**Conclusion SMARTFISH**

The expression of trout IL-2 and IL-21 in immune related tissues and induced expression by bacterial and viral infection suggests that both cytokines are important players in host defence in salmonids. Further experiments can now test other potential actions of the rIL-2, including whether it can have adjuvant activity in fish vaccines against bacterial and virus diseases. Trout rIL-21, with the ability to drive the expression of IFN-γ, IL-10 and IL-22, signature cytokines for Th1-, Th2- and Th17-type responses respectively, may become an important tool to investigate the existence and differentiation of Th cells in fish. In addition, trout IL-21 might be a good candidate as an adjuvant for the future development of effective vaccines against fish diseases.