Introduction

Oral mucositis is the painful inflammation and ulceration of oral tissues as a common side-effect of aggressive cancer therapies such as radiotherapy or chemotherapy. Currently, there is no available treatment or cure for the disease.

Recently, a highly bioactive extract from Arrabidaea chica, popularly known as Crajui, was isolated. This naturally occurring substance markedly reduced inflammation and skin infections in animal models and clinical trials. A. chica extract has the potential to treat and cure oral mucositis, a severe side-effect of chemo-radiation therapy of the head and neck.

The aim of this study was to explore the mechanisms by which A. chica extract interferes with the inflammatory pathways that are induced by oral bacterial/yeast PAMPs (Zymosan and Lipopolysaccharide). We hypothesize that A. chica will inhibit the expression of pro-inflammatory cytokines.

Methods

Fig. 2. Arrabidaea chica

Methods:

1. Human gingival fibroblast cells (ATCC CRL-2014) were exposed to LPS (10μg/mL) and/or Zymosan (10μg/mL). Cell toxicity was determined by CellTiter-Blue viability assay (Promega).

2. A. chica extract was determined by 24-hour exposure of A. chica extract in LPS/Zymosan-stimulated oral fibroblasts and THP-1 cells was investigated.

3. Cytokine production was determined by Luminex analysis of the supernatants. Inflammatory pathway modulation was/will be investigated using Simple Western blot techniques and RT-PCR.

Conclusions:

• Arrabidaea chica extract inhibits the expression of the pro-inflammatory cytokines IL-6, IL-8, and SDF-1α and promotes the expression of IL-10 in human gingival fibroblast cells that were exposed to the PAMPs Lipopolysaccharide and/or Zymosan.

• Future directions for this work include understanding how A. chica modulates the post-exposure transcriptome and the pre-transcription proteome of human monocytes.

Abstract

Objective: Oral mucositis is the painful inflammation and ulceration of oral tissues as a side-effect of aggressive cancer therapies. Cytokine of the innate immune responses triggered by DAMPs/PAMPs are important components in the production and severity of mucositis. Previously, we have evaluated the effects of A. chica extract on the expression of inflammatory and anti-inflammatory cytokines in human gingival fibroblasts. The current study was designed to investigate the potential therapeutic effects of A. chica extract on pro-inflammatory cytokines and the anti-inflammatory cytokine IL-10 in human oral fibroblasts exposed to LPS and Zymosan.

Methods: Human gingival fibroblast cells were exposed to LPS (10μg/mL) and/or Zymosan (10μg/mL). Cell viability assays were then performed to determine the LD50. A. chica extract was exposed to stimulating concentrations of LPS and/or Zymosan at 0.025-250μg/mL. Viability assays determined that the LD50 of A. chica extract was determined by 24-hour exposure of A. chica extract in LPS/Zymosan-stimulated oral fibroblasts and THP-1 cells was investigated.

Conclusions: A. chica extract inhibits the expression of the pro-inflammatory cytokines IL-6, IL-8, and SDF-1α and promotes the expression of IL-10 in human gingival fibroblast cells that were exposed to the PAMPs Lipopolysaccharide and/or Zymosan.

References


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