

>> Izzy: Hi Dude!

What are you up to?

>> Dude: I'm picking a promoter to use to in Buddy.

I need a promoter that is always on that will make Buddy be red.

>> Izzy: So why are you poking at the computer screen?

>> Dude: Well how else do I pick one?

I don't know which one to use so I figured I'd leave it to chance to decide.

>> Izzy: Well why don't you use some of the promoter characterization data available on the Registry of Standard Biological Parts to decide?

>> Dude: What is promoter measurement data?

>> Sally: Hi Dude.

Hi Izzy. Sounds like you two are having an interesting conversation.

>> Izzy: Yeah.

I was just about to tell Dude how to use promoter measurement data to pick the right promoter for Buddy.

>> Sally: Well before you get into those details it might be worth chatting a bit about measurement in general.

Why synthetic biologists measure part function?

What measurements they make and how they do the measurements before getting into the details of the data itself?

>> Izzy: That's true!

>> Sally: Why don't we take a walk?

Get some fresh air while we talk.

Measurement is a key aspect of science and engineering.

It lets you quantify the function of a part or component and compare its function to that of others.

Unfortunately in synthetic biology, we're still figuring out what are the most useful measurements to make for genetic parts and devices.

>> Dude: What do you mean?

Why don't we just measure everything for every part?

>> Sally: Well that can pretty quickly lead both to a lot of wasted time in making measurements that don't matter as well as an overwhelming amount of information.

Ideally, we'd like to be able to only measure those characteristics of a part that you need to know in order to decide whether the part will work in your system of interest.

>> Izzy: For example, when I bought a computer recently, I cared about how big the hard drive was and how much memory it had, because those were two performance metrics that I could use to figure out whether the computer would be sufficient for my needs.

>> Dude: Well in the case of Buddy, I just need to know which promoter to use that will make him red.

>> Izzy: But how red do you want Buddy to be?

Should Buddy be pink, red, or dark red?

To make decisions like that, you might need to know a bit more about how strong the promoter is.

>> Sally: Exactly.

Another measurement you might care about is how long the part works before it breaks.

Genetic parts can "break" as Buddy grows and divides.

For example, mutations or deletions can happen that interfere with part function.

So depending on how long you expect Buddy to stick around, you might choose promoters that are more or less genetically stable.

>> Dude: Whoa!

I had no idea that measuring part function could be so complicated!

Well I think I am going to find myself a strong promoter from the registry.

I've decided that I want Buddy to be very dark red!

>> Sally & Izzy: Have fun!

>> Sally & Izzy: Jinx!