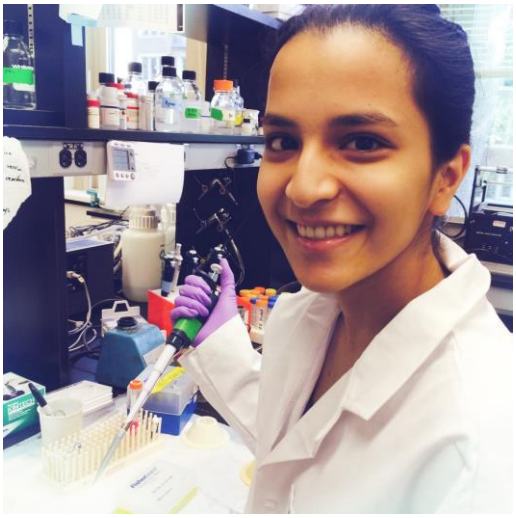

**Unorthodox Acetylcholine Binding Sites in α4β2* Nicotinic Acetylcholine Receptors**
**Akansha Jain (COL 2017)**
**Advisor: Jon Lindstrom**

During my freshman year, I was given the opportunity to work in a Neuroscience lab and this has been one of my most rewarding experiences during my undergraduate studies thus far. As a recipient of the Goldfeder Family Undergraduate Research Grant from the Center of Undergraduate Research and Fellowships, I was able to expand upon what I was learning in my upper level biology classes to a specific scientific question. Through this experience I have learned multiple lab skills from planning and conducting experiments, to analyzing my results, and figuring out how different pieces come together to help answer my research question.

My project looked at unorthodox acetylcholine binding sites that are formed by the α5 and β3 accessory subunits in α4β2* nicotinic acetylcholine receptors. All nicotinic acetylcholine receptors (nAChRs) evolved from homomeric nAChRs in which all five subunits are involved in forming ACh binding sites at their interfaces. Heteromeric α4β2* nAChRs typically have two ACh binding sites at α4/β2 interfaces and a fifth accessory subunit surrounding the central cation channel. β2 accessory subunits do not form ACh binding sites, but α4 accessory subunits do at the α4/α4 interface in $(\alpha4\beta2)_2\alpha4$ nAChRs. α5 and β3 are closely related subunits that had been thought to act only as accessory subunits and not take part in forming ACh binding sites. I investigated whether the α5 and β3 subunits, similar to the α4 accessory subunit, can form functional ACh binding sites. Looking forward, these unique interfaces can be targets for unique drugs, specifically site-selective agonists to bind to them for potential treatment of diseases or nicotine addiction.