About Us !

Al Shifa College of Pharmacy was established in the year 2002. The college offers MPharm (Pharmaceutics, Pharmacy practice, Pharmaceutical analysis and Pharmaceutical chemistry), Pharm D, Pharm D (PB) ,B Pharm & D Pharm. The courses have been approved by AICTE, PCI, DME, Govt. of Kerala & KUHS.

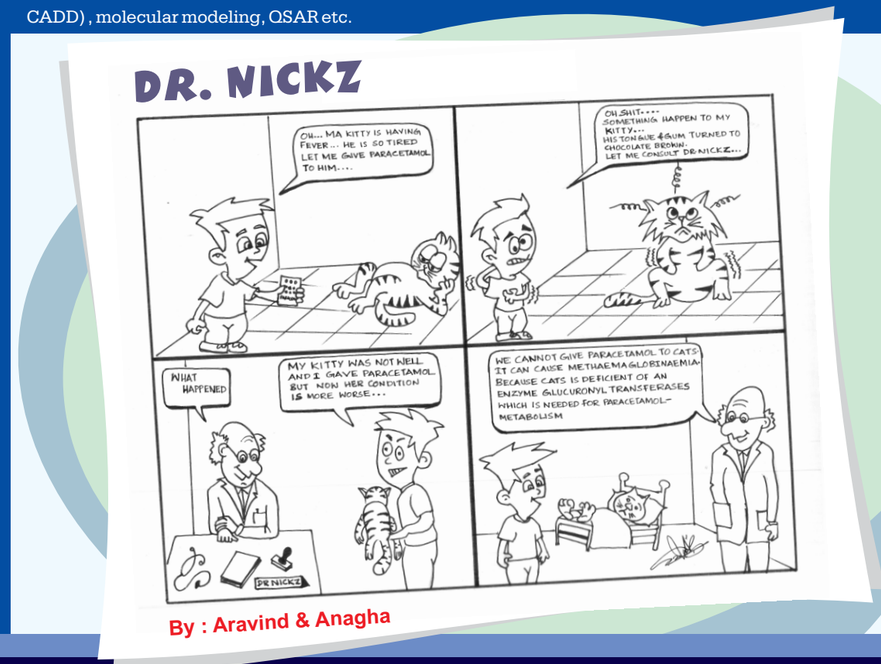
ACP has been recognized as minority education institution by the national commission for minority education institution, Govt. of India in the year 2008. The college is located in serene, picturesque and lush green surroundings of over 35 acres of land. Al Shifa college of pharmacy the pioneer of pharmacy education is the first college in self financing sector in Kerala to start post graduate course in pharmacy. The core branch of pharmacy, pharmaceutical chemistry was introduced in alshifa with the aim of developing new strategies in drug design.

Department of pharmaceutical chemistry is one of the biggest department in Al Shifa college of pharmacy constituting more than ten well experienced, competent and dedicated staffs. Most of our faculties are registered for PhD in well reputed institutions.

Department has five full fledged pharmaceutical chemistry laboratories is for conducting synthetic research oriented studies and a sophisticated instrumentation lab equipped with advanced instruments like HPLC, IR, UV, Flame photometer, Nephelo turbidimetry etc. In collaboration with Al Shifa hospital, our department engages analysis of biological samples, which is inevitable for toxicological studies. Our department serves as a center for analyzing various chemical samples from other institution for spectral studies.

Our Mission

We dream for establishing a department which focus on creating new standards in the world of chemistry through consistent update of knowledge and safe chemistry practice by applying green chemistry which enables effective education to the students with the aid of innovative approaches like Computer aided drug designing(CADD) , molecular modeling, QSAR etc.



By : Aravind & Anagha

For suggestions and feed backs please write to :

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Volume.1 Issue.1 January 2015

SHIFA CHEMPHARM

The journey of life through chemistry

Managing Trustee's Desk :

It is heartening to note that Department of Pharmaceutical Chemistry, Al Shifa College of Pharmacy, Perintalmanna is launching a newsletter with the name **ShifaChemPharm**, first of its kind in Kerala, for sharing their ideas with their peers all over.

