
Abstract: Injection of an agonistic CD40 monoclonal antibody to T and B cell-deficient mice induces an innate inflammatory response with colonic inflammation. This colitis is dependent on ROR-γT and various cytokines (IL-23, IL-17, IL-22 and GM-CSF [Pearson et al., eLIFE, 2015]. Therefore, we hypothesized that this colitis would be attenuated by oral treatment with a novel ROR-gamma T inverse agonist (VPR-254). Methods: Female scid mice were injected by the ip route with 12 mg/kg of anti-CD40 monoclonal antibody to induce innate acute colitis. On the same day (study day 0), mice (n = 10 per group) were treated (days 0–7) with vehicle, VPR-254 (50 mg/kg, po, bid), or ip with anti-IL-12 p40 antibody (0.5mg/mouse, on study days 0 and 3). A naïve group of four mice served as the non-colitis control group. Mice were euthanized on study day 7. Efficacy evaluations included: animal body weight, colon weight and length measurements, colonic histology (12 point severity scale, on coded slides) and the level of colonic GM-CSF (determined by ELISA). Colonic tissue samples (n = 4 per group) were also processed for immunohistochemistry, utilizing specific antibodies for IL-17A and GM-CSF. The percent areas of cytokine immunostaining in the mouse colon were determined with an online grid software program. Results: Vehicle control mice lost body weight (≈ 15%) during the study. VPR-254 modestly protected mice from weight loss; while anti-IL-12 antibody treated mice maintained their body weight throughout the study. Colonic weights (mg) were: 189±12 (naïve), 298±21 (vehicle), 248±12 (VPR-254) and 212±6 (anti-IL-12 antibody). Both drug treatments significantly reduced (p< 0.05) this morphometric parameter of colitis compared to vehicle treatment. Interestingly, VPR-254 treated mice had the longest colon length (p < 0.05 vs. vehicle) in this study. Colonic histology scores were: 2.6±0.2 (naïve), 9.0±0.5 (vehicle), 6.2±0.4 (VPR-254) and 3.7±0.3
(anti-IL-12 antibody). Both drug treatments significantly reduced (p< 0.05) this histological parameter of colitis compared to vehicle treatment. ELISA results showed that colonic GM-CSF antibody levels were significantly reduced in mice treated with VPR-254 (24% reduction), or anti-IL-12 (p40) (42% reduction), as compared to vehicle treatment. The mean percent areas of GM-CSF immunostaining were: 36±4 (naïve), 65±5 (vehicle), 56±7 (VPR-254) and 41±5 (anti-IL-12 ab, p<0.05 vs. vehicle). A somewhat similar pattern of immunostaining was found for IL-17A. There was a significant association (r = 0.704, p = 0.002) between colonic GM-CSF staining and histopathology scores. Summary: A novel ROR-γT Inhibitor (VPR-254), as well as an anti-IL-12 p40 antibody, reduced key parameters of innate immune colitis in mice. Conclusion: These results further support ROR-gamma T inhibition as a possible pharmacological approach for colonic inflammation.

Poster


Abstract: The introduction of tyrosine kinase inhibitor, imatinib, was a breakthrough in the treatment of CML that drastically improved outcomes. Medication adherence is essential to achieve these outcomes. Second-generation TKIs, dasatinib and nilotinib, are commonly used as second-line treatment after imatinib failure, yet studies comparing adherence between the two drugs have revealed conflicting results. Objective To compare treatment persistence and medication adherence between dasatinib and nilotinib as second-line treatment. Methods This observational study utilized internal Veterans Health Administration (VHA) databases for the time period of 10/1/2000-9/20/2012. The study included VHA beneficiaries, age 18-89 years, with ≥1 encounter at any of the VHA institution with a diagnosis code for CML (ICD-9 205.1x). Patients had to have filled ≥1 prescription of nilotinib or dasatinib as second-line treatment, defined as TKI treatment subsequent of previous treatment of one other TKI. Primary study endpoints included medication adherence, as measured by Proportion of Days (PDC),
and treatment persistence in the first year of treatment. Appropriate level of adherence was defined as achieving PDC ≥80%. Persistence was evaluated using Kaplan-Meier analysis in conjunction with a log-rank test. Multivariable analyses were performed to control for pertinent confounding variables. **Results** As second line treatment 457 patients received dasatinib while 124 received nilotinib. The average PDC was 51% (±35%) for dasatinib-treated patients as compared to 47% (±34%) of nilotinib-treated patients, resulting in a mean difference of 4% (95% CI: -3.5 - 11.0%, p= 0.309). Thirty-three percent of the dasatinib-treated patients were deemed adherent during first-year of treatment relative to 28% of nilotinib-treated patients resulting in an adjusted odds ratio (OR) of 1.24 (95% CI: 0.78-1.95, p= 0.361). A Kaplan-Meier analysis did not demonstrate a statistically significant difference in time to discontinuation between dasatinib and nilotinib (p= 0.740). Forty-five percent of patients receiving dasatinib continued therapy beyond one year relative to 44% of patients receiving nilotinib resulting in an adjusted OR of 1.10 (95% CI 0.71-1.68, p= 0.680). **Conclusion** In this national cohort of VHA patients receiving dasatinib or nilotinib as second-line treatment, no significant differences in the persistence or adherence were identified.

