Microfluidic device and method for enzymatic processing of macromolecules

A microfluidic device and method for enzymatic processing of ultra-long macromolecules is disclosed. The device comprises a reaction chamber with a first manifold, a second manifold, and a plurality of reaction channels, each reaction channel extending from the first manifold to the second manifold. The device further comprises first inlet and outlet channels for filling the reaction channels via the manifolds with one or more macromolecule containers suspended in a first carrier fluid, wherein the first inlet and outlet channels are configured such that a flow established from the first set of inlets to the first set of outlets is guided through the reaction channels, and second inlet and outlet channels for feeding an enzymatic reagent to the reaction chamber essentially without displacing the macromolecule containers trapped in the reaction channels, wherein the second set of inlets and outlets are configured such that a flow established from the second inlet to the second outlet is guided through at least one of the manifolds and bypasses the reaction channels.