Glial fibrillary acid protein (GFAP) is used commonly as a marker of astrogliosis and
astrocyte activation in several situations involving brain injury. Its content may be
measured by immunocytochemistry, immunoblotting or enzyme-linked immunosorbent
assay (ELISA), usually employing commercial antibodies. Two major post-translational
modifications in GFAP (phosphorylation and proteolysis) may alter the interpretation of
results or for immunoassay standardization. This study using a non-sandwich ELISA aimed
to investigate the putative changes in the immunorecognition due to the phosphorylated
state of the antigen by a routinely used polyclonal anti-GFAP antibody from DAKO.
Results involving *in vitro* phosphorylation of purified GFAP or biological samples (brain
tissue, cell culture and cerebrospinal fluid) mediated by protein kinase dependent on cAMP
indicate that GFAP phosphorylation improves the recognition by the used antibody. These
results provide support to the understanding of fast changes in the GFAP-immunoreactivity
and suggest that caution is necessary in the interpretation of results using this antibody, as
well as indicate that the effect of post-translational modifications must be considered during
the standardization of immunoassays with other antibodies.