*Studying the effects of bipolar disorder on the microenvironment of different areas in the brain*

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*Introduction to Bioinformatics – Final Project*

***Abstract***

\*Up to 250 words.

Brief introduction on the disease:

The knowledge gaps:

The main goal of the analysis: We aim to identify how people who suffer from bipolar disorder differ from healthy people on the microenvironment level – gene expression, pathways and tissue composition.

Brief overview of your analysis:

Your key result(s):

Main conclusion(s):

***Introduction***

Write a general overview of the disease (~1 page)

Bipolar disorder is a multicomponent genetic illness that involves severe mood disturbance, neuropsychological deficits, and physiological changes and it is one of the leading causes of disability globally (Rowland and Marwaha, 2018). Patients often experience extreme mood swings from manias to depressions and vice versa. The mood swings are different in different individuals and ranges from mild hypomania or depression to severe manias or depressions, sometimes accompanied by psychosis (Miklowitz, 2008; Müller-Oerlinghausen et al., 2002). We tend to classify bipolar disorder into 3 types: Bipolar Disorder I which includes manic episodes, Bipolar Disorder II which includes only hypomanic episodes and major depressive episodes and Cyclothymia which is consistent of hypomanias and minor depressions (Cerimele et al., 2014).

Bipolar disorder affects both young and adult people: recently, there have been some evidence that indicates an increase in the prevalence of bipolar disorder in young people (Moreno et al., 2007). In addition, in the United States, bipolar disorder patients make up 10% to 25% of all the geriatric patients with mood disorders (Aziz et al., 2006). When it comes to biological sex, men are affected slightly more than women in a ratio of 1.1:1 (Miller and Black, 2020). It is unclear what is the lifetime prevalence of people who are on the bipolar spectrum (suffer from one of the 3 bipolar types mentioned before) because different studies have came to very different results. In any case, all the studies have found that the patients' lifetime prevalence decreases significantly (Cerimele et al., 2014).

The mortality rate of people with bipolar disorder is quite high – around 10% to 20% of individuals with this illness has committed suicide and more than a third have attempted suicide at least once (Müller-Oerlinghausen et al., 2002).

As we have established before, the bipolar disorder portrays a threat on people of all kinds. It is of great importance for us to develop new ways of identifying patients before they experience an outbreak.

Write about what is still unknown, what main challenges do we face in the context of this disease? (~1 page)

How analyzing genomic data can help to overcome those challenges? (Give examples based on results of the studies you collected) (~0.5 pages)

In the last decade, various studies have focused on the genetics of bipolar disorder and the various risk factors that can affect its development (Rowland and Marwaha, 2018).

Finish by writing about the biological question you are about to address. What are you looking for? How is it going to help address those challenges? (~0.5 pages)

***Results***

The brain's Dorsolateral prefrontal cortex is equivalent the 9th and 46th areas of the brain according to the Brodmann areas system (Horn and Leigh, 2011).

***Discussion***

What conclusions have you drawn from the analysis? Do they provide any insight into the biological question?

Mention the limitations of your analysis.

What would you do next? Are there any ways to overcome those limitations? What future experiment can you suggest answering your biological question that will address what is still unknown?

***References***

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