**Poster**


**Abstract:** Chemotherapy often causes severe complications that may lead to hospitalizations and negatively affect clinical outcomes. Over time new treatments have been developed and guidelines have been updated to limit the negative impact of these complications. **Objective:** To evaluate the incidence and trends of hospitalizations as a result of certain chemotherapy-induced adverse effects among cancer patients. **Methods:** This was a retrospective cohort study that utilized the National Inpatient Sample database, within the Healthcare Cost and Utilization Project, to evaluate hospitalizations of cancer patients from 1997 to 2010 Hospitalizations were selected using ICD-9 diagnosis codes for aplastic anemia (284), neutropenia (288.00), nausea and vomiting (787.01 – 787.03), and pneumocystis (136.3). Cancer prevalence data, from the Surveillance, Epidemiology, and End Results program, were used to derive the incidence
of hospitalizations due to chemotherapy-induced adverse effects per 100,000 cancer patients. Linear regression was performed to assess trends in incidence while logistic regression assessed trends in mortality. Multivariable analyses were used to adjust for age, gender, race, and primary source of payment. **Results:** Among the observed chemotherapy-induced adverse effects, the adjusted changes in incidence per year per 100,000 persons with cancer were observed for patients hospitalized due to anemia (4.9 [-24.6 – 34.5]), neutropenia (-23.7 [-45.4 – -2.1]), nausea and vomiting (-4.9 [-9.6 – -0.1]), and pneumocystis (-0.8 [-1.4 – -0.3]). Additionally, the adjusted decreases in the odds of mortality per year were observed for hospitalizations due to anemia (0.947 [0.946 – 0.948]), neutropenia (0.946 [0.944 – 0.948]), nausea and vomiting (0.949 [0.946 – 0.953]), and pneumocystis (0.964 [0.959 – 0.968]). **Conclusion:** Among this national cohort of cancer patients hospitalized due to chemotherapy-induced adverse effects, small but statistically significant decreases in hospitalization incidence and mortality may suggest that newer treatment strategies and practices may reduce adverse effects and their impact.

**Poster**

Vinall R, Chen Q, Talbott G, Hubbard N et al. Use of a genetically engineered mouse model and RNA-Seq to identify genes that can be regulated by mutant p53 in prostate cells following irradiation. AACR annual meeting, Washington DC, April 2017.

**Abstract:** Our group has previously demonstrated that the Trp53 R270H mutation can drive prostate cancer (CaP) initiation in a genetically engineered mouse model, and that the human equivalent, TP53 R273H, can promote development of castration resistant growth of LNCaP cells as well as resistance to commonly-used therapeutic agents. The primary objective of the current study was to identify genes that may contribute to the development of these gain-of-function phenotypes.

Wildtype mice and mice that were heterozygous or homozygous for the Trp53 R270H mutation (referred to as Trp53 +/-, Trp53 +/ R270H, or Trp53 R270H/R270H, respectively) that were ~3 months old were exposed to 5 Gy radiation to activate and stabilize p53, consequently increasing its expression. Mouse prostates were harvested 6 hours post-irradiation and either processed for subsequent
histological/immunohistochemistry (IHC) analysis or snap-frozen for subsequent RNA extraction and transcriptome profiling with RNA-Sequencing (RNA-Seq) analysis. P53 expression was determined by IHC. RNA-Seq data were processed to quantify transcript levels and to assess differential gene expression between the 3 groups.

PIN lesions were observed in 3-month-old Trp53 R270H/R270H mice prostates, but not in Trp53 +/- or Trp53 +/- R270H mice prostates. IHC analysis demonstrated that p53 was stabilized in the majority of prostate cells from Trp53 +/-, Trp53 +/- R270H, or Trp53 R270H/R270H mice 6 hours post-irradiation. RNA-Seq analysis of RNA isolated from irradiated mice prostates identified 1,444 genes that were differentially expressed in Trp53 +/- versus Trp53 R270H/R270H mice prostate cells, and 796 genes that were differentially expressed in Trp53 +/- versus Trp53 +/- R270H mice. Statistically significant differences in gene expression between the 3 groups were observed for 1,378 genes, including a number of p53 target genes, such as Cdkn1a, Bax, Bcl2, Kras, Mdm2, and Id4.

