Investigation of the enantiomer affinity pattern of mianserin, nomifensine and primaquine towards various cyclodextrins using capillary electrophoresis.

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A significant part of biological processes is based on chiral recognition. Therefore, these recognition mechanisms are widely studied. One of the valuable instrumental methods for such studies is capillary electrophoresis (CE). Since neither electrophoretic nor electroosmotic mobility alone is enantioselective migration for enantiomers, addition of a chiral selector is necessary to separate them. For this purpose, native and substituted cyclodextrins (CD) can be used. CDs can bind enantiomers selectively and thus lead to a difference in their migration speed. Due to the high efficiency of CE, even the binding constant ratio as low as 1.01 is sufficient for the baseline separation of enantiomers. This cannot be achieved with any other separation methods[1].

The aim of this research was to study the affinity pattern of enantiomers of an antidepressant drugs Mianserin and Nomifensineand also Primaquine (which is used to treat and prevent malaria) with various, native and substituted CDs. a-, b- and γ-CDs were used as native CDs. These CDs consist of 6, 7, and 8 glucopyranose rings respectively. Therefore, their cavity sizes are different. In all three cases, the enantiomers were baseline separated using b- and γ-CDs, however, no separation wasobserved for a-CD. To study the migration order, the enantiomers were fractionated using high-performance liquid chromatography (HPLC). Then CE analysis was performed using the sample enriched with an enantiomer.

Various other substituted CDs were used, derivatives of all 3 native Cyclodextrins:

- Hexakis(2,3-di-O-methyl-6-sulfo)-alpha-cyclodextrinsodiumsalt. (**HDMSACD)**
- Heptakis(2,3-di-O-methyl-6-sulfo)-beta-cyclodextrinsodiumsalt. (**HDMSBCD)**
- Octakis(2,3-di-O-methyl-6-sulfo)-gamma-cyclodextrinsodiumsalt. (**ODMSGCD)** and others.

The migration order of Mianserin is the same for all the above CDs.In the case of Primaquine and Nomifensine the migration order was changed, which allows us to deepen the research.

References

[1] P. Peluso, B. Chankvetadze *Electrophoresis* **2021,** 42, 1676-1708.