

DBT/ National Institute of Animal Biotechnology

Small molecule inhibitors of *Toxoplasma gondii* CDK-related kinases: Unlocking therapeutic potential.

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Toxoplasma gondii is a protozoan parasite responsible for abortion and neonatal mortality in human and animals. Infection not only results in significant reproductive losses in animals, but has public health implications since consumption of infected meat can facilitate animal to human transmission.

The success of this parasite across wide host range has long been attributed to its efficient control of gene expression which in turn depends on regulation of transcription. It is mediated through master molecule RNAPolymerase II (RNAPII). RNAPII often requires assistance from protein factors especially Cyclin Dependent Kinases (CDKs).

In this regard, scientists at National Institute of Animal Biotechnology identified two important *T. gondii* CDK-related kinases, TgCrk7 and TgCrk9 and studied the molecular mechanism of infection. These important protein factors have remained largely unexplored as far as their potential to serve as drug target for combating Toxoplasmosis.

Utilizing an excellent in-vitro infectious model like *T. gondii*, they identified and unravelled the potential of such proteins as valuable drug targets, which selectively marks and clears these infectious organisms without harming the host cells. The study has also succeeded in highlighting the untapped potential of small molecule inhibitors against notorious infectious agents like *Toxoplasma gondii*. In addition, the inhibitor was used as a tool to understand the fundamentals of molecular mechanism of transcription regulation in *Toxoplasma gondii* which will further add to our knowledge of infectious disease biology.

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