WEBVTT

00:00:05.046 --> 00:00:06.756 - The nucleus is really

00:00:06.756 --> 00:00:09.801 the command center of all the cells in our body.

00:00:10.301 --> 00:00:12.971 It houses and ultimately protects

00:00:12.971 --> 00:00:15.974 the genetic code of all our cells

00:00:16.182 --> 00:00:18.768 and so that protection is actually afforded

00:00:18.768 --> 00:00:23.857 by this really unique membrane system that we call the nuclear envelope.

00:00:24.357 --> 00:00:27.902 - Because the nucleus is such an integrator of signals,

00:00:28.236 --> 00:00:31.114 we really need to think about how is that integration

00:00:31.114 --> 00:00:34.284 happening to maintain health and how is it altered in disease?

00:00:39.330 --> 00:00:41.791 I think for us, we're particularly interested

00:00:41.791 --> 00:00:45.837 in the relationship between the integrity of the nucleus

00:00:45.837 --> 00:00:48.256 and the integrity of the genome itself,

00:00:48.256 --> 00:00:50.717 and thinking about this crosstalk between

00:00:51.051 --> 00:00:56.139 how cells are actually surveilling, whether the nucleus is functioning well

00:00:56.556 --> 00:01:00.226 and how that ultimately can impinge on the genome.

00:01:01.394 --> 00:01:05.982 - We're a fundamental biology lab, so we're very interested in understanding

00:01:05.982 --> 00:01:08.985 what we would call fundamental molecular mechanisms

00:01:09.069 --> 00:01:12.072 that control how the nucleus works

00:01:12.197 --> 00:01:17.285 and I think once we're armed with this knowledge, we're in a very strong position

00:01:17.285 --> 00:01:21.289 to be able to understand what happens in different disease states.

00:01:24.334 --> 00:01:27.879 - So really take a very interdisciplinary approach.

00:01:28.004 --> 00:01:31.758 It's one of the things we really love about being at Yale

00:01:31.758 --> 00:01:34.219 and embedded in the Yale School of Medicine.

00:01:34.219 --> 00:01:39.265 So, within our own laboratory, we have collaborations with physicists

00:01:39.265 --> 00:01:41.392 who are in the faculty of Arts and Sciences and Yale,

00:01:41.684 --> 00:01:45.146 and our work with them really helps us model the genome,

00:01:45.146 --> 00:01:49.692 thinking about actually the genome and its mechanical contributions to the nucleus,

00:01:49.692 --> 00:01:52.695 thinking about how the nucleus responds to force.

00:01:54.114 --> 00:01:57.075 - We're quite flexible in the way we approach sites.

00:01:57.075 --> 00:02:04.290 We ask questions and we use the experimental model systems and the experimental techniques

00:02:04.290 --> 00:02:08.169 that are most suited or best suited to answer those questions.

00:02:12.757 --> 00:02:14.384 So I think one of the most

00:02:14.384 --> 00:02:17.512 exciting things about doing fundamental biology

00:02:18.054 --> 00:02:22.308 is that we often don't know where it's going to lead.

00:02:22.725 --> 00:02:23.601 We have no idea.

00:02:23.601 --> 00:02:27.355 And I think this is, to me, one of the most exciting elements

00:02:27.355 --> 00:02:32.402 of the science that we do because it enables really unanticipated discovery.

00:02:33.945 --> 00:02:37.365 - Really be as basic scientists, someone who sits in the middle

00:02:37.657 --> 00:02:42.036 of really fundamental concepts that we really lean on

00:02:42.036 --> 00:02:46.082 many of our other disciplines and kind of the physical, chemical

00:02:46.082 --> 00:02:47.542 and basic sciences.

00:02:47.542 --> 00:02:51.462 But really motivated by observations that come from clinical medicine

00:02:51.462 --> 00:02:53.173 and where there are open questions,

00:02:53.173 --> 00:02:58.636 where really at the basic scientists are essential, to really make progress ultimately

00:02:58.636 --> 00:03:00.013 and connecting these two worlds

00:03:00.013 --> 00:03:03.016 that might seem really far apart, but actually we can see

00:03:03.099 --> 00:03:07.937 are both really, in many ways interested in some of the same fundamental questions.