The role of microglia in neurodegeneration, toxicology and immunity is an expanding area of biomedical research requiring large numbers of animals. Use of a microglia-like cell line would accelerate many research programmes and reduce the necessity of continuous cell preparations and animal experimentation, provided that the cell line reproduces the in vivo situation or primary microglia (PM) with high fidelity. The immortalised murine microglial cell line BV-2 has been used frequently as a substitute for PM, but recently doubts were raised as to their suitability. Here, we re-evaluated strengths and potential short-comings of BV-2 cells. Their response to lipopolysaccharide was compared with the response of microglia in vitro and in vivo. Transcriptome (480 genes) and proteome analyses after stimulation with lipopolysaccharide indicated a reaction pattern of BV-2 with many similarities to that of PM, although the average upregulation of genes was less pronounced. The cells showed a normal regulation of NO production and a functional response to IFN-gamma, important parameters for appropriate interaction with T cells and neurons. BV-2 were also able to stimulate other glial cells. They triggered the translocation of NF-kappaB, and a subsequent production of IL-6 in astrocytes. Thus, BV-2 cells appear to be a valid substitute for PM in many experimental settings, incuding complex cell-cell interaction studies [1)].

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Henn A, Lund S, Hedtjärn M, Schrattenholz A, Pörzgen P, Leist M. The suitability of BV2 cells as alternative model system for primary microglia cultures or for animal experiments examining brain inflammation. ALTEX. 2009;26(2):83-94. PubMed PMID: 19565166.