Determination of the binding rate of Naringenin flavonoid to plasma proteins.

V. ZAMBOTI-SOUZA¹, L. LACHI-SILVA¹, E. KIMURA², A. DINIZ²

Pharmacy Depart. Of Maringá State University ¹ Graduate of Pharmacy course ² Researcher

**Introduction:** After the absorption, drugs are present bound or unbound to the plasmatic proteins. The binding rate of drug is essential to determine some pharmacokinetics parameters (SHARGEL, L.; Med. Pub. Div., 5ed., p.892, 2005). One of the most important plasmatic proteins is the albumin, which binds to several drugs, it has two binding sites called I and II (SUDLOW, G., Mol. Pharmacol., pp. 824, 1975). One of the flavonoids widely distributed in the plant kingdom is the naringenin which presents a variety of biological activities beneficial to human health (CARLO, G. D., Life Sci. 65, pp. 337, 1999), including the antitumor activity (SO, F.V., Nutr. Cancer 26, 167-81, 1996). In view of this, the present study evaluated the binding rate of the naringenin to human serum albumin and total plasma.

**Experimental Part:** Naringenin was added to the solution of human serum albumin (HSA) (0.19 g/ml - 1.7086x10⁻⁴ mM) or total human plasma, making the final concentration being 125 mg/ml (0.459 mM) of naringenin. The mixture was stirred by vortex for 3 minutes and then placed in a water bath at 37°C for 20 minutes. Sequentially, the sample was transferred to Amicon ® filters (Millipore) - 30 K and centrifuged at 10°C at 5600 rpm for 20 minutes. Naringenin concentration in the filtrate was quantified by HPLC-MS in previously validated method. Analyses of the binding rate to albumin was performed in true triplicate.

**Results:** No effect of the filter membranes over the pure naringenin solution, albumin or total plasma, was observed. The results showed that the percentage of free naringenin with albumin and total plasma, were, respectively 0.99 ± 0.05% and 3.52 ± 1.29%, and therefore the rate of binding to albumin was 99.01 %, and plasma of 96.48 %.

**Conclusion:** The technique has shown that the naringenin flavonoid has a high rate of binding to albumin and to other plasma proteins, with the albumin being the major protein in systemic distribution of this flavonoid.

**Acknowledgments:** Maringá State University and Bioequivalence Laboratory of UEM for support.