# ABSTRACT

Investigation of the Basis of Attachment of *Leptospira* to Mammalian Cells

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Leptospirosis is a globally re-emerging disease caused by pathogenic *Leptospira*. Clinical manifestations range from subclinical infections to the potentially fatal Weil's disease. Though recognized in Jamaica as endemic, cases are frequently misdiagnosed and reports to the Ministry of Health are not mandatory which implies the incidence rate is grossly underreported.

The spirochete uses several, but poorly understood virulence factors to mediate pathogenesis including heat shock proteins, lipopolysaccharides and haemolysins. *Leptospira* are not intracellular organisms and attachment has been proven to be a key characteristic of the more virulent species. Because important interactions with host tissues and cells are specific in pathogenesis, it is likely that several molecules mediate the attachment of the *Leptospira* to mammalian cells.

The attachment of *Leptospira borgpetersenii* serovar Jules and *Leptospira interrogans* serovar Portlandvere to integrins, lectins, sugars and proteoglycans

were assessed through an indirect ELISA assay, using HEp-2 cells as a model and acute human anti serum.

It was found that serovar Jules demonstrated better attachment to integrins $\alpha V\beta 3$ and $\alpha 5\beta 1$ than serovar Portlandvere. Both serovars showed a significant increase in attachment to the ConA coated cells ($p<0.01$ for both) and Jules showed a slight increase in attachment to PNA, UEA, SBA and ECA while Portlandvere showed a decrease in attachment to the same. All sugars analyzed provoked a decrease in attachment of the spirochetes to the host cells with the exception of D-mannose in the case of serovar Jules. Both serovars showed a significant decrease in attachment to HEp-2 cells after the monolayer was treated with trypsin ($p<0.05$ for both), but chondroitinase, neuraminidase and heparinase provoked an increase in attachment.

These findings indicate that serovar Jules has overall greater affinities for the mediators examined in this study when compared to serovar Portlandvere, and may suggest that it might have a greater potential for virulence.

Keywords: Gabrielle Ihsan Andrade, Attachment of *Leptospira* to integrins, lectins and proteoglycans, *Leptospira interrogans* serovar Portlandvere, *Leptospira borgpetersenii* serovar Jules.