

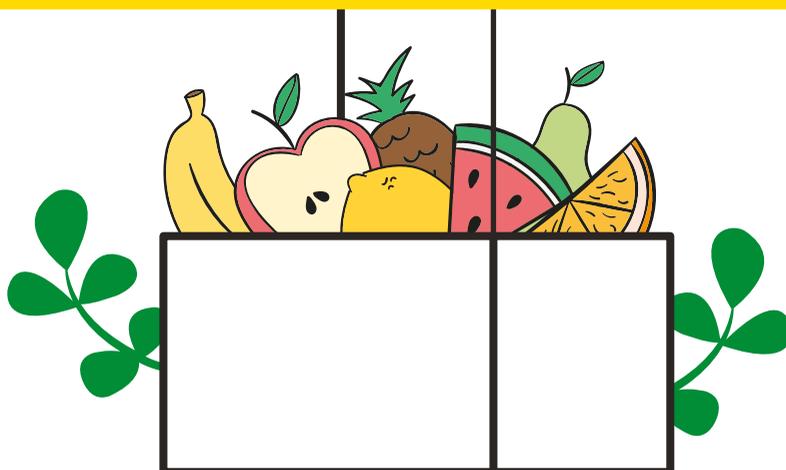


# SOP Magazine

Volume 5 | Issue 1 | Summer 2017



STAY WELL THIS  
SUMMER



When dealing with people,  
remember you are not  
dealing with creatures of  
logic, but creatures of  
emotion.

Dale Carnegie



# SOP Magazine

## ABOUT THE SCHOOL OF PHARMACY

One of the highly ranked private schools of pharmacy nationwide, the Lebanese International University School of Pharmacy maintains an elegant reputation for innovative educational programs and skillful training through both degrees it offers, the BPharm and PharmD. Over the past few years the School has strived to establish a structure which enables our graduates to become an added quality to the healthcare system. The School focuses on clinical pharmacy, community outreach, and training on the optimal use of medication therapy through didactic as well as clerkship/internship courses. Today, our School is acknowledged by private, public, and international institutions. Our graduates attain high success rate in the national pharmacy examination (colloquium), and are highly recognized by national and international pharmaceutical companies.

The SOP Magazine, published tri-annually, delivers drug and health information news from the School's Faculty members and highlights some of the School's events.

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SCHOOL OF PHARMACY



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## Dean's Message To Graduates

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Dearest graduates, there is nothing more superior to success and distinction, and there is no joy equals the joy of accomplishment and excellence.

Your success did not come easily or by chance, but it was a result of the extensive effort, research, determination and willpower that you put through your years of study. You have achieved your ambitions, goals and wishes through your success and graduation from the university and by pioneering in the colloquium exams. You are distinguished by your knowledge, ethics, skills, and communications with your patients and with you colleague doctors and nurses as well as other healthcare providers, and by that, you reflect the true image and value of Lebanese International University.

Today you have proudly become pharmacists, and the owners of the most honorable profession among humans. You are not, as many people think, traders and your sole goal is to make money and your major concern is to calculate profits and losses. You do not trade with people's lives; instead, you save people's lives insure the society's wellbeing. You are the brave guards of the homeland who protect the health of our children, elders, mothers, and all people. Your profession is subjected to many challenges and distortions and often to fabrications. It is your duty to preserve it and protect it and to fortify it with your unity, determination and professional development.

The last thing that I would like to mention is a message of love and belonging to this University, and to the School of Pharmacy, and to the dedicated soldiers in this school; the amazing, astonishing, and wonderful instructors of the school. The mission of the university was and will continue to be the provision of the distinguished education to all citizens of the country; and the aim of the school was to develop and upgrade its scientific level to compete with the most prestigious universities, not only local but even global ones and has become one of the best schools worldwide.

LIU Pharmacy Alumni was established this year to make sure that our graduates are affiliated with the University and with the School of Pharmacy. This Alumni strengthens the relationship between the university and the pharmacy graduates through several activities inside and outside the university. Such activities include continuing education lectures and seminars, the pharmacy day, seminars and conferences. In addition, the Alumni will work to cooperate between graduates and the school in order to provide employment opportunities for new graduates and benefit from the experiences of senior graduates. So, I invite you to join the Alumni and to participate actively in all its activities and projects.

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# Seminars



# "Chronic Kidney Disease to End-Stage Renal Disease: A Train We Need to Stop at Earlier Stations"

The School of Pharmacy at Beirut campus organized seminar on Tuesday, March 14, 2017 entitled "Chronic Kidney Disease to End-Stage Renal Disease: A Train We Need to Stop at Earlier Stations".

The aim of the seminar was to raise awareness on importance of our kidneys on our overall health during the World Kidney Day. The seminar was delivered by Dr. Sahar Koubar.

Dr. Koubar is an Instructor of Clinical Medicine, subspecialty Nephrology and Hypertension, in the Department of Internal Medicine at American University of Beirut Medical Center. She graduated with the degree of Bachelor of Medicine & Surgery from Beirut Arab University. Dr. Koubar was then accepted as a resident at Duke University Hospital, North Carolina, where she trained for 3 years in Internal Medicine. At Duke, she won the resident research award. She then completed a two-year fellowship in Nephrology and Hypertension at Johns Hopkins University. At Hopkins, she was involved in several Quality Improvement projects and received training in clinical research and statistics. Dr. Koubar is practicing in all areas of clinical nephrology, hypertension, dialysis, and

transplantation. Her particular clinical interests include improving care for chronic kidney disease patients, glomerulonephritis, and peritoneal dialysis. She is engaged in clinical research projects. Dr. Koubar is actively involved in teaching medical students and residents in her area of specialty. She is contributing to the training of Nephrology fellows in the Division of Nephrology and Hypertension at American University of Beirut Medical Center.

Dr. Koubar gave a brief definition of Chronic Kidney Disease (CKD), causes, symptoms, complications, risk factors for CKD and CKD Progression, and importance of screening or early detection. "Late nephrology referral remains common" Dr. Koubar said. She highlighted that most of patients are lately diagnosed, despite all awareness campaigns. She then discussed the role of medical therapy for the treatment of kidney disease complications, as well as slowing disease progression. She ended with the different types of kidney replacement therapy and how they will affect patient quality of life.

The seminar was concluded by giving a trophy of gratitude from the SOP to the speaker.



# Acquired Immune Deficiency Syndrome

In the context of raising disease awareness and promoting public health, the School of Pharmacy at Bekaa Campus organized an AIDS awareness seminar on March 15th, 2017, presented by Dr. Mostafa Al-Nakib, Manager of the National AIDS Control Program at the Lebanese Ministry of Public Health (MoPH) and the World Health Organization (WHO) office in Lebanon. Dr. Al-Nakib highlighted major properties, epidemiology and pathophysiology of the human immunodeficiency virus (HIV), then described the available methods of rapid and confirmatory diagnosis, and elaborated available options of anti-retroviral therapy. He also gave an account about HIV/AIDS statistics in Lebanon over the past years. According to MoPH records, Lebanon represents a successful model of decreasing the progress of HIV infection as a result of coordinated screening, awareness, and adequate follow-up and treatment of cases. The seminar was attended by School of Pharmacy students and faculty, as well as by students and instructors from other schools, and was concluded by a short discussion.



