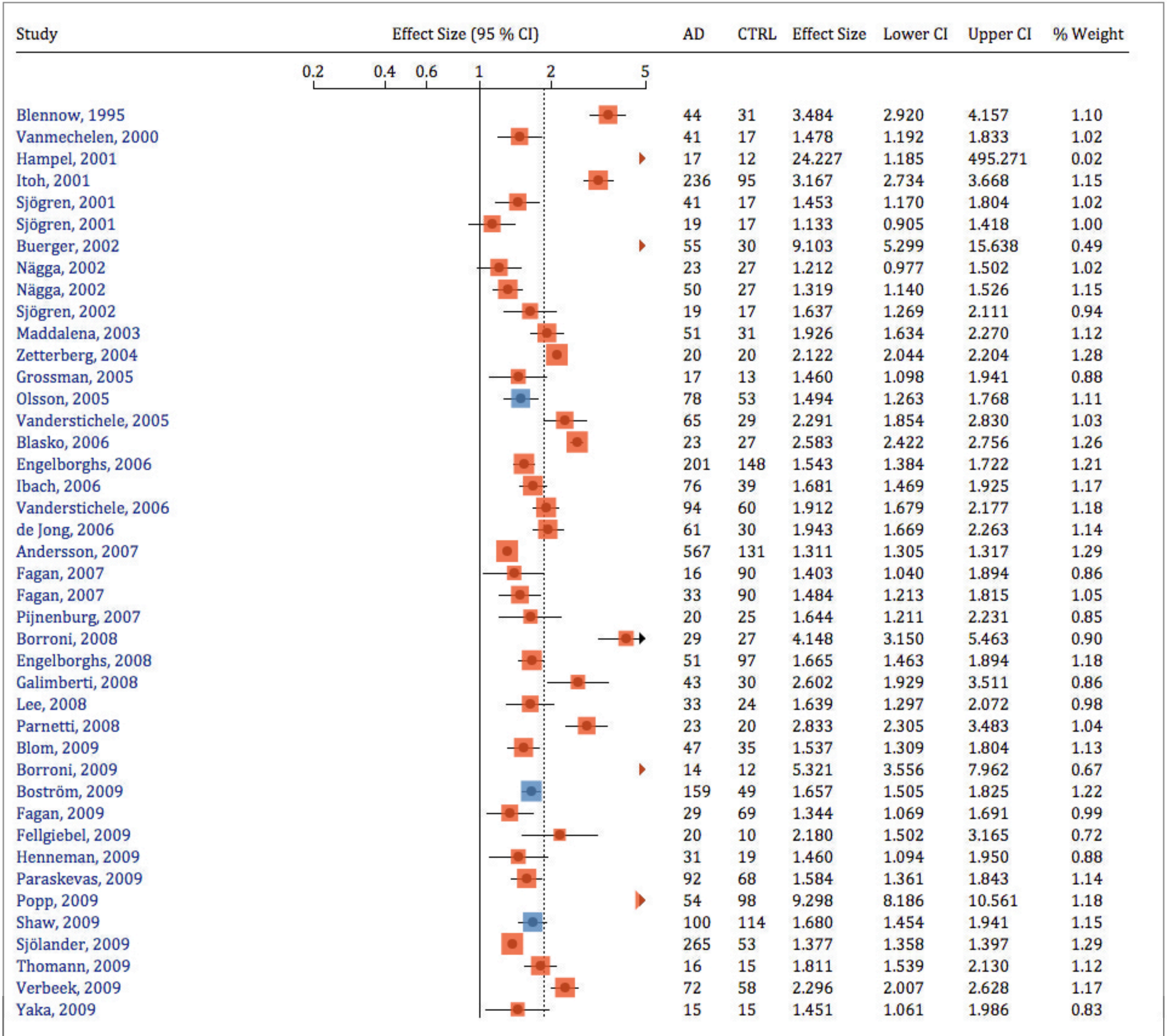


# ALZBIOMARKER

## Alzheimer's Disease vs Control: tau-phospho (CSF)

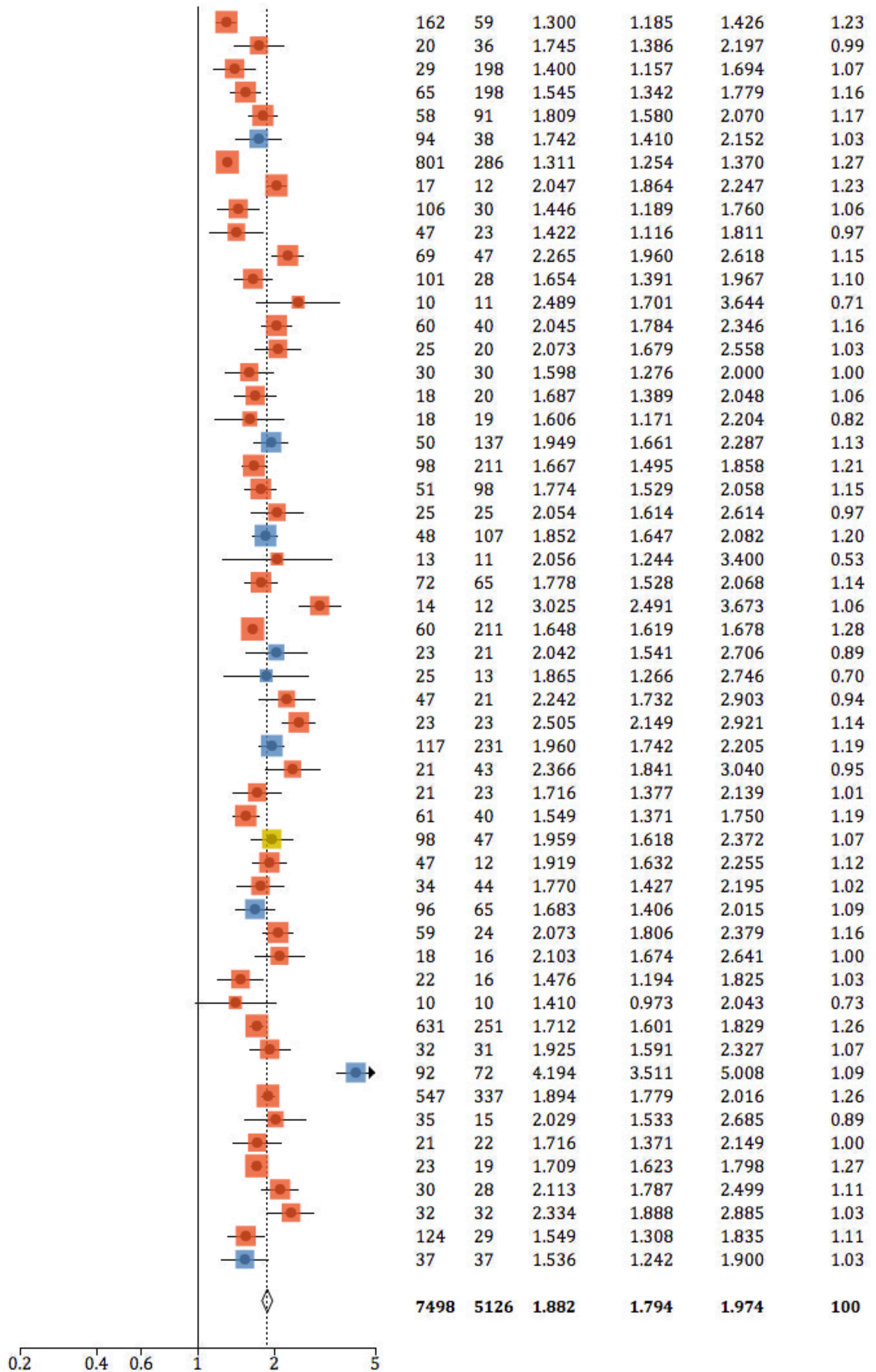
**Meta-analysis Results:** A large number of studies over the past 20 years have quantified phosphorylated tau protein in the cerebrospinal fluid of people with Alzheimer's disease. Meta-analysis of 94 studies shows a highly significant increase in the AD group, with overall levels being nearly twofold higher than controls (effect size = 1.882,  $p < 0.0001$ ). This meta-analysis includes all phospho epitopes of tau; however, the majority of assays used antibodies targeting p181. Levels of phospho-tau in CSF are thought to reflect neurofibrillary tangle pathology in the brain.

ELISA
Electrochemiluminescence
xMAP





Zhang, 2009  
 Alves, 2010  
 Craig-Schapiro, 2010  
 Craig-Schapiro, 2010  
 Exalto, 2010  
 Hertze, 2010  
 Landgren, 2010  
 Mulder, 2010  
 Riepe, 2010  
 Sluimer, 2010  
 Spies, 2010  
 Sundelöf, 2010  
 Thorsell, 2010  
 Verwey, 2010  
 Bibl, 2011  
 Bjerke, 2011  
 Johansson, 2011  
 Rami, 2011  
 Shi, 2011  
 Tarawneh, 2011  
 Arlt, 2012  
 Bartos, 2012  
 Hall, 2012  
 Malnar, 2012  
 Rosén, 2012  
 Santos, 2012  
 Tarawneh, 2012  
 Abraham, 2013  
 Hu, 2013  
