

## EXOSOMES CONTAINING ARCHAEAL DNA ARE INCREASED IN THE SERUM OF HEART FAILURE CHAGAS' DISEASE PATIENTS.

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### *Abstract:*

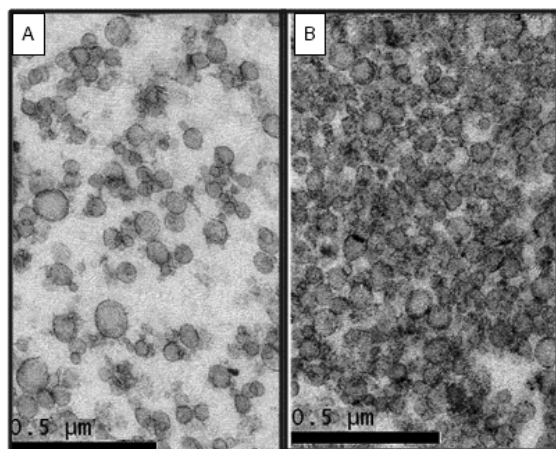
**Introduction:** Exosome are microparticles smaller than 100nm, and have been described to prevent myocardial dysfunction. In accordance, we have found large amount of electron dense lipidic exosomes (EDexo) containing collagenase, in the serum of asymptomatic indeterminate form (IF) patients (pts) with Chagas' disease (CD), in negative correlation with free collagenase. On the other hand, heart failure (HF) has been associated with increased levels of microparticles and we previously have detected pathogenic archaea in the myocardium of HFCD pts.

**Purpose:** Demonstrate that exosomes present in the serum of HF CD pts are derived from archaea, being different from EDexo present in IF CD pts.

**Methods:** Sera from 9 HF (07 males) and 13 from IF chagasic pts (04 males) were submitted to a gradient separation, with a mannitol/ sucrose rich solution. After centrifugation, the supernatant samples were rich in ED exosomes, which were studied by in situ hybridization at electron microscopy, using archaea DNA probe ARCH915. The numbers of EDexo and archaea DNA dots were counted in 4 photos representing the richest places of each case in x50K magnification. Comparison between HF and IF was performed by T test or Mann Whitney and correlation by Spearman test. A difference  $P < 0.05$  was considered significant.

**Results:** HF group presented lower numbers of ED exo than IF ( $5.6 \pm 8.3$  vs  $42.5 \pm 56.6$ ),  $P < 0.001$ , however their EDexo contained higher amount of archaeal DNA dots ( $1.5 \pm 3.0$  vs  $0.2 \pm 0.5$ ,  $P = 0.02$ ). A higher amount of extracellular archaeal DNA in HF than IF ( $63.0 \pm 150$  vs  $11.1 \pm 13.1$ ,  $P < 0.001$ ) had positive correlation with numbers of EDexo ( $r = 0.66$ ,  $P = 0.01$ ), but not in IF ( $r = 0.29$ ,  $P = 0.10$ ).

**Discussion and Conclusions :** EDexo present in the serum of HF CD pts are carrying and seem to release archaeal DNA, differently from those present in asymptomatic IF CD pts, which do not contain archaeal DNA and could have a protective role removing abnormal proteins linked to development of HF.



Electron micrography showing examples of ED exosomes in serum: A- Heart failure with lower numbers of ED exo and B-asymptomatic indeterminate form riched in ED exo.

**Key words** – Archaea, Exosome, Chagas' disease, heart failure, archaeal DNA

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