News letter from Department of Pharmaceutical Chemistry is rare phenomenon which really needs lot of application from the editorial board. I have faith in them that they could do it.

The editors have great plans for this newsletter which would be very much useful to the faculties, scientists and peers of other colleges and industries.

I am very much delighted to know that Department of Pharmaceutical Chemistry, Al Shifa College of Pharmacy is bringing up the quarterly news letter **ShifaChemPharm**. I appreciate the efforts of Prof. (Dr.) T.N.K. Suriyaprakash M.Pharm., PhD, Principal, for taking the initiatives and Prof. (Dr.) Arun Rasheed, Head, Department of Pharmaceutical Chemistry and his whole team behind the effort for bringing out this informative newsletter.

Mr. P. UNNEEN
Managing Trustee

Editorial Board Director's Desk :

I am delighted to introduce our new Newsletter, ShifaChemPharm, published by Department of Pharmaceutical Chemistry, Al Shifa College of Pharmacy, Perintalmanna, with Prof. (Dr.) Arun Rasheed, Head, Department of Pharmaceutical Chemistry, as Editor-in-Chief, from this month onwards.

This is the second Newsletter from this prestigious institution with ShifaClinPharm already in circulation for the past nearly three year published without interruption.

This is all possible in this institution because of the inspiring leadership of our beloved Mr. P. Unneen, Managing Trustee, who immediately accepted and encouraged to share the Chemistry knowledge with the peers in other colleges and industries.

ShifaChemPharm is a different newsletter wherein the peers can participate by sending their reviews, findings, knowledge etc to the editor, which will be reproduced.

A team of professionals comprises of the faculties of Department of Pharmaceutical Chemistry and Department of Pharmaceutical Analysis who will interact with you in all matters related to synthetic compounds, phytocompounds and analytical works.

In this First issue, most of the faculties have contributed interesting facts about chemistry and in the last page a caricature will be done by our students and faculties!

My best wishes to the team headed by dynamic HoD, Prof. (Dr.) Arun Rasheed for publishing this newsletter.

We expect contributions from peers and criticism for improving the quality of this newsletter.

"Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning - Albert Einstein"

Prof. (Dr.) T.N.K. SURIYAPRAKASH
M.Pharm., PhD., Principal

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Chief Editor's Desk :

Dr. ARUN RASHEED
Head Department of Pharmaceutical Chemistry

Dear reader,

It is a proud moment for us to introduce a Quarterly News letter from the Department of Pharmaceutical Chemistry from this issue onwards. This newsletter will focus new findings in Pharmaceutical Chemistry, Drug Design, Drug Analysis etc. Also we accept articles from peers in industry and academia.This newsletter is possible because of constant motivation and guidance of our Principal, Prof.(Dr.) T.N.K. Suriyaprakash M.Pharm., PhD., who supports us in all ways to bring out this newsletter.

Our heartfelt thanks bestowed upon our Managing Trustee, Mr. P. Unneen who is the force behind us in bringing out this newsletter and much more is possible under his leadership.I thank Mr. S. Balasubramanian, Ex-IPGA president for contributing a article, 'Plant drugs :Safe uses and risks' which Also I thank my department colleagues for their willingness to put more work.

PLANT DRUGS : SAFE USES AND RISKS

Prof. S. Balasubramanian
C.I.Baid Metha College of Pharmacy, Chennai

INTRODUCTION :

Plants are used as drugs from time immemorial but that use was always together with their misuse and abuse. Ancient people used many herbs for many purposes, as food, as drug, as cosmetic and for intoxication when they accidently found them to be an intoxicant. Even poisonous plants were used either for suicide or for killing other human beings or animals. Thus the history of use of herbs is full of twists and turns, as the mankind started realizing its actual use by trial and error

REACH OF HERBAL MEDICINES :

