**Effective & Tolerated Cancer Treatment**

**Plant Derived Nanoparticle Complexes Containing Triterpene Glycosides or Triterpenes**

**BACKGROUND**
Breast cancer is the second most common type of cancer, worldwide. Efforts to develop effective prevention and treatment of this disease have fallen short of being fully effective, mostly because they employ toxic agents that cannot be targeted to the affected cells. A treatment that can surmount this obstacle and is effective and safe is thus of the highest priority.

**INVENTION**
This invention overcomes the toxicity problem with herbal compounds (the triterpene glycoside actein and related compounds) that work alone or in combination with chemopreventive and chemotherapy agents and overcomes the bioavailability problem by delivering the drug via nanoparticles comprising liposomes or exosomes from black cohosh.

**APPLICATIONS**
- Prevent and treat breast and other (prostate, colon, oral, skin, liver) cancers.
- Nanoparticle actein has added health benefits and can be used as an:
  - anti-inflammatory,
  - lipid lowerer,
  - anti-HIV and osteoprotective agent.

**ADVANTAGES**
Nanoparticle actein is a logical and promising cancer treatment candidate because:
- It targets the growth factors involved in tumorigenesis.
- Combination therapy with existing anti-cancer therapeutics will reduce the dose of the known drugs, resulting in fewer side effects.
- The body will maximize the use of a customized anti-cancer treatment that is delivered via nanoparticles directly to the affected cells.

**MARKET**
- Market Opportunities - $50-100 Billion
- Breast Cancer: Rising Revenues
  Pharma companies in 2010 had US sales over $12.7 billion from breast cancer treatments. But patents for their leading drugs will expire soon
- Other Cancers/Other Diseases
  Add other cancers (prostate, colon, skin, and oral cancers) and other diseases (HIV, lipid and inflammatory disorders), the market potentially exceeds $50-100 billion, worldwide.

**TEAM**

**Lehman College:**
- Dr. Linda Einbond, genetic and dietary factors in human cancer causation/chemoprevention
- Professor Stephen Redenti, nanoparticles/stem cells

**Columbia University Medical Center:**
- Professor David Figurski, characterization of cancer genes
- Dr. Rong Cheng, statistics and bioinformatics
- Professor Nancy Reame, clinical trials

**European Foundation for Oncology and Environmental Sciences “B. Ramazzini,” Bologna, Italy:**
- Dr. Morando Soffritti, M.D., Scientific Director, animal models of cancer

**Naturex**
- Marc Roller, Scientific Director, herbal medicines/phytochemistry.

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- Dr. Keith Bostian, Jon Saxe, Aaron Etra, Stanley Kohlenberg

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