Our data identify multiple genes that may contribute to prostate cancer initiation and/or progression through p53 gain-of-function and loss-of-function mechanisms. It is possible that further analysis of these genes may lead to the development of new therapies and/or biomarkers for prostate cancer patients as well as guide the usage of currently available therapies in men at risk of developing CaP and CaP patients who harbor TP53 mutations.

**Poster**

Fitzpatrick LR, Talbott G, Mokrushin E, Woldemariam T. *Ex Vivo* Effects of Silymarin Fractions on Pro-inflammatory Cytokine Secretion from Colonic Strips of Mice with DSS-Induced Colitis. Digestive Disease Week annual meeting, Chicago IL, May 2017.

**Abstract:** Silymarin is an extract of milk thistle seeds. The silymarin complex consists of four major classes of flavonoligans: silibinin, silychristin, silydianin and isosilibinin. These compounds have both antioxidant and anti-inflammatory activities. Previously, we found that certain silymarin-derived fractions attenuated pro-inflammatory cytokine (TNF-α and IL-8) secretion from macrophage and colonic epithelial cell lines [Gastroenterology 150: S376-S377, 2016]. **Methods:** Silymarin fraction compositions were confirmed by (LC/MS) analyses. Silibinin and isosilibinin were obtained from a commercial source. Dextran
Sulfate Sodium (DSS) was given to male C57BL/6 mice (n = 16) in the drinking water (2% concentration), for a six day period, in order to induce colitis. Control mice (n = 8) received water. The ex vivo effects of crude silymarin extract, two distinct silymarin fractions, as well as silibinin and isosilibinin (20 to 200 μg/ml concentration range) were tested in our 24 hour colonic culture system [Fitzpatrick et al., Inflammopharmacology, 2014]. We utilized ≈ 4 mm colonic strips (n = 4 to 7 per flavonoligan treatment group) from mice with DSS-induced colitis. The secretion of TNF-α and MIP-2 were determined in the cell culture media by ELISA. Some colonic strips were stimulated with IL-1β (10 ng/ml) plus IL-23 (10 ng/ml) to induce IL-17 secretion. This cytokine was measured with an ELISA kit. Results: Mice that were administered DSS showed clear evidence of colitis (enhanced diseases activity indices and reduced colon lengths). Ex vivo treatment with fraction 2 (containing mainly isosilibinin and silibinin), silibinin, or isosilibinin were most effective for inhibiting dual cytokine stimulated IL-17 secretion. Specifically, IL-17 values (pg/ml) were: 55±7 (Vehicle), 26±5 (fraction 5), 20±7 (crude extract), 13±5 (fraction 2), 11±5 (silibinin) and 9±2 (isosilibinin). All treatments significantly reduced (p < 0.05 vs. vehicle) IL-17 secretion. Fraction 2 and isosilibinin (at 200 μg/ml) also significantly (p<0.05 vs. vehicle treatment) attenuated TNF-α secretion to the level found in colonic strips from non-DSS treated mice. Other silymarin-derived fractions and compounds also reduced TNF-α secretion, but not to the same degree. For attenuating MIP-2 secretion: the mean percent inhibition (compared to vehicle treatment) was: Fraction 2 (96%) = Isosilibinin (96%) > Silibinin (92%) > crude extract (75%) > fraction 5 (69%). Summary: A silibinin/isosilibinin containing fraction of silymarin, as well as these two compounds, prominently inhibited basal and stimulated pro-inflammatory cytokine secretion from colonic strips of mice with DSS-induced colitis. Conclusion: These data further contribute to the identification of optimal silymarin-derived anti-inflammatory flavonoligans, which can be used for follow-up in vivo testing in murine models of colitis.

