BBMRI.nl consortium members: Interview series, part 1

In order to showcase the variety of work we do in BBMRI.nl, we dedicate special news items to several BBMRI.nl investigators. We asked them about their work for BBMRI.nl. What excites and challenges them the most, especially during the present COVID-19 pandemic, and how do they see the future for our activities?

We spoke to **Dr. P. Eline Slagboom**, professor of molecular epidemiology at the Leiden UMC in The Netherlands. She is a board member of BBMRI.nl.

Dr. Slagboom working from her home office

What is your job title and what does your day-to-day job imply?
I am professor of molecular epidemiology and I am heading a group with the same name at the LUMC. My day to day job is to steer this group of about 40 people now, and to make sure that everything goes well despite these difficult times. My day-to-day activities vary but I usually discuss results from our research, edit papers, think about novel research, give lectures and teach students and partake in committees to strategize on larger projects, among others.

What is the focus of your work within the BBMRI.nl project?
Within BBMRI I mainly work in work package 2 which is about generating, sharing and analysing molecular data of any type in cohort and patient based studies. This fits with my profession – molecular epidemiology. Prof. Bas Heijmans in my group steered with BBRMI colleagues the transcriptome and epigenome data collections and I did this especially with prof. Boomsma for metabolome data. Prof. Wijmenga organised the genome of the Netherlands at the time. We combine this data with all types of clinical outcomes and participant characteristics (phenotypes). Together with dr. Marian Beekman and Leon Mei at LUMC and other BBMRI colleagues, we are heavily involved in trying to get people together to work on these data sets, publications and making facilities work, so that everyone can access data sets under the right conditions in order to have bigger datasets and more robust answers. Another goal is adapt to changes such as the GDPR, novel assays, or novel situations such as the COVID-19 outbreak and turn that into useful science for the community.

My part of this work focuses on a specific cohort study – I am PI of the Leiden Longevity Study. Since I study ageing and longevity, I am interested in biomedical and biomarker research with health impact on older people and for now, impact of data collected during the COVID-19 pandemic.

How does this relate to your other work/projects/activities?
I am working with molecular data within cohort studies. Moreover, with my PhD students we

combine molecular data with the risks that older people develop during their lives for functional decline, disease and mortality. The PhD students and Postdocs in our Molecular Epidemiology group perform analyses, teach and publish papers on BBMRI data. BBMRI gave us these possibilities. We show younger people in workshops how valuable it is to share data and how much more we can learn about people by doing so. In lectures I also let people know about specific problems in older age and that specific programs such as BBMRI can help make data more accessible, findable and usable for health research.

What do you enjoy the most about your work on the project?
I like to brainstorm with my colleagues and share experiences, thoughts or documents on best practices concerning various issues that deal with novel (COVID-related) research. For instance, our colleagues from Rotterdam, RIVM and the VU are very helpful in these discussions and I enjoy this collegiality a lot**!** You can easily contact other PIs to ask for support. In that regard, scientific robustness is important as one should not only be involved in their own study and cohort but rather be engaged in exchanging information. This is both inspiring and helps with overcoming the hurdles of small studies and solitary actions, while ultimately contributing to the achievement of scientific robustness.

What is challenging about your work?
It is challenging to keep everything running simultaneously and in the right order. We are used to do many things by ourselves and at the same time get inspired and receive support from others. We have to invent novel research, find the budget, the study participants, scientific staff, represent the research to the experts, the public and teach students. Every success is based on timing, insight and being smart when publishing and adding something new to the research. This makes my job very demanding as I have to be on top of science if I am to be of use to people.

What do you think is the importance of the project for the wider field of data sharing and health research?
The complexity of humans is that their life course is totally unique it is personal. In essence, your genetic make-up in combination with environmental factors, all that happened to you during your younger and adult years, conditions you've had, your lifestyle and habits all matter for the overall state of your health when you age. Where you lived, what happened to you, what the effect was, for example, will you recover from a hospital stay with a COVID-19 diagnosis – all that depends on your whole lifetime and your physical and mental health and wellbeing. From that perspective, for every human being it is important to tackle this by sharing data for causes relevant for that person. You can get the best science if you share the data in order to have the best overview of what happened and what is likely to happen to people over their lives. For example, research in the hospitals is focused on having enough information about patients with COVID-19 by exploring blood samples, tissues, etc. However, what happened to these patients before that determines their risk and what will happen to them after they leave the hospital that determines their recovery is not immediately known. The cohort studies could come in here as this pipeline has to be completed. In fact, the principle is the same – the pieces of the life course have to be completed to obtain an overview of one's health and behaviour.

What makes BBMRI.nl unique in your view?
BBMRI has always focused a lot on sharing data in cohort studies and we published an impressive number of papers together on the molecular studies. We are well organised as a biobanking consortium with respect to combining existing molecular and imaging data, ICT solutions and ELSI matters. The joint cohort activities can still be improved as we experienced in the COVID outbreak situation. Interlocking this with clinical studies focusing on treatment all under the HealthRI umbrella

would even make the consortium more unique. With a situation like the COVID-19 outbreak you see how necessary it is to have a national organization of patient data from hospitals combined, if required, with population based data. To do this efficiently one needs both BBMRI.nl and the clinical studies on board.

