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## Cellular vectors to enhance the pulmonary delivery of chemotherapeutics

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In the last decades, great efforts have been dedicated to developing drug delivery systems that are able to accumulate at the pathological site and locally deliver their payload while sparing off-site organs. Oncological diseases, in particular, are the major targets of the scientific community as current treatments are affected by significant systemic toxicity (chemotherapy) and or biodegradation (biological therapeutics). Current technologies developed for systemic treatments can exert their therapeutic effects only if the cancer lesions are characterized by a targetable vasculature. On the other hand, cancer lesions can be very heterogenous in their blood supply (particularly during metastatic spreading) and, as a result, tumor vasculature can iniquitous or completely absent. This is the case of pulmonary metastases that can occur at different stages of tumor progression and are capable of spreading to many different locations of the organ. For this reason, we hypothesize that a delivery system conceived to target the whole lung could be more effective than carriers designed to target only the cancer lesion. Cellular Vectors (CELVEC) are immune cells isolated from the whole blood, overloaded with chemotherapy (Doxorubicin) and enabled of sustained release for several hours after drug loading. After intravenous injection, they showed 100% accumulation in the dense capillary network of the lungs and they reside in these organs for several hours before they are cleared and digested in liver and spleen. In comparison to free drug administration, they showed an increased concentration of the drug within the lung and enhanced therapeutic efficacy towards cancer lesions.

### Biography

Alessandro Parodi has completed his PhD at University of Genoa in Pharmacological and Cosmetic Sciences. His Post-doctoral study was initially performed at Advanced Biotechnology Center (Genoa) investigating tumor angiogenesis and the impact of carbon nanostructures on endothelium. He then moved to Houston Methodist Research Institute (HMRI-Houston) where he distinguished himself in the designing and the development of biomimetic carriers to target inflammatory disease. Currently he is an Instructor of the Department of Regenerative Medicine at the HMRI and author of more than 20 papers and 1 patent describing cellular vector technology for the treatment of pulmonary cancer lesions.

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