# END TB



know your risk

## Tuberculosis Awareness

In observation of the World Tuberculosis Day on March 24th, the School of Pharmacy at Bekaa Campus organized a seminar to highlight the current status of tuberculosis in Lebanon, and to raise awareness towards detection of cases and optimization of care for patients. The seminar was delivered by Dr. Hani Abdel Sater, MD, who is a pulmonary disease specialist and is the director of Ministry of Public Health tuberculosis center in North Bekaa area. He is also the head of intensive care unit at Rayyan Hospital, Baalbeck, and a member of both the European and French Societies of pulmonary medicine. Dr. Abdel Sater discussed the epidemiology and transmission modes of tuberculosis, and showed statistics about its prevalence in Lebanon. Moreover, he mentioned methods of surveillance and diagnosis, and elaborated the treatment plan including options for patients with multi-drug or extremely-drug resistant diseases. Booklets describing the Ministry of Public Health strategic plan for elimination of tuberculosis in Lebanon and how to "work together to eliminate Tb" were distributed to the audience including some hospital personnel. The seminar was concluded by a discussion session and a final gathering at the campus cafeteria for lunch.



# Awareness on Immunization: Information to Pharmacists

The School of Pharmacy at Beirut campus organized a seminar on Tuesday, April 25, 2017 entitled "Awareness on Immunization: Information to Pharmacists".

The aim of the seminar was to highlight on the importance of vaccines to protect people of all ages against disease in the occasion of World Immunization Week.

The seminar was delivered by Dr. Alissar Rady. Dr. Rady has a Medical Doctorate from American University of Beirut, specialty in Family Medicine, a Masters Degree in Public Health and a Masters Degree in Basic Sciences from AUB. She occupies the post of senior National Professional Officer at World Health Organization (WHO) Beirut, responsible of all the technical programs, including planning and monitoring and providing technical support and as well coaching and supervising the WHO teams.

Dr. Rady gave a brief introduction about the history and importance of vaccines. She explained how individuals develop immunity, the different types of vaccines, route of



administration, adverse events, and factors influencing its effect. "Public trust in vaccine safety is the key to the success of vaccination programs" Dr. Rady said. She described the vaccine management system steps, influencing factors, and monitoring and managerial tools. Finally she ended with vaccination facts and myths, and role of pharmacist in correcting those misconceptions.

The seminar was concluded by giving a trophy of gratitude from the SOP to the speaker.



# Campaigns

# World Health Day: Depression: Let's Talk



The School of Pharmacy at Bekaa Campus organized an awareness campaign on occasion of the World Health Day, whose theme for the year 2017 is: Depression: Let's talk. The purpose of this activity was to show how people with mental illness, such as depression, can be encouraged to discuss their mental problems with their healthcare professionals, family and friends, to avoid devastating consequences of such illness. The campaign consisted of six stations, each with a poster and some activities displaying essentials that the public should know about depression and its management in the various stages of life. Students distributed informational pamphlets about depression adopted from the World Health Organization campaign, and entertained the attendees through games, personality tests, mood-boosting treats, tips to handle depression, role-plays, artwork therapy, and many other fun activities.



# World Kidney Day

## “Protect Your Kidneys and Save Your Life”

In the process of keeping up with the “World Kidney Day” event which is held annually, the School of Pharmacy (SOP) at Bekaa Campus organized an awareness campaign for a better kidney health for students and university staff on Thursday, March 9th, 2017. This year’s theme was: “Kidney Disease & Obesity: Healthy Lifestyle for Healthy Kidneys”. The event was attended by Bekaa Campus academic director Dr. Ahmad Faraj, administrative director Mr. Bassem Bazimeh, deans, instructors, and students.

Following the National and University anthems, Dr. Mohammad Hendaus, faculty member at the SOP, welcomed the audience and mentioned in his speech that the “World Kidney Day” is an annual observation held every year on the second Thursday of March with an aim of drawing attention to the importance of maintaining a healthy lifestyle to keep the kidneys functioning properly. He declared that any defect in the kidneys’ function can lead to poor health at a minimum, and can be fatal at the extreme. Because of this,

reducing the risk of kidney disease and failure is essential. A variety of activities were performed by pharmacy students during this day. Students provided scientific counseling about kidney diseases focusing on the important functions of the kidneys, in addition to presenting epidemiological data and facts about kidney disease, diagnosis, preventative methods, and management options. Additionally, they assessed participants at risk of developing kidney disease by allowing them to fill a checklist of risk factors. They also handed out informative leaflets and fact sheets about the disease.

Furthermore, the students focused on the role of healthy lifestyle and proper nutrition in preventing kidney disease and obesity. They motivated people about the dietary habits and weight control measures like reducing the salt intake, limiting the intake of processed and sugary food, daily physical exercises, and encouraged them on maintaining normal fluid intake on daily basis. Moreover, measurements of

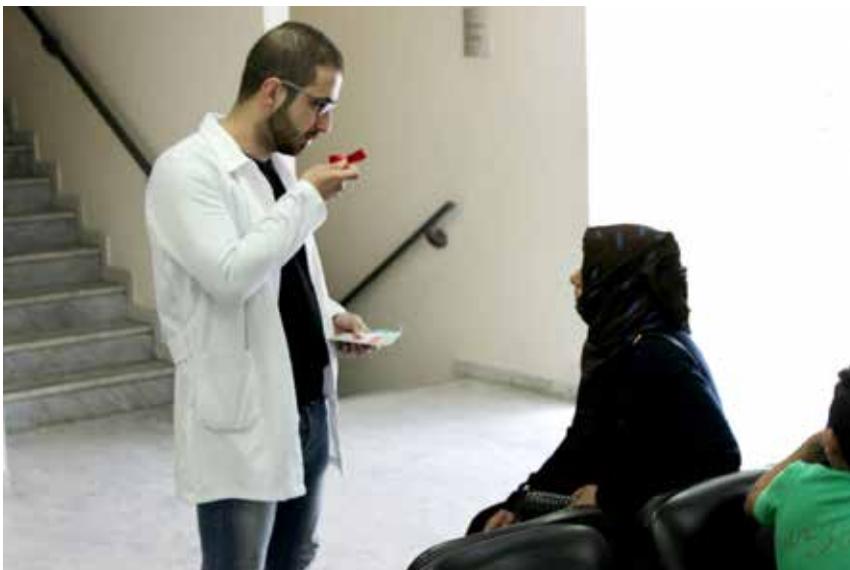
blood pressure and obesity parameters were collected. Those who were found to be at risk, were encouraged to adopt healthy lifestyle changes and to monitor their weight and blood pressure on regular basis.

The successful event ended up with many entertainment activities involving students and instructors who all had lots of fun.



# World Tuberculosis Day

Interprofessional communication services was provided to the parents all over Lebanon in different Lebanese hospitals



# World Immunization Day

Interprofessional communication services was provided to the parents all over Lebanon in different Lebanese hospitals



# World Physical Activity Day

## "Every Moment Counts" in Bekaa and Beirut Campuses

The school of Pharmacy organized Physical Activity Day on Tuesday, April 4th, 2017, with the theme of Fit to Benefit. The aim was to emphasize on the importance of exercise on our overall health and give the opportunity for our students to be active for at least one day a year.

The event started with a bake sale, followed by a students' posters presentation.

Students and instructors competed in different fun games as pushups, situps, planks, and others. Then they actively participated in five sports classes by Radical Fitness ( X55, FACTOR F, UBOUND, MEGADANZ, FIGHT DO).

Two basketball matches were done; first match was played between ladies instructors and students. Second Match was played between male instructors and students. Both teams of students won, and winners were given a trophy by the Dean Dr Mohamad Rahal. The event was concluded with appreciation certificates from the students to the organizing instructors: Dr Mariam Dabbous, Dr Ahmad Dimassi, Dr Bahia Chahine, and Dr Mariam Sraj.

All students and faculty had a lot of fun during this day.



