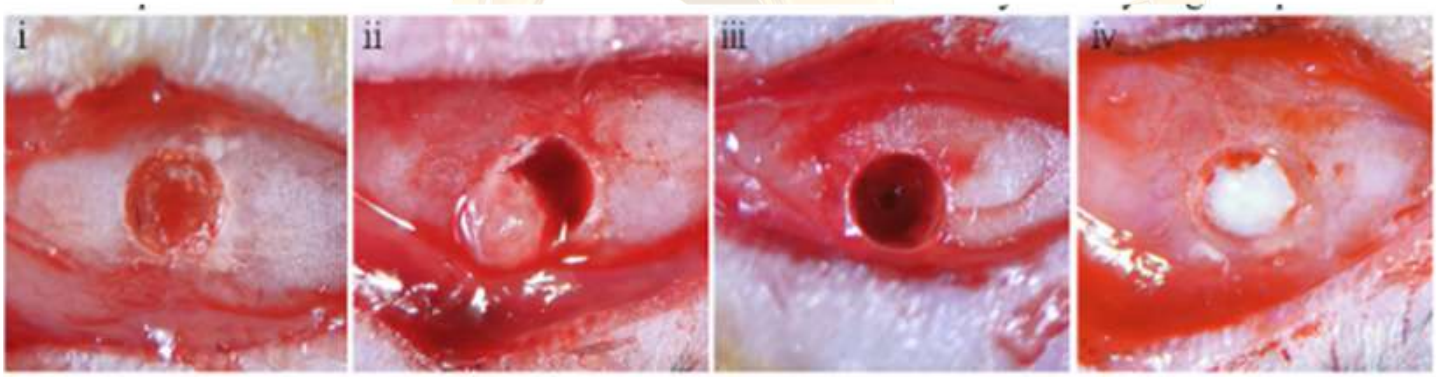
c) Test Group 3: Mice in this group received a hydrogel containing only paclitaxel (chemo medication) and survived for a median of 63 days

d) Test Group 4: Mice in this group received a hydrogel containing both the chemo medication and the antibody, without tumor removal

Half of the mice in this group survived for 80 days, qualifying them as "long-term survivors."

The researchers re-challenged any surviving mice with tumor cells on day 80 after the initial tumor implantation. When scientists examined the mice again 20 days later, they discovered no evidence of cancer in the brains of individuals who had received the hydrogel containing both the chemo medication and the antibody.

The combination of surgical resection with local drug delivery devices prove to be a highly successful therapy method for extending the survival of brain tumor's patients. In this study, researchers utilized recent advances in cancer immunotherapy to create a self-assembling prodrug hydrogel system, which delivered both PTX and a CD47 after Glioblastoma Multiforme (GBM)



Exposure | Tumor resection | Resection cavity | Hydrogel implantation

resection, as a promising treatment approach for this devastating illness.

The use of the hydrogel demonstrated a significant reduction in tumor recurrence following postsurgical GBM excision and resulted in a remarkable 100% survival rate in the treated subjects.

Moreover, the local delivery of the hydrogel effectively generated robust effector T-cells memory, which played a crucial role in preventing tumor recurrence. It is noteworthy that the self-supporting hydrogel solely incorporates the PTX prodrug, eliminating potential toxicity concerns associated with other excipients.

The in situ-formed hydrogel exhibited the ability to enhance therapeutic concentrations specifically at the target region, while minimizing drug leakage into the bloodstream and major organs, thereby reducing off-target side effects.

Overall, these compelling findings strongly indicate that a CD47/PF hydrogel injection following surgical resection presents a highly promising and clinically meaningful chemoimmunotherapy method for treating recurrent GBM. This novel approach has the potential to significantly improve patient outcomes and quality of life in the battle against this aggressive form of brain cancer. Further research and clinical trials are warranted to validate and optimize this therapeutic strategy, potentially leading to transformative advancements in GBM treatment.

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AI-Enabled Wound-Monitoring Battery-Free Sensor Patch for Healing Assessment

Ensuring timely and accurate monitoring of wound healing status is of utmost importance in wound care and management. Impaired wound healing, including chronic wounds and post-burn pathological scars, not only pose life-threatening medical complications but also imposes significant economic burden on patients and healthcare systems globally. To overcome the limitations of existing methods, a collaborative team of researchers from the National University of Singapore (NUS) and A*STAR's Institute of Materials Research and Engineering (IMRE) has developed an innovative and convenient approach to monitor wound recovery effectively, facilitating timely clinical intervention and enhancing wound care and management outcomes.

Monitoring wound healing traditionally relies on visual examination by clinicians, which may not provide accurate assessments. Additionally, the diagnosis of wound infections through swabbing and bacterial culture is time-consuming, leading to delayed treatment.

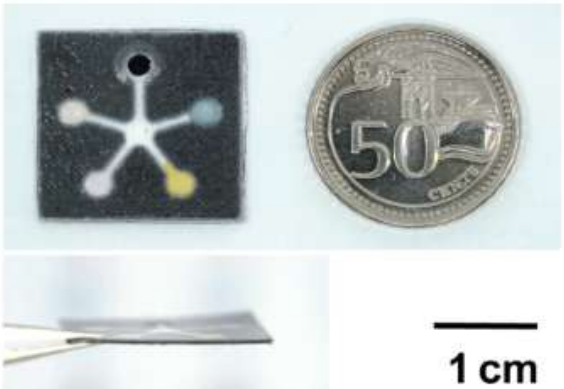


Image Courtesy: https://www.science.org/doi/10.1126/sciadv.adg6670

The Real Sensor Patch and its side view, next to a 50-cent Singapore coin

Image Courtesy: https://cde.nus.edu.sg/news-detail/ai-powered-sensor-patch-for-wound-monitoring/

Moreover, frequent manual removal of dressings for wound assessment poses infection risks and causes discomfort for patients, hampering the healing process.

To address these challenges, the NUS researchers combined expertise in flexible electronics, artificial intelligence (AI), and sensor data processing with the nano-sensor capabilities of IMRE researchers. The result is the PETAL (Paper-like Battery-free In situ AI-enabled Multiplexed) sensor patch, a thin, flexible, and biocompatible patch that integrates with wound dressings to detect biomarkers and provide prompt wound diagnosis. The patch incorporates five colorimetric sensors that measure temperature, pH, trimethylamine, uric acid, and moisture, allowing a comprehensive assessment of wound inflammation, infection, and environmental conditions.

The PETAL sensor patch operates without the need for an external energy source. Utilizing a mobile phone, images of the sensor patch are captured and analyzed by AI algorithms to determine the patient's healing status

accurately. This approach enables continuous monitoring without removing the patch, minimizing interruptions to the wound-healing process. Timely medical intervention can be administered to prevent complications and reduce scarring effectively.

Unlike many wearable wound sensors that measure only a limited number of parameters and require bulky printed circuit boards and

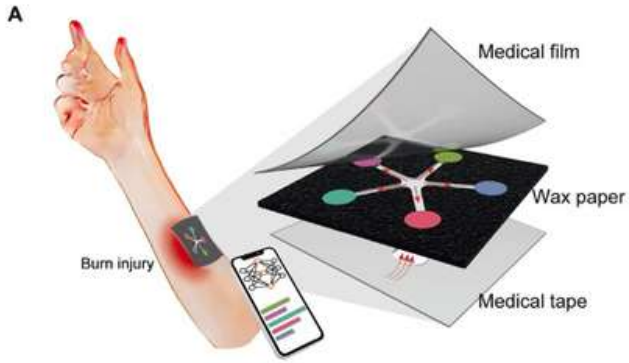


Image courtesy: https://www.science.org/doi/10.1126/sciadv.adg6670

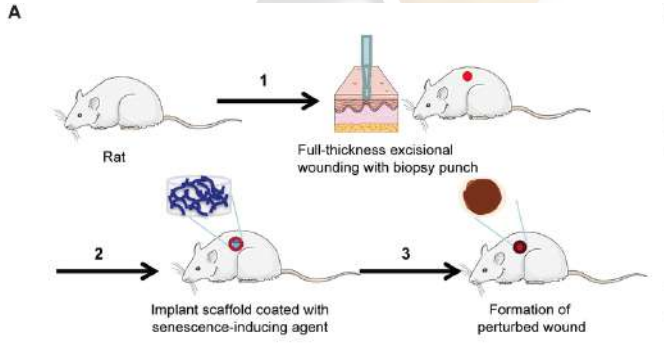
Schematic of a Battery-free Colorimetric Multiplexed Sensor for Wound Monitoring.