There are many indigenous systems of medicines largely depending on the herbs as its main tool for treatment. Thus in India, Ayurveda, Siddha and Unani systems of medicines use hundreds of medicinal plants for treating patients. Similarly Oriental medicines of East Asian countries, Tibetan medicines and Arab systems of medicine also use medicinal plants for the last thousands of years. Accepting their usefulness and value, even modern systems of medicine like Homeopathy and Allopathy also started using either parts of medicinal plants or their chemical constituents. Thus there are many exclusive pharmacopoeias published by various countries for Herbal medicines like British Herbal Pharmacopoeia (BHP), Japanese Standards for Herbal Medicines (JSHM), Ayurvedic Pharmacopoeia and Siddha Pharmacopoeia. British Herbal Pharmacopoeia alone has more than 500 herbal drugs listed. But many ancient documents list far more number of monographs of Herbal Medicines.

For example, Egypt's 'Papyrus Ebers' lists 800 formulae and 700 different drugs. China's 'Pen-t-sao' contains 350drugs, one for each day of the year. In India Ayurvedic physician Charaka has classified 50 groups of ten drugs each, totaling to 500, at the same time, ayurvedic surgeon Sushruta had arranged 760 herbs in 7 sets.

USE OF HERBAL MEDICINES :

The successful herbal medicines of ancient systems of medicines were analyzed and assimilated by modern allopathic system of medicines. Thus we have scores of active ingredients isolated, purified and made into formulations by modern systems of medicine.

The list is long and cannot be given here. Almost all the drugs we study in the Pharmacognosy subject are examples for this adaptation of herbal medicine into English medicine.Starting with more powerful and popular, Digitalis glycosides to Sennasides, Reserpine, Ergot alkaloids to Morphine their use has been proved beyond doubt, long time back. We know very well we have best hepatitis (Jaundice) medicines only in alternative systems of medicines than allopathy like Phyllanthus niruri and Eucalypta alba. Even the common Neem tree is found to be useful as antiviral and antiseptic. Thus the use of herbs as medicine is well known and need not be elaborated.

ABUSE OF HERBAL MEDICINES :

As pointed out earlier, abuse of herbal medicine started along with right use of herbs. There are many reasons for this; foremost among them is ignorance about the particular plant and its bad effects. For example when people came to know about Hallucinogens among the plant species, they started misusing it. Indian hemp (Cannabis sativa) is the best example for this misuse. Similarly Opium latex containing Narcotics like Morphine and Codeine were highly misused. Nutmeg and Coca are the other plants abused by people to certain extend. Other common addiction forming plant species are Tobacco, Areca Nut, Coffee and Tea. This apart there is misuse of herbal formulations containing alcohol like Arista and Asava. It is well known that medicinal plants in high doses are used as poison. Moreover herbal practitioners with poor knowledge or quacks, prescribe many herbs for impotency, abortion and even for AIDS, to cheat the public. Hence patients should be advised to take treatment with correct herbs prescribed by correct physician.

CONCLUSION :

Like a coin, there are two sides for everything; medicinal plants are not an exemption. One has to be careful while selecting a medicinal plant for regular use. Herbal medicines are comparatively safer than modern medicine, if we use them judicially, properly and with caution. As complete assay or standardization methods are not available for herbal medicines, we have to be careful while purchasing and using them. If properly used they help us to lead a healthy life!

