Assessing the ERG rearrangement for clinical use in patients with prostate cancer

av

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Abstract

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In Sweden, close to 10 000 men are annually diagnosed with prostate cancer (PCa) and approximately 2400 men die of their disease each year. Today there is no reliable marker that can separate patients who will have an aggressive type of disease that requires treatment, from patients who will have a more indolent clinical course and can be left untreated. This further leads to the current problem of over treatment of men with PCa. Hence, there is an urgent need for reliable prognostic markers that can be used at time of diagnosis. With the discovery of recurrent gene rearrangements in PCa, most commonly *ERG* rearrangements, hope came that this aberration could play a role in diagnosis and/or prognosis of the disease.

The aim of this thesis was to investigate the clinical implication of *ERG* rearrangements in the management of PCa.

The work in this thesis supports the findings from previous studies, suggesting that the *ERG* rearrangement is a sign of a more aggressive type of cancer. The major findings are that in multifocal PCa, the *ERG* rearranged cancer foci are more prone to metastatic dissemination compared to foci without the *ERG* rearrangement and that patients harboring the *ERG* rearrangement have a faster disease progression leading up to earlier start of hormonal treatment. Furthermore, the results add an additional level of complexity in a subset of PCa tumors that harbor multiple gene rearrangements on the cellular level. The result also show that the newly available ERG antibody is highly predictive of *ERG* rearrangement and is appropriate to use when faced with limitations in tissue amounts.

The findings in this thesis indicate that the *ERG* rearrangement has a potential role in the clinical management of PCa but further studies are required.

Keywords: Prostate cancer, prognosis, biomarkers, ETS genes, ERG rearrangement, fluoroscence in situ hybridization.

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