Abstract # 1844

A high-sensitivity magnetic multiplex assay detects changes in plasma concentrations of interleukin-6 induced by the Trier Social Stress Test

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Concern exists about whether or not multiplex assays are sensitive enough to detect subtle yet biologically relevant changes in circulating concentrations of inflammatory biomarkers such as interleukin (IL)-6 in healthy humans. We tested two different multiplex kits (human Magnetic Luminex Performance Assay, R&D Systems [Minneapolis, MN]; and human Cytokine/Chemokine Magnetic Bead Panel, Millipore [Billerica, MA]) to detect IL-6 concentration changes versus a high sensitivity (HS)-ELISA (R&D Systems) plasma collected from eighteen healthy adults (mean age 35.3 [SD = 8.88]) (10 women) before and 90 and 210 min after the start of an acute laboratory psychosocial stressor, the Trier Social Stress Test (TSST). Multiplexes were completed per manufacturer instructions and analyzed using a MAGPIX (Luminex, Austin, TX). For the R&D multiplex, IL-6 was detected in all samples and values were associated with concentrations determined by HS-ELISA (r = 0.81, p < 0.001). For the Millipore multiplex, IL-6 was detected in only 83% of the samples and values were not correlated with those determined by HS-ELISA (p = 0.46). To examine associations between IL-6 responses to the TSST we computed areas under the curve (AUCs) using the trapezoidal method. AUCs were positively correlated between the R&D multiplex and HS-ELISA (r = 0.83, p = 0.001), but not between the Millipore multiplex and HS-ELISA. These results suggest that certain multiplex assays may be able to detect changes in plasma concentrations of IL-6 as a result of TSST challenge.

http://dx.doi.org/10.1016/j.bbi.2016.07.125

Abstract # 1847

Cross-sectional and longitudinal associations between immune cells in blood and brain – A TSPO PET study in healthy control subjects


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The interaction between immune cells in the periphery and brain in humans is poorly understood, partly due to the lack of in vivo studies. Here, we examined 32 healthy individuals using positron emission tomography (PET) and [11C]PBR28, a radioligand for the 18-kDa translocator protein (TSPO) which is expressed in immune cells both in brain and blood. In 26 individuals, two measurements were performed. In a subgroup of 19 individuals, of which 12 had repeat examinations, leukocyte numbers in blood was measured on each day of PET measurements. We assessed TSPO binding expressed as total distribution volume of [11C]PBR28r in brain and in blood cells. TSPO binding in brain was strongly and positively correlated to binding in blood cells at baseline (r = 0.85, p = 2.1 × 10^-9), corrected for TSPO genotype). A correlation was also observed when analyzing change in TSPO levels in brain and blood between two PET examinations (r = 0.60, p = 0.002). Finally, there was a significant correlation between change of leukocyte numbers and change in brain TSPO binding, and a trend-level correlation to TSPO change in blood cells (r = 0.63, p = 0.038; r = 0.5, p = 0.052). These findings indicate a functional association between immunological cells in blood and brain at physiological conditions, such as interchange of peripherally derived cells or a common regulatory mechanism.

http://dx.doi.org/10.1016/j.bbi.2016.07.127