

40 The Food Fight Podcast - Spotlight: Eagle Genomics on data science

Lukxmi Balathasan [00:00:06] Welcome to this bonus episode of The Food Fight podcast from EIT Food.

Matt Eastland [00:00:10] In these episodes, we want to shine a light on new projects and agrifood startups and hear about their efforts to fight for a better food future. This week, we're handing over to Anthony Finbow to tell us about Eagle Genomics, a Start-Up using data technology and science to further understand the health and environmental impact of microbiomes.

Anthony Finbow [00:00:39] Hello, my name's Anthony Finbow, I'm chief executive at Eagle Genomics. We're part of the EIT Food Rising Food Stars programme, and I'm fighting for the future of food because we've expunged biodiversity from our approaches to grow the food we need to subsist as a species on the planet. And unless we reverse that and reintroduce biodiversity into the approach that we take to grow our foods, our future is at stake.

[00:01:11] Well, Eagle Genomics is innovating at the intersection of biology and data science. We are effectively a software company. We have a product called the e[datascientist], which is addressing what McKinsey Co. call the digital reinvention of Life Sciences R&D. What does that mean? Over recent years, we have started to explore biology at a nanoscale and beyond in fact, with the advent of genomics technologies, we're able to understand the fundamental software programming mechanisms of life on Earth. We are focussing more and more on broadening our understanding of life on Earth through understanding the genomics of microorganisms, so-called microbiome. We're looking at gene-editing technologies like CRISPR and we're now looking at quantum biological approaches to really understand the fundamentals of life. So we are focussing on building that software environment, that intuitive software environment that enables scientists to explore these massive scale datasets and to generate insights from them and then to describe the experiments they're doing dry or data orientated experiments and trace them through our platform, create sort of traceable, repeatable scientific experiments in data.

[00:02:32] We're making that platform, the e[datascientist] available to large distributed R&D teams in some of the major food producing companies in the world who are, in fact, trying to address some of these grand challenges, how do we implement more sustainable agriculture practises? How do we look at the microbiome of animals that we're producing and ensure that we're feeding them things that are not making them sick? How do we ensure that we aren't using fertilising approaches that are decimating soil microbiome and denuding the soil of nutritional value and in fact, possibly even killing the soil.

[00:03:09] I want to enable our customers, partners, scientists to reintroduce that concept of biodiversity and particularly microbiome biodiversity into their models for growing food so that we can improve the nutritional value of the foods we grow, improve the soil we grow our foods in, and improve the environment fundamentally with that.

[00:03:39] We have a particular focus on the microbiome. That is, if you like, the point of the spear by the microbiome. I'm talking about both the narrow and the broad sense, the definition of that, if you like, concept. In the narrow sense, the microbiome is the ecology of microorganisms subsisting in your lower gut. That translates the food you eat into the nutrients your body needs to subsist. It's the software programming mechanism, if you like,

that programmes your immune systems and you're protected against the environment. It's the barrier layer between your skin and in all of your orifices. That early warning system detection mechanism that you're in danger from external pathogens. In the broadest sense, the microbiome is the lion's share of the biomass on Earth. Because these organisms are invisible, we've sort of systematically ignored them for most of our you know, the last two hundred years as science has evolved and developed. As a consequence, the models we've built to describe what's healthy, what's not are missing a major component, a major component of the system. So we're trying to focus on revealing the secrets of that component of the system, the microbiome, so that we can incorporate the models back into our understanding of wellness models, illness models and even, you know, go further and perhaps, you know, address the challenge of solving illness through nutrition.

[00:05:07] Look, humans generally require a simple narrative to explain anything, but nature is far from simple. The sort of narrative that has shaped our concept and our understanding of health and wellness over the last hundred years is really, you know, characterised by the germ theory of disease, that the bugs, the germs are the enemy and we need to kill them. But I think the picture is much more complicated and I think we are evolving now. There's gradual recognition. That model, if you like, doesn't really describe the reality. We possibly can start to understand whether the microbiome or disposes of the microbiome is at the root of some of these illnesses. You know, we've seen in the U.K, of course, most recently, governments efforts to drive to counter the obesity epidemic. Is obesity itself a disease? Is it a communicable disease? These are questions that scientists are now starting not only to ask, but in fact, answer through the understanding of the microbiome and the signalling and the impact of the communications between the microbiome and the host, the human being, the host in this instance.

[00:06:19] We sought to be recognised and sought to join the EIT consortium, we were then singled out and recognised as a rising star, participated in the EIT Food strategy meetings at the beginning of the year, which was really the most fantastic meeting of wonderful, exciting people and meeting of minds as well in Budapest. Had some amazing conversations there which have led to us now working in consortium with some of the major food companies and particularly a couple of the universities in Europe, University of Turin, University of Madrid, to actually start to look now at the signalling mechanisms between communities of microbes and gut neurones. We're working in a consortium to try and develop that understanding and who knows, you know, try and fundamentally solve that particular challenge. Try and understand how the microbiome affects mood, for instance.

[00:07:18] It's quite clear to me is that food is the most important market, if you like, for venture capital investment, there's a huge interest in the industry, evolving the industry. You know, the practises, agricultural practises, food practises, you know, they were developed a very long time ago and they're evolving quickly because of the urgency. Plant substitutes for meats and things like that. It's attracting a lot of attention from the venture capital community. And I think we do have a revolution in the making. And, you know, we're at the beginning of that right now. So I think that this revolution is going to spawn a whole range of new technology innovations, technology companies. I think we're going to see extraordinary growth, extraordinary potential here. And the result of that is going to be hopefully not too late, but you know, a reversal in some of the practises that have been so damaging and are unsustainable and won't get us to what we need.

[00:08:15] Be a conscious consumer, because that might just be a little individual revolution you're starting, then we have a chance of transforming this world. But until you do that, don't rely on the producers on their own to do it for you.

Lukxmi Balathasan [00:08:37] Thanks for listening to this bonus episode of The Food Fight podcast.

Matt Eastland [00:08:41] To find out more and to learn how you can get involved in the fight for a better future, head over to eitfood.eu/podcast.

Matt Eastland [00:08:55] For more information on Eagle Genomics, head over to eaglegenomics.com.