Poster
**Abstract:** In an effort to discover novel bioactive plant natural products with utility in the treatment of cancer, we generated and assessed variety of classes of compounds for possible *in vitro* cytotoxic activity against Human HT-29 colon carcinoma cells. Sesquiterpene lactones isolated from *Taraxacum officinale* (Dandelion) leaf and flavonoids from *Glycyrrhiza uralensis* (Licorice) root were found to show significant anti-tumor activities. Chemical and physical data for the active compounds, cytotoxic activity and the bioassay-guided fractionation of the methanolic extracts will be presented. Bioactivity-guided fractionation of the methanol extracts afforded several fractions and sesquiterpene lactones and flavonoids which showed significant reductions in cell viability were observed. Observation under a microscope suggested the cancer cells were dying by an apoptotic mechanism and the exact mechanism of cell death is currently being investigated biochemically. Combinations of fractions containing the sesquiterpene lactones and flavonoids showed improved IC50 values and the results of the synergistic anti-tumor activity of the fractions as well as pure compounds will be presented. These findings highlight the importance of the use of combining different compounds to augment direct synergistic therapeutic effects when active constituents are combined within and between many medicinal herbs.

**Poster**


**Abstract:** A library of compounds derived from variety of plants were generated and assessed for possible *in vitro* cytotoxic activity against Human HT-29 colon carcinoma cells. Bioactivity-guided fractionation of the methanol extracts of these plants afforded several fractions and compounds which showed significant reductions in cell viability were observed. Compounds isolated from Panax Ginseng root and Tanacetum Parthenium leaf in particular were found to show significant anti-tumor activities. The most active purified fractions isolated from both Panax Ginseng root and Tanacetum Parthenium leaves contain flavonoids. Efforts are underway to identify and determine the efficacy of individual flavonoids. Observation under a microscope suggested the cancer cells were
dying by an apoptotic mechanism and the exact mechanism of cell death is currently being investigated biochemically. Chemical and physical data for the active compounds, cytotoxic activity and the bioassay-guided fractionation of the methanolic extracts will be presented. The observed potent anti-tumor activity of flavonoids from both Tanacetum Parthenium and Panax Ginseng make attractive drug candidates for further testing in other tumor cell lines.

**Poster**


**Abstract:** The extraction efficacy of different solvent systems was investigated for extraction of carotenoids from Lycium barbarum, known as Goji berries. Biocompatible extraction solvents were used the extract in the liquid form directly in pharmaceutical formulations that are at least substantially non-toxic and acceptable for human use, topically or orally. Goji berries are full of nutrients including amino acids, carotenoids, and polysaccharides. The optimized solvents selectively extracted the carotenoids from minerals, vitamin C, amino acids, and polysaccharides. The solvents could offer an environmentally friendly way to isolate the plant compounds without the need for toxic organic solvents. The solvents produced yields similar to those of typical organic solvents including ethanol, ethyl acetate and acetone. The individual carotenoids were further isolated with flash chromatography and identified with nuclear magnetic resonance and mass spectrometry. Chemical and physical data of the extraction and isolation procedure will be presented. These data further contribute to the identification of optimal and selective extraction and isolation of procedure, which can be used for follow-up in vivo oral and topical administration of carotenoids.
Clark S, Khansari PS, Atef E, Elkeeb R, Hassell K. Adapting Supplemental Instruction (SI) methods to a Doctor of Pharmacy program with curriculum-wide Team-Based Learning (TBL) pedagogy. The Association of Colleges for Tutoring and Learning Assistance Conference, Sacramento, California, April 2017

Abstract:

Presentation Description

On-time graduation rates and degree completion are important goals for colleges and universities, including healthcare programs. To support early career professional pharmacy students, we have adapted traditional undergraduate supplemental instruction (SI) methods to a Doctor of Pharmacy program for which team-based learning (TBL) is used across the curriculum.

What do you hope to accomplish (session outcomes)?

On-time graduation rates and completion are important goals for colleges, including professional pharmacy programs. Early student support programs, such as supplemental instruction (SI), can promote student success. We hope to share the methods by which we have adapted the traditional undergraduate SI approach to a Doctor of Pharmacy (PharmD) program, including integrating team-based learning (TBL) techniques. We will share with the audience how our California Northstate University College of Pharmacy SI (CSI) student leaders apply SI and TBL techniques. We also will outline how Department Chairs and Academic Deans can support CSI for the classes in their departments, and how teaching faculty can help the CSI Student Leaders target their sessions to the most difficult material, while still allowing CSI Student Leaders full autonomy. We will deliver this program using TBL active learning methods with the aim of encouraging audience engagement, gathering input, and allowing dissemination of ideas at the end of the program.

What is the significance of your topic?

Despite the success of Supplemental Instruction (SI) in undergraduate and some professional programs, few reports exist on adapting a formal SI approach to PharmD education. We report here how many of the traditional methods of SI can be adapted to a PharmD program. We will discuss the methods we have used to assure the success
Podium

Abstract:
Program Purpose: Supplemental Instruction (SI) is a pre-remediation academic assistance program focused on high-risk courses instead of struggling students. This program will discuss how SI has been applied to three different PharmD programs.

