

# **Diagnostic performances of *Schistosoma haematobium* and *Schistosoma mansoni* recombinant proteins, peptides and chimeric proteins antibody based tests. Systematic scoping review**

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## **Abstract**

### **Background**

Traditional diagnostic tests for schistosome infections are suboptimal, particularly when the parasite burden is low. In the present review we sought to identify recombinant proteins, peptides, and chimeric proteins with potential to be used as sensitive and specific diagnostic tools for schistosomiasis.

### **Methods**

The review was guided by PRISMA-ScR guidelines, Arksey and O'Malley's framework, and guidelines from the Joanna Briggs Institute. Five databases were searched: Cochrane library, PubMed, EMBASE, PsycInfo and CINAHL, alongside preprints. Identified literature were assessed by two reviewers for inclusion. A narrative summary was used to interpret the tabulated results.

### **Results**

Diagnostic performances were reported as specificities, sensitivities, and AUC. The AUC for *S. haematobium* recombinant antigens ranged from 0.65 to 0.98, and 0.69 to 0.96 for urine IgG ELISA. *S. mansoni* recombinant antigens had sensitivities ranging from 65.3% to 100% and specificities ranging from 57.4% to 100%. Except for 4 peptides which had poor diagnostic performances, most peptides had sensitivities ranging from 67.71% to 96.15% and specificities ranging from 69.23% to 100%. *S. mansoni* chimeric protein was reported to have a sensitivity of 86.8% and a specificity of 94.2%.

### **Conclusion**

The tetraspanin CD63 antigen had the best diagnostic performance for *S. haematobium*. The tetraspanin CD63 antigen Serum IgG POC-ICTs had a sensitivity of 89% and a specificity of 100%. Peptide Smp\_150390.1 (216–230) serum based IgG ELISA had the best diagnostic performance for *S. mansoni* with a sensitivity of 96.15% and a specificity of 100%. Peptides

were reported to demonstrate good to excellent diagnostic performances. *S. mansoni* multi-peptide chimeric protein further improved the diagnostic accuracy of synthetic peptides. Together with the advantages associated with urine sampling technique, we recommend development of multi-peptide chimeric proteins urine based point of care tools.