Development of an automated sampling unit for morbidostat systems

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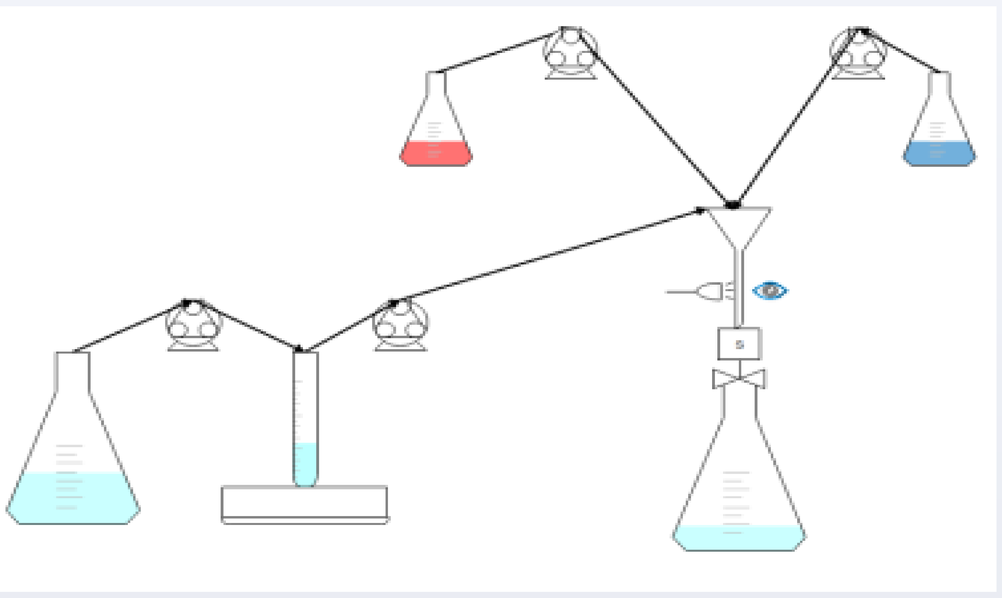
ABSTRACT

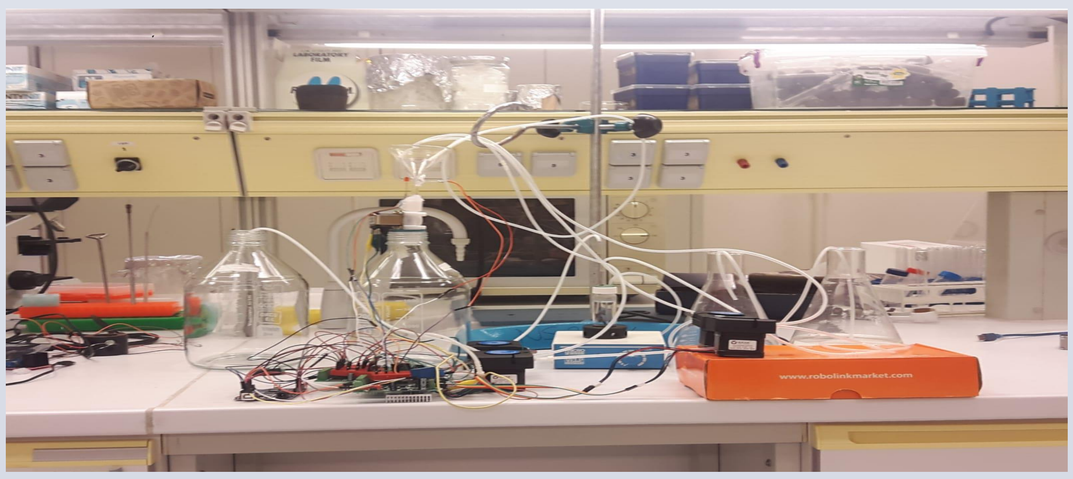


After learning the possible problems about sampling in an experimental evolution system, we decided to focus on improving the sampling method. For this we implemented a new automated sampling system. This system includes two tubes containing acid and base, two peristaltic pumps, and a solenoid valve. Instead of sampling within the chemostat tube, the new system takes samples from the pipe that goes to waste by blocking the pipe using solenoid valve. In order to prevent the previous system's problems, the sampling pipe is regularly cleaned using acid and base.

OBJECTIVES

- **Designing a new and more efficient system for experimental evolution**
- **Making the sampling more reliable and making it in less need of inspection by experimenter**

ELECTRONIC



Arduino
Arduino is a microcontroller device which controls the system according to software that is implemented

Relay
Relay is the swith for the solenoid valve.Relay operates the voltage to control solenoid valve.