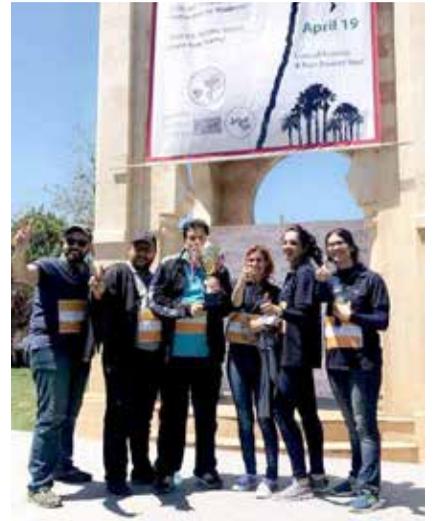
To celebrate the World Day of Physical Activity, the School of Pharmacy in the Bekaa campus organized a Physical Activity Day on April 19th, 2017 under the slogan "Every Movement Counts".

The purpose of this day was to encourage students to integrate physical activity into their daily lives; at home, at work, in the university... and thus promote active living!

The day started with a mini-football game between the instructors and students, after the match ended 2-2, the students were declared as winners by penalty kicks. Then, the international trainer Mr. Mohamad

Zain performed a "Tae Bo" session where the Dean of the School of Pharmacy Dr. Mohamad Rahal, faculty members and many students enjoyed this unique and challenging exercise. This was followed by a Bubble Soccer match, racing and other small games. Throughout the day, the nutritionist Ms. Nadin Smaili, IFPA provided counseling about pre- and post-workout snacks, in addition to fat-burning Ramadan workouts. Finally, the day ended with the distribution of medals to the winners.

As promised the day was full of fun and games where every movement did count.



# Workshops

# “Effective Leadership Training” Workshop

The School of Pharmacy (SOP) at the Lebanese International University, Bekaa Campus, held a workshop for the faculty instructors, entitled “Effective Leadership Training” on the 10th of March 2017. The interactive workshop was presented by Dr. Farah Chehimi, faculty member at the School of Pharmacy and School of Business, and was attended by fourteen SOP faculty members.

During this workshop, Dr. Chehimi stressed on different aspects of leadership including the styles, principles, traits, process and improvement. In addition, leadership skills, conflict management and the development of positive mental attitude were discussed. The workshop was very successful, and had left a fruitful impact on all the participants. At the end of the workshop, a trophy and certificate of appreciation were awarded to Dr. Chehimi and certificates of participation were distributed to all the participants.



# Cooking Workshop

The School of Pharmacy has organized a cooking workshop in collaboration with the Hospitality Management and Tourism Department at LIU on Friday, March 31st, 2017.

The workshop was conducted by the Chef Rabih el Jammal and attended by the SOpP faculty members and Dean Dr. Mohamad Rahal as well as the Chairperson of the Hospitality Management and Tourism Department Dr. Nadine Sinno. The faculty members learned how to do noodles with shrimps, bafflo wings, and steak with mushroom sauce, brownies and cheese cake.

The workshop was concluded with certificate distribution to all attendees.



# International Conferences

# Sixth Kuwait International Pharmacy Conference Under the Theme: The 2<sup>nd</sup> Forum on Advancing Pharmacy Education in the GCC and Middle East

The School of Pharmacy, represented by the Dean, Dr. Mohamad Rahal, Assistant Dean at Beirut Campus, Dr. Michelle Cherfan, and Chairperson of the Pharmaceutical Sciences Department, Dr. Dalal Hammoudi, participated in the 6th Kuwait International Pharmacy Conference under the theme: The 2nd Forum on Advancing Pharmacy Education in GCC and Middle East. The meeting was organized by the Faculty of Pharmacy, Kuwait University, and took place at Radisson Blu hotel, Kuwait city, between 9th and 11th of February, 2017.

The conference hosted a collection of keynote speeches, plenary lectures, workshops and poster sessions mostly revolving around the theme of pharmacy education. The participating

faculty from SOP contributed to the 4 workshops within the scientific program of the conference. Dr. Cherfan coordinated a workshop on development of competency-based curricula in pharmacy schools, and another on assessment of student performance during active learning activities. Dr. Hammoudi coordinated a workshop on educational activities to prepare students for life-long learning, and another on team teaching in integrated courses.

Scholars and leaders in pharmacy education from major pharmacy schools in Lebanon, Kuwait, Saudi Arabia, Qatar, Canada, USA, and Croatia attended the workshops, which were interactive and rewarding. They included an exchange of skills, expertise, and trends of education

among pharmacy schools, and were a good platform for communication and discussion. The SOP faculty from LIU were acknowledged by the organizers for their lively contributions, and their presence was considered "part of the success".

Like other participating pharmacy schools, SOP also joined poster stations displaying the mission and vision of the School, key points about curriculum, and degrees offered. The experience of SOP in experiential training, continuing education, contribution to Lebanese Order of Pharmacists activities, pharmacy day, newsletter, awareness campaigns, and research was also shared during the workshops.



# Second Regional Pharmacy Faculty Development Workshop On Best Practices For Planning Educational Assessment And Curriculum Mapping



The School of Pharmacy represented by the Dean, Dr. Mohamad Rahal, Assistant Dean at Beirut Campus Dr. Michelle Cherfan, Chairperson of the Biomedical Department and of the Curriculum Committee Dr. Fadi Hdeab and Chairperson of the pharmaceutical Sciences Department and of the Assessment and Evaluation Committee, Dr. Dalal Hammoudi participated in the second regional faculty development workshop under the theme Best Practices for Planning Educational Assessment and Curriculum Mapping. The workshop was held at Al Ain University (AAU) -Abu Dhabi Campus, on the 5th and 6th of March, 2017. It was organized by

AAU in conjunction with the American Association of Colleges of Pharmacy (AACCP) and the Accreditation Council for Pharmacy Education (ACPE) represented by Dr. John Ressler director of academic programs and professional development at AACCP and Dr. Mike Rouse, director of international services ACPE.

More than 80 faculty members from 22 schools of pharmacy from 11 countries participated in the workshop that was designed to assist teams of 3 to 5 pharmacy faculty members from a university work together to evaluate their assessment practices.

Dr. Fadi Alkhateeb and Dr. Linda Garavalia, world-renowned pharmacy educators and experts in assessment and accreditation, lead discussions and activities intended to assist attendees in developing a framework for a comprehensive assessment plan. One plenary session focused on programmatic and curricular assessment. Another session aimed at developing effective program outcomes and learning objectives and discussed how the use of assessment data can improve student learning and educational programs by increasing program cohesiveness through alignment of assessments, course objectives, and program outcomes.

## Int. Conferences

Moreover, different assessment methods were explained with a focus on selecting and creating effective assessments most suited to individual institution and program needs. Lastly, curriculum mapping was presented as a powerful assessment tool and the participating attendees had the opportunity to start the curriculum mapping process.

After each plenary session, faculty members from each university worked together through exercises referred to as team time activities. The objective of these activities was to answer questions and to discuss cases designed to consider the assessment activities related to our program, along with developing a survey and initiating a list of program assessments within assessment map categories to create the foundation for a program-specific assessment plan.

The SOP faculty members actively participated in the different deliberations and discussions that allowed them to return to the SOP with a comprehensive assessment plan aimed to further develop the pharmacy program and to improve the student learning outcomes.



# Activities

# Lebanese Pharmacy Students Association: Overview and Recruitment

Within context of exposure of our students to student organizations and widening scope of their relationships with peer pharmacy students, the School of Pharmacy at Bekaa Campus organized a meeting of students with representatives from Lebanese Pharmacy Students Association (LPSA). During this meeting, a presentation entitled: "Lebanese Pharmacy Students Association (LPSA): Overview and Recruitment" was presented by Ms. Elsa Kobeissi (LPSA President), Ms. Nancy Hoyeck (International Pharmaceutical Students' Federation Representative) and Miss Jinan Ghattas (representative from LIU). This presentation introduced LPSA to LIU pharmacy students and demonstrated its professional activities and networking opportunities. It also sought participation of students in events organized by LPSA including drug awareness campaigns, anti-counterfeit drug campaigns, and international conference attendance.