(A) Illustration of the PETAL sensor adhered to a burn wound for colorimetric analysis of wound healing status with the detailed layer-by-layer structure of the PETAL sensor.

batteries, the PETAL sensor patch measures five biomarkers without the need for a battery. The fluidic panel design resembles a pinwheel flower, with each "petal" acting as a sensing region. The panel collects wound fluid through a central opening and distributes it evenly to the sensing regions for analysis. The transparent top layer allows for normal skin functions and facilitates accurate image capture, while the bottom layer gently attaches the patch to the skin, minimizing disruption to wound tissue.

Lab experiments have shown that the PETAL sensor patch achieves a high accuracy of 97% in differentiating healing and non-healing

The PETAL sensor patch operates without the need for an external energy source. Utilizing a mobile phone, images of the sensor patch are captured and analyzed by AI algorithms to determine the patient's healing status accurately



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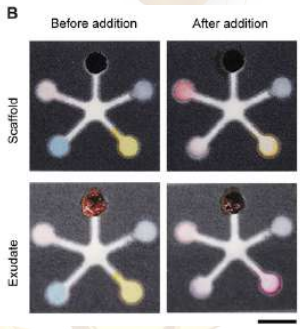

Ex-situ benchtop analysis of perturbed wound exudate

(A) The formation of perturbed wounds. (B) Sensor images before and after the addition of perturbed wound exudate versus extracted fluid from scaffold.

chronic and burn wounds. The patch also demonstrates excellent biocompatibility during ambulatory wound monitoring, with no observed adverse reactions over four days. The technology's versatility allows for customization to various wound types, incorporating different colorimetric sensors to detect biomarkers specific to diabetic ulcers or other wound conditions. Human clinical trials are the next step in further refining and validating the PETAL sensor patch's effectiveness after filing an international patent for this invention.

The development of the PETAL sensor patch represents a significant advancement in wound monitoring and management.

By combining flexible electronics, AI, and nano-sensor capabilities, this innovative solution offers a convenient, accurate, and non-invasive method to monitor wound healing status. With the potential to revolutionize wound care both in healthcare facilities and non-specialist settings, the PETAL sensor patch paves the way for timely interventions, improved patient outcomes, and reduced economic burden.

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Synthetic Human Embryos from Single Stem Cell - A Sneak Peak into Future

The creation of synthetic human embryos using stem cells was a momentous achievement announced by Professor Magdalena Żernicka-Goetz during the annual meeting of the International Society for Stem Cell Research. The implications of this discovery are vast, promising to enhance our comprehension of human development and genetic disorders. Nevertheless, such scientific progress also brings forth a myriad of ethical concerns that necessitate careful consideration.

Image courtesy: https://www.popularmechanics.com/science/health/a44211711/first-synthetic-human-embryo-created/

Professor Żernicka-Goetz and team utilized embryonic stem cells to generate each synthetic human embryo from a single stem cell. The 14-day rule, which sets a legal limit for embryo cultivation, has been surpassed by them, who successfully nurtured these embryos to a stage of development called "gastrulation." Gastrulation is a critical phase during embryonic development when cells begin to differentiate into vital body systems.

Previously, the 14-day rule was upheld due to technological limitations and the differentiation of cells into vital body systems. However, the International Society for Stem Cell Research's updated guidelines suggest re-evaluating this restriction.

The creation of synthetic human-like embryos marks a significant advancement in scientific understanding. These embryos exhibited certain developmental traits akin to those of natural human embryos. Notably, they began forming placenta and yolk sacs, potentially offering valuable insights into the relatively understudied field of placenta research, which holds crucial significance for both maternal and foetal health.

While the potential for knowledge acquisition through synthetic embryos is evident, ethical dilemmas abound. One quandary pertains to whether their creation genuinely obviates the need for using natural human embryos in research. It remains uncertain whether the current synthetic embryos are independent of human embryos since they were developed from human embryonic stem cells. Additionally, concerns exist about their ability to accurately model human development, as animal models of similar synthetic embryos have failed to develop into viable beings.

One of the primary motivations for exploring synthetic embryos is to gain insights into miscarriages and developmental anomalies.

Image courtesy: https://www.newscientist.com/article/2335281-synthetic-mouse-embryos-with-rudimentary-brain-grown-in-the-lab/

However, the extent to which these synthetic embryos resemble natural human embryos in revealing valuable answers remains uncertain. Researchers might still find themselves reliant on natural human embryos if the creation of synthetic models necessitates their involvement or if certain research questions cannot be addressed using synthetic alternatives.

The creation of synthetic human embryos using stem cells represents a remarkable scientific achievement with the potential to advance our understanding of human development and genetic disorders

This brings us to the fundamental moral question of whether using human embryos for research purposes is morally acceptable. Furthermore, if synthetic embryos have the potential to develop into living beings, the ethical implications of creating them exclusively for research must be thoroughly examined. While current synthetic embryos may not extend beyond the 14-day mark, scientists may strive to overcome this limitation. However, such endeavours would pose substantial moral quandaries, prompting a careful evaluation of the ethics surrounding the creation and use of living human-like beings for research purposes.

The creation of synthetic human embryos using stem cells represents a remarkable scientific achievement with the potential to advance our understanding of human development and genetic disorders. Nevertheless, this breakthrough also raises significant ethical concerns. As the public debate continues and further research unfolds, it is essential to approach these advancements with thoughtful consideration of their implications for society and human values.

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Novel Robotic Pill Loaded with Teriparatide for Osteoporosis Therapy

Millions of individuals throughout the world suffer from osteoporosis, a disorder marked by decreasing bone density and increasing risk of fractures. The illness often required treatment with oral drugs, dietary changes, and occasionally injectable therapy. Among the most frequently affected areas are the vertebrae, which, when shattered, can cause severe, chronic pain. However, medical advancements have provided hope in slowing the pace of bone thinning through various oral and intravenous drugs, along with dietary supplements. Notably, parathyroid hormone therapies have emerged as the most effective in inducing bone resorption. Teriparatide, a specific parathyroid hormone utilized to treat osteoporosis, was initially available parentral use.

Image courtesy: https://www.biotechniques.com/bioengineering-biophysics/robotic-pill-delivers-osteoporosis-treatment/

However, a new field in the treatment of osteoporosis was being opened up with the development of robotic tablets. These minute, technologically advanced ingestible devices promised to revolutionize medication delivery, adherence, and personalized monitoring.

The groundbreaking concept of the "robotic pill" was unveiled by researchers from Rani Therapeutics (CA, USA). In the past, an effective osteoporosis medication has only been available as an injectable, causing some discomfort for patients. However, the researcher's ingeniously devised a tablet-based solution, aiming to make the medication more widely accessible and less invasive.

