L-3-羥基丁酸於 H9c2 細胞株及大鼠組織內含量之分析

The Study of Endogenous Free L-3-Hydroxybutyrate in H9c2 Cell Line and Rat Tissues

中文摘要

本論文藉由螢光衍生化試劑搭配逆相高效能層析法，對大鼠各組織中 L-3 羥基丁酸進行定量。將 4、8、16 和 24 週大的 SD 雄鼠各組織離心後，取上清液與螢光衍生化試劑 4 nitro 7 piperazino 2,1,3 benzoxadiazole(NBD PZ)衍生，並利用 ODS 管柱和串聯的 OD-RH 管柱進行鏡像異構物的分離。結果發現又以八週大心臟中所定量的 L-3HB 含量較高(2.10 ± 1.10 μM)，而心臟除了 L-3HB 含量最高之外，所佔的比例也相當高(L%=28.56%)，僅次於比例最高的腎上腺(43.4%)。另外，以心肌 H9c2 細胞株外加 0-10 mM 不等的(D+L)-3HB、L 3HB、D 3HB 並培養 0, 2, 10 個小時後，測定在不同時間點細胞內 L-3HB 的含量。根據實驗結果，外加 2 mM D-3HB 培養十小時後，心肌細胞株中 L-3HB 會大量增加，代表 D-3HB 可能是 L-3HB 的前驅物。

英文摘要

The concentrations of L-3-hydroxybutyrate (L-3HB) in rat various tissues were determined by column-switching HPLC with pre-column fluorescence derivatization. The tissues of 4, 8, 16, 24-week-old male Sprague–Dawley rats were homogenized and the supernatants were derivatized with a fluorescent reagent, 4-nitro-7-piperazino-2,1,3-benzoxadiazole (NBD-PZ), then separated on an ODS column followed by two-OD-RH-connected chiral columns for enantioseparation. The results showed that the contents of L-3HB were highest in the heart (2.10 ± 1.10 μM, 8 weeks of age). In the adrenal gland, the percentage of L-3HB was found to compose as high as 43.4% of total 3HB, followed by 28.6% in heart homogenate. We further investigated L-3HB levels in heart-derived H9c2 cell line in the presence or absence of 0-10 μM (D+L)-3HB, L-3HB, D-3HB in the medium. After incubation with 2 mM D-3HB for 10 hrs, the concentration of L-3HB in the cells was increased significantly. The result suggests that D-3HB is a precursor of L-3HB.