# Chance Association Fundraiser

The students at SOP at LIU have carried a fundraising campaign for CHANCE (CHildren AgaiNst CancEr) Association.

On 06/02/2017, a small delegation of the students who carried the fundraisin along with Dr. Jihan Safwan and Dr. Mariam Dabbous visited the association St. Georges Hospital (Roum Hospital) in Ashrafieh and met with the president the association Dr. Rola Farah to donate the sum of 3,000,000 L.L.

During the meeting, Dr. Farah thanked us for our contribution and expressed l gratitude for our thoughtfulness. She also gave us the privilege of meeting on the little children who has been diagnosed with Child Cancer and is being tree by the help of CHANCE Association.



# Field Visit to Arwan Pharmaceutical Industries

Within the context of field visits to industry, fifth year pharmacy students from Bekaa campus, accompanied by Chairperson of the Pharmaceutical Sciences Department, Dr. Dalal Hammoudi, and those from Beirut campus, accompanied by parenteral dosage form course instructor, Dr. Salam Osta, visited the premises of Arwan Pharmaceutical Industries, Jadra, South Lebanon. Directed by the QA manager at Arwan, Engineer Chady Atieh, and the QC manager, Dr. Abir Kozayha, the students were introduced to parenteral drug industry basics via presentations and videos,

then were led through a tour into the manufacturing and laboratory units. Principles of cGMP, inspection, lyophilization, sterilization, and pharmaceutical laboratory testing were demonstrated. Arwan offered our students the opportunity of training in its industry departments and laboratories, and possibility of research or other collaboration with LIU School of Pharmacy. Some job vacancies for pharmacists, chemists, and engineers were also revealed. The visit was concluded by distribution of training certificates and a lunch gathering at Arwan conference room.



# Establishment of SOP Herbal Libraries



9. Pharmacy Oath.
10. Herbal calendar
11. Poison book (a collection of natural poisons used in ancient time and middle ages)
12. Other items related to herbal medicine.

However, this is not all! A future plan for the herbal library is also to create a software and/or smart applications about herbs, as well as to upgrade and modernize the contents to meet innovations in herbal medicine.

Hippocrates once said that Nature itself is the best physician. Our students engraved the importance of herbs in a scientific and artistic manner, and made Learning Pharmacognosy and Herbal Medicine course an interesting and interactive experience.

While our libraries are designed to be continuously updated and better evolving with every time the course is taught, we would like to express our most sincere thanks for all those parties, inside and outside the School, who supported our project, and who helped in making these libraries a reality.

Tell me and I forget.  
Teach me and I remember.  
Involve me and I learn.

The idea of creation of a herbal library at the School of Pharmacy was there since many years. During Fall Semester 2016-17, the Pharmacognosy and Herbal Medicine course instructor, Dr. Hadi Dasouki, and his students, managed to establish not only one, but two amazing, eye catching, informative, and unique herbal libraries both in Bekaa and Beirut campuses.

Students were inspired by the Pharmacognosy course that showcased the wonderful world of herbs, their role in disease treatment, and how nature provides healthy ingredients needed for medicine and pharmaceutical industry. By the help of their instructor, and his permanent encouragement, they decided to build up a long-living herbal library in the School, to include available herbs and natural remedies as well as their own projects. Directed by team leaders, and assisted by a graphic designer, students took care of all the details from layout to lightening to contents,

to ensure that the libraries will be attractive and will form a rich herbal resource for student generations who will come thereafter, and who can also renovate and introduce further original ideas.

These libraries at both campuses include:

1. Many endogenous, foreign, and medicinal plants preserved in glass jars with Latin, Scientific and folk Arabic names
2. Samples of some herbal drugs, both brand and generic, available in the Lebanese market
3. Herbal dictionary (definition of many terms used in pharmacognosy and herbal medicine)
4. Pharmacy logos and signs (designed by students on ceramics or by joining drug pills together)
5. Rubik's 3-dimentional cubes (branded with pharmacognosy scholars and scientists)
6. Instruments used in pharmacognosy laboratories
7. Students artwork (plant albums, theme mugs, plant flashcards)
8. Herbal playing cards (2 sets branded with different plants)



Dr. Rima Boukhary Defended her PhD Thesis entitled:

## **“Phytochemical investigation of some plants grown in Lebanon and belonging to genera Salvia, Centaurea and Anthemis”**

Modern science is beginning to research and verify herbal remedies that created “Herbal renaissance” in recent years. But, it should be admitted that, herbal medicine is not free from risks. Further investigation of their active chemical constituents, their therapeutic efficacy and safety must be the primary interest while developing them. Salvia known as “sage” strengthens the senses and memory . The National Institute of Medical Herbalists in the United Kingdom referred to Sage’s application for hot flashes as it has estrogenic like effect.

Otherwise, Literature survey indicated that, the Lebanese flora has not been yet extensively studied. According to the previous studies carried out on the three genera Salvia, Centaurea and Anthemis that revealed their great potency and the diversity of the chemical nature of the isolated compounds, it was decided to investigate the following three plants: Salvia libanotica fruticosa, Centaurea horrida and Anthemis chia L.

The three chosen plants are largely used in folk medicine in the treatment of different diseases. For this reason, the aim of

this work was to explore the chemical constituents of these plants widely used and to determine their biological activities including antiinflammatory and antidiabetic activities which have been proved.

It is important to mention that Quercetin 3-D-galactoside isolated from Centaurea horrida in addition to Fisetin, Hispidulin and other flavonoids were obtained for the first time from Centaurea horrida growing in Lebanon and abroad.

**Figure 1 : Genus Centaurea**



Group	Dose (mg/kg)	Mean blood glucose concentration ± S.E.M.(mg/dl)			
		0 hr	2hr	4hr	6hr
control	—	201.29 ± 5.60	210.43 ± 4.50	213.71 ± 9.70	209.05 ± 7.30
Glibenclamide	5	219.20 ± 3.70	222.14 ± 1.80	158.24 ± 2.10	129.14 ± 2.40**
Salvia libanotica fruticosa	12.5	209.56 ± 4.40	193.33 ± 4.20	191.57 ± 2.50	103.89 ± 4.20*
Salvia libanotica fruticosa	25	213.66 ± 3.80	171.54 ± 4.20	221.43 ± 3.70	126.77 ± 3.40*
Salvia libanotica fruticosa	50	217.44 ± 3.20	154.56 ± 1.80	106.99 ± 2.90*	108.56 ± 1.80
Centaurea horrida	25	211.65 ± 3.30	202.22 ± 3.30	170.77 ± 3.40	150.33 ± 3.10*
Centaurea horrida	50	214.44 ± 2.90	239.87 ± 3.10	154.33 ± 3.20	143.77 ± 2.90*
Centaurea horrida	100	219.33 ± 3.10	154.56 ± 1.80	106.99 ± 2.90	106.56 ± 1.80*

**Table 1: Acute effect of methanolic extracts of Salvia libanotica fruticosa roots and Centaurea horrida herb on blood glucose.**

All our findings and results afforded the clinicians with promising drugs for the management of diabetic neuropathic symptoms and proved that these two endogenous Lebanese plants Salvia libanotica fruticosa and Centaurea horrida plants exerted remarkable hypoglycemic effect and improved peripheral nerve function leading to the treatment of diabetes and its related complications especially, diabetic neuropathy. Hot plate and Tail flick tests were used for assessment of management of diabetic neuropathy. Otherwise, the anti-inflammatory activity of plants were determined for the first time too.

