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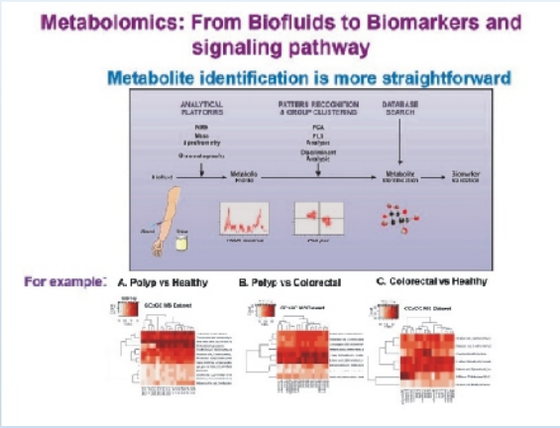
研究興趣

代謝症候群是一個嚴重的問題，它已經被證實增加了腫瘤發生的風險。代謝體學是一種新的研究技術可以增加了解代謝症候群與癌症之間的關係並提供關於癌症的新治療方式。

我的實驗室的研究主要是針對代謝症候群相關的癌症（胰臟癌，大腸癌和肝癌）進行研究。並利用液相色譜-質譜聯用儀（Liquid chromatographymass spectrometry; LC / Ms）的代謝體學分析技術，次世代分序（next generation Sequencing; NGS）與基因工程小鼠模型（$KRAS^{G12D}$，$Renin^{-/-}$，$ACE^{-/-}$，$ApoE^{-/-}$，db / db，ob / ob和$Ppargc1a^{-/-}$小鼠），我們採用系統性方法研究代謝症候群與癌症共同特定訊號路徑（IKKα和IKKβ，PI3K / Akt， STAT3和ER stress）。此外，我們使用蛋白質印跡，免疫組織化學，共聚焦顯微鏡 和FACS來驗證蛋白質表達和蛋白質相互作用。我實驗室的重點項目包括：

- 肥胖和糖尿病的分子和生化機制。我們專注於研究胰臟的β細胞，肌肉細胞和肝臟細胞中的骨橋蛋白（osteopontin; OPN），STAT3，IKKα和β-肌萎縮蛋白 (betatrophin)和糖尿病的發生機制。
- 研究第2型糖尿病和癌症的相關研究。研究糖尿病中的脂肪酸和氨基酸的改變和導致胰島素抵抗的的機制（第2型糖尿病與80%的胰臟癌，50%大腸癌和60%的HCC有關



- 利用代謝體學研究 “Warburg效應”。如何使癌細胞以不同於正常細胞的的代謝增加細胞癌性。目前，我們專注於PKM2和PGC-1在葡萄糖和脂肪酸代謝途徑中涉及腫瘤發生和癌症惡化的關係。
- 利用次世代分序方法研究癌症相關基因遺傳的變化，包括SNV及CNV與肥胖相關的癌症中的染色體重排的變化。

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Research Interests

Metabolic syndrome is a serious problem which heightens the risk of tumorigenesis. Metabolomics is a novel tool to understand of the link between metabolic syndrome and cancer and it may provide new insight about oncogenesis.

My laboratory research focuses on understanding of metabolic syndrome related cancer (pancreatic cancer, colorectal cancer, and hepatocellular carcinoma). By using mass spectrometry (LC/MS/MS) coupled with metabolomic profiling technologies, next generation sequencing (NGS), and genetically engineered mouse models (Patient-Derived Xenograft [PDX], $KRAS^{G12D}$, $Renin^{-/-}$, $ACE^{-/-}$, ApoE $^{-/-}$, db/db, ob/ob, and $Ppargc1a^{-/-}$ mice), we take a systems-level approach to study comprehensive metabolism and identify specific pathways (autophagy, inflammation (IKK α and IKK β), PI3K/Akt, STAT3, and ER stress) that are altered in connection with particular phenotypes in metabolic syndrome. In addition, I also used western blot, immunohistochemistry (IHC), confocal microscopy, LC/MS, and FACS to validate protein expression and protein interaction. The key projects in my laboratory include:

- *Molecular and biochemical mechanisms of obesity and diabetes.* We focus on osteopontin (OPN), STAT3, IKK α ,and betatrophin in pancreatic beta cells, muscle cells, and liver cells.
- *Investigating the mechanisms by which metabolic syndrome enhances tumorigenesis through fatty acid and amino acid metabolism.* It has been known that cancer results in alterations of fatty acid and amino acid homeostasis and the pathogenic events leading to insulin resistance in type 2 diabetes and cancer-associated diabetes (80% of pancreatic cancer, 50% of colorectal cancer, and 60% of HCC are associated diabetes). We focus on why Lecuin plays an important role in tumorigenesis and metastasis.
- *Determine how the "Warburg effect" involves cancer cells to metabolize nutrients differently than normal differentiated cells.* We focus on PKM2 and PGC-1 in the glucose and fatty acid metabolic pathway involved tumorigenesis.
- *Powerful target capture/NGS approach reveals oncogenic genes changes* including SNVs, CNVs and gross chromosomal rearrangements in obesity associated cancers.