PublisherInfo

PublisherName	:	BioMed Central
PublisherLocation	:	London
PublisherImprintName	:	BioMed Central

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Investigation of cellular proliferative potential of lectin extracted from *Bauhinia variegata* according to different cell lines

ArticleInfo

ArticleID	:	3010
ArticleDOI	:	10.1186/1753-6561-8-S4-P265
ArticleCitationID	:	P265
ArticleSequenceNumber	:	315
ArticleCategory	:	Poster presentation
ArticleFirstPage	:	1
ArticleLastPage	:	3
ArticleHistory	:	RegistrationDate : 2014–10–1
		OnlineDate : 2014–10–1

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ArticleGrants	:	
ArticleContext	:	1291988S4S4

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Background

Lectins belong to a structurally heterogeneous group of proteins that have at least one non-catalytic domain of reversible binding to specific mono-or oligosaccharides. This interaction with carbohydrates is reported in important fields such as immunology, oncology and medicine; some studies have reported the ability of these molecules in cell recognition with useful applications [1]. Seeds from leguminous plants are particularly rich in lectins and have highly homologous structures, differing mainly in their quaternaries structures, which are sufficient to provide different biological properties. The specie Bauhinia variegata belongs to the leguminous family [2]. Alencar and coworkers have demonstrated that the lectin B. variegata has pro-inflammatory properties capable of inducing migration in vivo and in vitro of mastocyte resident cells, activating immune cells and stimulating the healing response in vivo, through fibroblasts and myofibroblast differentiation, an important event during the tissue remodeling [3]. Thus, the aim of this study is to evaluate the use of lectin extracted from Bauhinia variegata at events of cell proliferation and cytotoxicity in MDCK, NIH-3T3 and HFF1 cell lines.

Methods

The native lectin B. variegata (BVL) was extracted from seeds, according to the protocol described by Pinto et al [4]. The protein was characterized, quantified and tested for hemagglutination activity. The biological activity was evaluated by MTT (3 - (4,5-dimethylthiazol-2-yl) -2,5-diphenyltetrazolium bromide) in accordance with the strains HFF1, NHI-3T3 and MDCK. For the experiments, cells were maintained in DMEM supplemented with 10% fetal bovine serum at 37°C at a humidified atmosphere with 5% of CO2. The activity was evaluated with cells in logarithmic growth stage. Treatments were used at concentrations of 100, 50 and 25 µg/mL at times of 24 and 48 hours with the HFF1 and NIH-3T3 lineages, and the time of 3 hours to MDCK lineage.

Results and conclusions

The MTT trial was performed to detect the effect of BVL on cell proliferation and cytotoxicity. This lectin, when used in skin wounds in mice, was responsible for the epithelium reconstruction and increased keratin deposition, indicating improved wound healing [4]. Partial results of this experiment showed no cytotoxicity for the lineages tested, when compared to the control groups. After 3 hours of treatment, the BVL concentrations of 50 and 25 µg/mL stimulated MDCK cell proliferation. Fibroblast strains also showed proliferation at BVL presence; an increase in cell number was evidenced in NIH-3T3 cells at a concentration of 25 µg/mL (24 hours) and HFF1 cells at concentrations of 100, 50 and 25 µg/mL (48 hours). Fibroblasts are essential to the healing of skin wounds, particularly in the early stages of healing. Stimulation of their proliferation is a mechanism that therapeutic agents may initiate repair [5]. Thus, the BVL could be used as biotechnological input, stimulating tissue healing. However, other studies will be performed as RT-PCR and flow cytometry in order to better evaluate their action mechanisms.

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