Background: According to Maize, et al., (AJPE 2010), preventive measures are divided into three categories: admissions standards, early detection, and academic assistance programs. PharmD academic assistance programs include remediation and pre-remediation. Remediation occurs after a student has failed a course, whereas pre-remediation aims to prevent failure. In that respect, pre-remediation strategies focus on facilitating academic progression, which is an important component of the ACPE 2016 Standard 17. One common pre-remediation program is Supplemental Instruction (SI). SI is used in undergraduate programs across the US, as well as international colleges and universities, to target high-risk courses. In a review of remediation and pre-remediation programs, SI was considered appropriate for PharmD programs (Maize, et al., 2010). Although certain aspects of traditional SI are not amenable to PharmD programs, many core aspects can be maintained professional PharmD Programs (Mosley, et al, 2013).

Session Goals: Our session will provide an overview of the SI, as well as a review of modified SI programs at 3 different PharmD programs. These programs, combined, include a total of 20 years of experience offering SI. We will use active learning strategies to assist the audience in adapting SI for their own high-risk courses for which they would like to develop a pre-remediation peer-led SI program.

History and Principles of Traditional SI Programs: SI was developed by Deanna C. Martin, PhD in 1973 at the University of Missouri, Kansas City (UMKC). It is now is used
widely in undergraduate programs across the US, as well as in educational institutions worldwide, including the UK, EU, Australia, Canada and South Africa. (Marcia Ody, Teaching and Learning Manager, The University of Manchester, Oxford Road, Manchester, M13 9PL, July 2017, on SINET@LISTSERV.UMKC.EDU.)

References:

Podium

Abstract:
Objective: To implement strategies that enhances feedback effectiveness in pharmacy education. Design: California Northstate University College of Pharmacy (CNUCOP) utilizes Team-Based-Learning (TBL), a small group learning technique as its exclusive pedagogy. Although TBL inherently encompasses feedback through team and class discussion and peer evaluation, the faculty at CNUCOP have implemented additional strategies to enhance feedback effectiveness. Assessment: One such strategy is the implementation of a team review exam prior to a major summative exam. The team exam has a similar format to individual exams, with the exception that teammates work together to answer questions and discuss answers. Our data suggest that students perceived taking a team exam as an effective approach to identify knowledge gaps and areas for improvement. Another strategy to provide effective feedback is a short meeting with each student after a summative exam to review areas requiring improvement. Although this is a short meeting, it enriches the students’ commitment to improve their academic performance, evidenced by an increase in requests for supplemental instruction from their peers or instructors. Furthermore, students are given feedback and receive training on giving feedback to their peers when they develop a formal case study presentation in their
Pathophysiology/Pharmacology class. Students are instructed to provide constructive, informative feedback to their fellow co-presenters and to other student presenters. **Conclusion:** Providing timely and effective feedback is an instrumental approach to improve learning outcome.

References

**Poster**


**Abstract:**
Empowering students to become effective leaders is a vital part of the PharmD program at California Northstate University College of Pharmacy. Our College strives to create an environment for students to develop and practice their leadership skills. The Student Ambassadors Advisory Council (SAAC) and Rho Chi/CNU Supplemental Instruction (Rho Chi/CSI) are major student-led group on campus that contribute to student learning and success.

Each fall the new SAAC members are selected by current members, based on their candidates’ understanding of effective leadership qualities. SAAC leaders run the student-centered component of our interview day for PharmD applicants. The SAAC team assigns and facilitates key student roles in the interview process. They also represent the student body for accreditation site visits and highlight the institution in open house events, tours and orientation.

Rho Chi/CSI provides student-led academic assistance through formal, regularly scheduled review sessions. These opportunities promote student leadership in academics and teamwork, as well as provide exposure to academic careers. As CSI
Leaders are among our strongest students academically, they model professionalism and academic excellence for the P1 class. These practices are well-aligned with two of our six fundamental Co-Curricular Learning Outcomes (# 2: Professionalism and Advocacy and # 6: Service and Leadership). These opportunities help student leaders develop collaborative leadership and mentoring skills to accomplish shared goals. The effectiveness of these leadership training programs was demonstrated in the recent Western Association of Schools and Colleges accreditation report where CNU received commendations as having an “…intentional spirit of innovative educational practices.”

**Poster**


**Abstract:**

**Program Purpose:**
As healthcare professionals, we are constantly working in a team and in our pharmacy curriculum, we give our students the tools necessary for team building and activities to become an effective member of the interprofessional team. Being part of a team also takes into account being able to reflect on one’s own and teammates behaviors which allows the team to be either a high functioning team or a low functioning team. Providing effective and constructive feedback is a skill that can aid in making a person an effective teammate which can lead to personal and professional growth. The purpose of this session is to sample a successful self and peer evaluation process in didactic pharmacy curriculum that allows pharmacy students an opportunity to reflect and improve on their behaviors to increase self-awareness.