**Figure 2: Hot plate test**



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# Faculty Highlights



## What's New in Pediatrics?

# FDA Approves Deflazacort for the Treatment Of Duchenne Muscular Dystrophy

Ahmad Dimassi, PharmD

## Key point:

On February 9th, 2017 the U.S. Food and Drug Administration (FDA) approved Deflazacort (Emflaza®, Marathon Pharmaceuticals) an oral corticosteroid, for the treatment of Duchenne Muscular Dystrophy (DMD) in patients 5 years of age and older.



## Finer points:

Duchenne Muscular Dystrophy (DMD) is a rare genetic disorder that affects mainly boys and young men with an incidence of approximately 1 in 5,000 live male births. DMD is caused by mutations in the dystrophin gene on X chromosome and causes progressive muscle deterioration and weakness. Symptoms appear in the early childhood, usually between ages 3 and 5, and include inability to walk, severe respiratory and cardiac complications that lead to death generally between the late teens and early twenties.

Deflazacort is a corticosteroid prodrug, whose active metabolite, 21-desDFZ, acts through the glucocorticoid receptor to exert anti-inflammatory and immunosuppressive effects. The precise mechanism by which deflazacort exerts its therapeutic effects in patients with DMD is unknown.

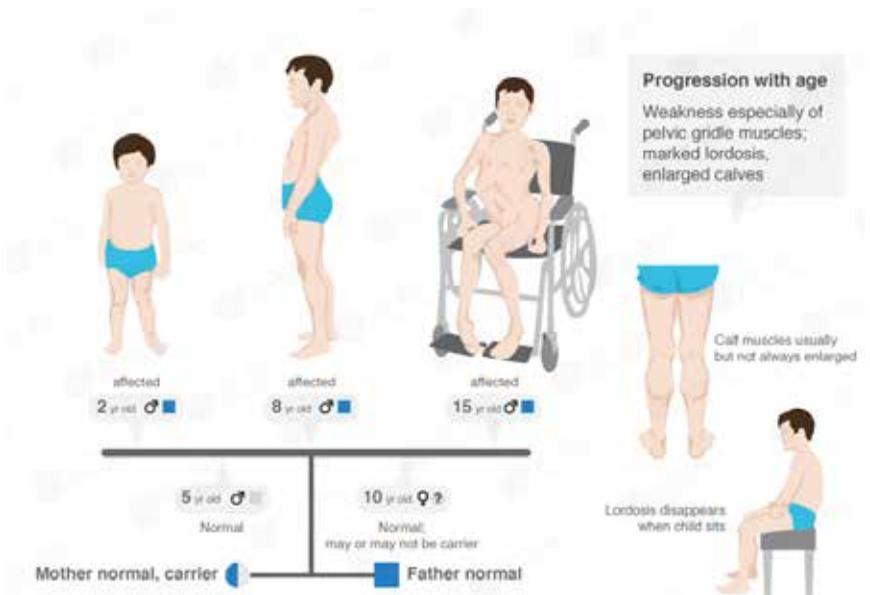
Deflazacort's effectiveness in the treatment of DMD was established in a

phase III double-blind, randomized, placebo-controlled, multi-centre study, which enrolled 196 boys with DMD and aged between 5 and 15 years. The patients were randomized to receive deflazacort in two dose strengths of 0.9mg/kg/day and 1.2mg/kg/day, and an active comparator prednisone 0.75mg/kg/day or placebo for 12 weeks. Treatment with deflazacort was associated with significant improvements in average muscle strength score after 12 weeks of therapy ( $p=0.017$ ). Increases in muscle strength continued through the 52 week duration of the study demonstrating persistence of the treatment effect observed at Week 12.

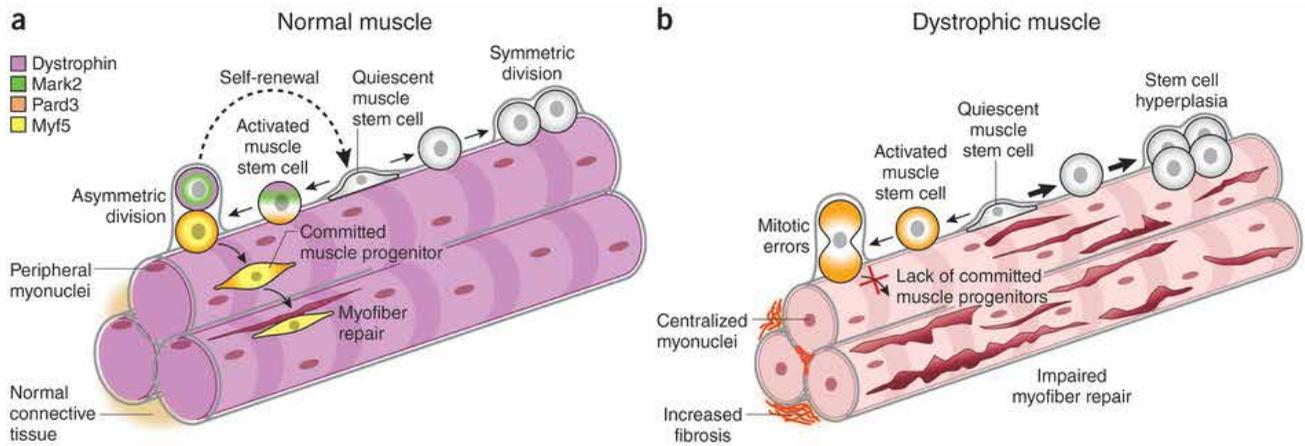
The most common adverse events found during the clinical study in all corticosteroid groups included weight gain, loss of bone mass, upper respiratory tract infection, cough, hirsutism, glucose intolerance, and behavioral issues. Those caused by deflazacort were found to be less severe compared to other corticosteroids.

Emflaza® (deflazacort) is supplied as tablet (6 mg, 18 mg, 30 mg, and 36 mg) or oral suspension (22.75 mg/mL in 13 mL). The recommended dose is approximately 0.9 mg/kg/day once daily with or without food. Any combination of the four tablet strengths can be used to achieve this dose. If the oral suspension is used, round up to the nearest tenth of a milliliter.

According to the label, a gradual decrease in dosage is recommended when deflazacort therapy is discontinued to avoid fatal adrenal insufficiency.



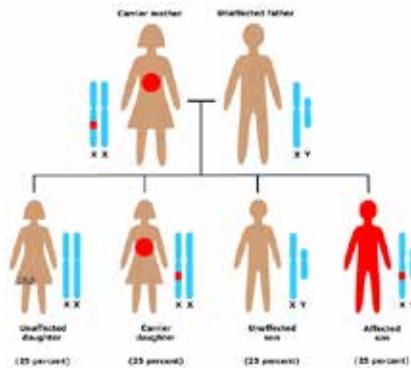
Punnoose AR, Burke AE, Golub RM. Muscular Dystrophy. *Jama*. 2011 Dec 14;306(22):2526-.



Keefe AC, Kardon G. A new role for dystrophin in muscle stem cells. *Nature medicine*. 2015 Dec 1;21(12):1391.

### What the reader should know:

Emflaza® (deflazacort) is the first glucocorticoid drug approved by the FDA for the treatment of patients aged five and older suffering from Duchenne Muscular Dystrophy (DMD). Deflazacort is a synthetic heterocyclic corticosteroid, oxazoline-derivative of prednisolone characterized by high efficacy and good tolerability, as demonstrated by several clinical studies. The recommended dose is approximately 0.9 mg/kg/day orally once daily with or without food.



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- 1- Mendell JR, Lloyd-Puryear M. Report of MDA muscle disease symposium on newborn screening for Duchenne muscular dystrophy. *Muscle Nerve*, 2013;48(1):21-6.
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## What's New in Neurology?