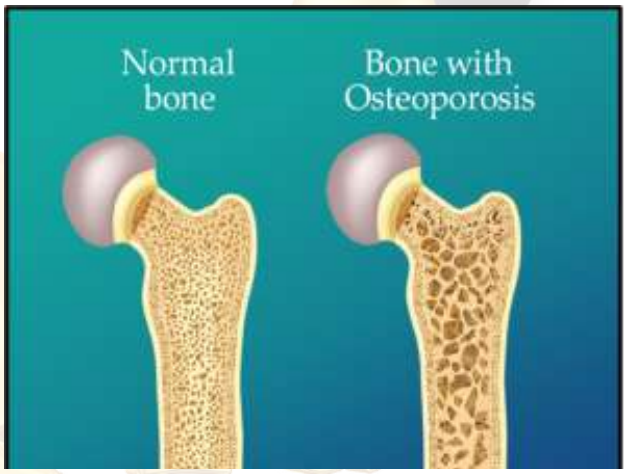

Image courtesy: https://orthopedicnj.com/news/how-to-prevent-osteoporosis

The robotic pill was designed with a sophisticated program that ensured its integrity until it reached the gastrointestinal tract. Upon reaching its destination, the pill's internal system activated, releasing a self-inflating balloon equipped with a microsyringe, which contained the osteoporosis medication teriparatide. This innovative approach aimed to enhance the availability of parathyroid hormone treatment. The microsyringe delicately injected the drug into the intestinal wall.

Once the medication was successfully administered, the delivery mechanism deflated, and the needle naturally degraded within the body before being eliminated.

Image courtesy: https://www.fiercebiotech.com/medtech/rani-therapeutics-nets-69m-to-transform-injections-into-easy-to-swallow-robotic-pill

The mechanics behind these cutting-edge technologies are fascinating. Once ingested, the robotic pill embarks on a journey through the digestive system, unharmed by the stomach's acidic environment. As it reaches the colon, the pill releases a self-inflating balloon housing a microsyringe, which contains the necessary medicine. The injection process is painless, as the intestines do not respond with discomfort to the delicate microneedle. Once the medicine is delivered, the microneedle naturally dissolves, and the pill's delivery device safely exits the body.

In Phase I study conducted on 39 healthy women, RT-102, filled with the medication teriparatide (PTH 1-34), underwent thorough examination for safety, tolerability, and its journey through the body.

Teriparatide, a synthetic version of the human parathyroid hormone, has been used as an injectable drug called Forteo® to treat patients suffering from osteoporosis and brittle bones for several years.

The robotic pill exhibited bioavailability on par with or even superior to that of the drug administered through conventional injections

During the study, the participants were divided into three groups. Two groups received varying doses of the robotic pill, while the third group received the standard teriparatide injection. To monitor the robotic pill's progress, researchers utilized fluoroscopic imaging to track its entry and exit from the body. Blood samples taken over a six-hour period were also examined to determine drug concentrations.

The findings were astounding. The medicine delivered by the robotic pill exhibited bioavailability on par with or even superior to that of the drug administered through conventional injections. Bioavailability refers to a drug's ability to be absorbed and utilized effectively by the body, making this new pill an incredibly promising alternative for painless and efficient medication delivery.

In the realm of advanced medical technology, robotic pills have emerged as a revolutionary means of administering medication for osteoporosis, boasting a myriad of advantages. As the research and development phases persist, these cutting-edge devices showcase their potential to transform osteoporosis care, granting patients superior treatment and improved quality of life. Real-time monitoring

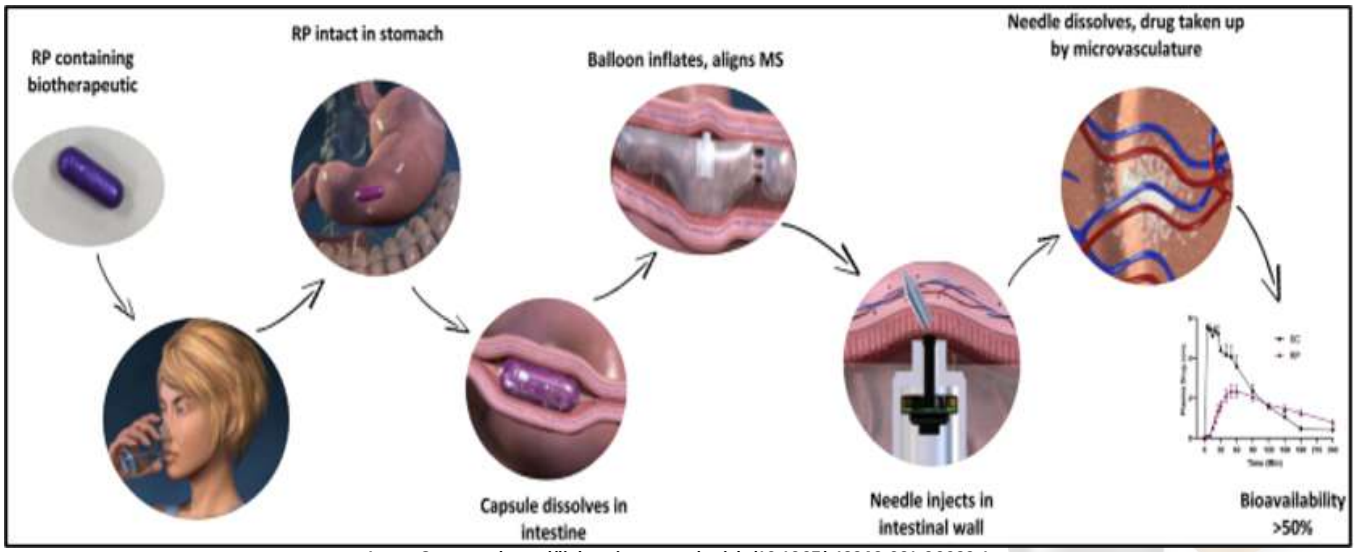

Image Courtesy: https://link.springer.com/article/10.1007/s13346-021-00938-1

capabilities, heightened adherence rates, and a minimally invasive approach elevate the prospects of these futuristic gadgets, positioning them as a potential new frontier in the field of medical innovation.

The advent of robotic pills presents a promising outlook for osteoporosis therapy in the future, as technology continues to evolve. This ground-breaking approach to medication administration can cater to individual patient needs, delivering tailored and efficient remedies for this prevalent ailment. With such remarkable potential, robotic pills hold the key to reshaping the landscape of osteoporosis treatment, paving the way for a new era of medical advancement and patient-centric care.

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Immune Checkpoint Inhibitors Combats Cancer - Available Therapeutic Strategy

Aggressive bladder cancer is commonly associated with aging in males. However, recent studies have shown that immune checkpoint inhibitors, a major therapeutic approach, may render the illness more susceptible. Each human cell contains a distinct set of sex chromosomes, with females having X-X sex chromosomes and males possessing X-Y chromosomes. Interestingly, a significant percentage (10-40%) of bladder tumours were found to exhibit loss of the Y chromosome which led to the investigation of the impact of Y chromosome loss on cancer cell behaviour in a muscle-invasive bladder cancer model and its response to immune checkpoint inhibitor therapy in both human patients and mouse models by comparing prognosis and survival rates between treated and untreated individuals.

A comprehensive analysis of bladder cancer cell growth in mice was conducted by closely examining cell multiplication under different microenvironments. Assessment of the tumour development rates in environments devoid of immune cells and in mice lacking T-cells type of immune cells was made to understand the role of Y chromosome loss in cancer progression more clearly.

It was found that the presence or absence of the Y chromosome had no significant impact on tumour development rates under conditions lacking immune cells. However, in mice with a healthy immune system, cancers without the Y chromosome displayed markedly accelerated growth compared to those with an intact Y chromosome. This "loss-of-Y" effect in bladder cancer appears to be contingent on an active immune system, where cancer cells exhaust their T-cell supply, leading to rapid tumour expansion.