 Kaerst, 2013  
 Kandimalla, 2013  
 Kramberger, 2013  
 Krut, 2013  
 Li, 2013  
 Luo, 2013  
 Molinuevo, 2013  
 Molinuevo, 2013  
 Molinuevo, 2013  
 Olsson, 2013  
 Alcolea, 2014  
 Arodin, 2014  
 Arodin, 2014  
 Deuschle, 2014  
 Duits, 2014  
 Hanzel, 2014  
 Hertze, 2014  
 Kester, 2014  
 Kristofikova, 2014  
 Li, 2014  
 Lodeiro, 2014  
 Monge-Argilés, 2014  
 Schmidt, 2014  
 Slaets, 2014  
 Wagshal, 2014



**How to interpret a forest plot:** Each individual effect size (ES) is a ratio of the mean biomarker level in one condition over the mean level in another condition. An ES equal to 1 means that the two conditions had identical mean values. An ES > 1 indicates higher levels in the first condition, whereas an ES < 1 indicates lower levels in the first condition. The overall ES, indicated by a black diamond, is a weighted average of the individual effect sizes. The weight of each data point was determined by the inverse of the variance and is



*reflected in the size of each square. The width of the overall ES diamond is determined by the 95 percent confidence interval. Data out of range of the scale, including ES and confidence intervals, are indicated by an arrowhead at the edge of the plot, when applicable.*