# A New Hope for Patients with Tardive Dyskinesia

Dalal Hammoudi, PhD



Tardive dyskinesia (TD) is a hyperkinetic movement disorder that appears with a delayed onset after prolonged use of dopamine receptor blocking agents, mainly the antipsychotic drugs. It is an iatrogenic condition characterized by rapid, repetitive, stereotypic, involuntary movements of the face and extremities. These symptoms are thought to be caused by an irregular dopamine signaling in a region of the brain that controls movement. The symptoms of TD can be severe and are often persistent and irreversible. Furthermore, TD is disabling and can further stigmatize patients with mental illness. Despite discovery of TD nearly 60 years ago, its wide prevalence (at least 500,000 people in the U.S), and the tremendous amount of research and follow-up studies to understand its course and prognosis,

effective treatment of the condition was not available until April 2017.

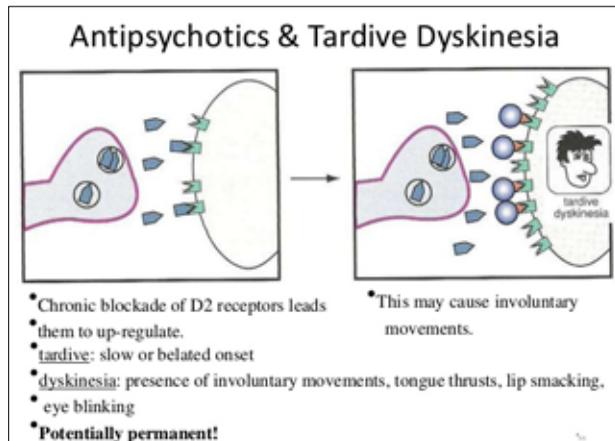
During this month, the US Food and Drug Administration (FDA) approved the first medication for the treatment of TD: the highly selective vesicular monoamine transporter 2 inhibitor valbenazine (Ingrezza®, Neurocrine Biosciences). This approval is considered a major advance for patients with TD, and was granted Fast Track, Priority Review and Breakthrough Therapy designations by the FDA.

Approval of valbenazine was based on positive results from several studies, the most important of which being the Kinect 3 phase 3 trial of valbenazine versus placebo. This 6-week, randomized, double-blind study included 234 patients with moderate to severe TD

plus schizophrenia, schizoaffective disorder, or a mood disorder. Patients were randomized to 40mg/day of valbenazine, 80 mg/day of valbenazine, or placebo. The primary efficacy endpoint was change from baseline to week 6 in the 80 mg/day group compared with the placebo group on the Abnormal Involuntary Movement Scale (AIMS) dyskinesia score, as assessed by blinded central AIMS video raters. Safety assessments included adverse event monitoring, laboratory tests, ECG, and psychiatric measures. The mean change from baseline to week 6 in AIMS dyskinesia score was -3.2 for the 80 mg/day group,

significantly different from -0.1 for the placebo group. AIMS dyskinesia score was also reduced in the 40 mg/day group (-1.9 compared with -0.1 with placebo).

Valbenazine is available in 40 mg capsules, and the initial dose is 40 mg once daily, which can be increased to 80 mg once daily after one week. The capsules can be taken with or without food, and are not recommended during pregnancy or lactation. The most common adverse reaction of valbenazine is somnolence, and it may also cause QT prolongation. Although this effect is not clinically significant at concentrations expected with recommended dosing, the use of valbenazine should be avoided in patients with congenital long QT syndrome or with arrhythmias associated with a prolonged QT interval. Other adverse reactions ( $\geq 2\%$  and  $>$ placebo) include: anticholinergic effects, balance disorders/falls, headache, akathisia, vomiting, nausea, and arthralgia.



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## What's New in Hematology?

# REFIXIA FOR HEMOPHILIA B

Hawraa Kisserwan, PharmD

**Key point:** On 23 March 2017, the Committee for Medicinal Products for Human Use (CHMP) accepted nonacog beta pegol (Refixia®, Novo Nordisk A/S) for the treatment and prophylaxis of bleeding in patients 12 years and above with hemophilia B.

**Finer points:** Hemophilia B, a congenital factor IX deficiency, affects approximately 0.1 in 10,000 people in the European Union (EU). In order to overcome such situation, the main treatment for hemophilia B is to replace the missing factor IX to control bleeding disorders. The core medications are: Bioverativ's Alprolix (eftrenonacog alfa) in 2014, CSL Behring's Idelvion (albutrepenonacog alfa) in 2016 and Refixia® will be the third one in the market. Refixia®, a recombinant coagulation factor IX, helps in blood

clotting through replacing the missing factor IX. It was chosen as an orphan medicinal product on 15 May 2009. One of the benefits of Refixia® is its pegylated form where glycopegylation will lead to the prolongation of half-life of the medication. The decision of the enrollment of Refixia® was based on a clinical trial where 115 children and adults with moderately severe or severe hemophilia B were enrolled in the study for 2.7 years. According to the clinical trials, Refixia® is administered as once weekly dose of 40IU/Kg where this dose regulates patients' factor IX activity levels above 15 percent, and reduced the median annualized bleeding rate (ABR) to 1.0.

It is available as a powder and solvent for solution for injection (500 IU, 1000 IU and 2000 IU). The common adverse

effects are nausea, pruritus, fatigue and injection site reactions. Some patients taking factor IX medicines may develop inhibitors like antibodies against factor IX, resulting in a loss of bleeding control.

**What you need to know:** Hemophilia is a life threatening condition and Refixia® is a new medication that is expected to protect patients against bleeds and improve quality of life.

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# Diabetes Drugs and Cardiovascular Outcomes

Iqbal Fahs, PharmD

**Key point:** Cardiovascular diseases are the leading cause of morbidity and mortality among diabetic patients, despite the efforts to control blood glucose and associated risk factors. Choosing anti-diabetic drugs that do not increase CV risk but might reduce the risk of CV events is crucial.

**Finer points:** Adverse data from a meta-analysis published in New England Journal of Medicine in 2007 evoked concern about a possible increased CV risk associated with rosiglitazone use (43% increased risk of MI and 64% in-

creased risk of CV death). As a result, the FDA imposed restrictions on the prescription and use of rosiglitazone in 2010, which were lifted in 2013 after re-evaluation of the RECORD trial.

The rosiglitazone experience aroused awareness of potential CV risk associated with diabetes drugs. It prompted the FDA to issue a Guidance for Industry in 2008 defining preapproval and post approval requirements for the demonstration of cardiovascular safety for all new medications developed for glycemic management in type 2 diabetes. The table below summarizes the CV outcomes of currently prescribed anti-diabetic drugs.

