

# 中山醫學大學 100 學年度博士班入學招生考試試題

## 營養學系博士班

考試科目：營養科學總論

時間：120 分鐘

※請注意本試題共( 2 )張，如發現頁數不足，應當場請求補齊，否則缺頁部份概以零分計算。第( 1 )頁

本試題共一大題，總分 100 分。

一、問答題：(100%)

1. 請解釋 glycemic index and glycemic load 及其間的差異 (10%)
2. What are the positive and negative consequences of hydrogenated oil? (10%)
3. What is metabolic syndrome? 對於此一族群患者，你有何建議，為什麼？ (15%)
4. 近來多項飲食建議包括 DASH (Dietary Approaches to Stop Hypertension) 飲食，建議每天吃一些核果 (nuts) 或種子，這些食物含有哪些成分對健康有何好處？請舉五種說明。(20%)
5. Free radicals 或 reactive oxygen (nitrogen) species 跟許多疾病的發生或發展有關，但究竟其中因果關係為何，尚存在許多爭議，你認為如果氧化壓力是體內某種疾病發展的重要原因，應該要符合哪些要件。(15%)
6. Please define probiotics and prebiotics. What are their possible benefits to human health? (10%)
7. 參考下列摘要，你認為目前營養與癌症有哪些重要的議題有待研究，並請擬定一個議題，簡單設計一個計畫探討。(20%)

### Abstract

The relationship between diet and cancer has advanced in recent years, but much remains to be understood with respect to diet and dietary components in cancer risk and prevention. Evidence from clinical trial outcomes, epidemiological observations, preclinical models and cell culture systems have all provided clues about the biology of cancer prevention. Sequencing of the human genome has opened the door to an exciting new phase for nutritional science. There are also many advances in our understanding of the control of gene expression in eukaryotic cells that might impact cancer development, including mechanisms regulating chromatin structure and dynamics, epigenetic processes (DNA methylation, histone posttranslational modification), transcription factors, and noncoding RNA and evidence suggests that environmental factors such as diet influence these processes. Unraveling the effects of bioactive food components on genes and their encoded proteins as well as identifying genetic influences on dietary factors is essential for identifying those who will and will not benefit from intervention strategies for cancer prevention. Additional research needs concerning diet and cancer prevention include: identification and validation of cancer biomarkers and markers of dietary exposure; investigation of the

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exposure/temporal relationship between food component intakes and cancer prevention; examination of possible tissue specificity in response to dietary factors; and examination of interactions among bioactive food components as determinants of response. Other emerging areas that require greater attention include understanding the link between obesity, diet and cancer, the interaction between diet and the microbiome, as well as how bioactive food components modulate inflammatory processes. Importantly, for the future of nutrigenomics, the "omics" (e.g., genomics, epigenomics, transcriptomics, proteomics, metabolomics) approach may provide useful biomarkers of cancer prevention, early disease, or nutritional status, as well as identify potential molecular targets in cancer processes that are modulated by dietary constituents and/or dietary patterns.