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MESSAGE FROM THE DESK OF THE ASSOCIATE EDITOR

The 'Pharma Innovations' is on its march of success since its inception and the growing interests of the students as well as the faculty members to participate and submit writings to its various sections have led to create increased interest of the members of the Editorial Board for its faster publication. With the blessings and good wishes of all directly or indirectly associated with its publication, 'Pharma Innovations' is going to turn into a full fledged pharma journal of both national and international repute very soon. Thus, hope that the objectives of publication of this e-magazine will be fulfilled very soon and 'Pharma Innovations' will further fulfil the queries and research interest of the budding scientists of pharmacy.

DR. R. MAZUMDER
PROFESSOR AND DEAN (R & D)
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MESSAGE FROM THE DESK OF THE ASSOCIATED EDITOR

"Pharma Innovations" is a right platform for the faculty and students for sharing the views and the innovative research and knowledge in Pharmacy, medicines and health. Its really a great thing for bringing out the first issue of 2019 with good quality articles that will enhance the depth of knowledge treasury. I am firm about the ensuing issues of the magazine with regard to quality and coverage. I wish the magazine for its attempt and continuity of its tempo in the same direction in the days to come.

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FACULTY FORUM

NANOMEDICINE – A BOON FOR HEALTH CARE

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In current scenario life science interact with nanoengineering, nanotechnology and nanoscience and give a fruitful result in the form of nanomedicine. Nanomedicine is the application of nanotechnology to achieve innovation in healthcare. It uses the properties developed by a material at its nanometric scale 10-9 m which often differ in terms of physics, chemistry or biology from the same material at a bigger scale.

Nanomedicine ia science which finds its use for screening, medical diagnosis and treatment by using tools of nanoscale along with the knowledge of the human body system simultaneously. Nanomedicines provides a research area by which researcher can focus on design of medicines such that they target to diagnose and treat life- threatening diseases in a shorter period of time by improving drug bioavailability and potency, while reducing adverse effects.

Nanomedicines are designed for enhancing the solubility of drug by encapsulating relatively insoluble pharmaceuticals in liposomes or micelles so that they get easily transfer to target site, via the blood stream. Nanomedicines are used to deliver drugs, heat, light or other substances to specific types of cells (such as cancer cells). One more benefit is that in nanomedicines particles are designed in such a way that they are directly attracted by desired target cells thus curtailing the chances of destruction of normal human cells. This also confer an advantage for early detection of diseases.

Various examples of nanomedicines replicating some functions of biological macromolecules are

- Drug Abraxane
- Carbon dots (C-dots)
- Nanodiamonds (NDs)
- Carbon nanotubes (CNTs)
- Mesoporous silica NPs (MSNP),
- Superparamagnetic iron oxide NPs (SPIONs)
- Biochips, needleless injectors, hearing aids, medical flow sensors and blood pressure, glucose monitoring and drug delivery systems.

In a nutshell science of nanomedicine plays an increasingly integral and transformative role in medicine and public health in the 21st century.

Application of IOT in Pharmaceutical Industry

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Internet of Things (IoT) is a network of physical devices and other items, embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data. The term internet of things was devised by Kevin Ashton, cofounder and executive director of Auto-ID Center at MIT in 1999 and refers to uniquely identifiable objects and their virtual representations in an “internet-like” structure.

The early years of Internet of Things (IoT) started with Machine to Machine (M2M) communication. M2M communication indicates two machines communicating with each other, usually without human involvement. The communication platform is not defined, and can be both wireless and wired communication. E-health becomes the development of internet for medical requirement . E-health provides information on disease prevention, detecting early symptoms of the disease, and monitor the patient's condition based on medical parameters from a far distance. In addition, E-health combines wearable sensors, Smartphone and web interface to make one system that connects each other. Some research shows the utilization of E-Health in many purposes such as Pulmonary disease , Parkinson disease, diabetes mellitus , and cardiac disease .Similarly, smart watch becomes an alternative wearable sensor, combined with a Smartphone as the interface for health monitoring

SENSORS:

Wearable Sensor, Bluetooth, Near Field Communication (NFC), Wi-Fi, Wireless sensor network (WSN), low-power wide-area networks (LPWA), Radio-frequency identification (RFID).

The combination of sensors attached to the body and serves to detect vital conditions in the body called wearable sensors. for detecting heart-beat, level of oxygen in the blood and blood pressure using photoplethysmography (PPG) sensor.

IOT applications are used widely in many domains. Healthcare, agriculture, smart buildings (school, hospital, home), supply chain management , Transportation and defence.

Monitor an aging family member

Healthcare-Telemedicine

Logistics

Pharmaceutical intelligent information system

Adverse drug reaction (ADR)

Scalable, continuous, heart rate monitoring.

Pharmaceutical intelligent information system:

The Pharmaceutical Intelligent Information System (PIIS) is focused on drug checking in order to detect ADR, and interactions related with renal absorption, side effects during pregnancy or during breastfeeding, and interactions for specific diseases like tuberculosis (TB).