**Table 1: Cardiovascular Outcomes of Anti-Diabetics**

Drugs	Cardiovascular outcomes
<b>Biguanides Metformin</b>	<ul style="list-style-type: none"> <li>• ↓ in TC, LDL, TG, body weight and BP</li> <li>• Beneficial effects on fibrinolysis and platelet aggregation</li> <li>• 36% ↓ in all-cause mortality &amp; 39% ↓ in MI</li> <li>• ↓1-year mortality and re-hospitalization rate of CHF</li> <li>• ↓ diabetes-related deaths and total deaths when combined with Sulfonylureas</li> </ul>
<b>Sulfonylureas</b>	<ul style="list-style-type: none"> <li>• ↑ CV risk and mortality, except for gliclazide</li> <li>• Gliclazide ↓ platelet adhesion, aggregation and hyperactivity &amp; ↑ fibrinolysis</li> <li>• No detrimental effects on ischemic preconditioning with Glimpiride (safer in CVD patients)</li> </ul>
<b>Meglitinides</b>	<ul style="list-style-type: none"> <li>• Improvements in CV risk parameters (homocysteine, plasminogen activator inhibitor, and lipoprotein (a) with Repaglinide</li> <li>• No significant effect on the CV outcomes with Nateglinide</li> </ul>
<b>Thiazolidindiones</b>	<ul style="list-style-type: none"> <li>• No ↑ risk of heart attack or death (RECORD trial) &amp; no ↑ in major ischemic CV events in CAD patients (BARI 2D trial) with Rosiglitazone</li> <li>• Pioglitazone (PROactive trial):</li> <li>• Non-statistically significant 10% ↓ in all-cause mortality, MI &amp; ACS</li> <li>• Statistically significant 16% ↓ in death, MI &amp; stroke</li> <li>• ↑ CHF events without an associated ↑ in mortality</li> <li>• ↓ progression of carotid intima media thickness</li> </ul>
<b>α-Glucosidase Inhibitor</b>	<ul style="list-style-type: none"> <li>• Significant ↓ in CV events with Acarbose</li> </ul>
<b>DPP4 Inhibitors</b>	<ul style="list-style-type: none"> <li>• No CV risk associated with Sitagliptin (TECOS trial)</li> <li>• No improvements in CV outcomes; 27% ↑ in CHF hospitalization with Saxagliptin (SAVOR-TIMI 53 trial)</li> <li>• No improvement in CV mortality, non-fatal MI, &amp; stroke &amp; non-statistically significant ↑ risk in CHF hospitalizations with Alogliptin (Examine trial)</li> <li>• CAROLI-NA trial (Linagliptin) expected in March 2019</li> <li>• No dedicated CV outcome trial for Vildagliptin</li> </ul>
<b>GLP1-RA</b>	<ul style="list-style-type: none"> <li>• 22% ↓ in CV death, 12% ↓ in non-fatal MI &amp; 11% ↓ in non-fatal stroke with Liraglutide (LEADER trial)</li> <li>• No benefit on CV outcomes; neutral effect on CHF hospitalization with Lixesinatide (Elixa trial)</li> <li>• EXSCEL trial (Exenatide) due in April, 2018</li> <li>• REWIND trial (Dulaglutide) due in July, 2018</li> <li>• HARMONY trial (Albiglutide) due in May, 2019</li> </ul>
<b>SGLT2 Inhibitors</b>	<ul style="list-style-type: none"> <li>• 14% ↓ in CV events, 38% ↓ in CV death &amp; 35% ↓ hospitalizations for CHF with Empagliflozin (EMPA-REG trial)</li> <li>• No ↑ in the overall CV risk with Canagliflozin (Interim analysis of CANVAS trial) <ul style="list-style-type: none"> <li>◦ CANVAS trial was completed and results are expected in 2018</li> </ul> </li> <li>• DECLARE-TIMI58 trial (<b>Dapagliflozin</b>) due in April, 2019</li> </ul>
<b>Dopamine Agonist</b>	<ul style="list-style-type: none"> <li>• ↓ incidence of composite CV end points with <b>Bromocriptine</b></li> </ul>

ACS: Acute coronary syndrome; BP: Blood pressure; CHF: Congestive heart failure; CV: Cardiovascular; DPP4: Dipeptidyl-peptidase 4; GLP1-RA: Glucagon-like peptide 1 receptor agonist; LDL: Low-density lipoprotein; MI: Myocardial infarction; SGLT2: Sodium glucose cotransporter 2; TC: Total cholesterol; TG: Triglycerides.

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## What's New in Oncology?

# FDA Approves New PARP Inhibitor Ovarian Cancer Drug

Malak Alame, PharmD

**Key points:** Epithelial ovarian, fallopian tube or primary peritoneal cancer is a cancer of the tissue covering the ovary or lining the fallopian tube or abdominal wall (peritoneum). The National Cancer Institute estimates that more than 22,000 women will be diagnosed with these cancers in 2017 and more than 14,000 will die of these diseases.

**Finer points:** Maintenance therapy is an important part of a cancer treatment regimen for patients who have responded positively to a primary treatment. The U.S. Food and Drug Administration (FDA) approved niraparib for the maintenance treatment (intended to delay cancer growth) of adult patients with recurrent epithelial ovarian, fallopian tube or primary peritoneal cancer, whose tumors have completely or partially shrunk (complete or partial response, respectively) in response to platinum-based chemotherapy. Niraparib is a poly ADP-ribose polymerase (PARP) inhibitor that blocks an enzyme involved in repairing damaged DNA. By blocking this enzyme, DNA inside the cancerous cells may less likely be repaired, leading to cell death and possibly a slow-down or stoppage of tumor growth. It is

the first PARP inhibitor to be approved by the FDA that does not require BRCA mutation or other biomarker testing. Niraparib is an oral, once-daily dosing, enabling convenient administration for maintenance treatment.

**Take home message:** Despite high response rates to platinum-based treatment in recurrent ovarian cancer patients, the effectiveness of such chemotherapy diminishes over time. Unfortunately, progression free survival (PFS) generally gets shorter after each subsequent treatment with a platinum-based chemotherapy regimen. Niraparib has demonstrated a clinically meaningful increase in PFS in women with recurrent ovarian cancer, regardless of BRCA mutation or biomarker status.

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#### References:

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# Lavender Oil an Aroma that will Change your Life

Nisreen Mourad, PharmD

Lavender is currently the most commonly used essential oil; however it has been long used for centuries by the Egyptians and the Romans. Lavender being a very beautiful flower from the outside making it no strange that it holds many therapeutic benefits in the oil which is extracted from the inside.

Health Benefits Of Lavender Essential Oil	
Analgesic:	It has an analgesic effect on various types of pains including muscular aches, rheumatic pain, backache and joint pain.
Blood Circulation:	It is good for improving the blood's circulation and lowering blood pressure.
Cancer:	Animal studies have shown that lavender, in combination with other essential oils, is effective as a preventative measure for the development of breast cancer.
Dermatology:	It is effective in the treatment of acne, where lavender was shown to have some antibacterial activities towards Propionibacterium acnes, to reduce some of the over-excretion of sebum, and to reduce the acne scarring. Also, once it is added to chamomile it can relieve eczema.
Gastrointestinal System:	It increases the intestinal motility and stimulates the production of gastric juices and bile, making it effective for indigestion.
Hair Care:	It is shown to be very effective in the management of hair loss and pediculosis infestation.
Insect Repellent:	Once applied to the skin, lavender essential oil has a dual function where the smell of it is a potent insect repellent in addition it has anti-inflammatory qualities that will reduce the irritation and the pain associated with insect bites.
Insomnia:	It induces sleep thus it is recommended as an alternative treatment for insomnia.
Nervous System:	It is effective in treating migraines, headaches, depression, and emotional stress with its calming scent; also it has been shown to increase the mental activity.
Respiratory Disorders:	Lavender essential oil has antibacterial qualities in addition to its ability to loosen up phlegm making them easier to be expelled, and to relieve congestion, making it effective for many respiratory problems including flu, cold, asthma, sinus congestion, bronchitis, whooping cough, laryngitis, and tonsillitis.
Urine Flow:	It can stimulate urine production thus reducing the risk of developing cystitis.

With all the lavender benefits, no doubt it will become your favorite essential oil taking into consideration that it is only applied topically or inhaled through means of aromatherapy but never ingested orally.

#### References:

1- <https://www.organicfacts.net/health-benefits/essential-oils/health-benefits-of-lavender-essential-oil.html>

2- <https://draxe.com/lavender-oil-benefits/>



## What's New in Dermatology?

# FDA Approves DUPILUMAB: The First Biologic For Atopic Dermatitis

Nour Chamsine, PharmD



**Key Points:** On March 28, 2017 the US Food and Drug Administration (FDA) has approved dupilumab (Dupixent®) injection to treat adults with moderate-to-severe atopic dermatitis. Dupilumab is indicated for patients whose disease is not controlled adequately by topical therapies, or those for whom topical therapies are not advisable. Dupilumab can be used with or without topical corticosteroids.

