

## Tualang Honey Formulation as Potential Osteoarthritis Treatment: *In-vitro* Cytotoxicity Outcome

<sup>1</sup>Zulkifly, AH; <sup>2</sup>Nour El Huda, AR; <sup>1</sup>Mohd Jan, NH; <sup>1</sup>Mohamad Amri, NF; <sup>1</sup>Ibrahim, MZ; <sup>1</sup>Hassan, H; <sup>3</sup>Rajab, NF

<sup>1</sup>Department of Orthopaedics, Traumatology and Rehabilitation, Kulliyah of Medicine, International Islamic University Malaysia, Kuantan, Malaysia

<sup>2</sup>Department of Basic Medical Sciences, Kulliyah of Medicine, International Islamic University Malaysia, Kuantan, Pahang, Malaysia.

<sup>3</sup>Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

### INTRODUCTION:

Osteoarthritis (OA) is a degenerative joint disease affecting millions worldwide. In the orthopaedic field, viscosupplementation is widely used as an option treatment for pain relief among osteoarthritis patients as it acts as a lubricant in the joints. Tualang Honey Formulation (THF), a patented (patent no. MY179303-A) viscosupplement, is being investigated as a potential treatment for OA. This study aimed to evaluate the biocompatibility of THF by assessing cell viability upon exposure.

### MATERIALS & METHODS:

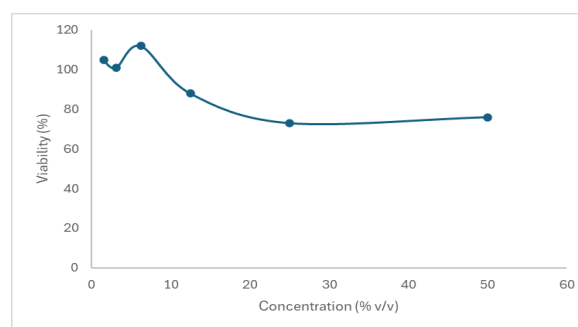
A dose-response cytotoxicity of THF was evaluated in V79-4 cells. The THF was dissolved in a two-times complete growth medium at the concentration of 50% v/v. A serial 2-fold dilution was carried out using a complete growth medium prior to exposure towards cells. Cells were exposed to serially diluted Tualang Honey Formulation (THF) concentrations (1.56% to 50% v/v) for 24 hours. The cytotoxicity was determined by accessing the cell viability through the reduction of tetrazolium salts (MTT). Cell viability was obtained by dividing the mean optical density (OD) values of the THF with the mean OD of negative control and multiplied by 100.

### RESULTS AND DISCUSSIONS:

V79-4 cells were used to study the cytotoxicity of THF. As shown in Table 1, the viability of the cell treated with the THF was more than 73% in all concentrations. Figure 1 shows the cell viability of THF at all concentrations. The outcomes of this study showed there was no toxicity for THF even at higher concentrations, which demonstrated that THF can be used safely and applied in OA as a potential viscosupplement.

**Table 1:** Optical density values and VT9-4 cell viability obtained after 24-hour exposure to THF and controls.

	Negative control	Positive control (10 mM)	FORMULATED TUALANG HONEY (% v/v)					
			1.56	3.13	6.25	12.5	25	50
OD (570 nm)	2.06	0.262	2.143	2.133	2.486	1.928	1.528	1.652
	2.327	0.24	2.455	2.288	2.36	1.926	1.594	1.648
	2.066	0.26	2.176	2.122	2.36	1.804	1.593	1.599
Mean	2.151	0.254	2.258	2.181	2.402	1.886	1.572	1.633
SD	0.15	0.01	0.17	0.09	0.07	0.07	0.04	0.03
Viability (%)	100	12	105	101	112	88	73	76



**Figure 1:** Viability of V79-4 cells at various concentrations of THF.

### CONCLUSION:

The present study revealed that THF did not demonstrate a cytotoxic effect when exposed to the cell. This outcome shows that THF is biocompatible and is a potential candidate for osteoarthritis treatment in future.

### REFERENCES:

- Muhammad AMS et al.; Review on the In Vitro Cytotoxicity Assessment in Accordance to the International Organization for Standardization (ISO); Mal J Med Health Sci 17(2): 261-269, April 2021.
- Carlos M.A et al.; Therapeutic Potential of Bioactive Compounds in Honey for Treating Osteoarthritis; Front. Pharmacol. doi: 10.3389/fphar.2021.642836.
- Andrew L.N et al.; In Vitro Viability and Cytotoxicity Testing and Same-Well Multi-Parametric Combinations for High Throughput Screening; Current Chemical Genomics, 2009, 3, 33-41.