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Influence of the silver containing plasma polymer matrix design on the releasing profiles enabling both antibacterial and cytocompatible properties[1] ENRICO KÖRNER, DIRK HEGEMANN, Empa, ADVANCED FIBERS TEAM — Plasma generated coatings and films in the nano-scale are of high interest for various application fields, e.g. in the medical sector. New materials are investigated regarding their biomedical properties and potential in the field of biotechnology. Different strategies against bacterial colonization are already available but still it remains a major problem. The exact interplay between antibacterial effectiveness and cytocompatibility is a great issue. Silver (Ag) is an efficacious antibacterial agent. Small amounts of Ag (nano-scale) already show antibacterial properties. It is important to develop antibacterial products that contain an optimal amount of Ag avoiding (cytotoxic) overdoses. Functional hydrocarbon plasma polymer coatings with embedded Ag particles were deposited using an asymmetric RF plasma reactor at low pressure (10 Pa). The plasma polymer is produced with a reactive gas/monomer mixture of CO2/C2H4. Ar was added in order to sputter Ag atoms from the Ag cathode and form nanoparticles in the growing polymer matrix. The Ag content of the coatings was found to be adjustable by power input and gas ratio. The particle size can be controlled by CO2 addition and power input. An increasing Ag content of the coatings consequentially yields a higher Ag release over a timescale of 14 days showing antibacterial properties.

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