**Estrogen effects on microvascular protection under ischemic conditions – role of the two estrogen receptors ERα and ERβ**

The hormone 17β-estradiol (estrogen, E2) and its estrogen receptors ERα and ERβ have protective effects on stroke and myocardial infarction in animal models. This opposes the output of several clinical studies which revealed, that long term treatment with estrogens leads to an increased risk of dementia and stroke or myocardial infarction. This controversy shows that there is a clear need for a better understanding of the action of estrogen and the relative roles of ERα and ERβ in the prevention of stroke and myocardial infarction. In an attempt to dissect the relative role of ERα and ERβ in protection from ischemic insult, the use of ERα and ERβ−/− mice was initiated in experimental models and highly controversial results were obtained. In proposed project, a dissemination of the molecular roles of ERα and ERβ in vascular protection in brain and the myocard under ischemic conditions shall be addressed in vivo and in vitro in a concerted manner. For this, in vitro studies on brain and myocardial microvascular endothelial cell lines from ERα and ERβ−/− mice shall be coordinated and compared with in vivo studies in animal models of stroke and myocardial infarction of wild type mice, ERα mice and ERβ mice treated or untreated with E2. Potential roles of the two ERs in promoting the integrity of brain and myocardial vasculature will be assessed, and the potential use of selective estrogen receptor modulators (SERMs) will be evaluated.

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