Technology Opportunity, Ref. No. IS-14/0092

Minimally invasive targeted delivery of drugs / genes / biologicals

This novel electro-spray device allows for subtle localized and targeted delivery of bioactive compounds either through natural body openings or by minimally invasive surgery. It has been successfully shown that tumor volume in a mouse-model was substantially reduced upon treatment with known chemotherapeutics. In another, ex-vivo experiment, highly efficient gene transfection was achieved, which holds potential for drug delivery and gene therapy to solid organs.

Keywords Electrospray, targeted drug delivery, targeted gene delivery, endoscopic delivery

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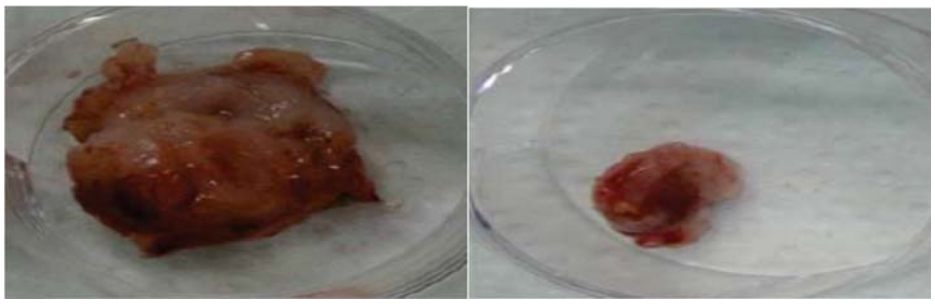
Reference in preparation

Background The targeted delivery of bioactive compounds locally to diseased organ and also at difficult to access regions of the human body is of great medical interest. Gene therapy approaches, currently hindered due to adverse effects associated with viral vectors, and chemotherapies, accompanied with severe side effects due to systemic administration, will greatly benefit from an efficient targeted in-situ delivery method. The inventive device has potential for cost-effective and less invasive therapy of various cancer types and to improve/prolong life in currently incurable diseases like pulmonary fibrosis.

Invention The single-port electrospray device for targeted, local treatment for intraluminal tumors or difficult to access regions can be applied using endoscopic or catheter application. With a tunable electric field, the device nebulizes and accelerates droplets containing the therapeutic agent in a controlled manner towards the target region. By choosing the optimal parameters, efficient and local penetration of otherwise poorly permeating chemical compounds or biologicals into living cells is achieved.



Lung tumors sub-cutaneously grown in mice.
Left: Untreated control, right: After two treatments with Cisplatin electrospray

Application Tumor targeting incl. intraluminal tumors, non-viral gene therapy to solid organs.

Patent Status Patent families EP2892595 and US2015251201 under prosecution

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