Design Criteria (weight)	*Separation*						*Detection*					
	Cell Deformation		Magnetic Searation		Electric Separation		Antibody		PS Beads		GNPs	
Sensitivity (25)												
Equipment Free/Usable in Field/Intuitive (20)												
Userfriendly (20)												
Time (10)												
Cost (10)												
Ease of Fabrication (10)												
Versatility (type of Malaria or other diseases) (5)												
Total												

Category Descriptions:

Sensitivity/Specificity > 95% (25%):

Separation: The device should effectively separate 80% of infected RBCs into separate channels and should allow minimal passage of any uninfected RBCs into these channels.

Detection: The detection method should be 95% effective in labeling the concentrated portals of infected RBCs. It would ideally detect all strains of malaria.

Equipment Free / Portable / Ease of Detection (20%):

Separation: The method of separation should be able to be transported long distances and be provided in a device smaller than a personal computer. Preference would be for the device to not need power.

Detection: The detection method should be able to use the naked eye or a cheap and easy to use device in order to obtain an accurate reading of the state of the disease.

User Friendly (20%):

Separation: A small amount of sample and easy to handle reagents are necessary in the resource limited regions where this device would be implemented. Collection of sample should be safe for both the patient and the technician. Also should not require extensive training to be able to run many tests.

Detection: The form of detection should be able to be monitored on site by a modestly trained technician, without the use of high tech laboratory equipment. A simple protocol for the type of detection would be provided.

Ease of Fabrication (10%):

Due to resource restrictions in Jimma at Jimma University, as well as the developing world in general, the microfluidic device protocol for fabrication should be relatively straightforward and not require high tech resources to produce. The design also needs to be able to be mass produced in order to be an effective POC diagnostic device.

Cost (10%):

The projected cost per device once the production is optimized should be less than $5.

Time < 1 Hour (10%):

Separation: The amount of time it will take to run the blood sample through the concentration device should be less than 20 minutes.

Detection: The total time it would take for a patient to be diagnosed needs to be less than one hour.

Versatility (5%):

Separation: The ability for the concentration device to separate infected RBCs, specifically the malaria parasite, from healthy RBCs. It would be prefered for the device to be able to separate different strains of malaria or different diseases, but we will focus on the Plasmodium falciparum parasite which is specific to malaria.

Detection: The ability to detect different strains of malaria parasites or different diseases with minor alterations to our final design would be useful. Patients presenting with mixed symptoms would be able to use the same device to test for multiple diseases.