



OFFICE OF RESEARCH AND TECHNOLOGY TRANSFER

TECHNOLOGY: COMPOUNDS PRODUCED BY PATENTED PLANT ROOT SYSTEM HAVING IMPROVED HEALTH BENEFITS, INCLUDING ANTIOXIDANT ACTIVITY, WITH APPLICATIONS FOR DRUG DISCOVERY, NUTRACEUTICALS, AND COSMECEUTICALS

The compounds are a novel set of resveratrol analogues that exhibit a variety of health benefits in standard tests indicating superior stability, bioavailability, and efficacy.

Key Features:

- **Efficacy:** early stage in vitro data indicates the following:
 - Superior metabolic stability and bioavailability
 - 30% higher antioxidant activity
 - Superior activity relevant to:
 - Neuro-protection
 - Anti-aging
 - Anti-cancer
 - Weight control
 - Addiction control
- **Quality:** Process results are reliable and repeatable at laboratory scale; purity = 90-95%.

Project Summary:

Arkansas State University (ASU) is seeking to commercialize a patented process for producing a diverse range of novel antioxidant compounds from plant hairy root cultures. This technology is differentiated in that it is a sustainable, plant based process having reproducible results, unlike results occurring in nature, while mimicking natural processes in that it produces high value combinations of compounds not replicable by current industrial means.

Resveratrol is well-known as a powerful antioxidant manifesting various health benefits. The ASU technology reliably produces a novel set of Resveratrol analogues, which includes **Arachidin-1**, **Arachidin-3**. Data from standard in vitro tests show that Arachidin-1 and Arachidin-3, as well as the bulk extract generated, have significantly higher bioavailability, antioxidant activity, and, thus, the potential for greater health benefits compared to other Resveratrol products currently on the market.

Potential Markets

Overview:

1. Cosmeceuticals

The U.S. cosmeceutical market was \$9.7 Billion in 2011 and expected to approach \$11.7 Billion in 2016. According to the latest market reports, antioxidants are a likely ingredient inclusion in cosmeceuticals and, thus, possess tremendous growth potential during the next 10 years.

2. Nutraceuticals

The U.S. nutraceutical market was \$50.4 Billion in 2010 (Frost & Sullivan

report) and expected to reach more than \$90 Billion by the end of 2015; dietary supplements will make up approximately \$33 Billion of the \$90 Billion. Demand for antioxidants continues to rise despite the tough spending decisions most people had to make during the financial crisis. According to Food Marketing Institute's 2011 "Shopping for Health" survey, antioxidants are among the top five health components that U.S. consumers want in their food products.

3. Drug discovery

According to reports the global market for drug discovery technology and products is projected to reach \$41.4 Billion in 2012 and \$79 Billion in 2017. Two target segments within this large market are high-throughput screening and bioanalytical instruments for drug discovery, which are projected to account for \$11.5 Billion and \$10 Billion respectively in 2012, and estimated to reach \$20 Billion and \$15 Billion respectively in 2017.

4. Research reagents

The global market for Biotechnology Reagents was valued at \$40.3 Billion in 2011 and forecast to reach \$59.3 Billion by the year 2016. The U.S. represents the largest market for biotechnology reagents.

5. Pharmaceuticals

The global pharmaceutical market is expected to grow at a rate of 6% during 2012-2017, exceeding sales worth \$ 1.1 Trillion by 2017. The U.S. is still the world's biggest market.

Additional applications for this technology are: anti-cancer drugs, neuro-degenerative disorders (Parkinson, Alzheimer), drug addiction control.

Development Status:	Laboratory scale production and product quality are proven and repeatable.
Patent Status:	Patented.
Commercialization Status:	License pending. Seeking funding/collaborations for process and yield characterization, process scale-up, and in vivo testing.