



## Ageing and telomeres in non-model organisms

**Speaker:** Alice ROUAN,

Pr. Eric Gilson's team « Telomere, Senescence and Cancer », IRCAN

**Master Class Language:** English

### Abstract:

Ageing theories have been built over years using mostly the input from mammalian models, opposing perishable soma against germline. Telomere length dynamic is one of the key mechanisms regulating ageing as those repeated sequences, located at the end of eukaryotic linear chromosomes, are shortening at each round of cell division. Excessive telomere shortening will result in unprotected DNA's ends thus leading to senescence and/or apoptosis but in the meantime preventing cancer by limiting cell proliferation. Telomere homeostasis is therefore a key mechanism which leads to premature ageing or cancer when disrupted.

Nowadays studies integrating models with extreme lifespan (bats, tortoise, killifish...) are challenging our understanding of the ageing phenomenon. In this Master Class we'll review the different theories of ageing and the recent discovery that are breaking the dogma focusing in particular in cnidarian models.

Cnidarians are well-known for their regeneration capacity coupled with long-lived mode that is rising the question of their immortality and their cell proliferation regulation. Here we will investigate coral ageing by looking at telomere length and transcriptomic signature in the model species *Stylophora pistillata*, using individuals of different ages and in nutritionally compromised ones. We will also use wild populations of 3 different cnidarians coming from the TARA-PACIFIC expedition that brought 2 600 coral samples from 32 islands of the Pacific Ocean in a global scale integrated study.

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### Technical Abstract: *Telomere length measurements:*

Since telomere shortening has been discovered to be linked to senescence in human cell culture, investigation of telomere length (TL) in human and other species has become an important research field. Depending on the type of sample and the tools available for the biological model used TL measurements can be conducted using different methods.

*In this Master Class we'll get an overview of the different available techniques, their advantages and disadvantages. The different techniques investigated will be Telomere Restriction Fragment assay (TRF), Telomeres Quantitative Genomic PCR (Telo qPCR), Flow Fluorescent In Situ Hybridization (Flow-FISH), Individual Telomere Amplification (STELA and TeSLa), New sequencing and bioinformatic Telomere measurements.*

### Technical issues and lab management of big cohort samples:

Biological studies have seen the number of samples and individuals per cohort increased exponentially both with the improvement of technologies and storage methods. Nowadays it's widely common that a project pass from hand to hand before arriving to publication step.

This new scale of sampling and time-lapse of experiment raise a challenge in every step of the research process, not only in big data analysis and storage, but also in lab management. Thus, effort must be made in order to strengthen the transparency in experimental design as well as classification to ensure a proper knowledge transfer and to avoid any information/sample loss during the research process.