Selected Meeting Abstracts from 2016 4th International Conference on Biomedicine and Pharmaceutics

Oral Session

Pharmaceutics and Drug Delivery Research

1 AN INVESTIGATION OF MICRO-HYDROXYAPATITE SPHERES LOADED WITH INDOMETHACIN FOR TARGETED DRUG DELIVERY

Xiue Ren*, Hongjuan Weng, Xianhe Wang, Liying Wang. *Department of Chemistry and Pharmacy, Zhuhai College of Jilin University, Zhuhai, China*

10.1136/jim-2016-000328.1

Objectives A major obstacle to be overcome for oral drug delivery is that drug absorption/release must be avoided before the drug reaches the target site. In an attempt to overcome this challenge, we selected synthetic hydroxyapatite (HA) as a drug carrier for the hydrophobic drug indomethacin (IDM) used in local treatment of the colon, exploring the loaded drug and in vitro release characteristics of IDM/HA.
Methods An easy one-step hydrothermal method was employed to prepare micro-hydroxyapatite (HA) spheres. Infrared spectroscopy, X-ray diffraction and scanning electron microscopy further confirmed the composition, structure and morphology of the obtained sample. In vitro release of the anti-inflammatory drug (IDM) was performed successively under simulated conditions. The loading and release profiles of the drug were analysed by UV-spectrophotometry.
Results The use of ethanol enhances solubilization, and the drug loading rate is about 62.21% at 37° C for 12 hours when the mass ratio of IDM/HA is 2:1. The in vitro release of IDM/HA is dependent on solution pH. There is almost no release of IDM (only 0.159%) at pH 1.0, poor release (about 10.55%) at pH 6.8, and a cumulative release rate of up to 84.95% at pH 7.8. These results suggest that HA particles can be used as a pH responsive vehicle for delivering drugs.
Conclusions The as-synthesized micro-hydroxyapatite spheres may act as a promising drug delivery system due to their good biocompatibility, pH sensitivity and high drug loading/release efficiency. The IDM/HA drug delivery system satisfies the basic demand of oral site-specific delivery.
Acknowledgments This work was financially supported by a college students' innovative training project (Grant No. 4041906168).

2 OPPOSITE EFFECTS OF *ABCG4* KNOCKOUT ON GONADAL FAT/BODY WEIGHT RATIO CHANGES BETWEEN MALE AND FEMALE MOUSE LITTERMATES

[1]Jinmei Wu*, [2]Shailendra B Patel. *[1]College of Biotechnology, Jiangsu University of Science and Technology, Zhenjiang, China; [2]Department of Medicine, Medical College of Wisconsin, Milwaukee, USA*

10.1136/jim-2016-000328.2

Objectives To explore the effect of ATP-binding cassette subfamily G member 4 (*Abcg4*) gene knockout on gonadal white adipose tissue (GWAT) production in the mouse.
Methods *Abcg4* knock-out/GFP knock-in mice were bred and verified by genotyping. Sex-matched littermates 1–2 months old were chosen for the study. The mice were anaesthetized and weighed. Epididymal white adipose tissue (EWAT) from male mice and peri-uterine adipose tissue from female mice was removed and weighed and the gonadal fat/body weight ratio was calculated.
Results The GWAT/body weight ratio of the *Abcg4*–/– female mouse was 20% higher than that of its wild-type female littermate, but for the male mouse, the ratio was much lower in the knockout mouse than in its wild-type littermate (the ratio for the knockout mouse was only 66% of that of the wild-type littermate). *Abcg4* knockout results in an obese female mouse and a lean male mouse, compared to their normal sex-matched littermates.
Conclusions *Abcg4* knockout has a remarkable effect on gonadal fat/body weight ratio, with opposite effects in male and female mice.

3 PRELIMINARY INVESTIGATION ON THE HIGH-PRESSURE GAS FOAMING POLY-(LA-SERINE)-ESTER AS A NITRIC OXIDE DONOR

[1]Jia Fu, [1]Tian Zhong, [2]Jiamin Ding, [2]Ran Huang*. *[1]Department of Chemistry and Pharmacy, Zhuhai College of Jilin University, Zhuhai, China; [2]Department of Materials Technology and Engineering, Research Institute of Zhejiang, University-Taizhou, Taizhou, China*

10.1136/jim-2016-000328.3

Objectives Because of its excellent biocompatibility, non-toxicity and biodegradability, polylactide (PLA) is a natural choice for various types of biomaterials, for example as a drug carrier. However, the use of PLA as a base substance for nitric oxide (NO) used as the donor has not been previously reported. On the other hand, high pressure gas foaming preparation of porous polylactide for tissue engineering or other biomedical applications has been developed for decades and proven to be a successful method to manipulate PLA. We employed nitric oxide as the pressure gas injected into amorphous amino acid modified-PLA solid to obtain a gas-solid solution, while the amino acids provided the amino group for EDTA modification, which may serve as a candidate for donating NO.
Methods We synthesized poly-(la-serine)-esters to introduce the diazo-group on the side chain, which can be loaded with NO and acts as a NO donor (diazeniumdiolate). The bulk poly-(la-serine)-ester was formed by high pressure NO and CO_2 gas to obtain a NO-loaded porous scaffold (Figure 1).
Results The block ratio of LA:serine 50:50 is feasible for fine products with both good properties and NO capacity. Thermal and mechanical characterization shows good thermal, tensile and processing properties. SEM observation confirms the porous structure induced by gas foaming. The Griess method applied to measure NO release in PBS (pH 7.4) showed 1082 mol/mg release in 7 hours.
Conclusions The results indicate this methodology is feasible. The block-polyester we synthesized shows a practical NO capacity with a convenient loading process, while good thermal and mechanical properties are maintained, and therefore may serve as a candidate for donating NO.