



BRAINSCAPES - INTERVIEW DANIELLE POSTHUMA

Gravitation grant comes at just the right time to exploit the revolutions within genetics, neurobiology and cell biology



“What was science fiction 20 years ago is now a reality”

Danielle Posthuma, Professor of Genetics at VU Amsterdam, leads the Brainscapes project. With a consortium of seven Dutch research institutes, she will be able to work on ground-breaking brain research for the next 10 years with 20 million euros granted by the Gravitation programme. She talks about her fascinations and the Gravitation project.

“I am fascinated by the causes of individual differences. Especially if these causes arise from the functioning of our brain. Why is one person more prone to depression than another? Where does the good memory of some of us come from, or the sensitivity to addiction?”

“These are very exciting times for us geneticists. When I started as a researcher 20 years ago, estimating the heritability of traits through family research was the highest achievable. The Human Genome Project, which produced a first version of the human genome in 2001, meant a landslide for us geneticists. This was followed by breakthrough after breakthrough. What was science fiction 20 years ago is now a reality. We currently have databases

that contain genetic, medical and phenotypic information on millions of people. Analysing these data provides a wealth of information; it allows us to map out very accurately which genes are involved in which characteristics. For brain disorders such as depression, insomnia, and Alzheimer's disease we have already identified many of the hundreds of genes that are involved in these disorders."



and Jeroen Pasterkamp of the University Medical Centre Utrecht and Boudewijn Lelieveldt of the Leiden University Medical Centre.'

"Identifying genes isn't enough"

"**Identifying a group of genes** isn't enough. After all, what role do these genes play within the different cell types in our brain? If we can make that visible, then we also understand more about the mechanisms in the brain. Understanding these mechanisms is important, because only then are we able to develop targeted therapies for brain disorders that occur as a result of a certain interplay of genes."

"So far, it has hardly been possible

to translate our genetic findings to brain cell level or mechanistic insight. Many genes are involved in each of the conditions that we examine, and this multiplicity was a problem for neurobiologists. They simply didn't have the techniques to work with so many genes. A recent revolution in cell biology now makes it possible to map out the effects of gene expression on individual cells. New techniques have also become available in neurobiology, which we can use for this research. And that's exactly what we're going to do with our Gravitation grant over the next ten years."

"**To this end we work** together with a consortium of twenty-one top researchers from seven Dutch research institutes. Besides me, our core team consists of Guus Smit and Huib Mansvelder of Vrije Universiteit Amsterdam, Elly Hol

"Considering all the new developments, we have an exceptionally good starting position for our research."

Considering all the new developments, we have an exceptionally good starting position for our research. I expect that in ten years' time we will certainly have taken a number of important steps to unravel the mechanisms that are relevant to brain disorders. This is also important information for pharmacologists involved in the development of new therapies for brain diseases. And, of course, also interesting for us as scientists, to go one step further in unravelling the mysteries of our brain.