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Kristy A. Brown · Evan R. Simpson

Obesity and Breast Cancer

The Role of Dysregulated Estrogen
Metabolism

Kristy A. Brown
Evan R. Simpson
Metabolism and Cancer Laboratory
Prince Henry's Institute
Clayton, VIC
Australia

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Introduction

Despite the decreased mortality rates attributable to breast cancer in women, the number of cases diagnosed has steadily increased over the past 30 years. This is believed to be due, at least in part, to an increased prevalence of obesity not only in the Western world, but also in other parts of the world where obesity has only recently reached epidemic proportions. The risk of breast cancer increases with age and a strong correlation between obesity and the risk of breast cancer in postmenopausal women is well established. The majority of postmenopausal breast cancers are hormone receptor positive and rely heavily on estrogens produced from the adipose tissue for growth. The enzyme responsible for the final and key step in estrogen biosynthesis, aromatase, is increased in the adipose tissue in response to factors produced in obesity, including adipokines, inflammatory cytokines, and prostaglandins, as well as insulin. Novel therapies are now being considered in light of evidence suggesting that obesity may affect current endocrine therapy, as well as the identification of novel pathways involved in estrogen regulation, including metabolic pathways that can be targeted by drugs currently used for the treatment of other obesity-related diseases. The current work aims to provide a comprehensive view of the relationship between obesity and breast cancer with particular emphasis on the role of dysregulated estrogen metabolism.