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A human relevant rat model of breast cancer

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Estrogen receptor (ER) status is an important prognostic factor of human breast cancer. ER+ breast cancers, which make up 95% of human breast cancers, have a good prognosis because the growth of these tumors is dependent on estrogen. A human-relevant, ER+ rodent model of breast cancer in which estrogen induces mammary tumors, would be immensely valuable for testing prevention and treatment options for breast cancer. The ACI rat model is the only rat model known to develop estrogen responsive mammary tumors when exposed to estrogen alone, without carcinogens. The E2-induced tumors in the ACI rats express ER? and are abolished by the estrogen antagonist tamoxifen. The drawback to the ACI rat is a propensity for pituitary tumors which can cause morbidity and mortality. A new rat strain, ACE, derived from the ACI rat, develops mammary tumors in response to E2, but with a reduced incidence of pituitary tumors. We are investigating whether ACE mammary tumors are ER+ and respond to tamoxifen. If mammary tumors in ACE rats are estrogen responsive, this model will be ideal for studying breast cancer prevention. Women are exposed to hundreds of chemicals in their diet and lives which may have a subtle or delayed effect in promoting or protecting them from breast cancer. It is impossible using clinical studies to identify a strong effect of a single agent. Because this model is highly relevant to human disease, it will allow us to determine the effects associated with modest exposure to dietary chemicals and lifestyles.