ANTI - CANCER DRUG DISCOVERY AND DEVELOPMENT, BCL-2 FAMILY SMALL MOLECULE INHIBITORS

Mrs.Lathika C.G

Apoptosis is an orchestrated cellular process important for maintaining the homeostasis between cell proliferation and cell death. Apoptosis can be induced to the activation of effector caspases. The extrinsic pathway of apoptosis is initiated at the plasma membrane upon ligation of death receptors, the intrinsic pathway is initiated in response to intracellular stress, eventually leading to mitochondrial outer membrane permeabilization (MOMP). The B-cell lymphoma-2 (Bcl-2) family of proteins is central to the intrinsic pathway of apoptosis. Deregulated apoptosis is a hallmark of cancer, and the B-cell lymphoma-2 (Bcl-2) family of proteins is pivotal to mediating the intrinsic pathway of this process. Recent advances have yielded both pan-Bcl-2 small molecule inhibitors (SMIs) that inhibit both the Bcl-2 and the Mcl-1 arm of the Bcl-2 family antiapoptotic proteins, as well as selective SMIs to differentially target the two arms. Of these SMIs, ABT-263 (navitoclax), AT- 101 [(-)-gossypol], and obatoclax (GX15–070) are currently in clinical trials for multiple cancers. While pan-Bcl-2 inhibitors such as AT-101 and obatoclax can be more toxic for inhibiting all members of the anti-apoptotic Bcl-2 family of proteins, resistance can quickly develop for ABT-263, a selective Bcl-2 inhibitor. As Mcl- 1 upregulation is a major mechanism of ABT-263 resistance, Mcl-1-specific inhibitors are expected to be efficacious both in combination/sequential treatments and as a single agent against cancers resistant to ABT-263.

A BLUE DYE CAN CURE ALZHEIMER !!!

Neethu Varghese. M.Pharm., Assistant Professor, Dept. of Pharmaceutical chemistry,
Al Shifa College of Pharmacy

Alzheimer's disease is the most common type of dementia characterized by memory impairment and alteration of diverse cognitive abilities. Alzheimer's disease is characterized by slow and progressive neuro degeneration, which is associated mostly with intracellular accumulation of tau protein leading to neurofibrillary tangles (NFTs) and other inclusions containing modified tau.

Abnormal phosphorylation of tau protein in Alzheimer's disease decreases its tubulin binding capacity leading to microtubule disorganization. Moreover the protein polymerizes by itself and sticks together in the form of NFTs. The protein clumps thus accumulated in the brain cells, disrupt their function, and can even kill them.

The role of methylene blue as a potential agent for treating Alzheimer's was being discussed through the past decades.However, until now it was unknown why methylene blue had this effect. Researchers from *Goettingen and Bonn* in Germany have now shed light on this microscopic process.The study published in AngewandteChemie by a team of scientist including *Markus Zweckstetter and EckhardMandelkow* reported that, methylene blue inactivates molecular residues that promotes the bonding of tau proteins. The researchers also found indications that the substance acts as a spacer to keep the proteins apart.

NMR spectroscopy study carried out by *Prof.Zweckstetter* and his team members concluded that methylene blue reacts with certain elements called cysteines in the tau proteins.

This effective reaction of Methylene blue specifically modifies the two cysteines of the tau proteins at critical spots. Sulphur and Hydrogen groups, of cysteines are coupled with oxygen atoms. This chemical transformation prevents tau proteins from bonding together. In absence of this reaction SH groups from different proteins would react and form a disulfide bridge. In a healthy organism, the formation of these disulfide bridges is suppressed naturally with the help of antioxidants. However, with age and in cases of neurodegenerative diseases such as Alzheimer's, this protective system weakens allowing tau proteins to aggregate. However, tau proteins can also aggregate without these bridges. This is due to the structure of the molecule, the backbone of which can fold like an accordion in some places. Such regions can pile up to "beta sheets" when two proteins come together closely enough and in the appropriate orientation.

The experiments also presented a distinct effect of methylene blue on the regions that want to form these beta sheets. Methylene blue, particularly its derivatives "Azure A" and "Azure B", also appear to inhibit the aggregation of beta sheets.

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CHEMOMETRIC ANALYSIS FOR SPECTROSCOPY : AN OVERVIEW

Shebina P. Rasheed, Assistant Professor, Dept.of Pharmaceutical Analysis

Chemometrics is the science of extracting information from chemical systems by data-driven means. Chemometrics is the use of mathematical and statistical methods to improve the understanding of chemical information and to correlate quality parameters or physical properties to analytical instrument data. Patterns in the data are modeled; these models can then be routinely applied to future data in order to predict the same quality parameters. The result of the chemometrics approach is gaining efficiency in assessing product quality. It can lead to more efficient laboratory practices or automated quality control systems.

