Discovery of new genes will help childhood arthritis treatment

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(Medical Xpress)—Scientists from The University of Manchester have identified 14 new genes which could have important consequences for future treatments of childhood arthritis.

Scientists Dr Anne Hinks, Dr Joanna Cobb and Professor Wendy Thomson, from the University's Arthritis Research UK Epidemiology Unit, whose work is published in *Nature Genetics* yesterday (21 April), looked at DNA extracted from blood and saliva samples of 2,000 children with childhood arthritis and compared these to healthy people.

Principal Investigator Professor Thomson, who also leads the Inflammatory Arthritis in Children theme at the National Institute for Health Research (NIHR) Manchester Musculoskeletal Biomedical Research Unit, said: "This study brought together an international group of scientists from around the world and is the largest investigation into the genetics of childhood arthritis to date."

Childhood arthritis affects one in 1,000 in the UK. It is caused by a combination of genetic and environmental risk factors, however until recently very little was known about the genes that are important in developing this disease – only three were previously known.

Dr Hinks, joint lead author of the study, said the findings were a significant breakthrough for understanding more about the biology of the disease and this might help identify novel therapies for the disease. "Childhood arthritis, also known as juvenile idiopathic arthritis (JIA), is

a specific type of arthritis quite separate from types found in adults and there's been only a limited amount of research into this area in the past," she said. "This study set out to look for specific risk factors. To identify these 14 genetic risk factors is quite a big breakthrough. It will help us to understand what's causing the condition, how it progresses and then to potentially develop new therapies."

The study may help to predict which children need specific treatment earlier and allow health workers to better control their pain management, quality of life and long-term outcome. Currently 30 per cent of children with the disease continue to suffer from arthritis in adulthood.

Dr Cobb, joint lead author, added: "There are lots of different forms of childhood arthritis so identifying the markers will help us understand a little bit more about the disease process. It will also help to categorise children with JIA into sub-types dependent on which genes they have and allow us to determine the best course of treatment."

The study which took two years to complete, will ultimately help clinicians to better manage children with the disease and give potential to develop new therapies.

Professor Alan Silman, medical director of Arthritis Research UK who part funded the work, said: "We have known for some time that there is a strong genetic contribution to a child's risk of developing JIA, however previously only three genetic risk factors had been identified. This study is the largest genetic investigation of JIA to date and has identified 14 new risk regions, adding a significant amount to our knowledge of the genetic basis of this disorder. Further work is now required to investigate each of these regions in more detail, to enable us to understand how they are involved in disease development and identify potential new therapeutic targets."

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More information: Dense genotyping of immune-related disease regions identifies 14 new susceptibility loci for juvenile idiopathic arthritis, DOI: 10.1038/ng.2614

Provided by University of Manchester

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