**Program Experience:**
As the Director of Assessment at California Northstate University, we have successfully implemented the self and peer evaluation program in the didactic pharmacy curriculum. After literature search on best practices to capture behaviors of students that aids them in becoming effective teammates, we adopted the Comprehensive Assessment
of Team Member Effectiveness (CATME), behaviorally anchored rating scale, to conduct self and peer evaluations and rating team processes in Fall of 2015. Five behaviors the tool asks the participants to reflect upon include contributing to the team's work, interactive with teammates, keeping the team on track, expecting quality, and having relevant knowledge, skills and abilities.

The process of self and peer evaluation involves comprehensive student training during orientation on providing effective feedback, opportunities for students to work in teams for a semester including utilization of team contracts, administering mid-semester formative CATME self and peer evaluations followed by end of the semester summative CATME self and peer evaluations. The formative non-punitive evaluations are run during mid-semester and results are disseminated to the students in a timely fashion so they can reflect on their behaviors and give them an opportunity to both keep the positive behaviors as well as improve on the behaviors that they were rated low on. It also allows students to visualize their behaviors in relationship to the aggregate peer's results utilizing a Likert-scale. At the end of the semester, students complete the same summative evaluation which is a graded exercise in an attempt to hold students accountable for being either an effective or non-effective team member. We have successfully run this program for over a year and we have received positive feedback from students during focused group discussions.

**Poster**


**Abstract:**

**Background:** In the US, the incidence and mortality rates of prostate cancer (CaP) for African American (AA) men are about 1.5 and 2.3 times higher compared to Caucasian American (CA) men, respectively. CaP is diagnosed at an earlier age and is more aggressive in AA compared to CA patients. The causes for these differences are multifactorial, but include genetic effects that contribute to CaP-associated health disparity. We previously showed that in androgen-dependent CaP cells, the androgen receptor (AR) suppresses levels of the receptor tyrosine kinase ErbB3, a molecule that is known to drive CaP progression,
by stimulating the E3 ubiquitin ligase Nrdp1 (also called RNF41 or FLRF). The purpose of the current study was to investigate the role of the AR-Nrdp1-ErbB3 signaling axis in CaP development and progression in AA vs CA men with CaP. **Methods:** All data was collected with approval from the University of California Davis (UCD) or VA Northern California Health Care System (VANCHCS) Institutional Review Board (IRB). Sections from prostate tumors of 157 patients who underwent radical retropubic prostatectomy at UCD (79) or VANCHCS (78) were analyzed for these studies. Tumor and non-tumor areas were identified by a pathologist and 60 µm core samples were extracted from the specific areas of the donor blocks. The specimens were arranged in triplicate in a tissue microarray (TMA) using a Beecher Instruments Manual Tissue Arrayer. Hematoxylin-eosin staining was used as a reference for interpreting the additional sections of the TMA stained with antibodies to Nrdp1 and AR. **Results:** Nrdp1 has two major proteins isoforms of 317 amino acids (36kDa) and 246 amino acids (28kDa) - both isoforms are expressed in CaP. Subcellular fractionation and immunofluorescence staining of various CaP cell lines showed that while the 36 kDa Nrdp1 was localized to both the cytoplasm and the nucleus, the 28 kDa was localized exclusively in the cytoplasm. Hence we investigated the expression of Nrdp1 in primary prostate tissues from 157 individual patients, including 19 AA, 121 non-Hispanic CA, 5 Hispanic CA and 11 others. Using a scoring system based on immunohistochemistry (IHC) scores from 0 to 3, where 0 represents no staining and 3 represents 100% staining, we observed that Nrdp1 was strongly expressed in the epithelial cells of the prostate and could be observed in both the nucleus and the cytoplasm. Comparison of cytoplasmic Nrdp1 levels showed no difference in expression between the different racial groups; however, nuclear Nrdp1 levels differed significantly between races (P = 0.008), with post-hoc testing showing significantly higher expression in CA patients than in AA patients (P = 0.002). Therefore, it is likely that the difference is in the 36 kDa fragment and not the 28 kDa fragment. Further, increased preoperative PSA is associated with significantly higher nuclear Nrdp1 levels (P = 0.030), with a Spearman correlation of 0.19. Finally, we demonstrated that nuclear Nrdp1 levels are significantly higher in subjects without acetylsalicylic acid (Aspirin, ASA) use (P = 0.001). **Conclusions:** Since PSA levels are considered to be a measure of AR transcriptional activity, the correlation between nuclear Nrdp1 and preoperative PSA is supportive of our previous report showing that Nrdp1 is a direct transcriptional target of the AR. Since preoperative PSA is indicative of advanced disease, these results suggest that one reason for higher incidence of CaP and higher CaP progression among AA patients compared to CA is due to the lower levels of nuclear Nrdp1 in the former. Further, since aspirin use increased the levels of nuclear Nrdp1, these data indicate that the use of aspirin may increase nuclear Nrdp1 levels, thereby decreasing the risk of advanced CaP and perhaps reducing CaP disparities between these groups.

