WEBVTT

00:00:05.255 --> 00:00:07.882 Many RNAs inside ourselves,

00:00:07.882 --> 00:00:11.094 now we recognize as functioning in a non-coding way.

00:00:11.177 --> 00:00:12.887 The meaning of non-coding means

00:00:12.887 --> 00:00:15.390 they are not for producing proteins,

00:00:15.390 --> 00:00:16.516 but they're doing something else,

00:00:16.558 --> 00:00:19.602 and so we're starting to study what these RNA molecules

00:00:19.602 --> 00:00:22.605 are doing inside the cells and also inside the bodies.

00:00:26.860 --> 00:00:29.195 My lab has two major angles of study.

00:00:29.195 --> 00:00:33.908 One angle study is to study non-coding RNAs in the blood cell system

00:00:33.908 --> 00:00:36.578 And there's a particular type of non-coding RNA we're studying currently,

00:00:36.578 --> 00:00:39.039 it's the so-called glycosidic RNA.

00:00:39.080 --> 00:00:42.125 But it basically means the RNA is sugar coated.

00:00:42.375 --> 00:00:45.295 So it basically has a sugar modification on the RNA molecules,

00:00:45.295 --> 00:00:49.174 and these modification enables RNA molecules

00:00:49.174 --> 00:00:51.676 to do things that normal RNA molecules cannot do.

00:00:51.718 --> 00:00:54.471 So that's one aspect of it that's very interesting.

00:00:54.471 --> 00:01:00.477 The second aspect of it is almost all RNA inside our body are housed inside the cell.

00:01:00.477 --> 00:01:04.481 But these RNAs actually appear many times on cell surface

00:01:04.481 --> 00:01:06.316 on the outside cell surface of cells,

00:01:06.316 --> 00:01:09.444 which is again a very unusual place where they're supposed to be.

00:01:09.486 --> 00:01:13.740 So my lab was the first one to show a major function for this group of RNA.

00:01:13.782 --> 00:01:15.909 They actually control blood cells,

00:01:15.909 --> 00:01:19.704 how blood cells migrate inside the body in a significant way

00:01:19.704 --> 00:01:24.626 and now we are really studying their relationship in disease settings,

00:01:24.626 --> 00:01:28.171 how they controlling disease and how can we can potentially use them

00:01:28.171 --> 00:01:31.508 as a therapeutic target or be used somehow

00:01:31.549 --> 00:01:33.593 towards a therapy for human disease.

00:01:34.552 --> 00:01:38.431 The second area we're studying is what kind of information

00:01:38.431 --> 00:01:42.435 we can extract from the morphology aspect of tissues or cells.

00:01:42.435 --> 00:01:45.980 What is the shape of this cell telling us about,

00:01:46.314 --> 00:01:49.609 you know, this particular sample or this particular condition?

00:01:49.609 --> 00:01:52.779 We studied neutrophils and looking at the shape of the cells

00:01:52.862 --> 00:01:56.407 versus what they can potentially tell us in terms of what they're doing,

00:01:56.407 --> 00:02:00.745 and it's amazing that, you know, there are quite some diseases.

00:02:00.745 --> 00:02:04.666 We know that these cells look different from other normal conditions.

00:02:04.666 --> 00:02:08.336 Yet we have very little clue what those shapes are actually telling us

00:02:08.378 --> 00:02:13.800 and now our research is actually starting to uncover this link between

00:02:14.175 --> 00:02:17.971 these abnormal cell shapes versus what they are potentially doing to the body.

00:02:21.683 --> 00:02:23.560 What my lab does is we

00:02:23.560 --> 00:02:28.648 try to use the best technology to address specific questions we have in mind,

00:02:28.648 --> 00:02:32.443 and in some cases, we have to develop our own technologies.

00:02:32.485 --> 00:02:35.905 One example is when we are studying the sugar coated RNA

00:02:35.905 --> 00:02:39.534 because it's a new field, the methodologies are quite limiting.

00:02:39.534 --> 00:02:42.328 So to do anything that's going to be interesting,

00:02:42.328 --> 00:02:46.082 we, many times, had to invent new techniques to do those things,

00:02:46.082 --> 00:02:51.171 and that's something also, my lab is actually working on to develop those techniques.

00:02:55.008 --> 00:02:57.385 For the sugar coated RNA, for example,

00:02:57.385 --> 00:03:02.348 one thing we're looking at is how these RNAs are dysregulated in disease settings,

00:03:02.348 --> 00:03:06.186 especially in other autoimmune diseases,

00:03:06.186 --> 00:03:09.272 because many of these cells we're studying is immune cells.

00:03:09.314 --> 00:03:12.066 We also looking at the cancer relationship as well.

00:03:12.066 --> 00:03:15.195 In that sense, the second aspect is to look at

00:03:15.195 --> 00:03:19.532 whether they can be used as a way, as a target for therapies.

00:03:19.657 --> 00:03:21.993 So we're developing new ways to perturb them,

00:03:21.993 --> 00:03:26.289 or new ways to get rid of them or enhance them.

00:03:26.289 --> 00:03:32.378 In those ways, we're trying to develop new strategies for disease treatments.