also employed, however are not necessary. Well-resolved picks and their characteristic 2θ values can be used for examining powder diffraction databases in qualitative composition analysis. Diffraction patterns can serve as fingerprints of manufacturers – both legal and illegal – since even small changes in composition are visible. It is worth noting, however, that X-ray powder diffraction, same as NIR spectroscopy, is not a method of trace analysis, and that for those purposes other methods are more sensitive and hence more reliable. The power of XRPD in medicines control demonstrates its unusual application for identification of rubber closures fragments.

10:15 Oral

Focus on drug discovery – new opportunities in life science sector in Poland.

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One of the major problems encountered by Polish scientists working in the drug discovery field in Poland, is a shortage of business partners capable of conducting preclinical development phase. Since only few companies in Poland are working on innovative therapies, the interaction between the academia and industry should be identified as a bottleneck of Polish ingenious drug development and marketing. Therefore companies that bridge the progression in the pipeline using a value-added approach are urgently needed in the Polish medical biotechnology area.

The first company in Poland specialized in preclinical drug development is Selvita. Our mission is to create a multidisciplinary platform which provides wide range of possibilities necessary to translate innovative discoveries into preclinical candidates with high chances of becoming marketed in the future. Expert-based evaluation of the project, decrease in the attrition rates through smart *in silico* target and compound selections, enriched by a wide range of in vitro and in vivo assays performed by our company are the key features allowing us to focus on the rapid and successful advancement of a drug candidate in the pipeline. This presentation provides comprehensive information about Selvita's novel approach in the field of Polish medical biotechnology and our integrated procedure of modern therapeutics development.

10:35 Oral

Registration dossier of chemical active substance

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During the registration process quality of medicinal products is assessed on the basis of chemical documentation of active substance and chemical, pharmaceutical and biological documentation of finished product.

In the European Union a common format of documentation – CTD (Common Technical Document) is applicable for every the type of regulatory procedure (centralized procedure CP, decentralized procedure DCP mutual recognition procedure MRP and national procedure NP).

Data concerning quality of medicinal product are included in Module 3.2.S and must contain the following information:

3.2.S.1 General Information

3.2.S.2 Manufacture

3.2.S.3 Characterisation

3.2.S.4 Control of Drug Substance

3.2.S.5 Reference Standards or Materials

3.2.S.6 Container Closure System

3.2.S.7 Stability

There are three possible ways for submission of documentation of quality of the active substance:

· Active Substance Master File (ASMF)

· Certificate of Suitability of the Monographs of the European Pharmacopoeia

· Module 3.2.S

European legislation requires manufacturing of every active substance according to GMP.

Coffee break

Monday morning, 26 May, 10:55

First Session

Monday morning, 26 May, 11:25

11:25 Oral

The ligand binding to the serotonin transporter

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Abnormalities in serotonin levels can lead to depression and anxiety, as well as other mental disorders such as obsessive compulsive disorder. The serotonin transporter (SERT) plays a key role in the regulation of synaptic serotonin (5-hydroxtryptamine, 5-HT) levels and therefore is the major target for antidepressants including both the tricyclic antidepressants and selective serotonin reuptake inhibitors. The antidepressants affect the concentration of the serotonin by inhibiting the reuptake of the 5-HT into nerve cells. To examine the molecular mechanism of their different binding affinities the interactions between ligands and serotonin transporter were studied.

In the present study molecular modelling techniques were used to study the interaction between ligands and SERT. The SERT model was based on the crystal structure of the bacterial homologue Na^+/Cl- dependent neurotransmitter transporters from *Aquifex aeolicus* ($LeuT_{Aa}$) [1-3]. For the docking studies two sets of ligands were considered: ligands with quite high affinity, and ligands with a nitro group at the quinoline moiety with much lower affinity for SERT. The ligands were docked to the SERT model using the ICM (Internal Coordinate Mechanics) molecular modelling software.

The docking studies indicate that the binding site of the SERT model constituted amino acids in transmembrane helices (TMHs): 1, 3, 6, 8 for all the studied ligands. The ligands without a nitro group at the quinoline moiety interacted also with amino acids in TMH 10. In complexes of SERT and the ligands with the nitro group at the quinoline moiety a steric interactions between ligand and transporter protein were observed.

Additionally, a putative substrate binding site corresponding to low affinity binding was identified in the pore formed between TMHs 1, 6, 10 and 11. The docking of ligands to this binding site pinpointed an additional region that might be considered for development of new inhibitors.

Acknowledgement
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11:45 Oral

Hydrogel coatings and a local drug delivery

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Hydrogel coating as a method for solid substrate surface modification, beside advantages like improving material biocompatibility, hydrophilization and lubrication, brings the additional possibility of the active agent incorporation. Combination of the hydrophilic matrix and the hydrophobic drug seems to be especially promissing.

We have developed a method for polymer coating by water insoluble hydrogel, based on polyurethane (PUR) and polyvinylpyrrolidone (PVP), designed for medical polymeric devices. This hydrogel layer was characterized by the means of the Fourier Transform Infra-Red Attenuated Total Reflection (FTIR-ATR) spectroscopy, static and kinematic friction factor relative to the uncoated backbone material and against porcine tissue counter-face, water wetting angle and microscopic observations.

Our tests confirmed changes in surface composition, superhydrophilicity and enormous lubricity in hydrated state (even 10-fold friction factor reduction). In case of urethral poly(vinyl chloride) catheters with hydrogel coated inner surface the capillary action phenomenon was observed, proving high affinity between coating and water molecules. Experiments with Escherichia coli biofilm growth on unmodified backbone material and hydrogel coated one revealed a significant decrease in a number of adhered bacterial colonies.

Hydrogel modified surface have another advantage over unmodified one, while it can serve as a drug reservoir for a local drug delivery. There are cases when drug dosage time should last at least few hours, but no longer than 3 days. It can be desirable in case of implantation of devices like tracheotomy tubes, when anti-inflammatory active substance should be released at the very beginning to prevent later side effects like tracheal stenosis, but later can not interrupt normal cell divisions in subsequent levels of healing process and epithelium formation. In case of hydrophilic matrix with hydrophobic drug these profile can be easy obtained due to its behavior as the swelling controlled drug release system.

In further investigations we used antibacterial triclosan and anti-inflammatory dexamethasone as model hydrophobic drugs, which were incorporated in two modes: as a component of the solution in any step of the coating formation or through the additional impregnation bath. The recent mode allows also for modification of devices like silicone catheters or polyglycolic acid resorbable sutures without polymeric coating step.

The effects of active agent incorporation were then verified through drug dissolution tests to the phosphate buffered saline (PBS) with 20% methanol or ethanol, extraction, and, in case of germicidal drug, by the inhibited growth zones method. The dependency of the rate of drug dissolution and the load capacity, as well as coating stability on the process parameters was investigated.

We also observed an interesting “spraying effect” during hydrogel swelling, when solid microparticles of the drug were precipitaded out of the coating layer to the surrounding solution. This phenomenon can be utilized in design of drug release systems, reacting on water content increase as the start signal.