

Over 20% of adults, are sufferers from chronic pain. As of now, opioid drugs remain the cornerstone in treating this affliction. Reluctantly despite being highly efficient in managing symptoms, those drugs also carry many side/effects like addiction, respiratory problems as well as leading to developing tolerance.

Opioid drugs work by binding to a group of transmembrane receptors *a group of protein, that transfer signals from outside of the cells into the inside. Those receptors were thus called opioid receptors. They belong to the GPCR group of proteins, that have a similiar function, and are targets of over 30% of currently available drugs. Recent data has shown, that to obtain pain medication with a better therapeutic profil, they have to bind only to a certain subtype of opioid receptors, and also illicit a certian signaling response.

Analysing how a drug initiates a distinct signaling response i s not possible with using current experimental in vitro techniques. In our project we aim to analyze the mechanism of signal propagation in opioid receptors, using computer simulations.

We hope that our data will enable designing better pain medication, as well as better understanding GPCR proteins mechanism of function.