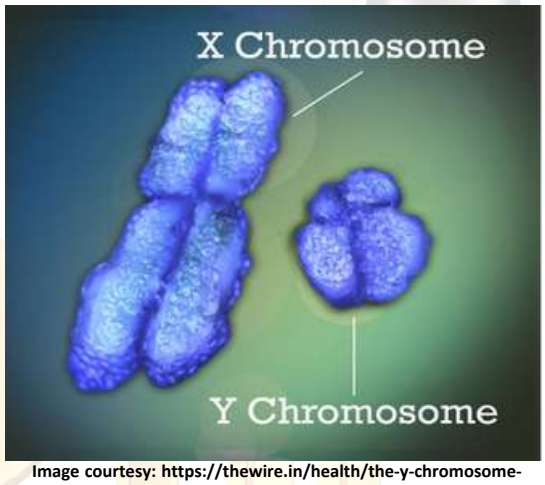

Image courtesy: https://thewire.in/health/the-y-chromosome-is-disappearing-so-whats-in-the-future-for-men

The findings strongly suggested a link between Y chromosome loss and T-cell exhaustion, providing a potential explanation for the more aggressive nature of Y chromosome-deficient cancer cells are immune checkpoint inhibitors help in combating Y chromosome-deficient tumours, as these inhibitors prevent T-cell depletion, thereby allowing the immune system to effectively fight against cancer.

The study presented illuminates the significance of Y chromosome loss in cancer biology, consequently unveiling novel

Y chromosome loss in cancer biology, consequently unveiling novel avenues for comprehending the disparities in cancer susceptibility based on sex

avenues for comprehending the disparities in cancer susceptibility based on sex. The multifaceted functions attributed to the Y chromosome, extending beyond its role in determining biological sex, establish it as a crucial element in both cancer development and therapeutic approaches. Through the integration of data obtained from both human patients and mice, valuable insights have been garnered concerning the genetic correlation linking Y chromosome loss with T-cell fatigue.

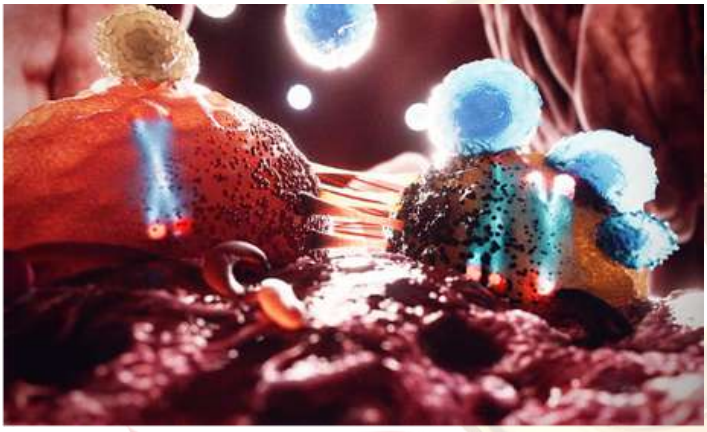

Image courtesy: https://www.cedars-sinai.org/newsroom/loss-of-y-chromosome-in-men-enables- cancer-to-grow

The study presented illuminates the importance of Y chromosome loss in cancer biology. The knowledge acquired from this study has the potential to contribute towards the development of more efficient and targeted cancer therapies. Furthermore, these findings may offer an explanation for the differential impact of certain cancers on men and women, thus instigating further research into the significance of sex as a variable in human biology studies. Ultimately, comprehending the mechanisms underlying Y chromosome loss and its influence on cancer progression may pave the way for personalized treatment approaches and enhanced outcomes for patients.

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Pharmacometabolomics
Current Applications and Future Perspectives

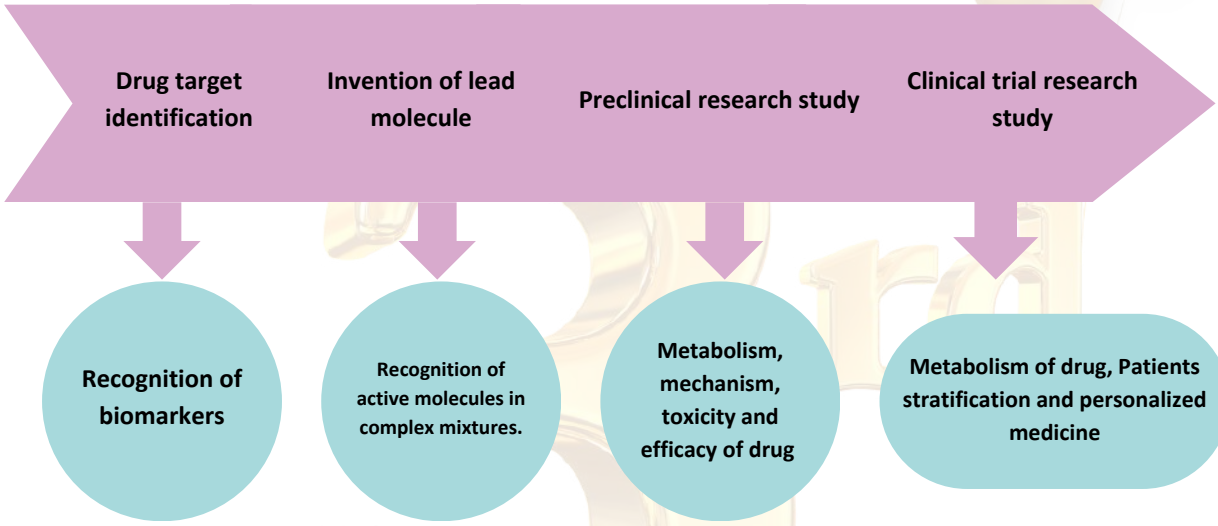
The study of all the tiny molecules found in cells, tissues, and organs are known as metabolomics. The metabolic phenotype, which is controlled by interactions between genotype and other environmental factors like diet, lifestyle, and the gut microbiota, may be reflected by these tiny molecules, which are intermediates and/or end products of cellular activities.

It is possible to identify intra- and inter-patient variances in drug response using the metabolite information from the baseline and treatment metabotypes

Pharmacometabolomics is a fast-developing field that directly measures metabolites in a person's bodily fluids in order to better understand drug action mechanisms and discover new biomarkers of the cellular response to pharmacological intervention. The identification of the metabolic pathways involved in individual variations in response to pharmacological therapy is also made possible with this method.

Pharmacometabolomics (PMx) studies make predictions about a subject's response to medication therapy using data from metabolic profiles (or metabolomes). An individual's metabolic profile can be influenced by their genome, gut microbiota, sex, nutrition, age, stress, health state, and other variables. Some of these elements are known to affect how each person reacts to medicinal substances. The term "metabotype" refers to a person's unique metabolic profile. As a result, metabolomic profiles collected before, during, or after pharmacological treatment may shed light on the mechanism of action of the drug and the range of responses to the therapy. Pharmacometabonomics was defined as "the prediction of the outcome (e.g., efficacy or toxicity) of a drug or xenobiotic intervention in an individual, based on a mathematical model of 'preintervention' metabolite signatures" (prediction of the efficacy or toxicity). Drugs were examined in animal models as part of the Consortium for Metabonomic Toxicology (COMET) research at Imperial College London, which greatly contributed to the development of pharmacometabonomics. The pharmaco - metabolomics (PMx), is an "enhanced understanding of mechanisms for drug or xenobiotic effect and increased ability to predict individual variation in drug response phenotypes, based on using both baseline metabolic profiles prior to treatment and also effects of drug treatment over time". The first PMx study examined lipid profiles in schizophrenia patients at baseline and changes over time as they received three antipsychotics, providing information on the effectiveness of treatment.

Pharmacometabolomics and "Metabotypes":
In PMx investigations, there are two different kinds of metabotypes. Both a "baseline metabotype" produced from pre-dose samples and a "treatment metabotype" derived from samples taken while dosing are included in this. It is possible to identify intra- and inter-patient variances in drug response using the metabolite information from the baseline and treatment metabotypes. Prior to therapy, metabolic variables such as the status of the sulphur pool, environmental exposure, and dietary status can have an impact on disease subtypes and heterogeneity. The metabolic profile, or metabotype, at baseline can provide this information.



