Quantitative analysis of very small quantities of cultured cells

K. Sera[1], S. Goto[2], T. Hosokawa[2], Y. Saitoh[2] and T. Nagamine[3]

[1]Cyclotron Research Center, Iwate Medical University
348-58 Tomegamori, Takizawa, Iwate 020-0603, Japan

[2]Nishina Memorial Cyclotron Center, Japan Radioisotope Association
348-58 Tomegamori, Takizawa, Iwate 020-0603, Japan

[3]Graduate School of Health Sciences, Gunma University
3-39-22 Showa-machi, Mabashi, Gunma 371-8514, Japan

Abstract

Methods of quantitative elemental analysis of very small quantity of cultured cells were developed. First of all, an internal-standard method for the solution containing cells whose density is more than 1×10^6 cells / mL was established, and then a standard-free method for cultured cells was developed. It was confirmed that the method allows us to quantitatively analyze more than 25 elements in the samples containing only 20 thousand cells. Also, the methods for removing cultured cells from a flask were examined in order to improve accuracy and sensitivity of analysis, since the use of trypsin and PBS sometimes brings a large amount of sodium, phosphorus and potassium, which have direct effect upon accuracy of analysis based on the standard-free method. It was found that the method of removing cells with a scraper without using trypsin and PBS is the best manner. Also, the effects of using thinner backing materials were examined in order to improve sensitivity of analyses. It is expected that accurate analysis of samples containing nearly two thousand cells is possible on the basis of the standard-free method when using a thinner backing material.