MICROWAVE ORIENTED REACTION ENHANCEMENT (MORE): A REVIEW

NIDHI SRIVASTAVA
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Organic synthesis plays an important role in understanding as well as application of the same to get large number of diverse organic compounds which are useful for various reasons. Among much usefulness of these organic compounds one such important use is in production of various drugs which already exist in the market as well as those which are yet to come to the market. The mode of heating from the history it started with fire to transform organic compounds later bunsen burner once after Bunsen invented it, then heating mantles came to give a heat in a more focused way. Now we are in an era of microwaves wherein the reactions are driven super fast with aid of MORE.

Domestic microwave ovens are used as a convenient mode for rapid heating of foodstuffs in kitchen since 1970. Traditionally, microwaves are also used as a source of energy and heat in chemical laboratories for efficient heating of water, for moisture analysis and wet ashing procedures of biological and geological materials. Their computerized versions are commercially available for the acid digestion of ores and minerals and to determine thermodynamic function of chemical reactions. The applications of microwave technology in the catalytic hydrogenation of alkenes, the hydrocracking of bitumen obtained from tar sand, degradation of polychlorinated hydrocarbons, hydrolysis or denaturation of proteins and peptides, waste material management, preparation of samples for analysis, drug release, accelerated stability/ decomposition studies of drugs and polymer/ ceramic technology are well known. Now we are in an era of microwaves wherein the reactions are driven super fast with aid of MORE.

STUDENTS FORUM

PHARMACEUTICAL CARE

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Pharmaceutical care including pharmaceutical care plan process (CORE, PRIME and FARM) is a systematic method for recording the pharmacist's examination of patient pharmacotherapy and subsequent modification of medication related problems.

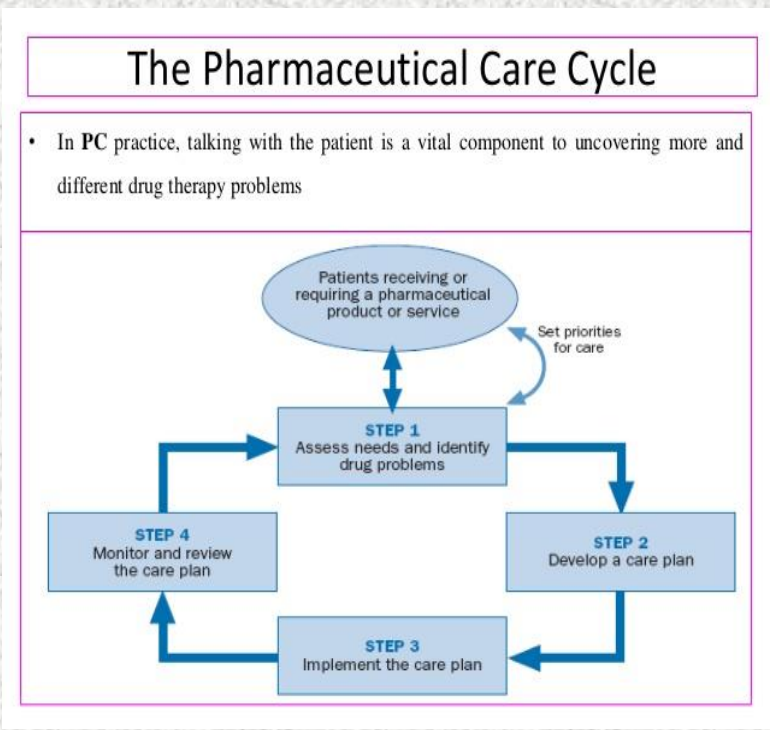
Pharmaceutical care is the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life . These outcomes are

- cure of a disease;
- elimination or reduction of a patient's symptomatology;
- arresting or slowing of a disease process; or
- preventing a disease or symptomatology.

Pharmaceutical care involves the process through which a pharmacist cooperates with a patient and other professionals in designing, implementing, and monitoring a therapeutic plan that will produce specific therapeutic outcomes for the patient. This in turn involves three major functions:
- identifying potential and actual drug-related problems;
- resolving actual drug-related problems; and
- preventing drug-related problems.

It actually includes provisions for identification and assessment of actual or potential medication related problems, description of a therapeutic plan and appropriate follow -up monitoring of problems.

Documentation of pharmaceutical care is integral to the continuity of care demonstration of clinician competence , communication of health care providers , evidence of health contributions to patient care and reinforcement of professional services.



