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DIFFERENCES BETWEEN *in vitro* AND *in vivo* OBTAINED SCHISTOSOMULES[1]

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SUMMARY

The injection of cercariae of **Schistosoma mansoni** into the peritoneal cavity of naive mice induces cell adhesion to these larvae, and this adherence sharply decreases when the infecting larva changes to schistosomule. This procedure was used to detect differences between schistosomules obtained **in vivo** and **in vitro.** Reinoculation of schistosomules obtained **in vivo** into the peritoneal cavity of mice did not trigger cell adhesion. In contrast, adherent cells were found in 4 and 24-hour-**in vitro** schistosomules. Our data on schistosomules obtained **in vitro** indicate that more than 24 hours are needed for complete remotion of molecules involved in the phenomenon of cell adhesion.

KEY WORDS: Schistosoma mansoni; transformation; Schistosomula; **in vivo, in vitro.**

INTRODUCTION

Cercariae of **Schistosoma mansoni** after release from a molluscan host penetrate the skin of the vertebrate host in order to continue their life cycle. So, the parasite undergoes many structural and physiological changes, originating schistosomules which mature to adult worms adapted to the bloodstream.

The difficulties for the recovery of schistosomules from the skin led to the development of several techniques for transforming cercariae into schistosomula, **in vitro.** The schistosomule-host cell interactions have been also studied, mainly through **in vitro** experiments. However, schistosomules can be easily obtained **in vivo** by inoculating cercariae into the peritoneal cavity of mice[2, 3, 4]. In this study, the kinetics of cell adhesion to **Schistosoma mansoni** larvae developing in the peritoneal cavity of naive mice was used to compare **in vitro** and **in vivo** obtained schistosomules.

Aiming at obtaining **in vivo** schistosomules, **S. mansoni** cercariae (LE strain) shed by laboratory reared and infected **Biomphalaria glabrata** were concentrated, and 0.5 ml of well water containing about 500 cercariae was injected in albino mice (males, weighing 18-22 g), intraperitoneally. The mice were killed by cervical fracture 4, 24 hours and 7 days after cercarial inoculation. The larvae recovered by washing the peritoneal cavity with saline were concentrated by centrifu-

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gation. The **in vitro** schistosomules (4 hours, 24 hours, and 7 days) were obtained according to RAMALHO-PINTO et al.[5]. The **in vitro** and **in vivo** obtained schistosomules were inoculated into the peritoneal cavity of naive mice (groups of 10 animals) and recovered 30 and 180 minutes later, as described above. Reinoculation of **in vivo** obtained schistosomules (4, 24 hours and 7 days old) did not trigger cell adhesion. In contrast, adherent cells, mainly neutrophils, were present in 87.7% (4 hours) and 85.2% (24 hours) of the **in vitro** obtained schistosomules, recovered 30 minutes after inoculation. All **in vitro** obtained schistosomules recovered 180 minutes after inoculation were free of host cells. Cell adhesion was not induced by 7-day-old schistosomules obtained **in vitro** (either after 30 or 180 minutes post-inoculation).

It seems very likely that the attachment and subsequent detachment of cells to **S. mansoni** larvae **in vivo** are both related to surface molecules that are lost during the process of transformation. The glycocalyx is the most probable structure involved in cell adhesion. In contrast to the **in vivo** obtained schistosomules, the **in vitro** obtained organisms were able to induce host cell adhesion when inoculated into the mice peritoneal cavity. Comparative studies on the development of schistosomules produced by several techniques showed that the degradation of glycocalyx is slowered in artificially derived organisms, and may be not complete until 24 hours[1]. Our data on schistosomules obtained **in vitro** indicate that more than 24 hours are needed for the complete remotion of molecules involved in the phenomenon of cell adhesion.

RESUMO

Diferenças entre esquistossômulos obtidos in vitro **e** in vivo.

Injeção de cercárias de **Schistosoma mansoni** na cavidade peritoneal de camundongos normais induz adesão celular a estas larvas. Esta aderência diminui acentuadamente quando as larvas infectantes se transformam em esquistossômulos. Este procedimento foi usado para detectar diferenças entre esquistossômulos obtidos **in vivo** e **in vitro.**

A reinoculação de esquistossômulos obtidos **in vivo** na cavidade peritoneal de camundongos não acarreta adesão celular. Por outro lado, células aderentes foram encontradas em esquistossômulos obtidos **in vitro** (4 e 24 horas, respectivamente). Nossos dados referentes a esquistossômulos obtidos **in vitro** indicam que mais de 24 horas são necessárias para a completa remoção de moléculas envolvidas no fenômeno de adesão celular.

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