

Bio-Medicine

Scientists have discovered epigenetic changes (i.e. chemical changes to a gene that do not alter the DNA sequence) in individuals with schizophrenia and bipolar disorder. This is the first epigenome-wide investigation in psychiatric research, and this groundbreaking data may be a significant step on the journey to fully understanding major psychosis.

Dr. Arturas Petronis, senior scientist in the Krembil Family Epigenetic Laboratory at the Centre for Addiction and Mental Health (CAMH), and his team studied 12,000 locations on the genome using an epigenomic profiling technology developed at camh. Approximately one in every two hundred of these genes showed an epigenetic difference in the brains of psychiatric patients. Significantly, these changes were noted on genes involved in neurotransmission (the exchange of chemical messages within the brain), brain development, and other processes linked to disease origins.

Dr. Petronis explains that these epigenetic changes may be the missing link in understanding what causes an illness. The DNA sequence of genes for someone with an illness like schizophrenia and a for someone without a mental illness often look the same; there are no visible changes that explain the cause of a disease. But we now have tools that show us changes in the second code, the epigenetic code, which may give us some very important clues for uncovering the mysteries of major psychosis and other complex non-Mendelian illnesses.

This proof-of-principle study is the first demonstration of what camh epigeneticists have hypothesized for the last 10 years. Until now, we only had theories that epigenetic changes were important to understanding what causes major psychosis, explains Dr. Petronis. Now we have the tools and expertise to support our theories and we can look at conducting larger studies, which will hopefully give us an even better understanding of psychiatric illnesses. And once we understand the primary molecular causes of an illness, we can advance diagnosis and treatment approaches, and possibly even prevent illness.