

# SELF TARGETING NOVEL POLYMERIC DRUG DELIVERY SYSTEM FOR CANCER TREATMENT

Ramli, E <sup>1</sup>, Tan, SMJ <sup>2</sup>, Kiew, LV <sup>2</sup>, Sidik, K <sup>3</sup>, Cheong, SK <sup>4</sup>, Chung, LY <sup>1</sup>

<sup>1</sup> Department of Pharmacy & <sup>2</sup> Department of Pharmacology, Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia

<sup>3</sup> University of Illinois College of Medicine at Rockford, Rockford, IL 61107, USA

<sup>4</sup> IMU Clinical School, International Medical University, 70300 Seremban, Malaysia

## INTRODUCTION/OBJECTIVES

Polymer drug conjugation has attracted much attention as one of the novel techniques in minimising non-specific toxicity and improving tumour targeting of anticancer drugs. Among the known polymeric carriers, poly-L-glutamic acid (PG) has been found to possess relatively good potential as tumour targeting carrier that can significantly improve the efficacy of the conventional chemotherapeutics. However, few investigations have been carried out to study the biodistribution of PG based drug conjugates. Therefore, in this study, we investigated the effect of molecular weight on the biodistribution of PG in mice, as a preliminary step to correlate the *in vivo* tumour targeting property of PG to its pharmacokinetics profile.

## METHODOLOGY

Poly-L-glutamic acid (17 and 41 kDa) was conjugated to tritium labelled 2'-deoxycytidine (<sup>3</sup>H]-dC) to produce poly-L-glutamic-acid-[<sup>3</sup>H]-2'-deoxycytidine (PG-[<sup>3</sup>H]-dC) conjugate using carbodiimide reaction. PG-[<sup>3</sup>H]-dC was then injected into groups of tumour and non-tumour induced mice via the tail vein. The mice were sacrificed at time intervals, and the major organs removed. The organs were then homogenised, lyophilised and the radioactivity counted.

## RESULTS AND DISCUSSION

Significant and persistent accumulation of radiolabelled PG carrier was found in tumour tissues. This finding correlates well with previous findings on PG's ability in enhancing tumour targeting properties of chemotherapeutics. High levels of radiolabelled PG were also found in kidney and liver for a prolonged period compared to other tissues. The potential cytotoxic effect of the PG based drug conjugate on these organs must be considered. In addition, selective accumulation of PG in kidney and liver may indicate its potential to target therapeutic compounds to these organs.