PhD Students Coffee Time

JUEVES 21/11/2019

Sala de Reuniones SEMISOTANO

15:00

Aitor Navarro Díaz

Paleobiology and theoretical biology

He says:

Anatomical Network Analysis: a tool to study relationships and organization in biological systems.

Anatomical Network Analysis (AnNA) appeared as a new mathematical framework to study the organization of gross anatomy using tools from Network Theory. Anatomical networks are abstract representations of an organism's topology that are comprised by two sets of elements: a set of nodes that represent the constituent parts of the system (e.g. bones), and a set of links that connect pairs of nodes and represent interactions or relations among them (e.g. bone sutures). In this sense, AnNA cover the suite of concepts and methods for the analysis of connectivity relations and anatomical organization in morphological systems. The aim of the conference is to introduce the basics and concepts of AnNA, as well as the multitude of statistical parameters that are useful in developmental and evolutionary studies. In this context, I present the results obtained in a particular evolutionary transition: the middle ear evolution of mammals. AnNA highlights the homology between the mammalian incus, malleus, gonial and ectotympanic bones with the quadrate, articular, prearticular and angular bones of reptiles. In addition, AnNA allows identifying the key event in this evolutionary transition: the progressive disconnection of mandibular bones that changed the modular organization of the anatomical system through five evolutionary stages.