Science Overcomes Drug Addiction: A New Approach on Monitoring the Receptors Overexpress on Brain Cells

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We want to put the light on substance abuse and create awareness towards these problems especially amongst students. In the area of substance addiction, studies about destroying the neurological receptors are scarce. In addition to that detecting substance abuse is important in many ways such as, socio economic structures, medicine Due to substance abuse, some of the receptors like sigma-1 receptors in our brain increase in number. We aim to create fluorescence materials that can identify these receptors with our project, so that they can be used for diagnosis of drug addiction and monitoring of related treatment processes. To this respect, the developed fluorescent probe was targeted to sigma receptors owing to modification with Haloperidol. Materials chosen for fluorescence imaging are Gold nano particles and lipids marked with Texas red fluorescence dye. Characterization studies were made on the synthesized liposomal samples. In addition to that their potentials for receptor imaging were studied with in vitro cell culture tests. For the cell culture tests, Hela and HaCaT cell lines were selected because of their high and low concentration of sigma-1 receptors respectively. With these cell lines we have examined the targeting activity of the fluorescence probes. To sum it up, attaching binding haloperidol to fluorescence liposomes enabled imaging targeted towards sigma-1 receptors. This nano material based approach has a great potential of products in the field of substance abuse and addiction. The material can also be used in different receptor imaging studies. The outcome of this project is a product which can be used to treat substance addiction effectively and innovatively.

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