Example: Basic Science Research Proposal

RSP Proposal Form

Background: PRL-omas are a common tumor of the pituitary gland, and localize in peripheral margins of the pituitary gland. These tumors also appear to recruit a blood supply from the systemic vasculature, thus bypassing the normal hypothalamo-hypophyseal blood supply containing high levels of dopamine. Dopamine normally prevents hypertrophy and hyperplasia of mammotrophs. The tissue-level events that may be contributing to the altered blood supply are not known. FGF (bFGF) is known to have potent angiogenic functions, and can now be localized within the pituitary gland, and preliminary evidence indicates high levels of bFGF within the pituitary gland.

Statement of the Problem: Improving our understanding of the tissue-level events that may contribute to the altered blood supply of the pituitary gland has the potential to benefit diagnosis and management of these tumors.

Hypothesis: This study will investigate the possibility that release of bFGF in peripheral sites of the pituitary gland may be an important contributor to the development of PRL-omas. We propose that release of bFGF at peripheral sites of the gland, i.e., the dominant site of mammotrophs, results in recruitment of systemic vessels into the pituitary leading to mammotroph hypertrophy, hyperplasia and tumor formation.

Study Design: PRL-omas will be induced (in ovx rats) by silastic implants of 17-beta-estradiol benzoate, i.e., an established methodology for the induction of PRL-omas. Rats will be sacrificed after 10-20 days, pituitaries isolated by routine methods for immunostaining of bFGF and PRL. The presence of "new" systemic blood vessels will be evaluated by morphological criteria (LM and TEM) and the use of polystyrene microsphere labeling since the microspheres can only access the pituitary gland from systemic vessels (larger than capillaries of normal pituitary blood flow).