Application of Pharmacometabolomics in drug and discovery development

Current applications of Pharmacometabolomics :

1. Clinical study:

Due to the ease with which urine may be obtained using non-invasive, basic techniques, metabolomic analysis of urine in the pediatrics population is a significant benefit of the approach. This information can be used to make accurate diagnostic decisions. Prenatal asphyxia, inborn metabolic errors, respiratory distress syndrome, gestational age-related metabolic maturation, intrauterine growth retardation, patent ducts arteriosus, renal and respiratory diseases, drug therapies, and even maternal milk are some of the ground-breaking applications of pharmacometabolomics in the field of pediatrics medicine.

2. Role in Drug discovery and development:

A. Metabotype-based Subtypes:

Detoxification or toxicity brought on by metabolic imbalances will determine whether a therapy is safe and successful or brings about a negative medication reaction. Using a metabolomic technique, pharmaco-metabolomic analysis unquestionably offers a subject's complete and in-depth metabolic profile. Pharmacometabolomics does in fact try to predict or assess individual medication response, allowing continuation of treatment with the appropriate drug (or dosage based on variations in drug metabolism) and capacity to respond to treatment.

To achieve molecular sub typing in such a situation, the metabotype of an individual (specified as a "single-sample" data set) should be compared to an "as big-as-

possible" number of related data sets. These efforts to construct multi-gene classifiers that forecast breast cancer recurrence (Mamma Print, PAM50 Signature), or molecular subtypes in colorectal cancer, have been made recently with encouraging findings in cancer research.

B.Metabotype based Pharmacokinetics/ Pharmacodynamics:

Pharmacometabolomics helps to identify changes in metabolic pathways. An individual's metabolic profile is examined for this after medication treatment. The pre- and post-treatment metabolite levels can be compared when this analysis is paired with a pre-treatment metabolic analysis.

In patients with KRAS-wt colorectal cancer receiving cetuximab, it has been demonstrated that the activated type of epidermal growth factor correlates well with disease monitoring and medication response. Despite the fact that KRAS, NRAS, and BRAF genes also play a significant influence in disease prognosis, cetuximab is rarely used as a monotherapy as a result of updates to clinical protocols. Pharmacometabolomics would be quite helpful in such a clinical situation.

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Dr. Aziz Ahmed has completed Master of Pharmacy in Pharmacognosy and Phytochemistry from Faculty of Pharmacy, Jamia Hamdard, New Delhi (2009) and Ph.D. in Pharmaceutical Sciences from Pacific Academy of Higher Education and Research University (2020). He is currently working as Professor in Department of Pharmacognosy, Jaipur College of Pharmacy. He has experience in Phytochemistry, Plant Tissue Culture, Herbal Formulation, Natural Product Chemistry, Natural Product Isolation, Ethnopharmacology Traditional Medicine and Phytochemical Analysis.

Reversing Stem Cell Senescence with Polymeric Crystals

Senescence is the term for the gradual alteration and deterioration of our bodies as we age. Senescence is a problem when trying to maintain cell cultures for therapeutic use since stem cells, which have the unusual potential to transform into different cell types, also undergo it. These cell cultures develop biomolecules that are crucial for many medicines and therapies, but when the cells reach a senescent state, they cease making these biomolecules and start producing ones that are antagonistic to these therapeutics.

Even though there are techniques for removing ageing cells from a culture, the capture rate is low. Senescent cells should not be removed; instead, the best course of action is to stop them from ever going through senescence. Mesenchymal stem cells, which are derived from fat tissues helps in producing therapeutically important macromolecules, to maintain the health of the cell cultures. The best strategy to prevent senescence in a clinical situation would be to regulate the oxidative state of the environment that these stem cells are in. "With antioxidants, it is easy to pull the cells out of this senescent state and make them behave like a healthy stem cell".

While antioxidant therapy for cells can postpone senescence, there are many drawbacks to existing antioxidant delivery techniques, including significant differences

The new antioxidant crystal maintains its bioactivity for at least two days, allowing us to prolong the action of the medication and diminish the need to often add antioxidants to the media used for cell growth

in the amount of medication released over time and between cells. However, a new strategy for reliably, persistently, and minimising variationally delivering antioxidants to stem cells is described in a study by the labs of Kong and Hee-Sun Han (GNDP/IGOH).

Antioxidants are used in the novel technique as crystals stabilised by polymers. By employing microfluidics, a technology that enables scientists to operate with very little volumes of fluid, the researchers can produce crystals that are all the same size and dosage, minimising variation in drug release between cells. Traditional methods develop crystals inside reactors but "With microfluidics, each drop functions as a small reactor, allowing us to obtain small, comparable-sized individual crystals and minimising variation in drug release rate". The medicine is released uniformly throughout time due to the crystal's slower rate of dissolution than conventional techniques, which also increases the period the drug is effectivity.

It is quite significant if the drug's release profile has a small fluctuation. When the drugs dissolved in water, there is a period, where a large amount of the drug dissolves all at once. However, the crystal permits this consistent, prolonged release, which aids in maintaining the required narrow range of ideal concentrations.

"Typical antioxidants lose their vital activity within six hours of being added to water or biological fluid". However, the new antioxidant crystal maintains its bioactivity for at least two days, allowing us to prolong the action of the medication and diminish the need to often add antioxidants to the media used for cell growth. This increases the reproducibility of the product, which is one of the main challenges, and also reduces the variety in the type of biomolecules the stem cells are producing.

Increased duration of the drug's effectiveness allows stem cell cultures to be kept out of the senescent state, which increases the number of biomolecules that can be harvested for therapeutic use. This technique could be applied to patient-derived stem cell therapies, which use a patient's own biomolecules to cure numerous tissue ailments including wounds and diseases.

"A Host effect can occur when the biomolecules used from donors rather than the patient". Ideally, the stem cells are taken from the patient under treatment, grow them in a bioreactor, and then extract the biomolecules needed for the treatment.

The greater quantity of therapeutically important biomolecules for the patient can be prepared from the senescence cells and get them to function like healthy cells.

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Harsha is currently working as Trainee Clinical Data Coordinator at "IQVIA". He completed his Master's in Pharmacology in the year 2022 from the Faculty of Pharmacy, Ramaiah University of Applied Sciences, Bengaluru, Karnataka. He is also the recipient of Annual Exemplary Student Achiever Award from Ramaiah University of Applied Sciences in year 2022 in recognition of his contribution towards National Service Scheme.

Padma Shri Prof. Ranjit Roy Chaudhury

Padma Shri Prof. Ranjit Roy Chaudhury, an eminent Indian clinical pharmacologist, medical academic, and health planner, dedicated his life to advancing the fields of pharmacology, drug development, and pharmacovigilance. Born on November 4, 1930, in Patna, Bihar, Chaudhury's contributions have left an indelible mark on the Indian pharmaceutical landscape, shaping regulations, promoting patient safety, and advancing medical research.

Chaudhury's journey in medicine began at the Prince of Wales Medical College in Patna, where he pursued his undergraduate studies in medicine. His thirst for knowledge led him to secure a doctoral degree (D.Phil) from Lincoln College, Oxford. In 1958, he joined the prestigious All India Institute of Medical Sciences (AIIMS) in Delhi, where he served as an assistant professor until 1960. Seeking new challenges, he moved to the Ciba-Geigy Research Center in Bombay, where he held the position of professor of pharmacology.

In 1964, Chaudhury's expertise led to his appointment as the Head of the Department of Pharmacology at the renowned Post Graduate Institute of Medical Education and Research (PGIMER) in Chandigarh. During his tenure, he served as the dean and eventually became the director of PGIMER until his retirement in 1980. It was during this period that he initiated a DM course in clinical pharmacology, the first of its kind in India. Chaudhury's innovative approach and leadership at PGIMER propelled the institution to new heights in the field of clinical pharmacology.

