

SARDAR PATEL UNIVERSITY
Programme: M.Sc (Home Science)
Subject: Food Biotechnology
Semester: III
Syllabus with Effect from: June - 2013

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| Paper Code: PH03CFBT03 | Total Credit: 4 |
| Title Of Paper: Molecular Nutrition | |

| Unit | Description in detail | Weightage (%) |
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| I | Introduction to Molecular Nutrition: Concept of molecular nutrition opposed to 'classic' concept of nutrition. Gene regulation and nutrient-gene interaction. Types of regulation by nutrient. Research methods in molecular nutrition. Application of genomic and post-genomic technologies. | |
| II | The effect of nutrients on proliferation, differentiation and cell apoptosis. Nutritional regulation of cell proliferation and differentiation. Nutrients and apoptosis. Concrete example: nutritional regulation of gene expression in the intestinal epithelium and the physiological importance of said regulation. | |
| III | Role of nutrients and derivatives in gene expression and signal transduction: Gene expression by carbohydrates: effects on rate of transcription, processing and stability of mRNA. Gene expression by fats: effects on lipogenic enzymes and other proteins. Gene expression by amino acids: inhibition of growth through protein malnutrition. Gene expression by vitamins: Vitamins A and D. Gene regulation through minerals. Effects of nutrients on ubiquitination and proteolysis depending on proteasomes. Role of lipids in the signal transduction system. Action of TOR signalling cascade in response to nutrients. | |
| IV | Immuno-nutrition : Malnutrition and immune function. Obesity and immune system: role of leptin. Nutrients and immunity: essential amino acids, omega-3 fatty acids, vitamins and minerals. Examples of specific nutrients. | |
| V | The immune system associated to mucous and adverse food reactions. The role of mucous in the defence system: intestinal flora. Probiotic food and prebiotics: The intestinal immune system: intestinal barrier and its functions, the intestine as effector in inflammatory reactions. Control of absorption of antigens in the intestine. Oral tolerance and allergic sensitivity. Immunological reactions (allergies) and non-immunological reactions (intolerances) to foods. Causes, pathogenesis and symptoms of food allergies and intolerances. Allergens. | |

Basic Text & Reference Books:-

- Nutritional Genomics: Discovering the Path to Personalized Nutrition by Jim Kaput, Raymond L. Rodriguez, Willi Publications.
- Nutritional Genomics : Regina Brigelius -Flohe and Hans- Geory Joost, Willi Publication

