

Idaho Incubation Fund Program

Bi-Annual Progress Report Form

Proposal No. 12683 IF13-001
Name: Patrick J Hrdlicka
Name of Institution: University of Idaho
Project Title: DEVELOPMENT OF DIAGNOSTIC KITS FOR GENDER DETERMINATION OF ANIMAL EMBRYOS

Information to be reported in your progress report is as follows:

1. Provide a summary of project goals/milestones for the period just completed, accomplishments for the period just completed, and plans and goals for the coming quarter: The project is proceeding successfully and according to schedule. Approximately ~5 Cy3-labeled *Invaders* have been designed, synthesized and evaluated against the gender-specific gene, which will form the basis of the diagnostic kit. The five synthesized *Invaders* were based on lead compounds emerging from the first six months, and contained additional destabilizing units (so-called de-stabilizers), which are expected to result in stronger and more specific target binding. The plan for the remainder of the project is to attach the most promising *Invaders* to nanomaterials, a process which will further enhance detection and the performance of the diagnostic kit. A very interesting side-project that has emerged as a direct consequence of our efforts toward developing diagnostic kits for gender determination of animal embryos, is the discovery that our *Invader* technology can be used for production of gender-sorted sperm for applications in the animal reproduction industry. In fact, we have submitted a separate HERC proposal concerning this particular application back in early May 2013.
2. Provide a summary of budget expenditures for the period: Funds have been used toward (amounts are through May 10 2013): a) salary (~\$15,000), fringe (~\$800) and tuition (~\$7,150) for a graduate research assistant, b) operating expenses (~\$11,500) covering reagents, solvents, and supplies for machine-assisted synthesis of *Invader* oligonucleotides; columns, solvents and consumables for HPLC purification of *Invaders*; and instrumentation time, and c) capital outlay <5K (~\$2,400), i.e., small pieces of instrumentation that were necessary for the project.
3. List patents, copyrights, plant variety protection certificates received or pending: No new patents have been filed in the present period. We have previously filed the PCT entitled "Embodiments of a probe and method for targeting nucleic acids",

PCT/US2012/047442, back on July 19, 2012.

4. List invention disclosures, patent, copyright and PVP applications filed, technology licenses/options signed, start-up businesses created, and industry involvement: The evaluation of the ~5 Cy3-labeled Invaders mentioned under “1”, is conducted in collaboration with our industry partner, Minitube of America (Verona, WI). The PI visited Minitube in April 2013 to assess project progress and to discuss future strategies.

5. Include funding burn rate: Amounts given are through May 10 2013. Approximately ~67% of the allocated funds have been spent, which is on par with expectations (~project is 83% complete). Funds for PI summer salary have not been utilized yet. This, together with regular expenses covering research assistant salary/fees/tuition and operating expenses, ensures that we will spend funds in a balanced and timely manner.

6. Any other pertinent information: A manuscript entitled “Invaders: Recognition of Double-Stranded DNA using Duplexes Modified with Interstrand Zippers of 2'-O-(Pyren-1-yl)methylribonucleotides” describing the preliminary results from the Hrdlicka-Minitube collaboration has been submitted to a high-impact international journal. A copy of the manuscript can be obtained upon request.