The only requirements are an appropriate instrument and software to interpret the patterns in the data. The science of chemometrics gives spectroscopists many efficient ways to solve the calibration problem for analysis of spectral data. Chemometrics can be used to enhance methods development and make routine use of statistical models for data analysis. The spectroscopists chemometrics requirements are:

- Proper application of spectroscopic data pre-processing, to reduce and correct interferences such as overlapped bands, baseline drifts, scattering, and path length variation
- Strong calibration and diagnostics means of sample selection and variable election, statistic result calculation to build representative and reliable models.
- Model validation and integration means to supply rigorous prediction, measurement QC and real-time product quality and process monitoring.

Spectroscopists need to use the following methods within a chemometricssoftware package to explore their data :

- **Principal Component Analysis (PCA)**
- **Regression (PLS, PCR, MLR, 3-way PLS) and Prediction**
- **SIMCA and PLS-DA Classification**
- **Design of Experiments**
- **ANOVA and Response Surface Methodology**
- **Multivariate Curve Resolution (MCR)**
- **Clustering (K-Means)**

Techniques include :-

- Multi variate calibration
- Classification, pattern recognition, clustering
- Multi variate curve resolution
- Other techniques
- Experimental design
- Signal processing
- Performance characterization, and figures of merit
- Multivariate statistical process control (MSPC)
- Multi way Methods

In conclusion, Chemometrics is the bridge between connecting the state of a chemical system to the measurements of the system. It has become an essential part in the modern chemical and biomedical industries.Chemometrics software has been widely used by product development scientists, process engineers, PAT specialists, and QA/QC scientists to build reliable model, ensure product quality.

Chemometric techniques are heavily used in analytical chemistry and metabolomics, and the development of improved chemometric methods of analysis also continues to advance the state of the art in analytical instrumentation and methodology. It is an application driven discipline, and thus while the standard chemometric methodologies are very widely used industrially, academic groups are dedicated to the continued development of chemometric theory, method and application development.

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PHARMACOPHORE MAPPING - AN INEVITABLE PROCESS OF DRUG DESIGNING

Arunkumar.R.S, Asst.Professor, Dept. of Pharmaceutical chemistry,Al Shifa College of Pharmacy.

Pharmacophore mapping is the prediction of an important part of a small molecule which binds to a larger molecule. A Pharmacophore can be termed as the spatial mutual orientation of atoms or groups assumed to be recognized by and interacted with a receptor or active site of a receptor. It includes a set of structural, physical and chemical features, a compound must possess to elicit certain biological activity. In pharmacophore mapping process, finding various features required for biological activity, determination of molecular conformation required, and development of superposition or allignment rule for a series of compounds have been carried out.Two aspects which are to be considered during pharmacophore mapping are 1) Conformational properties and 2) Common pharmacophoric group present in a series of compounds, which can be positioned in a similar orientation in space. For derivation of 3 dimensional pharmacophores various methods are employed. 1) Constrained systematic search 2) Ensemble distance geometry and Ensemble molecular dynamics 3) Clique detection method.

Did you know...!!!!

Using nano-technology, chemists have made reflective particles small enough to allow visible light to pass through, but not harmful UV. Use of these particles now enables clear sun screen to be produced.

