

# Detecting BDNF gene Polymorphisms using genosensors and molecular biology tools

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Major depressive disorder (MDD) is a complex and highly prevalent psychiatric disorder with a high impact on quality of life and negative effects on mood, behaviour, and cognition. Currently, the main medical treatment for MDD is antidepressant medication. The selective serotonin reuptake inhibitors (SSRIs), including fluoxetine, sertraline, fluvoxamine, paroxetine and citalopram, are the most commonly prescribed drugs. However, as with all antidepressant treatments, about 30–40% of MDD patients do not respond sufficiently to SSRIs. Several factors, including genetic factors, play important roles in antidepressant responses. BDNF is one of the most investigated genes regarding depression and antidepressant response. In fact, the rs6265 (Val66Met) non-synonymous polymorphism, has been demonstrated to decrease pro-BDNF processing, and consequently affect the dependent secretion of BDNF. Curiously, carriers of Met-allele have been described to have smaller hippocampal volume, either in healthy or depressed patients. So, it is likely they can contribute to the interindividual differences in patient's responses to antidepressants. Therefore, it is crucial to develop methodologies to predict the individual antidepressant response.

In this work, two analytical approaches based in molecular biology and electrochemical genosensor techniques are under development to create a low-cost genotyping platform able to genotype BDNF SNPs related with antidepressant therapeutic response.

**Keywords:** Major depressive disorder, BDNF, genosensor, molecular biology

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