Detailed Project Description (Word or PDF Format)
Not to exceed 10 pages. Project description should include
(1) an introduction/background that describes the problem or need being addressed and relevant precedents;
- LH is the basis of the bio lab
- Industry standard machines cost $60,000
- All the software is locked down (ask John S.)
- Open source designs would allow the individual labs to tweak the design to facilitate additional through put
- labs interested in custom functionality could pay up for the designs and inegration ... then we can distrubute the new hardware
- Automation in this manner is a step in the direction of: "http://marciovm.com/i-want-a-github-of-science/index.html"

(2)specific aims for the project;
- Open source the designs
- Create massive liquid handling capability in comparison to any additional throughputs
- Work to be specifically centered around regenrative medicines
- Create an API / UI based around a local server (thus cutting any Operating System dependency)
- API would allow for liquid handling to be run remotely by simply connecting to a website
- FURTHER this would allow for any downtime on the lab to be utilized as available machine time

(3)strategy and methodology to be applied;
- Ruby on rails server
- One individual is capable of completeing this beginning to end ... however I'd love assistance from an Electrical Engineer.
- Contact local Biotechs and work towards dialing in their specific needs.
- Featured in industry blogs (Already mentioned on Derek Lowe's blog)

(4)outcomes and potential impact of the work;
- Liquid handling could be run remotely
- Hugely disruptive to the established existing Liquid handling structure
- Acts as the basic platform for all other lab processes to be connected and automated
- removing scientists from the hands on work (and thus removing all the associated reproduceability issues associated with current hand written scientific protocols ... copy the code once ... and run it

(5)timeline and intermediate milestones for the project. Please include references to relevant literature and also provide any unpublished data that you have gathered in support of your project.

- Dialing in of the 5uL accuracy of the peristaltic pump
- Creating assembly instructions for the machine
- Creating the UI and backend server to run the system
- Creation of the API allowing for even greater parallelization of the liquid handling process.
- The possibility of treating the lab like a computer tower. Where the only need for a human to be involved in the process is when maintenance is needed.