23RD BALTPHARM FORUM

STUDENT POSTER PRESENTATION ABSTRACTS

EVALUATION OF HARMFUL AND POTENTIALLY HARMFUL EXCIPIENTS FOR NEWBORNS FOUND IN MEDICATIONS USED IN CHILDREN'S CLINICAL UNIVERSITY HOSPITAL (DEPARTMENT OF NEONATOLOGY) IN 2019

AIVA BIRNE
aivabirne@gmail.com

University of Latvia
Address: Jelgavas iela 3, Riga, Latvia, LV-1004

Introduction: Excipients are essential components of a medicinal product that are needed in the manufacturing process, although there are growing concerns about their safety. Not all excipients are biologically inert and therefore may cause adverse effects which makes neonate population especially vulnerable.

Study aim: To study the safety of industrially produced medicines used for neonates in the Neonatology Clinic of the Latvian Children's Clinical University Hospital from the excipients perspective.

Methods: Information on medications used in the Neonatology Clinic was obtained from the hospital's drug accounting software *Horizon*. Using the summaries of product characteristics, excipients were identified for each medication, which were then grouped into 3 categories: harmful excipients, potentially harmful excipients, and other excipients. Data collection was performed using the computer program *Microsoft Office Excel 2019* and descriptive statistical methods (natural numbers and percentage distribution), which were presented in the form of graphs. In addition, the possibilities of replacing medications that contain at least four harmful or potentially harmful excipients with other medications available in Latvia that do not contain or contain less undesirable excipients for newborns were evaluated.

Results: Of the medications used in the Neonatology Clinic, 133 (57%) contained at least one undesirable excipient, and in 99 (43%) medicines they were not present. Propylene glycol was the most widespread harmful excipient, used in 20 medicines. Benzalkonium chloride was also common, used in 18 medications, similar to ethanol, which was included in 16 drugs. Among the potentially harmful excipients, the most common were titanium dioxide and disodium edetate, which were used in 21 and 20 of the drugs, respectively. 22 medicines contained at least 4 undesirable excipients, of which only 3 can be replaced by other medicines available in Latvia which have a lower number of undesirable excipients.

Conclusions: Most of the industrially produced medications analyzed are not appropriate for use in newborns. The next step would be to study the amount of these excipients that the newborn receives in the hospital in relation to his weight as well as to evaluate other possible replacement options.

PHARMA DRIVEN INNOVATION

VIKTORIJA BUTRIMAITĖ, INGA KANAPECKIENĖ
viktorija.butrimaite@lsmu.lt; inga.kanapeckiene@lsmu.lt

Lithuanian University of Health Sciences
Address: Sukileliu Ave. 13, Kaunas, LT-50162, Lithuania

Introduction: Pharma-driven innovations, hackathons, entrepreneurship seminars, and training are all important components of the healthcare industry's efforts to drive progress and innovation. These events and programs provide a platform for individuals and teams to collaborate and create new solutions, products, and technologies that can address unmet needs and improve patient outcomes. Hackathons allow for rapid prototyping and testing of innovative ideas. Entrepreneurship seminars provide guidance and support for those interested in starting their own businesses in the pharmaceutical and healthcare space. Trainings offer opportunities for individuals to develop new skills and knowledge in areas such as drug development, regulatory affairs, and marketing. These events and programs are essential for the continued advancement of the pharmaceutical industry and the improvement of patient care.

Background: Pharma-driven innovations, hackathons, entrepreneurship seminars, and trainings are becoming increasingly popular in the healthcare industry as a means of driving progress and innovation. These events and programs offer a platform for individuals and teams to collaborate and develop new solutions, products, and technologies that can address unmet needs and improve patient outcomes.

Method: In this abstract, we reviewed case studies of our organized health care hackathons, workshops, and entrepreneurship trainings. We collected data and feedback from participants and organizers to evaluate the value and impact of these events and programs in the healthcare industry.

Results: Our case studies found that these events and programs have been successful in fostering collaboration and innovation within the pharmaceutical industry. Our health care hackathons, in particular, have been effective in providing a platform for rapid prototyping and testing of new ideas. Our entrepreneurship seminars have been successful in providing guidance and support for individuals interested in starting their own businesses in the healthcare space. Our trainings have been successful in providing opportunities for individuals to develop new skills and knowledge in areas such as drug development, regulatory affairs, and marketing.

Conclusion: In conclusion, our case studies demonstrate that pharma-driven innovations, hackathons, entrepreneurship seminars, and trainings are all valuable tools in driving progress and innovation within the healthcare industry. These events and programs provide a platform for collaboration, innovation, and skill development, ultimately leading to better patient outcomes. As the healthcare industry continues to evolve, we will continue to organize these types of events and programs to drive the industry forward.