Solenoid Valve
Solenoid valve is an electromechanical controled valve.Whenever relay permits the eletricity to activate solenoid, valve will open.

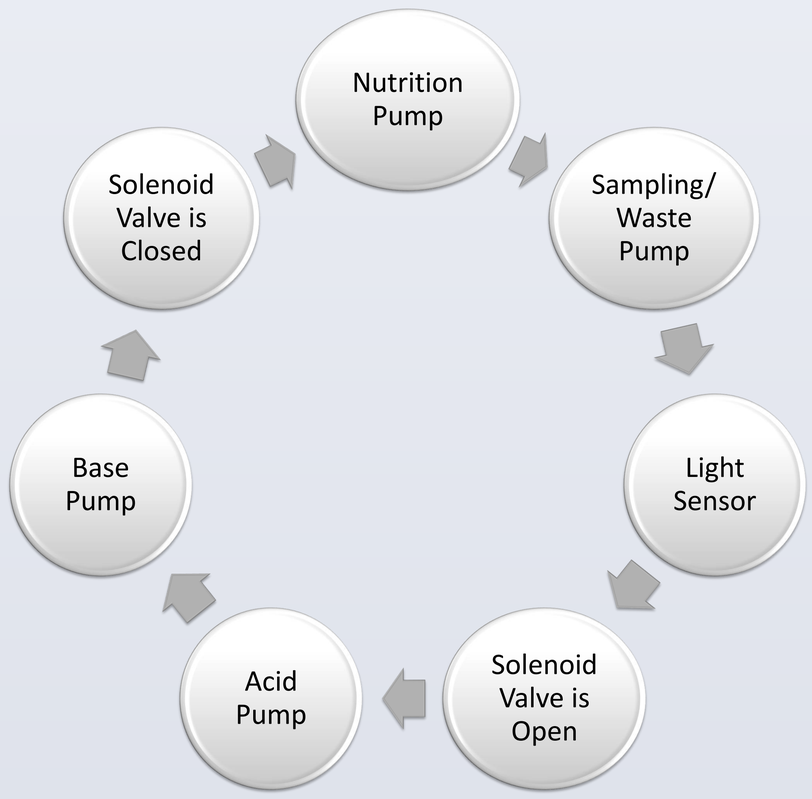
Motor Driver
Motor driver is used for the operate peristaltic pumps. According to pin on the motor driver the amount of the voltage connected to peristaltic pump is determined.

Peristaltic Pump
A peristaltic pump is a type of positive displacement pump used for pumping a variety of fluids. As the rotor turns, the part of the tube under compression is pinched closed thus forcing the fluid to be pumped to move through the tube

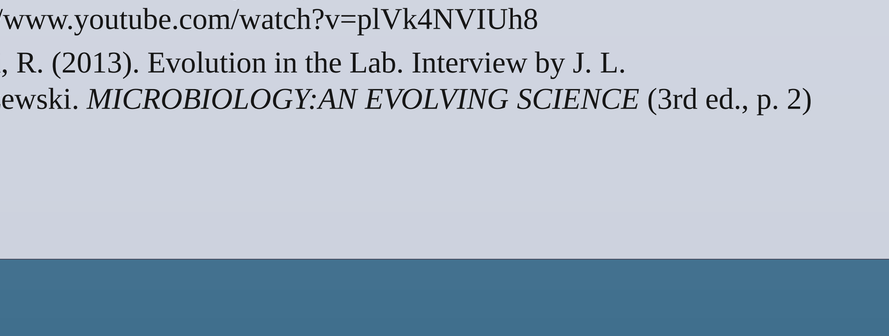
SOFTWARE

```
while (DistanceOne != 360)//besin
{

digitalWrite(12, HIGH);

delayMicroseconds(10000);

digitalWrite(12, LOW);

delayMicroseconds(10000);

DistanceOne = DistanceOne + 1;
}

digitalWrite(12, LOW);

DistanceOne = 0;
```

```
int ldrstatus=analogRead(ldrPin);//control
   Serial.println(ldrstatus);

delay(500);


 delay(500);
while(valvecount!=360) {
 digitalWrite(7,HIGH);
 valvccount=valvccount+1;
}
digitalWrite(7,LOW);
```



CONLUSION



References

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Lenski, R. (2013). Evolution in the Lab. Interview by J. L. Slonczewski. *MICROBIOLOGY:AN EVOLVING SCIENCE* (3rd ed., p. 2)