Temporizin an antimicrobial peptide kill *T. cruzi* by a pore mediated process

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**Introduction:** Chagas disease (ChD), caused by *Trypanosoma cruzi*, is responsible for producing significant morbidity and mortality throughout Latin America. The disease has recently become a public health concern to nonendemic regions like the U.S. and Europe. There is no specific treatment against it and the antimicrobial peptides (AMPs) represent alternative new effector molecule candidates. The natural resistance of frogs to *T. cruzi*, and the diversity of AMP produced by this group of vertebrates motivated our laboratory to synthesize hybrid molecules, formed by segments of *Tp-A*, Gramicidin-A and the PolyLeu peptide, named Temporizin (Tz) and Temporizin-1 (Tz-1). **Objectives:** Investigated the anti-trypanosomal activity of Temporin A, Tz and Tz-1, and compared with the activity of the potent pore forming peptide Gramicidin-A and benznidazole, the drug used for ChD treatment. **Material and Methods:** The peptides were synthesized by F-moc chemistry and the antimicrobial activity was evaluated by cell permeabilization assay (CPA), flow cytometry (FC), lactate dehydrogenase (LDH) release, and MTT assay and study of ionic current by the patch clamp technique. The other cells evaluated were: murine monocyte/macrophage cell line J774A1, GH3 and human T leukemic Jurkat cells. Peritoneal macrophages were obtained from the intraperitoneal cavity of Swiss mice. **Results and Discussion:** Temporizin and Temporizin-1 showed good biocide activity against *T. cruzi* using the CPA, FC and MTT assays. In all the approaches used Temporizin was slightly more potent than Temporizin-1 to kill the parasite. Neither peptide showed toxicity on mouse primary peritoneal macrophages, rat adenoma GH3 cell or human lymphoma Jurkat cells. However, a low toxicity to the macrophage lineage- J774 cells was observed with both peptides at concentrations ≥100 µg. **Conclusion:** Both peptides were effective as long as benznidazole to kill *T. cruzi*, but Temporizin-1 presented a lower toxicity to mammalian cells. The mechanism of action was similar to pore formation.

**Key words:** *Trypanosoma cruzi*, Temporin A, Gramicidin A, Temporizin

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