QUALITY CONTROL OF PHOTOINITIATORS FOR UV-CURABLE COATINGS USING SPECTROSCOPIC TECHNIQUES

DANUTE STIVRIŅA, ARTA OSE
danute.stivrina@lu.lv; arta.zarina@lu.lv

University of Latvia; Institute of Atomophysics and Spectroscopy, University of Latvia
Address: Jelgavas iela 3, Riga, Latvia, LV-1004

Introduction: The absorption specifications of four photoinitiators, BAPO, TPO, TPO-L and IRG184, were investigated in this work. All three (BAPO, TPO, TPO-L) are phosphor-containing photoinitiators. TPO and TPO-L have almost similar molecular weights, BAPO has the largest molecular weight and IRG the smallest. Photoinitiators are compounds that produce radicals when exposed to UV light. These then react with monomers and/or oligomers to initiate the growth of polymer chains. They are essential components of all UV-resistant adhesives, inks and coatings. For the study, Kinetics provided three photoinitiators in powder form and one in liquid form. These photoinitiators were then given at 2% dilution with monomer+oligomer and finally polymerised films were also offered, which Kinetics Ltd made themselves, but these polymerised films were too thick and impossible to measure, so we made the polymerised material ourselves. The preparation of the polymerised material consisted of 2% diluted photoinitiator in a drying lamp, and thus we obtained a thinner type of polymerised material with which to make the measurements.

Method: Three research methods were used to obtain the results: UV-VIS-NIR spectroscopy, which measured transmittance and absorbance, photoluminescence spectroscopy, which measured light reflectance, and Fourier transform infrared spectroscopy (FTIR), which detected the specific molecular groups that predominate in the samples.

Results: The results of the study indicate that the photoinitiators have good optical properties in the 400-460 nm range. Monomer+oligomer modifies the absorption peak of the photoinitiator and causes an absorption shift in the UV range. Significant changes are observed for IRG182 and BAPO (BAPO is thought to have an absorption band in the 360-420 nm range). PL measurements showed a good rate of conversion of the photodischarge to the chemical reaction. FTIR spectra for 2 % photoinitiator showed that the composite was formed only in the case of TPO-L. Based on the data, TPO-L and BAPO are the most compatible with this type of monomer.

Conclusion: In conclusion, the study revealed valuable insights into the properties of photoinitiators in a certain nm range. The results showed that the monomer-oligomer can influence the absorption peak of the photoinitiator by causing an absorption shift. In addition, the study found that IRG182 and BAPO showed significant changes and BAPO was found to have its own characteristic absorption band. The rate of photoconversion to the chemical reaction was also found to be efficient, as evidenced by the photoluminescence measurements. In addition, FTIR spectra of the 2% photoinitiator showed that the composite was formed only in TPO-L. The data from this study show that TPO-L and BAPO are the most compatible with this type of monomer. Overall, these results provide useful information for researchers in the field of photopolymerisation and materials science.

FABRICATION AND CHARACTERIZATION OF POLYCAPROLACTONE NANOFIBERS BY ELECTROSPINNING METHOD FOR CELL/BIOTECHNOLOGY APPLICATIONS

ILVA VĀVERE, UNA RIEKSTIŅA, ROMAN VITER, MAKSYM POGORIELOV
ilva.vavere@lu.lv

University of Latvia; Institute of Atomophysics and Spectroscopy, University of Latvia
Address: Jelgavas iela 3, Riga, Latvia LV-1004

Introduction: Polycaprolactone is a synthetic polymer that is widely used due to its low cost, availability, and physical and biological properties. Nanofibers made from this material are used and further researched in the fields of biotechnology and bioengineering. The aim of the research was to develop a polycaprolactone nanofiber matrix for the cultivation and evaluation of human skin cells in the field of biotechnology.

Methods: In the course of the work, polycaprolactone membranes were prepared by the electrospinning method. The morphology of the sample was characterized using scanning electron microscopy, while Fourier transform infrared spectroscopy was employed to assess its chemical purity. Human skin cells were inoculated and incubated under specific conditions to determine their ability to proliferate. Cells were also stained with Hoechst 33342 and ActinRed 555 dyes to characterize cell adhesion under fluorescence microscopy.

Results: Polycaprolactone matrices were biocompatible with skin cells. However, the morphology differed between samples, and the viability in the positive control was reduced.

Conclusion: The material produced in the study can be used for skin cell regeneration; it affects the adhesion of mesenchymal stem cells to the substrate as well as their proliferation ability. Its properties could be improved with further studies.