Case #585

A Piperazine Based Lead Compound for Cryptosporidium Reduces Both Diarrhea and Parasites

Cryptosporidiosis is a main important cause of life-threatening diarrhea for young children and immunocompromised people and *Cryptosporidium parvum*, one of the two main human *Cryptosporidium* pathogens, is also an important cause of diarrhea in dairy calves. In spite of this, the best available treatment of *Cryptosporidium* is only modestly efficacious and anti-*Cryptosporidium* drug development is complicated by the fact that rodents do not get diarrhea from *Cryptosporidium* strains relevant to humans. The Huston lab has developed a suite of phenotypic assays to ensure pipeline diversity and to determine molecular mode of action for potential *Cryptosporidium* growth inhibitors and has developed a dairy model of cryptosporidiosis to determine clinical response as well. With these tools, the lab identified a piperazine based lead compound, MMV665917, and treatment of infected calves resulted in both prompt resolution of diarrhea and reduced total fecal oocyte shedding by 94%, establishing MMV665917 as an outstanding lead compound for *Cryptosporidium* drug development.

Applications:

- Treatment of both human and bovine *Cryptosporidium* infections.
- Potential prophylaxis applications.

Advantages:

- Safe and effective novel lead compound.
- Treats both parasitic infection and clinical symptoms.
- Can treat both establish infections and provide prophylaxis protection
- Easy synthesis and modification for optimization

Intellectual Property and Development Status:

US Non-Provisional Application US20180064711A1 and EP Patent Application EP3285764A4
Looking for both licensing and industry partners for optimization of lead compound

References:

Clinical and microbiologic efficacy of the piperazine-based drug lead MMV665917 in the dairy calf cryptosporidiosis model. Stebbins E. *et al* PMC5774826

A suite of phenotypic assays to ensure pipeline diversity when prioritizing drug-like Cryptosporidium growth inhibitors. Jumani RS *et al* PMC6478823

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