Dear Excellence Cluster,

My name is Guillermo Torres and I plan to carry out an academic stay in the Laboratory of Biological Networks from 22. - 31. of August 2015 in Madrid. This research group offered me the possibility to learn new powerful network-based methods to analyze complex biological data that I currently use in my cluster PhD project (e.g. 16S and metagenome data from human stool samples).

In the recent years network-based approaches have emerged as a powerful tool for studying complex systems. This allows us to uncover systems organization and to understand the emergent demeanor of complex biological systems. Many diseases including inflammatory and aging processes are caused by combination of genetic perturbations and exogenic factors interacting in complex systems. In my current cluster PhD project I investigate the host-microbiome crosstalk regarding FOXO3A gene activity/variability, the inflammatory status and the age (age-range 20 – 103 years) of our study participants making use of 16S and metagenome data of human stool samples. This research involves genes, gene variation, gene activity, associated microorganisms, the inflammatiory status and different age groups of our study participants interacting with each other to form a complex interaction network, which is a clear exemplification of a complex biological system. Consequently a perturbation in one factor can be propagated through the interactions, and affect or not affect other elements in the network. Hence, this academic stay at the laboratory of Biological Networks addressed by Dr. Javier Buldú, in the Center for Biomedical Engineering of the Technical University of Madrid would be a great opportunity to learn this new and powerful network-based methods in order to apply them in the course of my cluster PhD project. Besides, to my knowledge I cannot learn this methods at the centers related to the Excellence Cluster. Hence, this trip would be a unique opportunity to engage my knowledge at this field of data analysis.

Atogether I think that I could acquire this cutting-edge data analysis methodology from an excellence group that performs state of the art research on network-based methods and that those biological applications would be really beneficial for the development of my cluster PhD project.

Yours faithfully,

Guillermo G. Torres

MSc. PhD. student