Activery Biotech is seeking to join a research proposal as a partner on the following theme:

HEALTH-2007-2.4.1-7: Improving targeted drug delivery to cancer cells for cancer therapeutics other than gene therapy (in coordination with NMP-2007-4.0-4 in Theme 4)

Theme: Bioavailability and permeability enhancement of antineoplastic drugs through supercritical fluid technology.

Objective: Activery envisages playing a significant role in the research, development and production of drug nanoparticles or the generation of stable amorphous drug/excipient powders in treatment of cancer. The use of stable nanoparticulate drugs crystalline or amorphous in their solid state could allow enhanced solubility and permeability of these usually poorly bioavailable drugs.

Competency: Activery (www.activery.com) is a leading company in the use and development of supercritical fluid technology for drug particle engineering. Development of nanoparticulate drugs or drug/polymer co-formulations by using a proprietary supercritical fluid precipitation process. Production of batches at laboratory and pilot scale for the use in animal trials.

Context: Cancer drugs frequently display very low aqueous solubility often coupled with low permeability leading to high drug doses to reach minimal plasma levels. This could lead to increased side effects and toxicity when undergoing therapy. It is therefore desirable that improved drug delivery vehicles for these drugs are found and utilized.
Currently, drug powders are milled with or without surfactants to achieve small drug particles. However, milling is highly undesirable for these potent drugs due to the generation of substantial amounts of undesired fines together with a fraction of large particles which have escaped the milling process. Alternatively, the powder is suspended in irritating or sensitizing vehicles, e.g. Cremophor.
Alternatively, the in-vitro and in-vivo solubility of many antineoplastic drugs could be enhanced using a supercritical fluid technique for particle size reduction or solid state alteration. Both steps can be performed simultaneously using our proprietary supercritical fluid technology without the drawbacks of current methodologies. Supercritical fluid produced pure drug nanoparticles or drug/excipient co-formulates are physically and chemically stable and the amorphous state provides the highest possible solubility.
It can be envisaged that supercritical fluid engineered particles would provide better drugs with improved solubility and permeability. Formulated into nano-medicines this would generate better drugs with effectively lower doses with reduced side effects during treatment through more precise targeting leading to significant patient benefits.

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