MULTI-PARAMETRIC SPR – *IN VITRO* CHARACTERIZATION METHOD FOR BIOPHARMACEUTICALS AND DRUG DELIVERY SYSTEMS

JANUSZ W. SADOWSKI*, NIKO GRANQVIST, ANNIKA JOKINEN

BIONAVIS LTD., HERMIANKATU 6-8 H,
33720 TAMPERE, FINLAND
*E-MAIL: JANUSZ.SADOWSKI@BIONAVIS.COM

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Introduction

Surface Plasmon Resonance (SPR) has been used already few decades for label-free characterization of affinity and kinetics of the interaction, like drugs and proteins. New Multi-Parametric Surface Plasmon Resonance (MP-SPR) research instrument extends application range from small molecules also to characterization of biopharmaceuticals and their delivery systems such as real time interactions of proteins, viruses and nanoparticles.

Materials and Methods

Surface sensitive MP-SPR Navi™ (BioNavis, Finland) instrument enables optimization of various analytes (such as nucleotide, peptide, small molecules, antibody, or virus) targeting to different ligands (protein, nucleotide, peptide, receptor, membrane receptor, antibody, or cells). Recently MP-SPR Navi™ was used to characterize virus – peptide interaction for vaccine development [1] as well as to determine adsorption kinetics of gold nanoparticles (50nm) on the self-assembled surface. MP-SPR system allows drug interaction measurements also with biomembranes and uniquely provides conformation information to ensure reliable measurements [2]. Real time drug release kinetics from micrometers thick polymer film for controlled drug release applications was also determined [3].

Results and Discussion

Due to wide angular range measurement MP-SPR enables detection of large shifts in the resonance angle produced by virus or nanoparticle binding and provides precise information for drug delivery studies (FIG. 1). Wide angular range enables also drug release measurements from even micrometres thick polymer films (FIG. 2).

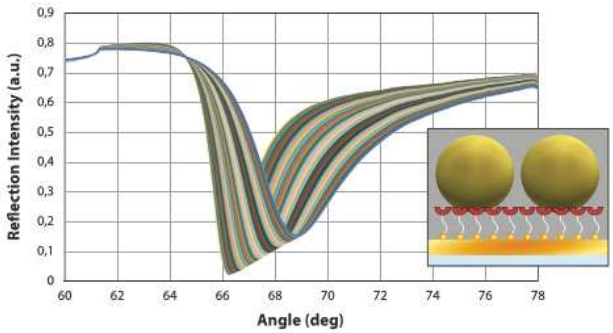

FIG. 1. Gold nanoparticles adsorption kinetic on a self-assembled surface.

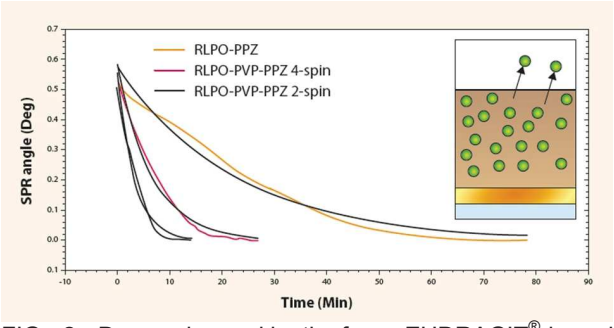

FIG. 2. Drug release kinetic from EUDRAGIT®-based polymer films.

Conclusions

MP-SPR is new *in vitro* characterization tool for biopharmaceuticals enabling development of enhanced targeted drug delivery systems.

Acknowledgments

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References

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