WEBVTT

00:00:05.296 --> 00:00:08.174 Neutrophil is a type of a innate immune cell.

00:00:08.174 --> 00:00:10.385 They have three main features.

00:00:10.385 --> 00:00:12.429 One is that they're very abundant.

00:00:12.429 --> 00:00:14.931 So they're the most abundant in human blood,

00:00:14.931 --> 00:00:17.225 in the bone marrow, that's the most abundant of the immune cells.

00:00:17.225 --> 00:00:19.728 The second feature is they like to kill.

00:00:19.728 --> 00:00:24.107 So they, when they get activated, they eat and kill microbes,

00:00:24.149 --> 00:00:27.694 and the third property is that they live for a very short time.

00:00:27.694 --> 00:00:30.697 So they've being produced all the time.

00:00:34.701 --> 00:00:37.162 We study the innate immune system broadly,

00:00:37.162 --> 00:00:39.122 especially two types of cells.

00:00:39.164 --> 00:00:42.751 One is neutrophils and the other one are macrophages,

00:00:42.751 --> 00:00:46.171 which is another major component of innate immune system,

00:00:46.171 --> 00:00:49.174 and there's the realization that the immune system

00:00:49.174 --> 00:00:53.053 protects in a very broad sense of the term.

00:00:53.053 --> 00:00:55.346 So they protect not only by killing microbes

00:00:55.346 --> 00:00:57.307 but also by reinforcing barriers,

00:00:57.307 --> 00:01:01.561 by helping thermo regulate better when the specific challenges in temperature.

00:01:01.561 --> 00:01:03.980 So what we study is all these adaptations,

00:01:03.980 --> 00:01:07.567 the idea that they're there to make the body function better.

00:01:08.610 --> 00:01:13.448 And this brings things that are interesting, for example, with with aging.

00:01:13.448 --> 00:01:16.910 So if we don't have innate in the system, the body still works,

00:01:16.910 --> 00:01:19.579 the heart contracts, the lungs breathe,

00:01:19.579 --> 00:01:22.165 but they do that a little bit worse

00:01:22.165 --> 00:01:25.335 and when that accumulates over time, it can lead to the effects

00:01:25.668 --> 00:01:28.880 with what we know are chronic disease or aging.

00:01:29.005 --> 00:01:33.927 So there's a lot of ideas of of how the innate immune system optimizes these functions

00:01:33.927 --> 00:01:35.345 and that's what we're interested in.

00:01:35.345 --> 00:01:37.305 What do they do to to preserve that.

00:01:40.725 --> 00:01:41.976 We use a lot of imaging.

00:01:41.976 --> 00:01:44.979 So we look directly using microscopy.

00:01:45.313 --> 00:01:46.981 There are other ways of seeing molecules.

00:01:46.981 --> 00:01:48.691 We use a lot of flow cytometry.

00:01:48.691 --> 00:01:51.778 It's a way in which we can see proteins in the cells.

00:01:52.445 --> 00:01:56.324 We use a lot of transcriptomics single cell wall transcriptomics

00:01:56.324 --> 00:01:59.327 because they give us access to the inside of the nucleus

00:01:59.410 --> 00:02:04.124 and all these genes that are transcribed so we can get more and more resolution

00:02:04.124 --> 00:02:07.710 and generally we use this in the context of all the systems

00:02:07.710 --> 00:02:13.383 that we use, specific perturbations, aging, tumors, all those things

00:02:13.383 --> 00:02:16.386 that allow us to see how the cells respond

00:02:16.553 --> 00:02:18.096 to specific challenges.

00:02:22.100 --> 00:02:26.729 Eventually the purpose is to get into, you know, learning why we age,

00:02:26.729 --> 00:02:30.233 why the lung or the heart start function worse

00:02:30.233 --> 00:02:32.861 when the study sees or just over time.

00:02:32.861 --> 00:02:36.197 So can we use this massive army of cells?

00:02:36.239 --> 00:02:40.410 We're talking about billions of cells every day circulating and dying.

00:02:40.451 --> 00:02:44.831 So can we use this massive army inside our bodies to

00:02:45.123 --> 00:02:49.586 to improve how the body works, to improve the quality of the health of tissues,

00:02:49.627 --> 00:02:52.672 not only to prevent aging, but, for example, in the case

00:02:52.672 --> 00:02:56.426 when there's a disease and they tell, you know,

00:02:56.467 --> 00:02:59.429 the reason for this disease is not very well known.

00:02:59.429 --> 00:03:03.183 Can we use this to learn what is going on?

00:03:03.308 --> 00:03:07.187 So, diagnosis, prevention and treatment.