Chaudhury's influence extended beyond the confines of PGIMER. He played a pivotal role as the founder chairman of the Toxicology Review Panel established by the Indian Council of Medical Research. Following his tenure at PGIMER, he joined the World Health Organization (WHO) in various capacities, with assignments in Geneva, Alexandria, Yangon, and Chulalongkorn University in Bangkok.

Chaudhury's work with WHO contributed significantly to the global discourse on healthcare policies, drug development, and pharmacovigilance.

Returning to India in 1991, Chaudhury continued to make significant contributions to the medical field. He co-founded the Delhi Medical Council and served as its first president. He also maintained his position as a WHO consultant while serving as the chairman of the selection committee at PGIMER. Chaudhury's expertise was sought by numerous medical and health organizations, including the National Institute of Immunology, where he served as the Emeritus Scientist until 2005.

Chaudhury's influence extended to his involvement in various governing bodies and advisory councils. He chaired the Board of Trustees of the International Clinical Epidemiological Network for two terms until 2006. Additionally, he served as a member of the Sub-Commission in Macroeconomics and Health established by the Government of India in 2005. His vast experience and insights were highly regarded, leading to his appointment as an advisor to the Ministry of Health and Family Welfare in 2014.

Chaudhury contributed significantly to academia and research. He authored over 275 articles in national and international journals and wrote 25 textbooks on medical education throughout his career. In recognition of his remarkable contributions, he received numerous accolades and honours. As the first Indian doctor to receive a Rhodes Scholarship in 1955, Chaudhury established himself as a trailblazer. He was a Fellow of the Royal College of Physicians of Edinburgh, a recipient of the honorary degree of Doctor of Science from Chulalongkorn University, and an elected Fellow of the National Academy of Medical Sciences.

The Council of Scientific and Industrial Research honored Chaudhury with the prestigious Shanti Swarup Bhatnagar Award in 1969, recognizing his outstanding contributions to science and technology. The Medical Council of India also bestowed upon him with esteemed Dr. B. C. Roy Award, the highest recognition in the Indian medical field. In 1998, the Government of India included him in the Republic Day Honours list, conferring upon him the civilian award of the Padma Shri. In 2013, the Federation of Indian Chambers of Commerce and Industry (FICCI) recognized his lifetime achievements with a special award.

Chaudhury's legacy as a trailblazer in pharmacology and drug development continues to inspire generations of researchers, healthcare professionals, and policymakers. His dedication to patient safety, scientific rigor, and ethical practices set the stage for advancements in medical research and innovation in India and beyond. Chaudhury's visionary leadership and unwavering commitment to improve healthcare have left an indelible impact on the field of pharmacology, ensuring the well-being of patients and the pursuit of safe and effective medicines.

On October 27, 2015, just days before his 85th birthday, Chaudhury passed away during a visit to Chennai, Tamil Nadu, where he was attending a conference on Pharmaco-vigilance. Although he is no longer, his

contributions and enduring legacy will forever be remembered and celebrated by the medical community and the countless lives he touched through his pioneering work.

Awards and honours:

- Chaudhury, the first Indian doctor to receive a Rhodes Scholarship in 1955, was a Fellow of the Royal College of Physicians of Edinburgh and a recipient of the degree of Doctor of Science (Honoris Causa) from the Chulalongkorn University.

- He was the Patron of the India chapter of the International Society For Pharmacoeconomics and Outcomes Research (ISPOR) and an Emeritus Professor and an elected Fellow of the National Academy of Medical Sciences.

- The Council of Scientific and Industrial Research awarded him the Shanti Swarup Bhatnagar Award, the highest Indian award in the science and technology category, in 1969, and the Medical Council of India honoured him with the Dr. B. C. Roy Award, the highest Indian medical award.

- The Government of India included him in the 1998 Republic Day Honours list for the civilian award of the Padma Shri.

- The Federation of Indian Chambers of Commerce and Industry (FICCI) awarded him the Lifetime Achievement Award in 2013.

- He was also a recipient of awards such as Vishisht Bihari Samman, Unichem Award, Chulalongkorn University Award, and the Amrut Modi Award of the UNITRUST

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PAST EVENTS
NEVER STOP LEARNING

Department of Pharmacology, FPH, RUAS is dedicated to empowering students and the pharmaceutical community by fostering a culture of knowledge sharing that extends beyond the standard curriculum. Our commitment to enhance learning experiences led to the successful organization of the following insightful webinars:

Smart Multifunctional Nanoparticles In Cancer Theranostics: Progress and Perspective

By Dr. Ashok Kumar J

Assistant Professor
Department of Pharmaceutical Technology
UCSI University, Kuala Lumpur, Malaysia

Finding Joy in Giving Back - Be A Potential Life Saver

An awareness session on the occasion of World Blood Cancer Day

By Ms Sheetal Kapil & Ms Kruthika Ramesh

Donor Recruitment – Executives
DKMS BMST Foundation India

Living Organisms To Cybernetic Organisms: Struggle For Existence Or Survival Forever!

By Dr. Gaurav Shah

Associate Professor
Department of Biotechnology,
Veer Narmad South Gujarat University, Surat.Gujarat

Oncobiome: Boon or Bane in Translational Research

By Dr. Ishan Pandey

Reader and Head
Department of Microbiology,
Babu Banarasi Das College of Dental Sciences, Babu Banarasi Das University, Lucknow, (U.P.)

UPCOMING EVENTS
WEBINARS

Protection of Children against Sexual Offences Act 2012 (POCSO Act 2012) & Gender Equality

The Rakshin Project addresses the underlying issue and poses as a sustainable solution to Prevent Sexual Violence and Child Sexual Abuse. The project with a pro bono partnership with the Ministry of Youth Affairs and Sports, Govt. of India aims to work with 4 Million Youth across 40,000 colleges pan India to raise, a generation of responsible and accountable adults who can prevent harm and are equipped to create a Constitutional Rights-Based Enabled Environment

Dr. Ramya Nisal
Senior Trainer / Programme Head,
The Rakshin Project

Date: 21-Aug-2023
Time: 03:30 PM - 05:00 PM(IST)

REGISTER NOW

Contemporary Updates: Diabetes Mellitus and Role of GLP-1

Mrs. Anju Das
Assistant Professor
Royal School of Pharmacy
The Assam Royal Global University
Guwahati, Assam.

Mrs. Anju Das is an accomplished Assistant Professor at the Royal School of Pharmacy, The Assam Royal Global University. She has completed her B.Pharm and M.Pharm degrees from Rajiv Gandhi University of Health Sciences in Bangalore, Karnataka. Currently, she is pursuing her Ph.D. from Dayananda Sagar University, Bangalore. With a total 6.4 years of experience in academia and an additional 2 years of research experience. Mrs. Anju Das has established herself as an expert in the field of pharmacology. Her research work spans both clinical and preclinical aspects, contributing to the advancement of pharmaceutical knowledge.

Date: 26-Aug-2023
Time: 11:30 AM - 1:00 PM(IST)

REGISTER

NATIONAL WORKSHOP

Desktop to Benchtop

Desktop to Benchtop is a comprehensive two days national workshop being organized by the Department of Pharmacology aimed at bridging the gap between computational methods and real-world drug development. This workshop is brought together by experts from academia to explore cutting-edge approaches in drug discovery, from initial computational analyses to *in vivo* experiments involving animals.