ARTIFICIAL BLOOD: RESPIROCYTE

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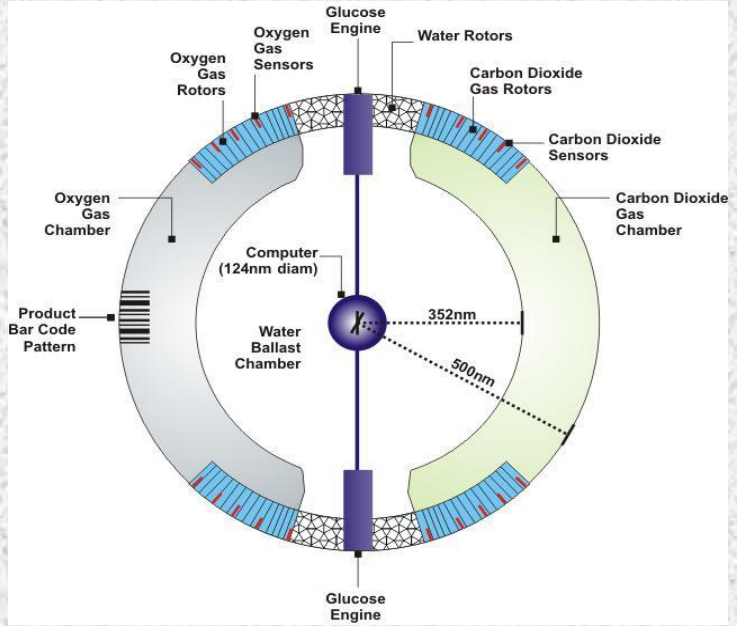
It is very difficult to find a blood group match when a patient needs blood transfusion. The concept of Respirocyte was introduced to cope up with this problem. Prior to this approach many attempts were made to produce synthetic blood by chemical processes (eg, Hemopure, Fluosol-Da-20) but all failed due to significant drawbacks.

Respirocytes are hypothetical nano machines capable of mimicking the action of red blood cells. In other words Respirocytes are artificial red blood cells. The concept of Respirocytes was proposed by

Robert A. Freitas Jr in 1998 in his research paper titled: "A Mechanical Artificial Red Blood Cell: Exploratory Design in Medical Biotechnology".

Respirocytes are categorized under Molecular Nanotechnology field which is still at its infant stage. The original proposed structure of Respirocyte had a diameter of 1 micrometer significantly smaller than RBC (6-8 micrometer). Small size allows for delivery of oxygen even to the farthest tissues. The outer shell will be made from any crystal with diamond like structure eg;- sapphire.

A working Respirocyte would need- Molecular rotors, to pump gases in and out of the pressurized gas chambers and collect glucose for energy; A Power Generator, with similar operation as that of a fuel cell using glucose as energy source; Water Ballast Chambers, to control buoyancy; Sensors, to determine oxygen and carbon-dioxide concentration; A Tiny Computer to interpret information from sensors and to control flow rate of gages; Pressure transducers, on the outside to act as receiver of programming instructions.



The applications and medical opportunities of Respirocytes are clearly limitless. A Respirocyte can carry 236 times more oxygen than a natural RBC. Respirocytes can be used for supplementing blood loss during wars, accidents, etc. They may also be used for enhancing the potential of athletes.

So, as I conclude my words I would just like to say that Respirocytes may seen hypothetical now but they are undoubtedly the future of medicine and haematology. What seems impossible today will one day become our reality!

ABUSED DRUGS

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All medicines are drugs but all drugs are not medicines.

Substance abuse is when you take drugs that are not legal. It's also when you use alcohol, prescription medicine, and other legal substances too much or in the wrong way. Substance abuse differs from addiction. Many people with substance abuse problems are able to quit or can change their unhealthy behavior. Addiction, on the other hand, is a disease. It means you can't stop using even when your condition causes you harm.

And scientists are finding that some illegal drugs have significant medicinal uses.

- Heroin for Opiate Addiction. The majority of opiate addicts don't use heroin. ...
- Ketamine for Bipolar Disorder. ...
- MDMA for Post-Traumatic Stress Disorder. ...
- Magic Mushrooms for Alcoholism and Anxiety.

Commonly abused drugs include:

- Alcohol.
- Amphetamines.
- Cocaine and crack.
- Cough and cold medicines
- Depressants.
- γ-Hydroxybutyric acid (GHB).
- Heroin.

What types of drugs are there?

There are seven different drug types, and each has its own set of effects and risks:

- Stimulants.
- Depressants.
- Hallucinogens.
- Dissociatives.
- Opioids.
- Inhalants.
- Cannabis.

Some illegal drugs are

- Methamphetamine.
- Crack cocaine.
- Black tar heroin.
- Phencyclidine (pcp)
- Synthetic cannabinoids (see also: synthetic cannabis)
- Dimethyltryptamine (dmt)
- 5-meo-dmt.
- Many others, including some prescription drugs.

Substance abuse affects every part of ones life. It can hurt one and the people around him. It can ruin relationships and ones financial health. Abusing drugs can also lead to addiction and cause serious health problems and even death. To stop, one may need counseling, medicine, or both. If one has a substance abuse problem and want to quit, a doctor can help figure out the best treatment options for you.

"See you in Next Edition"

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