CLAIMS

1. Use of the HIP/PAP protein of SEQ ID N°1 or of a protein derivative thereof comprising an amino acid sequence having at least 90% amino acid identity with a polypeptide selected from the group consisting of the polypeptides of SEQ ID N° 1 to 3, for manufacturing a medicament, for increasing the complexity and branch points of neurites in the brain, for preventing or treating a disease selected from the group consisting of:

- a neonatal brain injury, which includes a neonatal brain injury caused by a brain hypoxia,
- an adult or child brain injury, which includes an adult or child brain injury caused by a brain hypoxia,
- an adult or child or neonatal traumatic brain injury,
- a cerebellar disease or disorder, and
- a disease involving a defect in the production or in the phosphorylation of Gap-43.

2. The use according to claim 1, wherein neonatal brain injury encompasses a pathological state selected from the group consisting of foetal hypoxemia, perinatal hypoxemia, foetal ischemia, perinatal ischemia, and an excess release of excitatory neurotransmitters.

3. The use according to claim 1, wherein the said neonatal, adult or child brain injury consists of a cerebrovascular accident, which includes stroke.

4. The use according to claim 1, wherein the said neonatal, adult or child brain injury is selected for the group consisting of ischemic stroke and hemorrhagic stroke.

5. The use according to claim 1, wherein the said cerebellar disease or disorder is a cerebellar ataxia.

6. The use according to claim 1, wherein the said disease involving a defect in the production or in the phosphorylation of Gap-43 consists of Alzheimer's disease.

7. The use according to any one of claims 1 to 6, wherein the HIP/PAP protein or a protein derivative thereof exerts a protective effect against neuronal cell apoptosis or against neuronal cell death.

8. The use according to any one of claims 1 to 7, wherein the said HIP/PAP protein derivative is selected from the group consisting of a biologically active portion of a HIP/PAP protein and HIP/PAP chimeric or fusion proteins.

9. The use of a HIP/PAP protein of SEQ ID N°1 or of a protein derivative thereof comprising an amino acid sequence having at least 90% amino acid identity with a polypeptide selected from the group consisting of the polypeptides of SEQ ID N° 1 to 3,for increasing the complexity and branch points of neurites, for the *in vitro* culturing of neuronal cells.

10. A culture medium for neuronal cells comprising a HIP/PAP protein of SEQ ID N°1 or of a protein derivative thereof comprising an amino acid sequence having at least 90% amino acid identity with a polypeptide selected from the group consisting of the polypeptides of SEQ ID N° 1 to 3,for increasing the complexity and branch points of neurites.

11. Use of the HIP/PAP protein of SEQ ID N°1, or of a protein derivative thereof comprising an amino acid sequence having at least 90% amino acid identity with a polypeptide selected from the group consisting of the polypeptides of SEQ ID N° 1 to 3, for manufacturing a medicament for increasing brain neuroplasticity in a subject in need thereof, wherein said subject have undergone a disease selected from the group consisting of:

- a neonatal brain injury, which includes a neonatal brain injury caused by a brain hypoxia,
- an adult or child brain injury, which includes an adult or child brain injury caused by a brain hypoxia,
- an adult or child or neonatal traumatic brain injury, and acquired cerebellar ataxia.

CLAIMS

1. Use of the HIP/PAP protein of SEQ ID N°1 or of a protein derivative thereof comprising an amino acid sequence having at least 90% amino acid identity with a polypeptide selected from the group consisting of the polypeptides of SEQ ID N° 1 to 3, in the manufacture of a medicament for the prevention or treatment of a disease selected from the group consisting of:

- a neonatal brain injury, which includes a neonatal brain injury caused by a brain hypoxia,
- an adult or child brain injury, which includes an adult or child brain injury caused by a brain hypoxia,
- an adult or child or neonatal traumatic brain injury,
- a cerebellar disease or disorder, and
- a disease involving a defect in the production or in the phosphorylation of Gap-43,

by increasing the complexity and branch points of neurites in the brain.

2. The use according to claim 1, wherein neonatal brain injury encompasses a pathological state selected from the group consisting of foetal hypoxemia, perinatal hypoxemia, foetal ischemia, perinatal ischemia, and an excess release of excitatory neurotransmitters.

3. The use according to claim 1, wherein the said neonatal, adult or child brain injury consists of a cerebrovascular accident, which includes stroke.

4. The use according to claim 1, wherein the said neonatal, adult or child brain injury is selected for the group consisting of ischemic stroke and hemorrhagic stroke.

5. The use according to claim 1, wherein the said cerebellar disease or disorder is a cerebellar ataxia.

6. The use according to claim 1, wherein the said disease involving a defect in the production or in the phosphorylation of Gap-43 consists of Alzheimer's disease.

7. The use according to any one of claims 1 to 6, wherein the HIP/PAP protein or a protein derivative thereof exerts a protective effect against neuronal cell apoptosis or against neuronal cell death.

8. The use according to any one of claims 1 to 7, wherein the said HIP/PAP protein derivative is selected from the group consisting of a biologically active portion of a HIP/PAP protein and HIP/PAP chimeric or fusion proteins.

9. Use of the HIP/PAP protein of SEQ ID N°1, or of a protein derivative thereof comprising an amino acid sequence having at least 90% amino acid identity with a polypeptide selected from the group consisting of the polypeptides of SEQ ID N° 1 to 3, in the manufacture of a medicament for for the prevention or treatment of a disease selected from the group consisting of:

- a neonatal brain injury, which includes a neonatal brain injury caused by a brain hypoxia,
- an adult or child brain injury, which includes an adult or child brain injury caused by a brain hypoxia,
- an adult or child or neonatal traumatic brain injury, and acquired cerebellar ataxia,

by increasing brain neuroplasticity.

10. Use of the HIP/PAP protein of SEQ ID N°1, or of a protein derivative thereof comprising an amino acid sequence having at least 90% amino acid identity with a polypeptide selected from the group consisting of the polypeptides of SEQ ID N° 1 to 3, for manufacturing a medicament for preventing or treating a neonatal brain injury, which includes a neonatal brain injury caused by a brain hypoxia.