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Function of novel Iba1-positive cells appearing in the ischemic core

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Brain ischemia induces massive cell death, and ischemic core is considered to be an unsalvageable necrotic tissue. However, we previously demonstrated that cerebral ischemia induces the multipotent stem cells (ischemia-induced multipotent stem cells: iSCs) in the ischemic core, and iSCs are originated from brain vascular pericytes. In this study, we revealed that there were Iba1-positive cells in the ischemic core, and they expressed Nestin (stem cell marker) and PDGFR β (pericyte marker). Parabiosis between GFP-expressing mouse and wild-type mouse showed that these novel Iba1-positive cells were not derived from peripheral blood cells. Microarray analysis revealed that they expressed more abundant vascular development-related genes compared to other type of Iba1-positive cells in the peri-ischemic cortex, intact cortex, or infant cortex. These results suggest that ischemic core-resident Iba1-positive cells may affect the appearance and maintenance of vascular pericyte-derived iSCs. We confirmed that deprivation of ischemic core-resident Iba1-positive cells inhibited the formation of iSCs spheres derived from ischemic core. In conclusion, our present study revealed the appearance of new type of Iba1-positive cells in the ischemic core and their functions, which may be involved in regenerative process in ischemic brain.