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In vivo controlled release of fenretinide from long-acting release depots for chemoprevention of oral squamous cell carcinoma recurrence

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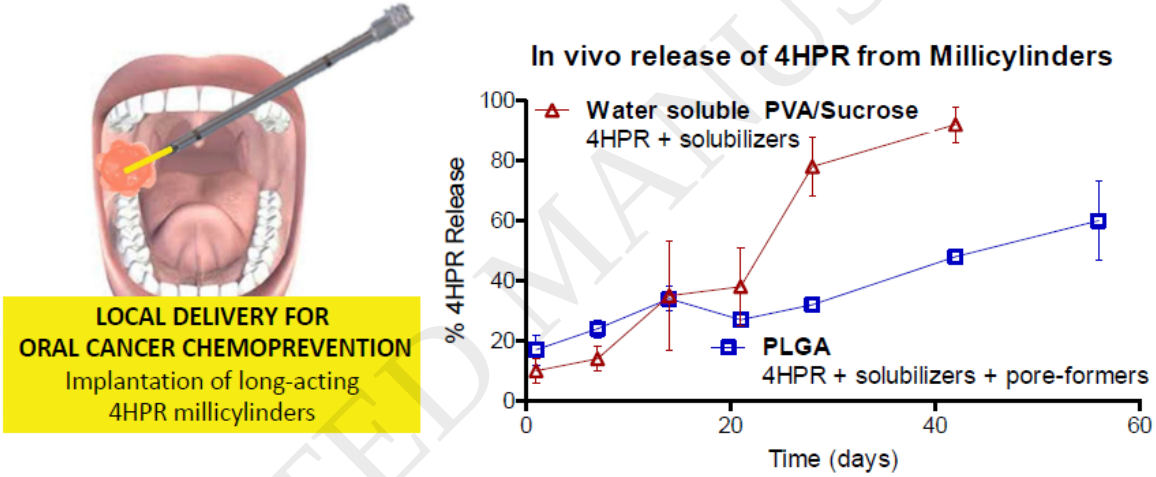
Graphical abstract



ABSTRACT

Local, long-acting release fenretinide (4HPR) millicylindrical implants were prepared and evaluated for their release kinetics *in vivo* and their ability to suppress oral cancer tumor explant growth. Poly(lactic-*co*-glycolic acid)(PLGA) implants were prepared as a function of drug loading and the presence of various excipients (pore-formers, solubilizers, crystallization inhibitors) to enhance release of the insoluble 4HPR. Release kinetics and bioerosion of PLGA were monitored both *in vitro* in a PBS/Tween 80 buffer and *in vivo* by recovery of the drug remaining at the injection site. 4HPR was released from PLGA implants much slower *in vivo* than in the drug solubilizing media *in vitro*, with a 3-week lag phase and continuous release of >2 months, but showed some release enhancement by addition of solubilizers. Water-soluble