

analysis, while fresh frozen tissues were used for stereological and biomolecular analysis. The absence of MHC-I expression and CD8<sup>+</sup> T cell infiltration in the sciatic nerve of ALS mice interferes with the axonal function, hampering the trigger of pro-regenerative processes which led to an anticipation of the hindlimb muscles atrophy and the motor onset of the disease. Conversely, the MHC-I depletion in resident microglia and the lack of CD8<sup>+</sup> T cell infiltration in the spinal cord protects cervical motor neurons, delaying forelimb paralysis and prolonging the overall survival of SOD1<sup>G93A</sup> mice. We suggest that the activation of MHC-I and T cells plays a contrasting role in governing the disease progression of SOD1<sup>G93A</sup> mice depending on the compartment involved. In the peripheral nervous system, the activation of MHC-I pathway and CD8<sup>+</sup> T cells promotes the collateral re-innervation of the skeletal muscles and significantly delays the disease course. On the contrary, in the spinal cord, the activation of MHC-I in the microglia cells and the massive infiltration of CD8<sup>+</sup> T cells become detrimental, leading to motor neuron degeneration. These findings offer a possible explanation for the failure of immunomodulatory therapies which target both central and peripheral nervous system and suggest new potential strategies to slow down ALS progression. Supported by the Thierry-Latran Foundation and TRANS-ALS.

### **Cognitive Impairment and oral microbiome analysis in centenarians from CaT study: preliminary data**

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**Aim:** Alterations in microbiota composition influence human health. In recent years, several studies have been conducted on human gut microbiome in all age groups. Some studies have examined centenarians' gut microbiome investigating its possible role as a marker for longevity. Sometimes the collection of this type of biological material from centenarians is extremely difficult. We sought to overcome this problem by analyzing oral microbiome from centenarians enrolled in the CaT Study. We analyzed the oral microbiome composition obtained by brushing of oral mucosa and we compared the microbiome profiles with the data collected during medical examinations. Here we present the preliminary data of oral microbiome profiles in 20 centenarians put in relation to the results with their cognitive evaluation. **Materials and methods:** The protocol of the CaT study has been published. The brushing of the oral mucosa has been performed using a standard protocol (sterile swab for oral mucosa sampling rotated under light pressure several times on the oral cavity, samples put into a sterile tube with 1 mL of sodium chloride solution and stored in freezer at -20 °C). The microbiota characterization was performed by the Ion PGM™ System on oral samples. QIIME 1.8.01 was used to process the sequence data. Operational taxonomic units (OTUs) were defined at 97% similarity and clustered against the Human Oral Microbiome Database. **Results:** Preliminary results from nonparametric correlational analyses between cognitive status and microbiome composition show significant positive correlations between scores at neuropsychological tests and specific bacteria some of which have been found relevant with respect to frailty in studies on fecal microbiome samples. These results pave the way for exploring potential markers of a specific cognitive status in centenarians. Moreover, we observed a difference between those centenarians whose oral microbiome was composed by more species (concentration threshold > 1%), with respect to those who had less. **Discussion:** Our preliminary results suggest that there is a relation

between oral microbiome and cognitive status. These results deserve further investigation, in order to explore whether a specific bacterial composition may constitute a marker of dementia-free extreme ageing. Moreover, these data could be further explored, with a larger sample size, in high vs. low performers at cognitive tests. **Conclusion:** The study of oral microbiome may be a promising tool for a deeper understanding of centenarians. Moreover, a comparison of oral and gut microbiome and their relationship with cognitive status could be an interesting future development.