Which BBMRI.nl product or accomplishment would you highlight as deserving more attention, and why?

Well, I think we made a lot of progress for a relatively limited budget. If such initiatives are performed in another country, there is usually a lot of funding to organise biobanking nationally (UK Biobank, Estonian biobank). As compared to bigger initiatives, however, we accomplished a lot in BBMRI. For example, we have had many publications in renowned journals on epigenetics, genetics, molecular data, among others, which are valued and used by many scientists internationally. In terms of specific results I am proud that we started in 2013 to generate one type of metabolomics data in 30.000 participants in over 20 biobanks. Using all data combined in BBMRI my group aimed at generating a health score that indicated the physiological health or biological age of persons. We know that calendar age is not the best indicator for health and vulnerability. There are very healthy old people but also very unhealthy middle-aged people. That is why we extracted from all the metabolomics data that was collected in BBMRI and in international cohorts, a score per person which will potentially help us judge how vulnerable especially older people are irrespective of their age. The score, consisting of 14 blood metabolites, was generated on the basis of mortality prediction. We are now testing whether the score represents vulnerability to a range of health conditions and the results of the first analyses look very promising. We also test the health indicators in further clinical research, among older patients with kidney failure, hip fractures etc.

How do you foresee the future for the BBMRI.nl activities?

It is obvious that the problem of differences between humans will not disappear. You need the organisation of cohorts and clinical populations to be connected as good as possible along the life-course across the globe. Especially if you want to tackle bigger problems such as the obesity and infectious disease pandemics or ageing societies. In fact, it is amazing how much our life expectancy increased in the last 200 years. However, we are presently exposed to many factors which make us unhealthy. Such exposures during our lifetimes are not going away. That is why, the better we are organising ourselves to share data, the more knowledge we have to face these time framed and cumulative problems. My major part in all this is to measure molecules in people's blood, urine and other tissues which hold a lot of information. To my knowledge, there is not a single study that has followed all its participants from birth to death yet. However, jointly cohorts cover periods of the course of life but in separate studies focusing for example on life between 0-30 or 20-40, 50-100 years of age. You need all of that data if you are interested in the life course of people: how the maximum physiological capacity is reached in adolescence and how and at what rate it declines with age. The better the data collected across these periods of people's lives are by consortia such as BBMRI and Health RI are linked, within the boundaries of privacy protection, the more useful science will be to face the challenges facing humanity.

How has the COVID-19 crisis impacted your work?

On the 12th of March I went home and I did not visit the lab until yesterday June 2nd . This is almost 3 months! I was never away for so long except for the two times I've been on pregnancy leave! This had a major impact on me. Moreover, now there is a lot of skyping to do which can get me tired. I manage, of course, but I do miss all my contacts**.** At the same time, with all communication possibilities and the fact we do a lot on data analysis, a lot of the work could continue. Part of my group is suffering as they worry about the continuation of their work, since they work mostly in the

lab. Students also worry as they are alone at home and stressed to finish their exams, reports, internships etc. Others went home to their countries of origin, or just started this year. In that sense, it is hard to inspire them in the online environment as when having discussions face-to-face. Thus, all in all in my professional world the biggest impact is on the students and people with small children.

How have you adapted to the new circumstances created by the pandemic?
For me adaptating meant organizing all my communications. In the beginning I thought I would have a lot of time to work peacefully on papers. However, after two weeks, I realized there are many meetings every day which are exhausting. I also find that communication through online channels is not as inspiring.

What newly emergent opportunities do you see as created by the present COVID-19 pandemic?
Usually I have a very busy life with my family at home and being a professor, so finishing meals and spending time cooking, organising my life, interacting with friends is something for which I never seem to have enough time. I can see that I can organise a part of my work more efficiently now since I am working from home. Actually, I would happily stay at home to work two days a week from here even after the crisis. Especially for reading and thinking I can be more efficient at home. . Also, everyone is more used to it now, which means people will be more comfortable with it in the future too which saves the energy and environmental burden of travelling and running around.

In case of new opportunities, can you explain?
COVID-19 is a terrible disease, of course, but if there is one thing for sure, this is that such viruses will certainly occur in the future too. Viruses are increasingly becoming more able to infect us, I understood. This past period has shown how immensely important it is for Health-RI, for instance, to be able to provide the safe environment to share data while respectfully considering privacy issues. Moreover, with my colleagues we aimed for sending comparable questionnaires to participants in our cohorts, and we are exploring whether we can link cohort data to clinical data, how is someone doing physiologically or mentally before anything happened and then when the person was tested positive and/or when they entered or left a hospital. This situation also shows that it is nice to share this data, but you can only do that if people are convinced that this is important. Health-RI is capable to link this data in a safe environment where no one will abuse the data.

How do you mitigate the (negative) impact of the crisis on your work?
Unfortunately, sometimes things don't go as fast as I would like them to and not as pleasantly as when handled face to face. Targets, deliverables and timeliness are important nowadays, but now it takes more time to see what should be done if we want to make sure we understand each other. Accomplishing tasks by e-mail or skype is more complicated and takes longer if you want to ensure you are aligned with all parties involved. The most difficult part is to deal with the postponed activities, not only my own, also postponed education, internships, labwork, meetings. This means. for example, that contracts ideally must be extended. The consequences of all of that is not yet completely felt, I think.