

## A FRACTION OF MCM 2-7 PROTEINS REMAINS ASSOCIATED WITH REPLICATION FOCI DURING A MAJOR PART OF S-PHASE

Martin Mašata<sup>1,2</sup>, Pavel Jůda<sup>1</sup>, M. Cristina Cardoso<sup>2,3</sup> and Ivan Raška<sup>1+</sup>

<sup>1</sup>First Faculty of Medicine, Charles University in Prague and Institute of Physiology, ASCR, v.v.i, Albertov 4, 128 00 Prague, Czech Republic

<sup>2</sup>Max Delbrück Center for Molecular Medicine, D-13125 Berlin, Germany

<sup>3</sup>Technische Universität Darmstadt, D-64287 Darmstadt, Germany

<sup>+</sup>E-mail : [iraska@lf1.cuni.cz](mailto:iraska@lf1.cuni.cz)

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At the end of G1 phase, the MiniChromosome Maintenance (MCM) 2-7 proteins are bound to chromatin in excess with respect to the number of replication origins and the role of these proteins in the initiation of DNA replication in all eukaryotes is well known [1]. However, there is a discrepancy about their participation in replication elongation. In the yeasts, several studies have demonstrated that all MCM 2-7 proteins are necessary not only for initiation but also for replication elongation [e.g. 2]. This is further supported by the structure of MCM 2-7 complex that shows similarities to known DNA helicases and by observations that the complex of MCM 4, 6 and 7 has helicase activity *in vitro* [e.g. 3]. However, immunofluorescence studies in mammalian cells have shown that MCM 2-7 proteins are displaced from sites of DNA replication and are present only on unreplicated chromatin [e.g. 4]. In order to reconcile this discrepancy, we implemented a novel methodical approach, that also included the robust cross-correlation analysis, to more precisely analyze immunofluorescence localization of MCM proteins with respect to DNA replication sites in HeLa cells. We showed that despite the predominantly different localization of MCM and replication signals during S-phase, there was a significant fraction of MCM proteins that co-localized with DNA replication sites throughout most of S phase. The fluorescence localization of MCM proteins and DNA replication apparently reflects the fraction of the MCM complex functionally active at the replication fork, which is in harmony with a role of the MCM complex as the replicative DNA helicase. This work was supported by Czech grants MSM0021620806, LC535, AV0Z50110509 (to I.R.) and DFBF grant (to M.C.C.).

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