Resource Person

Dr. Vasudeva Rao Avupati

E-Learning Lead, School of Pharmacy
Senior Lecturer
Department of Pharmaceutical Chemistry
International Medical University, Malaysia

Resource Person

Dr. J. Anbu

Professor & Head
Department of Pharmacology
Faculty of Pharmacy
Ramaiah University of Applied Sciences

Resource Person

Dr. Mohamed Shabi

Assistant Professor
Department of Pharmacology
Faculty of Pharmacy
Ramaiah University of Applied Sciences

31 August 2023
&
01 September 2023

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Awards & Achievements

PANPHARMACON STUDENT CLUB ACTIVITIES

Team panpharmacon participated in the 2 days workshop organized by JSS College of Pharmacy, Ooty on "Basic Techniques in Experimental Pharmacology". Various aspects of the origin of animal studies and the 3'Rs concept in animal studies, handling, and behavior of animals were discussed. Various routes of administration were demonstrated and hands-on training was provided to the students. Blood withdrawal techniques and isolated tissue experiments were performed. Surgical procedures were demonstrated in rodents. Computer-aided drug design hands on training was also conducted as a part of the alternative to animal experimentation. Team Panpharmacon expresses its gratitude to Dr.S.P. Dhanabal, Dr. Praveen T. K. & the entire organizing committee for providing an excellent learning environment and the opportunity to be part of the workshop.

Team Panpharmacon volunteered and participated in 76th Independence Day celebrations held at the university house on 15-Aug-2023. The team also participated in Azad Kadam - Walk with Tiranga Rally organized jointly by NSS RUAS & Rotaract RUAS powered by Rotary Bengaluru Manyata and RUAS.

AWARDS

Ms. Thanuja N K, was awarded the Best Presentation Award under the Faculty category in the International Conference on Applications of Natural Products Nanomaterials and Nano-pharmaceuticals (ICAN3) (Hybrid mode) held between 9 & 10 August 2023 for the presentation entitled "Explorative Study of Lavandula angustifolia Herbal Extract for Angiogenic Inhibition Property in chorioallantoic membrane (CAM)".

Ms. Sushmitha Narayan, PG Research Scholar was awarded Best Presentation Award under the research scholar category in the International Conference on Applications of Natural Products Nanomaterials and Nano-pharmaceuticals (ICAN3) (Hybrid mode) held between 9 & 10 August 2023 for the presentation entitled "Amending Effect of Ginsensoide rg1 against Valporic Acid Induced Autism in Mice" supervised by Mrs. Gouri Nair.

Ms. Thanuja N K, Assistant Professor Department of Pharmacology represented FPH in the sports event Sproothi 8th Annual Athletic Meet 2022-2023 held on 27 and 28 of January 2023 at MSR ground, Bengaluru conducted by RUAS on which various events like shot put, disc throw, hit the wicket, running race, relay, lemon and spoon, sac race, etc., were organized and won 2nd place in disc throw and hit the wicket also 3rd place in tug of war.

Mr. Damodar Nayak A, Advisor - Rotaract Club of RUAS was awarded the Best Faculty Coordinator for the Rota Year 2022-23 by Rotaract District 3190. Rotaract Club of RUAS also bagged Best Charter Club Award under his eminent leadership.

AWARDS

Mr. Sameerana Hammigi, President, Panpharmacon Student Club (2023-23) participated and won in state level essay writing competition organized by Karnataka Science and Technology Academy (KSTA) held on 8th July 2023 in Raman Research Institute, Bangalore.

Mr. Sharath H, Director of Alumni Affairs, Panpharmacon Student Club, and President of Rotaract Club of RUAS was awarded as Best charter club president-secretary award. Also, the club led by him was awarded the Best charter club award for the Rota year 2022-23 of district 3190.

CONFERENCE PRESENTATIONS

- Ms. Liya Biju presented an oral presentation of research work entitled "Development of Experimental Model and Evaluation of Ameliorative Effect of Pirfenidone on Sporadic Amyotrophic Lateral Sclerosis" at the International Conference on Applications of Natural Products Nanomaterials and Nano-pharmaceuticals (ICAN3) (Hybrid mode) held between 9 & 10 August 2023.

- Ms. Poornima presented an oral presentation of research work entitled "Development of Enriched Topical Formulation and their Evaluation for Hair Re-Growth and Vitality using Rat Model" at the International Conference on Applications of Natural Products Nanomaterials and Nano-pharmaceuticals (ICAN3) (Hybrid mode) held between 9 & 10 August 2023.

RECENT PUBLICATIONS

- Akshata, N., Ayamani, V., Sivashankari, S. and Muralidharan, P., 2023. A Landscape of Monosodium Glutamate on Homosapiens, *Europian Chemical Bulletin*, 12(7), pp. 711-731.

- Shabi, M.M., Sneha, H.C., Sneha, S., Supritha, C. and Surabhi, N., 2023. A Review on Nutritional Management of Stroke, *World Journal of Pharmaceutical Research*, 12(13), pp.229-247.

- Shabi, M.M., Kavana M., S. Priya N., and R. B. M. Gowda., 2023. Ebola Virus Disease: A Review, *World Journal of Pharmaceutical Research*, 12(13), pp.550-558.

- Lukose, L., Shantaram, P. M., Raj, A., Nair, G., Shaju, A. M. & V, K. S. 2023. Purine Antimetabolites Associated Pneumocystis Jirovecii Pneumonia, *Pharmacoepidemiological Drug Safety*.10.1002/pds.5647. Epub ahead of print. PMID: 37265365.

- Bhusan, K., Ammunje, D.N., Kunjiappan, S., Jayaraman, A., Devi, M. and Pavadai, P., 2023. An in-Silico approach to evaluate the binding efficacy and stability profile of MWCNT entangled rutin for breast cancer treatment. *Nanomedicine Journal*. 10(3), pp. 1-6.

- Srivathsa, A.V., Sadashivappa, N.M., Hegde, A.K., Radha, S., Mahesh, A.R., Ammunje, D.N., Sen, D., Theivendren, P., Govindaraj, S., Kunjiappan, S. and Pavadai, P., 2023. A Review on Artificial Intelligence Approaches and Rational Approaches in Drug Discovery. *Current Pharmaceutical Design*, 29(15), pp.1180-1192.

CONFERENCE ATTENDED & VIRTUAL LEARNINGS

- Dr. Kesha M Desai delivered an IQAC expert talk on "Drug safety Evaluation on Special Population" organized by ROFEL, Shri G. M. Bilakhia College of Pharmacy, Gujarat on 13-05-2023.

- Ms. Thanuja N K attended International Conference on Multidisciplinary Innovative Research and Development on 1st -2nd July 2023 organized by Nilkanthrao Shinde Science and Arts College, Chandrapur, Maharashtra, and Sidvi Foundation New Delhi.

- Ms. Thanuja N K attended National One-Day Workshop on “Use of Smart Tools for Effective & Interactive Teaching” Organized by APTI Maharashtra in association with SVKM’s, NMIMS, SPTM, Shirpur Campus on May 8th 2023.

- Ms. Thanuja N K attended workshop on Game Changing Technologies organized by Advanced Computation and Data Sciences Division, CSIR-North East Institute of Science and Technology, Jorhat on June 5th 2023.

