BAT STEM CELL LINES FOR BIODIVERSITY CONSERVATION AND VIRAL STUDIES

N. Aurine, C. Baquerre and Bertrand Pain
University Lyon, Université Lyon 1, INSERM, INRA, Stem Cell and Brain Research Institute, U1208, USC1361, Bron, France

Bats represent, after rodents, the largest group of mammals with more than 1,000 species, representing nearly 20% of mammalian biodiversity. Present in almost all latitudes and climates, they also occupy a very large number of ecological niches. But paradoxically, aside from studies on the ecology and adaptation to the environment of these animals, very few studies have been and are being carried out on the original physiology of these species. Their role as a reservoir of many viruses is de facto one of the first reasons to study the reproduction, metabolism, immunology and genomics of these species, disciplines closely associated with the study and understanding of the host-virus interaction. But despite their key roles in numerous ecological niches, numerous bat species are over the world also endangeered species. Understanding and deciphering their physiology is is also imperative to better protect them. Beside, bats are an important reservoir for some of the deadliest viruses, including Filoviruses, Hénipaviruses, Arenaviruses and Coronaviruses (Wang and Cowled, 2015). Most of these viruses cause haemorrhagic fevers, respiratory and neurotropic disorders in humans, livestock and wildlife, but no clinical symptoms have ever been observed in bats. Despite their key role in the outbreak and spread of these zoonotic epidemics, the physiology of the bat is poorly studied, particularly the immunology of bats and their immune response to a viral infection. Regarding the difficulty of having large colonies of bats and infected animals, an alternative is to develop in vitro models to study the cellular response and more particularly the innate immunity response, essential in the antiviral response. Here, we will present an innovative approach to generate bat stem cell lines by somatic reprogramming. By using those new non invasive procedures, those reprogrammed cells could contribute both to maintain the genotypes and biodiversity of numerous bat species and to help deciphering their role as host reservoir of numerous pathogens.