Technology Summary: Antischistosomal Polypeptide

Opportunity Statement

Schistosomiasis is a debilitating disease that is ranked second only to malaria as the most common parasitic disease. It is caused by the schistosoma parasite and is prevalent in tropical and sub-tropical areas, especially in poor communities without potable water and adequate sanitation. According to the World Health Organization, there are more than 200 million people afflicted with the disease worldwide. Hundreds of millions of animals are also affected.

There are growing concerns that water-resource development projects, such as large dams and irrigation systems, might further exacerbate schistosomiasis transmission. In 2001, the World Health Assembly passed a resolution to set a global target to treat at least 75% of school-aged children who are at risk of schistosomiasis and intestinal worms by the year 2010. Unfortunately, this goal will not be achieved.

In view of these trends, the demand for schistosomiasis treatment is expected to increase in the future.

Problem

Praziquantel is the only drug currently used to treat schistosomasis on a large scale. The manufacture of the active ingredient for Praziquantel involves a complex and polluting process, which increases the cost of production. This complex process, together with the drug's low profit margin, is a potential deterrent for existing suppliers to increase capacity to meet future demand. In addition, Praziquantel (and all other existing drugs for schistosomisis treatment) are also known to be ineffective for treating early-stage schistosomiasis where the parasitic worms are less than 7 days old.

Therefore, there is a need for a solution which addresses the limitations of the manufacturing processes and lack of efficacy against early-stage schistosomiasis of current drugs.

360ip's Partner Solution

360ip's partner has discovered a living polypide membrane-binding short peptide with specific targeting and antischistosomal functions. The peptide fragment (ZL-4) was selected by a bacteriophage 12-peptide library from the pellicle of a schistosoma-tailed living schistosomula. The peptide fragment can be used to prepare antischistosomal compounds as well as produce targeting molecules used to perform specific binding with a schistosoma body membrane. The peptide fragment also has potential applications in the development of diagnostic tests for schistosomiasis.

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The use of this peptide can provide the following benefits:

- Simple manufacturing processes with minimal environmental pollution
- Effective in treating early-stage schistosomiasis
- Targeting function has potential to provide improved efficacy or reduced dosage when used with existing drugs

Group	Observed polypide number	Polypide dying rate at different time points (*%)		
		24hrs	48hrs	72hrs
PBS	304	21.71	54.28	74.01
Microtus fotis serum	300	69	97.33	100
ZL-4 cloning	303	97.69	100	100
M13KE	297	20.54	58.92	79.12

Effect of In-vitro Schistosoma Schistosomula Killing of ZL-4 Positive Cloning

Patents

360ip's partner has filed one patent application on this invention and it plans to seek protection in multiple jurisdictions.

Summary

360ip's partner has developed a solution that is able to provide treatment for early-stage schistosomiasis with improved efficacy. It is currently planning pre-clinical trials to provide more data for validation.

360ip is seeking interested parties for the licensing further development and commercialization of this technology-based solution.

For additional information, contact:
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