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Prostaglandin D Synthase: Development of Analytical Methodology and Preliminary Clinical Studies

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We have developed mouse monoclonal antibodies against prostaglandin D synthase (PGD synthase) using recombinant protein as immunogen. The antibodies were used to construct a two-site "sandwich-type" assay for PGD synthase using time-resolved fluorometry as a detection technique. The assay has a detection limit of 0.05 µg/L and is precise (CVs <10%) and accurate. Excellent specificity was achieved as assessed by various criteria. Using this assay, we have measured PGD synthase concentrations in serum, urine, amniotic fluid, cerebrospinal fluid (CSF), seminal plasma, breast cyst fluid, breast discharge fluid, breast milk and breast tumor extracts. Highest levels were present in CSF. In amniotic fluid, we identified proteolytic degradation of PGD synthase. Fetal tissues contained varying amounts of the enzyme with highest levels found in brain and heart. In placental extracts, PGD synthase content was highest at 11-28 weeks gestation, in accordance with levels in amniotic fluids of this gestational period.

Conclusion: We conclude that PGD synthase is very ubiquitous and is present in many fluids and tissues of adults and fetuses. This first quantitative and sensitive PGD synthase assay will facilitate expansion of knowledge on this enzyme and possibly find applications for diagnosis and monitoring of human disease.