THE POWER OF FORMIC ACID

S.S Prashanth, Associate Professor, Al Shifa College of Pharmacy

Nature & Chemistry

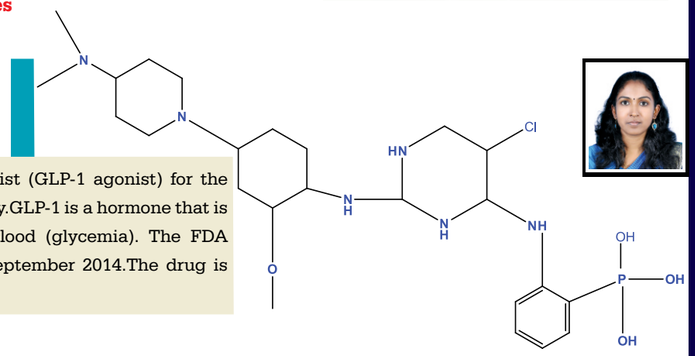
Sun Birds are beautiful wonders created by God. They are Peculiar in every aspect of life. Look at their beaks ,Long enough to suck honey from flowers, they too have a long tongue which also acts like a pipette to suck honey from the flower. They can fly backwards- redefining the principle of aerodynamicity. Their wings can be flipped 400-550times per minute.It produces a different Oil in the feathers during its mating Season etc.These facts we all Know.But I want to share with You an interesting aspect about this Bird.Look at the Picture of a Hanging nest of a sunbird family, which I took from Alshifa Campus. You can see another nest hanging by the side. That is the nest of Red Ants. I was observing this nest from the beginning of its Construction.The male Bird was carrying some Red Ants and was putting near its construction ongoing nest. Red Ants also started building its own nest. Slowly Both of them finished their nest in same time. You can observe wherever these Sunbirds build nest there a Red Ant nest also. Why this Bird do so?

Red Ants are having a powerful weapon of Formic acid. By its smell itself no other insects or Birds will come on that way. Moreover the parent birds feed their youngones with Red ants when they hatch(no shortage of food).In turn Red Ants are fed with the birds excreta.(the mother bird carry this excreta and put in to Ants nest).So what a wonderful Symbiosis...!!!.

NB: Red Ants will not bite Sunbirds or its youngones

NEW TO MARKET !

Ms. Sunisha. K.S., M.Pharm., Assistant Professor
Al Shifa College of Pharmacy



Dilaglutide

Dulaglutide is a glucagon-like peptide 1 receptor agonist (GLP-1 agonist) for the treatment of type 2 diabetes that can be used once weekly.GLP-1 is a hormone that is involved in the normalization of level of glucose in blood (glycemia). The FDA approved dulaglutide for use in the United States in September 2014.The drug is manufactured by Eli Lilly under the brand name Trulicity.

MECHANISM OF ACTION

Dulaglutide binding to glucagon-like peptide 1 receptor slows gastric emptying and increases insulin secretion by beta cells in the pancreas. Simultaneously the compound reduces the elevated glucagon secretion by alpha cells of the pancreas, which is known to be inappropriate in the diabetic patient. GLP-1 is normally secreted by L cells of the gastrointestinal mucosa in response to a meal.

MEDICINAL USES

The compound is indicated for adults with type 2 diabetes mellitus as an adjunct to diet and exercise to improve glycemic control. Dulaglutide is not indicated in the treatment of subjects with type 1 diabetes mellitus or patients with diabetic ketoacidosis. Dulaglutide can be used either stand-alone or in combination with other medicines for type 2 diabetes, in particular metformin, sulfonylureas, thiazolidinediones, and insulin taken concomitantly with meals.

SIDE EFFECTS

The most common side effects include gastrointestinal disorders, such as dyspepsia, decreased appetite, nausea, vomiting, abdominal pain, diarrhoea. Some patients may experience serious adverse reactions: acute pancreatitis (symptoms include persistent severe abdominal pain, sometimes radiating to the back and accompanied by vomiting), hypoglycemia, renal impairment (which may sometimes require hemodialysis). The risk of hypoglycemia is increased if the drug is used in combination with sulfonylureas or insulin.

CONTRAINDICATIONS

The compound is contraindicated in subjects with hypersensitivity to active principle or any of the product's components. As a precautionary measure patients with a personal or family history of medullary thyroid carcinoma or affected by multiple endocrine neoplasia syndrome type 2 should not take dulaglutide, because for now it is unclear whether the compound can increase the risk of these cancers.

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