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Multistage vector delivery of Sulindac and Silymarin for prevention of colon cancer

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Familiar adenomatous polyposis (FAP) is a genetic condition secondary to germline mutations in the *APC* gene with a prevalence of one in 10,000 newborns. Patients with this disease will eventually develop colorectal cancer and other cancers of the digestive tract, which typically present themselves in the mid-teens. Prophylactic surgery of the colon is actually the only current standard of care, to avoid malignancy, as long-term exposure to chemo preventive agents such as sulindac (a non-steroidal anti-inflammatory drug) and silymarin (phytoestrogen), usually used to prevent polyps formation in this type of patients, is not feasible. Here, we have used a modified porous silicon-based multistage vector (MSV), rationally designed to deliver therapeutic agents to neoplastic tissue to delivery sulindac and silymarin. Furthermore, the surface of the MSV can be coated with antibodies and other targeting agents that bind to tumor vasculature or neoplastic cells. In this study, MSVs were loaded with poly (ethylene glycol)-block-poly(ε-caprolactone) (PEG-PCL) micelles encapsulating sulindac or silymarin. Preferential binding and internalization of these drugs into colon cancer cells was obtained using a targeting strategy against the protein meprin A, which is demonstrated and we confirmed in our work, is overexpressed in human colon cancer cells and in the small intestine of $Apc^{Min/+}$ mice. We propose that this delivery system could potentially be used to reduce drug-induced side effects in FAP patients, thus enabling long-term prevention of adenoma formation.

Biography

Maria Principia Scavo has completed her PhD from University of Bari, Italy and Postdoctoral studies from University of Bari and Methodist Research Institute. She is a Researcher Associate at Markey Cancer Center, University of Kentucky and she has published more than 17 papers in reputed journals.

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