Rita De Santis, J Biotechnol Biomater 2017, 7:1(Suppl)
http://dx.doi.org/10.4172/2155-952X.C1.069

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AvidinOX-targeted delivery: A new way to improve efficacy of well-known monoclonal antibodies for cancer therapy

We recently discovered that the oxidized version of hen egg white avidin, named AvidinOX, can chemically link to tissue proteins when injected or nebulized, thus becoming an artificial receptor for biotinylated therapeutics. This product is currently under investigation in phase I clinical trials for targeting intravenously administered ^{177}Lutetium-biotinDOTA to inoperable tumor lesions and liver metastases, pre-injected with AvidinOX (ClinicalTrials.gov NCT02053324). Several published and some non-published data from our group indicate that AvidinOX-targeted delivery of the biotinylated version of some marketed monoclonal antibodies turns non-effective doses of such antibodies effective for cancer treatment. Among the antibodies tested, AvidinOX-targeted delivery of biotinylated anti-EGFR cetuximab and panitumumab, and anti-*ErbB2/neu* trastuzumab and pertuzumab were particularly effective. Molecular mechanisms explaining the improved anti-tumor activity of AvidinOX-anchored biotinylated antibodies have been also described by our group. Overall, our data provide a scientific rational for further pre-clinical and clinical investigation of therapeutic approaches based on the local delivery of AvidinOX (i.e., intra-tumor, aerosol or intra-peritoneal delivery) followed by local or systemic delivery of low dose biotinylated antibodies. The expectation of our AvidinOX-targeted delivery platform is to reduce the cost of cancer treatments and improve tolerability by reaching anti-tumor efficacy with significantly less amount of expensive antibodies.

Biography

Rita De Santis has a degree in Biological Sciences and PhD in Experimental Medicine from Rome University and National Institutes of Health, USA, respectively. Since 1999, she directs the group of Biotech Products at Sigma Tau SpA, leading innovative products from bench to clinical trials. She is the author of 70 papers and 20 patents. Her work focuses on the development of the AvidinOX-based therapeutic platform for cancer therapy and looking for collaborations to fully exploit the potential of AvidinOX for targeted delivery of biotinylated drugs in additional therapeutic fields.

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