**Finer Points:** Atopic dermatitis is a serious, chronic, inflammatory skin condition characterized by intense itching and recurrent eczematous lesions. Approximately 1 million adults were estimated to have uncontrolled, moderate to severe atopic dermatitis in the U.S. Standard treatment modalities for the management of atopic dermatitis are centered around the use of topical antiinflammatory preparations and moisturization of the skin, but patients with severe disease may require phototherapy or systemic immunosuppressant treatment. Dupilumab, a human monoclonal antibody against interleukin-4 receptor alpha, inhibits signaling of interleukin-4 and interleukin-13, which are thought to cause the persistent underlying

inflammation in atopic dermatitis. Dupilumab is available in a pre-filled syringe and can be self-administered subcutaneously (SQ) as an initial dose of 600 mg (two 300 mg injections), followed by 300 mg given every other week.

The FDA approval of dupilumab was based on the results of the LIBERTY AD Clinical Program which included three randomized Phase 3 pivotal trials of 2,119 adult patients with inadequately controlled atopic dermatitis. The SOLO 1 and SOLO 2 trials examined dupilumab as monotherapy, and the CHRONOS trial examined treatment with both dupilumab and topical corticosteroids (TCS). **Table 1 contains the results for the three trials.**

Dupilumab significantly improved measures of skin clearing, intensity, and severity of disease at 16 weeks compared to placebo.

	SOLO 1		SOLO 2		CHRONOS	
	Dupilumab 300 mg Q2W	Placebo	Dupilumab 300 mg Q2W	Placebo	Dupilumab 300 mg Q2W + TCS	Placebo +TCS
<b>Number of subjects randomized</b>	224	224	233	236	106	315
IGA 0 or 1a	38%	10%	36%	9%	39%	12%
EASI-75b	51%	15%	44%	12%	69%	23%
EASI-90c	36%	8%	30%	7%	40%	11%
Number of subjects with baseline Peak Pruritis NRS <sub>≥</sub> 4d	213	212	225	221	102	299
Peak Pruritis NRS (≥ 4 point improvement)	41%	12%	36%	10%	59%	20%

**Table 1: Efficacy results of dupilumab with or without concomitant TCS at week 16**

<sup>a</sup> IGA: Investigator's Global Assessment score. Responder was defined as a subject with IGA 0 or 1 ("clear" or "almost clear") with a reduction of  $\geq 2$  points on a 0-4 IGA scale.

<sup>b</sup> EASI-75: 75% reduction in the Eczema Area and Severity Index Score (EASI) from baseline

<sup>c</sup> EASI-90: 90% reduction in the Eczema Area and Severity Index Score (EASI) from baseline

<sup>d</sup> Pruritis NRS : Pruritis Numeric Rating Scale

The most common side effects with dupilumab include injection site reactions; cold sores in the mouth or on the lips; and eye and eyelid inflammation, including redness, swelling and itching. In addition, the safety and efficacy of dupilumab have not been established in the treatment of asthma. Patients with comorbid asthma should not adjust or stop their asthma treatment without talking to their physicians.

**Take Home Message:** Dupilumab marks the first approval for a biologic aimed for the treatment of adults with moderate to severe atopic dermatitis. Dupilumab currently is being studied for children with atopic dermatitis in phase II studies and is being studied for other indications: eosinophilic esophagitis, asthma and nasal polyps.

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# Doxycycline: A potential new treatment for PTSD

Razan Mhanna, PharmD



**Key points:** A new study published in *Molecular Psychiatry* found that Doxycycline disrupts the formation of negative associations in the brain that contribute to post-traumatic stress disorder (PTSD). The drug can suppress fear memory and potentially prevent the development of overactive fear memory.

**Finer Points:** Posttraumatic stress disorder, or PTSD, is a serious potentially debilitating condition that can occur in people who have experienced or witnessed a natural disaster, serious accident, terrorist incident, sudden death of a loved one, war, violent personal assault such as rape, or other life-threatening events. Among Americans aged 18 years and older, 7.7 million have PTSD.

It is characterized by four main types of symptoms:

1. Re-experiencing a traumatic event through intrusive distressing recollections, flashbacks, and nightmares
2. Emotional numbness and avoidance of places, people, and activities that are reminders of the trauma
3. Feeling cut off from others and other negative alterations in cognitions (ways of thinking, understanding, learning, and remembering) and mood

4. Marked changes in arousal and reactivity, including difficulty sleeping and concentrating, feeling jumpy, easily irritated, and angered

A specially designed placebo-controlled, double-blind, randomized trial involved 76 healthy volunteers who were given either doxycycline or a placebo. Those who were on doxycycline had a 60 percent lower fear response than those who were not. Scientists said the antibiotic works in this way because it blocks certain proteins outside nerve cells, called matrix enzymes, which our brains need to form memories.

In the trial, volunteers were put in front of a computer while taking doxycycline or placebo. The screen would flash either blue or red, and one of the colors was associated with a 50 percent chance of getting a painful electric shock. After 160 flashes with colors in random order, participants learnt to associate the 'bad' color with the shock.

A week later, under no medication, the volunteers repeated the experiment. This time there were no electric shocks, but a loud sound played after either color was shown. Fear responses were measured by tracking eye blinks, as this is an instinctive response to sudden threats. The fear memory was

calculated by subtracting the baseline startle response – to the sound on the 'good' color – from the response to the sound when the 'bad' color was showing.

While the fear response was 60 percent lower in those who had doxycycline in the first session, the researchers found that, importantly, other cognitive measures - including sensory memory and attention - were not affected. The participants who took doxycycline may not forget that they received a shock when the screen was red (thus not deleting what actually happened), but they 'forget' to be instinctively scared when they next see a red screen

The researchers concluded that the findings could hold direct therapeutic implications, indicating that tetracycline antibiotics could be used for primary prevention of fear memory acquisition in individuals.

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*It has been eight years since I graduated from Lebanese International University, and since then, I've been using every single information I acquired during my studies there.*

*A mother of two boys now, I feel how attached a mother is to her children, exactly as LIU is attached to its students, trying the best for paving the way for a brighter future for its children. LIU, along with the qualified professors there, invested and believed in me. The result was accomplishing my dream: working in the prestigious AUBMC as an "Night Rotational Attending Pharmacist", applying all the clinical data I acquired there. All the knowledge, continued education, rotations at hospitals and community pharmacies, late night studies, paid off and made my goal come possible.*

*Thank you LIU for all the efforts you put in your students, for accepting us to be a member of the big LIU family.*

*My salutations go to the Dean of Pharmacy, the School of Pharmacy, the professors, instructors, preceptors, and every single member of LIU.*

*The best is yet to come!!!*

**Regards,  
Diala Dimachk  
School of Pharmacy Graduate year 2009**



“

*It's has been 8 years now since I graduated with honors in june2009.*

*I'm grateful for my professors for giving me the knowledge and skills in how to provide the best patient-specific services, counseling and education. Keeping updated through online and live conferences, in addition to performing tutoring & seminars at our leading Pharmacy makes me feel like a fresh graduate who has all up to date knowledge to serve human. Special thanks for Dr Rahhal and Dr Malaeb whom forever I'll be grateful for all the Loyalty the performed in educating us.*

”



**Develop success from failures. Discouragement and failure are two of the surest stepping stones to success.**

Dale Carnegie



## 9 Campuses in Lebanon

Beirut: 01 706883  
Saida: 07 750550  
Tripoli: 06 416333  
Tyre: 07 351410  
Rayak: 08 901666

Akkar: 06 695488  
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