

Development of Drink for Cranial Nerve

Protectionbiopharmaceuticals of Platelet-Rich Plasma for Therapeutic Canine Stem Cell Lines

I. Title of Research: Development of Drink for Cranial Nerve Protectionbiopharmaceuticals of Platelet-Rich Plasma for Therapeutic Canine Stem Cell Lines

II. Research Team Members

Department	Name	Position
General Research Service Center	Chao-Hung Chen	Assistant Professor Rank Research Fellow
Graduate Institute of Animal Vaccine Technology	Guan-Ming Ke	Professor

III. Description of Industrial Needs and Research Result Applications

Platelet-Rich Plasma (PRP) is a blood derivative rich in growth factors and cytokines that can stimulate tissue regeneration and repair. Autologous and homologous PRP are two different approaches to harnessing the therapeutic potential of platelets in regenerative medicine. The main differences between these techniques are the source of PRP and its application. Autologous PRP is isolated from the patient himself, and its significant advantage is its safety, which minimizes the risk of adverse reactions or immune reactions. However, the production of autologous PRP is limited, the production cost is high, and the treatment process requires high costs and time. Homologous PRP is obtained from the blood of healthy donors and usually requires careful screening and purification processes to ensure the safety and tissue compatibility of the recipient patients. Clinically, homologous PRP has been shown to have advantages in efficacy compared with autologous PRP. Therefore, commercializable homologous PRP is an important development focus of related biological agents.

IV. Performance of Research Team

1. Three master students participate in this R&D

projects.

- Derivative technology report and R&D special issue, 1 in Chinese and 1 in English.
- Proposing National Science Council practical research project (cross-domain implementation) with partner Lijia Biotech Co., Ltd. - commercial mass production technology and clinical practice of canine and feline stem cell exosomes
- Commercialization of R&D results (knowhow) "Canine and feline adipose stem cell isolation method (TTN-113-021)" Technology transfer partner Lijia Biotech Co., Ltd.
- Commercialization of R&D results: High-concentration platelet plasma of dogs and cats, high-purity active dry powder

技術名稱	技術成品圖片	成果歸屬	說明
高濃度血小板血漿高純度活性冷凍乾燥技術		屏東科技大學	PRP生物製劑原料

Fig. 1: Product of PRP freeze-dried active preservation technology.

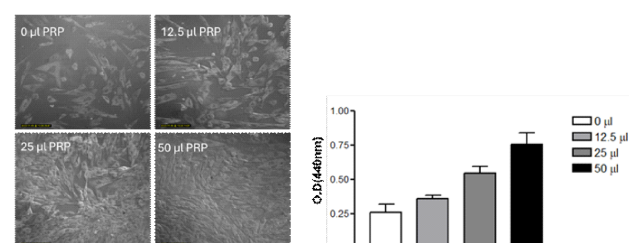


Fig. 2: Visible light microscope view and WST-1 spectrophotometry demonstrate that high-concentration platelet plasma high-purity active dry powder effectively stimulates the proliferation of adipose stem cell lines.

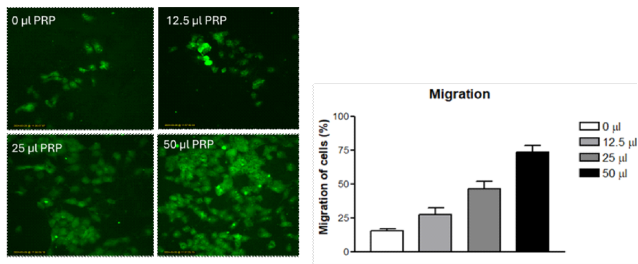


Fig. 3: Adipose-derived stem cells were cultured in the upper layer of a double-layer culture dish, and high-concentration platelet plasma high-purity active dry powder was added. The proportion of green fluorescent-stained adipose-derived stem cells that migrated to the lower culture dish was calculated under a fluorescent microscope. It was found that high-concentration platelet plasma high-purity active dry powder effectively stimulated the migration of adipose-derived stem cells.

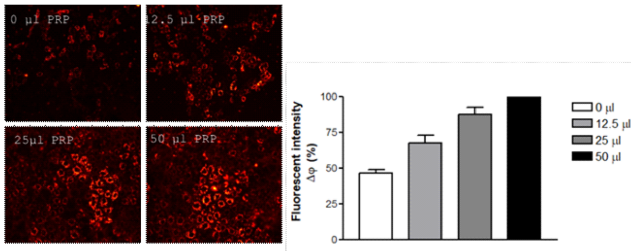


Fig. 4: Cryopreserved adipose-derived stem cell lines were cultured and high-concentration platelet plasma high-purity active dry powder was added to calculate the normal mitochondrial membrane potential $\Delta\Psi$ (red fluorescence density) under the fluorescence microscope. High-concentration platelet plasma high-purity active dry powder effectively stabilized the mitochondrial activity of the stem cell lines after thawing.