CASE STUDY

ASTRA THERAPEUTICS – PRECISION-ENGINEERED DRUGS

Problem – Challenge

Eukaryotic pathogens cause a wide range of infections in humans, animals, and plants, leading to debilitating diseases, crop damage, and significant economic losses. Despite decades of relentless efforts, protozoan parasites such as Plasmodium, Toxoplasma, Babesia, Cryptosporidium, and Eimeria continue to pose significant global health challenges. Additionally, other pathogens such as roundworms and flatworms, are of major concern in parasitic infections, especially with the emergence of drug resistance. There is a lack of safe and effective drugs, and no broadly applicable vaccines exist for any of these diseases.

Solution

Using technologies and infrastructures available at PSI, scientists and ASTRA Therapeutics founders Natacha Gaillard and Ashwani Sharma have developed and refined a technology leveraging the subtle sequence differences between tubulins in parasite pathogens and their hosts to enable precise inhibitor design through atomic-scale drug engineering.

The microtubule cytoskeleton, an essential component of the intricate cellular machinery in living organisms, plays a critical role in cell structure division, transport, tissue development and neuronal function, making it indispensable for any organism.

Throughout their pathogenic evolution, eukaryotic pathogens have acquired notable modifications in the sequence, structure, and function of their cytoskeleton, distinguishing them from their host organisms.

ASTRA Therapeutics' technology exploits these unique microtubule features to develop targeted therapeutic interventions against eukaryotic pathogens.