**Poster**
Cusick JK, Khansari P, **Fitzpatrick LR.** Use of engaging student-created posters to explain fundamental scientific concepts. CLUTE Conference, Las Vegas NV, October 2017.
Abstract:
The goal of this assignment was to create a fun and interactive exercise in which students were encouraged to create an engaging and informative poster describing aspects of Immunology in a course that utilized Team-Based Learning (TBL) as its sole pedagogy. Teams were assigned differing subjects relevant to an upcoming exam, and each team was asked to create a poster describing the subject matter utilizing TV characters, superheroes, or other caricatures. Rubrics used to grade the final posters were included in the original assignment, providing information on how the final poster would be graded based on its accuracy, completeness, presentation style, originality, and the ability of the poster to serve as a teaching tool to fellow students. During the class period in which the final posters were due, the sole application exercise was a gallery walk, in which teams of students worked together to evaluate and grade posters from fellow students according to the rubrics, providing students with the opportunity to learn from one another. This application exercise was utilized on three separate occasions over a two-year period to cover lymphocytes, leukocytes of innate immunity, and diseases of the immune system. Positive feedback was received from students regarding the poster exercise, and the posters also served as an excellent recruiting tool for applicant candidates that were not familiar with TBL, as examples of student creations from application exercises generated positive feedback from visiting applicant candidates during the pharmacy school interview process.

Keywords: TBL, poster, drawing, caricature, Immunology

Poster

Abstract:
Objectives: This study investigated the predicting factors of depression, antidepressant use and positive antidepressant response during the perinatal/postpartum periods. Methods: The 2007-2012 National Health and Nutrition Examination Surveys (NHANES) were combined to identify adult pregnant women, those within the 18-month
postpartum period (n=492) and their depression statuses via demographic information, information on health care accessibility, antidepressant use and illicit drug use information. The characteristics of the different study groups were compared (depression versus no-depression groups, antidepressant users versus non-antidepressant users, and antidepressant responders versus antidepressant non-responders). Multivariable logistic regression analysis was used to investigate the predicting factors of perinatal depression (PND)/postpartum depression (PPD), antidepressant use and antidepressant positive response in PND/PPD. **Results:** PND/PPD individuals had higher rates of mental health visits. No predicting factor for developing PND/PPD was shown. Antidepressant users were significantly older with insurance and recent health checkups/mental visits. Being below the poverty level and having some health care accessibility are predictors for being on antidepressants. Recent non-illicit drug use is a predictor for PND/PPD symptom improvement while on antidepressants. Ethnicity is not a predicting factor for any of the investigating outcomes. **Conclusion:** The group of those with social-economic disadvantages was more likely to be on antidepressants for PND/PPD. Recent illicit drug users were less likely to show improvement with antidepressants. The safety and efficacy of antidepressant use during this period is controversial. More studies need to focus on the barriers involving antidepressant treatments, the safety and outcomes of antidepressants, and their appropriateness for PND/PPD management.

**Poster**


**Abstract:**

**Objectives:** To investigate the public perceptions of pharmacists and the expected pharmacists’ roles in the healthcare system stratified by age groups. **Methods:** A 59 multiple-choice and open-ended question survey was created to investigate the public perceptions of pharmacists and their expected roles in the healthcare system. The survey has advertised through social networks since January 2017. The expected pharmacy
clinical services, the perceptions toward pharmacists and the expectations from pharmacists of different age groups (<30, 30-59, >60) were compared by utilizing fisher exact test from current available respondents (statistical significance: p<0.05) Results: A total of 34 respondents have filled out the surveys [14 patients <30 years old (41.18%); 12 patients from 40-59 years old (35.29%); 8 patients >60 years old (23.53%)]. The respondents were mostly white, from the Western US and had at least some college education. In comparison to >60-year-old group, the younger groups expected pharmacists to perform more clinical services besides dispensing medications and patients counseling. The older the patients, the more likely the patients thought that pharmacists and technicians provided same quality of medication information (p=0.0353). The age group 30-59 were more likely than other age groups to believe that pharmacists were more accessible than other healthcare professional (p=0.0168). All age groups agreed similarly that pharmacists are healthcare professionals, should more widely collaborate with the healthcare teams and should prescribe medications independently. Conclusions: The public expects pharmacists to provide more clinical services, especially in younger populations. More respondents will solidify the findings of the study.

