Sally: This is Systems Sally.

Dude: Hey Sally.

It's Dude.

Sally: Dude, are you OK?

You sound out of breath.

Dude: Well I started growing some bacterial cells with Izzy last night, and today I had to get to practice but coach kept us late and now I'm worried that the cells.

Sally: Dude?

You still there?

The cells what?

Dude Well I guess I don't really know.

Izzy said dog phase but that seems wrong.

Sally: Izzy probably said log phase which is when the cells are actively growing and dividing.

If you have some bacteria growing, I'm happy to put the cultures on ice.

That will slow down their growth, and you can measure their density when you get here.

Dude: Thanks Sally!

Last night we put two flasks at room temperature and two in the 37 degrees incubator.

I'll be there as fast as I can.

Izzy: Hi Sally.

Have you seen Dude?

Sally: He just called to say he's on his way.

I'm putting these cultures on ice, but look: the ones that were at room temperature don't seem to have grown

much.

Izzy: I was a little afraid of that.

They carry a high-copy protein generator that Dude and I made, but the growth of the cells takes a real hit when they carry this plasmid.

We've seen them spend 12 hours in lag phase and then take two days to reach stationary phase.

Without the plasmid, it's more like 4 hours to go from lag to log and they're saturated overnight.

Sally: When did you start these growing?

Izzy: About 8:00 last night we diluted the strain 1:1000.

And I don't think these have grown much since then, but I'll measure their density anyway.

Sally: The cells that were growing at 37 degrees look a little more dense.

Maybe they're doubling at an almost normal rate.

Izzy: Yup.

Their density has definitely changed since yesterday and if Dude gets here fast, we might be able to catch them in log phase and transform in a control device.

Sally: You might also want to count the cells since some of the light scattering you're measuring at the spectrophotometer could be coming from cell debris.

Izzy: I hadn't thought about that, but you're right.

I'll teach Dude to count cells when he gets here Sally: One other thing that I've seen happen is for the cells to lose a plasmid if it's making them sick.

You and Dude might want to check that the cells are still resistant to whatever antibiotic marker you have on the plasmid.

Dude: Hi Sally!

Hi Izzy! Sorry to be late.

I hope you've left me some things to do.

Izzy: In lab there's always plenty to do.

Let's get started figuring out what's going on Dude: Getting here, I saw the most amazing pack of dogs getting walked over the bridge.