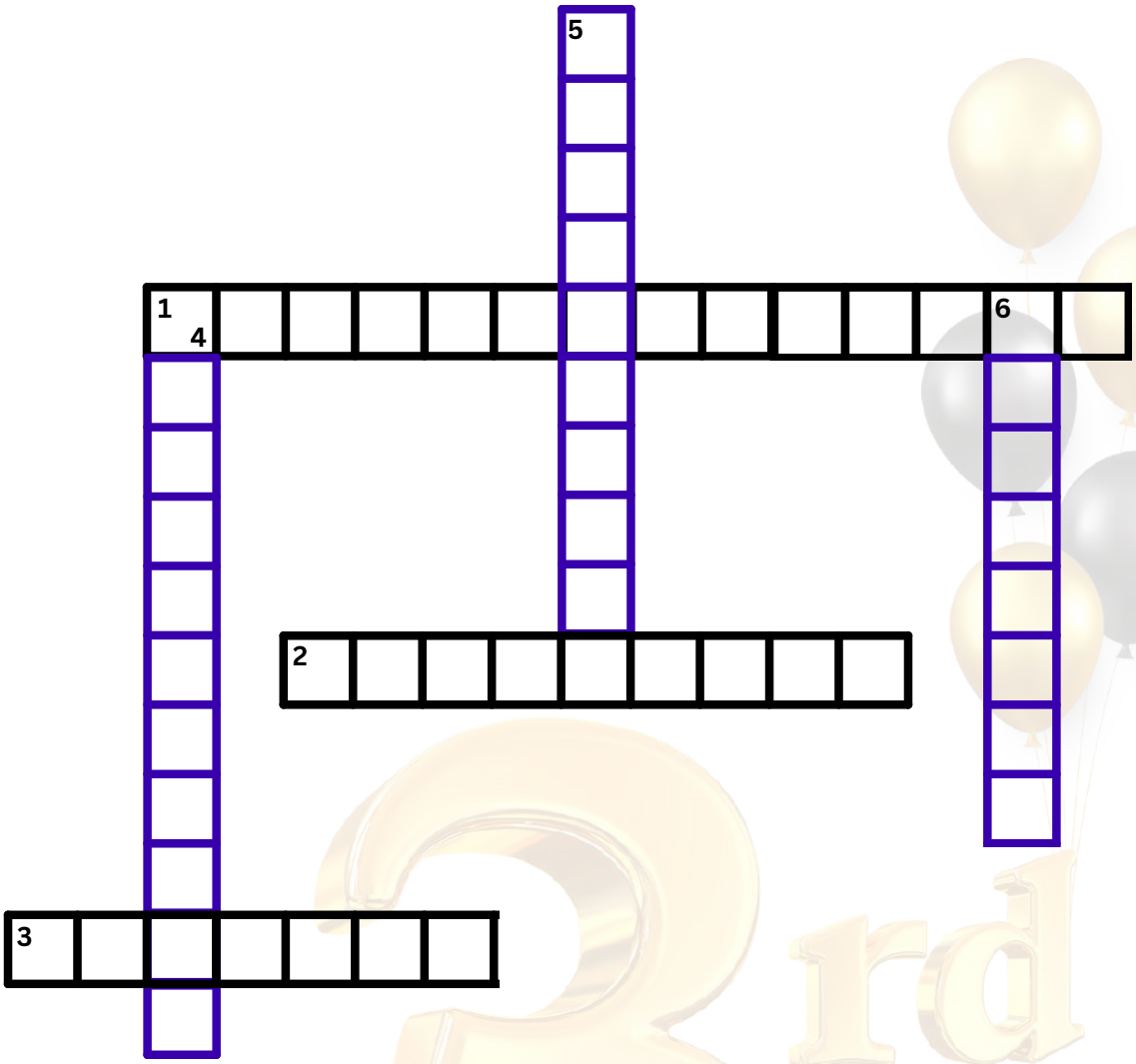
- Ms. Thanuja N K attended IPR awareness/training program under the special mission called “National Intellectual Property Awareness Mission (NIPAM)” on 21st May 2023 organized by Intellectual Property Office, India.

- Ms. Vaishnavi Patel completed various online courses- Precision Medicine offered by University of Geneva Data management for clinical trials offered by Vanderbilt University, Introduction to cancer biology offered by John Hopkins University and Leadership skills offered by IIM Ahmedabad on Coursera Platform.

- Ms. Vaishnavi Patel participated in Virtual internship offered by Thermo Fisher Scientific for a month which includes tasks like Understanding Real-time PCR for diagnostics and how to find and analyze real-time data 1st June - 1st July 2023.

MIND LAB - CROSS WORD

Mind Lab



ACROSS

1. I am a process that tests a drug's effects on human

2. Targets the overexpression of the HER 2 protein in breast cancer cells

3. I am an anticoagulants medication, derived from leeches

DOWN

1. Immunosuppressant medication, derived from a fungus used to prevent organ transplant rejection

2. What is the active ingredient in over-the-counter sleep aid medication known as Nyquil

3. Gene therapy for inherited retinal disease

MIND LAB - FIND THE WORD

Mind Lab

M	R	T	S	E	T	M	N	E	A	R	R	I	G	B
O	P	I	I	L	T	B	I	S	A	R	G	A	D	A
T	A	T	V	Y	U	A	B	A	P	A	A	M	M	M
G	P	A	P	A	P	C	I	B	I	R	G	O	B	P
A	A	V	I	S	P	T	A	P	A	I	A	N	A	E
N	R	I	I	C	I	A	B	B	T	S	E	T	M	N
T	E	P	I	T	I	C	C	V	M	S	R	O	U	A
E	C	A	M	A	M	N	E	A	R	R	I	G	L	T
N	O	T	B	B	B	O	P	E	N	T	T	I	E	N
E	E	I	E	V	E	D	F	R	I	E	I	V	P	E
R	S	M	A	I	A	O	P	M	R	V	L	E	E	S
U	I	E	T	X	T	E	C	I	O	J	I	P	L	R
M	A	Z	T	S	T	M	I	C	R	L	B	S	E	A
A	I	A	C	A	C	H	T	A	C	N	O	R	T	P
Q	U	I	Z	A	R	T	I	N	I	B	C	U	E	S

Mitapivat, Adagrasib, Quizartinib, Sparsentan, Lenacapavir, Tofersen

Winner Mind Lab VIII

Manthri Yagna Sree

V Year Pharm D

Department of Pharmacy Practice

Raghavendra Institute of Pharmaceutical Education and Research RIPER -Autonomous

ThesauRx

Drug: Lecanemab/Leqembi, Companies: Eisai/Biogen
Used for: Alzheimer's disease
Lecanemab is a humanized monoclonal antibody that binds with high affinity to soluble amyloid-beta (Aβ) protofibrils, which have been shown to be more toxic to neurons than monomers or insoluble fibrils.

Image Courtesy: https://www.wbbjtv.com/2023/01/07/explainer-new-drug-slows-alzheimers-but-comes-with-caveats/

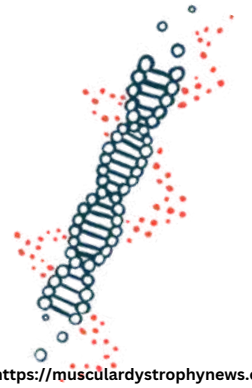


Image Courtesy: https://musculardystrophynews.com/news/ sarepta-asks-fda-to-approve-gene-therapy-srp-9001-for-dmd/

Drug: SRP-9001, Companies: Sarepta/Roche
Used for: Gene therapy for Duchenne muscular dystrophy
Duchenne muscular dystrophy (DMD) is a devastating disease that takes hold in childhood, slowly weakening the muscles including the heart. The disease, which only affects males, leaves young boys wheelchair-bound and statistically highly unlikely to see their fourth decade.

USFDA approved Xacduro (sulbactam for injection; durlobactam for injection), a new treatment for hospital-acquired bacterial pneumonia (HABP) and ventilator-associated bacterial pneumonia (VABP) caused by susceptible strains of bacteria called Acinetobacter baumannii-calcoaceticus complex, for patients 18 years of age and older.

Image courtesy: https://www.drugs.com/history/xacduro.html

Image courtesy: https://www.drugs. com/history/xacduro.html

USFDA approved Cyfendus™ (anthrax vaccine absorbed, adjuvanted) for postexposure prophylaxis of disease following suspected or confirmed exposure to Bacillus anthracis in persons 18 through 65 years of age when administered in conjunction with recommended antibacterial drugs.

|| ज्ञानं विज्ञानं च भक्तिसहितं ||

Devotion to Enlightenment

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