HLA-C*06:02 and DRB3*01:01 might indicate a good response to Pfizer-BioNTech anti-SARS-COV-2 vaccine

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The appearance of the first anti-SARS-COV-2, vaccines by Pfizer-BioNTech and Moderna was a turning point to the recent pandemic. However, these vaccines, sharing a novel, m-RNA technology, raised a lot of questions regarding their effectiveness. Furthermore, it would be interesting to investigate, genetic parameters that might affect the response to the vaccines. As the HLA plays a pivotal role in both humoral and cellular immune responses, presenting antigens to the immune cells, we investigated HLA similarities between poor, average and good vaccine responders. To achieve that, blood samples were collected from 200 members of the staff of Athens Medical Center Hospital, right before the 2nd dose of the Pfizer-BioNTech vaccine and one and three months after. Their specific antibody title was measured using the Alinity ci-ABBOTT analyser and they were subsequently grouped, in three categories (poor, average and good responders). Additionally, DNA was extracted using the TanBead system and HLA was typed at high resolution, using the NANOPORE technology. Data was analyser with the BIGDAWG and Hapl-o-Mat open-source software. We observed that age and sex of the individuals didn't affect antibody response, though younger persons (21-30 yo) had higher antibody level before the second dose. Interestingly, HLA-C*06:02 and DRB3*01:01 were found in significantly higher frequency in the good responders (f=0.17213 and 0.12295 respectively) vs the rest (f=0.05224 and 0.03731 respectively). As previous studies have correlated both alleles with the Covid-19 disease severity, our findings suggest a pivotal role of these two alleles in both pathogenicity and immunogenicity of SARS-COV-2.