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Heterocyclic chalcone derivatives: Synthesis and biological activity evaluation

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Aim: Synthesis of new heterocyclic chalcone derivatives with promising antitumor activity.

Introduction: Natural chalcones have been intensively studied for their wide range of biological activities, namely antitumor.[1] Possessing two electrophilic reactive centers at α,β-unsaturated ketone group, chalcone derivatives can participate in addition reactions leading to the synthesis of promising bioactive compounds with a more rigid structure, like isoxazoles and pyrazoles.[2]

Methods: Chalcones were synthesized by base catalysed Claisen Schmidt condensation via microwave assisted organic synthesis (MAOS). The antiproliferative activity was assessed using sulforhodamine B assay.[3]

Results: Seventeen chalcone derivatives were synthesized and identified as having in vitro growth inhibitory activity on three human tumor cell lines from breast, lung and melanoma (MCF-7, NCI-H460, and A375-C5).

Conclusion: Most of the synthetized chalcones revealed to be promising growth inhibitors of human tumor cell lines. The molecular mechanisms involved in their antiproliferative effect are being evaluated.

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A posttranslational modification in histones as prognostic/predictive marker in Estrogen-Positive Breast Cancer

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Aim: This work aims to evaluate H3K27me3 expression in luminal-like breast tumors, using immunohistochemistry assay, to assess the prognostic value of this epigenetic alterations in estrogen positive breast cancer (BrC).

Introduction: BrC is the second most incident cancer worldwide. In Portugal, in 2012, BrC was simultaneously the leading cancer in incidence and mortality in women.[1] Around 70% of all BrC are hormone-receptor positive, that is the major part of breast tumors is luminal-like.[2] H3K27m3 is a gene repression marker[3,4] and is associated with gene silencing, playing a crucial role in cell proliferation and differentiation.[3] H3K27me3 may have some clinical value in several types of cancer since it can be used as a biomarker. This histone modification has been associated with poor prognosis of some BrC subtypes.[5]

Methods: It was used a cohort of BrC patients of the Portuguese Oncology Institution of Porto (IPO-Porto), diagnosed between 1994 and 2002. A total of 102 luminal-like tumor cases were assessed by immunohistochemistry, to H3K27me3 expression. To verify the prognostic value of H3K27me3 levels, Cox regression with a log rank test was performed for both disease-specific and disease-free survival.

Results: Through the result analysis, it was established that only tumor grade ($p = 0.021$) was significant associated with disease-specific survival. Nevertheless, both luminal subtype ($p = 0.016$) and H3K27me3 expression ($p = 0.012$) were significantly associated with disease-free survival. Indeed, H3K27me3 high expression is associated with higher recurrence risk, especially in Luminal A.

Conclusion: We could confirm the prognostic value of H3K27me3 expression in luminal A subtype BrC patients. Therefore, higher H3K27me3 expression in luminal A tumors is associated with a greater probability of recurrence.

However, studies in larger cohorts are mandatory to validate its clinical utility.

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