

Evidence of the nerve-cancer connection in female reproductive cancers †

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Abstract: In recent years, the infiltration of tumours by axons or nerves has been increasingly reported and has been linked to poor prognosis. This includes, among others, publications by Magnon et al (Science 341, 2013); and our own work (Faulkner et al., FASEB BioAdvances 2, 2020). Thus, recent investigations have been defying the old mechanistic, non-participating, view of the role of the nervous system in the tumour microenvironment. The “nerve-cancer connection” now is believed to encompass novel therapeutic targets already reported for breast, prostate and gastric cancers. However, the role of the autonomic nervous system in ovarian cancer development and progression remains unclear. We aimed to characterize this new component in ovarian tumours microenvironment. We identified the infiltration of peripheral axons in some ovarian tumours. In addition, ovarian tumours expressed neurotrophins, including nerve growth factor (NGF), in particular in the initial onset of the tumour. Our work exposes the need to further comprehend the role of the nervous system in female cancers, namely in the unique microenvironments of ovarian tumours.

Keywords: ovarian cancer; nerves; cancer; peripheral nervous system; NGF