

Idaho Incubation Fund Program

Progress Report Form

Proposal No. IF14-009
Name: Guang Yan
Name of Institution: Idaho State University
Project Title: Cationic Prodrugs to Improve Topical Treatment of MSD
Reporting Period: July 1st 2013 to December 20th 2013

Information to be reported in your progress report is as follows (attach additional information as needed):

1. Summary of project accomplishments for the period just completed and plans for the coming reporting period:

Accomplishments:

- 1) We have synthesized and characterized a series of cationic prodrugs: ketoprofen choline ester, ketoprofen β -methylcholine ester, Ketoprofen α -methylcholine ester, Ketoprofen N,N-dimethylamino-1-propanol ester, ketoprofen trimethylammonium-1-propanol ester, diclofenac β -methylcholine ester. All the prodrugs have low protein binding and can be converted to parent drug in rat and human plasma.
- 2) We have conducted the in vivo rat studies with several of the cationic prodrugs. Several iontophoresis conditions were investigated including 0.7 mA for 6 hr, 0.7 mA for 2 hr, 0.7 mA for 2 hr than with no current for 4 hr, 0.1 mA for 6 hr. The prodrugs showed more penetration into the local tissues including skin, subcutaneous, and muscle tissues.
- 3) We have initiated the patent application process, a initial market analysis have been conducted, a draft of the provisional patent have written, a patent layer has been identified, and is in the process in filing the patent.

Plans for the coming reporting period:

- 1) Will file a provisional or even a full patent.
- 2) Will initiate the process of identifying commercial collaborator.
- 3) Will conduct additional in vivo study with rats.
- 4) Will conduct an in vivo rabbit study for drug penetration into joint tissue.

2. Summary of budget expenditures for the period just completed (include project burn rate):

As of December 9th, the total amount of expenditure is \$22,123, in which \$11,167 was spent on salary and wages, \$2,973 was spent on animal and animal care, \$1,914 on instrument, and \$6,069 was spent on chemicals, regents and lab supplies.

The burn rate is about \$4,200/month. With this burn rate, we are in the right pace with the money left to cover for the rest of the budget period.

3. Numbers of faculty and student participation resulting from the funding, including internships:

There are one faculty and one graduate student participated in this project.

4. List patents, copyrights, plant variety protection certificates received or pending:

We are in the process of filing a patent. A draft is written, is in process of working with a patent attorney in filing.

5. List technology licenses signed and start-up businesses created:

We have not reached that stage yet.

6. Status of private/industry partnerships (include enough information to judge level of engagement):

We have not reached that stage yet.

7. Any other pertinent information that will indicate to the council that the project is meeting satisfactory progress.

The project is meeting satisfactory progress. We have obtained very promising results. A patent filing is underway. After that, the process of identification of potential collaboration will be initiated.