Poster

Abstract:
Objective: To investigate factors associated with the prescription of opioid analgesics among patients who have visited ambulatory care settings (2009-2013). Methods: This is a pooled cross sectional study using 2009-2013 NAMCS data. Opioid prescriptions were identified through drug codes for narcotic and narcotics combination. Disease states were categorized based on ICD-9 codes. We conducted descriptive analyses using t-test, Wilcoxon Mann Whitney and chi-square tests where appropriate to assess differences in the distribution of various patient characteristics among opioid, disease states, and other prescription records. We used the multivariate logistic regression model to evaluate the
association between the following factors and opioid prescriptions: demographics, number of yearly visits, total prescribed medications, reasons for visits, average physicians visit time, insurance types, physician specialties, having mental disorders, nervous system and musculoskeletal system/connective tissue diseases (statistical significance: p<0.05; 95% confidence interval). **Results:** A total of 15882 from 225234 visits included opioid prescriptions (7.05%). Statistical significant differences were observed among the opioid prescribed and opioid non-prescribed groups in year of visit, race, insurance types, geographic regions, physician specialty and visit reasons (p<0.0001). Opioid group was older, had more diseases, higher number of yearly visits, higher number of prescription medications and longer visit time than non-prescribed narcotic group (p<0.0001). Associated characteristics with receiving an opioid prescription included being American Indian/Alaska Natives (AIAN), male, self-paid, from Southern US, younger than 60 years old, having surgical care prescribers, receiving multiple medications, having at least 4 visits yearly, pre/post-surgery visit, having nervous system and musculoskeletal system/connective tissue diseases (p<0.0001). **Conclusions:** Caution is advised before prescribing opioids to the population with high rate of substance abuse such as AIAN. Future studies must focus on the exact causes of the high rate of prescribing opioids in Southern US, young population and those who self-paid for opioids.

**Poster**

**Purpose** As part of optimizing the ternary system solid dispersion and understanding the synergistic and antagonistic precipitation inhibition of mixed polymers, our goal of this study was to investigate the effect of the order of polymers addition to the model drug molecule.

**Methods** The effect of Eudragit 100 and PVP K 90 order of addition on the precipitation of indomethacin solution was studied using the following four sequences of adding the 1 mL of the alcoholic phase to 25 mL of the aqueous phase: 1- Adding indomethacin and PVP K 90 solution to the precipitation media of 0.1N HCl solution of Eudragit 100. 2-
Adding indomethacin and Eudragit 100 solution to the precipitation media of 0.1N HCl solution of PVP K 90, 3- Adding solution of indomethacin, Eudragit 100, and PVP K 90 to the precipitation media of 0.1N HCl, 4- Adding solution of indomethacin to a 0.1N HCl solution of Eudragit and PVP K 90. The control was a methanolic solution of indomethacin added to 0.1N HCl solution with no polymers. The precipitation study was conducted using a continuous UV at 500 nm. Then the precipitates from the 5 samples were collected and studied using IR and DSC. The studies drug to polymers weight ratios are 1:1:1, i.e. 4:4:4 mg of each.

Results We have observed a difference in the precipitation and nucleation onset times of indomethacin from the above sequences. Although, after adding the two phases together, all samples had the same final concentration of indomethacin, Eudragit 100, and PVP K 90, the order of adding the polymers and drug resulted in difference on the precipitation times and patterns. We have also observed a slower precipitation rate when Eudragit 100 was either mixed with the indomethacin alone or in combination with PVP K 90 in the alcohol phase compared to the other sequences. Using DSC and IR to identify the nature of the collected precipitate, it was confirmed that the 4 sequences and the control were alpha indomethacin crystalline form. In addition to the rate of precipitation and crystal form, the nucleation and precipitation patterns were different when observed using UV turbidity detection at 500 nm.

Conclusion We are reporting that, in addition to the type and the number of used polymers in precipitation inhibition, the order of addition of the polymer to the drug can affect the drug nucleation and precipitation rate. The latter can have a significant impact on the success of the solid dispersion preparation. This phenomenon could be due to hydrophobic interaction confirmed by the drug precipitating in the same form from all sequences.