

JOANNE STUBBE: The way we teach the course is we show them that all of these chemical transformations can be described by 10 pretty simple steps. And if you understand the basic chemistry of these simple steps, you can really understand almost all of the kinds of interconversions you see and basic metabolism.

And what you'll see is while this looks overwhelming, really, with a few central pathways, which is what we focus on in this course-- glycolysis, fatty acid oxidation, biosynthesis, sugar biosynthesis as well as degradation, the Krebs cycle, which feeds into the respiratory chain-- knowing those central reactions-- almost everything in metabolism feeds in and out of these pathways. And so then, it really is a question of what is the environment like and how do you enhance breakdown of sugar under the appropriate environment versus synthesize sugar under a different environment.

So then it's a question of regulation. So what you're going to learn in this course is really focused on central metabolism. And it doesn't matter whether you study a bacteria or a human, the central metabolism is pretty much the same. The thing that's different is the detailed regulation and the complexity of the regulation.

And we don't really talk that much about regulation in 5.07. What we do is introduce you to five or six basic regulatory mechanisms that are used over and over again. But then, regulation is really distinct, even between organisms. And so then that becomes much more complicated. And when you go off and become a biochemist, you've got to study your own system and figure out what the environment is.