Institut Européen de Chimie et Biologie

I E C B

Soutenance de thèse

Functional study of human RNA Polymerase III specific subunits hRPC62 and hRPC39.

Leyla EL AYOUBI
IECB/U869, Equipe M. Teichmann

In eukaryotes, nuclear transcription is carried out by DNA dependent RNA polymerases (Pol) I, II and III. Pol I transcribes ribosomal RNA's, Pol II produces essentially messenger and micro RNA's whereas Pol III transcribes small untranslated RNA's involved in a variety of cellular processes such as translation, splicing or the regulation of transcription. Human Pol III is a multi-subunit enzyme composed of 17 subunits. The majority of these subunits are homologous or closely related to Pol II and/or Pol I subunits. However, five subunits are specific to Pol III with no counterparts in Pol I or Pol II. One of the Pol III specific subunits, hRPC32 has two paralogues, α and β, expressed from two different genes. hRPC32β is expressed ubiquitously while hRPC32α expression is specific to transformed or non-differentiated cells. Within the Pol III enzyme, hRPC32α or β associate with two other Pol III specific subunits, hRPC62 and hRPC39, to form stable ternary sub-complexes thought to be implicated in transcription initiation. The purpose of this work was to clarify the functional mechanism of hRPC32α/β-hRPC62-hRPC39 sub-complexes.
In this study, we first mapped the protein-protein interaction of hRPC62 with hRPC32α and hRPC32β. In addition, we analyzed biochemical and functional properties of hRPC62 and hRPC39. We also investigated functional similarities between hRPC62 and TFIIEα, a Pol II general transcription factor shown to have structural similarities with hRPC62. Our data offer a new vision of Pol III transcription with respect to its mechanism and its implication in various cellular processes.

Institut Européen de Chimie et Biologie
2, rue Robert Escarpit - 33607 Pessac, France
Tél. : +33(0)5 40 00 30 38 - Fax. : +33(0)5 40 00 22 15
www.iecb.u-bordeaux.fr